

January 31, 2025

Subject:

2024 Annual Groundwater Monitoring and Corrective Action Report  
JH Cambell Power Plant  
Pond A

Enclosures:

<b>Document</b>	<b>Date</b>
CCR Annual Groundwater Report Requirements: § 257.90(e) Checklist for the JH Campbell Pond A CCR Unit	January 31, 2025
2024 Annual Groundwater Monitoring and Corrective Action Report, JH Campbell Power Plant Pond A CCR Unit. (TRC, January 31, 2025)	January 31, 2025

The attached document(s) are prepared in conformance with:

<b>Document</b>	<b>Date</b>
§257.90(e) of 40 CFR Part 257, Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments, under Subpart D of the Resource Conservation and Recovery Act (RCRA)	April 17, 2015

**CCR Annual Groundwater Report Requirements: § 257.90(e)**  
**Checklist for the JH Campbell Pond A CCR Unit**  
**2024 Annual Report**

Requirement	Reference
At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:  (1) 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;	Figure 2 <sup>(1)</sup>
(2) 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;	Section 2.1 <sup>(1)</sup> Note: No monitoring wells were installed or decommissioned during 2024.
(3) 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;	Section 2.2 <sup>(1)</sup> , Tables 3 and 4 <sup>(1)</sup>
(4) 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); and	Section 1.1 <sup>(1)</sup> Note: CCR unit remains in Assessment Monitoring and Corrective Measures
(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.	Section 2.0 <sup>(1)</sup> , Section 3.0 <sup>(1)</sup> , Section 4.0 <sup>(1)</sup>
(6) 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. At a minimum, the summary must specify all of the following: (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;	Section 1.0 <sup>(1)</sup>
(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;	Section 1.0 <sup>(1)</sup>
(iii) If it was determined that there was a statistically significant increase 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	Section 1.1 <sup>(1)</sup>
(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Section 1.1 <sup>(1)</sup>
(iv) If it was determined that there was a statistically significant level above the groundwater protection standard 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;	Section 1.1 <sup>(1)</sup> , Section 4.2 <sup>(1)</sup>
(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Section 1.1 <sup>(1)</sup>
(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	Not Applicable; Final remedy selection in progress
(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Section 4.2 <sup>(1)</sup>
(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	Section 4.3 <sup>(1)</sup> Note: Final remedy selection in progress
(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.	Not Applicable; Final remedy selection in progress

**Notes:**

(1) 2024 Annual Groundwater Monitoring and Corrective Action Report JH Campbell Power Plant Pond A CCR Unit. TRC. January 31, 2025.



# 2024 Annual Groundwater Monitoring and Corrective Action Report

**JH Campbell Power Plant  
Pond A CCR Unit**

**West Olive, Michigan**

January 2025

A handwritten signature in black ink, appearing to read "Sarah B. Holmstrom".

---

Sarah B. Holmstrom, P.G.  
Project Manager/Sr. Hydrogeologist

**Prepared For:**

Consumers Energy Company

**Prepared By:**

TRC  
1540 Eisenhower Place  
Ann Arbor, Michigan 48108

A handwritten signature in black ink, appearing to read "Graham Crookford".

---

Graham Crookford, C.P.G.  
Program Manager

## TABLE OF CONTENTS

<b>Executive Summary</b> .....	<b>iii</b>
<b>1.0 Introduction</b> .....	<b>1</b>
1.1 Program Summary .....	1
1.2 Site Overview .....	2
1.3 Geology/Hydrogeology.....	3
<b>2.0 Groundwater Monitoring</b> .....	<b>4</b>
2.1 Monitoring Well Network .....	4
2.2 Semiannual Groundwater Monitoring.....	4
2.2.1 Data Summary.....	5
2.2.2 Data Quality Review .....	5
2.2.3 Groundwater Flow Rate and Direction .....	5
<b>3.0 Statistical Evaluation</b> .....	<b>7</b>
3.1 Establishing Groundwater Protection Standards .....	7
3.2 Data Comparison to Groundwater Protection Standards.....	7
<b>4.0 Corrective Action</b> .....	<b>9</b>
4.1 Nature and Extent Groundwater Sampling .....	9
4.2 Assessment of Corrective Measures .....	10
4.3 Remedy Selection .....	10
<b>5.0 Conclusions and Recommendations</b> .....	<b>12</b>
<b>6.0 References</b> .....	<b>13</b>

### TABLES

Table 1	Summary of Groundwater Elevation Data
Table 2	Summary of Field Parameter Results
Table 3	Summary of Background Well Groundwater Sampling Results (Analytical)
Table 4	Summary of Pond A Groundwater Sampling Results (Analytical)
Table 5	Summary of Groundwater Protection Standard Exceedances – April 2024
Table 6	Summary of Groundwater Protection Standard Exceedances – October 2024
Table 7	Summary of Nature and Extent Groundwater Sampling Results (Analytical)

## FIGURES

Figure 1	Site Location Map
Figure 2	Site Plan with CCR Monitoring Well Locations
Figure 3	Groundwater Contour Map – April 2024
Figure 4	Groundwater Contour Map – October 2024

## APPENDICES

Appendix A	Laboratory and Field Data
Appendix B	Data Quality Reviews
Appendix C	April 2024 Assessment Monitoring Statistical Evaluation
Appendix D	October 2024 Assessment Monitoring Statistical Evaluation
Appendix E	Semiannual Progress Report

## Executive Summary

On behalf of Consumers Energy, TRC has prepared this report for the JH Campbell Pond A Coal Combustion Residual (CCR) unit to cover the period of January 1, 2024 to December 31, 2024. Pond A was in assessment monitoring at the beginning and at the end of the period covered by this report. Data that have been collected and evaluated in 2024 are presented in this report.

Consumers Energy first reported the potential for statistically significant increases (SSIs) for Appendix III constituents in the *Annual Groundwater Monitoring Report, JH Campbell Power Plant, Pond A CCR Unit*. The statistical evaluation of the Appendix III indicator parameters confirming SSIs over background were as follows:

- Boron at JHC-MW-15006, JHC-MW-15007, JHC-MW-15008, JHC-MW-15009, JHC-MW-15010, and JHC-MW-15011; and
- Sulfate at JHC-MW-15006, JHC-MW-15007, JHC-MW-15008, JHC-MW-15009, JHC-MW-15010, and JHC-MW-15011

On April 25, 2018, Consumers Energy entered assessment monitoring upon determining that an Alternate Source Demonstration for the Appendix III constituents was not successful. After subsequent sampling for Appendix IV constituents, Consumers Energy provided notification in the *Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g)* that arsenic was present at statistically significant levels above the federal groundwater protection standard (GWPS) established at 10 ug/L in one out of six downgradient monitoring wells at Pond A as follows:

- Arsenic at JHC-MW-15011.

The *Assessment of Corrective Measures (ACM)* was initiated on April 14, 2019, and was certified and submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on September 11, 2019, in accordance with the schedule in §257.96.

The ACM documents that the groundwater nature and extent has been defined, as required in §257.95(g)(1). Although arsenic concentrations exceed the GWPS in on-site groundwater, the property containing the site is owned and operated by Consumers Energy and on-site groundwater is not used for drinking water. Per §257.96(b), Consumers Energy is continuing to monitor groundwater in accordance with the assessment monitoring program as specified in §257.95. Overall, the assessment monitoring statistical evaluations show arsenic concentrations are declining and confirm that arsenic is the only Appendix IV constituent present at statistically significant levels above the federal GWPS. Groundwater monitoring downgradient from Pond A further demonstrates that there are currently no adverse effects on human health or the environment from either surface water or groundwater due to the CCR management at Pond A.

---

Remedy selection for Pond A, prescribed by the CCR Rule, is being undertaken in coordination with the EGLE Consent Agreement WMRPD No. 115-01-2018, which was executed on December 28, 2018. The January 2025 semiannual progress report describing the progress in selecting and designing the remedy required pursuant to §257.97(a) is included in this report. As documented in the *Pond A Construction Documentation and Certification Report*, Pond A was closed with final cover in place in the summer of 2019.

The general decrease in arsenic concentrations suggest that the pond closure continues to have an observable impact on groundwater quality. Changing concentrations indicate that the system is establishing a new equilibrium following source removal and that an alternate source is impacting groundwater monitoring in the Pond A well network. The groundwater management remedy for Pond A will be selected as soon as feasible to, at a minimum, meet the federal standards of §257.97(b) of the CCR Rule. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98, which includes semiannual assessment monitoring in accordance with §257.95 to monitor site groundwater conditions and inform the remedy selection. The next semiannual assessment monitoring events are scheduled to occur in the second and fourth calendar quarters of 2025.

## 1.0 Introduction

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule) (USEPA, April 2015 as amended). Standards for groundwater monitoring and corrective action codified in the CCR Rule (40 CFR 257.90 – 257.98), apply to the Consumers Energy Company (Consumers Energy) Pond A CCR Unit at the JH Campbell Power Plant Site (Pond A). Pursuant to the CCR Rule, no later than January 31, 2018, and annually thereafter, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of groundwater monitoring and corrective action for the preceding year in accordance with §257.90(e).

On behalf of Consumers Energy, TRC has prepared this Annual Groundwater Monitoring Report for Pond A to cover the period of January 1, 2024 to December 31, 2024. Pond A was in assessment monitoring at the beginning and at the end of the period covered by this report. Data that have been collected and evaluated in 2024 under §257.90 - §257.98 are presented in this report.

### 1.1 Program Summary

Consumers Energy first reported the potential for statistically significant increases (SSIs) for Appendix III constituents in the *Annual Groundwater Monitoring Report, JH Campbell Power Plant, Pond A CCR Unit* (TRC, January 2018). The statistical evaluation of the Appendix III indicator parameters confirming SSIs over background were as follows:

- Boron at JHC-MW-15006, JHC-MW-15007, JHC-MW-15008, JHC-MW-15009, JHC-MW-15010, and JHC-MW-15011; and
- Sulfate at JHC-MW-15006, JHC-MW-15007, JHC-MW-15008, JHC-MW-15009, JHC-MW-15010, and JHC-MW-15011.

As discussed in the *2018 Annual Groundwater Monitoring Report for the JH Campbell Power Plant Pond A CCR Unit* (2018 Annual Report) (TRC, January 2019), Consumers Energy initiated an Assessment Monitoring Program for Pond A pursuant to §257.95 of the CCR Rule on April 25, 2018 upon determining that an Alternate Source Demonstration for the Appendix III constituents was not successful. After subsequent sampling for Appendix IV constituents, Consumers Energy provided notification in the *Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g)* (Consumers Energy, January 2019) that arsenic was present at statistically significant levels above the federal groundwater protection standard (GWPS) established at 10 ug/L in one out of the six downgradient monitoring wells at Pond A as follows:

- Arsenic at JHC-MW-15011.

The CCR Rule 40 CFR §257.96(a) requires that an owner or operator initiate an assessment of corrective measures to prevent further release, to remediate any releases, and to restore impacted areas to original conditions if any Appendix IV constituent has been detected at a statistically significant level exceeding a GWPS. The *Assessment of Corrective Measures*



(ACM) (TRC, September 2019) was initiated on April 14, 2019, and was certified and submitted on September 11, 2019, in accordance with the schedule in §257.96.

The ACM documents that the groundwater nature and extent has been defined, as required in §257.95(g)(1), based on the site-specific hydrogeology and data collected from existing monitoring wells. Although arsenic concentrations exceed the GWPS in on-site groundwater, an evaluation of risk demonstrates that there are currently no adverse effects on human health or the environment from either surface water or groundwater due to CCR management at Pond A. In addition, Pond A was closed with final cover in place in the summer of 2019.

The groundwater management remedy for Pond A will be selected as soon as feasible to, at a minimum, meet the federal standards of §257.97(b) of the CCR Rule. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98, which includes semiannual assessment monitoring in accordance with §257.95. In addition to the semiannual assessment monitoring performed in accordance with §257.95, Consumers Energy is also conducting quarterly monitoring in accordance with the *Pond A Hydrogeological Monitoring Plan, JH Campbell Power Plant, West Olive, Michigan* (Pond A HMP) (TRC, March 2019; Revised July 2019), which includes the *Pond A Assessment Monitoring Plan* (Pond A AMP). Quarterly monitoring results are reported under a separate cover in accordance with the requirements of the Michigan Natural Resources and Environmental Protection Act, also known as Part 115 of PA 451 of 1994, as amended (a.k.a., Michigan Part 115 Solid Waste Management) and the Pond A HMP. This report covers the semiannual assessment monitoring performed in accordance with §257.95.

## 1.2 Site Overview

The JH Campbell Power Plant is a coal fired power generation facility located in West Olive, Michigan, on the eastern shore of Lake Michigan. It is bordered by the Pigeon River on the south, 156th Avenue on the east, and Croswell Street to the north with Lakeshore Drive bisecting the site from north to south. The power generating plant consists of three coal fired electric generating units located on the western side of the site and the CCR disposal area is on the east side of the site, east of Lakeshore Drive. Figure 1 is a site location map showing the facility and the surrounding area.

Currently, there are no remaining active CCR surface impoundments at the JH Campbell solid waste disposal facility. The CCR surface impoundments located within the former wet ash pond area are Pond 1-2 North and Pond 1-2 South Bottom Ash Ponds (collectively Ponds 1-2), Pond 3 North and Pond 3 South Bottom Ash Pond (collectively Pond 3), and Pond A. Site features are shown on Figure 2.

The surface impoundments in the wet ash pond areas were decommissioned starting in 2017 and replaced with concrete bottom ash treatment tanks. Dry ash from all of the generating units is stored in silos until it is placed into the Dry Ash Landfill or is sold and shipped off site. This report focuses on the Pond A CCR unit.

---

### 1.3 Geology/Hydrogeology

Groundwater is typically encountered at elevations ranging from 604 feet near the background wells (located to the north/northwest of the Dry Ash Landfill) to 590 feet along the southeast corner of the Dry Ash Landfill and south of the former Ponds 1-2 and Pond A CCR surface impoundments and generally flows to the south-southeast toward the Pigeon River. The subsurface materials encountered at the JH Campbell site generally consist of approximately 40 to 60 feet of poorly graded, fine-grained lacustrine sand. A laterally extensive clay-rich till is generally encountered within approximately 40 to 60 feet below ground surface (ft bgs) across the site that according to deep drilling logs conducted at the JH Campbell Power Plant (just west of the CCR units) is on the order of 80 feet thick and extends to the top of shale bedrock approximately 140 ft bgs.

---

## 2.0 Groundwater Monitoring

### 2.1 Monitoring Well Network

In accordance with 40 CFR 257.91, Consumers Energy established a groundwater monitoring system for Pond A, which currently consists of 11 monitoring wells (6 background monitoring wells and 5 downgradient monitoring wells) that are screened in the uppermost aquifer. The monitoring well locations are shown on Figure 2.

Six monitoring wells located north-northwest of the Dry Ash Landfill provide data on background groundwater quality that has not been affected by the CCR units (JHC-MW-15023 through JHC-MW-15028). Background groundwater quality data from these six background wells are additionally used for the CCR groundwater monitoring program at three other JH Campbell CCR units.

As documented in the *2021 Annual Groundwater Monitoring and Corrective Action Report for the JH Campbell Power Plant Pond A CCR Unit (2021 Annual Report)* (TRC, January 2022), the groundwater flow direction changed significantly following permanent discontinuation of hydraulic loading in June 2018 and completion of the final cover installation in 2019 such that groundwater mounding is no longer observed around Pond A and groundwater has equilibrated to a lower static water elevation. As a result, replacement monitoring wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed and monitoring wells JHC-MW-15007, JHC-MW-15009, JHC-MW-15010, and JHC-MW-15011 were decommissioned in July 2021. The groundwater monitoring network certification was included in the 2021 Annual Report. The Pond A monitoring well network currently includes five downgradient wells (JHC-MW-15006, JHC-MW-15007R, JHC-MW-15008R, JHC-MW-15009R, and JHC-MW-15011R) located south and southeast of Pond A.

No changes were made to the Pond A monitoring well network in 2024.

As shown on Figure 2, monitoring wells JHC-MW-15029 and JHC-MW-15030 are used for water level measurements only. Static water level data are collected at additional wells throughout the JH Campbell CCR units and used to construct a site-wide groundwater contour map.

### 2.2 Semiannual Groundwater Monitoring

Per §257.95, all wells in the CCR unit monitoring program must be sampled at least semiannually. One semiannual event must include analysis for all constituents from Appendix III and Appendix IV and one semiannual event may include analysis for all constituents in Appendix III and those constituents in Appendix IV of the CCR Rule that were detected during prior sampling. In addition to the Appendix III and IV constituents, field parameters including dissolved oxygen, oxidation reduction potential, specific conductivity, temperature, and turbidity were collected at each well. Samples were collected and analyzed in accordance with the *Sample and Analysis Plan* for JH Campbell Power Plan Pond A (SAP) (TRC, January 2021).

### **2.2.1 Data Summary**

The first semiannual groundwater assessment monitoring event for 2024 was performed on April 15 through 17, 2024 and the second semiannual groundwater assessment monitoring event for 2024 was performed on October 14 through 16, 2024. Both events were performed by Consumers Energy. Samples were analyzed by Consumers Energy Laboratory Services in Jackson, Michigan, with radium samples analyzed by Eurofins Environmental Testing in Earth City, Missouri, in accordance with the SAP. Static water elevation data were collected at all monitoring well locations. Groundwater samples were collected from the background monitoring wells and Pond A monitoring wells for the Appendix III and Appendix IV constituents and field parameters.

A summary of the groundwater data collected during the April and October 2024 events are provided on Table 1 (static groundwater elevation data), Table 2 (field data), Table 3 (background well analytical results), and Table 4 (Pond A analytical results). Sample data, including laboratory reports and field data, are included in Appendix A.

### **2.2.2 Data Quality Review**

Data from each round were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the CCR monitoring program. The data quality reviews are summarized in Appendix B.

### **2.2.3 Groundwater Flow Rate and Direction**

Groundwater elevation data collected site-wide during the 2024 semiannual assessment monitoring events were generally similar to data collected previously since the background sampling events commenced in December 2015. The data showed that groundwater within the uppermost aquifer generally flows to the south-southeast across the site, with a southwesterly groundwater flow component on the western edge of the site. Groundwater flow in the immediate vicinity of Pond A is predominately toward the south-southeast, consistent with previous assessment monitoring events completed after pond closure. The groundwater mounding previously observed in the immediate vicinity of Pond A early on in the program is no longer apparent subsequent to completing decommissioning activities in Summer 2019.

Groundwater elevations measured across the site during the April and October 2024 events are provided on Table 1. April and October 2024 groundwater elevations were used to construct the groundwater contour maps provided on Figure 3 and Figure 4, respectively. The average hydraulic gradient for each sampling event was calculated using the following well pairs: JHC-MW-15026/PZ-23S, JHC-MW-15017/PZ-24S, and JHC-MW-15024/JHC-MW-15031 (Figure 2). The average hydraulic gradient was 0.0036 ft/ft in April 2024 and 0.0034 in October 2024. Using the mean hydraulic conductivity of 62 ft/day (ARCADIS, 2016) and an assumed effective porosity of 0.4, the estimated average seepage velocity is approximately 0.55 ft/day or 200 ft/year for the April 2024 event, and approximately 0.53 ft/day or 190 ft/year for the October 2024 event.

---

The general groundwater flow direction is similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix IV constituents that could potentially migrate from Pond A.

### 3.0 Statistical Evaluation

Assessment monitoring is continuing at Pond A, while corrective measures are further evaluated in accordance with §257.96 and §257.97 as outlined in the ACM. The following section summarizes the statistical approach applied to assess the 2024 groundwater data in accordance with the assessment monitoring program. The statistical evaluation details are provided in Appendix C (*Statistical Evaluation of April 2024 Assessment Monitoring Sampling Event*) and Appendix D (*Statistical Evaluation of October 2024 Assessment Monitoring Sampling Event*).

#### 3.1 Establishing Groundwater Protection Standards

The federal Appendix IV GWPSs are used to assess whether Appendix IV constituent concentrations are present in groundwater at unacceptable levels as a result of CCR Unit operations by statistically comparing concentrations in the downgradient wells to the GWPSs for each Appendix IV constituent. The calculation of the GWPSs is documented in the Groundwater Protection Standards technical memorandum included in Appendix C of the 2018 Annual Report.

#### 3.2 Data Comparison to Groundwater Protection Standards

Consistent with the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009), the preferred method for comparisons to a fixed standard are confidence limits. An exceedance of the standard occurs when the 99 percent lower confidence limit of the downgradient data exceeds the GWPS. As documented in the January 14, 2019 *Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g)*, arsenic was present at statistically significant levels above the GWPSs in one of the downgradient wells at Pond A based on the statistical data comparison for the initial semiannual assessment monitoring event (June 2018). Therefore, Consumers Energy initiated the ACM. Assessment monitoring is ongoing.

Arsenic was identified at downgradient monitoring well JHC-MW-15011 at statistically significant levels exceeding the GWPS during the initial assessment monitoring event conducted in June 2018. Arsenic at JHC-MW-15011/R (combined dataset from the original well and the replacement well as denoted by the "/R") continued to be present at statistically significant levels at or above the GWPS through second quarter 2021. As shown in the data tables and trend tests included in Appendix B and Appendix C, arsenic concentrations at JHC-MW-15011/R declined in 2020 and 2021 such that the arsenic concentration at JHC-MW-15011R was below the GWPS in fourth quarter 2021 and second quarter 2022 and the lower confidence limit (LCL) for JHC-MW-15011/R has been below the GWPS since the second semiannual event of 2021. A slight rebound was observed in 2022, with the fourth quarter 2022 arsenic concentration being slightly above the GWPS; however, the second quarter 2023 through fourth quarter 2024 arsenic concentrations were once again below the GWPS and the LCL remains below the GWPS. No other Appendix IV constituents have been detected at statistically significant levels above the GWPS. Select Appendix IV constituents, including arsenic at JHC-MW-15006 and selenium at JHC-MW-15009R and JHC-MW-15011R, have been detected at concentrations above the GWPS; however, these detections are not statistically significant, i.e., the LCL

remains below the GWPS.

The statistical data comparison for the April 2024 (Appendix C) and October 2024 (Appendix D) semiannual assessment monitoring events indicate that no Appendix IV constituents were present at statistically significant levels exceeding the GWPSs.

The decrease in arsenic concentrations since 2019 demonstrates the effectiveness of the cap on addressing the arsenic concentrations associated with operations at Pond A. However, as the groundwater flow regime has changed and Pond A has been dewatered with site conditions stabilized through capping, changes in groundwater concentrations for Appendix III and Appendix IV constituents within the Pond A monitoring network associated with influence from historical Ponds B-K are being observed post-closure. Trends continue to be monitored and statistical significance relative to applicable GWPSs continues to be evaluated during the post-closure period as groundwater continues to reach its new equilibrium and groundwater travel times allow upgradient Ponds B-K groundwater to fully reach the entire Pond A well network.

A summary of the confidence intervals for April 2024 and October 2024 are provided in Table 5 and Table 6, respectively.

## 4.0 Corrective Action

Consumers Energy provided notification in January 2019 that arsenic was present at statistically significant levels above the federal GWPS established at 10 ug/L in one out of the six downgradient monitoring wells at Pond A as follows:

- Arsenic at JHC-MW-15011.

The CCR Rule 40 CFR §257.96(a) requires that an owner or operator initiate an assessment of corrective measures to prevent further release, to remediate any releases, and to restore impacted areas to original conditions if any Appendix IV constituent has been detected at a statistically significant level exceeding a GWPS. The ACM was initiated on April 14, 2019, and was certified and submitted to the EGLE on September 11, 2019, in accordance with the schedule in §257.96.

### 4.1 Nature and Extent Groundwater Sampling

Per §257.95(g)(1), in the event that the facility determines, pursuant to §257.93(h), that there is a statistical exceedance of the GWPSs for one or more of the Appendix IV constituents, the facility must characterize the nature and extent of the release of CCR as well as any site conditions that may affect the remedy selected. The nature and extent data consist of Appendix III and IV constituents collected from the background and downgradient CCR monitoring well networks and from supplemental downgradient wells in the Pond A HMP monitoring well network. Nature and extent sampling in 2024 included shallow temporary step-out wells TW-19-05 and TW-19-06A in addition to wells and parameters monitored as part of the Pond A HMP and nature and extent sampling program at MW-14S, PZ-23S, PZ-24, PZ-24S, PZ-40, and PZ-40S. Locations of the monitoring wells used for nature and extent groundwater sampling are shown on Figure 2. A summary of the nature and extent groundwater data collected in 2024 are provided on Table 7. The soil boring logs and well construction diagrams for the step out monitoring wells utilized for the nature and extent groundwater sampling are included in the *2019 Annual Groundwater Monitoring and Corrective Action Report and Fourth Quarter 2019 Hydrogeological Monitoring Report, JH Campbell Power Plant, Pond A CCR Unit (2019 Annual Report)* (TRC, January 2020).

As discussed in the ACM, the nature and extent of contamination (e.g. arsenic in groundwater) relative to GWPSs has been defined per the RCRA CCR Rule requirements based on the site-specific hydrogeology. The presence of nearby surface water bodies (Recirculation Pond and the Pigeon River) as well as the unimpacted background monitoring wells to the north provide the boundaries for the extent of the GWPS exceedances. This was further confirmed by the additional 2021 grab groundwater sampling data that shows arsenic is well below the GWPS at all five of the soil boring locations immediately downgradient from Pond A as detailed in the 2021 Annual Report. In addition, the underlying clay unit prevents the downward vertical migration of groundwater. Although Michigan Part 201 residential drinking water criteria are exceeded, there are no onsite drinking water wells downgradient from Pond A and the closest downgradient drinking water wells are located south and east of the Pigeon River, separated hydraulically by the river. Shallow groundwater has the potential to vent to nearby surface water boundaries that are not used for drinking water. Although several Appendix III and IV



constituents exceed the Michigan Part 201 generic groundwater-surface water interface (GSI) criteria in on-site wells, compliance for the GSI pathway is currently met based on data collected from the supplemental Pond A HMP wells and the National Pollutant Discharge Elimination System (NPDES) outfall at the Recirculation Pond. Compliance for the GSI pathway will continue to be monitored in accordance with the EGLE-approved Pond A AMP.

## 4.2 Assessment of Corrective Measures

The ACM was submitted on September 11, 2019, as a step towards developing a final remedy.

Several groundwater remediation alternatives evaluated in the ACM are considered technically feasible to reduce on-site groundwater concentrations. The following corrective measures were retained for further evaluation in conjunction with closure in place for Pond A:

- Groundwater Monitoring and Institutional Controls;
- Post Source Control/Removal Monitoring;
- Groundwater Capture/Control;
- Impermeable Barrier with Groundwater Capture/Control;
- Active Geochemical Sequestration; and
- Passive Geochemical Sequestration.

Consumers Energy is following an adaptive management strategy for selecting the final groundwater remedy for Pond A in conjunction with the specified CCR source material management strategies discussed in the ACM. Under this remedy selection strategy, measures that remove source material, reduce infiltration, and/or minimize the potential for future migration during the closure process may be implemented to address existing conditions followed by monitoring and evaluation of the performance after closure. Adjustments will be made to the corrective measure remedy, as needed, to achieve the remedial goals.

## 4.3 Remedy Selection

Remedy selection for Pond A, prescribed by the CCR Rule, is being undertaken in coordination with the EGLE Consent Agreement WMRPD No. 115-01-2018, which was executed on December 28, 2018. The January 2025 semiannual progress report describing the progress in selecting and designing the remedy required pursuant to §257.97(a) is included in Appendix E of this report. Pond A has been closed according to the *JH Campbell Generating Facility Pond A Closure Plan, West Olive, Michigan* (Golder, October 2016) and the updated closure plan detailing the final cover system that was submitted to the EGLE in February 2019. Pond A was closed with waste in place in accordance with the requirements for CCR landfills under RCRA (§257.102(d)). Cover construction was completed in summer 2019 and the *Construction Documentation and Certification Report* (Golder, October 2019) was approved by the EGLE on November 25, 2019.

Changes in groundwater chemistry continue to be evaluated following the completion of capping at Pond A. The arsenic exceedance at JHC-MW-15011, which initially triggered corrective action, continues to attenuate following the completion of the final cover for Pond A. Since the

---

installation of the final cover, groundwater monitoring data for several other constituents indicate an observable influence from immediately adjacent, upgradient, closed, pre-existing units. Remedial action for the upgradient units is being taken under Consent Agreement WMRPD No. 115-01-2018.

---

## 5.0 Conclusions and Recommendations

Assessment monitoring is ongoing at the Pond A CCR unit while corrective action continues to be assessed. Pond A has been closed in place. Overall, the statistical evaluations have confirmed that arsenic is the only Appendix IV constituent to have shown a statistically significant concentration above the GWPSs throughout the assessment monitoring program (2018-2024). In 2024, the statistical evaluation indicated that there were no statistically significant exceedances of the GWPS.

The ACM also documents that groundwater nature and extent have been defined, as required in §257.95(g)(1). Although arsenic concentrations exceed the GWPS in individual wells or samples on-site, concentrations are generally declining, and an evaluation of risk demonstrates that there are currently no adverse effects on human health or the environment from either surface water or groundwater due to CCR management at Pond A.

The ACM report provides a high-level assessment of groundwater remediation technologies that could potentially address site-specific constituents of concern (i.e. arsenic) under known groundwater conditions. Changes in groundwater chemistry following the completion of capping at Pond A indicate that the system is establishing a new equilibrium following closure and that the immediately upgradient closed CCR units are impacting groundwater quality in the Pond A well network.

The groundwater management remedy for Pond A will be selected as soon as feasible to, at a minimum, meet the federal standards of §257.97(b) of the CCR Rule. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98. The next semiannual monitoring events are scheduled for the second and fourth calendar quarters of 2025.

---

## 6.0 References

- Consumers Energy. January 14, 2019. Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g).
- Golder Associates Inc. March 22, 2019. J.H. Campbell Generating Facility, Pond A Construction Quality Assurance (CQA) Plan. Prepared for Consumers Energy Company.
- Golder Associates Inc. March 8, 2019; Revised March 27, 2019. J.H. Campbell Generating Facility, Pond A Closure Plan. Prepared for Consumers Energy Company.
- Golder Associates Inc. October 1, 2019. J.H. Campbell Generating Facility, Pond A – Construction Documentation and Certification Report. Submitted to Consumers Energy Company.
- TRC. January 2018. Annual Groundwater Monitoring Report, JH Campbell Power Plant, Pond A CCR Unit, West Olive, Michigan. Prepared for Consumers Energy Company.
- TRC. January 2019. 2018 Annual Groundwater Monitoring Report, JH Campbell Power Plant, Pond A CCR Unit, West Olive, Michigan. Prepared for Consumers Energy Company.
- TRC. March 2019; Revised July 2019. Pond A Hydrogeological Monitoring Plan, JH Campbell Power Plant, West Olive, Michigan. Prepared for Consumers Energy Company.
- TRC. September 2019. Assessment of Corrective Measures, JH Campbell Ponds 1-2 North and 1-2 South and Pond A Coal Combustion Residual Units, West Olive, Michigan. Prepared for Consumers Energy Company.
- TRC. January 2020. 2019 Annual Groundwater Monitoring and Corrective Action Report and Fourth Quarter 2019 Hydrogeological Monitoring Report, JH Campbell Power Plant, Pond A CCR Unit, West Olive, Michigan. Prepared for Consumers Energy.
- TRC. January 2021. Sample and Analysis Plan, Electric Generation Facilities RCRA CCR Assessment Monitoring Program, JH Campbell Power Plant Pond A, West Olive, Michigan. Prepared for Consumers Energy.
- TRC. January 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report for the JH Campbell Power Plant Pond A CCR Unit, West Olive, Michigan. Prepared for Consumers Energy.
- USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.

## Tables

**Table 1**  
**Summary of Groundwater Elevation Data**  
**JH Campbell – RCRA CCR Monitoring Program**  
**West Olive, Michigan**

Well Location	Ground Surface Elevation (ft)	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)		April 15, 2024		October 14, 2024		
						Depth to Water (ft BTOC)	Groundwater Elevation (ft)	Depth to Water (ft BTOC)	Groundwater Elevation (ft)	
<b>Background</b>										
JHC-MW-15023	617.01	619.98	Sand	603.0	to	593.0	17.96	602.02	20.00	599.98
JHC-MW-15024	613.79	616.62	Sand	606.8	to	596.8	13.68	602.94	15.46	601.16
JHC-MW-15025	614.14	617.17	Sand	607.1	to	597.1	13.20	603.97	14.91	602.26
JHC-MW-15026	615.09	618.04	Sand	607.1	to	597.1	15.19	602.85	16.76	601.28
JHC-MW-15027	614.77	617.30	Sand	604.8	to	594.8	15.80	601.50	17.40	599.90
JHC-MW-15028	611.02	613.80	Sand	603.0	to	593.0	16.57	597.23	17.26	596.54
JHC-MW-15029	608.08	610.95	Sand	600.1	to	590.1	12.82	598.13	14.46	596.49
JHC-MW-15030	604.05	607.17	Sand	600.1	to	590.1	10.51	596.66	12.01	595.16
<b>Pond 1N, 1S, 2N, 2S</b>										
JHC-MW-15001	607.02	609.53	Sand	603.5	to	598.5	NM		NM	
JHC-MW-15002	618.18	621.27	Sand	590.2	to	580.2	24.50	596.77	NM	
JHC-MW-15003	623.16	627.20	Sand	595.2	to	585.2	32.69	594.51	NM	
JHC-MW-15005	606.22	609.99	Sand	579.2	to	569.2	18.13	591.86	NM	
JHC-MW-18004	602.92	605.72	Sand	596.9	to	586.9	11.37	594.35	NM	
JHC-MW-18005	600.30	603.16	Sand	595.3	to	585.3	10.30	592.86	NM	
JHC-MW-22001	601.52	604.28	Sand	596.5	to	586.5	10.68	593.60	NM	
<b>Pond 3N, 3S</b>										
JHC-MW-15013	632.40	635.25	Sand	604.4	to	594.4	35.39	599.89	NM	
JHC-MW-15015	632.46	635.20	Sand	604.5	to	594.5	34.96	600.24	NM	
JHC-MW-15016	631.81	632.52	Sand	603.8	to	593.8	32.42	600.10	NM	
JHC-MW-18001	609.09	611.98	Sand	603.1	to	593.1	12.26	599.72	NM	
JHC-MW-18002	605.53	608.93	Sand	602.0	to	592.0	9.09	599.84	NM	
JHC-MW-18003	605.36	608.78	Sand	601.9	to	591.9	9.00	599.78	NM	
<b>Landfill</b>										
JHC-MW-15017	613.69	616.61	Sand	603.7	to	593.7	16.80	599.81	18.11	598.50
JHC-MW-15018	614.26	617.02	Sand	604.3	to	594.3	17.47	599.55	18.65	598.37
JHC-MW-15022	620.92	623.79	Sand	597.9	to	587.9	NM		NM	
JHC-MW-15031	632.94	635.87	Sand	599.9	to	589.9	43.70	592.17	44.41	591.46
JHC-MW-15032	611.32	614.29	Sand	598.3	to	588.3	17.03	597.26	18.74	595.55
JHC-MW-15033	618.08	620.99	Sand	602.1	to	592.1	NM		NM	
JHC-MW-15034	612.90	615.97	Sand	601.9	to	591.9	18.70	597.27(3)	17.83	598.14
JHC-MW-15035	632.53	634.28	Sand	599.5	to	589.5	41.31	592.97	42.01	592.27
JHC-MW-15036	617.94	618.34	Sand	597.9	to	587.9	27.01	591.33	28.31	590.03
JHC-MW-15037	614.28	616.06	Sand	591.3	to	586.3	25.27	590.79	26.10	589.96
MW-B3	630.51	634.17	Sand	598.5	to	593.5	39.05	595.12	39.70	594.47
MW-B4	633.80	635.67	Sand	593.8	to	588.8	41.75	593.92	42.41	593.26
<b>Pond A</b>										
JHC-MW-15006	624.74	627.58	Sand	599.7	to	589.7	35.10	592.48	36.54	591.04
JHC-MW-15007R <sup>(2)</sup>	625.73	628.26	Sand	595.7	to	585.7	36.14	592.12	37.69	590.57
JHC-MW-15008R <sup>(1)</sup>	632.32	634.67	Sand	597.3	to	587.3	43.08	591.59	44.65	590.02
JHC-MW-15009R <sup>(2)</sup>	632.15	635.05	Sand	595.2	to	585.2	43.29	591.76	44.54	590.51
JHC-MW-15011R <sup>(2)</sup>	627.73	629.79	Sand	594.7	to	584.7	37.60	592.19	38.68	591.11
<b>Downgradient Wells</b>										
MW-13	593.40	595.37	Clayey Silt	587.9	to	585.4	9.98	585.39	Dry	
MW-14S	587.36	590.98	Sand	582.9	to	577.9	11.02	579.96	11.18	579.80
PZ-23S	602.84	604.97	Sand	591.8	to	586.8	15.09	589.88	15.94	589.03
PZ-24S	586.56	590.15	Sand	584.6	to	579.6	7.77	582.38	9.75	580.40
PZ-40S	589.51	593.25	Sand	585.5	to	575.5	10.83	582.42	13.07	580.18
TW-19-05	603.44	606.36	Sand	592.8	to	587.8	15.69	590.67	17.63	588.73
TW-19-06A	599.61	602.54	Sand	592.3	to	587.3	12.78	589.76	14.62	587.92

**Notes:**  
Survey conducted by Nederveld, November 2015, October 2018, December 2018, August 2019, and July 2021.  
Elevation in feet relative to North American Vertical Datum 1988 (NAVD 88).  
TOC: Top of well casing.  
ft BTOC: Feet below top of well casing.  
NM: Not measured  
(1) JHC-MW-15008R installed in June 2019.  
(2) JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R installed in July 2021.

**Table 2**  
 Summary of Field Parameters  
 JH Campbell Pond A - RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
<b>JH Campbell Background</b>							
JHC-MW-15023	4/15/2024	2.48	253.9	5.9	143	10.3	2.2
	10/14/2024	0.65	194.8	6.5	135	12.1	1.6
JHC-MW-15024	4/15/2024	2.67	174.5	7.5	286	9.4	2.1
	10/14/2024	0.67	178.4	7.9	328	12.1	1.8
JHC-MW-15025	4/15/2024	4.27	237.9	7.9	422	9.3	1.6
	10/14/2024	3.29	153.0	8.0	420	11.3	2.6
JHC-MW-15026	4/15/2024	6.91	350.0	5.8	34	10.4	2.7
	10/15/2024	4.05	316.2	5.9	46	11.9	2.3
JHC-MW-15027	4/15/2024	9.61	235.3	6.5	107	10.6	9.3
	10/15/2024	8.34	280.0	7.4	154	12.5	2.9
JHC-MW-15028	4/15/2024	8.25	148.4	8.5	102	12.7	3.5
	10/15/2024	8.20	225.1	8.7	109	13.4	3.5
<b>JH Campbell Pond A</b>							
JHC-MW-15006	4/16/2024	1.09	68.8	8.0	589	14.8	1.2
	10/14/2024	0.66	95.3	8.5	554	14.2	1.3
JHC-MW-15007R	4/16/2024	1.81	61.0	8.0	547	14.7	2.1
	10/14/2024	0.63	63.1	8.1	671	13.7	1.6
JHC-MW-15008R	4/16/2024	2.01	196.6	7.2	541	14.8	1.6
	10/14/2024	1.44	190.3	7.3	649	13.8	1.4
JHC-MW-15009R	4/16/2024	2.31	231.2	6.9	571	14.1	1.9
	10/14/2024	0.70	170.6	7.0	463	13.4	1.5
JHC-MW-15011R	4/16/2024	0.98	132.6	7.0	436	14.0	1.7
	10/14/2024	0.49	69.5	6.9	399	13.3	1.0

**Notes:**

mg/L - Milligrams per Liter.  
 mV - Millivolts.  
 SU - Standard Units.  
 umhos/cm - Micromhos per centimeter.  
 °C - Degrees Celsius.  
 NTU - Nephelometric Turbidity Unit

**Table 3**  
 Summary of Groundwater Sampling Results (Analytical)  
 JH Campbell Background - RCRA CCR Monitoring Program  
 West Olive, Michigan

		Sample Location:				JHC-MW-15023		JHC-MW-15024		JHC-MW-15025	
		Sample Date:				4/15/2024	10/14/2024	4/15/2024	10/14/2024	4/15/2024	10/14/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^						
<b>Appendix III<sup>(1)</sup></b>											
Boron	ug/L	NC	500	500	7,200	46	27	26	< 20	26	21
Calcium	mg/L	NC	NC	NC	500 <sup>EE</sup>	15.6	12.9	26.1	28.2	37.5	37.1
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	6.80	4.57	13.5	26.8	50.3	43.3
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	15.5	11.3	7.49	8.10	9.14	12.0
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	105	84	155	174	242	215
pH, Field	SU	<b>6.5 - 8.5**</b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 9.0</b>	<b>5.9</b>	6.5	7.5	7.9	7.9	8.0
<b>Appendix IV<sup>(1)</sup></b>											
Antimony	ug/L	6	6.0	6.0	130	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	2,000	2,000	820	48	24	17	17	9	10
Beryllium	ug/L	4	4.0	4.0	18	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	3.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	39	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	< 10	< 10	< 10	< 10	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	3,200	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	< 0.171	< 0.137	< 0.154	< 0.178	< 0.183	0.128
Radium-228	pCi/L	NC	NC	NC	NC	< 0.591	< 0.541	< 0.656	< 0.601	0.597	0.586
Radium-226/228	pCi/L	5	NC	NC	NC	< 0.591	0.546	< 0.656	< 0.601	0.607	0.714
Selenium	ug/L	50	50	50	5.0	< 1	< 1	1	< 1	< 1	< 1
Thallium	ug/L	2	2.0	2.0	3.7	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

\* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.

\*\* - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using site-specific hardness of 180 mg CaCO<sub>3</sub>/L as measured at surface water sample SW-01 collected on April 9, 2018 from the Pigeon River. Chromium GSI criterion based on hexavalent chromium per footnote {H}.

# - If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

<sup>E</sup> - Criterion is the aesthetic drinking water value per footnote {E}.

<sup>EE</sup> - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

**BOLD** value indicates an exceedance of one or more of the listed criteria.

**RED** value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.



**Table 3**  
 Summary of Groundwater Sampling Results (Analytical)  
 JH Campbell Background - RCRA CCR Monitoring Program  
 West Olive, Michigan

		Sample Location:				JHC-MW-15026		JHC-MW-15027		JHC-MW-15028	
		Sample Date:				4/15/2024	10/15/2024	4/15/2024	10/15/2024	4/15/2024	10/15/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^						
<b>Appendix III<sup>(1)</sup></b>											
Boron	ug/L	NC	500	500	7,200	< 20	< 20	25	22	< 20	< 20
Calcium	mg/L	NC	NC	NC	500 <sup>EE</sup>	3.14	4.28	13.1	18.7	13.6	15.0
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	1.58	3.07	< 1.00	1.27	< 1.00	< 1.00
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	5.85	7.24	5.02	4.79	4.12	5.23
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	29	27	84	75	62	62
pH, Field	SU	<b>6.5 - 8.5**</b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 9.0</b>	<b>5.8</b>	<b>5.9</b>	6.5	7.4	8.5	<b>8.7</b>
<b>Appendix IV<sup>(1)</sup></b>											
Antimony	ug/L	6	6.0	6.0	130	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	2,000	2,000	820	8	9	20	8	5	6
Beryllium	ug/L	4	4.0	4.0	18	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	3.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	< 1	1	< 1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	39	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	< 10	< 10	< 10	< 10	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	3,200	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	< 0.148	< 0.109	0.206	< 0.0985	< 0.239	< 0.116
Radium-228	pCi/L	NC	NC	NC	NC	< 0.562	< 0.617	1.03	0.828	< 0.628	< 0.566
Radium-226/228	pCi/L	5	NC	NC	NC	< 0.562	< 0.617	1.24	0.887	< 0.628	< 0.566
Selenium	ug/L	50	50	50	5.0	< 1	< 1	< 1	< 1	< 1	< 1
Thallium	ug/L	2	2.0	2.0	3.7	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

\* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.

\*\* - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using site-specific hardness of 180 mg CaCO<sub>3</sub>/L as measured at surface water sample SW-01 collected on April 9, 2018 from the Pigeon River. Chromium GSI criterion based on hexavalent chromium per footnote {H}.

# - If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

<sup>E</sup> - Criterion is the aesthetic drinking water value per footnote {E}.

<sup>EE</sup> - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

**BOLD** value indicates an exceedance of one or more of the listed criteria.

**RED** value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

**Table 4**  
**Summary of Groundwater Sampling Results (Analytical)**  
**JH Campbell Pond A - RCRA CCR Monitoring Program**  
**West Olive, Michigan**

		Sample Location:				JHC-MW-15006		JHC-MW-15007R		JHC-MW-15008R		JHC-MW-15009R		JHC-MW-15011R	
		Sample Date:				4/16/2024	10/14/2024	4/16/2024	10/14/2024	4/16/2024	10/14/2024	4/16/2024	10/14/2024	4/16/2024	10/14/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^										
<b>Appendix III<sup>(1)</sup></b>															
Boron	ug/L	NC	<b>500</b>	<b>500</b>	7,200	<b>609</b>	<b>695</b>	<b>1,900</b>	<b>1,500</b>	<b>1,190</b>	<b>1,780</b>	<b>2,120</b>	<b>1,940</b>	<b>3,400</b>	<b>3,800</b>
Calcium	mg/L	NC	NC	NC	500 <sup>EE</sup>	67.8	52.8	56.6	63.6	56.0	62.8	85.6	59.9	60.2	47.6
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	12.5	17.0	13.9	17.0	14.7	14.4	7.46	13.6	6.83	6.60
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	80.6	78.5	88.4	91.4	80.2	98.5	55.7	28.4	63.9	53.7
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	393	308	414	388	379	380	392	264	335	225
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	8.0	8.5	8.0	8.1	7.2	7.3	6.9	7.0	7.0	6.9
<b>Appendix IV<sup>(1)</sup></b>															
Antimony	ug/L	6	6.0	6.0	130	< 1	< 1	< 1	< 1	1	1	< 1	< 1	2	< 1
Arsenic	ug/L	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	9	<b>11</b>	6	6	< 1	< 1	< 1	< 1	8	5
Barium	ug/L	2,000	2,000	2,000	820	157	103	211	212	142	117	342	249	382	294
Beryllium	ug/L	4	4.0	4.0	18	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	3.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.3	< 0.2
Chromium	ug/L	100	100	100	11	2	< 1	1	< 1	1	1	1	< 1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	39	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	15	13	15	15	18	19	16	12	23	17
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	3,200	15	30	52	35	23	27	7	9	18	11
Radium-226	pCi/L	NC	NC	NC	NC	0.161	0.147	0.393	0.345	< 0.205	< 0.373	0.255	< 0.217	0.277	0.233
Radium-228	pCi/L	NC	NC	NC	NC	< 0.517	< 0.438	< 0.747	< 0.779	< 0.522	< 0.619	0.849	< 0.690	< 0.594	< 0.687
Radium-226/228	pCi/L	5	NC	NC	NC	< 0.517	0.476	0.925	1.08	0.548	< 0.619	1.1	0.823	0.674	< 0.687
Selenium	ug/L	<b>50</b>	<b>50</b>	<b>50</b>	<b>5.0</b>	<b>25</b>	5	<b>8</b>	5	7	<b>12</b>	<b>242</b>	<b>80</b>	<b>77</b>	<b>60</b>
Thallium	ug/L	2	2.0	2.0	3.7	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.  
pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.  
MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.  
NC - no criteria; -- - not analyzed.  
\* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.  
\*\* - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.  
^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using site-specific hardness of 180 mg CaCO3/L as measured at surface water sample SW-01 collected on April 9, 2018 from the Pigeon River. Chromium GSI criterion based on hexavalent chromium per footnote (H).  
# - If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.  
E - Criterion is the aesthetic drinking water value per footnote (E).  
EE - Criterion is based on the total dissolved solids GSI value per footnote (EE).  
(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.  
**BOLD** value indicates an exceedance of one or more of the listed criteria.  
**RED** value indicates an exceedance of the MCL.  
All metals were analyzed as total unless otherwise specified.

**Table 5**  
 Summary of Groundwater Protection Standard Exceedances – April 2024  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Constituent	Units	GWPS	JHC-MW-15008R		JHC-MW-15009/R		JHC-MW-15011/R	
			LCL	UCL	LCL	UCL	LCL	UCL
Arsenic	ug/L	10	--	--	--	--	3.2	16
Selenium	ug/L	50	5.3	30	24	170	19	190

**Notes:**

ug/L - micrograms per Liter

-- - Not Applicable; well/parameter pair did not directly exceed the GWPS and was not included in further analysis.

GWPS - Groundwater Protection Standard as established in TRC's Technical Memorandum dated October 15, 2018.

UCL - Upper Confidence Limit ( $\alpha = 0.01$ ) of the downgradient data set.

LCL - Lower Confidence Limit ( $\alpha = 0.01$ ) of the downgradient data set.

Indicates a statistically significant exceedance of the GWPS. An exceedance occurs when the LCL is greater than the GWPS.

**Table 6**  
 Summary of Groundwater Protection Standard Exceedances – October 2024  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Constituent	Units	GWPS	JHC-MW-15006		JHC-MW-15009/R		JHC-MW-15011/R	
			LCL	UCL	LCL	UCL	LCL	UCL
Arsenic	ug/L	10	4.8	10	--	--	3.9	11
Selenium	ug/L	50	--	--	25	170	26	110

**Notes:**

ug/L - micrograms per Liter

-- - Not Applicable; well/parameter pair did not directly exceed the GWPS and was not included in further analysis.

GWPS - Groundwater Protection Standard as established in TRC's Technical Memorandum dated October 15, 2018.

UCL - Upper Confidence Limit ( $\alpha = 0.01$ ) of the downgradient data set.

LCL - Lower Confidence Limit ( $\alpha = 0.01$ ) of the downgradient data set.

Indicates a statistically significant exceedance of the GWPS. An exceedance occurs when the LCL is greater than the GWPS.

**Table 7**  
 Summary of Groundwater Sampling Results (Analytical)  
 JH Campbell Pond A GSI - RCRA CCR Monitoring Program  
 West Olive, Michigan

		Sample Location:				MW-14S		PZ-23S		PZ-24		PZ-24S	
		Sample Date:				4/16/2024	10/15/2024	4/17/2024	10/15/2024	4/16/2024	10/15/2024	4/16/2024	10/15/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^								
<b>Appendix III<sup>(1)</sup></b>													
Boron	ug/L	NC	<b>500</b>	<b>500</b>	7,200	24	45	< 20	24	185	199	< 20	29
Calcium	mg/L	NC	NC	NC	500 <sup>EE</sup>	3.50	4.25	3.99	5.06	37.7	32.2	3.62	9.25
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	1.21	< 1.00	< 1.00	< 1.00	2.37	2.11	1.33	1.22
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	11.3	9.35	2.41	2.28	105	86.8	13.8	24.6
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	46	40	127	31	395	192	68	84
pH, Field	SU	<b>6.5 - 8.5**</b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 9.0</b>	<b>6.0</b>	<b>6.0</b>	7.0	7.1	7.4	7.7	<b>5.1</b>	<b>6.0</b>
<b>Appendix IV<sup>(1)</sup></b>													
Antimony	ug/L	6	6.0	6.0	130	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	3
Barium	ug/L	2,000	2,000	2,000	820	13	35	< 5	< 5	26	20	62	18
Beryllium	ug/L	4	4.0	4.0	18	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	3.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	39	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	3,200	6	9	< 5	< 5	8	10	< 5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	< 0.0864	< 0.194	< 0.0922	< 0.150	< 0.109	< 0.177	< 0.125	< 0.176
Radium-228	pCi/L	NC	NC	NC	NC	< 0.547	1.19	0.671	0.905	< 0.63	< 0.689	0.801	< 0.874
Radium-226/228	pCi/L	5	NC	NC	NC	< 0.547	1.15	0.737	0.955	< 0.63	< 0.689	0.85	< 0.874
Selenium	ug/L	<b>50</b>	<b>50</b>	<b>50</b>	<b>5.0</b>	1	1	< 1	< 1	< 1	< 1	< 1	< 1
Thallium	ug/L	2	2.0	2.0	3.7	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

\* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.

\*\* - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using site-specific hardness of 180 mg CaCO<sub>3</sub>/L as measured at surface water sample SW-01 collected on April 9, 2018 from the Pigeon River. Chromium GSI criterion based on hexavalent chromium per footnote {H}.

# - If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

E - Criterion is the aesthetic drinking water value per footnote {E}.

EE - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

**BOLD** value indicates an exceedance of one or more of the listed criteria.

**RED** value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

**Table 7**  
 Summary of Groundwater Sampling Results (Analytical)  
 JH Campbell Pond A GSI - RCRA CCR Monitoring Program  
 West Olive, Michigan

		Sample Location:				PZ-40		PZ-40S		TW-19-05		TW-19-06A	
		Sample Date:				4/17/2024	10/15/2024	4/17/2024	10/15/2024	4/16/2024	10/15/2024	4/16/2024	10/15/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^								
<b>Appendix III<sup>(1)</sup></b>													
Boron	ug/L	NC	<b>500</b>	<b>500</b>	7,200	210	162	27	70	81	156	<b>1,120</b>	78
Calcium	mg/L	NC	NC	NC	500 <sup>EE</sup>	13.9	9.36	1.75	2.16	24.9	52.5	23.7	19.4
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	7.96	3.08	1.58	1.95	< 1.00	1.29	15.5	< 1.00
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500 <sup>EE</sup>	15.7	9.47	6.52	6.73	9.72	11.2	63.8	5.88
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	97	60	121	41	184	276	159	82
pH, Field	SU	<b>6.5 - 8.5**</b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 8.5<sup>E</sup></b>	<b>6.5 - 9.0</b>	6.7	6.8	<b>5.1</b>	<b>5.2</b>	7.2	7.6	<b>8.9</b>	7.3
<b>Appendix IV<sup>(1)</sup></b>													
Antimony	ug/L	6	6.0	6.0	130	< 1	< 1	< 1	< 1	2	1	< 1	< 1
Arsenic	ug/L	10	10	10	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	2,000	2,000	820	17	11	26	31	23	74	5	8
Beryllium	ug/L	4	4.0	4.0	18	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	3.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	39	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	< 10	< 10	< 10	< 10	29	24	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	3,200	33	41	< 5	< 5	< 5	7	29	9
Radium-226	pCi/L	NC	NC	NC	NC	< 0.108	< 0.178	< 0.125	< 0.127	0.137	0.128	< 0.0952	< 0.170
Radium-228	pCi/L	NC	NC	NC	NC	< 0.496	< 0.788	< 0.554	0.773	< 0.666	0.487	< 0.622	0.653
Radium-226/228	pCi/L	5	NC	NC	NC	< 0.496	< 0.788	< 0.554	0.756	< 0.666	0.615	0.633	0.621
Selenium	ug/L	<b>50</b>	<b>50</b>	<b>50</b>	<b>5.0</b>	< 1	3	< 1	1	<b>18</b>	<b>23</b>	1	<b>111</b>
Thallium	ug/L	2	2.0	2.0	3.7	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

\* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.

\*\* - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using site-specific hardness of 180 mg CaCO<sub>3</sub>/L as measured at surface water sample SW-01 collected on April 9, 2018 from the Pigeon River. Chromium GSI criterion based on hexavalent chromium per footnote {H}.

# - If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

E - Criterion is the aesthetic drinking water value per footnote {E}.

EE - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

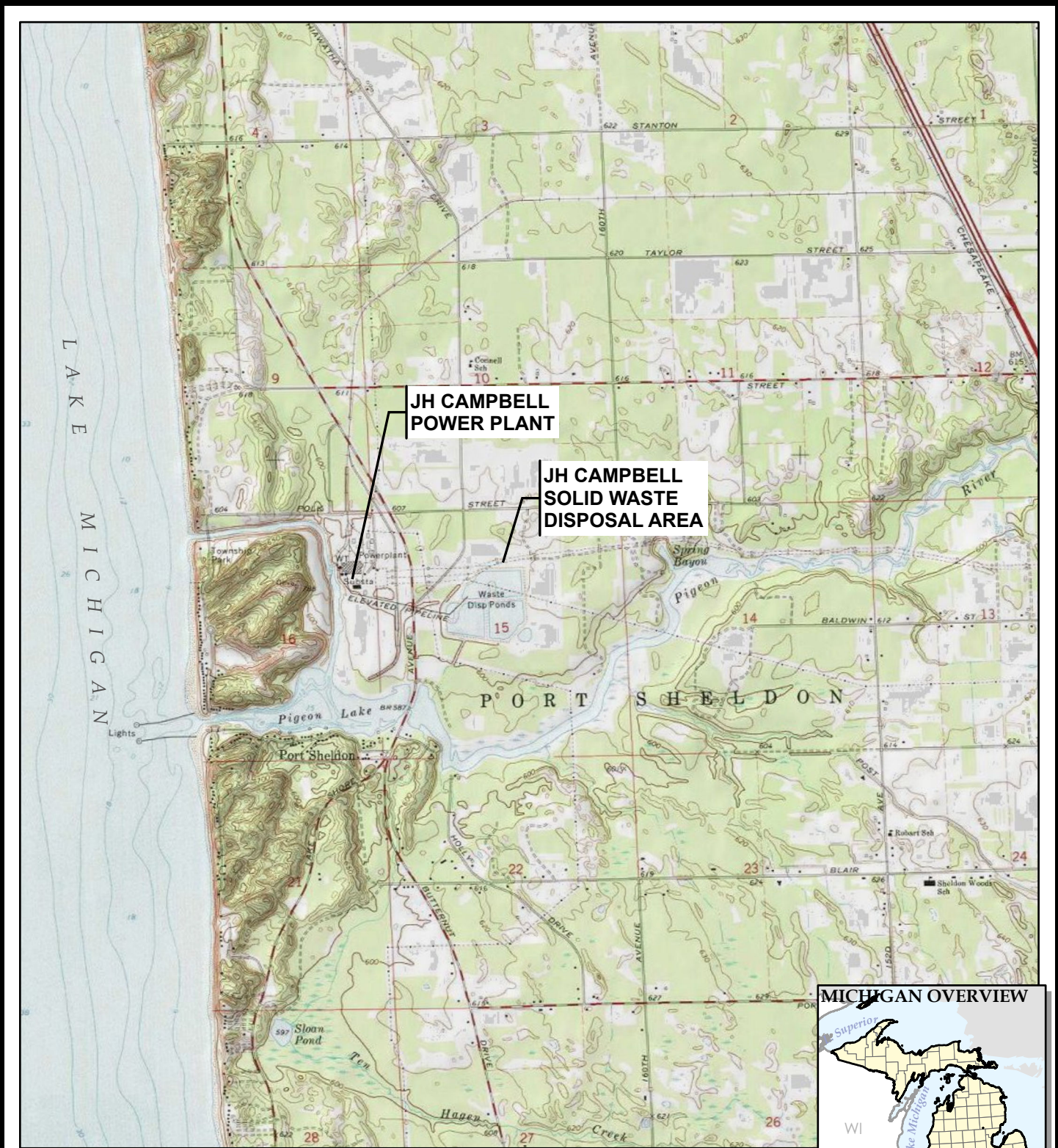
(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

**BOLD** value indicates an exceedance of one or more of the listed criteria.

**RED** value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

## Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.



999 Fourier Drive  
Suite 101  
Madison, WI 53717  
Phone: 608.826.3663

PROJECT:	<b>CONSUMERS ENERGY COMPANY JH CAMPBELL POWER PLANT WEST OLIVE, MICHIGAN</b>
TITLE:	<b>SITE LOCATION MAP</b>

DRAWN BY:	A. FOJTIK
CHECKED BY:	H. SCHNAIDT
APPROVED BY:	S. HOLMSTROM
DATE:	JULY 2024
PROJ. NO.:	553811
FILE:	T:\1-PROJECTS\Consumers_Energy\464090_JHC\2-APRX\464090_JHC.aprx

**FIGURE 1**



Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Map Rotation: 0  
 - Saved By: AFOJTIK on 6/27/2024, 17:10:09 PM; File Path: T:\PROJECTS\Consumers\_Energy\464090\_JHC\02-APR\X\464090\_JHC.aprx; Layout Name: JHC\_fig2\_Site\_Plan



**LEGEND**

- BACKGROUND MONITORING WELL
- DOWNGRAIDENT BOTTOM ASH POND 1/2 N/S MONITORING WELL
- DOWNGRAIDENT BOTTOM ASH POND 3 N/S MONITORING WELL
- DOWNGRAIDENT LANDFILL MONITORING WELL
- DOWNGRAIDENT POND A MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- DECOMMISSIONED
- DOWNGRAIDENT BOTTOM ASH POND 1/2 N/S MONITORING WELL (2018)
- DOWNGRAIDENT BOTTOM ASH POND 1/2 N/S MONITORING WELL (2022)
- DOWNGRAIDENT BOTTOM ASH POND 3 N/S MONITORING WELL (2018)
- NATURE AND EXTENT/DOWNGRAIDENT MONITORING WELLS

**NOTES:**

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2024.
2. WELL LOCATIONS BASED ON SURVEY DATA THROUGH JUNE 15, 2022.
3. MONITORING WELL DECOMMISSIONED NOVEMBER 13, 2017.
4. MONITORING WELL DECOMMISSIONED JUNE 14, 2018.
5. MONITORING WELL DECOMMISSIONED OCTOBER 10, 2018.
6. JHC-MW-1800X MONITORING WELLS INSTALLED IN DECEMBER 2018.
7. MONITORING WELL DECOMMISSIONED JUNE 24, 2019.
8. JHC-MW-15008R AND TW-19-XX MONITORING WELLS INSTALLED IN JUNE 2019.
9. MONITORING WELLS DECOMMISSIONED MAY 25, 2021.
10. MONITORING WELLS DECOMMISSIONED AND REPLACED JULY 20-22, 2021.
11. JHC-MW-22001 MONITORING WELL INSTALLED MAY 12, 2022.



1:8,400  
 1" = 700'



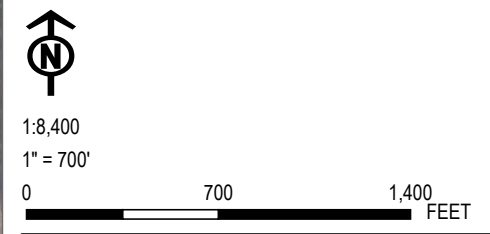
PROJECT: <b>CONSUMERS ENERGY COMPANY JH CAMPBELL POWER PLANT WEST OLIVE, MICHIGAN</b>	
TITLE: <b>SITE PLAN WITH CCR MONITORING WELL LOCATIONS</b>	
DRAWN BY: A. FOJTIK	PROJ. NO.: 553811
CHECKED BY: H. SCHNAIDT	<b>FIGURE 2</b>
APPROVED BY: S. HOLMSTROM	
DATE: JULY 2024	
999 FOURIER DRIVE SUITE 101 MADISON, WI 53717 PHONE: 608.826.3663	
FILE:	464090_JHC.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2119 Feet Intl; Map Rotation: 0  
 - Saved By: AFOJTIK on 7/10/2024, 17:36:02 Pkt. File Path: T:\PROJECTS\Consumers\_Energy\464090\_JHC02-APR\X\464090\_JHC.aprx; Layout Name: JHC\_GWEL\_Apr2024



- LEGEND**
- BACKGROUND MONITORING WELL
  - DOWNGRADE BOTTOM ASH POND 3 N/S MONITORING WELL
  - DOWNGRADE LANDFILL MONITORING WELL
  - DOWNGRADE POND A MONITORING WELL
  - MONITORING WELL (STATIC WATER LEVEL ONLY)
  - DECOMMISSIONED
  - DOWNGRADE BOTTOM ASH POND 1/2 N/S MONITORING WELL (2018)
  - DOWNGRADE BOTTOM ASH POND 1/2 N/S MONITORING WELL (2022)
  - DOWNGRADE BOTTOM ASH POND 3 N/S MONITORING WELL (2018)
  - NATURE AND EXTENT/DOWNGRADE MONITORING WELLS
  - GROUNDWATER ELEVATION CONTOUR (2' INTERVAL, DASHED WHERE INFERRED)
  - NU** NOT USED/NOT APPLICABLE

- NOTES:**
1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2024.
  2. WELL LOCATIONS BASED ON SURVEY DATA THROUGH JUNE 15, 2022.
  3. MONITORING WELL DECOMMISSIONED NOVEMBER 13, 2017.
  4. MONITORING WELL DECOMMISSIONED JUNE 14, 2018.
  5. MONITORING WELL DECOMMISSIONED OCTOBER 10, 2018.
  6. JHC-MW-1800X MONITORING WELLS INSTALLED IN DECEMBER 2018.
  7. MONITORING WELL DECOMMISSIONED JUNE 24, 2019.
  8. JHC-MW-15008R AND TW-19-XX MONITORING WELLS INSTALLED IN JUNE 2019.
  9. MONITORING WELLS DECOMMISSIONED MAY 25, 2021.
  10. MONITORING WELLS DECOMMISSIONED AND REPLACED JULY 20-22, 2021.
  11. JHC-MW-22001 MONITORING WELL INSTALLED MAY 12, 2022.
  12. STATIC WATER ELEVATIONS IN NORTH AMERICAN VERTICAL DATUM 1988, NAVD 88.



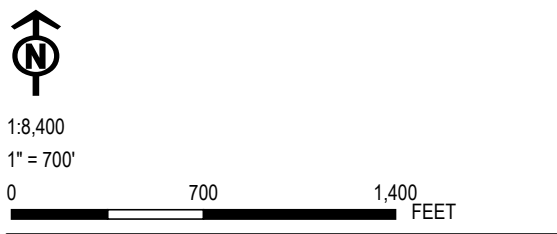
PROJECT: <b>CONSUMERS ENERGY COMPANY JH CAMPBELL POWER PLANT WEST OLIVE, MICHIGAN</b>	
TITLE: <b>GROUNDWATER CONTOUR MAP APRIL 2024</b>	
DRAWN BY: A. FOJTIK	PROJ. NO.: 553811
CHECKED BY: H. SCHNAIDT	<b>FIGURE 3</b>
APPROVED BY: S. HOLMSTROM	
DATE: JULY 2024	
999 FOURIER DRIVE SUITE 101 MADISON, WI 53717 PHONE: 608.826.3663	
FILE:	464090_JHC.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2119 Feet Intl; Map Rotation: 0  
 - Saved By: AFOJTIK on 1/23/2024, 1:51:03 PM; File Path: T:\PROJECTS\Consumers\_Energy\464090\_JHC\A-APRX\464090\_JHC.aprx; Layout Name: JHC\_GWEL\_Oct2024



- LEGEND**
- BACKGROUND MONITORING WELL
  - DOWNGRADENT BOTTOM ASH POND 3 N/S MONITORING WELL
  - DOWNGRADENT LANDFILL MONITORING WELL
  - DOWNGRADENT POND A MONITORING WELL
  - MONITORING WELL (STATIC WATER LEVEL ONLY)
  - DECOMMISSIONED
  - DOWNGRADENT BOTTOM ASH POND 1/2 N/S MONITORING WELL (2018)
  - DOWNGRADENT BOTTOM ASH POND 1/2 N/S MONITORING WELL (2022)
  - DOWNGRADENT BOTTOM ASH POND 3 N/S MONITORING WELL (2018)
  - NATURE AND EXTENT/DOWNGRADENT MONITORING WELLS
  - GROUNDWATER ELEVATION CONTOUR (2' INTERVAL, DASHED WHERE INFERRED)
  - NU** NOT USED/NOT APPLICABLE

- NOTES:**
1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2024.
  2. WELL LOCATIONS BASED ON SURVEY DATA THROUGH JUNE 15, 2022.
  3. MONITORING WELL DECOMMISSIONED NOVEMBER 13, 2017.
  4. MONITORING WELL DECOMMISSIONED JUNE 14, 2018.
  5. MONITORING WELL DECOMMISSIONED OCTOBER 10, 2018.
  6. JHC-MW-1800X MONITORING WELLS INSTALLED IN DECEMBER 2018.
  7. MONITORING WELL DECOMMISSIONED JUNE 24, 2019.
  8. JHC-MW-15008R AND TW-19-XX MONITORING WELLS INSTALLED IN JUNE 2019.
  9. MONITORING WELLS DECOMMISSIONED MAY 25, 2021.
  10. MONITORING WELLS DECOMMISSIONED AND REPLACED JULY 20-22, 2021.
  11. JHC-MW-22001 MONITORING WELL INSTALLED MAY 12, 2022.
  12. STATIC WATER ELEVATIONS IN NORTH AMERICAN VERTICAL DATUM 1988, NAVD 88.



PROJECT: <b>CONSUMERS ENERGY COMPANY JH CAMPBELL POWER PLANT WEST OLIVE, MICHIGAN</b>	
TITLE: <b>GROUNDWATER CONTOUR MAP OCTOBER 2024</b>	
DRAWN BY: A. FOJTIK	PROJ. NO.: 553811
CHECKED BY: H. SCHNAIDT	<b>FIGURE 4</b>
APPROVED BY: S. HOLMSTROM	
DATE: JANUARY 2025	
999 FOURIER DRIVE SUITE 101 MADISON, WI 53717 PHONE: 608.826.3663	
FILE:	464090_JHC.aprx

# **Appendix A**

## **Laboratory and Field Data**

To: JFirlit, JH Campbell Complex

From: EBlaj, T-258

Date: May 03, 2024

Subject: JH CAMPBELL SOLID WASTE DISPOSAL AREA – GROUNDWATER MONITORING  
2<sup>nd</sup> Quarter, 2024 – Background Wells

CC: HDRegister, P22-521  
ADSantini, P20-215B-REM

Sarah Holmstrom, Project Manager  
TRC Companies, Inc.  
1540 Eisenhower Place  
Ann Arbor, MI 48108

---

**Chemistry Project: 24-0278**

CE Laboratory Services conducted groundwater monitoring at the JH Campbell Solid Waste Disposal Area during the week of 04/15/2024, for the 2<sup>nd</sup> Quarter requirement, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for analysis by the Chemistry department on 04/17/2024.

Samples for Radium analysis have been subcontracted to Eurofins/TestAmerica, Inc. and their results are being reported separately. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples, as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj  
Sr. Technical Analyst  
Project Lead



*Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.*

## CASE NARRATIVE

### I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. Sample preservation upon receipt was verified by the sample custodian and confirmed to meet method requirements.

### II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from “Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, “Test Methods for Evaluating Solid Waste – Physical/Chemical Methods”, USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22<sup>nd</sup> Edition, 2012.

### III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container & aliquot number. Results for the field blanks, field duplicates, and percent recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

## DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report where applicable:

<u>Acronym</u>	<u>Description</u>
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Not a TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result

D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

**Customer Name:** JH Campbell Complex  
**Work Order ID:** Q2-2024 JHC Background Wells  
**Date Received:** 4/17/2024  
**Chemistry Project:** 24-0278

<u>Sample #</u>	<u>Field Sample ID</u>	<u>Matrix</u>	<u>Sample Date</u>	<u>Site</u>
24-0278-01	JHC-MW-15023	Groundwater	04/15/2024 20:16	JHC GW Monitoring - Background Wells
24-0278-02	JHC-MW-15024	Groundwater	04/15/2024 18:39	JHC GW Monitoring - Background Wells
24-0278-03	JHC-MW-15025	Groundwater	04/15/2024 18:20	JHC GW Monitoring - Background Wells
24-0278-04	JHC-MW-15026	Groundwater	04/15/2024 16:51	JHC GW Monitoring - Background Wells
24-0278-05	JHC-MW-15027	Groundwater	04/15/2024 17:32	JHC GW Monitoring - Background Wells
24-0278-06	JHC-MW-15028	Groundwater	04/15/2024 15:14	JHC GW Monitoring - Background Wells
24-0278-07	DUP-01	Groundwater	04/15/2024 00:00	JHC GW Monitoring - Background Wells
24-0278-08	FB-01	Water	04/15/2024 20:40	JHC GW Monitoring - Background Wells
24-0278-09	EB-01	Water	04/15/2024 20:25	JHC GW Monitoring - Background Wells
24-0278-10	JHC-MW-15025 Field MS	Groundwater	04/15/2024 18:20	JHC GW Monitoring - Background Wells
24-0278-11	JHC-MW-15025 Field MSD	Groundwater	04/15/2024 18:20	JHC GW Monitoring - Background Wells



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15023**  
 Lab Sample ID: 24-0278-01  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 08:16 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-01-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	48		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	46		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	15600		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	58		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	5310		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	1060		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	6050		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-01-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-01-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	6800		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	15500		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-01-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	105		mg/L	10.0	04/17/2024	AB24-0417-09



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15023**  
Lab Sample ID: 24-0278-01  
Matrix: Groundwater

Laboratory Project: **24-0278**  
Collect Date: 04/15/2024  
Collect Time: 08:16 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0278-01-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	47200		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	47200		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15024**  
 Lab Sample ID: 24-0278-02  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 06:39 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-02-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	17		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	26		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	26100		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	1		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	93		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	8010		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	863		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	1		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	20100		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-02-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-02-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	13500		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	7490		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-02-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	155		mg/L	10.0	04/17/2024	AB24-0417-09



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15024**  
Lab Sample ID: 24-0278-02  
Matrix: Groundwater

Laboratory Project: **24-0278**  
Collect Date: 04/15/2024  
Collect Time: 06:39 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0278-02-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	119000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	119000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15025**  
 Lab Sample ID: 24-0278-03  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 06:20 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-03-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	9		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	26		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	37500		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	1		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	34		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	11400		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	1190		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	25900		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-03-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-03-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	50300		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	9140		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-03-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	242		mg/L	10.0	04/17/2024	AB24-0417-09



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15025**  
Lab Sample ID: 24-0278-03  
Matrix: Groundwater

Laboratory Project: **24-0278**  
Collect Date: 04/15/2024  
Collect Time: 06:20 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0278-03-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	120000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	120000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15026**  
 Lab Sample ID: 24-0278-04  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 04:51 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-04-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	8		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	3140		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	45		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	387		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	1310		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-04-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-04-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1580		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	5850		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-04-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	29		mg/L	10.0	04/17/2024	AB24-0417-09



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15026**  
Lab Sample ID: 24-0278-04  
Matrix: Groundwater

Laboratory Project: **24-0278**  
Collect Date: 04/15/2024  
Collect Time: 04:51 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0278-04-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15027**  
 Lab Sample ID: 24-0278-05  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 05:32 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-05-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	20		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	25		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	13100		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	1		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	576		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	3290		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	357		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	1610		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-05-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-05-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	5020		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-05-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	84		mg/L	10.0	04/17/2024	AB24-0417-10



# Analytical Report

Report Date: 05/03/24

## Laboratory Services A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15027**  
Lab Sample ID: 24-0278-05  
Matrix: Groundwater

Laboratory Project: **24-0278**  
Collect Date: 04/15/2024  
Collect Time: 05:32 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0278-05-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	32000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	32000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15028**  
 Lab Sample ID: 24-0278-06  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 03:14 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-06-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	5		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	13600		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	51		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	3180		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	275		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-06-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-06-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	4120		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-06-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	62		mg/L	10.0	04/17/2024	AB24-0417-10



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15028**  
Lab Sample ID: 24-0278-06  
Matrix: Groundwater

Laboratory Project: **24-0278**  
Collect Date: 04/15/2024  
Collect Time: 03:14 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0278-06-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	47200		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	47200		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **DUP-01**  
 Lab Sample ID: 24-0278-07  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 12:00 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-07-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	9		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	3110		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	57		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	368		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	1290		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-07-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-07-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1590		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	5870		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-07-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	34		mg/L	10.0	04/17/2024	AB24-0417-10



# Analytical Report

Report Date: 05/03/24

## Laboratory Services A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **DUP-01**  
Lab Sample ID: 24-0278-07  
Matrix: Groundwater

Laboratory Project: **24-0278**  
Collect Date: 04/15/2024  
Collect Time: 12:00 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0278-07-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **FB-01**  
 Lab Sample ID: 24-0278-08  
 Matrix: Water

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 08:40 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-08-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	ND		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-08-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-08-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	ND		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-08-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	04/17/2024	AB24-0417-10

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **EB-01**  
 Lab Sample ID: 24-0278-09  
 Matrix: Water

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 08:25 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-09-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	ND		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-09-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-09-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Fluoride	ND		ug/L	1000.0	04/19/2024	AB24-0419-01
Sulfate	ND		ug/L	1000.0	04/19/2024	AB24-0419-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0278-09-C03-A01

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	04/17/2024	AB24-0417-10



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15025 Field MS**  
 Lab Sample ID: 24-0278-10  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 06:20 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-10-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	112		%	1.0	04/23/2024	AB24-0423-01
Arsenic	109		%	1.0	04/23/2024	AB24-0423-01
Barium	113		%	5.0	04/23/2024	AB24-0423-01
Beryllium	110		%	1.0	04/23/2024	AB24-0423-01
Boron	109		%	20.0	04/23/2024	AB24-0423-01
Cadmium	112		%	0.2	04/23/2024	AB24-0423-01
Calcium	95.0		%	1000.0	04/23/2024	AB24-0423-01
Chromium	110		%	1.0	04/23/2024	AB24-0423-01
Cobalt	104		%	6.0	04/23/2024	AB24-0423-01
Copper	103		%	1.0	04/23/2024	AB24-0423-01
Iron	116		%	20.0	04/23/2024	AB24-0423-01
Lead	105		%	1.0	04/23/2024	AB24-0423-01
Lithium	106		%	10.0	04/23/2024	AB24-0423-01
Magnesium	108		%	1000.0	04/23/2024	AB24-0423-01
Molybdenum	112		%	5.0	04/23/2024	AB24-0423-01
Nickel	107		%	2.0	04/23/2024	AB24-0423-01
Potassium	101		%	100.0	04/23/2024	AB24-0423-01
Selenium	107		%	1.0	04/23/2024	AB24-0423-01
Silver	108		%	0.2	04/23/2024	AB24-0423-01
Sodium	115		%	1000.0	04/23/2024	AB24-0423-01
Thallium	108		%	2.0	04/23/2024	AB24-0423-01
Vanadium	110		%	2.0	04/23/2024	AB24-0423-01
Zinc	110		%	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-10-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	97.0		%	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-10-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	106		%	1000.0	04/19/2024	AB24-0419-01
Fluoride	100		%	1000.0	04/19/2024	AB24-0419-01
Sulfate	96		%	1000.0	04/19/2024	AB24-0419-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15025 Field MSD**  
 Lab Sample ID: 24-0278-11  
 Matrix: Groundwater

Laboratory Project: **24-0278**  
 Collect Date: 04/15/2024  
 Collect Time: 06:20 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0278-11-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	110		%	1.0	04/23/2024	AB24-0423-01
Arsenic	110		%	1.0	04/23/2024	AB24-0423-01
Barium	110		%	5.0	04/23/2024	AB24-0423-01
Beryllium	111		%	1.0	04/23/2024	AB24-0423-01
Boron	108		%	20.0	04/23/2024	AB24-0423-01
Cadmium	112		%	0.2	04/23/2024	AB24-0423-01
Calcium	100		%	1000.0	04/23/2024	AB24-0423-01
Chromium	109		%	1.0	04/23/2024	AB24-0423-01
Cobalt	106		%	6.0	04/23/2024	AB24-0423-01
Copper	103		%	1.0	04/23/2024	AB24-0423-01
Iron	109		%	20.0	04/23/2024	AB24-0423-01
Lead	104		%	1.0	04/23/2024	AB24-0423-01
Lithium	105		%	10.0	04/23/2024	AB24-0423-01
Magnesium	113		%	1000.0	04/23/2024	AB24-0423-01
Molybdenum	111		%	5.0	04/23/2024	AB24-0423-01
Nickel	107		%	2.0	04/23/2024	AB24-0423-01
Potassium	106		%	100.0	04/23/2024	AB24-0423-01
Selenium	111		%	1.0	04/23/2024	AB24-0423-01
Silver	105		%	0.2	04/23/2024	AB24-0423-01
Sodium	120		%	1000.0	04/23/2024	AB24-0423-01
Thallium	106		%	2.0	04/23/2024	AB24-0423-01
Vanadium	112		%	2.0	04/23/2024	AB24-0423-01
Zinc	110		%	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0278-11-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	97.0		%	0.2	04/24/2024	AB24-0424-02

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0278-11-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	107		%	1000.0	04/19/2024	AB24-0419-01
Fluoride	100		%	1000.0	04/19/2024	AB24-0419-01
Sulfate	95		%	1000.0	04/19/2024	AB24-0419-01

---

Data Qualifiers	Exception Summary
-----------------	-------------------

---

No exceptions occurred.

---

**TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM**

Project Log-In Number: 24-0278

Inspection Date: 04-17-2024

Inspection By: EB

Sample Origin/Project Name: JHC Q2-2024 Background Wells

Shipment Delivered By: Enter the type of shipment carrier.

Pony \_\_\_\_\_ FedEx \_\_\_\_\_ UPS \_\_\_\_\_ USPS \_\_\_\_\_ Airborne \_\_\_\_\_

Other/Hand Carry (whom) EB

Tracking Number: \_\_\_\_\_ Shipping Form Attached: Yes \_\_\_\_\_ No \_\_\_\_\_

Shipping Containers: Enter the type and number of shipping containers received.

Cooler  Cardboard Box \_\_\_\_\_ Custom Case \_\_\_\_\_ Envelope/Mailer \_\_\_\_\_

Loose/Unpackaged Containers \_\_\_\_\_ Other \_\_\_\_\_

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None  Dented \_\_\_\_\_ Leaking \_\_\_\_\_

Other \_\_\_\_\_

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened N/A Sealed N/A

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC  Work Request \_\_\_\_\_ Air Data Sheet \_\_\_\_\_ Other \_\_\_\_\_

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 1.8-3.9°C Samples Received on Ice: Yes  No \_\_\_\_\_

M&TE # and Expiration 015402 / 5-23-24

Number and Type of Containers: Enter the total number of sample containers received.

pH Test Paper 0-14  
Lot # 205522  
Exp 02-15-25

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60ml)	<u>14</u>	_____	_____	_____	_____
Quart Liter (g/p)	<u>18</u>	_____	_____	_____	_____
9-oz (amber glass jar)	_____	_____	_____	_____	_____
2-oz (amber glass)	_____	_____	_____	_____	_____
125 mL (plastic)	<u>22</u>	_____	_____	_____	_____
24 mL vial (glass)	_____	_____	_____	_____	_____
<sup>250</sup> 500 mL (plastic)	<u>9</u>	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____

# CHAIN OF CUSTODY



## CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page 1 of 1

SAMPLING SITE / CUSTOMER: <b>JHC Q2-2024 Background Wells</b>			PROJECT NUMBER: <b>24-0278</b>			SAP CC or WO#: REQUESTER: Bethany Swanberg			ANALYSIS REQUESTED (Attach List if More Space is Needed)						QA REQUIREMENT: <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> TNI <input type="checkbox"/> ISO 17025 <input type="checkbox"/> 10 CFR 50 APP. B <input type="checkbox"/> INTERNAL INFO <input type="checkbox"/> OTHER _____																																																	
SAMPLING TEAM: <b>CLE + LMO</b>			TURNAROUND TIME REQUIRED: <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 3 DAYS <input type="checkbox"/> STANDARD <input checked="" type="checkbox"/> OTHER _____						<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Total Metals</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Anions</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">TDS</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Alkalinity</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Radium 226</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Radium 228</td> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>						Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228																																												
Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228																																																											
SEND REPORT TO: Joseph Firlit		email:		phone:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">CONTAINERS</td> <td colspan="6" style="text-align: center;">PRESERVATIVE</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Total #</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">None</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">HNO<sub>3</sub></td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">H<sub>2</sub>SO<sub>4</sub></td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">NaOH</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">HCl</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">MeOH</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Other</td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>									CONTAINERS	PRESERVATIVE						Total #	None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other																																			
CONTAINERS	PRESERVATIVE											Total #	None	HNO <sub>3</sub>		H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other																																												
COPY TO: JR Register		MATRIX CODES:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>GW = Groundwater</td> <td>OX = Other</td> </tr> <tr> <td>WW = Wastewater</td> <td>SL = Sludge</td> </tr> <tr> <td>W = Water / Aqueous Liquid</td> <td>A = Air</td> </tr> <tr> <td>S = Soil / General Solid</td> <td>WP = Wipe</td> </tr> <tr> <td>O = Oil</td> <td>WT = General Waste</td> </tr> </table>						GW = Groundwater	OX = Other	WW = Wastewater	SL = Sludge	W = Water / Aqueous Liquid	A = Air	S = Soil / General Solid	WP = Wipe	O = Oil	WT = General Waste	TRC		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">FIELD SAMPLE ID / LOCATION</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">DATE</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">TIME</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">MATRIX</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">TOTAL #</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">None</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">HNO<sub>3</sub></td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">H<sub>2</sub>SO<sub>4</sub></td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">NaOH</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">HCl</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">MeOH</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Other</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Total Metals</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Anions</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">TDS</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Alkalinity</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Radium 226</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Radium 228</td> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">REMARKS</td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>						FIELD SAMPLE ID / LOCATION	DATE	TIME	MATRIX	TOTAL #	None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228	REMARKS																		
GW = Groundwater	OX = Other																																																															
WW = Wastewater	SL = Sludge																																																															
W = Water / Aqueous Liquid	A = Air																																																															
S = Soil / General Solid	WP = Wipe																																																															
O = Oil	WT = General Waste																																																															
FIELD SAMPLE ID / LOCATION	DATE	TIME	MATRIX	TOTAL #	None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228	REMARKS																																														

RELINQUISHED BY: <i>Casper Ghert</i>		DATE/TIME: <b>4-16-24 1247</b>		RECEIVED BY: <i>[Signature]</i>		COMMENTS: Received on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No    M&TE #: <u>015402</u> Temperature: <u>1.8-3.9</u> °C    Cal. Due Date: <u>5-23-24</u>			
RELINQUISHED BY: <i>[Signature]</i>		DATE/TIME: <b>04-17-24 0700</b>		RECEIVED BY: <i>[Signature]</i>					

To: JFirlit, JH Campbell Complex

From: EBlaj, T-258

Date: May 03, 2024

Subject: JH CAMPBELL SOLID WASTE DISPOSAL AREA – GROUNDWATER MONITORING  
2<sup>nd</sup> Quarter, 2024 – Pond A Wells

CC: HDRegister, P22-521  
ADSantini, P20-215B-REM

Sarah Holmstrom, Project Manager  
TRC Companies, Inc.  
1540 Eisenhower Place  
Ann Arbor, MI 48108

---

**Chemistry Project: 24-0279**

CE Laboratory Services conducted groundwater monitoring at the JH Campbell Solid Waste Disposal Area during the week of 04/15/2024, for the 2<sup>nd</sup> Quarter requirement, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for analysis by the Chemistry department on 04/17/2024.

Samples for Radium analysis have been subcontracted to Eurofins/TestAmerica, Inc. and their results are being reported separately. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples, as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj  
Sr. Technical Analyst  
Project Lead



*Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.*

## CASE NARRATIVE

### I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. Sample preservation upon receipt was verified by the sample custodian and confirmed to meet method requirements.

### II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from “Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, “Test Methods for Evaluating Solid Waste – Physical/Chemical Methods”, USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22<sup>nd</sup> Edition, 2012.

### III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container & aliquot number. Results for the field blanks, field duplicates, and percent recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

## DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report where applicable:

<u>Acronym</u>	<u>Description</u>
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Not a TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result

D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative



**Customer Name:** JH Campbell Complex  
**Work Order ID:** Q2-2024 Pond A Wells  
**Date Received:** 4/17/2024  
**Chemistry Project:** 24-0279

<u>Sample #</u>	<u>Field Sample ID</u>	<u>Matrix</u>	<u>Sample Date</u>	<u>Site</u>
24-0279-01	JHC-MW-15006	Groundwater	04/16/2024 17:36	JHC GW Monitoring - Pond A Wells
24-0279-02	JHC-MW-15007R	Groundwater	04/16/2024 16:41	JHC GW Monitoring - Pond A Wells
24-0279-03	JHC-MW-15008R	Groundwater	04/16/2024 15:41	JHC GW Monitoring - Pond A Wells
24-0279-04	JHC-MW-15009R	Groundwater	04/16/2024 14:21	JHC GW Monitoring - Pond A Wells
24-0279-05	JHC-MW-15011R	Groundwater	04/16/2024 18:56	JHC GW Monitoring - Pond A Wells
24-0279-06	DUP-02	Groundwater	04/16/2024 00:00	JHC GW Monitoring - Pond A Wells
24-0279-07	FB-02	Water	04/16/2024 19:21	JHC GW Monitoring - Pond A Wells
24-0279-08	EB-02	Water	04/16/2024 19:29	JHC GW Monitoring - Pond A Wells
24-0279-09	JHC-MW-15007R MS	Groundwater	04/16/2024 16:41	JHC GW Monitoring - Pond A Wells
24-0279-10	JHC-MW-15007R MSD	Groundwater	04/16/2024 16:41	JHC GW Monitoring - Pond A Wells

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15006**  
 Lab Sample ID: 24-0279-01  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 05:36 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-01-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	9		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	157		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	609		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	67800		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	2		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	36		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	15		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	33600		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	15		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	4		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	5440		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	25		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	14600		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	14		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-01-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-01-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	12500		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	80600		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-01-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	393		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15006**  
Lab Sample ID: 24-0279-01  
Matrix: Groundwater

Laboratory Project: **24-0279**  
Collect Date: 04/16/2024  
Collect Time: 05:36 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0279-01-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	239000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	239000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15007R**  
 Lab Sample ID: 24-0279-02  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 04:41 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-02-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	6		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	211		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	1900		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	56600		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	1		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	47		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	15		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	33100		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	52		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	4		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	3540		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	8		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	15200		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	15		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-02-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-02-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	13900		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	88400		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-02-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	414		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15007R**  
Lab Sample ID: 24-0279-02  
Matrix: Groundwater

Laboratory Project: **24-0279**  
Collect Date: 04/16/2024  
Collect Time: 04:41 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0279-02-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	204000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	204000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15008R**  
 Lab Sample ID: 24-0279-03  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 03:41 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-03-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	1		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	142		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	1190		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	56000		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	1		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	5		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	18		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	29700		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	23		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	3		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	2480		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	7		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	17900		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-03-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-03-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	14700		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	80200		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-03-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	379		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15008R**  
Lab Sample ID: 24-0279-03  
Matrix: Groundwater

Laboratory Project: **24-0279**  
Collect Date: 04/16/2024  
Collect Time: 03:41 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0279-03-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	204000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	204000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15009R**  
 Lab Sample ID: 24-0279-04  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 02:21 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-04-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	342		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	2120		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	85600		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	1		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	16		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	19800		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	7		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	4		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	4110		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	242		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	7790		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	8		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-04-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-04-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	7460		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	55700		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-04-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	392		mg/L	10.0	04/19/2024	AB24-0419-04





# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15009R**  
Lab Sample ID: 24-0279-04  
Matrix: Groundwater

Laboratory Project: **24-0279**  
Collect Date: 04/16/2024  
Collect Time: 02:21 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0279-04-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	239000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	239000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15011R**  
 Lab Sample ID: 24-0279-05  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 06:56 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-05-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	2		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	8		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	382		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	3400		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	0.3		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	60200		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	1		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	323		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	23		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	14300		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	18		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	4		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	4130		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	77		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	12600		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	29		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-05-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-05-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	6830		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	63900		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-05-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	335		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15011R**  
Lab Sample ID: 24-0279-05  
Matrix: Groundwater

Laboratory Project: **24-0279**  
Collect Date: 04/16/2024  
Collect Time: 06:56 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0279-05-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	168000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	168000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **DUP-02**  
 Lab Sample ID: 24-0279-06  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 12:00 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-06-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	332		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	2080		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	83600		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	1		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	25		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	16		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	20000		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	7		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	4		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	4180		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	238		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	7830		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	8		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-06-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-06-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	7740		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	58800		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-06-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	427		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **DUP-02**  
Lab Sample ID: 24-0279-06  
Matrix: Groundwater

Laboratory Project: **24-0279**  
Collect Date: 04/16/2024  
Collect Time: 12:00 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0279-06-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	238000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Bicarbonate	238000		ug/L	10.0	04/22/2024	AB24-0422-05
Alkalinity Carbonate	ND		ug/L	10.0	04/22/2024	AB24-0422-05

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **FB-02**  
 Lab Sample ID: 24-0279-07  
 Matrix: Water

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 07:21 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-07-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	20		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	ND		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-07-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-07-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	ND		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-07-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	04/19/2024	AB24-0419-04

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **EB-02**  
 Lab Sample ID: 24-0279-08  
 Matrix: Water

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 07:29 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-08-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Arsenic	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Barium	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Beryllium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Boron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Cadmium	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Calcium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Chromium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Cobalt	ND		ug/L	6.0	04/23/2024	AB24-0423-01
Copper	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Iron	ND		ug/L	20.0	04/23/2024	AB24-0423-01
Lead	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Lithium	ND		ug/L	10.0	04/23/2024	AB24-0423-01
Magnesium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Molybdenum	ND		ug/L	5.0	04/23/2024	AB24-0423-01
Nickel	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Potassium	ND		ug/L	100.0	04/23/2024	AB24-0423-01
Selenium	ND		ug/L	1.0	04/23/2024	AB24-0423-01
Silver	ND		ug/L	0.2	04/23/2024	AB24-0423-01
Sodium	ND		ug/L	1000.0	04/23/2024	AB24-0423-01
Thallium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Vanadium	ND		ug/L	2.0	04/23/2024	AB24-0423-01
Zinc	ND		ug/L	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-08-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-08-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	ND		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0279-08-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	04/19/2024	AB24-0419-04

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15007R MS**  
 Lab Sample ID: 24-0279-09  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 04:41 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-09-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	112		%	1.0	04/23/2024	AB24-0423-01
Arsenic	109		%	1.0	04/23/2024	AB24-0423-01
Barium	116		%	5.0	04/23/2024	AB24-0423-01
Beryllium	119		%	1.0	04/23/2024	AB24-0423-01
Boron	100		%	20.0	04/23/2024	AB24-0423-01
Cadmium	112		%	0.2	04/23/2024	AB24-0423-01
Calcium	96.2		%	1000.0	04/23/2024	AB24-0423-01
Chromium	107		%	1.0	04/23/2024	AB24-0423-01
Cobalt	105		%	6.0	04/23/2024	AB24-0423-01
Copper	100		%	1.0	04/23/2024	AB24-0423-01
Iron	114		%	20.0	04/23/2024	AB24-0423-01
Lead	99		%	1.0	04/23/2024	AB24-0423-01
Lithium	113		%	10.0	04/23/2024	AB24-0423-01
Magnesium	112		%	1000.0	04/23/2024	AB24-0423-01
Molybdenum	111		%	5.0	04/23/2024	AB24-0423-01
Nickel	104		%	2.0	04/23/2024	AB24-0423-01
Potassium	108		%	100.0	04/23/2024	AB24-0423-01
Selenium	107		%	1.0	04/23/2024	AB24-0423-01
Silver	107		%	0.2	04/23/2024	AB24-0423-01
Sodium	110		%	1000.0	04/23/2024	AB24-0423-01
Thallium	106		%	2.0	04/23/2024	AB24-0423-01
Vanadium	109		%	2.0	04/23/2024	AB24-0423-01
Zinc	108		%	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-09-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	95.0		%	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-09-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	99		%	1000.0	04/22/2024	AB24-0422-01
Fluoride	96		%	1000.0	04/22/2024	AB24-0422-01
Sulfate	100		%	1000.0	04/22/2024	AB24-0422-01



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15007R MSD**  
 Lab Sample ID: 24-0279-10  
 Matrix: Groundwater

Laboratory Project: **24-0279**  
 Collect Date: 04/16/2024  
 Collect Time: 04:41 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0279-10-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	111		%	1.0	04/23/2024	AB24-0423-01
Arsenic	108		%	1.0	04/23/2024	AB24-0423-01
Barium	114		%	5.0	04/23/2024	AB24-0423-01
Beryllium	118		%	1.0	04/23/2024	AB24-0423-01
Boron	105		%	20.0	04/23/2024	AB24-0423-01
Cadmium	111		%	0.2	04/23/2024	AB24-0423-01
Calcium	93.2		%	1000.0	04/23/2024	AB24-0423-01
Chromium	109		%	1.0	04/23/2024	AB24-0423-01
Cobalt	106		%	6.0	04/23/2024	AB24-0423-01
Copper	100		%	1.0	04/23/2024	AB24-0423-01
Iron	108		%	20.0	04/23/2024	AB24-0423-01
Lead	99		%	1.0	04/23/2024	AB24-0423-01
Lithium	112		%	10.0	04/23/2024	AB24-0423-01
Magnesium	102		%	1000.0	04/23/2024	AB24-0423-01
Molybdenum	110		%	5.0	04/23/2024	AB24-0423-01
Nickel	105		%	2.0	04/23/2024	AB24-0423-01
Potassium	104		%	100.0	04/23/2024	AB24-0423-01
Selenium	106		%	1.0	04/23/2024	AB24-0423-01
Silver	107		%	0.2	04/23/2024	AB24-0423-01
Sodium	102		%	1000.0	04/23/2024	AB24-0423-01
Thallium	107		%	2.0	04/23/2024	AB24-0423-01
Vanadium	111		%	2.0	04/23/2024	AB24-0423-01
Zinc	109		%	10.0	04/23/2024	AB24-0423-01

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0279-10-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	95.0		%	0.2	04/23/2024	AB24-0423-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0279-10-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	97		%	1000.0	04/22/2024	AB24-0422-01
Fluoride	96		%	1000.0	04/22/2024	AB24-0422-01
Sulfate	101		%	1000.0	04/22/2024	AB24-0422-01



# Analytical Report

Report Date: 05/03/24

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Data Qualifiers	Exception Summary
-----------------	-------------------

No exceptions occurred.

**TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM**

Project Log-In Number: 24-0279

Inspection Date: 04-17-2024 Inspection By: EB

Sample Origin/Project Name: JHC Q2-2024 Pond A Wells

Shipment Delivered By: Enter the type of shipment carrier.

Pony \_\_\_\_\_ FedEx \_\_\_\_\_ UPS \_\_\_\_\_ USPS \_\_\_\_\_ Airborne \_\_\_\_\_  
Other/Hand Carry (whom) CLE  
Tracking Number: \_\_\_\_\_ Shipping Form Attached: Yes \_\_\_\_\_ No \_\_\_\_\_

Shipping Containers: Enter the type and number of shipping containers received.

Cooler  Cardboard Box \_\_\_\_\_ Custom Case \_\_\_\_\_ Envelope/Mailer \_\_\_\_\_  
Loose/Unpackaged Containers \_\_\_\_\_ Other \_\_\_\_\_

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None  Dented \_\_\_\_\_ Leaking \_\_\_\_\_  
Other \_\_\_\_\_

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened N/A Sealed N/A

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC  Work Request \_\_\_\_\_ Air Data Sheet \_\_\_\_\_ Other \_\_\_\_\_

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 1.6-3.8°C Samples Received on Ice: Yes  No \_\_\_\_\_  
M&TE # and Expiration 015402 / 5-23-24

Number and Type of Containers: Enter the total number of sample containers received.

	Container Type	Water	Soil	Other	Broken	Leaking
pH Test Paper 0-14 Lot # 209522 Exp 2-15-25	VOA (40mL or 60mL)	<u>12</u>	_____	_____	_____	_____
	Quart/Liter (gallon)	<u>16</u>	_____	_____	_____	_____
	9-oz (amber glass jar)	_____	_____	_____	_____	_____
	2-oz (amber glass)	_____	_____	_____	_____	_____
	125 mL (plastic)	<u>20</u>	_____	_____	_____	_____
	24 mL vial (glass)	_____	_____	_____	_____	_____
	<sup>250</sup> 500 mL (plastic)	<u>8</u>	_____	_____	_____	_____
	EB 041724 Other	_____	_____	_____	_____	_____

Page 2 of 2 not needed

# CHAIN OF CUSTODY



## CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: <b>JHC Q2-2024 Pond A Wells</b>			PROJECT NUMBER: <b>24-0279</b>			SAP CC or WO#: REQUESTER: Bethany Swanberg			ANALYSIS REQUESTED (Attach List if More Space is Needed)							QA REQUIREMENT: <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> TNI <input type="checkbox"/> ISO 17025 <input type="checkbox"/> 10 CFR 50 APP. B <input type="checkbox"/> INTERNAL INFO <input type="checkbox"/> OTHER _____																						
SAMPLING TEAM: <b>CLE</b>			TURNAROUND TIME REQUIRED: <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 3 DAYS <input type="checkbox"/> STANDARD <input checked="" type="checkbox"/> OTHER _____						<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">Total Metals</th> <th rowspan="2">Anions</th> <th rowspan="2">TDS</th> <th rowspan="2">Alkalinity</th> <th rowspan="2">Radium 226</th> <th rowspan="2">Radium 228</th> <th colspan="7">PRESERVATIVE</th> </tr> <tr> <th>None</th> <th>HNO<sub>3</sub></th> <th>H<sub>2</sub>SO<sub>4</sub></th> <th>NaOH</th> <th>HCl</th> <th>MeOH</th> <th>Other</th> </tr> </table>								Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228	PRESERVATIVE							None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other		
Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228	PRESERVATIVE																																
						None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other																										
SEND REPORT TO: Joseph Firlit			email:			phone:			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">LAB SAMPLE ID</th> <th colspan="2">SAMPLE COLLECTION</th> <th rowspan="2">MATRIX</th> <th rowspan="2">FIELD SAMPLE ID / LOCATION</th> <th rowspan="2">TOTAL #</th> <th colspan="7">CONTAINERS</th> <th rowspan="2">REMARKS</th> </tr> <tr> <th>DATE</th> <th>TIME</th> <th>None</th> <th>HNO<sub>3</sub></th> <th>H<sub>2</sub>SO<sub>4</sub></th> <th>NaOH</th> <th>HCl</th> <th>MeOH</th> <th>Other</th> </tr> </table>							LAB SAMPLE ID	SAMPLE COLLECTION		MATRIX	FIELD SAMPLE ID / LOCATION	TOTAL #	CONTAINERS							REMARKS	DATE	TIME	None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other
LAB SAMPLE ID	SAMPLE COLLECTION		MATRIX	FIELD SAMPLE ID / LOCATION	TOTAL #	CONTAINERS											REMARKS																					
	DATE	TIME				None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other																										
COPY TO: JR Register TRC			MATRIX CODES: GW = Groundwater WW = Wastewater W = Water / Aqueous Liquid S = Soil / General Solid O = Oil			OX = Other _____ SL = Sludge A = Air WP = Wipe WT = General Waste																																

RELINQUISHED BY: <b>C. Swanberg</b>			DATE/TIME: <b>4-17-24 0915</b>			RECEIVED BY:			COMMENTS:						
RELINQUISHED BY:			DATE/TIME:			RECEIVED BY:			Received on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Temperature: <b>1.6-3.8</b> °C M&TE #: <b>015402</b> Cal. Due Date: <b>5-23-24</b>						

To: JFirlit, JH Campbell Complex

From: EBlaj, T-258

Date: May 03, 2024

Subject: JH CAMPBELL SOLID WASTE DISPOSAL AREA – GROUNDWATER MONITORING  
2<sup>nd</sup> Quarter, 2024 – Supplemental and GSI Wells

CC: HDRegister, P22-521  
ADSantini, P20-215B-REM

Sarah Holmstrom, Project Manager  
TRC Companies, Inc.  
1540 Eisenhower Place  
Ann Arbor, MI 48108

---

**Chemistry Project: 24-0281**

CE Laboratory Services conducted groundwater monitoring at the JH Campbell Solid Waste Disposal Area during the week of 04/15/2024, for the 2<sup>nd</sup> Quarter requirement, as specified in the Hydrogeological Monitoring Plan for the site. Samples were not collected from MW-13; the well was dry. All other samples were received for analysis by the Chemistry department on 04/18/2024.

Samples for Radium analysis have been subcontracted to Eurofins/TestAmerica, Inc. and their results are being reported separately. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples, as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj  
Sr. Technical Analyst  
Project Lead



*Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.*

## CASE NARRATIVE

### I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. Sample preservation upon receipt was verified by the sample custodian and confirmed to meet method requirements.

### II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from “Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, “Test Methods for Evaluating Solid Waste – Physical/Chemical Methods”, USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22<sup>nd</sup> Edition, 2012.

### III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container & aliquot number. Results for the field blanks, field duplicates, and percent recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

## DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report where applicable:

<u>Acronym</u>	<u>Description</u>
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Not a TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result

D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

**Customer Name:** JH Campbell Complex  
**Work Order ID:** Q2-2024 Supplemental Wells  
**Date Received:** 4/18/2024  
**Chemistry Project:** 24-0281

<u>Sample #</u>	<u>Field Sample ID</u>	<u>Matrix</u>	<u>Sample Date</u>	<u>Site</u>
24-0281-01	MW-14S	Groundwater	04/16/2024 12:00	JHC GW Monitoring - Supplemental Wells
24-0281-02	PZ-23S	Groundwater	04/17/2024 13:40	JHC GW Monitoring - Supplemental Wells
24-0281-03	PZ-24S	Groundwater	04/16/2024 19:48	JHC GW Monitoring - Supplemental Wells
24-0281-04	PZ-24	Groundwater	04/16/2024 17:55	JHC GW Monitoring - Supplemental Wells
24-0281-05	PZ-40S	Groundwater	04/17/2024 11:03	JHC GW Monitoring - Supplemental Wells
24-0281-06	PZ-40	Groundwater	04/17/2024 09:38	JHC GW Monitoring - Supplemental Wells
24-0281-07	TW-19-05	Groundwater	04/16/2024 17:31	JHC GW Monitoring - Supplemental Wells
24-0281-08	TW-19-06A	Groundwater	04/16/2024 19:30	JHC GW Monitoring - Supplemental Wells
24-0281-09	DUP-07	Groundwater	04/16/2024 00:00	JHC GW Monitoring - Supplemental Wells
24-0281-10	TW-19-06A MS	Groundwater	04/16/2024 19:30	JHC GW Monitoring - Supplemental Wells
24-0281-11	TW-19-06A MSD	Groundwater	04/16/2024 19:30	JHC GW Monitoring - Supplemental Wells



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **MW-14S**  
 Lab Sample ID: 24-0281-01  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 12:00 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-01-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	13		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	24		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	3500		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	1		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	262		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	2390		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	6		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	195		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	1		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	1470		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-01-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-01-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1210		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	11300		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-01-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	46		mg/L	10.0	04/19/2024	AB24-0419-04

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **MW-14S**  
 Lab Sample ID: 24-0281-01  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 12:00 PM

**Alkalinity by SM 2320B**

Aliquot #: 24-0281-01-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0281-01-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Arsenic	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Chromium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Lithium	ND		ug/L	10.0	04/29/2024	AB24-0429-01
Molybdenum	6		ug/L	5.0	04/29/2024	AB24-0429-01
Nickel	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Selenium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Vanadium	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Boron	ND		ug/L	20.0	04/29/2024	AB24-0429-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-23S**  
 Lab Sample ID: 24-0281-02  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/17/2024  
 Collect Time: 01:40 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-02-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	ND		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	ND		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	3990		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	144		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	ND		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	ND		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	545		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	ND		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-02-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-02-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	2410		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-02-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	127		mg/L	10.0	04/19/2024	AB24-0419-04

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-23S**  
 Lab Sample ID: 24-0281-02  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/17/2024  
 Collect Time: 01:40 PM

**Alkalinity by SM 2320B**

Aliquot #: 24-0281-02-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	13900		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	13900		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0281-02-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Arsenic	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Chromium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Lithium	ND		ug/L	10.0	04/29/2024	AB24-0429-01
Molybdenum	ND		ug/L	5.0	04/29/2024	AB24-0429-01
Nickel	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Selenium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Vanadium	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Boron	ND		ug/L	20.0	04/29/2024	AB24-0429-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-24S**  
 Lab Sample ID: 24-0281-03  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 07:48 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-03-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	62		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	ND		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	3620		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	1		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	1850		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	ND		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	ND		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	380		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	1540		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-03-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-03-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1330		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	13800		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-03-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	68		mg/L	10.0	04/19/2024	AB24-0419-04

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-24S**  
 Lab Sample ID: 24-0281-03  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 07:48 PM

**Alkalinity by SM 2320B**

Aliquot #: 24-0281-03-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0281-03-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Arsenic	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Chromium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Lithium	ND		ug/L	10.0	04/29/2024	AB24-0429-01
Molybdenum	ND		ug/L	5.0	04/29/2024	AB24-0429-01
Nickel	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Selenium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Vanadium	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Boron	ND		ug/L	20.0	04/29/2024	AB24-0429-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-24**  
 Lab Sample ID: 24-0281-04  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 05:55 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-04-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	26		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	185		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	37700		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	1		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	2		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	9900		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	11900		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	8		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	1790		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	3620		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	31		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-04-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-04-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	2370		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	105000		ug/L	1000.0	04/23/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-04-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	395		mg/L	10.0	04/19/2024	AB24-0419-04

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-24**  
 Lab Sample ID: 24-0281-04  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 05:55 PM

**Alkalinity by SM 2320B**

Aliquot #: 24-0281-04-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	47700		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	47700		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0281-04-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Arsenic	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Chromium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Lithium	ND		ug/L	10.0	04/29/2024	AB24-0429-01
Molybdenum	8		ug/L	5.0	04/29/2024	AB24-0429-01
Nickel	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Selenium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Vanadium	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Boron	178		ug/L	20.0	04/29/2024	AB24-0429-01



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-40S**  
 Lab Sample ID: 24-0281-05  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/17/2024  
 Collect Time: 11:03 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-05-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	26		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	27		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	1750		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	1		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	93		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	ND		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	ND		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	109		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	2050		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-05-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-05-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1580		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	6520		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-05-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	121		mg/L	10.0	04/19/2024	AB24-0419-04

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-40S**  
 Lab Sample ID: 24-0281-05  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/17/2024  
 Collect Time: 11:03 AM

**Alkalinity by SM 2320B**

Aliquot #: 24-0281-05-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0281-05-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Arsenic	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Chromium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Lithium	ND		ug/L	10.0	04/29/2024	AB24-0429-01
Molybdenum	ND		ug/L	5.0	04/29/2024	AB24-0429-01
Nickel	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Selenium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Vanadium	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Boron	20		ug/L	20.0	04/29/2024	AB24-0429-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-40**  
 Lab Sample ID: 24-0281-06  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/17/2024  
 Collect Time: 09:38 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-06-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	17		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	210		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	13900		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	1		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	32		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	3230		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	33		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	1110		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	4540		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-06-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-06-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	7960		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	15700		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-06-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	97		mg/L	10.0	04/19/2024	AB24-0419-04

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-40**  
 Lab Sample ID: 24-0281-06  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/17/2024  
 Collect Time: 09:38 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0281-06-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	33900		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	33900		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

### Groundwater Metals by EPA 6020A, Dissolved, JHC List

Aliquot #: 24-0281-06-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Arsenic	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Chromium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Lithium	ND		ug/L	10.0	04/29/2024	AB24-0429-01
Molybdenum	34		ug/L	5.0	04/29/2024	AB24-0429-01
Nickel	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Selenium	ND		ug/L	1.0	04/29/2024	AB24-0429-01
Vanadium	ND		ug/L	2.0	04/29/2024	AB24-0429-01
Boron	199		ug/L	20.0	04/29/2024	AB24-0429-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-05**  
 Lab Sample ID: 24-0281-07  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 05:31 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-07-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	2		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	23		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	81		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	24900		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	1		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	3		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	24		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	29		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	7290		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	ND		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	6930		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	18		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	1340		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-07-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-07-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	9720		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-07-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	184		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **TW-19-05**  
Lab Sample ID: 24-0281-07  
Matrix: Groundwater

Laboratory Project: **24-0281**  
Collect Date: 04/16/2024  
Collect Time: 05:31 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0281-07-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	95400		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	95400		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-06A**  
 Lab Sample ID: 24-0281-08  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 07:30 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-08-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	5		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	1120		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	23700		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	48		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	2350		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	29		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	3290		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	1		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	16700		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-08-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-08-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	15500		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	63800		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-08-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	159		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **TW-19-06A**  
Lab Sample ID: 24-0281-08  
Matrix: Groundwater

Laboratory Project: **24-0281**  
Collect Date: 04/16/2024  
Collect Time: 07:30 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0281-08-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	27700		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	27700		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **DUP-07**  
 Lab Sample ID: 24-0281-09  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 12:00 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-09-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Arsenic	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Barium	60		ug/L	5.0	04/22/2024	AB24-0422-08
Beryllium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Boron	ND		ug/L	20.0	04/22/2024	AB24-0422-08
Cadmium	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Calcium	3570		ug/L	1000.0	04/22/2024	AB24-0422-08
Chromium	1		ug/L	1.0	04/22/2024	AB24-0422-08
Cobalt	ND		ug/L	6.0	04/22/2024	AB24-0422-08
Copper	1		ug/L	1.0	04/22/2024	AB24-0422-08
Iron	1860		ug/L	20.0	04/22/2024	AB24-0422-08
Lead	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Lithium	ND		ug/L	10.0	04/22/2024	AB24-0422-08
Magnesium	ND		ug/L	1000.0	04/22/2024	AB24-0422-08
Molybdenum	ND		ug/L	5.0	04/22/2024	AB24-0422-08
Nickel	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Potassium	369		ug/L	100.0	04/22/2024	AB24-0422-08
Selenium	ND		ug/L	1.0	04/22/2024	AB24-0422-08
Silver	ND		ug/L	0.2	04/22/2024	AB24-0422-08
Sodium	1560		ug/L	1000.0	04/22/2024	AB24-0422-08
Thallium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Vanadium	ND		ug/L	2.0	04/22/2024	AB24-0422-08
Zinc	ND		ug/L	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-09-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-09-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1270		ug/L	1000.0	04/22/2024	AB24-0422-01
Fluoride	ND		ug/L	1000.0	04/22/2024	AB24-0422-01
Sulfate	13800		ug/L	1000.0	04/22/2024	AB24-0422-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0281-09-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	103		mg/L	10.0	04/19/2024	AB24-0419-04



# Analytical Report

Report Date: 05/03/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **DUP-07**  
Lab Sample ID: 24-0281-09  
Matrix: Groundwater

Laboratory Project: **24-0281**  
Collect Date: 04/16/2024  
Collect Time: 12:00 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0281-09-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Bicarbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01
Alkalinity Carbonate	ND		ug/L	10.0	04/24/2024	AB24-0424-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-06A MS**  
 Lab Sample ID: 24-0281-10  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 07:30 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-10-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	108		%	1.0	04/22/2024	AB24-0422-08
Arsenic	109		%	1.0	04/22/2024	AB24-0422-08
Barium	111		%	5.0	04/22/2024	AB24-0422-08
Beryllium	105		%	1.0	04/22/2024	AB24-0422-08
Boron	107		%	20.0	04/22/2024	AB24-0422-08
Cadmium	107		%	0.2	04/22/2024	AB24-0422-08
Calcium	105		%	1000.0	04/22/2024	AB24-0422-08
Chromium	105		%	1.0	04/22/2024	AB24-0422-08
Cobalt	108		%	6.0	04/22/2024	AB24-0422-08
Copper	107		%	1.0	04/22/2024	AB24-0422-08
Iron	95		%	20.0	04/22/2024	AB24-0422-08
Lead	106		%	1.0	04/22/2024	AB24-0422-08
Lithium	102		%	10.0	04/22/2024	AB24-0422-08
Magnesium	102		%	1000.0	04/22/2024	AB24-0422-08
Molybdenum	109		%	5.0	04/22/2024	AB24-0422-08
Nickel	108		%	2.0	04/22/2024	AB24-0422-08
Potassium	104		%	100.0	04/22/2024	AB24-0422-08
Selenium	105		%	1.0	04/22/2024	AB24-0422-08
Silver	104		%	0.2	04/22/2024	AB24-0422-08
Sodium	91.6		%	1000.0	04/22/2024	AB24-0422-08
Thallium	108		%	2.0	04/22/2024	AB24-0422-08
Vanadium	107		%	2.0	04/22/2024	AB24-0422-08
Zinc	109		%	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-10-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	95.0		%	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-10-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	104		%	1000.0	04/22/2024	AB24-0422-01
Fluoride	99		%	1000.0	04/22/2024	AB24-0422-01
Sulfate	103		%	1000.0	04/22/2024	AB24-0422-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-06A MSD**  
 Lab Sample ID: 24-0281-11  
 Matrix: Groundwater

Laboratory Project: **24-0281**  
 Collect Date: 04/16/2024  
 Collect Time: 07:30 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0281-11-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	108		%	1.0	04/22/2024	AB24-0422-08
Arsenic	108		%	1.0	04/22/2024	AB24-0422-08
Barium	109		%	5.0	04/22/2024	AB24-0422-08
Beryllium	103		%	1.0	04/22/2024	AB24-0422-08
Boron	103		%	20.0	04/22/2024	AB24-0422-08
Cadmium	106		%	0.2	04/22/2024	AB24-0422-08
Calcium	96.1		%	1000.0	04/22/2024	AB24-0422-08
Chromium	106		%	1.0	04/22/2024	AB24-0422-08
Cobalt	108		%	6.0	04/22/2024	AB24-0422-08
Copper	105		%	1.0	04/22/2024	AB24-0422-08
Iron	115		%	20.0	04/22/2024	AB24-0422-08
Lead	106		%	1.0	04/22/2024	AB24-0422-08
Lithium	102		%	10.0	04/22/2024	AB24-0422-08
Magnesium	105		%	1000.0	04/22/2024	AB24-0422-08
Molybdenum	108		%	5.0	04/22/2024	AB24-0422-08
Nickel	106		%	2.0	04/22/2024	AB24-0422-08
Potassium	103		%	100.0	04/22/2024	AB24-0422-08
Selenium	105		%	1.0	04/22/2024	AB24-0422-08
Silver	104		%	0.2	04/22/2024	AB24-0422-08
Sodium	100		%	1000.0	04/22/2024	AB24-0422-08
Thallium	109		%	2.0	04/22/2024	AB24-0422-08
Vanadium	108		%	2.0	04/22/2024	AB24-0422-08
Zinc	110		%	10.0	04/22/2024	AB24-0422-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0281-11-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	95.0		%	0.2	04/23/2024	AB24-0422-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0281-11-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	105		%	1000.0	04/22/2024	AB24-0422-01
Fluoride	101		%	1000.0	04/22/2024	AB24-0422-01
Sulfate	103		%	1000.0	04/22/2024	AB24-0422-01

---

Data Qualifiers	Exception Summary
-----------------	-------------------

---

No exceptions occurred.

---

**TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM**

Project Log-In Number: 24-0281

Inspection Date: 4.18.24

Inspection By: UmO

Sample Origin/Project Name: JTC Q2-2024 Supplemental Wells

Shipment Delivered By: Enter the type of shipment carrier.

Pony \_\_\_\_\_ FedEx \_\_\_\_\_ UPS \_\_\_\_\_ USPS \_\_\_\_\_ Airborne \_\_\_\_\_

Other/Hand Carry (whom) UDR

Tracking Number: \_\_\_\_\_ Shipping Form Attached: Yes \_\_\_\_\_ No \_\_\_\_\_

Shipping Containers: Enter the type and number of shipping containers received.

Cooler  Cardboard Box \_\_\_\_\_ Custom Case \_\_\_\_\_ Envelope/Mailer \_\_\_\_\_

Loose/Unpackaged Containers \_\_\_\_\_ Other \_\_\_\_\_

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None  Dented \_\_\_\_\_ Leaking \_\_\_\_\_

Other \_\_\_\_\_

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened \_\_\_\_\_ Sealed

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC  Work Request \_\_\_\_\_ Air Data Sheet \_\_\_\_\_ Other \_\_\_\_\_

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 14-20 Samples Received on Ice: Yes  No \_\_\_\_\_

M&TE # and Expiration 015402 5.23.24

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	<u>18</u>	_____	_____	_____	_____
Quart/Liter (g/p)	_____	_____	_____	_____	_____
9-oz (amber glass jar)	_____	_____	_____	_____	_____
2-oz (amber glass)	_____	_____	_____	_____	_____
125 mL (plastic)	<u>28</u>	_____	_____	_____	_____
24 mL vial (glass)	_____	_____	_____	_____	_____
500 mL (plastic)	_____	_____	_____	_____	_____
Other <u>250mL Plastic</u>	<u>9</u>	_____	_____	_____	_____

# CHAIN OF CUSTODY



## CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page 1 of 1

SAMPLING SITE / CUSTOMER: <b>JHC Q2-2024 Supplemental Wells</b>		PROJECT NUMBER: <b>24-0281</b>		SAP CC or WO#: REQUESTER: Bethany Swanberg		ANALYSIS REQUESTED (Attach List if More Space is Needed)							QA REQUIREMENT: <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> TNI <input type="checkbox"/> ISO 17025 <input type="checkbox"/> 10 CFR 50 APP. B <input type="checkbox"/> INTERNAL INFO <input type="checkbox"/> OTHER _____																						
SAMPLING TEAM: <b>KDR, LMO</b>		TURNAROUND TIME REQUIRED: <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 3 DAYS <input type="checkbox"/> STANDARD <input checked="" type="checkbox"/> OTHER _____		email:		phone:		<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th rowspan="2">Total Metals</th> <th rowspan="2">Anions</th> <th rowspan="2">TDS</th> <th rowspan="2">Alkalinity</th> <th rowspan="2">Radium 226</th> <th rowspan="2">Radium 228</th> <th rowspan="2">Dissolved Metals</th> <th colspan="7">REMARKS</th> </tr> <tr> <th colspan="7"></th> </tr> </table>							Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228	Dissolved Metals	REMARKS													
Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228	Dissolved Metals	REMARKS																												
SEND REPORT TO: Joseph Firlit		MATRIX CODES: GW = Groundwater      OX = Other WW = Wastewater      SL = Sludge W = Water / Aqueous Liquid      A = Air S = Soil / General Solid      WP = Wipe O = Oil      WT = General Waste		CONTAINERS		PRESERVATIVE																													
COPY TO: JR Register		FIELD SAMPLE ID / LOCATION		TOTAL #		None		HNO <sub>3</sub>		H <sub>2</sub> SO <sub>4</sub>		NaOH		HCl		MeOH		Other																	
LAB SAMPLE ID		SAMPLE COLLECTION		DATE		TIME		MATRIX		DATE		TIME		MATRIX																					
24-0281-01		4.16.24		12:00		GW		MW-14S		8		4		4																					
-02		4.17.24		13:40		GW		PZ-23S		8		4		4																					
-03		4.16.24		19:48		GW		PZ-24S		8		4		4																					
-04		4.16.24		17:55		GW		PZ-24		8		4		4																					
-05		4.17.24		11:03		GW		PZ-40S		8		4		4																					
-06		4.17.24		09:38		GW		PZ-40		8		4		4																					
-07		4.16.24		17:31		GW		TW-19-05		7		4		3																					
-08		4.16.24		19:30		GW		TW-19-06A		7		4		3																					
-09		4.16.24		—		GW		DUP-07		7		4		3																					
-10		4.16.24		19:30		GW		TW-19-06A MS		2		1		1																					
-11		4.16.24		19:30		GW		TW-19-06A MSD		2		1		1																					

RELINQUISHED BY: <i>Leana Okopse</i>	DATE/TIME: 4.18.24 1234	RECEIVED BY: <i>[Signature]</i>	COMMENTS: pH Lot 205522 exp. 2.15.25 paper
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY: <i>[Signature]</i>	Received on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No      M&TE #: 015402 5.23.24 Temperature: 1.4-2.0 °C      Cal. Due Date: 5.23.24

To: JFirlit, JH Campbell Complex

From: EBlaj, T-258

Date: October 31, 2024

Subject: JH CAMPBELL SOLID WASTE DISPOSAL AREA – GROUNDWATER MONITORING  
4<sup>th</sup> Quarter, 2024 – Background Wells

CC: HDRegister, P22-521  
ADSantini, P20-215B-REM

Sarah Holmstrom, Project Manager  
TRC Companies, Inc.  
1540 Eisenhower Place  
Ann Arbor, MI 48108

---

**Chemistry Project: 24-0857**

CE Laboratory Services conducted groundwater monitoring at the JH Campbell Solid Waste Disposal Area during the week of 10/14/2024, for the 4<sup>th</sup> Quarter requirement, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for analysis by the Chemistry department on 10/16/2024.

Samples for Radium analysis have been subcontracted to Eurofins/TestAmerica, Inc. and their results are being reported separately. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples, as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj  
Sr. Technical Analyst  
Project Lead



*Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.*



## CASE NARRATIVE

### I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. Sample preservation upon receipt was verified by the sample custodian and confirmed to meet method requirements.

### II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from “Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, “Test Methods for Evaluating Solid Waste – Physical/Chemical Methods”, USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22<sup>nd</sup> Edition, 2012.

### III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container & aliquot number. Results for the field blanks, field duplicates, and percent recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

## DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report where applicable:

<u>Acronym</u>	<u>Description</u>
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Not a TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result

D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

**Customer Name:** JH Campbell Complex  
**Work Order ID:** Q4-2024 JHC Background Wells  
**Date Received:** 10/16/2024  
**Chemistry Project:** 24-0857

<u>Sample #</u>	<u>Field Sample ID</u>	<u>Matrix</u>	<u>Sample Date</u>	<u>Site</u>
24-0857-01	JHC-MW-15023	Groundwater	10/14/2024 17:06	JHC GW Monitoring - Background Wells
24-0857-02	JHC-MW-15024	Groundwater	10/14/2024 18:56	JHC GW Monitoring - Background Wells
24-0857-03	JHC-MW-15025	Groundwater	10/14/2024 20:11	JHC GW Monitoring - Background Wells
24-0857-04	JHC-MW-15026	Groundwater	10/15/2024 08:56	JHC GW Monitoring - Background Wells
24-0857-05	JHC-MW-15027	Groundwater	10/15/2024 10:31	JHC GW Monitoring - Background Wells
24-0857-06	JHC-MW-15028	Groundwater	10/15/2024 11:50	JHC GW Monitoring - Background Wells
24-0857-07	DUP-01	Groundwater	10/14/2024 00:00	JHC GW Monitoring - Background Wells
24-0857-08	FB-01	Water	10/15/2024 12:22	JHC GW Monitoring - Background Wells
24-0857-09	EB-01	Water	10/15/2024 12:10	JHC GW Monitoring - Background Wells
24-0857-10	JHC-MW-15025 Field MS	Groundwater	10/14/2024 20:11	JHC GW Monitoring - Background Wells
24-0857-11	JHC-MW-15025 Field MSD	Groundwater	10/14/2024 20:11	JHC GW Monitoring - Background Wells

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15023**  
 Lab Sample ID: 24-0857-01  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/14/2024  
 Collect Time: 05:06 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-01-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	24		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	27		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	12900		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	4640		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	913		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	4480		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-01-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-01-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	4570		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	11300		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-01-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	84		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15023**  
Lab Sample ID: 24-0857-01  
Matrix: Groundwater

Laboratory Project: **24-0857**  
Collect Date: 10/14/2024  
Collect Time: 05:06 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0857-01-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	44000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	44000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15024**  
 Lab Sample ID: 24-0857-02  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/14/2024  
 Collect Time: 06:56 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-02-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	17		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	28200		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	2		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	8220		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	1190		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	23900		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-02-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-02-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	26800		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	8100		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-02-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	174		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15024**  
Lab Sample ID: 24-0857-02  
Matrix: Groundwater

Laboratory Project: **24-0857**  
Collect Date: 10/14/2024  
Collect Time: 06:56 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0857-02-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	117000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	117000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15025**  
 Lab Sample ID: 24-0857-03  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/14/2024  
 Collect Time: 08:11 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-03-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	10		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	21		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	37100		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	1		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	11100		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	1460		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	26500		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-03-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-03-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	43300		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	12000		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-03-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	215		mg/L	10.0	10/17/2024	AB24-1017-02





# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15025**  
Lab Sample ID: 24-0857-03  
Matrix: Groundwater

Laboratory Project: **24-0857**  
Collect Date: 10/14/2024  
Collect Time: 08:11 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0857-03-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	127000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	127000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15026**  
 Lab Sample ID: 24-0857-04  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/15/2024  
 Collect Time: 08:56 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-04-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	9		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	4280		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	1		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	28		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	1050		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	4		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	557		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	2200		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-04-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-04-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	3070		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	7240		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-04-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	27		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15026**  
Lab Sample ID: 24-0857-04  
Matrix: Groundwater

Laboratory Project: **24-0857**  
Collect Date: 10/15/2024  
Collect Time: 08:56 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0857-04-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	10600		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	10600		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15027**  
 Lab Sample ID: 24-0857-05  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/15/2024  
 Collect Time: 10:31 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-05-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	8		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	22		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	18700		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	31		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	4800		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	478		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	2070		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-05-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-05-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1270		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	4790		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-05-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	75		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15027**  
Lab Sample ID: 24-0857-05  
Matrix: Groundwater

Laboratory Project: **24-0857**  
Collect Date: 10/15/2024  
Collect Time: 10:31 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0857-05-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	62200		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	62200		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15028**  
 Lab Sample ID: 24-0857-06  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/15/2024  
 Collect Time: 11:50 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-06-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	6		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	15000		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	25		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	3480		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	4		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	389		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	1120		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-06-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-06-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	5230		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-06-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	62		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **JHC-MW-15028**  
Lab Sample ID: 24-0857-06  
Matrix: Groundwater

Laboratory Project: **24-0857**  
Collect Date: 10/15/2024  
Collect Time: 11:50 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0857-06-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	50000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	50000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **DUP-01**  
 Lab Sample ID: 24-0857-07  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/14/2024  
 Collect Time: 12:00 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-07-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	21		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	30		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	13600		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	4840		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	988		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	1		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	4590		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-07-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-07-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	4500		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	11000		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-07-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	71		mg/L	10.0	10/17/2024	AB24-1017-02





# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
Field Sample ID: **DUP-01**  
Lab Sample ID: 24-0857-07  
Matrix: Groundwater

Laboratory Project: **24-0857**  
Collect Date: 10/14/2024  
Collect Time: 12:00 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0857-07-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	44000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	44000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **FB-01**  
 Lab Sample ID: 24-0857-08  
 Matrix: Water

Laboratory Project: **24-0857**  
 Collect Date: 10/15/2024  
 Collect Time: 12:22 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-08-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	ND		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-08-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-08-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	ND		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-08-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	10/17/2024	AB24-1017-02

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **EB-01**  
 Lab Sample ID: 24-0857-09  
 Matrix: Water

Laboratory Project: **24-0857**  
 Collect Date: 10/15/2024  
 Collect Time: 12:10 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-09-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	ND		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-09-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-09-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/17/2024	AB24-1017-01
Sulfate	ND		ug/L	1000.0	10/17/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0857-09-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	10/17/2024	AB24-1017-02

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15025 Field MS**  
 Lab Sample ID: 24-0857-10  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/14/2024  
 Collect Time: 08:11 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-10-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	107		%	1.0	10/21/2024	AB24-1021-08
Arsenic	109		%	1.0	10/21/2024	AB24-1021-08
Barium	104		%	5.0	10/21/2024	AB24-1021-08
Beryllium	101		%	1.0	10/21/2024	AB24-1021-08
Boron	107		%	20.0	10/21/2024	AB24-1021-08
Cadmium	107		%	0.2	10/21/2024	AB24-1021-08
Calcium	104		%	1000.0	10/21/2024	AB24-1021-08
Chromium	109		%	1.0	10/21/2024	AB24-1021-08
Cobalt	110		%	6.0	10/21/2024	AB24-1021-08
Copper	110		%	1.0	10/21/2024	AB24-1021-08
Iron	108		%	20.0	10/21/2024	AB24-1021-08
Lead	103		%	1.0	10/21/2024	AB24-1021-08
Lithium	100		%	10.0	10/21/2024	AB24-1021-08
Magnesium	111		%	1000.0	10/21/2024	AB24-1021-08
Molybdenum	108		%	5.0	10/21/2024	AB24-1021-08
Nickel	112		%	2.0	10/21/2024	AB24-1021-08
Potassium	105		%	100.0	10/21/2024	AB24-1021-08
Selenium	107		%	1.0	10/21/2024	AB24-1021-08
Silver	99.0		%	0.2	10/21/2024	AB24-1021-08
Sodium	107		%	1000.0	10/21/2024	AB24-1021-08
Thallium	105		%	2.0	10/21/2024	AB24-1021-08
Vanadium	113		%	2.0	10/21/2024	AB24-1021-08
Zinc	114		%	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-10-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	91.0		%	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-10-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	114		%	1000.0	10/17/2024	AB24-1017-01
Fluoride	99		%	1000.0	10/17/2024	AB24-1017-01
Sulfate	100		%	1000.0	10/17/2024	AB24-1017-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Background Wells (395496)**  
 Field Sample ID: **JHC-MW-15025 Field MSD**  
 Lab Sample ID: 24-0857-11  
 Matrix: Groundwater

Laboratory Project: **24-0857**  
 Collect Date: 10/14/2024  
 Collect Time: 08:11 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0857-11-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	106		%	1.0	10/21/2024	AB24-1021-08
Arsenic	106		%	1.0	10/21/2024	AB24-1021-08
Barium	106		%	5.0	10/21/2024	AB24-1021-08
Beryllium	103		%	1.0	10/21/2024	AB24-1021-08
Boron	101		%	20.0	10/21/2024	AB24-1021-08
Cadmium	108		%	0.2	10/21/2024	AB24-1021-08
Calcium	105		%	1000.0	10/21/2024	AB24-1021-08
Chromium	108		%	1.0	10/21/2024	AB24-1021-08
Cobalt	108		%	6.0	10/21/2024	AB24-1021-08
Copper	107		%	1.0	10/21/2024	AB24-1021-08
Iron	106		%	20.0	10/21/2024	AB24-1021-08
Lead	104		%	1.0	10/21/2024	AB24-1021-08
Lithium	102		%	10.0	10/21/2024	AB24-1021-08
Magnesium	101		%	1000.0	10/21/2024	AB24-1021-08
Molybdenum	110		%	5.0	10/21/2024	AB24-1021-08
Nickel	108		%	2.0	10/21/2024	AB24-1021-08
Potassium	103		%	100.0	10/21/2024	AB24-1021-08
Selenium	107		%	1.0	10/21/2024	AB24-1021-08
Silver	102		%	0.2	10/21/2024	AB24-1021-08
Sodium	107		%	1000.0	10/21/2024	AB24-1021-08
Thallium	106		%	2.0	10/21/2024	AB24-1021-08
Vanadium	109		%	2.0	10/21/2024	AB24-1021-08
Zinc	110		%	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0857-11-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	96.0		%	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0857-11-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	113		%	1000.0	10/17/2024	AB24-1017-01
Fluoride	100		%	1000.0	10/17/2024	AB24-1017-01
Sulfate	101		%	1000.0	10/17/2024	AB24-1017-01



# Analytical Report

Report Date: 10/31/24

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Data Qualifiers	Exception Summary
-----------------	-------------------

No exceptions occurred.

CONSUMERS  
ENERGY

Chemistry Department  
General Standard Operating Procedure

PROC CHEM-1.2.01  
PAGE 1 OF 2  
REVISION 5  
ATTACHMENT A

**TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM**

Project Number: 24-0857-04 Inspection Date: 10.16.24 Inspection By: LMO

Sample Origin/Project Name: JHC Q4-2024 Background Wells

Shipment Delivered By: Enter the type of shipment carrier.

Inter-Company Mail \_\_\_\_\_ FedEx \_\_\_\_\_ UPS \_\_\_\_\_ USPS \_\_\_\_\_

Tracking Number: \_\_\_\_\_ Other/Carry In (whom) LMO

Shipping Containers: Enter the type and number of shipping containers received.

Cooler  Cardboard Box \_\_\_\_\_ Custom Case \_\_\_\_\_ Envelope/Mailer \_\_\_\_\_

Loose/Unpackaged Containers \_\_\_\_\_ Other \_\_\_\_\_

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None \_\_\_\_\_ Dented \_\_\_\_\_ Leaking \_\_\_\_\_

Other \_\_\_\_\_

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened \_\_\_\_\_ Sealed  N/A \_\_\_\_\_

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC  Work Request \_\_\_\_\_ Air Data Sheet \_\_\_\_\_ Other \_\_\_\_\_

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 1.1-1.9 °C Samples Received on Ice: Yes  No \_\_\_\_\_

M&TE # and Expiration LS027723 / 6.27.25

Number and Type of Containers: Enter the type and total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or <u>60mL</u> )	<u>14</u>	_____	_____	_____	_____
Quart/Liter (g/p)	_____	_____	_____	_____	_____
9-oz (amber glass jar)	<u>9</u>	_____	_____	_____	_____
2-oz (amber glass)	_____	_____	_____	_____	_____
125 mL (plastic)	<u>22</u>	_____	_____	_____	_____
24 mL vial (glass)	_____	_____	_____	_____	_____
250 mL (plastic)	_____	_____	_____	_____	_____
Other <u>1L plastic</u>	<u>18</u>	_____	_____	_____	_____

All sample pH meeting criteria? Yes  No \_\_\_\_\_ N/A \_\_\_\_\_ pH paper lot # 205522 Exp. Date 2.15.25

Indicate if an Exception Report (Page 2 of 2) is needed: Yes \_\_\_\_\_ No

# CHAIN OF CUSTODY



## CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: <b>JHC Q4-2024 Background Wells</b>			PROJECT NUMBER: <b>24-0857</b>		SAP CC or WO#: REQUESTER: Bethany Swanberg		ANALYSIS REQUESTED (Attach List if More Space is Needed)						QA REQUIREMENT:  <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> TNI <input type="checkbox"/> ISO 17025 <input type="checkbox"/> 10 CFR 50 APP. B <input type="checkbox"/> INTERNAL INFO <input type="checkbox"/> OTHER _____										
SAMPLING TEAM: <b>LMO</b>			TURNAROUND TIME REQUIRED: <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 3 DAYS <input type="checkbox"/> STANDARD <input checked="" type="checkbox"/> OTHER _____																				
SEND REPORT TO: Joseph Firlit		email:		phone:																			
COPY TO: JR Register		MATRIX CODES: GW = Groundwater      OX = Other WW = Wastewater      SL = Sludge W = Water / Aqueous Liquid      A = Air S = Soil / General Solid      WP = Wipe O = Oil      WT = General Waste																					
TRC		CONTAINERS PRESERVATIVE																					
LAB SAMPLE ID	SAMPLE COLLECTION		MATRIX	FIELD SAMPLE ID / LOCATION								TOTAL #	None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl				MeOH	Other	Total Metals
	DATE	TIME																					
24-0857-01	10.14.24	1704	GW	JHC-MW-15023	7	4	3								x	x	x	x	x	x			
-02	10.14.24	1854	GW	JHC-MW-15024	7	4	3								x	x	x	x	x	x			
-03	10.14.24	2011	GW	JHC-MW-15025	7	4	3								x	x	x	x	x	x			
-04	10.15.24	0856	GW	JHC-MW-15026	7	4	3								x	x	x	x	x	x			
-05	10.15.24	1031	GW	JHC-MW-15027	7	4	3								x	x	x	x	x	x			
-06	10.15.24	1150	GW	JHC-MW-15028	7	4	3								x	x	x	x	x	x			
-07	10.14.24	—	GW	DUP-01	7	4	3								x	x	x	x	x	x			
-08	10.15.24	1222	W	FB-01	5	2	3								x	x	x		x	x			
-09	10.15.24	1210	W	EB-01	5	2	3								x	x	x		x	x			
-10	10.14.24	2011	GW	JHC-MW-15025 MS	2	1	1								x	x							
-11	10.14.24	2011	GW	JHC-MW-15025 MSD	2	1	1								x	x							

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	COMMENTS:
<i>Leeana Okopse</i>	10-16-24/1132	<i>Traci Buter</i>	
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	Received on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No      M&TE #: <u>L5627723</u>
			Temperature: <u>1.1-1.9</u> °C      Cal. Due Date: <u>6-27-25</u>



To: JFirlit, JH Campbell Complex

From: EBlaj, T-258

Date: October 31, 2024

Subject: JH CAMPBELL SOLID WASTE DISPOSAL AREA – GROUNDWATER MONITORING  
4<sup>th</sup> Quarter, 2024 – Pond A Wells

CC: HDRegister, P22-521  
ADSantini, P20-215B-REM

Sarah Holmstrom, Project Manager  
TRC Companies, Inc.  
1540 Eisenhower Place  
Ann Arbor, MI 48108

---

**Chemistry Project: 24-0858**

CE Laboratory Services conducted groundwater monitoring at the JH Campbell Solid Waste Disposal Area during the week of 10/14/2024, for the 4<sup>th</sup> Quarter requirement, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for analysis by the Chemistry department on 10/16/2024.

Samples for Radium analysis have been subcontracted to Eurofins/TestAmerica, Inc. and their results are being reported separately. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples, as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj  
Sr. Technical Analyst  
Project Lead



*Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.*

## CASE NARRATIVE

### I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. Sample preservation upon receipt was verified by the sample custodian and confirmed to meet method requirements.

### II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from “Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, “Test Methods for Evaluating Solid Waste – Physical/Chemical Methods”, USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22<sup>nd</sup> Edition, 2012.

### III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container & aliquot number. Results for the field blanks, field duplicates, and percent recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

## DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report where applicable:

<u>Acronym</u>	<u>Description</u>
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Not a TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result

D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

**Customer Name:** JH Campbell Complex  
**Work Order ID:** Q4-2024 Pond A Wells  
**Date Received:** 10/16/2024  
**Chemistry Project:** 24-0858

<u>Sample #</u>	<u>Field Sample ID</u>	<u>Matrix</u>	<u>Sample Date</u>	<u>Site</u>
24-0858-01	JHC-MW-15006	Groundwater	10/14/2024 18:51	JHC GW Monitoring - Pond A Wells
24-0858-02	JHC-MW-15007R	Groundwater	10/14/2024 17:56	JHC GW Monitoring - Pond A Wells
24-0858-03	JHC-MW-15008R	Groundwater	10/14/2024 15:41	JHC GW Monitoring - Pond A Wells
24-0858-04	JHC-MW-15009R	Groundwater	10/14/2024 14:16	JHC GW Monitoring - Pond A Wells
24-0858-05	JHC-MW-15011R	Groundwater	10/14/2024 19:41	JHC GW Monitoring - Pond A Wells
24-0858-06	DUP-02	Groundwater	10/14/2024 00:00	JHC GW Monitoring - Pond A Wells
24-0858-07	FB-02	Water	10/14/2024 19:08	JHC GW Monitoring - Pond A Wells
24-0858-08	EB-02	Water	10/14/2024 20:01	JHC GW Monitoring - Pond A Wells
24-0858-09	JHC-MW-15007R MS	Groundwater	10/14/2024 17:56	JHC GW Monitoring - Pond A Wells
24-0858-10	JHC-MW-15007R MSD	Groundwater	10/14/2024 17:56	JHC GW Monitoring - Pond A Wells

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15006**  
 Lab Sample ID: 24-0858-01  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 06:51 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-01-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	11		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	103		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	695		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	52800		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	13		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	27800		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	30		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	2		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	5280		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	5		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	15200		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	14		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-01-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-01-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	17000		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	78500		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-01-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	308		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15006**  
Lab Sample ID: 24-0858-01  
Matrix: Groundwater

Laboratory Project: **24-0858**  
Collect Date: 10/14/2024  
Collect Time: 06:51 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0858-01-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	188000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	188000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15007R**  
 Lab Sample ID: 24-0858-02  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 05:56 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-02-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	6		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	212		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	1500		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	63600		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	23		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	15		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	39200		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	35		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	3		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	3960		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	5		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	13800		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	14		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-02-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-02-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	17000		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	91400		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-02-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	388		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15007R**  
Lab Sample ID: 24-0858-02  
Matrix: Groundwater

Laboratory Project: **24-0858**  
Collect Date: 10/14/2024  
Collect Time: 05:56 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0858-02-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	243000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	243000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15008R**  
 Lab Sample ID: 24-0858-03  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 03:41 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-03-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	1		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	117		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	1780		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	62800		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	1		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	2		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	23		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	19		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	37300		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	27		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	4		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	1950		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	12		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	14600		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-03-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-03-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	14400		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	98500		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-03-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	380		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15008R**  
Lab Sample ID: 24-0858-03  
Matrix: Groundwater

Laboratory Project: **24-0858**  
Collect Date: 10/14/2024  
Collect Time: 03:41 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0858-03-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	262000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	262000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15009R**  
 Lab Sample ID: 24-0858-04  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 02:16 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-04-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	249		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	1940		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	59900		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	12		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	13100		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	9		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	3		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	4110		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	80		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	10700		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	8		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-04-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-04-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	13600		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	28400		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-04-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	264		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15009R**  
Lab Sample ID: 24-0858-04  
Matrix: Groundwater

Laboratory Project: **24-0858**  
Collect Date: 10/14/2024  
Collect Time: 02:16 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0858-04-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	188000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	188000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15011R**  
 Lab Sample ID: 24-0858-05  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 07:41 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-05-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	5		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	294		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	3800		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	47600		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	1		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	17		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	10900		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	11		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	3		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	3970		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	60		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	9730		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	11		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-05-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-05-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	6600		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	53700		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-05-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	225		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **JHC-MW-15011R**  
Lab Sample ID: 24-0858-05  
Matrix: Groundwater

Laboratory Project: **24-0858**  
Collect Date: 10/14/2024  
Collect Time: 07:41 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0858-05-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	138000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	138000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **DUP-02**  
 Lab Sample ID: 24-0858-06  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 12:00 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-06-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	1		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	116		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	1840		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	62300		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	1		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	19		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	38100		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	27		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	3		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	1940		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	12		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	15100		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-06-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-06-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	14300		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	98700		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-06-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	372		mg/L	10.0	10/17/2024	AB24-1017-02



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
Field Sample ID: **DUP-02**  
Lab Sample ID: 24-0858-06  
Matrix: Groundwater

Laboratory Project: **24-0858**  
Collect Date: 10/14/2024  
Collect Time: 12:00 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0858-06-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	230000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Bicarbonate	230000		ug/L	10000.0	10/22/2024	AB24-1021-07
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-07



## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **FB-02**  
 Lab Sample ID: 24-0858-07  
 Matrix: Water

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 07:08 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-07-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	ND		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-07-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-07-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	ND		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-07-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	10/17/2024	AB24-1017-02

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **EB-02**  
 Lab Sample ID: 24-0858-08  
 Matrix: Water

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 08:01 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-08-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Arsenic	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Barium	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Beryllium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Boron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Cadmium	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Calcium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Chromium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Cobalt	ND		ug/L	6.0	10/21/2024	AB24-1021-08
Copper	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Iron	ND		ug/L	20.0	10/21/2024	AB24-1021-08
Lead	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Lithium	ND		ug/L	10.0	10/21/2024	AB24-1021-08
Magnesium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Molybdenum	ND		ug/L	5.0	10/21/2024	AB24-1021-08
Nickel	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Potassium	ND		ug/L	100.0	10/21/2024	AB24-1021-08
Selenium	ND		ug/L	1.0	10/21/2024	AB24-1021-08
Silver	ND		ug/L	0.2	10/21/2024	AB24-1021-08
Sodium	ND		ug/L	1000.0	10/21/2024	AB24-1021-08
Thallium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Vanadium	ND		ug/L	2.0	10/21/2024	AB24-1021-08
Zinc	ND		ug/L	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-08-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-08-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1018-03
Sulfate	ND		ug/L	1000.0	10/18/2024	AB24-1018-03

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0858-08-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	ND		mg/L	10.0	10/17/2024	AB24-1017-02

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15007R MS**  
 Lab Sample ID: 24-0858-09  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 05:56 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-09-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	104		%	1.0	10/21/2024	AB24-1021-08
Arsenic	111		%	1.0	10/21/2024	AB24-1021-08
Barium	107		%	5.0	10/21/2024	AB24-1021-08
Beryllium	101		%	1.0	10/21/2024	AB24-1021-08
Boron	106		%	20.0	10/21/2024	AB24-1021-08
Cadmium	104		%	0.2	10/21/2024	AB24-1021-08
Calcium	101		%	1000.0	10/21/2024	AB24-1021-08
Chromium	106		%	1.0	10/21/2024	AB24-1021-08
Cobalt	103		%	6.0	10/21/2024	AB24-1021-08
Copper	102		%	1.0	10/21/2024	AB24-1021-08
Iron	107		%	20.0	10/21/2024	AB24-1021-08
Lead	100		%	1.0	10/21/2024	AB24-1021-08
Lithium	101		%	10.0	10/21/2024	AB24-1021-08
Magnesium	108		%	1000.0	10/21/2024	AB24-1021-08
Molybdenum	110		%	5.0	10/21/2024	AB24-1021-08
Nickel	106		%	2.0	10/21/2024	AB24-1021-08
Potassium	106		%	100.0	10/21/2024	AB24-1021-08
Selenium	107		%	1.0	10/21/2024	AB24-1021-08
Silver	100		%	0.2	10/21/2024	AB24-1021-08
Sodium	107		%	1000.0	10/21/2024	AB24-1021-08
Thallium	102		%	2.0	10/21/2024	AB24-1021-08
Vanadium	106		%	2.0	10/21/2024	AB24-1021-08
Zinc	104		%	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-09-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	83.0		%	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-09-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	102		%	1000.0	10/18/2024	AB24-1018-03
Fluoride	98		%	1000.0	10/18/2024	AB24-1018-03
Sulfate	106		%	1000.0	10/18/2024	AB24-1018-03

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Pond A Wells (395496)**  
 Field Sample ID: **JHC-MW-15007R MSD**  
 Lab Sample ID: 24-0858-10  
 Matrix: Groundwater

Laboratory Project: **24-0858**  
 Collect Date: 10/14/2024  
 Collect Time: 05:56 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0858-10-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	102		%	1.0	10/21/2024	AB24-1021-08
Arsenic	108		%	1.0	10/21/2024	AB24-1021-08
Barium	106		%	5.0	10/21/2024	AB24-1021-08
Beryllium	101		%	1.0	10/21/2024	AB24-1021-08
Boron	109		%	20.0	10/21/2024	AB24-1021-08
Cadmium	101		%	0.2	10/21/2024	AB24-1021-08
Calcium	100		%	1000.0	10/21/2024	AB24-1021-08
Chromium	104		%	1.0	10/21/2024	AB24-1021-08
Cobalt	106		%	6.0	10/21/2024	AB24-1021-08
Copper	102		%	1.0	10/21/2024	AB24-1021-08
Iron	103		%	20.0	10/21/2024	AB24-1021-08
Lead	100		%	1.0	10/21/2024	AB24-1021-08
Lithium	99		%	10.0	10/21/2024	AB24-1021-08
Magnesium	110		%	1000.0	10/21/2024	AB24-1021-08
Molybdenum	109		%	5.0	10/21/2024	AB24-1021-08
Nickel	106		%	2.0	10/21/2024	AB24-1021-08
Potassium	103		%	100.0	10/21/2024	AB24-1021-08
Selenium	106		%	1.0	10/21/2024	AB24-1021-08
Silver	99.6		%	0.2	10/21/2024	AB24-1021-08
Sodium	110		%	1000.0	10/21/2024	AB24-1021-08
Thallium	103		%	2.0	10/21/2024	AB24-1021-08
Vanadium	111		%	2.0	10/21/2024	AB24-1021-08
Zinc	105		%	10.0	10/21/2024	AB24-1021-08

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0858-10-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	94.0		%	0.2	10/21/2024	AB24-1021-03

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0858-10-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	105		%	1000.0	10/18/2024	AB24-1018-03
Fluoride	98		%	1000.0	10/18/2024	AB24-1018-03
Sulfate	111		%	1000.0	10/18/2024	AB24-1018-03



# Analytical Report

Report Date: 10/31/24

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Data Qualifiers	Exception Summary
-----------------	-------------------

No exceptions occurred.

**TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM**

Project Number: 24-0858 Inspection Date: 10.15.24 Inspection By: U-0

Sample Origin/Project Name: JHC 24-2024

Shipment Delivered By: Enter the type of shipment carrier.

Inter-Company Mail \_\_\_\_\_ FedEx \_\_\_\_\_ UPS \_\_\_\_\_ USPS \_\_\_\_\_

Tracking Number: \_\_\_\_\_ Other/Carry In (whom) CU

Shipping Containers: Enter the type and number of shipping containers received.

Cooler  Cardboard Box \_\_\_\_\_ Custom Case \_\_\_\_\_ Envelope/Mailer \_\_\_\_\_

Loose/Unpackaged Containers \_\_\_\_\_ Other \_\_\_\_\_

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None  Dented \_\_\_\_\_ Leaking \_\_\_\_\_

Other \_\_\_\_\_

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened \_\_\_\_\_ Sealed  N/A \_\_\_\_\_

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC  Work Request \_\_\_\_\_ Air Data Sheet \_\_\_\_\_ Other \_\_\_\_\_

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 0.8-2.2 °C Samples Received on Ice: Yes  No \_\_\_\_\_

M&TE # and Expiration U0123 / 6.27.25

Number and Type of Containers: Enter the type and total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	<u>12</u>	_____	_____	_____	_____
Quart/Liter (g/p)	<u>14</u>	_____	_____	_____	_____
9-oz (amber glass jar)	_____	_____	_____	_____	_____
2-oz (amber glass)	_____	_____	_____	_____	_____
125 mL (plastic)	<u>20</u>	_____	_____	_____	_____
24 mL vial (glass)	_____	_____	_____	_____	_____
250 mL (plastic)	<u>8</u>	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____

All sample pH meeting criteria? Yes  No \_\_\_\_\_ N/A \_\_\_\_\_ pH paper lot # 205522 Exp. Date 2.15.25

Indicate if an Exception Report (Page 2 of 2) is needed: Yes \_\_\_\_\_ No \_\_\_\_\_

# CHAIN OF CUSTODY



## CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page 1 of 1

SAMPLING SITE / CUSTOMER: <b>JHC Q4-2024 Pond A Wells</b>	PROJECT NUMBER: <b>24-0858</b>	SAP CC or WO#: REQUESTER: <i>Bethany Swanberg</i>	ANALYSIS REQUESTED (Attach List if More Space is Needed)	QA REQUIREMENT: <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> TNI <input type="checkbox"/> ISO 17025 <input type="checkbox"/> 10 CFR 50 APP. B <input type="checkbox"/> INTERNAL INFO <input type="checkbox"/> OTHER _____
--	-----------------------------------	--	---	---

SAMPLING TEAM: <b>CLE</b>	TURNAROUND TIME REQUIRED: <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 3 DAYS <input type="checkbox"/> STANDARD <input checked="" type="checkbox"/> OTHER _____
------------------------------	--

SEND REPORT TO: <b>Joseph Firlit</b>	email:	phone:
--------------------------------------	--------	--------

COPY TO: <b>JR Register</b>	MATRIX CODES: GW = Groundwater      OX = Other WW = Wastewater      SL = Sludge W = Water / Aqueous Liquid      A = Air S = Soil / General Solid      WP = Wipe O = Oil      WT = General Waste	CONTAINERS						
TRC		TOTAL #	None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH

LAB SAMPLE ID	SAMPLE COLLECTION		MATRIX	FIELD SAMPLE ID / LOCATION	TOTAL #	None	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	Alkalinity	Radium 226	Radium 228	REMARKS
	DATE	TIME																	
24-0858-01	10.14.24	1851	GW	JHC-MW-15006	7	4	3						x	x	x	x	x	x	
-02	10.14.24	1756	GW	JHC-MW-15007R	7	4	3						x	x	x	x	x	x	
-03	10.14.24	1541	GW	JHC-MW-15008R	7	4	3						x	x	x	x	x	x	
-04	10.14.24	1416	GW	JHC-MW-15009R	7	4	3						x	x	x	x	x	x	
-05	10.14.24	1941	GW	JHC-MW-15011R	7	4	3						x	x	x	x	x	x	
-06	10.14.24	—	GW	DUP-02	7	4	3						x	x	x	x	x	x	
-07	10.14.24	1908	W	FB-02	5	2	3						x	x	x		x	x	
-08	10.14.24	2001	W	EB-02	5	2	3						x	x	x		x	x	
-09	10.14.24	1756	GW	JHC-MW-15007R MS	2	1	1						x	x					
-10	10.14.24	1756	GW	JHC-MW-15007R MSD	2	1	1						x	x					

RELINQUISHED BY: <i>CAgent</i>	DATE/TIME: <i>10-16-24/1206</i>	RECEIVED BY: <i>Tami Ruth</i>
-----------------------------------	------------------------------------	----------------------------------

COMMENTS:

Received on Ice?  Yes  No      M&TE #: L8077723

Temperature: 0.8-2.2 °C      Cal. Due Date: 6-27-25

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
------------------	------------	--------------

To: JFirlit, JH Campbell Complex

From: EBlaj, T-258

Date: October 31, 2024

Subject: JH CAMPBELL SOLID WASTE DISPOSAL AREA – GROUNDWATER MONITORING  
4<sup>th</sup> Quarter, 2024 – Supplemental and GSI Wells

CC: HDRegister, P22-521  
ADSantini, P20-215B-REM

Sarah Holmstrom, Project Manager  
TRC Companies, Inc.  
1540 Eisenhower Place  
Ann Arbor, MI 48108

---

**Chemistry Project: 24-0860**

CE Laboratory Services conducted groundwater monitoring at the JH Campbell Solid Waste Disposal Area during the week of 10/14/2024, for the 4<sup>th</sup> Quarter requirement, as specified in the Hydrogeological Monitoring Plan for the site. Samples were not collected from MW-13; the well was dry. All other samples were received for analysis by the Chemistry department on 10/16/2024.

Samples for Radium analysis have been subcontracted to Eurofins/TestAmerica, Inc. and their results are being reported separately. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples, as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj  
Sr. Technical Analyst  
Project Lead



*Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.*



## CASE NARRATIVE

### I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. Sample preservation upon receipt was verified by the sample custodian and confirmed to meet method requirements.

### II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from “Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, “Test Methods for Evaluating Solid Waste – Physical/Chemical Methods”, USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22<sup>nd</sup> Edition, 2012.

### III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container & aliquot number. Results for the field blanks, field duplicates, and percent recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

## DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report where applicable:

<u>Acronym</u>	<u>Description</u>
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Not a TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result

D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

**Customer Name:** JH Campbell Complex  
**Work Order ID:** Q4-2024 Supplemental Wells  
**Date Received:** 10/16/2024  
**Chemistry Project:** 24-0860

<u>Sample #</u>	<u>Field Sample ID</u>	<u>Matrix</u>	<u>Sample Date</u>	<u>Site</u>
24-0860-01	MW-14S	Groundwater	10/15/2024 16:11	JHC GW Monitoring - Supplemental Wells
24-0860-02	PZ-23S	Groundwater	10/15/2024 12:17	JHC GW Monitoring - Supplemental Wells
24-0860-03	PZ-24S	Groundwater	10/15/2024 17:08	JHC GW Monitoring - Supplemental Wells
24-0860-04	PZ-24	Groundwater	10/15/2024 18:44	JHC GW Monitoring - Supplemental Wells
24-0860-05	PZ-40S	Groundwater	10/15/2024 14:51	JHC GW Monitoring - Supplemental Wells
24-0860-06	PZ-40	Groundwater	10/15/2024 15:44	JHC GW Monitoring - Supplemental Wells
24-0860-07	TW-19-05	Groundwater	10/15/2024 18:41	JHC GW Monitoring - Supplemental Wells
24-0860-08	TW-19-06A	Groundwater	10/15/2024 17:21	JHC GW Monitoring - Supplemental Wells
24-0860-09	DUP-07	Groundwater	10/15/2024 00:00	JHC GW Monitoring - Supplemental Wells
24-0860-10	TW-19-06A MS	Groundwater	10/15/2024 17:21	JHC GW Monitoring - Supplemental Wells
24-0860-11	TW-19-06A MSD	Groundwater	10/15/2024 17:21	JHC GW Monitoring - Supplemental Wells

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **MW-14S**  
 Lab Sample ID: 24-0860-01  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 04:11 PM

**Mercury by EPA 7470A, Total, Aqueous** Aliquot #: 24-0860-01-C01-A01 Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1021-03

**Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp** Aliquot #: 24-0860-01-C01-A02 Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	35		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	45		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	4250		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	2		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	127		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	2360		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	9		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	212		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	1		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	1640		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

**Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous** Aliquot #: 24-0860-01-C02-A01 Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	9350		ug/L	1000.0	10/18/2024	AB24-1017-01

**Total Dissolved Solids by SM 2540C** Aliquot #: 24-0860-01-C03-A01 Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	40		mg/L	10.0	10/17/2024	AB24-1017-03

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **MW-14S**  
 Lab Sample ID: 24-0860-01  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 04:11 PM

**Alkalinity by SM 2320B**

Aliquot #: 24-0860-01-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	15200		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	15200		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0860-01-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Arsenic	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Chromium	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Lithium	ND		ug/L	10.0	10/24/2024	AB24-1024-01
Molybdenum	9		ug/L	5.0	10/24/2024	AB24-1024-01
Nickel	ND		ug/L	2.0	10/24/2024	AB24-1024-01
Selenium	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Vanadium	ND		ug/L	2.0	10/24/2024	AB24-1024-01
Boron	31		ug/L	20.0	10/24/2024	AB24-1024-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-23S**  
 Lab Sample ID: 24-0860-02  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 12:17 PM

**Mercury by EPA 7470A, Total, Aqueous** Aliquot #: 24-0860-02-C01-A01 Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1021-03

**Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp** Aliquot #: 24-0860-02-C01-A02 Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	ND		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	24		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	5060		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	42		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	1210		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	ND		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	751		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	ND		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

**Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous** Aliquot #: 24-0860-02-C02-A01 Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	2280		ug/L	1000.0	10/18/2024	AB24-1017-01

**Total Dissolved Solids by SM 2540C** Aliquot #: 24-0860-02-C03-A01 Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	31		mg/L	10.0	10/17/2024	AB24-1017-03

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-23S**  
 Lab Sample ID: 24-0860-02  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 12:17 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0860-02-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	19700		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	19700		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

### Groundwater Metals by EPA 6020A, Dissolved, JHC List

Aliquot #: 24-0860-02-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Arsenic	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Chromium	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Lithium	ND		ug/L	10.0	10/24/2024	AB24-1024-01
Molybdenum	ND		ug/L	5.0	10/24/2024	AB24-1024-01
Nickel	ND		ug/L	2.0	10/24/2024	AB24-1024-01
Selenium	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Vanadium	ND		ug/L	2.0	10/24/2024	AB24-1024-01
Boron	ND		ug/L	20.0	10/24/2024	AB24-1024-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-24S**  
 Lab Sample ID: 24-0860-03  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 05:08 PM

**Mercury by EPA 7470A, Total, Aqueous** Aliquot #: 24-0860-03-C01-A01 Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1021-03

**Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp** Aliquot #: 24-0860-03-C01-A02 Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	3		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	18		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	29		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	9250		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	5550		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	1270		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	ND		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	585		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	1420		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

**Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous** Aliquot #: 24-0860-03-C02-A01 Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1220		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	24600		ug/L	1000.0	10/18/2024	AB24-1017-01

**Total Dissolved Solids by SM 2540C** Aliquot #: 24-0860-03-C03-A01 Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	84		mg/L	10.0	10/17/2024	AB24-1017-03



**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-24S**  
 Lab Sample ID: 24-0860-03  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 05:08 PM

**Alkalinity by SM 2320B**

Aliquot #: 24-0860-03-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0860-03-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Arsenic	3		ug/L	1.0	10/24/2024	AB24-1024-01
Chromium	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Lithium	ND		ug/L	10.0	10/24/2024	AB24-1024-01
Molybdenum	ND		ug/L	5.0	10/24/2024	AB24-1024-01
Nickel	ND		ug/L	2.0	10/24/2024	AB24-1024-01
Selenium	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Vanadium	2		ug/L	2.0	10/24/2024	AB24-1024-01
Boron	20		ug/L	20.0	10/24/2024	AB24-1024-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-24**  
 Lab Sample ID: 24-0860-04  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 06:44 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-04-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	20		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	199		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	32200		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	6340		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	10000		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	10		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	1960		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	3170		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	16		ug/L	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-04-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-04-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	2110		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	86800		ug/L	1000.0	10/18/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0860-04-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	192		mg/L	10.0	10/17/2024	AB24-1017-03



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **PZ-24**  
Lab Sample ID: 24-0860-04  
Matrix: Groundwater

Laboratory Project: **24-0860**  
Collect Date: 10/15/2024  
Collect Time: 06:44 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0860-04-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	47000		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	47000		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-40S**  
 Lab Sample ID: 24-0860-05  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 02:51 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-05-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	31		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	70		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	2160		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	1		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	164		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	ND		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	ND		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	188		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	1		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	1930		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-05-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-05-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1950		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	6730		ug/L	1000.0	10/18/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0860-05-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	41		mg/L	10.0	10/17/2024	AB24-1017-03

**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-40S**  
 Lab Sample ID: 24-0860-05  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 02:51 PM

**Alkalinity by SM 2320B**

Aliquot #: 24-0860-05-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	ND		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

**Groundwater Metals by EPA 6020A, Dissolved, JHC List**

Aliquot #: 24-0860-05-C08-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Arsenic	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Chromium	ND		ug/L	1.0	10/24/2024	AB24-1024-01
Lithium	ND		ug/L	10.0	10/24/2024	AB24-1024-01
Molybdenum	ND		ug/L	5.0	10/24/2024	AB24-1024-01
Nickel	ND		ug/L	2.0	10/24/2024	AB24-1024-01
Selenium	1		ug/L	1.0	10/24/2024	AB24-1024-01
Vanadium	ND		ug/L	2.0	10/24/2024	AB24-1024-01
Boron	57		ug/L	20.0	10/24/2024	AB24-1024-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **PZ-40**  
 Lab Sample ID: 24-0860-06  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 03:44 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-06-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	11		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	162		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	9360		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	ND		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	2220		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	41		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	1050		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	3		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	6130		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-06-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-06-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	3080		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	9470		ug/L	1000.0	10/18/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0860-06-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	60		mg/L	10.0	10/17/2024	AB24-1017-03



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **PZ-40**  
Lab Sample ID: 24-0860-06  
Matrix: Groundwater

Laboratory Project: **24-0860**  
Collect Date: 10/15/2024  
Collect Time: 03:44 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0860-06-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	33400		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	33400		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-05**  
 Lab Sample ID: 24-0860-07  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 06:41 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-07-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	1		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	74		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	156		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	52500		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	5		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	ND		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	24		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	16200		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	7		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	2		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	26200		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	23		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	1170		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-07-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-07-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1290		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	11200		ug/L	1000.0	10/18/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0860-07-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	276		mg/L	10.0	10/17/2024	AB24-1017-03





# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **TW-19-05**  
Lab Sample ID: 24-0860-07  
Matrix: Groundwater

Laboratory Project: **24-0860**  
Collect Date: 10/15/2024  
Collect Time: 06:41 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0860-07-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	220000		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	220000		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-06A**  
 Lab Sample ID: 24-0860-08  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 05:21 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-08-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	8		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	78		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	19400		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	2		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	125		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	3180		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	9		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	1860		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	111		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	ND		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	4		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-08-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-08-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	5880		ug/L	1000.0	10/18/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0860-08-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	82		mg/L	10.0	10/17/2024	AB24-1017-03



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **TW-19-06A**  
Lab Sample ID: 24-0860-08  
Matrix: Groundwater

Laboratory Project: **24-0860**  
Collect Date: 10/15/2024  
Collect Time: 05:21 PM

### Alkalinity by SM 2320B

Aliquot #: 24-0860-08-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	63700		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	63700		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **DUP-07**  
 Lab Sample ID: 24-0860-09  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 12:00 AM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-09-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Arsenic	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Barium	ND		ug/L	5.0	10/22/2024	AB24-1022-06
Beryllium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Boron	24		ug/L	20.0	10/22/2024	AB24-1022-06
Cadmium	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Calcium	5190		ug/L	1000.0	10/22/2024	AB24-1022-06
Chromium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Cobalt	ND		ug/L	6.0	10/22/2024	AB24-1022-06
Copper	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Iron	49		ug/L	20.0	10/22/2024	AB24-1022-06
Lead	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Lithium	ND		ug/L	10.0	10/22/2024	AB24-1022-06
Magnesium	1200		ug/L	1000.0	10/22/2024	AB24-1022-06
Molybdenum	ND		ug/L	5.0	10/22/2024	AB24-1022-06
Nickel	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Potassium	770		ug/L	100.0	10/22/2024	AB24-1022-06
Selenium	ND		ug/L	1.0	10/22/2024	AB24-1022-06
Silver	ND		ug/L	0.2	10/22/2024	AB24-1022-06
Sodium	ND		ug/L	1000.0	10/22/2024	AB24-1022-06
Thallium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Vanadium	ND		ug/L	2.0	10/22/2024	AB24-1022-06
Zinc	ND		ug/L	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-09-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/22/2024	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-09-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Fluoride	ND		ug/L	1000.0	10/18/2024	AB24-1017-01
Sulfate	2270		ug/L	1000.0	10/18/2024	AB24-1017-01

### Total Dissolved Solids by SM 2540C

Aliquot #: 24-0860-09-C03-A01

Analyst: LMO

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	33		mg/L	10.0	10/17/2024	AB24-1017-03



# Analytical Report

Report Date: 10/31/24

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
Field Sample ID: **DUP-07**  
Lab Sample ID: 24-0860-09  
Matrix: Groundwater

Laboratory Project: **24-0860**  
Collect Date: 10/15/2024  
Collect Time: 12:00 AM

### Alkalinity by SM 2320B

Aliquot #: 24-0860-09-C04-A01

Analyst: DLS

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	19700		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Bicarbonate	19700		ug/L	10000.0	10/22/2024	AB24-1021-09
Alkalinity Carbonate	ND		ug/L	10000.0	10/22/2024	AB24-1021-09

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-06A MS**  
 Lab Sample ID: 24-0860-10  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 05:21 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-10-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	95		%	1.0	10/22/2024	AB24-1022-06
Arsenic	101		%	1.0	10/22/2024	AB24-1022-06
Barium	100		%	5.0	10/22/2024	AB24-1022-06
Beryllium	99		%	1.0	10/22/2024	AB24-1022-06
Boron	105		%	20.0	10/22/2024	AB24-1022-06
Cadmium	98.7		%	0.2	10/22/2024	AB24-1022-06
Calcium	101		%	1000.0	10/22/2024	AB24-1022-06
Chromium	94		%	1.0	10/22/2024	AB24-1022-06
Cobalt	98		%	6.0	10/22/2024	AB24-1022-06
Copper	98		%	1.0	10/22/2024	AB24-1022-06
Iron	88		%	20.0	10/22/2024	AB24-1022-06
Lead	101		%	1.0	10/22/2024	AB24-1022-06
Lithium	100		%	10.0	10/22/2024	AB24-1022-06
Magnesium	103		%	1000.0	10/22/2024	AB24-1022-06
Molybdenum	103		%	5.0	10/22/2024	AB24-1022-06
Nickel	100		%	2.0	10/22/2024	AB24-1022-06
Potassium	99		%	100.0	10/22/2024	AB24-1022-06
Selenium	94		%	1.0	10/22/2024	AB24-1022-06
Silver	99.8		%	0.2	10/22/2024	AB24-1022-06
Sodium	104		%	1000.0	10/22/2024	AB24-1022-06
Thallium	103		%	2.0	10/22/2024	AB24-1022-06
Vanadium	99		%	2.0	10/22/2024	AB24-1022-06
Zinc	102		%	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-10-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	97.0		%	0.2	10/22/2024	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-10-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	100		%	1000.0	10/18/2024	AB24-1017-01
Fluoride	98		%	1000.0	10/18/2024	AB24-1017-01
Sulfate	97		%	1000.0	10/18/2024	AB24-1017-01

## Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: **JHC GW Monitoring - Supplemental Wells (395496)**  
 Field Sample ID: **TW-19-06A MSD**  
 Lab Sample ID: 24-0860-11  
 Matrix: Groundwater

Laboratory Project: **24-0860**  
 Collect Date: 10/15/2024  
 Collect Time: 05:21 PM

### Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0860-11-C01-A01

Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	99		%	1.0	10/22/2024	AB24-1022-06
Arsenic	102		%	1.0	10/22/2024	AB24-1022-06
Barium	103		%	5.0	10/22/2024	AB24-1022-06
Beryllium	101		%	1.0	10/22/2024	AB24-1022-06
Boron	114		%	20.0	10/22/2024	AB24-1022-06
Cadmium	101		%	0.2	10/22/2024	AB24-1022-06
Calcium	102		%	1000.0	10/22/2024	AB24-1022-06
Chromium	95		%	1.0	10/22/2024	AB24-1022-06
Cobalt	96		%	6.0	10/22/2024	AB24-1022-06
Copper	99		%	1.0	10/22/2024	AB24-1022-06
Iron	96		%	20.0	10/22/2024	AB24-1022-06
Lead	100		%	1.0	10/22/2024	AB24-1022-06
Lithium	100		%	10.0	10/22/2024	AB24-1022-06
Magnesium	111		%	1000.0	10/22/2024	AB24-1022-06
Molybdenum	108		%	5.0	10/22/2024	AB24-1022-06
Nickel	100		%	2.0	10/22/2024	AB24-1022-06
Potassium	102		%	100.0	10/22/2024	AB24-1022-06
Selenium	105		%	1.0	10/22/2024	AB24-1022-06
Silver	101		%	0.2	10/22/2024	AB24-1022-06
Sodium	109		%	1000.0	10/22/2024	AB24-1022-06
Thallium	104		%	2.0	10/22/2024	AB24-1022-06
Vanadium	100		%	2.0	10/22/2024	AB24-1022-06
Zinc	104		%	10.0	10/22/2024	AB24-1022-06

### Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0860-11-C01-A02

Analyst: CLE

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	98.0		%	0.2	10/22/2023	AB24-1022-04

### Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0860-11-C02-A01

Analyst: KDR

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	100		%	1000.0	10/18/2024	AB24-1017-01
Fluoride	99		%	1000.0	10/18/2024	AB24-1017-01
Sulfate	96		%	1000.0	10/18/2024	AB24-1017-01

Data Qualifiers	Exception Summary
-----------------	-------------------

No exceptions occurred.



**TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM**

Project Number: 24-0860 Inspection Date: 10-15-24 Inspection By: umo

Sample Origin/Project Name: DHC Q4-2024 Supplemental Wells

Shipment Delivered By: Enter the type of shipment carrier.

Inter-Company Mail \_\_\_\_\_ FedEx \_\_\_\_\_ UPS \_\_\_\_\_ USPS \_\_\_\_\_

Tracking Number: \_\_\_\_\_ Other/Carry In (whom) KOR

Shipping Containers: Enter the type and number of shipping containers received.

Cooler  Cardboard Box \_\_\_\_\_ Custom Case \_\_\_\_\_ Envelope/Mailer \_\_\_\_\_

Loose/Unpackaged Containers \_\_\_\_\_ Other \_\_\_\_\_

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None  Dented \_\_\_\_\_ Leaking \_\_\_\_\_

Other \_\_\_\_\_

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened \_\_\_\_\_ Sealed  N/A \_\_\_\_\_

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC  Work Request \_\_\_\_\_ Air Data Sheet \_\_\_\_\_ Other \_\_\_\_\_

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 1-2-3.4 °C Samples Received on Ice: Yes  No \_\_\_\_\_

M&TE # and Expiration LS62 7723 / 6-27-25

Number and Type of Containers: Enter the type and total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	<u>18</u>	_____	_____	_____	_____
Quart/Liter (g/p)	_____	_____	_____	_____	_____
9-oz (amber glass jar)	_____	_____	_____	_____	_____
2-oz (amber glass)	_____	_____	_____	_____	_____
125 mL (plastic)	<u>28</u>	_____	_____	_____	_____
24 mL vial (glass)	_____	_____	_____	_____	_____
250 mL (plastic)	<u>9</u>	_____	_____	_____	_____
Other <u>1L plastic</u>	<u>18</u>	_____	_____	_____	_____

All sample pH meeting criteria? Yes  No \_\_\_\_\_ N/A \_\_\_\_\_ pH paper lot # 205522 Exp. Date 2.15.25

Indicate if an Exception Report (Page 2 of 2) is needed: Yes \_\_\_\_\_ No

# CHAIN OF CUSTODY



## CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: <b>JHC Q4-2024 Supplemental Wells</b>				PROJECT NUMBER: <b>24-0860</b>				SAP CC or WO#: REQUESTER: Bethany Swanberg				ANALYSIS REQUESTED (Attach List if More Space is Needed)						QA REQUIREMENT:  <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> TNI <input type="checkbox"/> ISO 17025 <input type="checkbox"/> 10 CFR 50 APP. B <input type="checkbox"/> INTERNAL INFO <input type="checkbox"/> OTHER _____	
SAMPLING TEAM: <b>KDR, CLE, LMO</b>				TURNAROUND TIME REQUIRED: <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 3 DAYS <input type="checkbox"/> STANDARD <input checked="" type="checkbox"/> OTHER _____															
SEND REPORT TO:		Joseph Firlit		email:		phone:								REMARKS					
COPY TO:		JR Register		MATRIX CODES: GW = Groundwater      OX = Other WW = Wastewater      SL = Sludge W = Water / Aqueous Liquid      A = Air S = Soil / General Solid      WP = Wipe O = Oil      WT = General Waste				CONTAINERS PRESERVATIVE											
		TRC																	
LAB SAMPLE ID		SAMPLE COLLECTION		FIELD SAMPLE ID / LOCATION		TOTAL #		Total Metals    Anions    TDS    Alkalinity    Radium 226    Radium 228    Dissolved Metals											
		DATE    TIME																	
24-0860-01		10.15.24    1611		MW-14S		8    4    4		x    x    x    x    x    x    x											
-02		10.15.24    1217		PZ-23S		8    4    4		x    x    x    x    x    x    x											
-03		10.15.24    1708		PZ-24S		8    4    4		x    x    x    x    x    x    x											
-04		10.15.24    1844		PZ-24		8    4    4		x    x    x    x    x    x    x											
-05		10.15.24    1451		PZ-40S		8    4    4		x    x    x    x    x    x    x											
-06		10.15.24    1544		PZ-40		8    4    4		x    x    x    x    x    x    x											
-07		10.15.24    1841		TW-19-05		7    4    3		x    x    x    x    x    x											
-08		10.15.24    1721		TW-19-06A		7    4    3		x    x    x    x    x    x											
-09		10.15.24    —		DUP-07		7    4    3		x    x    x    x    x    x											
-10		10.15.24    1721		TW-19-06A MS		2    1    1		x    x											
-11		10.15.24    1721		TW-19-06A MSD		2    1    1		x    x											

RELINQUISHED BY:		DATE/TIME:		RECEIVED BY:		COMMENTS:  Received on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No    M&TE #: <u>LS027703</u> Temperature: <u>1.2-3.6</u> °C    Cal. Due Date: <u>6-27-25</u>					
		<u>10-16-24/1011</u>									
RELINQUISHED BY:		DATE/TIME:		RECEIVED BY:							

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15023 Date 4.15.24 Control Number 24-0278-01  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 17.90 Depth-To-Bottom T/PVC (ft) 27.67 Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1905	Started pump						180	17.97	
1910	6.79	11.6	131.2	26.0	2.91	+207.3	180	17.97	3.25
1915	5.21	11.1	81.8	32.4	3.55	+215.3	180	17.97	3.69
1920	5.35	11.0	87.5	36.5	3.33	+212.1	180	17.97	5.14
1925	5.53	11.1	89.9	31.5	3.42	+208.4	180	17.97	5.05
1930	5.60	11.1	103.7	29.0	3.20	+206.0	180	17.97	4.96
1935	5.68	10.9	115.3	27.3	3.01	+205.4	180	17.97	3.99
1940	5.73	10.7	121.9	26.3	2.90	+202.0	180	17.97	3.45
1945	5.80	10.9	132.8	25.9	2.86	+208.9	180	17.97	3.10
1950	5.85	10.8	138.6	24.9	2.89	+208.9	180	17.97	3.14
1955	5.88	10.7	139.6	24.3	2.70	+206.9	180	17.97	2.71
2000	5.88	10.7	139.5	24.5	2.73	+206.2	180	17.97	2.61
2005	5.89	10.5	142.7	24.6	2.67	+205.4	180	17.97	2.78
2010	5.89	10.3	143.1	22.9	2.47	+204.5	180	17.97	2.47
2016	5.90	10.3	143.4	22.7	2.46	+203.9	180	17.97	2.24

Total Pump Time (min): 70 Total Purge Volume (gal): 14.0 Review Date: 04-24-24

Weather: 70°F, Sunny, Wind Review By: [Signature]

Comments: 2016 collected sample

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	1-L	HDPE	B	N
1	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	60mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15024 Date 4.15.24 Control Number 24-0278-02  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Ecotech S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 13.66 Depth-To-Bottom T/PVC (ft) 19.92 Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1810	Started pump						180	13.68	
1814	6.79	11.1	279.9	33.0	3.58	+195.1	180	13.67	4.84
1819	7.54	9.5	294.7	18.3	2.10	+183.6	180	13.67	5.20
1824	7.53	9.5	290.2	21.9	2.50	+180.0	180	13.67	3.77
1829	7.53	9.4	286.3	22.9	2.63	+177.8	180	13.67	2.70
1834	7.53	9.3	285.6	23.6	2.73	+175.5	180	13.67	2.10
1839	7.51	9.4	286.4	23.3	2.67	+174.5	180	13.67	2.05
1840	sample collected								
1851	End								

Total Pump Time (min): 30 Total Purge Volume (gal): ~1.25 Review Date: 04/24/24

Weather: 70° Sunny, Windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	Plastic	A	N	2	1-L	Plastic	B	N
1	125 mL		B						
1	250 mL		A						
2	60 mL	VOA	A						

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15025 Date 4-15-25 Control Number 24-0278-03 <sup>MS</sup> <sup>MSD</sup> -10-11  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Geotech S/N: 7311

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 13.19 Depth-To-Bottom T/PVC (ft) 19.90 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1755	started pump						180	13.23	
1800	7.84	9.6	501	22.7	2.60	+256.8	180	13.23	1.64
1805	7.88	9.5	438	34.7	3.96	+244.3	180	13.23	1.67
1810	7.90	9.3	425	37.0	4.24	+241.4	180	13.23	1.68
1815	7.90	9.3	424	37.1	4.25	+239.8	180	13.23	1.63
1820	7.91	9.3	422	37.3	4.27	+237.9	180	13.23	1.62
1820 <sup>cu</sup>	collected samples								
1833	end								

Total Pump Time (min): 25 Total Purge Volume (gal): 21.25 Review Date: 04-24-24

Weather: 70°F, sunny Review By: [Signature]

Comments: collected field MS/MSD

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125mL	HDPE	B	N	2	1-L	HDPE	B	N
3	125mL	↓	A	↓					
1	250ML	↓	A	↓					
2	60mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-mw-15026 Date 4-15-25 Control Number 24-0278-04, -07  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP-01 Sonde ID:  15M  19H  20M  21G  22J


Depth-to-water T/PVC (ft) 15.18 Depth-To-Bottom T/PVC (ft) 21.02 Completed by CLE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1553	Started pump						200	15.20	
1600	6.00	10.7	35.5	60.2	6.49	+170.8	200	15.20	5.49
1605	5.90	10.7	34.7	59.5	6.41	+217.8	200	15.20	4.08
1610	5.87	10.5	34.8	59.8	6.48	+258.5	200	15.20	3.72
1615	5.85	10.5	34.4	62.0	6.92	+285.2	200	15.20	3.20
1620	5.84	10.5	34.2	62.8	7.01	+301.9	200	15.20	3.02
1625	5.87	10.4	34.8	59.7	6.68	+321.9	200	15.20	2.87
1630	5.86	10.4	34.3	60.5	6.67	+325.6	200	15.20	2.79
1635	5.81	10.4	33.3	63.9	7.14	+334.3	200	15.20	2.73
1640	5.81	10.4	33.4	63.5	7.10	+342.7	200	15.20	2.74
1645	5.83	10.5	34.1	63.2	7.05	+348.2	200	15.20	2.76
1650	5.84	10.4	34.4	61.8	6.91	+350.0	200	15.20	2.73
1651	collected sample								
1715	end								

Total Pump Time (min): 58 Total Purge Volume (gal): ~3.0 Review Date: 04-24-24

Weather: 70°F, Sunny Review By: 

Comments: collected FIELD DUP

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	B	N	4	1-L	HDPE	B	N
2	125mL	↓	A	↓					
2	250mL	↓	A	↓					
4	60mL	plastic	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC MW-15027 Date 4.15.23 Control Number 24-0278-05  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 15.80 Depth-To-Bottom T/PVC (ft) 23.00 Completed by UMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1601	Started Pumping						80	15.81	
1608	Turned speed up to 100						100	15.82	
1613	6.64	12.3	70.7	94.3	10.17	+213.4	100	15.82	25.04
1618	6.13	11.5	79.0	93.7	10.26	+228.8	100	15.80	16.70
1623	6.17	11.4	82.2	93.3	10.17	+232.9	100	15.80	17.00
1628	6.21	11.2	86.3	92.1	10.10	+232.7	100	15.80	14.92
1633	6.22	11.1	87.6	92.3	10.15	+234.1	100	15.80	12.18
1638	6.23	11.4	88.7	92.4	10.09	+235.2	100	15.80	12.82
1643	6.27	11.2	<del>90.8</del> 93.1	91.0	10.02	+236.9	100	15.80	10.79
1648	6.29	11.1	93.1	91.0	9.99	+236.2	100	15.80	11.27
1649	Turned speed up to 180							15.84	
1656	6.37	10.4	97.0	87.9	9.83	+235.8	180	15.85	10.86
1707	6.42	10.4	98.7	86.9	9.74	+235.8	180	15.85	10.77
1706	6.42	10.3	103.4	87.0	9.74	+233.9	180	15.85	11.52
1711	6.46	10.4	103.1	85.9	9.64	+233.1	180	15.85	11.46

Total Pump Time (min): - Total Purge Volume (gal): - Review Date: 04.24.24

Weather: 70°F Sunny, Windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	Plastic	A	N	2	1-L	Plastic	B	N
1	125 mL	I	B	I					
1	250 mL	I	A	I					
2	60 mL	VOR	A	I					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC-MW-15021 Date 4-15-23 Control Number 24-0278-05  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geo Tech S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 15.80 Depth-To-Bottom T/PVC (ft) 23.00 Completed by LMD

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1714	6.48	10.3	105.1	86.8	9.73	+233.2	180	15.85	10.48
1721	6.51	10.3	108.0	84.9	9.51	+235.3	180	15.85	9.88
1726	6.50	10.5	107.3	85.8	9.57	+235.3	180	15.85	9.39
1731	6.50	10.6	107.3	86.4	9.61	+235.3	180	15.85	9.29
1732	collected sample								
1745	End								

Total Pump Time (min): 91 Total Purge Volume (gal): ~4 Review Date: 04-24-24

Weather: \_\_\_\_\_ Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.



Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC MW-15208 Date 4.15.24 Control Number 24-0218-06  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Geotech S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP      Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 16.70 Depth-To-Bottom T/PVC (ft) 20.82 Completed by CUE/LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1432	Started Pump						220	16.91	
1435	Lowered pump speed to 180						180	17.38	
1439	lowered pump speed to 120						120	17.79	
1432	lowered pump speed to 80						80	16.85	
1453	8.41	12.8	102.5	77.7	8.24	+135.1	80	16.85	3.70
1458	8.48	12.4	101.9	77.0	8.24	+140.5	80	16.93	3.87
1503	8.44	12.6	100.5	78.0	8.31	+147.1	80	16.70	3.67
1508	8.45	12.6	100.8	77.5	8.23	+147.0	80	16.70	3.44
1513	8.49	12.7	101.7	77.6	8.25	+148.4	80	16.70	3.49
1514	collected sample								
1540	End								

Total Pump Time (min): 47 Total Purge Volume (gal): ~1 Review Date: 04-24-24

Weather: 70°F Sunny, windy Review By: J

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125ml	Plastic	A	N	2	1-L	Plastic	B	N
1	125ml	I	B	I					
1	250ml	I	A	I					
2	100ml	VOA	A	I					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID FB-01 Date 4.15.24 Control Number 24-0278-09  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: \_\_\_\_\_ S/N: \_\_\_\_\_  
 QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) \_\_\_\_\_ Depth-To-Bottom T/PVC (ft) \_\_\_\_\_ Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

<u>2410</u>	<u>collected sample</u>								

Total Pump Time (min):    Total Purge Volume (gal) :    Review Date: 04-24-24

Weather: \_\_\_\_\_ Review By: J

Comments: \_\_\_\_\_

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	<u>Plastic</u>	A	<u>P</u>					
1	125mL		B	<u>I</u>					
1	250 mL		A						
2	1-L		B						

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID EB-01 Date 4-15-24 Control Number 24-0278-09  
 Location 2nd Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: \_\_\_\_\_ S/N: \_\_\_\_\_

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) \_\_\_\_\_ Depth-To-Bottom T/PVC (ft) \_\_\_\_\_ Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

<u>2025 collected sample</u>									

Total Pump Time (min): — Total Purge Volume (gal): — Review Date: 24-24-24

Weather: \_\_\_\_\_ Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 ml	<u>Plastic</u>	A	<u>N</u>					
1	125 ml	<u>T</u>	B	<u>T</u>					
1	250 ml	<u>T</u>	A	<u>T</u>					
2	1-L	<u>T</u>	B	<u>T</u>					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-mw-15006 Date 4.16.24 Control Number 24-0279-01  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: GeoTech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 35.10 Depth-To-Bottom T/PVC (ft) 38.00 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1655	started pump						306	35.12	
1705	7.99	14.8	590	9.1	0.92	+100.6	306	35.12	1.89
1710	7.97	14.9	589	10.4	1.05	+96.9	300	35.12	1.90
1715	7.96	14.9	589	10.9	1.11	+87.7	300	35.12	1.56
1720	7.94	15.0	588	12.0	1.21	+72.0	300	35.12	1.25
1725	7.95	14.9	588	10.6	1.06	+70.3	300	35.12	1.23
1730	7.96	15.0	588	10.4	1.03	+69.2	300	35.12	1.19
1735	7.97	14.8	589	10.8	1.09	+68.8	300	35.12	1.23
1736	collected sample								
1743	end								

Total Pump Time (min): 36 Total Purge Volume (gal): 22.75 Review Date: 04.24.24

Weather: 69°F, sun, windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	1-L	HDPE	B	N
1	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	60mL	UDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC-mw-1500TR Date 4-16-24 Control Number 24-0279-02, <sup>MS</sup> -09, <sup>MSD</sup> -10  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Gcotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 36.09 Depth-To-Bottom T/PVC (ft) 43.10 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1555	started pump						325	36.10	
1605	7.99	15.6	574	11.7	1.18	+116.0	325	36.10	22.30
1610	7.96	14.8	548	17.0	1.72	+110.3	325	36.10	12.18
1615	7.97	14.8	545	17.8	1.80	+93.8	325	36.10	7.99
1620	8.00	14.9	542	17.9	1.81	+78.2	325	36.10	5.39
1625	8.01	14.7	545	17.9	1.81	+69.3	325	36.10	3.24
1630	8.02	14.6	545	18.2	1.85	+66.2	325	36.10	2.42
1635	8.03	14.6	546	18.0	1.83	63.2	325	36.10	2.11
1640	8.03	14.7	547	17.9	1.81	61.0	325	36.10	2.09
1641	collected sample								
1650	-end								

Total Pump Time (min): 41 Total Purge Volume (gal) ~3.5 Review Date: 4-24-24  
 Weather: 70°F, sun, windy Review By: [Signature]

Comments: collected field MS/MSD

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125mL	HDPE	B	N	2	1-L	HDPE	B	N
3	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	60mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC-mw-15008R Date 4.16.24 Control Number 24-6279-03  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 43.05 Depth-To-Bottom T/PVC (ft) 47.44 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1505	Started pump						310	43.10	
1510	7.25	15.1	554	14.2	1.42	+229.7	310	43.10	6.92
1515	7.24	15.1	553	14.9	1.50	+219.8	310	43.10	3.73
1520	7.23	15.0	548	18.2	1.83	+205.6	310	43.10	2.05
1525	7.23	15.0	545	19.3	1.94	+202.5	310	43.10	1.88
1530	7.22	14.8	539	21.0	2.12	+199.8	310	43.10	1.68
1535	7.22	14.8	539	20.3	2.05	+197.5	310	43.10	1.53
1540	7.22	14.8	541	20.0	2.01	+194.4	310	43.10	1.55
1541	collected sample								
1549	end								

Total Pump Time (min): 46 Total Purge Volume (gal): ~3.75 Review Date: 04.24.24

Weather: 69°F, Sun, Windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	2-L	HDPE	B	N
1	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	40mL	VOA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15009R Date 4-16-24 Control Number 24-0279-01-00  
 Location JHC POND A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP 02 Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 43.24 Depth-To-Bottom T/PVC (ft) 50.80 Completed by CLE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1335	started pump						300	43.25	
1340	6.83	14.3	569	13.2	1.35	+230.4	300	43.25	7.38
1345	6.83	14.2	569	15.0	1.55	+226.9	300	43.25	5.70
1350	6.83	14.3	569	16.9	1.74	+224.5	300	43.25	4.97
1355	6.84	14.3	570	19.7	2.01	+224.1	300	43.25	3.59
1400	6.84	14.1	569	20.5	2.10	+225.4	300	43.25	2.91
1405	6.84	14.2	569	21.2	2.17	+226.8	300	43.25	2.68
1410	6.85	14.1	569	22.1	2.26	+230.0	300	43.25	2.15
1415	6.85	14.0	570	22.3	2.29	+230.7	300	43.25	1.90
1420	6.85	14.1	571	22.5	2.31	+231.2	300	43.25	1.94
1421	collected sample								
1430	end								

Total Pump Time (min): 44 Total Purge Volume (gal): ~3.75 Review Date: 04-24-24

Weather: 68°F, SUN, WINDY Review By: [Signature]

Comments: Collected Field DUP

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	B	N	4	1-L	HDPE	B	N
2	125mL	↓	A	↓					
2	250mL	↓	A	↓					
4	400mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-mw-15011R Date 4.16.24 Control Number 24-6279.05  
 Location JHC POND A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 37.57 Depth-To-Bottom T/PVC (ft) 45.20 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1825	Started pump						310	37.58	
1830	7.03	14.2	456.6	7.6	0.78	+143.9	310	37.58	9.17
1835	6.99	14.1	450.1	9.3	0.94	+144.7	310	37.58	5.50
1840	6.98	14.0	449.0	10.1	1.04	+143.2	310	37.58	3.31
1845	7.00	14.0	441.1	9.7	1.00	+138.9	310	37.58	2.42
1850	6.97	14.0	437.4	9.6	0.99	+138.7	310	37.58	1.75
1855	6.98	14.0	435.5	9.5	0.98	+132.6	310	37.58	1.69
1856	collected sample								
1708	end								

Total Pump Time (min): 30 Total Purge Volume (gal): ~3.0 Review Date: 04-24-24

Weather: 65°F, cloudy, windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	1-L	HDPE	B	N
1	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	60mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.









Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID PZ-235 Date 4.17.24 Control Number 24-0281-02  
 Location JHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Solinst 101 P7 S/N: L5030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 15.10 Depth-To-Bottom T/PVC (ft) 17.50 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

13:07	started pump						256	15.18	
13:11	7.49	10.7	36.6	84.9	9.43	-5.9	256	15.19	4.41
13:15	7.18	10.5	34.3	83.6	9.33	31.3	256	15.19	4.17
13:19	7.08	10.5	33.5	83.6	9.33	<del>33.5</del> 41.4 4.17.24	256	15.19	4.09
13:23	7.02	10.4	34.0	83.5	9.33	51.5	256	15.19	4.02
13:27	7.01	10.5	33.1	83.9	9.36	56.0	256	15.19	3.95
13:31	6.99	10.7	34.5	84.2	9.35	62.5	256	15.19	3.96
13:35	7.00	10.6	34.2	84.4	9.38	65.1	256	15.19	3.89
13:39	6.99	10.5	34.0	84.0	9.36	69.3	256	15.19	3.71
13:40	Collected sample								
13:55	End sample collection								

Total Pump Time (min): 33 Total Purge Volume (gal) : ≈2.0 Review Date: 04.24.24

Weather: 60°F, cloudy, light wind Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	HDPE	B	Y	2	60 mL	VOA	A	N
1	125 mL	↓	B	N	2	1L	HDPE	B	N
1	125 mL		A	N					
1	250 mL		A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID PZ-245 Date 4.16.24 Control Number 24-0281-03,-09  
 Location SHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Solinst 101P7 S/N: 65030623

QC SAMPLE:  MS/MSD  DUP 07 Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 7.81 Depth-To-Bottom T/PVC (ft) 11.09 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

19:10	Started pump						272	7.89	
19:15	5.55	9.4	29.5	81.6	9.32	75.6	272	7.89	3.22
19:19	5.11	9.4	35.0	73.8	8.45	103.6	272	7.89	3.18
19:23	5.09	9.1	38.8	68.3	7.85	111.9	272	7.89	3.22
19:27	5.07	9.1	43.3	62.8	7.22	122.0	272	7.89	2.99
19:31	5.06	9.0	45.0	60.5	7.00	125.5	272	7.89	2.67
19:35	5.05	9.1	46.4	58.8	6.78	129.7	272	7.89	2.59
19:39	5.06	9.1	47.2	57.4	6.62	133.5	272	7.89	2.45
19:43	5.06	8.9	47.7	56.5	6.55	135.4	272	7.89	2.34
19:47	5.08	8.9	48.1	55.8	6.47	137.5	272	7.89	2.32
19:48	Collected sample								
20:21	End sample collection								

Total Pump Time (min): 38 Total Purge Volume (gal): ≈ 3.0 Review Date: 04.24.24

Weather: 55°F, Cloudy, windy Review By: J

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	Y	4	60mL	VOA	A	N
2	125mL	T	B	N	4	1L	HDPE	B	N
2	125mL	T	A	N					
2	250mL	T	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID PZ-24 Date 4.16.24 Control Number 24-0281-04  
 Location JHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Solinst 101PZ S/N: LS030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 5.24 Depth-To-Bottom T/PVC (ft) 13.81 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

16:57	Started pump						180	5.95	
17:05	7.61	10.4	306.6	28.2	3.02	-174.9	180	7.82	57.33
17:09	8.03	9.8	312.3	4.2	0.46	-280.7	180	7.15	49.28
17:13	8.06	9.8	324.0	2.2	0.25	-285.1	180	7.25	38.91
17:14	Emptied sonde and slowed pump speed						140	7.20	
17:18	7.68	10.5	343.1	17.2	1.83	-217.9	140	7.09	17.83
17:22	7.72	10.4	350.2	3.6	0.39	-210.0	140	7.00	12.77
17:26	7.62	10.4	353.9	2.2	0.24	-192.4	140	6.91	9.03
17:30	7.59	10.4	354.8	1.8	0.20	-186.2	140	6.90	7.83
17:34	7.53	10.4	355.8	1.4	0.16	-176.0	140	6.90	6.30
17:38	7.49	10.4	357.4	1.2	0.14	-169.6	140	6.90	5.87
17:42	7.48	10.2	357.7	1.0	0.11	-166.0	140	6.90	5.34
17:46	7.44	10.3	358.1	0.8	0.09	-159.7	140	6.90	5.13
17:50	7.42	10.2	358.0	0.8	0.08	-155.5	140	6.90	4.84
17:54	7.41	10.3	357.6	0.8	0.08	-153.0	140	6.90	4.79

Total Pump Time (min): 58 Total Purge Volume (gal): ≈ 2.0 Review Date: 04.24.24

Weather: 60°F, Sunny, Windy Review By: [Signature]

Comments: 17:55 collected sample 18:23 End sample collection

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	Y	2	60mL	VOA	A	N
1	125mL	I	B	N	2	1L	HDPE	B	N
1	125mL	I	A	N					
1	250mL	I	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID PZ-405 Date 4.17.24 Control Number 24-0281-05  
 Location JHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Solinst 101 P7 S/N: LS030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 10.89 Depth-To-Bottom T/PVC (ft) 17.98 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

10:31	started pump						288	10.92	
10:34	5.30	10.6	30.6	73.5	8.11	128.8	288	10.92	4.21
10:38	5.11	10.4	29.7	60.9	6.81	135.5	288	10.92	3.88
10:42	5.10	10.1	29.8	58.0	6.53	141.3	288	10.92	3.59
10:46	5.12	10.1	29.6	57.5	6.45	145.5	288	10.92	3.30
10:50	5.12	10.2	29.7	55.7	6.27	147.7	288	10.92	3.35
10:54	5.11	10.1	29.2	53.7	6.04	149.6	288	10.92	3.27
10:58	5.11	10.3	29.1	52.8	5.91	151.3	288	10.92	3.19
11:02	5.11	10.1	28.9	51.9	5.88	152.2	288	10.92	3.15
11:03	Collected sample								
11:19	End sample collection								

Total Pump Time (min): 32 Total Purge Volume (gal): ≈ 2.5 Review Date: 04.24.24

Weather: 60°F, sunny, light wind Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	Y	2	60mL	VOA	A	N
1	125mL	T	B	N	2	1L	HDPE	B	N
1	125mL		A	N					
1	250mL	↓	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID PZ-40 Date 4-17-24 Control Number 24-0281-06  
 Location 3HC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Solinst 101 P7 S/N: LS030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 8.04 Depth-To-Bottom T/PVC (ft) 22.45 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

09:10	started pump						264	8.09	
09:13	6.59	10.2	120.4	26.5	2.91	102.0	264	8.09	3.47
09:17	6.63	10.0	129.1	5.9	0.66	103.0	264	8.09	3.38
09:21	6.65	9.9	131.4	3.7	0.42	103.8	264	8.09	3.19
09:25	6.66	9.9	131.9	2.8	0.32	104.0	264	8.09	3.15
09:29	6.66	9.9	132.2	2.4	0.27	104.6	264	8.09	3.07
09:33	6.66	10.0	132.3	2.3	0.26	105.4	264	8.09	3.08
09:37	6.66	10.0	132.4	2.2	0.25	106.2	264	8.09	3.01
09:38	Collected sample								
09:54	End sample collection								

Total Pump Time (min): 28 Total Purge Volume (gal): ≈ 2.0 Review Date: 04-24-24

Weather: 50°F, Cloudy, light wind Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	Y	2	60mL	VOA	A	N
1	125mL	↓	B	N	2	1L	HDPE	B	N
1	125mL	↓	A	N					
1	250mL	↓	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.



Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID TW-19-05 Date 4.16.24 Control Number 240281-07  
 Location JHC supplemental Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 15.68 Depth-To-Bottom T/PVC (ft) 18.55 Completed by Lmo

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1615	started pump						240	15.78	
1618	slowed pump to 220						220	15.78	
1625	7.09	11.2	90.6	80.8	8.91	+126.5	220	15.78	1.73
1630	7.03	10.6	94.2	79.4	8.83	+119.0	220	15.78	1.56
1635	7.04	10.6	98.5	79.3	8.80	+126.3	220	15.78	1.48
1640	7.04	10.9	104.6	78.3	8.64	+130.1	220	15.78	1.53
1645	7.05	10.9	107.6	78.0	8.63	+144.7	220	15.78	1.53
1650	7.05	10.6	119.7	75.1	8.34	+141.3	220	15.78	1.69
1655	7.05	10.5	138.8	69.2	7.71	+176.9	220	15.78	1.55
1700	7.04	10.4	161.3	64.9	7.24	+180.9	220	15.78	1.62
1705	7.05	10.5	171.1	62.6	7.06	+184.2	220	15.78	2.03
1710	7.08	10.4	185.9	60.4	6.74	+187.3	220	15.78	1.62
1715	7.09	10.4	189.3	59.2	6.60	+190.5	220	15.78	1.51
1720	7.14	10.4	196.8	57.7	6.46	+190.7	220	15.78	1.44
1725	7.14	10.4	197.9	57.7	6.45	+191.9	220	15.78	1.39

Total Pump Time (min): 78 Total Purge Volume (gal): ~4.6 Review Date: 04-24-24

Weather: 70°F sunny windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____								
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N	
1	125ml	A	Plastic	N	2	1-L	Plastic	B	N	
1	125ml	B								
1	250ml	A								
2	60ml	A								

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID TW-19-05 Date 4-16-24 Control Number 24-0281-07

Location JHC Supplemental Well Material:  PVC  SS  Iron  Galv. Steel

Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer

Depth to Water Tape: 6.25 ft S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP          Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 15.68 Depth-To-Bottom T/PVC (ft) 18.55 Completed by WMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1730	7.17	10.4	200.9	57.4	6.42	192.6	220	15.78	1.40
1731	collected sample								
1751	End								

Total Pump Time (min): 78 Total Purge Volume (gal): 24.0 Review Date: 04-24-24

Weather: 70°F sunny, windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
* See page one									

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID TW-19-06A Date 4-16-24 Control Number 24-0281-08, -10, -11  
 Location JHC Supplemental Well Material:  PVC  SS  Iron  Galv. Steel

Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor

Depth to Water Tape: Geotech S/N: 1009-22

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 12.53 Depth-To-Bottom T/PVC (ft) 15.31 Completed by Uma

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

<del>1829</del>	<del>8.84</del>	<del>10.9</del>	<del>263.1</del>	<del>7.7</del>	<del>0.84</del>	<del>+147.7</del>	<del>220</del>	<del>12.54</del>	<del>1.53</del>
<del>1839</del>	<del>8.87</del>	<del>10.7</del>	<del>259.4</del>	<del>5.3</del>	<del>0.57</del>	<del>+138.4</del>	<del>220</del>	<del>12.54</del>	<del>1.27</del>
<del>1839</del>	<del>8.87</del>	<del>10.7</del>	<del>259.4</del>	<del>5.3</del>	<del>0.57</del>	<del>+138.4</del>	<del>220</del>	<del>12.54</del>	<del>1.27</del>
1844	8.87	10.7	259.4	5.3	0.57	+138.4	220	12.54	1.27
1849	8.89	10.7	258.7	4.6	0.51	+130.8	220	12.54	1.37
1854	8.88	10.9	257.4	11.4	1.22	+122.4	220	12.54	1.48
1859	8.89	10.8	256.0	4.7	0.52	+116.6	220	12.54	1.43
1904	8.89	10.6	259.8	4.4	0.49	+113.3	220	12.54	1.44
1909	8.89	10.6	258.6	4.2	0.46	+106.3	220	12.54	1.41
1914	8.90	10.7	257.3	4.0	0.45	+102.1	220	12.54	1.53
1919	8.90	10.7	258.1	4.0	0.44	+97.2	220	12.54	1.42
1924	8.90	10.6	258.7	3.9	0.44	+92.4	220	12.54	1.40
1929	8.90	10.7	258.9	3.9	0.44	+88.7	220	12.54	1.80
+1934	uma 4.16.24								
1930	collected Sample								
2037	End								

Total Pump Time (min): 61 Total Purge Volume (gal): ~3.5 Review Date: 04-24-24

Weather: 70° sunny Windy Review By: Jfi

Comments: \* repaired kink in tubing

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125ml	PLASTIC	B	N	6	1-L	PLASTIC	B	N
3	125ml	I	B	I					
1	250ml	I	A						
2	60ml	VOR	A						

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC-MW-15023 Date 10.14.24 Control Number 24-0857-01, ~~06-07~~ <sup>LMO 10.14.24</sup>

Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel

Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor

Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE:  MS/MSD  DUP -01 Sonde ID:  15M  19H  20M  21G  22J


Depth-to-water T/PVC (ft) 20.02 Depth-To-Bottom T/PVC (ft) 27.71 Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1610	started pump						220	20.02	
1615	6.20	12.2	81.3	8.2	0.88	+222.7	220	20.02	3.04
1620	6.26	12.1	95.4	7.0	0.75	+221.0	220	20.02	2.91
1625	6.37	12.0	106.0	5.9	0.64	+212.3	220	20.02	2.37
1630	6.39	12.0	111.8	6.2	0.67	+210.0	220	20.02	2.18
1635	6.43	12.0	122.4	6.0	0.65	+205.6	220	20.02	1.92
1640	6.44	12.2	123.9	6.1	0.65	+202.4	220	20.02	1.74
1645	6.49	12.1	132.2	5.8	0.63	+196.6	220	20.02	1.75
1650	6.49	12.1	129.9	5.9	0.63	+196.0	220	20.02	1.68
1655	6.50	12.1	134.9	6.0	0.64	+195.4	220	20.02	1.69
1700	6.51	12.1	134.0	5.9	0.62	+194.6	220	20.02	1.67
1705	6.51	12.1	134.5	6.0	0.65	+194.8	220	20.02	1.64
1706	collected sample								
1731	End								

Total Pump Time (min): 56 Total Purge Volume (gal): ~3.25 Review Date: 10-23-24

Weather: 55°F cloudy Review By: 

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F -							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
<del>4</del>	<del>60 ml</del>	<del>Plastic</del>	<del>A</del>	<del>N</del>	4	1L	Plastic	B	N
2	125ml	I	A	N	4	60ml	VOA	A	N
2	125ml	I	B	N					
2	125ml	I	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC-MW-15024 Date 10.14.24 Control Number 24-0867-02  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: GeoTech S/N: 1005

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 15.45 Depth-To-Bottom T/PVC (ft) 19.94 Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1800	started pump						220	15.46	
1805	7.92	12.2	341.4	5.6	0.60	+230.1	220	15.46	3.09
1810	7.88	12.3	316.4	5.7	0.61	+215.0	220	15.46	3.25
1815	7.88	12.2	329.1	5.4	0.58	+209.0	220	15.46	3.13
1820	7.89	12.2	331.1	5.2	0.56	+200.7	220	15.46	2.97
1825	7.90	12.1	337.0	4.8	0.52	+192.4	220	15.46	2.48
1830	7.90	12.1	328.9	4.9	0.53	+188.1	220	15.46	2.26
1835	7.90	12.1	332.6	5.2	0.56	+184.2	220	15.46	2.02
1840	7.90	12.1	330.5	5.5	0.59	+181.9	220	15.46	1.97
1845	7.90	12.1	330.1	5.9	0.63	+179.4	220	15.46	1.87
1850	7.90	12.1	329.9	5.9	0.64	+178.7	220	15.46	1.81
1855	7.90	12.1	328.3	6.1	0.67	+178.4	220	15.46	1.79
1856	collected sample								
1908	End								

Total Pump Time (min): 56 Total Purge Volume (gal): ~3.25 Review Date: 10-23-24  
 Weather: 55°F cloudy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
<del>2</del>	<del>60ml</del>	<del>Plastic</del>	<del>A</del>	<del>N</del>	2	1L	Plastic	B	N
1	125ml	I	A	N	2	60ml	VOA	A	N
1	125ml	I	B	N					
1	250ml	I	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15025 Date 10.14.24 Control Number 24-0857-03, -10, -11 <sup>MS MSP</sup>  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 14.93 Depth-To-Bottom T/PVC (ft) 19.89 Completed by Umo

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1935	Started pump						240	14.97	
1940	7.95	11.5	464.3	26.3	2.86	+127.3	240	14.97	3.28
1945	7.96	11.5	439.1	26.5	2.89	+139.9	240	14.97	2.89
1950	7.97	11.4	431.3	28.1	3.07	+153.3	240	14.97	2.71
1955	7.97	11.4	431.9	28.6	3.12	+155.0	240	14.97	2.72
2000	7.98	11.3	420.2	29.2	3.20	+156.5	240	14.97	2.65
2005	7.98	11.3	420.6	29.8	3.21	+157.2	240	14.97	2.59
2010	7.99	11.3	419.9	30.0	3.29	+155.0	240	14.97	2.58
2011	collected sample								
2026	End								
<del>2027</del>	10.14.24								

Total Pump Time (min): 24 Total Purge Volume (gal) : ~1.5 Review Date: 10.23.24

Weather: 56°F cloudy Review By: 

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125ml	Plastic	B	N	2	1 L	Plastic	A	N
3	125ml	Plastic	A	N					
1	250 ml	Plastic	A	N					
2	60ml	VGA	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15026 Date 10.15.24 Control Number 24-0857-04  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE:  MS/MSD  DUP        Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 16.77 Depth-To-Bottom T/PVC (ft) 21.02 Completed by UMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

0815	Started pump						220	16.78	
0820	5.89	11.9	44.0	40.0	4.32	+288.9	220	16.78	2.53
0825	5.87	11.9	45.3	38.5	4.15	+296.1	220	16.78	2.62
0830	5.91	12.0	47.4	37.6	4.05	+301.3	220	16.78	2.55
0835	5.88	12.0	46.3	37.6	4.06	+306.0	220	16.78	2.56
0846	5.88	11.9	46.6	37.4	4.06	+309.9	220	16.78	2.47
0845	5.88	12.0	46.4	37.7	4.05	+313.2	220	16.78	2.31
0850	5.87	11.9	46.6	37.6	4.06	+315.1	220	16.78	2.22
0855	5.87	11.9	46.0	37.6	4.05	+316.2	220	16.78	2.25
0856	collected sample								
0911	End								

Total Pump Time (min): 41 Total Purge Volume (gal): ~ 2.25 Review Date: 10-23-24

Weather: 50 °F cloudy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	60 mL	VOA	A	N	2	1L	Plastic	B	N
1	125 mL	Plastic	A	N					
1	125 mL	I	B	N					
1	250 mL		A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC MW-15027 Date 10-15-24 Control Number 24-0857-06  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 17.41 Depth-To-Bottom T/PVC (ft) 23.00 Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

0930	Started pump							17.43	
0935	7.00	12.5	173.8	83.4	8.87	+301.2	240.0	17.43	29.54
0936	Stopped sandy fixed air bubbles								
0945	started pump						220	17.43	
0950	7.22	12.5	150.1	81.2	8.68	+286.0	220	17.43	9.94
0955	7.27	12.4	154.3	82.3	8.79	+283.3	220	17.43	10.32
1000	7.27	12.4	155.8	80.8	8.61	+282.2	220	17.43	7.53
1005	7.30	12.5	153.1	80.3	8.56	+280.6	220	17.43	4.72
1010	7.32	12.5	152.3	79.8	8.50	+280.7	220	17.43	4.01
1015	7.34	12.5	153.2	79.8	8.42	+280.0	220	17.43	3.25
1020	7.35	12.5	154.1	78.6	8.38	+279.8	220	17.43	2.94
1025	7.35	12.4	154.9	78.5	8.37	+280.0	220	17.43	2.89
1030	7.36	12.5	154.4	78.3	8.34	+280.0	220	17.43	2.90
1031	collected sample								
1147	End								

Total Pump Time (min): 61 Total Purge Volume (gal): ~3.5 Review Date: 10-23-24

Weather: 40°F, cloudy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	60mL	VOA	A	N	2	1L	Plastic	B	N
1	125 mL	Plastic	A	N					
1	125 mL		B	N					
1	250 mL		A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.



**Consumers Energy Company**  
**Monitoring Well Sampling Worksheet**

Well ID JHC MW-15028 Date 10.15.24 Control Number 24-0857-06  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 17.26 Depth-To-Bottom T/PVC (ft) 26.83 Completed by Lmo

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

*Stablization parameters for the last three readings*

1105	Started pump							17.28	
1110	8.62	13.1	116.7	75.4	7.92	+224.0	240	17.28	3.55
1115	8.65	13.0	110.5	77.0	8.10	+221.8	240	17.28	3.01
1120	8.67	13.2	111.9	78.1	8.19	+221.6	240	17.28	2.53
1125	8.68	13.2	110.4	78.4	8.21	+221.9	240	17.28	2.64
1130	8.68	13.2	108.2	78.6	8.24	+222.9	240	17.28	2.98
1135	8.68	13.2	108.9	78.7	8.25	+223.5	240	17.28	3.14
1140	8.68	13.3	108.3	78.9	8.25	+224.3	240	17.28	3.39
1145	8.68	13.3	109.0	78.9	8.27	+224.7	240	17.28	3.45
1150	8.68	13.4	109.4	79.1	8.26	+225.1	240	17.28	3.50
1151	collected,								
1205	End								

Total Pump Time (min): 46 Total Purge Volume (gal) : ~3.0 Review Date: 10.23.24

Weather: 50° cloudy Review By: 

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	60mL	VofA	A	N	2	1L	Plastic	B	N
1	125 mL	PLASTIC	A	N					
1	125 mL	I	B	N					
1	250 mL	I	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID FB-01 Date 10.15.24 Control Number 24-0851-08  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: \_\_\_\_\_ S/N: \_\_\_\_\_

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) \_\_\_\_\_ Depth-To-Bottom T/PVC (ft) \_\_\_\_\_ Completed by LMO

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1222	collected sample								

Total Pump Time (min): \_\_\_\_\_ Total Purge Volume (gal): \_\_\_\_\_ Review Date: 10.23.24

Weather: \_\_\_\_\_ Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125ml	PLASTIC	B	N					
1	125ml		A	N					
1	250ml		A	N					
2	1L		B	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID EB-01 Date 10.15-24 Control Number 24-0851-09  
 Location JHC Background Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: \_\_\_\_\_ S/N: \_\_\_\_\_

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) \_\_\_\_\_ Depth-To-Bottom T/PVC (ft) \_\_\_\_\_ Completed by UM0

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1210	collected sample								

Total Pump Time (min): — Total Purge Volume (gal) : — Review Date: 10-23-24

Weather: \_\_\_\_\_ Review By: 

Comments: \_\_\_\_\_

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125ml	Plastic	B	N					
1	125ml		A	N					
1	250ml		A	N					
2	1L		B	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15006 Date 10-14-24 Control Number 24-0858-01  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J


Depth-to-water T/PVC (ft) 36.54 Depth-To-Bottom T/PVC (ft) 38.01 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	<0.33	+/- 10%

Stabilization parameters for the last three readings

1805	started pump						425	30.55	
1810	8.43	14.3	554	7.4	0.76	+144.7	425	*	1.56
1815	8.44	14.3	555	7.0	0.72	+136.0	425	*	1.36
1820	8.45	14.3	555	6.9	0.71	+131.6	425	*	1.35
1825	8.45	14.3	555	6.8	0.70	+125.7	425	*	1.30
1830	8.45	14.3	554	6.7	0.68	+115.5	425	*	1.29
1835	8.46	14.2	554	6.5	0.67	+107.0	425	*	1.29
1840	8.46	14.2	554	6.5	0.66	+101.1	425	*	1.24
1845	8.46	14.2	554	6.4	0.66	+97.8	425	*	1.27
1850	8.46	14.2	554	6.4	0.66	+95.3	425	*	1.25
1851	collected sample								
1904	end								

Total Pump Time (min): 46 Total Purge Volume (gal): ~ 5.25 Review Date: 10-23-24

Weather: 52°F, CLOUDY Review By: 

Comments: \*WATER LEVEL BELOW PUMP - CAN'T MEASURE

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	1-L	HDPE	B	N
1	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	60mL	VOA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC-MW-15007R Date 10-14-24 Control Number 24-0858-02 <sup>MS, USD</sup> <sub>-09, -10</sub>  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: GeoTech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 37.70 Depth-To-Bottom T/PVC (ft) 43.05 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1702	started pump						450	37.71	
1715	7.83	13.8	675	9.5	0.97	+173.7	450	37.71	23.90
1720	7.98	13.7	672	7.1	0.74	+144.1	450	37.71	9.34
1725	8.03	13.7	672	7.0	0.73	+129.8	450	37.71	4.43
1730	8.16	13.7	668	6.2	0.64	+61.8	450	37.71	2.33
1735	8.09	13.7	671	7.1	0.73	+69.3	450	37.71	1.93
1740	8.11	13.7	671	6.6	0.68	+67.2	450	37.71	1.91
1745	8.12	13.7	670	6.2	0.65	+65.7	450	37.71	1.68
1750	8.10	13.7	672	6.0	0.63	+64.2	450	37.71	1.63
1755	8.11	13.7	671	6.0	0.63	+63.1	450	37.71	1.62
1756	collected sample								
1809	end								

Total Pump Time (min): 54 Total Purge Volume (gal): ~6.5 Review Date: 10-23-24

Weather: 53°F, partly sunny, windy Review By: [Signature]

Comments: collected FIELD MS/MSD

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125mL	HDPE	B	N	2	1-L	HDPE	B	N
3	125mL	↓	A	↓					
1	250ML	↓	A	↓					
2	60ML	VQA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID JHC-MW-15008R Date 10-24-24 Control Number 24-0858-03-06  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP 02 Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 44.69 Depth-To-Bottom T/PVC (ft) 47.58 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1510	Started pump						450	44.69	
1515	7.34	13.7	651	15.0	1.53	+231.4	450	44.69	1.44
1520	7.35	13.6	652	16.7	1.74	+230.0	450	44.69	1.44
1525	7.33	13.7	655	17.4	1.80	+212.3	450	44.69	1.51
1530	7.35	13.8	651	14.2	1.47	+195.4	450	44.69	1.42
1535	7.34	13.8	652	14.0	1.44	+192.2	450	44.69	1.47
1540	7.34	13.8	649	14.0	1.44	+190.3	450	44.69	1.43
1541	collected samples								
1549	end								

Total Pump Time (min): 31 Total Purge Volume (gal): ~3.75 Review Date: 10-23-24

Weather: 54°F, partly sunny, windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	B	N	2+2=4	1-L	HDPE	B	N
2	125mL	↓	A	↓					
2	250mL	↓	A	↓					
4	60mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID JHC-MW-15009R Date 10-14-24 Control Number 24-0858-04  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 44.55 Depth-To-Bottom T/PVC (ft) 50.80 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1340	started pump						425	44.55	
1345	6.96	13.4	479.1	11.4	1.20	+201.7	425	44.55	3.67
1350	6.95	13.3	474.1	8.8	0.92	+193.6	425	44.55	2.11
1355	6.95	13.4	472.6	8.0	0.84	+190.3	425	44.55	1.96
1400	6.95	13.5	466.7	7.1	0.74	+175.5	425	44.55	1.63
1405	6.97	13.3	467.1	7.1	0.73	+173.6	425	44.55	1.61
1410	6.97	13.3	463.1	7.0	0.71	+172.1	425	44.55	1.54
1415	6.96	13.4	462.9	6.9	0.70	+170.4	425	44.55	1.49
1416	collected sample								
1427	END								

Total Pump Time (min): 36 Total Purge Volume (gal): ~4.0 Review Date: 10-23-24

Weather: 55°F, partly sunny, wind Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	1-L	HDPE	B	N
1	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	60mL	VOA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID: JHC-MW-1501R Date: 10-14-24 Control Number: 24-0858-05  
 Location: JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 38.68 Depth-To-Bottom T/PVC (ft) 45.19 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1910	Started pump						400	38.70	
1915	6.90	13.8	400.2	4.3	0.45	+67.0	400	38.70	1.33
1920	6.88	13.3	399.0	4.4	0.46	+69.9	400	38.70	1.23
1925	6.86	13.3	396.8	4.6	0.48	+69.5	400	38.70	1.24
1930	6.85	13.3	397.7	4.7	0.49	+69.9	400	38.70	1.07
1935	6.86	13.3	398.1	4.7	0.49	+69.6	400	38.70	1.05
1940	6.86	13.3	398.7	4.7	0.49	+69.5	400	38.70	1.04
1941	collected sample								
1956	end								

Total Pump Time (min): 31 Total Purge Volume (gal): ~3.5 Review Date: 10-23-24

Weather: 50°F, clear Review By: [Signature]

Comments:

Bottles Filled Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - \_\_\_\_\_

Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	1-L	HDPE	B	N
1	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	40mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.



Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID FB-02 Date 10-14-24 Control Number 24-0858-07  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: \_\_\_\_\_ S/N: \_\_\_\_\_

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID: 15M 19H 20M 21G 22J

Depth-to-water T/PVC (ft) \_\_\_\_\_ Depth-To-Bottom T/PVC (ft) \_\_\_\_\_ Completed by CIC

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%
<i>Stablization parameters for the last three readings</i>									

1908	collected sample								

Total Pump Time (min):     Total Purge Volume (gal):     Review Date: 10-23-24

Weather: \_\_\_\_\_ Review By: *[Signature]*

Comments: \_\_\_\_\_

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B						
1	125mL	↓	A						
1	250mL		A						
2	1-L	↓	B						

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID EB-02 Date 10-14-24 Control Number 24-0858-08  
 Location JHC Pond A Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: \_\_\_\_\_ S/N: \_\_\_\_\_

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) \_\_\_\_\_ Depth-To-Bottom T/PVC (ft) \_\_\_\_\_ Completed by CLE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

2001	collected	Sample							

Total Pump Time (min): — Total Purge Volume (gal): — Review Date: 10-25-24

Weather: \_\_\_\_\_ Review By: gi

Comments: \_\_\_\_\_

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125mL	↓	A	↓					
1	250mL		A						
2	1-L	↓	B	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID MW-14S Date 10-15-24 Control Number 24-0860-01  
 Location JHC Supplemental Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Greotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 11.19 Depth-To-Bottom T/PVC (ft) 13.30 Completed by CIE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1530	started	pump					120	11.23	
1535	6.22	13.4	54.3	16.2	1.69	+69.7	120	11.23	1.69
1540	6.09	13.3	55.9	18.3	1.92	+71.6	120	11.23	1.27
1545	6.04	13.4	54.1	17.3	1.81	+88.0	120	11.23	1.09
1550	6.02	13.2	53.9	17.8	1.87	+97.4	120	11.23	1.05
1555	6.00	13.4	53.9	17.7	1.85	+105.9	120	11.23	1.03
1600	6.00	13.3	53.9	17.9	1.87	+110.0	120	11.23	1.05
1605	5.99	13.3	53.8	18.2	1.90	+114.2	120	11.23	1.01
1610	5.99	13.4	53.7	18.4	1.93	+116.4	120	11.23	1.03
1611	collected	samples							
1627	end								

Total Pump Time (min): 41 Total Purge Volume (gal): 21.5 Review Date: 10-23-24

Weather: 50°F, Sunny, windy Review By: [Signature]

Comments: Historic draw down - low purge speed

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	Y	2	60mL	VOA	B A	N
1	125mL	↓	B	N				CIE 10/15/24	
1	250mL	↓	A	N					
1	125mL	↓	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID PZ-23S Date 10.15.24 Control Number 24-0860-02,09  
 Location JHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Solinist 101 P7 S/N: LS030623

QC SAMPLE:  MS/MSD  DUP 07 Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 15.95 Depth-To-Bottom T/PVC (ft) 18.28 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1149	Started pump						296	16.04	
1152	7.66	13.7	43.3	75.7	7.86	52.4	296	16.05	3.17
1156	7.30	13.8	42.6	75.0	7.76	66.3	296	16.05	3.04
1200	7.17	13.7	42.6	75.0	7.79	78.6	296	16.05	2.97
1204	7.13	13.6	42.7	75.0	7.79	84.3	296	16.05	2.89
1208	7.10	13.6	42.7	75.0	7.79	89.6	296	16.05	2.85
1212	7.11	13.8	42.7	75.1	7.78	94.0	296	16.05	2.84
1216	7.12	13.8	42.8	75.5	7.81	97.4	296	16.05	2.83
1217	Collected sample								
1242	End sample collection								

Total Pump Time (min): 28 Total Purge Volume (gal): ~2.5 Review Date: 10.23.24

Weather: 45°F, Sunny, windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125 mL	HDPE	B	N	4	60 mL	VOA	A	N
1	125 mL	↓	B	Y	4	1 L	HDPE	B	N
2	125 mL	↓	A	N					
2	250 mL	↓	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID PZ-245 Date 10.15.24 Control Number 24-0860-03  
 Location JHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Solinst 101 P7 S/N: LS03023

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 9.73 Depth-To-Bottom T/PVC (ft) 11.11 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1633	Started pump						184	9.87	
1639	6.01	13.9	99.7	18.0	1.82	66.9	184	9.87	2.51
1643	5.96	13.6	98.0	6.0	0.62	59.1	184	9.87	2.10
1647	5.96	13.5	95.3	4.6	0.48	56.2	184	9.87	2.01
1651	5.96	13.6	94.7	4.2	0.44	53.1	184	9.87	1.95
1655	5.96	13.6	93.9	4.8	0.50	49.9	184	9.87	1.92
1659	5.97	13.6	94.9	4.4	0.46	46.8	184	9.87	1.89
1703	5.97	13.5	94.6	4.3	0.45	44.7	184	9.87	1.82
1707	5.98	13.5	94.5	4.2	0.43	42.6	184	9.87	1.82
1708	Collected sample								
1720	End sample collection								

Total Pump Time (min): 35 Total Purge Volume (gal): ≈ 2.0 Review Date: 10.23.24

Weather: 45°F Sunny, light wind Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N	2	60mL	VOA	A	N
1	125mL	↓	B	Y	2	1L	HDPE	B	N
1	125mL	↓	A	N					
1	250mL	↓	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID PE-24 Date 10.15.24 Control Number 24-0860-04  
 Location SHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: Solinst 101 P7 S/N: LS030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 7.09 Depth-To-Bottom T/PVC (ft) 13.80 Completed by KPR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1738	started Pump						172	7.82	
1743	7.08	13.2	246.7	12.8	1.30	-158.9	172	8.22	35.06
1747	7.60	12.9	248.9	4.1	6.43	-222.7	172	8.56	27.96
1751	7.72	12.7	251.2	3.2	0.34	-254.7	172	8.69	22.38
1755	7.79	12.6	261.2	2.5	0.26	-259.9	172	8.70	18.14
1759	7.87	12.6	278.9	2.1	0.23	-264.2	172	8.70	13.00
1803	7.92	12.6	286.1	1.8	0.19	-270.9	172	8.70	12.09
1807	7.95	12.6	286.7	1.6	0.17	-268.3	172	8.70	14.39
1811	7.97	12.6	293.5	1.3	0.14	-263.6	172	8.70	13.45
1815	7.95	12.6	293.6	1.3	0.14	-257.1	172	8.70	11.60
1819	7.90	12.6	296.3	1.3	0.13	-244.8	172	8.70	9.61
1823	7.85	12.5	299.3	1.2	0.12	-233.4	172	8.70	6.06
1827	7.81	12.5	307.7	1.2	0.13	-220.7	172	8.70	4.53
1831	7.77	12.5	306.4	1.2	0.13	-214.0	172	8.70	4.61
1835	7.73	12.4	306.2	1.2	0.13	-206.6	172	8.70	4.72

Total Pump Time (min): On Pg. 2 Total Purge Volume (gal): On Pg. 2 Review Date: 10-23-24

Weather: 45°F, Sunny, light wind Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	HDPE	B	N	2	60 mL	VOA	A	N
1	125 mL	T	B	Y	2	1L	HDPE	B	N
1	125 mL	I	A	N					
1	250 mL	J	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID PZ-24 Date 10-15-24 Control Number 24-0860-04  
 Location JHC Well Material:  PVC  SS  Iron  Galv. Steel

Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer

Depth to Water Tape: Solinst 101 P7 S/N: LS030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 7.09 Depth-To-Bottom T/PVC (ft) 13.80 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stablization parameters for the last three readings

1839	7.70	12.4	303.3	1.2	0.12	-202.3	172	8.70	4.90
1843	7.69	12.4	303.0	1.2	0.12	-200.0	172	8.70	4.99
1844	Collected Sample								
1859	End Sample collection								

Total Pump Time (min): 66 Total Purge Volume (gal) : ~3.0 Review Date: 10-23-24

Weather: 45°F, sunny, light wind Review By: J

Comments:

Bottles Filled					Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____				
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	HDPE	B	N	2	60 mL	VOA	A	N
1	125 mL	↓	B	Y	2	1L	HDPE	B	N
1	125 mL	↓	A	N					
1	250 mL	↓	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
Monitoring Well Sampling Worksheet

Well ID PZ-405 Date 10.15.24 Control Number 24-0860-05  
 Location SHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Solinst 101 PZ S/N: LS030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 13.10 Depth-To-Bottom T/PVC (ft) 17.96 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1420	Started Pump						292	16.15	
1426	5.93	11.9	33.6	59.4	6.30	92.8	292	16.20	7.24
1430	5.18	11.5	33.9	41.8	4.56	133.9	292	16.25	4.34
1434	5.15	11.5	33.8	41.1	4.47	144.9	292	16.25	2.85
1438	5.15	11.5	33.4	41.7	4.54	149.2	292	16.25	2.91
1442	5.15	11.5	33.8	40.8	4.45	153.4	292	16.25	2.75
1446	5.15	11.5	33.7	41.2	4.49	156.2	292	16.25	2.61
1450	5.15	11.5	33.7	41.2	4.48	159.7	292	16.25	2.55
1451	Collected sample								
1505	End sample collection								

Total Pump Time (min): 31 Total Purge Volume (gal): ~2.5 Review Date: 10-23-24

Weather: 50°F, windy, sunny Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	HDPE	B	N	2	60 mL	VOA	A	N
1	125 mL	↓	B	Y	2	1 L	HDPE	B	N
1	125 mL		A	N					
1	250 mL		A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.



Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID PZ-40 Date 10.15.24 Control Number 24-0860-06  
 Location SHC Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailer  
 Depth to Water Tape: Solinst 101 P7 S/N: L5030623

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 10.24 Depth-To-Bottom T/PVC (ft) 22.45 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1516	started Pump						308	10.27	
1519	6.34	11.1	97.3	55.0	5.95	151.2	308	10.27	3.22
1523	6.65	10.7	98.1	45.2	5.02	146.4	308	10.27	2.35
1527	6.70	10.6	98.1	46.0	5.12	145.6	308	10.27	1.90
1531	6.72	10.5	98.1	46.2	5.16	145.0	308	10.27	1.97
1535	6.73	10.5	98.1	46.7	5.21	140.1	308	10.27	1.88
1539	6.75	10.5	98.0	47.0	5.24	138.9	308	10.27	1.81
1543	6.75	10.5	98.0	47.2	5.26	138.1	308	10.27	1.77
1544	collected sample								
1557	End sample collection								

Total Pump Time (min): 28 Total Purge Volume (gal): ~2.5 Review Date: 10.23.24

Weather: 50°F, sunny, windy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	HDPE	B	N	2	60 mL	VOA	A	N
1	125 mL	↓	B	Y	2	1L	HDPE	B	N
1	125 mL	↓	A	N					
1	250 mL	↓	A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

**Consumers Energy Company**  
**Monitoring Well Sampling Worksheet**

Well ID JW-19-05 Date 10.15.24 Control Number 24-0860-07  
 Location JHC Supplemental Well Material:  PVC  SS  Iron  Galv. Steel  
 Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor  
 Depth to Water Tape: 60ftch S/N: 1005

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 17.64 Depth-To-Bottom T/PVC (ft) 18.55 Completed by UM

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/-0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

*Stabilization parameters for the last three readings*

1810	Started pump						220	17.85	
1811	slowed pump						110	17.73	
1820	7.64	11.9	460.0	10.7	1.14	+133.7	110	17.73	1.82
1825	7.62	11.8	461.6	9.2	0.99	+133.7	110	17.73	1.28
1830	7.62	11.7	461.3	8.7	0.94	+133.1	110	17.73	1.30
1835	7.62	11.7	461.5	8.8	0.95	+139.0	110	17.73	1.28
1840	7.61	11.7	458.5	9.0	0.95	+138.9	110	17.73	1.25
1841	collected sample								
1903	End								

Total Pump Time (min): 31 Total Purge Volume (gal): ~1.0 Review Date: 10.22.24

Weather: 50° cloudy Review By: [Signature]

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	60 mL	VON	A	N	2	1L	PLASTIC	B	N
1	125 mL	PLASTIC	A	N					
1	125 mL		B	N					
1	250 mL		A	N					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.

Consumers Energy Company  
 Monitoring Well Sampling Worksheet

Well ID TW-19-06A Date 10-15-24 Control Number 24-0860-08, -10, -11 <sup>MS MSD</sup>

Location JHC Supplemental Well Material:  PVC  SS  Iron  Galv. Steel

Purge Method:  Peristaltic  Submersible  Bladder  Fultz  Bailor

Depth to Water Tape: Geotech S/N: 7371

QC SAMPLE:  MS/MSD  DUP \_\_\_\_\_ Sonde ID:  15M  19H  20M  21G  22J

Depth-to-water T/PVC (ft) 14.62 Depth-To-Bottom T/PVC (ft) 15.31 Completed by UE

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	+/- 0.1	NA	+/- 3%	+/- 10%	+/- 0.3ppm	+/- 10mV	*	< 0.33	+/- 10%

Stabilization parameters for the last three readings

1650	started pump						180	14.62	
1655	7.12	12.7	127.8	42.7	4.52	+80.3	180	14.63	1.10
1700	7.18	12.7	129.0	42.2	4.47	+88.1	180	14.63	1.12
1705	7.22	12.6	130.2	41.7	4.43	+94.4	180	14.63	1.10
1710	7.25	12.6	131.7	40.6	4.31	+101.2	180	14.63	1.04
1715	7.26	12.6	132.7	40.7	4.33	+105.2	180	14.63	1.05
1720	7.28	12.6	133.7	39.5	4.20	+109.4	180	14.63	1.03
1721	collected samples								
1740	end								

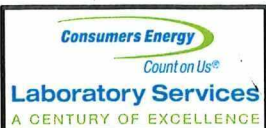
Total Pump Time (min): 31 Total Purge Volume (gal): 21.5 Review Date: 10-23-24

Weather: 53°F, sunny, windy Review By: [Signature]

Comments: collected field MS/MSD

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125mL	HDPE	B	N	2	1-L	HDPE	B	N
3	125mL	↓	A	↓					
1	250mL	↓	A	↓					
2	60mL	VDA	A	↓					

\* Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.



### WATER LEVEL DATA

**Site:** JH Campbell  
**Project No:** 24-0285, 24-0284, 24-0283, 24-0282, 24-0281, 24-0280, 24-0279, 24-0278  
**Analyst:** LMO/CLL **Reviewed by:** *[Signature]*  
**Date:** 4-15-24 **Review Date:** 04-24-24  
**Method:** Electronic Tape  
**Tape ID:** Geotech **S/N:** 1009-22

Well ID	Time	DTW (ft)	DTB (ft)	Re-Check (if needed)	Remarks
JHC-MW-15017	1046	16.80	22.93		GOOD
JHC-MW-15018	1050	17.47	22.95		GOOD
MWB1	1043	35.25	35.25		DM @ 4-15-24 @ 1043 DM @ 4-14-24 @ 1905 check @ 4-17-24 @ 1900 = 37.68
MWB2	1040	37.68	37.77		
MWB3	1033	39.05	40.20		GOOD
MWB4	1029	41.75	47.74		GOOD
JHC-MW-15035 (MW-B5)	0755	41.31	45.28		GOOD
JHC-MW-15031	1017	43.70	46.18		GOOD
JHC-MW-15036 (MW-B6)	1009	27.01	32.52		Broken well hinge cap
JHC-MW-15037 (MW-B7)	0958	25.27	30.90		GOOD
MW-8	0953	29.19	33.42		GOOD
MW-8C	0955	29.80	43.10		GOOD
JHC-MW-15032	0947	17.03	26.05		GOOD
JHC-MW-15034	0942	18.70	23.98		GOOD
JHC-MW-15023	0938	17.96	27.67		GOOD, not locked, well cover doesn't fit
MW5	0935	11.29	19.55		GOOD
MW4	0925	31.71	32.72		GOOD
JHC-MW-15024	0915	13.68	19.92		GOOD
JHC-MW-15025	0910	13.20	19.90		GOOD
MW3	0902	12.50	16.43		GOOD
JHC-MW-15026	0857	15.19	21.02		GOOD
JHC-MW-15027	0847	15.80	23.00		GOOD
MW1	0842	12.92	16.07		GOOD
JHC-MW-15028	0837	14.57	20.82		GOOD
JHC-MW-15029	0827	12.82	20.91		GOOD
<del>JHC-MW-15035</del>	1026	11.04	15.24		


NOTES: TOC reference point (top of steel plate for RWs)  
 DTW = Depth to Water  
 DTB = Depth to Bottom







**WATER LEVEL DATA**

**Site:** JH Campbell  
**Project No:** 24-0278, -0279, -0280, -0281, -0282, -0283, -0284, -0285  
**Analyst:** KDR **Reviewed by:** 04-24-24  
**Date:** 4-15-24 **Review Date:**   
**Method:** Electronic Tape  
**Tape ID:** Solinst 101 P7 **S/N:** LS030623

Well ID	Time	DTW (ft)	DTB (ft)	Re-Check (if needed)	Remarks
MW-9B	0757	21.86	29.59		Good Locked
MW-9C	0759	21.12	41.39		Good Locked
MW-9D	0801	20.95	54.75		Good Locked
MW-10B	0807	14.12	23.54		Good Locked
MW-13	0813	9.98	16.25	Dry	Good Locked well was Dry when Rechecked on 4-16-24 at 20:32
MW-14	0817	10.28	17.46		Good Locked
MW-14S	0818	11.02	13.29		Good Locked
PZ-24	0826	5.24	13.81		Good Locked
PZ-24S	0828	7.77	11.09		Good Locked
PZ-40	0835	7.98	22.45		Good Locked
PZ-40S	0836	10.83	17.98		Good Locked
MW-12	0751	8.59	9.82		Good Locked
MW-11A	0855	10.98	16.65		Good Locked
MW-15	0857	14.06	16.39		Good Locked
MW-16A	0859	12.64	20.90		Good Locked
MW-17	0901	15.71	23.48		Good Locked
RW-1	1444	30.25	48.40		Good
RW-2	1710	34.72	49.40		Good
RW-3	1732	17.25	23.30		Good
RW-4	1753	16.90	22.00		Good
RW-5	1816	9.91	21.63		Good
RW-6	1830	14.95	21.95		Good
RW-7	1843	12.00	20.12		Good
SG-22-1	0910	1.30	-		Good
SG-22-2	0913	1.26	-		Good


**NOTES:** TOC reference point (top of steel plate for RWs)  
 DTW = Depth to Water  
 DTB = Depth to Bottom







### WATER LEVEL DATA

**Site:** JH Campbell  
**Project No:** 24-0278,-0279,-0280,-0281,-0282,-0283,-0284,-0285  
**Analyst:** KDR **Reviewed by:**   
**Date:** 4-15-24 **Review Date:** 04-24-24  
**Method:** Electronic Tape  
**Tape ID:** Solinst 101 P7 **S/N:** L5030623

Well ID	Time	DTW (ft)	DTB (ft)	Re-Check (if needed)	Remarks
PZ-21-01	1128	34.39	38.30		Good locked
PZ-21-02	1143	37.52	43.64		Good locked
PZ-21-03	1148	38.00	43.77		Good locked
PZ-21-04	1201	38.87	44.32		Good locked
PZ-21-05	1208	34.06	43.10		Good locked
PZ-21-06	1155	38.84	46.00		Good locked
PZ-1203	1217	Dry	37.90		Good locked
PZ-1204	1224	Dry	31.12		Good locked
PZ-1205	1230	35.07	35.95		Good locked
PZ-1206	1238	Dry	27.00		Good locked
PZ-1208	1244	Dry	37.27		Good locked
PZ-1212	1210	Dry	24.70		Good locked

**NOTES:** TOC reference point (top of steel plate for RWs)  
DTW = Depth to Water  
DTB = Depth to Bottom



**Laboratory Services**  
A CENTURY OF EXCELLENCE

Sonde ID	15H
Start Date	04-15-2024
Project #	Q2-2024 JHC GW
Site	
Reviewed By & Date:	<i>[Signature]</i> 04-24-24

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 19F104713
Sonde Brand	YSI ProDSS S/N 15H101425 262909-1
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 15G103714
Turbidity Probe	YSI ProDSS S/N 21H105795
pH With ORP	YSI ProDSS S/N 22D102306
Conductivity & Temperature Probe	YSI ProDSS S/N 22G103712

pH Standard (±0.1)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	24003185	5.31.25	4.05	3.99	4.01	3.98		
7.0	GFS # 1639	24003597	7.26.25	7.04	7.00	7.00	7.01		
10.0	GFS # 1645	24003156	5.28.25	9.94	9.99	9.99	10.01		
Initials & Date:				<i>cl</i> 4-12-24	<i>cl</i> 4-15-24	<i>cl</i> 4-14-24	<i>cl</i> 4-17-24		

- Is the same standard used for calibration and as-found? Y or  N (if no, document on pg. 2)
- Are the calibration values within ±0.10 of the standard?  Y or N (if no, recalibration is required)

ORP Standard (±10 mV)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
+228 (mV)	GFS	24005992	7.4.24	+229.1	+228.7	+227.1	+227.3		
Initials & Date:				<i>cl</i> 4-17-24	<i>cl</i> 4-15-24	<i>cl</i> 4-14-24	<i>cl</i> 4-7-24		

- Is the same standard used for calibration and as-found? Y or  N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or N (if no, recalibration is required)

DO	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	95.2	95.3	95.0	95.1		
Initials & Date:				<i>cl</i> 4-12-24	<i>cl</i> 4-15-24	<i>cl</i> 4-14-24	<i>cl</i> 4-17-24		

- Is the same standard used for calibration and as-found?  Y or  N (if no, document on pg. 2)
- Are the calibration values within 90-110%?  Y or N (if no, recalibration is required)

Sonde ID	15H	Project #:	24-0278 to 24-0283
Start Date	04.15.2024		
Reviewed By & Date:	<i>J</i> 04-24-24	Site:	Q2-2024 JHC GW

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
COA = 1403	GFS 24003734 →	← 30982	7.3.24	1413	1403	1404	1407		
Initials & Date:				<i>CU</i> 04/22/24	<i>CU</i> 4.15.24	<i>CU</i> 4.16.24	<i>CU</i> 4.17.24		

- Is the same standard used for calibration and as-found?  Y or  N (if no, document on pg. 2)
- Are the calibration values within ±3% of the standard?  Y or  N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.20	0.07	0.01	0.03		
40.0 (±4.0 NTUs)	Hach 2746356	A2122	05.2024	38.99	39.47	38.91	38.71		
800.0 (±80.0 NTUs)	Hach 2660553	A 2188	07-2024	602.5	769.11	789.36	780.13		
Initials & Date:				<i>CU</i> 04/22/24	<i>CU</i> 04.15.24	<i>CU</i> 4.16.24	<i>CU</i> 4.17.24		

- Is the same standard used for calibration and as-found?  Y or  N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or  N (if no, recalibration is required)

Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS 18411	2237002	9.9.24	pH 9.0	—	—	—
pH 7.0	GFS 1854	24002182	4.22.25	ORP	GFS 17781	24005728	6.24.24
pH 10.0	GFS 18571	2235006	8.8.24				
Sp. Conductivity	GFS 30982	24003734	7.3.24				
10.0 Turbidity	Hach	A 2089	05-2024				
800	Hach	A2315	11.2024				

Sonde ID	21G
Start Date	4.12.24 24-028, 24-0279
Project #	JHC 24-0280, 24-0281, 24-0282, 24-0283, 24-0285, 24-0284
Site	JHC
Reviewed By & Date	J. 04.24.24

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 21G102278
Sonde Brand	YSI ProDSS S/N 21G105848
Flow Cell	EXO1 599080
DO Probe	95.4 YSI ProDSS S/N 21G101534
Turbidity Probe	YSI ProDSS S/N 21G101646
pH With ORP	YSI ProDSS S/N 21H101604
Conductivity & Temperature Probe	YSI ProDSS S/N 21G101888

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	24003185	5.21.25	4.09	4.09	4.05	4.04		
7.0	GFS # 1639	24003597	7.26.25	7.06	7.07	7.04	7.05		
10.0	GFS # 1645	24003156	5.28.25	10.0	9.95	9.98	10.0		
Initials & Date:				umo 4.12.24	umo 4.15.24	umo 4.16.24	umo 4.17.24		

- Is the same standard used for calibration and as-found?  or N (if no, document on pg. 2)
- Are the calibration values within ±0.10 of the standard?  or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
+228 (mV)	GFS # 3525	24005992	7.4.24	229.4	229.2	228.0	228.0		
Initials & Date:				umo 4.12.24	umo 4.15.24	umo 4.16.24	umo 4.17.24		

- Is the same standard used for calibration and as-found?  or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  or N (if no, recalibration is required).

DO	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	94.8	100.5	94.9	95.4		
Initials & Date:				umo 4.12.24	umo 4.15.24	umo 4.16.24	umo 4.17.24		

- Is the same standard used for calibration and as-found?  or N (if no, document on pg. 2)
- Are the calibration values within 90-110%?  or N (if no, recalibration is required)

Sonde ID	21G	Project #:	24-0278, 24-0279 24-0282, 24-0281, -24-0280 24-0285, 24-0284, 24-0283
Start Date	4.12.24	Site:	JHC
Reviewed By & Date:	J. 04-24-24		

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1403 (1399-1427)	GFS # 2174	24003734	7.3.24	1393	1394	1399	1410		
Initials & Date:				LMD 4.12.24	unc 4.15.24	unc 4.16.24	unc 4.17.24		

Final Cal. check on project on 4.17.24

- Is the same standard used for calibration and as-found?  or N (if no, document on pg. 2)
- Are the calibration values within range of the standard?  or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.19	0.09	0.06	0.13		
40.0 (± 4.0 NTUs)	Hach 2746356	A2122	05/2024	41.00	40.00	38.64	40.88		
800.0 (± 80.0 NTUs)	Hach 2660553	A2188	7/2024	738.22	741.31	776.54	824.19		
Initials & Date:				LMD 4.12.24	unc 4.15.24	unc 4.16.24	unc 4.17.24		

- Is the same standard used for calibration and as-found?  or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  or N (if no, recalibration is required)

**Additional Information for calibration standards**

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0				pH 9.0 Check			
pH 7.0				ORP			
pH 10.0							
Sp. Conductivity							
40.0 Turbidity							
10.0 Turbidity							

Sonde ID	22J
Start Date	4.15.24
Project #	24-0278, -0279, -0280, -0281, -0282, -0283 -0284, -0285
Site	JHC
Reviewed By & Date	<i>[Signature]</i> 04-24-24

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 22L102214
Sonde Brand	YSI ProDSS S/N 22J103704
Flow Cell	EXO1 599080
DO Probe 96.1	YSI ProDSS S/N 23B101266
Turbidity Probe	YSI ProDSS S/N 22K100049
pH With ORP	YSI ProDSS S/N 23A103253
Conductivity & Temperature Probe	YSI ProDSS S/N 23C105385

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	24003185	5.31.25	4.00	4.03	4.04			4.06
7.0	GFS # 1639	24008587	1.21.26	7.00	7.02	7.01			7.08
10.0	GFS # 1645	22350048	8.18.24	10.00	10.04	10.03			10.05
Initials & Date:				KDR 4.14.24	KDR 4.15.24	KDR 4.16.24			KDR 4.17.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±0.10 of the standard?  Y or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
+228.0 (mV)	GFS # 5525	24005728	6.4.24	228.0	227.4	226.8			224.3
Initials & Date:				KDR 4.14.24	KDR 4.15.24	KDR 4.16.24			KDR 4.17.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or N (if no, recalibration is required)

DO	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	96.1	96.9	97.5			97.1
Initials & Date:				KDR 4.14.24	KDR 4.15.24	KDR 4.16.24			KDR 4.17.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within 90-110%?  Y or N (if no, recalibration is required)

Sonde ID	22J	Project #:	24-0278, -0279, -0280 -0281, -0282, -0283, -0284, 0285
Start Date	4.15.24	Site:	JHC
Reviewed By & Date:	<i>J</i> 04-24-24		

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Field Checks Completed	End Project Calibration Value
1403 (1399-1427)	GFS # 2174	24003734	7.3.24	1403	1404	1406			1410
Initials & Date:				KDR 4.14.24	KDR 4.15.24	KDR 4.16.24			KDR 4.17.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within range of the standard?  Y or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.00	0.05	0.06			0.09
40.0 (± 4.0 NTUs)	Hach 2746356	A2315	11.24	40.00	40.61	40.29			38.33
800.0 (± 80.0 NTUs)	Hach 2660553	A3063	5.25	800.00	782.19	777.15			769.87
Initials & Date:				KDR 4.14.24	KDR 4.15.24	KDR 4.16.24			KDR 4.17.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or N (if no, recalibration is required)

#### Additional Information for calibration standards


Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0				pH 9.0 Check			
pH 7.0				ORP			
pH 10.0							
Sp. Conductivity							
40.0 Turbidity							
10.0 Turbidity							

## WATER LEVEL DATA

Site: JH Campbell

Project No: 24-0857, -0858, -0859, -0860, -0861, -0862

Analyst: LMO/CLB

 Reviewed by: 

Date: 10.14.24

Review Date: 10-23-24

Method: Electronic Tape

Tape ID: Geotech

S/N: 1005 / 7372

Well ID	Time	DTW (ft)	DTB (ft)	Re-Check (if needed)	Remarks
JHC-MW-15017	1001	18.11	22.95		Good
JHC-MW-15018	1005	18.65	22.95		Good
MWB1	1010	—	35.25		Dry
MWB2	1013	—	37.60		Dry
MWB3	1015	39.70	40.20		Good
MWB4	1019	42.41	47.70		Good
JHC-MW-15035 (MW-B5)	1023	42.01	45.25		Good
JHC-MW-15031	1026	44.41	46.14		Good
JHC-MW-15036 (MW-B6)	1030	28.31	32.59		Good
JHC-MW-15037 (MW-B7)	1032	26.10	30.90		Good
MW-8	1036	29.71	33.43		Good
MW-8C	1034	30.30	63.10		Good
JHC-MW-15032	0845	18.74	26.00		Good, Locked
JHC-MW-15034	0859	17.83	23.91		Good, Not locked, Well cover doesn't fit
JHC-MW-15023	0907	20.00	27.71		Good, Locked *
MW5	0927	13.36	15.54		Good, locked *
MW4	1006	—	32.74		Good, Dry
JHC-MW-15024	1012	15.46	19.94		Good, locked *
JHC-MW-15025	1017	14.91	19.89		Good, locked
MW3	1042	14.18	16.44		Good, locked *
JHC-MW-15026	1026	16.76	21.02		Good, locked *
JHC-MW-15027	1057	17.40	23.00		Good, locked *
MW1	1106	14.64	16.03		Good, locked *
JHC-MW-15028	1111	17.26	20.83		Good, locked
JHC-MW-15029	1135	14.46	20.90		Good, locked *

⊗ Measurement cross-checked with Q3-2024 data and confirmed current reading

NOTES: TOC reference point (top of steel plate for RWs)

DTW = Depth to Water

DTB = Depth to Bottom

Form Rev.10-13-23EB









### WATER LEVEL DATA

**Site:** JH Campbell  
**Project No:** 24-0857,-0858,-0859,-0860,-0861,-0862  
**Analyst:** KDR **Reviewed by:** *[Signature]*  
**Date:** 10.14.24 **Review Date:** 10.23.24  
**Method:** Electronic Tape  
**Tape ID:** Solinst 101 P7 **S/N:** LS030623


Well ID	Time	DTW (ft)	DTB (ft)	Re-Check (if needed)	Remarks
MW-18A	0850	29.29	37.11		Good Locked
MW-9B	0855	22.34	29.57		Good Locked
MW-9C	0857	21.60	41.38		Good Locked
MW-9D	0859	21.45	54.71		Good Locked
MW-10B	0903	15.07	23.54		Good Locked
TW-19-05	0908	17.63	18.55		Good Locked
TW-19-06A	0914	14.62	15.31		Good Locked
MW-13	0921	—	10.27	—	Good, Locked Well was Dry 10.14.24 at 0921 Well was Dry 10.14.24 at 0948
MW-14	0925	10.41	17.56		Good, Locked
MW-14S	0927	11.18	13.30		Good, Locked
PZ-24	0933	7.19	13.80		Good, Locked
PZ-24S	0935	9.75	11.11		Good, Locked
PZ-40	0943	10.24	22.45		Good, Locked
PZ-40S	0945	13.07	17.96		Good, Locked
MW-12	0959	9.52	9.78		Good, Locked

**NOTES:** TOC reference point (top of steel plate for RWs)

DTW = Depth to Water

DTB = Depth to Bottom

## WATER LEVEL DATA

Site: JH Campbell  
 Project No: 24-0857, -0858, -0859, -0860, -0861, -0862  
 Analyst: KDR  
 Date: 10-14-24  
 Method: Electronic Tape  
 Tape ID: Solinst 101 P7 S/N: L5030623  
 Reviewed by:   
 Review Date: 10-23-24

Well ID	Time	DTW (ft)	DTB (ft)	Re-Check (if needed)	Remarks
MW-11A	1014	10.56	16.65		Good, Locked
MW-16A	1016	12.29	20.90		Good, Locked
MW-15	1019	13.75	16.36		Good, Locked
MW-17	1021	15.44	23.46		Good, Locked
P1S	1024	16.20	22.63		Good, Locked
P2S	1026	14.91	22.73		Good, Locked
P3S	1028	14.98	22.83		Good, Locked
P5S	1030	14.16	22.57		Good, Locked
P6S	1032	13.55	22.85		Good, Locked
P7S	1033	13.05	22.93		Good, Locked
P9S	1035	9.47	19.98		Broken on TOP, Locked w/ 10-14-24
P10	1038	9.91	10.73		No Plug Installed plug and locked
P11	1040	8.06	9.75		Good, Locked
RW-1	1358	30.35	48.45		Good
RW-2	1419	34.40	49.65		Good
RW-3	1455	15.75	23.66		Good
RW-4	1535	10.72	22.00		Good
RW-5	1556	18.55	21.70		Good
RW-6	1620	13.77	22.12		Good
RW-7	1638	7.80	20.19		Good
SG-22-1	1048	1.28			Good
SG-22-2	1055	1.26			Good

NOTES: TOC reference point (top of steel plate for RWs)

DTW = Depth to Water

DTB = Depth to Bottom

Form Rev.10-13-23EB

Sonde ID	15H
Start Date	10.14.24
Project #	24-0857, -0858, -0859, -0860, -0861 -0862
Site	JHC
Reviewed By & Date:	[Signature] 10/23/24

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 19F104713
Sonde Brand	YSI ProDSS S/N 15H101425 262909-1
Flow Cell	EXO1 599080
DO Probe	96.9% YSI ProDSS S/N 15G103714
Turbidity Probe	YSI ProDSS S/N 21H105795
pH With ORP	YSI ProDSS S/N 22D102306
Conductivity & Temperature Probe	YSI ProDSS S/N 22G103712

pH Standard (±0.1)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	24003185	5.31.25	4.00	4.04	4.02			4.02
7.0	GFS # 1639	24012727	6.3.26	7.00	7.08	7.03			7.03
10.0	GFS # 1645	23060188	2.16.25	9.99	9.99	10.08			10.08
Initials & Date:				KDR 10.11.24	umo 10.14.24	umo 10.15.24			umo 10.15.24

- Is the same standard used for calibration and as-found? Y or N (if no, document on pg. 2)
- Are the calibration values within ±0.10 of the standard? Y or N (if no, recalibration is required)

ORP Standard (±10 mV)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
+228.0 (mV)	GFS # 5525	24014269	5.3.25	+228.0	+227.5	+231.9			+231.9
Initials & Date:				KDR 10.11.24	umo 10.14.24	umo 10.15.24			umo 10.15.24

- Is the same standard used for calibration and as-found? Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? Y or N (if no, recalibration is required)

DO	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	96.9%	96.8%	97.0%			97.0%
Initials & Date:				KDR 10.11.24	umo 10.14.24	umo 10.15.24			umo 10.15.24

- Is the same standard used for calibration and as-found? Y or N (if no, document on pg. 2)
- Are the calibration values within 90-110%? Y or N (if no, recalibration is required)

Sonde ID	15H	Project #:	24-0857, -0858, -0859, -0860, -0861 -0862
Start Date	10.14.24	Site:	JHC
Reviewed By & Date:	J 10/23/24		

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
1414 (1399-1427)	GFS # 2174	24012460	6.3.25	1414	1409	1403			1403
Initials & Date:				KDR 10.11.24	umo 10.14.24	umo 10.19.24			umo 10.15.24

- Is the same standard used for calibration and as-found?  Y or  N (if no, document on pg. 2)
- Are the calibration values within  $\pm 3\%$  of the standard?  Y or  N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.00	0.04	0.02			0.02
40.0 ( $\pm 4.0$ NTUs)	Hach 2746356	A3093	4.25	40.22	41.17	39.89			39.89
800.0 ( $\pm 80.0$ NTUs)	Hach 2660553	A3310	11.25	817.00	832.1	809.60			809.60
Initials & Date:				KDR 10.11.24	umo 10.14.24	umo 10.19.24			umo 10.15.24

- Is the same standard used for calibration and as-found?  Y or  N (if no, document on pg. 2)
- Are the calibration values within  $\pm 10\%$  of the standard?  Y or  N (if no, recalibration is required)

#### Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS 1634	24003185	5.31.25	pH 9.0			
pH 7.0	GFS 1639	24003597	7.24.25	ORP	GFS 17782	24009578	11.25.24
pH 10.0	GFS 1645	24003158	5.28.25				
Sp. Conductivity	GFS 2174	2402460	6.3.25				
10.0 Turbidity							
40.0 Turbidity							



**Laboratory Services**  
A CENTURY OF EXCELLENCE

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 21G102278
Sonde Brand	YSI ProDSS S/N 21G105848
Flow Cell	EXO1 599080
DO Probe (97.2)'	YSI ProDSS S/N 21G101534
Turbidity Probe	YSI ProDSS S/N 21G101646
pH With ORP	YSI ProDSS S/N 21H101604
Conductivity & Temperature Probe	YSI ProDSS S/N 21G101888

Sonde ID	21G
Start Date	10-14-24
Project #	24-0851, 0858, 0859, 0860, 0861, 0862
Site	JHC Q4 GW
Reviewed By & Date	J 10/21/24

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	24003185	5-31-25	4.00	3.97	4.01			4.01
7.0	GFS # 1639	24012727	6-3-26	7.00	7.01	7.02			7.00
10.0	GFS # 1645	23040188	2-16-25	10.00	10.01	10.02			10.01
<b>Initials &amp; Date:</b>				LMD 10-11-24	CIE 10-14-24	CIE 10-15-24			CIE 10-15-24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±0.10 of the standard?  Y or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
+228.0 (mV)	GFS #5525	24014269	5-23-25	+228.6	+228.1	+227.9			+228.1
<b>Initials &amp; Date:</b>				LMD 10-11-24	CIE 10-14-24	CIE 10-15-24			CIE 10-15-24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or N (if no, recalibration is required)

DO	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	96.9%	97.1%	97.0%			97.1%
<b>Initials &amp; Date:</b>				LMD 10-11-24	CIE 10-14-24	CIE 10-15-24			CIE 10-15-24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within 90-110%?  Y or N (if no, recalibration is required)

Sonde ID	21G	Project #:	24-0851, 0858, 0859, 0860 0861, 0862
Start Date	10-14-24	Site:	JAC Q4 GW
Reviewed By & Date:	J 10/23/24		

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Field Checks Completed	End Project Calibration Value
1413 (1399-1427)	GFS #2174	2401260	6-3-25	1415	1417	1416			1415
Initials & Date:				LMB 10-11-24	CIE 10-14-24	CIE 10-15-24			CIE 10-15-24

- Is the same standard used for calibration and as-found?  Y or  N (if no, document on pg. 2)
- Are the calibration values within range of the standard?  Y or  N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.02	0.00	0.02			0.01
40.0 (± 4.0 NTUs)	Hach 2746356	A3093	04-2025	40.32	40.39	40.13			40.21
800.0 (± 80.0 NTUs)	Hach 2660553	A3310	11-2025	811.43	802.63	807.11			806.92
Initials & Date:				LMB 10-11-24	CIE 10-14-24	CIE 10-15-24			CIE 10-15-24

- Is the same standard used for calibration and as-found?  Y or  N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or  N (if no, recalibration is required)

### Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0				pH 9.0 Check			
pH 7.0				ORP			
pH 10.0							
Sp. Conductivity	GFS 2174	2402460	6-3-25				
40.0 Turbidity							
10.0 Turbidity							



Sonde ID	22J
Start Date	10.14.24
Project #	24-0857,-0858,-0859,-0860 -0861,-0862
Site	JHC
Reviewed By & Date	J 10/23/24

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 22L102214
Sonde Brand	YSI ProDSS S/N 22J103704
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 23B101266
Turbidity Probe	YSI ProDSS S/N 22K100049
pH With ORP	YSI ProDSS S/N 23A103253
Conductivity & Temperature Probe	YSI ProDSS S/N 23C105385

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	24003185	5.31.25	4.00	4.01				4.05
7.0	GFS # 1639	24012727	6.3.26	7.00	7.03				7.06
10.0	GFS # 1645	24003156	5.28.25	10.00	9.98				9.95
Initials & Date:				KDR 10.11.24	KDR 10.14.24				KDR 10.15.24


- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±0.10 of the standard?  Y or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
+228.0 (mV)	GFS # 5525	24012255	3.1.25	228.0	233.4				226.0
Initials & Date:				KDR 10.11.24	KDR 10.14.24				KDR 10.15.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or N (if no, recalibration is required)

DO	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1 <sup>st</sup> Daily Field Checks Completed	2 <sup>nd</sup> Daily Field Checks Completed	3 <sup>rd</sup> Daily Field Checks Completed	4 <sup>th</sup> Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	97.28	97.7				99.0
Initials & Date:				KDR 10.11.24	KDR 10.14.24				KDR 10.15.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within 90-110%?  Y or N (if no, recalibration is required)

Sonde ID	22J	Project #:	24-0857,-0858,-0859,-0860 -0861,-0862
Start Date	10.14.24	Site:	JHC
Reviewed By & Date:	 10/23/24		

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1414 (1399-1427)	GFS# 2174	24012460	6.3.25	1414	1407				1406
Initials & Date:				KDR 10.11.24	KDR 10.14.24				KDR 10.15.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within range of the standard?  Y or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.00	0.15				0.11
40.0 (± 4.0 NTUs)	Hach 2746356	A3093	4.25	40.00	40.81				41.69
800.0 (± 80.0 NTUs)	Hach 2660553	A3310	11.25	817.00	826.92				831.14
Initials & Date:				KDR 10.11.24	KDR 10.14.24				KDR 10.15.24

- Is the same standard used for calibration and as-found?  Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard?  Y or N (if no, recalibration is required)

**Additional Information for calibration standards**

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0				pH 9.0 Check			
pH 7.0				ORP			
pH 10.0							
Sp. Conductivity							
40.0 Turbidity							
10.0 Turbidity							

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Emil Blaj  
Consumers Energy  
135 W Trail Street  
Jackson, Michigan 49201

Generated 5/24/2024 11:58:24 AM

**JOB DESCRIPTION**

JH Campbell Background Wells

**JOB NUMBER**

160-53901-1

# Eurofins St. Louis

## Job Notes

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

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

## Authorization



Generated  
5/24/2024 11:58:24 AM

Authorized for release by  
Rhonda Ridenhower, Business Unit Manager  
[Rhonda.Ridenhower@et.eurofinsus.com](mailto:Rhonda.Ridenhower@et.eurofinsus.com)  
Designee for  
Micha Korrinhizer, Project Manager  
[Micha.Korrinhizer@et.eurofinsus.com](mailto:Micha.Korrinhizer@et.eurofinsus.com)  
(314)298-8566



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Chain of Custody . . . . .	6
Receipt Checklists . . . . .	7
Definitions/Glossary . . . . .	8
Method Summary . . . . .	9
Sample Summary . . . . .	10
Client Sample Results . . . . .	11
QC Sample Results . . . . .	17
QC Association Summary . . . . .	19
Tracer Carrier Summary . . . . .	20

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Background Wells

Job ID: 160-53901-1

Job ID: 160-53901-1

Eurofins St. Louis

## CASE NARRATIVE

Client: Consumers Energy

Project: JH Campbell CCR Groundwater Testing

Report Number: 160-53901-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method.

Eurofins Environment Testing attests to the validity of the laboratory data generated by Eurofins facilities reported herein. All analyses performed by Eurofins Environment Testing facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins Environment Testing's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

Calculations are performed before rounding to avoid round-off errors in calculated results.

Proper preservation was noted for the methods performed on these samples, unless otherwise detailed below.

All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client.

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.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.

Reference the chain of custody and receipt report for any variations on receipt conditions.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

### Receipt

The samples were received on 4/26/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and properly preserved. The temperature of the cooler at receipt time was 16.5°C.

### Receipt Exceptions

The following sample was received at the laboratory without a sample collection time documented on the chain of custody: DUP-01 (160-53901-7). A time of 12:00am was used to log the samples.

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

Samples JHC-MW-15023 (160-53901-1), JHC-MW-15024 (160-53901-2), JHC-MW-15025 (160-53901-3), JHC-MW-15026 (160-53901-4), JHC-MW-15027 (160-53901-5), JHC-MW-15028 (160-53901-6), DUP-01 (160-53901-7), FB-01 (160-53901-8) and EB-01 (160-53901-9) were analyzed for Radium-226 (GFPC). The samples were prepared on 4/29/2024 and analyzed on 5/23/2024.

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

Samples JHC-MW-15023 (160-53901-1), JHC-MW-15024 (160-53901-2), JHC-MW-15025 (160-53901-3), JHC-MW-15026 (160-53901-4), JHC-MW-15027 (160-53901-5), JHC-MW-15028 (160-53901-6), DUP-01 (160-53901-7), FB-01 (160-53901-8) and EB-01 (160-53901-9) were analyzed for Radium-228 (GFPC). The samples were prepared on 4/29/2024 and analyzed on 5/23/2024.

Eurofins St. Louis

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Background Wells

Job ID: 160-53901-1

**Job ID: 160-53901-1 (Continued)**

**Eurofins St. Louis**

5/21/2024.

## Method Ra226\_Ra228 - Combined Radium-226 and Radium-228

Samples JHC-MW-15023 (160-53901-1), JHC-MW-15024 (160-53901-2), JHC-MW-15025 (160-53901-3), JHC-MW-15026 (160-53901-4), JHC-MW-15027 (160-53901-5), JHC-MW-15028 (160-53901-6), DUP-01 (160-53901-7), FB-01 (160-53901-8) and EB-01 (160-53901-9) were analyzed for Combined Radium-226 and Radium-228. The samples were analyzed on 5/24/2024.

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

Eurofins St. Louis

1

2

3

4

5

6

7

8

9

10

11

12

# Chain of Custody Record



Environment Testing  
TestAmerica

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

**Eurofins TestAmerica, St. Louis**  
13715 Rider Trail North

Earth City, MO 63045-1205  
phone 314.298.8566 fax 314.298.8757

Regulatory Program:  DW  NIPDES  RCRA  Other:

Project Manager: Emil Blaj

Email: Emil.Blaj@cmsenergy.com

Tel/Fax: 517-788-5888

CALENDAR DAYS  WORKING DAYS

TAT if different from Below: 22 days

2 weeks

1 week

2 days

1 day

Analysis Turnaround Time

Site Contact:

Lab Contact: Jayna Await

Date:

Carrier: UPS

COC No.:

1 of 1 COCs

Sampler: CELS

For Lab Use Only:

Walk-in Client:

Lab Sampling:

Job / SDG No.:

## Sample Identification

Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cont.	Preservative	Sample Specific Notes:
4/15/24	2016	GW	GW	2	4	Radium 228 (EPA 904.0)
4/15/24	1839	GW	GW	2	4	Radium 226 (EPA 903.1)
4/15/24	1820	GW	GW	2	4	Perform MS / MSD (Y / N)
4/15/24	1651	GW	GW	2	4	
4/15/24	1732	GW	GW	2	4	
4/15/24	1514	GW	GW	2	4	
4/15/24	--	GW	GW	2	4	
4/15/24	2040	W	W	2	4	
4/15/24	2025	W	W	2	4	
JHC-MW-15023						
JHC-MW-15024						
JHC-MW-15025						
JHC-MW-15026						
JHC-MW-15027						
JHC-MW-15028						
DUP-01						
FB-01						
EB-01						



Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other  
Possible Hazard Identification: Please List any EPA Waste Codes for the sample in the  
Are any samples from a listed EPA Hazardous Waste?  Yes  No  
Comments Section if the lab is to dispose of the sample.

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments:

Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Therm ID No.: \_\_\_\_\_  
Cooler Temp. (°C): Obs'd: \_\_\_\_\_  
Company: UPS  
Received by: Steve Wadsworth  
Date/Time: 04/14/24  
Company: CONSUMERS ENERGY  
Date/Time: 04/14/24  
Received in Laboratory by: \_\_\_\_\_  
Date/Time: \_\_\_\_\_





# Login Sample Receipt Checklist

Client: Consumers Energy

Job Number: 160-53901-1

**Login Number: 53901**

**List Source: Eurofins St. Louis**

**List Number: 1**

**Creator: Worthington, Sierra M**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	Sample 7 had no time listed on the COC.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Definitions/Glossary

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

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

# Method Summary

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

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

**Protocol References:**

- EPA = US Environmental Protection Agency
- None = None
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

**Laboratory References:**

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



# Sample Summary

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-53901-1	JHC-MW-15023	Water	04/15/24 20:16	04/26/24 09:30
160-53901-2	JHC-MW-15024	Water	04/15/24 18:39	04/26/24 09:30
160-53901-3	JHC-MW-15025	Water	04/15/24 18:20	04/26/24 09:30
160-53901-4	JHC-MW-15026	Water	04/15/24 16:51	04/26/24 09:30
160-53901-5	JHC-MW-15027	Water	04/15/24 17:32	04/26/24 09:30
160-53901-6	JHC-MW-15028	Water	04/15/24 15:14	04/26/24 09:30
160-53901-7	DUP-01	Water	04/15/24 00:00	04/26/24 09:30
160-53901-8	FB-01	Water	04/15/24 20:40	04/26/24 09:30
160-53901-9	EB-01	Water	04/15/24 20:25	04/26/24 09:30

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

**Client Sample ID: JHC-MW-15023**

**Lab Sample ID: 160-53901-1**

Date Collected: 04/15/24 20:16

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.143	U	0.119	0.120	1.00	0.171	pCi/L	04/29/24 08:51	05/23/24 09:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.8		30 - 110					04/29/24 08:51	05/23/24 09:48	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.421	U	0.375	0.377	1.00	0.591	pCi/L	04/29/24 08:55	05/21/24 12:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.8		30 - 110					04/29/24 08:55	05/21/24 12:26	1
Y Carrier	80.0		30 - 110					04/29/24 08:55	05/21/24 12:26	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.564	U	0.393	0.396	5.00	0.591	pCi/L		05/24/24 07:51	1

**Client Sample ID: JHC-MW-15024**

**Lab Sample ID: 160-53901-2**

Date Collected: 04/15/24 18:39

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0670	U	0.0916	0.0918	1.00	0.154	pCi/L	04/29/24 08:51	05/23/24 09:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.2		30 - 110					04/29/24 08:51	05/23/24 09:48	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.280	U	0.390	0.391	1.00	0.656	pCi/L	04/29/24 08:55	05/21/24 12:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.2		30 - 110					04/29/24 08:55	05/21/24 12:26	1
Y Carrier	78.1		30 - 110					04/29/24 08:55	05/21/24 12:26	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

**Client Sample ID: JHC-MW-15024**

**Lab Sample ID: 160-53901-2**

Date Collected: 04/15/24 18:39

Matrix: Water

Date Received: 04/26/24 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.347	U	0.401	0.402	5.00	0.656	pCi/L		05/24/24 07:51	1

**Client Sample ID: JHC-MW-15025**

**Lab Sample ID: 160-53901-3**

Date Collected: 04/15/24 18:20

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00989	U	0.0886	0.0886	1.00	0.183	pCi/L	04/29/24 08:51	05/23/24 09:48	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.1		30 - 110					04/29/24 08:51	05/23/24 09:48	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.597		0.392	0.396	1.00	0.581	pCi/L	04/29/24 08:55	05/21/24 12:26	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.1		30 - 110					04/29/24 08:55	05/21/24 12:26	1
Y Carrier	81.9		30 - 110					04/29/24 08:55	05/21/24 12:26	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.607		0.402	0.406	5.00	0.581	pCi/L		05/24/24 07:51	1

**Client Sample ID: JHC-MW-15026**

**Lab Sample ID: 160-53901-4**

Date Collected: 04/15/24 16:51

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0470	U	0.0828	0.0829	1.00	0.148	pCi/L	04/29/24 08:51	05/23/24 09:48	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	98.5		30 - 110					04/29/24 08:51	05/23/24 09:48	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

**Client Sample ID: JHC-MW-15026**

**Lab Sample ID: 160-53901-4**

Date Collected: 04/15/24 16:51

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.347	U	0.349	0.350	1.00	0.562	pCi/L	04/29/24 08:55	05/21/24 12:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		30 - 110					04/29/24 08:55	05/21/24 12:30	1
Y Carrier	81.9		30 - 110					04/29/24 08:55	05/21/24 12:30	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.394	U	0.359	0.360	5.00	0.562	pCi/L		05/24/24 07:51	1

**Client Sample ID: JHC-MW-15027**

**Lab Sample ID: 160-53901-5**

Date Collected: 04/15/24 17:32

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.206		0.146	0.148	1.00	0.203	pCi/L	04/29/24 08:51	05/23/24 10:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.7		30 - 110					04/29/24 08:51	05/23/24 10:05	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.03		0.461	0.471	1.00	0.597	pCi/L	04/29/24 08:55	05/21/24 12:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.7		30 - 110					04/29/24 08:55	05/21/24 12:30	1
Y Carrier	75.9		30 - 110					04/29/24 08:55	05/21/24 12:30	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.24		0.484	0.494	5.00	0.597	pCi/L		05/24/24 07:51	1

# Client Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

**Client Sample ID: JHC-MW-15028**

**Lab Sample ID: 160-53901-6**

Date Collected: 04/15/24 15:14

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0161	U	0.123	0.123	1.00	0.239	pCi/L	04/29/24 08:51	05/23/24 10:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		30 - 110					04/29/24 08:51	05/23/24 10:05	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0191	U	0.329	0.329	1.00	0.628	pCi/L	04/29/24 08:55	05/21/24 12:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		30 - 110					04/29/24 08:55	05/21/24 12:30	1
Y Carrier	76.6		30 - 110					04/29/24 08:55	05/21/24 12:30	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.00294	U	0.351	0.351	5.00	0.628	pCi/L		05/24/24 07:51	1

**Client Sample ID: DUP-01**

**Lab Sample ID: 160-53901-7**

Date Collected: 04/15/24 00:00

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.143	U	0.118	0.119	1.00	0.324	pCi/L	04/29/24 08:51	05/23/24 10:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	56.1		30 - 110					04/29/24 08:51	05/23/24 10:05	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.634	U	0.564	0.567	1.00	0.888	pCi/L	04/29/24 08:55	05/21/24 12:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	56.1		30 - 110					04/29/24 08:55	05/21/24 12:30	1
Y Carrier	79.6		30 - 110					04/29/24 08:55	05/21/24 12:30	1



# Client Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

**Client Sample ID: DUP-01**  
 Date Collected: 04/15/24 00:00  
 Date Received: 04/26/24 09:30

**Lab Sample ID: 160-53901-7**  
 Matrix: Water

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.492	U	0.576	0.579	5.00	0.888	pCi/L		05/24/24 07:51	1

**Client Sample ID: FB-01**  
 Date Collected: 04/15/24 20:40  
 Date Received: 04/26/24 09:30

**Lab Sample ID: 160-53901-8**  
 Matrix: Water

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.467		0.173	0.178	1.00	0.166	pCi/L	04/29/24 08:51	05/23/24 10:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		30 - 110					04/29/24 08:51	05/23/24 10:05	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.211	U	0.310	0.311	1.00	0.525	pCi/L	04/29/24 08:55	05/21/24 12:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		30 - 110					04/29/24 08:55	05/21/24 12:31	1
Y Carrier	82.6		30 - 110					04/29/24 08:55	05/21/24 12:31	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.678		0.355	0.358	5.00	0.525	pCi/L		05/24/24 07:51	1

**Client Sample ID: EB-01**  
 Date Collected: 04/15/24 20:25  
 Date Received: 04/26/24 09:30

**Lab Sample ID: 160-53901-9**  
 Matrix: Water

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.113	U	0.111	0.111	1.00	0.170	pCi/L	04/29/24 08:51	05/23/24 10:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.2		30 - 110					04/29/24 08:51	05/23/24 10:05	1

# Client Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

**Client Sample ID: EB-01**

**Lab Sample ID: 160-53901-9**

Date Collected: 04/15/24 20:25

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0615	U	0.281	0.282	1.00	0.515	pCi/L	04/29/24 08:55	05/21/24 12:31	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	97.2		30 - 110					04/29/24 08:55	05/21/24 12:31	1
Y Carrier	79.6		30 - 110					04/29/24 08:55	05/21/24 12:31	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.174	U	0.302	0.303	5.00	0.515	pCi/L		05/24/24 07:51	1

# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

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

**Lab Sample ID: MB 160-659070/1-A**  
**Matrix: Water**  
**Analysis Batch: 662988**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 659070**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.1169	U	0.106	0.107	1.00	0.158	pCi/L	04/29/24 08:51	05/23/24 09:46	1
Carrier	MB	MB	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	%Yield	Qualifier	30 - 110							
	94.4				04/29/24 08:51	05/23/24 09:46	1			

**Lab Sample ID: LCS 160-659070/2-A**  
**Matrix: Water**  
**Analysis Batch: 662988**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 659070**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	10.90		1.25	1.00	0.239	pCi/L	96	75 - 125
Carrier	LCS	LCS	Limits		Prepared	Analyzed	Dil Fac		
Ba Carrier	%Yield	Qualifier	30 - 110						
	92.1				04/29/24 08:51	05/23/24 09:46	1		

**Lab Sample ID: 160-53902-A-4-A DU**  
**Matrix: Water**  
**Analysis Batch: 663009**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 659070**

Analyte	Sample	Sample	DU	DU	Total	RL	MDC	Unit	RER	RER Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					
Radium-226	0.257		0.04134	U	0.123	1.00	0.229	pCi/L	0.82	1
Carrier	DU	DU	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	%Yield	Qualifier	30 - 110							
	89.8				04/29/24 08:55	05/21/24 12:25	1			

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

**Lab Sample ID: MB 160-659071/1-A**  
**Matrix: Water**  
**Analysis Batch: 662590**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 659071**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.05926	U	0.289	0.289	1.00	0.530	pCi/L	04/29/24 08:55	05/21/24 12:25	1
Carrier	MB	MB	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	%Yield	Qualifier	30 - 110							
	94.4				04/29/24 08:55	05/21/24 12:25	1			
Y Carrier	%Yield	Qualifier	Limits		Prepared	Analyzed	Dil Fac			
	78.1		30 - 110							
					04/29/24 08:55	05/21/24 12:25	1			

# QC Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

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

**Lab Sample ID: LCS 160-659071/2-A**  
**Matrix: Water**  
**Analysis Batch: 662590**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 659071**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-228	8.92	10.40		1.42	1.00	0.584	pCi/L	117	75 - 125
<b>LCS LCS</b>									
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>						
Ba Carrier	92.1		30 - 110						
Y Carrier	78.9		30 - 110						

**Lab Sample ID: 160-53902-A-4-B DU**  
**Matrix: Water**  
**Analysis Batch: 662590**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 659071**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-228	0.998		0.4943	U	0.423	1.00	0.655	pCi/L	0.54	1
<b>DU DU</b>										
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							
Ba Carrier	89.8		30 - 110							
Y Carrier	80.0		30 - 110							

# QC Association Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

## Rad

### Prep Batch: 659070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-53901-1	JHC-MW-15023	Total/NA	Water	PrecSep-21	
160-53901-2	JHC-MW-15024	Total/NA	Water	PrecSep-21	
160-53901-3	JHC-MW-15025	Total/NA	Water	PrecSep-21	
160-53901-4	JHC-MW-15026	Total/NA	Water	PrecSep-21	
160-53901-5	JHC-MW-15027	Total/NA	Water	PrecSep-21	
160-53901-6	JHC-MW-15028	Total/NA	Water	PrecSep-21	
160-53901-7	DUP-01	Total/NA	Water	PrecSep-21	
160-53901-8	FB-01	Total/NA	Water	PrecSep-21	
160-53901-9	EB-01	Total/NA	Water	PrecSep-21	
MB 160-659070/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-659070/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
160-53902-A-4-A DU	Duplicate	Total/NA	Water	PrecSep-21	

### Prep Batch: 659071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-53901-1	JHC-MW-15023	Total/NA	Water	PrecSep_0	
160-53901-2	JHC-MW-15024	Total/NA	Water	PrecSep_0	
160-53901-3	JHC-MW-15025	Total/NA	Water	PrecSep_0	
160-53901-4	JHC-MW-15026	Total/NA	Water	PrecSep_0	
160-53901-5	JHC-MW-15027	Total/NA	Water	PrecSep_0	
160-53901-6	JHC-MW-15028	Total/NA	Water	PrecSep_0	
160-53901-7	DUP-01	Total/NA	Water	PrecSep_0	
160-53901-8	FB-01	Total/NA	Water	PrecSep_0	
160-53901-9	EB-01	Total/NA	Water	PrecSep_0	
MB 160-659071/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-659071/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
160-53902-A-4-B DU	Duplicate	Total/NA	Water	PrecSep_0	

# Tracer/Carrier Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-53901-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
160-53901-1	JHC-MW-15023	84.8	
160-53901-2	JHC-MW-15024	79.2	
160-53901-3	JHC-MW-15025	87.1	
160-53901-4	JHC-MW-15026	98.5	
160-53901-5	JHC-MW-15027	81.7	
160-53901-6	JHC-MW-15028	84.0	
160-53901-7	DUP-01	56.1	
160-53901-8	FB-01	98.2	
160-53901-9	EB-01	97.2	
160-53902-A-4-A DU	Duplicate	89.8	
LCS 160-659070/2-A	Lab Control Sample	92.1	
MB 160-659070/1-A	Method Blank	94.4	
<b>Tracer/Carrier Legend</b>			
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 (30-110)	Y (30-110)
160-53901-1	JHC-MW-15023	84.8	80.0
160-53901-2	JHC-MW-15024	79.2	78.1
160-53901-3	JHC-MW-15025	87.1	81.9
160-53901-4	JHC-MW-15026	98.5	81.9
160-53901-5	JHC-MW-15027	81.7	75.9
160-53901-6	JHC-MW-15028	84.0	76.6
160-53901-7	DUP-01	56.1	79.6
160-53901-8	FB-01	98.2	82.6
160-53901-9	EB-01	97.2	79.6
160-53902-A-4-B DU	Duplicate	89.8	80.0
LCS 160-659071/2-A	Lab Control Sample	92.1	78.9
MB 160-659071/1-A	Method Blank	94.4	78.1
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Emil Blaj  
Consumers Energy  
135 W Trail Street  
Jackson, Michigan 49201

Generated 6/24/2024 5:56:47 PM

**JOB DESCRIPTION**

JH Campbell Pond A Wells

**JOB NUMBER**

160-53903-1

# Eurofins St. Louis

## Job Notes

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

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

## Authorization



Generated  
6/24/2024 5:56:47 PM

---

Authorized for release by  
Micha Korinhizer, Project Manager  
[Micha.Korinhizer@et.eurofinsus.com](mailto:Micha.Korinhizer@et.eurofinsus.com)  
(314)298-8566





# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Chain of Custody . . . . .	6
Receipt Checklists . . . . .	8
Definitions/Glossary . . . . .	9
Method Summary . . . . .	10
Sample Summary . . . . .	11
Client Sample Results . . . . .	12
QC Sample Results . . . . .	17
QC Association Summary . . . . .	20
Tracer Carrier Summary . . . . .	21

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Pond A Wells

Job ID: 160-53903-1

Job ID: 160-53903-1

Eurofins St. Louis

## CASE NARRATIVE

Client: Consumers Energy

Project: JH Campbell CCR Groundwater Testing

Report Number: 160-53903-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method.

Eurofins Environment Testing attests to the validity of the laboratory data generated by Eurofins facilities reported herein. All analyses performed by Eurofins Environment Testing facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins Environment Testing's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

Calculations are performed before rounding to avoid round-off errors in calculated results.

Proper preservation was noted for the methods performed on these samples, unless otherwise detailed below.

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.

The matrix for the Method Blank and LCS/LCSD is as close to the samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

The method blank (MB) z-score is within limits, unless stated otherwise below, and is stored in the level IV raw data.

This laboratory report is confidential and is intended for the sole use of Eurofins Environment Testing and its client.

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

### Receipt

The samples were received on 4/26/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved. The temperature of the cooler at receipt time was 16.1°C.

### Receipt Exceptions

The following sample was received at the laboratory without a sample collection time documented on the chain of custody: DUP-02 (160-53903-6). A time of 12:00am was used to log the sample.

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

Samples JHC-MW-15006 (160-53903-1), JHC-MW-15007R (160-53903-2), JHC-MW-15008R (160-53903-3), JHC-MW-15009R (160-53903-4), JHC-MW-15011R (160-53903-5), DUP-02 (160-53903-6), FB-02 (160-53903-7) and EB-02 (160-53903-8) were analyzed for Radium-226 (GFPC). The samples were prepared on 4/30/2024 and 5/29/2024 and analyzed on 5/26/2024 and 6/21/2024.

The laboratory control sample (LCS) associated with the following samples in batch 160-659257 was inadvertently not spiked and therefore recovered outside acceptance limits: JHC-MW-15008R (160-53903-3), (LCS 160-659257/2-A), (MB 160-659257/1-A) and (160-53903-A-3-A DU). There was insufficient sample to perform a re-extraction or re-analysis. The client was informed of the discrepancy and requested the data be flagged and reported.

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

Samples JHC-MW-15006 (160-53903-1), JHC-MW-15007R (160-53903-2), JHC-MW-15008R (160-53903-3), JHC-MW-15009R (160-53903-4), JHC-MW-15011R (160-53903-5), DUP-02 (160-53903-6), FB-02 (160-53903-7) and EB-02 (160-53903-8) were

Eurofins St. Louis

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Pond A Wells

Job ID: 160-53903-1

## Job ID: 160-53903-1 (Continued)

**Eurofins St. Louis**

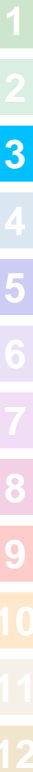
analyzed for Radium-228 (GFPC). The samples were prepared on 4/30/2024 and analyzed on 5/23/2024.

The laboratory control sample (LCS) associated with the following samples in batch 160-659258 recovered at 126%: JHC-MW-15006 (160-53903-1), JHC-MW-15007R (160-53903-2), JHC-MW-15008R (160-53903-3), JHC-MW-15009R (160-53903-4), JHC-MW-15011R (160-53903-5), DUP-02 (160-53903-6), FB-02 (160-53903-7) and EB-02 (160-53903-8). The limits in our LIMS system are 75-125%, which reflect the requirements of a regulatory agency that represents a large amount of our work. However, the samples associated with this LCS are not from this agency and are therefore held to our in-house statistical limits of (69-145%) The LCS is within criteria and no further action is required.

### Method Ra226\_Ra228 - Combined Radium-226 and Radium-228

Samples JHC-MW-15006 (160-53903-1), JHC-MW-15007R (160-53903-2), JHC-MW-15008R (160-53903-3), JHC-MW-15009R (160-53903-4), JHC-MW-15011R (160-53903-5), DUP-02 (160-53903-6), FB-02 (160-53903-7) and EB-02 (160-53903-8) were analyzed for Combined Radium-226 and Radium-228. The samples were analyzed on 6/24/2024.

Eurofins St. Louis



**Eurofins TestAmerica, St. Louis**  
13715 Rider Trail North

Earth City, MO 63045-1205  
phone 314.298.8566 fax 314.298.8757

# Chain of Custody Record



Environment Testing  
TestAmerica

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Regulatory Program:  DW  NPDES  RCRA  Other:

**Project Manager:** Emil Blaj  
Email: Emil.Blaj@cmsenergy.com  
Tel/Fax: 517-788-5888

**Client Contact**  
Consumers Energy, Laboratory Services  
135 W. Trail Street  
Jackson, MI 49201  
517-788-5888  
(xxx) xxx-xxxx FAX  
Project Name: JH Campbell (Pond A Wells)  
Project #: 24-0279  
P O # (PR24040552/PO4400121591)

**Site Contact:** Bethany Swanberg  
**Lab Contact:** Emil Blaj  
Date: \_\_\_\_\_  
Carrier: \_\_\_\_\_

**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
TAT if different from Below: 22 \_\_\_\_\_  
 2 weeks  
 1 week  
 2 days  
 1 day

COC No: \_\_\_\_\_ of \_\_\_\_\_ COCs  
Sampler: CELS  
For Lab Use Only:  
Walk-in Client:  
Lab Sampling:  
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Preservative		Sample Specific Notes:
						Perform MS / MSD (Y / N)	Radium 226 (EPA 903.1)	
JHC-MW-15006	04/16/24	1736		GW	2	4	X	
JHC-MW-15007R	04/16/24	1641		GW	2	4	X	
JHC-MW-15008R	04/16/24	1541		GW	2	4	X	
JHC-MW-15009R	04/16/24	1421		GW	2	4	X	
JHC-MW-15011R	04/16/24	1856		GW	2	4	X	
DUP-02	04/16/24	--		GW	2	4	X	
FB-02	04/16/24	1921		W	2	4	X	
EB-02	04/16/24	1929		W	2	4	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

**Special Instructions/QC Requirements & Comments:**

**Sample Disposal** ( A fee may be assessed if samples are retained longer than 1 month )

Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Cooler Temp. (°C): Obs'd: \_\_\_\_\_ Corrid: \_\_\_\_\_ Therm ID No.: \_\_\_\_\_  
Received by: **UPS** Company: \_\_\_\_\_  
Received by: **Silvia Wathington** Company: **EPSR**  
Received in Laboratory by: \_\_\_\_\_ Company: \_\_\_\_\_

Custody Seal No.: \_\_\_\_\_  
Relinquished by: **f** Company: **CONSUMERS ENERGY** Date/Time: **04/24/24**  
Relinquished by: **UPS** Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_



# Chain of Custody Record



Environment Testing  
TestAmerica

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Regulatory Program:  DW  NPDES  RCRA  Other:

**Project Manager:** Emil Blaj  
Email: Emil.Blaj@cmsenergy.com  
Tel/Fax: 517-788-5888

**Client Contact**  
Consumers Energy, Laboratory Services  
135 W. Trail Street  
Jackson, MI 49201  
517-788-5888  
(xxx) xxx-xxxx FAX  
Project Name: JH Campbell Pond A Wells  
Project #: 24-0279  
P.O.# (PR24040552/PO4400121591)

**Site Contact:** Bethany Swenberg  
**Lab Contact:** Emil Blaj  
Date: \_\_\_\_\_  
Carrier: \_\_\_\_\_

**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
TAT if different from Below: 22  
 2 weeks  
 1 week  
 2 days  
 1 day

COC No: 1 of 1 COCs  
Sampler: CELS  
For Lab Use Only:  
Walk-in Client:  
Lab Sampling:  
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Preservative		Sample Specific Notes:
						Perform MS / MSD (Y / N)	Radium 226 (EPA 903.1)	
JHC-MW-15006	04/16/24	1736	GW	GW	2		X	
JHC-MW-15007R	04/16/24	1641	GW	GW	2		X	
JHC-MW-15008R	04/16/24	1541	GW	GW	2		X	
JHC-MW-15009R	04/16/24	1421	GW	GW	2		X	
JHC-MW-15011R	04/16/24	1856	GW	GW	2		X	
DUP-02	04/16/24	--	GW	GW	2		X	
FB-02	04/16/24	1921	W	W	2		X	
EB-02	04/16/24	1929	W	W	2		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

**Special Instructions/QC Requirements & Comments:**  
 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

**Received by:** UPS  
Received by: *Steve Waddington*  
Received in Laboratory by: \_\_\_\_\_  
Company: \_\_\_\_\_  
Date/Time: 04/24/24  
Date/Time: \_\_\_\_\_

**Relinquished by:** *[Signature]*  
Relinquished by: \_\_\_\_\_  
Relinquished by: \_\_\_\_\_  
Company: \_\_\_\_\_  
Date/Time: \_\_\_\_\_  
Date/Time: \_\_\_\_\_

**Custody Seal No.:** \_\_\_\_\_  
Company: CONSUMERS ENERGY  
Company: \_\_\_\_\_  
Company: \_\_\_\_\_

**Therm ID No.:** \_\_\_\_\_  
Cooler Temp. (°C): Obs'd: \_\_\_\_\_  
Date/Time: \_\_\_\_\_  
Date/Time: \_\_\_\_\_



# Login Sample Receipt Checklist

Client: Consumers Energy

Job Number: 160-53903-1

**Login Number: 53903**

**List Source: Eurofins St. Louis**

**List Number: 1**

**Creator: Worthington, Sierra M**

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.	False	Sample 6 has no time listed on the COC.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	Sample 6 preserved upon arrival
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Definitions/Glossary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

## Qualifiers

### Rad

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
U	Result is less than the sample detection limit.

## Glossary

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

# Method Summary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

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

**Protocol References:**

EPA = US Environmental Protection Agency

None = None

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

**Laboratory References:**

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





# Sample Summary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-53903-1	JHC-MW-15006	Water	04/16/24 17:36	04/26/24 09:30
160-53903-2	JHC-MW-15007R	Water	04/16/24 16:41	04/26/24 09:30
160-53903-3	JHC-MW-15008R	Water	04/16/24 15:41	04/26/24 09:30
160-53903-4	JHC-MW-15009R	Water	04/16/24 14:21	04/26/24 09:30
160-53903-5	JHC-MW-15011R	Water	04/16/24 18:56	04/26/24 09:30
160-53903-6	DUP-02	Water	04/16/24 00:00	04/26/24 09:30
160-53903-7	FB-02	Water	04/16/24 19:21	04/26/24 09:30
160-53903-8	EB-02	Water	04/16/24 19:29	04/26/24 09:30

1

2

3

4

5

6

7

8

9

10

11

12

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

**Client Sample ID: JHC-MW-15006**

**Lab Sample ID: 160-53903-1**

Date Collected: 04/16/24 17:36

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.161		0.0776	0.0790	1.00	0.0836	pCi/L	05/29/24 08:48	06/21/24 09:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.5		30 - 110					05/29/24 08:48	06/21/24 09:59	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0288	U	0.279	0.279	1.00	0.517	pCi/L	04/30/24 08:07	05/23/24 12:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.9		30 - 110					04/30/24 08:07	05/23/24 12:11	1
Y Carrier	84.5		30 - 110					04/30/24 08:07	05/23/24 12:11	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.190	U	0.290	0.290	5.00	0.517	pCi/L		06/24/24 16:53	1

**Client Sample ID: JHC-MW-15007R**

**Lab Sample ID: 160-53903-2**

Date Collected: 04/16/24 16:41

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.393		0.107	0.113	1.00	0.0700	pCi/L	05/29/24 08:48	06/21/24 09:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.8		30 - 110					05/29/24 08:48	06/21/24 09:59	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.531	U	0.469	0.471	1.00	0.747	pCi/L	04/30/24 08:07	05/23/24 12:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.6		30 - 110					04/30/24 08:07	05/23/24 12:11	1
Y Carrier	79.3		30 - 110					04/30/24 08:07	05/23/24 12:11	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

**Client Sample ID: JHC-MW-15007R**

**Lab Sample ID: 160-53903-2**

Date Collected: 04/16/24 16:41

Matrix: Water

Date Received: 04/26/24 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.925		0.481	0.484	5.00	0.747	pCi/L		06/24/24 16:53	1

**Client Sample ID: JHC-MW-15008R**

**Lab Sample ID: 160-53903-3**

Date Collected: 04/16/24 15:41

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0977	U *	0.124	0.124	1.00	0.205	pCi/L	04/30/24 08:03	05/26/24 13:35	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.7		30 - 110					04/30/24 08:03	05/26/24 13:35	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.450	U	0.339	0.342	1.00	0.522	pCi/L	04/30/24 08:07	05/23/24 12:07	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.7		30 - 110					04/30/24 08:07	05/23/24 12:07	1
Y Carrier	83.4		30 - 110					04/30/24 08:07	05/23/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.548		0.361	0.364	5.00	0.522	pCi/L		06/24/24 16:53	1

**Client Sample ID: JHC-MW-15009R**

**Lab Sample ID: 160-53903-4**

Date Collected: 04/16/24 14:21

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.255		0.0937	0.0965	1.00	0.0887	pCi/L	05/29/24 08:48	06/21/24 09:59	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	86.8		30 - 110					05/29/24 08:48	06/21/24 09:59	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

**Client Sample ID: JHC-MW-15009R**

**Lab Sample ID: 160-53903-4**

Date Collected: 04/16/24 14:21

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.849		0.445	0.452	1.00	0.633	pCi/L	04/30/24 08:07	05/23/24 12:08	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.8		30 - 110					04/30/24 08:07	05/23/24 12:08	1
Y Carrier	83.4		30 - 110					04/30/24 08:07	05/23/24 12:08	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.10		0.455	0.462	5.00	0.633	pCi/L		06/24/24 16:53	1

**Client Sample ID: JHC-MW-15011R**

**Lab Sample ID: 160-53903-5**

Date Collected: 04/16/24 18:56

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.277		0.101	0.104	1.00	0.0999	pCi/L	05/29/24 08:48	06/21/24 09:59	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	82.5		30 - 110					05/29/24 08:48	06/21/24 09:59	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.398	U	0.373	0.375	1.00	0.594	pCi/L	04/30/24 08:07	05/23/24 12:08	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	86.8		30 - 110					04/30/24 08:07	05/23/24 12:08	1
Y Carrier	81.1		30 - 110					04/30/24 08:07	05/23/24 12:08	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.674		0.386	0.389	5.00	0.594	pCi/L		06/24/24 16:53	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

**Client Sample ID: DUP-02**

**Lab Sample ID: 160-53903-6**

Date Collected: 04/16/24 00:00

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.280		0.0977	0.101	1.00	0.0892	pCi/L	05/29/24 08:48	06/21/24 09:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.8		30 - 110					05/29/24 08:48	06/21/24 09:59	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.293	U	0.356	0.357	1.00	0.589	pCi/L	04/30/24 08:07	05/23/24 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.2		30 - 110					04/30/24 08:07	05/23/24 12:08	1
Y Carrier	83.4		30 - 110					04/30/24 08:07	05/23/24 12:08	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.573	U	0.369	0.371	5.00	0.589	pCi/L		06/24/24 16:53	1

**Client Sample ID: FB-02**

**Lab Sample ID: 160-53903-7**

Date Collected: 04/16/24 19:21

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.00801	U	0.0507	0.0507	1.00	0.111	pCi/L	05/29/24 08:48	06/21/24 10:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	73.0		30 - 110					05/29/24 08:48	06/21/24 10:00	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0229	U	0.288	0.288	1.00	0.549	pCi/L	04/30/24 08:07	05/23/24 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.1		30 - 110					04/30/24 08:07	05/23/24 12:08	1
Y Carrier	83.0		30 - 110					04/30/24 08:07	05/23/24 12:08	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

## Client Sample ID: FB-02

Date Collected: 04/16/24 19:21

Date Received: 04/26/24 09:30

## Lab Sample ID: 160-53903-7

Matrix: Water

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0309	U	0.292	0.292	5.00	0.549	pCi/L		06/24/24 16:53	1

## Client Sample ID: EB-02

Date Collected: 04/16/24 19:29

Date Received: 04/26/24 09:30

## Lab Sample ID: 160-53903-8

Matrix: Water

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0365	U	0.0466	0.0468	1.00	0.0765	pCi/L	05/29/24 08:48	06/21/24 10:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.5		30 - 110					05/29/24 08:48	06/21/24 10:00	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.236	U	0.350	0.351	1.00	0.591	pCi/L	04/30/24 08:07	05/23/24 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		30 - 110					04/30/24 08:07	05/23/24 12:08	1
Y Carrier	80.0		30 - 110					04/30/24 08:07	05/23/24 12:08	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.272	U	0.353	0.354	5.00	0.591	pCi/L		06/24/24 16:53	1

# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

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

**Lab Sample ID: MB 160-659257/1-A**  
**Matrix: Water**  
**Analysis Batch: 663394**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 659257**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.06579	U	0.0846	0.0848	1.00	0.140	pCi/L	04/30/24 08:03	05/26/24 13:34	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	92.9		30 - 110					04/30/24 08:03	05/26/24 13:34	1

**Lab Sample ID: LCS 160-659257/2-A**  
**Matrix: Water**  
**Analysis Batch: 663394**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 659257**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	0.4350	*	0.171	1.00	0.179	pCi/L	4	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits		Prepared	Analyzed	Dil Fac		
Ba Carrier	96.4		30 - 110					04/30/24 08:03	05/26/24 13:34

**Lab Sample ID: 160-53903-3 DU**  
**Matrix: Water**  
**Analysis Batch: 663394**

**Client Sample ID: JHC-MW-15008R**  
**Prep Type: Total/NA**  
**Prep Batch: 659257**

Analyte	Sample		DU	DU	Total	RL	MDC	Unit	RER	RER Limit
	Result	Sample Qual	Result	Qual	Uncert. (2σ+/-)					
Radium-226	0.0977	U *	0.2019	*	0.138	1.00	0.195	pCi/L	0.40	1
Carrier	DU %Yield	DU Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	96.7		30 - 110					04/30/24 08:03	05/26/24 13:34	1

**Lab Sample ID: MB 160-663644/1-A**  
**Matrix: Water**  
**Analysis Batch: 667323**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 663644**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.08497	U	0.0640	0.0644	1.00	0.0883	pCi/L	05/29/24 08:48	06/21/24 09:56	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	82.8		30 - 110					05/29/24 08:48	06/21/24 09:56	1

**Lab Sample ID: LCS 160-663644/2-A**  
**Matrix: Water**  
**Analysis Batch: 667323**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 663644**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	11.52		1.18	1.00	0.102	pCi/L	102	75 - 125

Eurofins St. Louis

# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

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

Lab Sample ID: LCS 160-663644/2-A  
Matrix: Water  
Analysis Batch: 667323

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 663644

	LCS	LCS	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	88.3		30 - 110

Lab Sample ID: 380-93199-Q-4-F DU  
Matrix: Water  
Analysis Batch: 667440

Client Sample ID: Duplicate  
Prep Type: Total/NA  
Prep Batch: 663644

Analyte	Sample		DU		Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
	Result	Qual	Result	Qual						
Radium-226	0.0717		0.1020		0.0738	1.00	0.0645	pCi/L	0.22	1

	DU	DU	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	86.5		30 - 110

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

Lab Sample ID: MB 160-659258/1-A  
Matrix: Water  
Analysis Batch: 663009

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 659258

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.5316	U	0.405	0.408	1.00	0.626	pCi/L	04/30/24 08:07	05/23/24 12:11	1

	MB	MB	Limits	Prepared	Analyzed	Dil Fac
Carrier	%Yield	Qualifier				
Ba Carrier	92.9		30 - 110	04/30/24 08:07	05/23/24 12:11	1
Y Carrier	83.0		30 - 110	04/30/24 08:07	05/23/24 12:11	1

Lab Sample ID: LCS 160-659258/2-A  
Matrix: Water  
Analysis Batch: 663009

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 659258

Analyte	Spike Added	LCS		Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
		Result	Qual						
Radium-228	8.92	11.23		1.47	1.00	0.524	pCi/L	126	75 - 125

	LCS	LCS	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	96.4		30 - 110
Y Carrier	81.1		30 - 110

Lab Sample ID: 160-53903-3 DU  
Matrix: Water  
Analysis Batch: 663010

Client Sample ID: JHC-MW-15008R  
Prep Type: Total/NA  
Prep Batch: 659258

Analyte	Sample		DU		Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
	Result	Qual	Result	Qual						
Radium-228	0.450	U	0.7926		0.383	1.00	0.510	pCi/L	0.47	1

Eurofins St. Louis



# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

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

Lab Sample ID: 160-53903-3 DU

Matrix: Water

Analysis Batch: 663010

Client Sample ID: JHC-MW-15008R

Prep Type: Total/NA

Prep Batch: 659258

Carrier	DU DU		Limits
	%Yield	Qualifier	
Ba Carrier	96.7		30 - 110
Y Carrier	82.2		30 - 110

1

2

3

4

5

6

7

8

9

10

11

12

# QC Association Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

## Rad

### Prep Batch: 659257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-53903-3	JHC-MW-15008R	Total/NA	Water	PrecSep-21	
MB 160-659257/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-659257/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
160-53903-3 DU	JHC-MW-15008R	Total/NA	Water	PrecSep-21	

### Prep Batch: 659258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-53903-1	JHC-MW-15006	Total/NA	Water	PrecSep_0	
160-53903-2	JHC-MW-15007R	Total/NA	Water	PrecSep_0	
160-53903-3	JHC-MW-15008R	Total/NA	Water	PrecSep_0	
160-53903-4	JHC-MW-15009R	Total/NA	Water	PrecSep_0	
160-53903-5	JHC-MW-15011R	Total/NA	Water	PrecSep_0	
160-53903-6	DUP-02	Total/NA	Water	PrecSep_0	
160-53903-7	FB-02	Total/NA	Water	PrecSep_0	
160-53903-8	EB-02	Total/NA	Water	PrecSep_0	
MB 160-659258/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-659258/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
160-53903-3 DU	JHC-MW-15008R	Total/NA	Water	PrecSep_0	

### Prep Batch: 663644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-53903-1	JHC-MW-15006	Total/NA	Water	PrecSep-21	
160-53903-2	JHC-MW-15007R	Total/NA	Water	PrecSep-21	
160-53903-4	JHC-MW-15009R	Total/NA	Water	PrecSep-21	
160-53903-5	JHC-MW-15011R	Total/NA	Water	PrecSep-21	
160-53903-6	DUP-02	Total/NA	Water	PrecSep-21	
160-53903-7	FB-02	Total/NA	Water	PrecSep-21	
160-53903-8	EB-02	Total/NA	Water	PrecSep-21	
MB 160-663644/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-663644/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
380-93199-Q-4-F DU	Duplicate	Total/NA	Water	PrecSep-21	

# Tracer/Carrier Summary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-53903-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (30-110)
160-53903-1	JHC-MW-15006	81.5
160-53903-2	JHC-MW-15007R	87.8
160-53903-3	JHC-MW-15008R	99.7
160-53903-3 DU	JHC-MW-15008R	96.7
160-53903-4	JHC-MW-15009R	86.8
160-53903-5	JHC-MW-15011R	82.5
160-53903-6	DUP-02	86.8
160-53903-7	FB-02	73.0
160-53903-8	EB-02	80.5
380-93199-Q-4-F DU	Duplicate	86.5
LCS 160-659257/2-A	Lab Control Sample	96.4
LCS 160-663644/2-A	Lab Control Sample	88.3
MB 160-659257/1-A	Method Blank	92.9
MB 160-663644/1-A	Method Blank	82.8

#### 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 (30-110)	Y (30-110)
160-53903-1	JHC-MW-15006	93.9	84.5
160-53903-2	JHC-MW-15007R	90.6	79.3
160-53903-3	JHC-MW-15008R	99.7	83.4
160-53903-3 DU	JHC-MW-15008R	96.7	82.2
160-53903-4	JHC-MW-15009R	84.8	83.4
160-53903-5	JHC-MW-15011R	86.8	81.1
160-53903-6	DUP-02	82.2	83.4
160-53903-7	FB-02	92.1	83.0
160-53903-8	EB-02	94.4	80.0
LCS 160-659258/2-A	Lab Control Sample	96.4	81.1
MB 160-659258/1-A	Method Blank	92.9	83.0

#### Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Emil Blaj  
Consumers Energy  
135 W Trail Street  
Jackson, Michigan 49201

Generated 6/24/2024 6:12:30 PM

**JOB DESCRIPTION**

JH Campbell Supplemental

**JOB NUMBER**

160-53904-1

# Eurofins St. Louis

## Job Notes

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

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

## Authorization



Generated  
6/24/2024 6:12:30 PM

---

Authorized for release by  
Micha Korinhizer, Project Manager  
[Micha.Korinhizer@et.eurofinsus.com](mailto:Micha.Korinhizer@et.eurofinsus.com)  
(314)298-8566



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Chain of Custody . . . . .	6
Receipt Checklists . . . . .	7
Definitions/Glossary . . . . .	8
Method Summary . . . . .	9
Sample Summary . . . . .	10
Client Sample Results . . . . .	11
QC Sample Results . . . . .	17
QC Association Summary . . . . .	19
Tracer Carrier Summary . . . . .	20

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Supplemental

Job ID: 160-53904-1

Job ID: 160-53904-1

Eurofins St. Louis

## CASE NARRATIVE

Client: Consumers Energy

Project: JH Campbell CCR Groundwater Testing

Report Number: 160-53904-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method.

Eurofins Environment Testing attests to the validity of the laboratory data generated by Eurofins facilities reported herein. All analyses performed by Eurofins Environment Testing facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins Environment Testing's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

Calculations are performed before rounding to avoid round-off errors in calculated results.

Proper preservation was noted for the methods performed on these samples, unless otherwise detailed below.

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.

The matrix for the Method Blank and LCS/LCSD is as close to the samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

The method blank (MB) z-score is within limits, unless stated otherwise below, and is stored in the level IV raw data.

This laboratory report is confidential and is intended for the sole use of Eurofins Environment Testing and its client.

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

### Receipt

The samples were received on 4/26/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved. The temperature of the cooler at receipt time was 15.6°C.

### Receipt Exceptions

The following sample was received at the laboratory without a sample collection time documented on the chain of custody: DUP-07 (160-53904-9). A time of 12:00am was used to log the sample.

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

Samples MW-14S (160-53904-1), PZ-23S (160-53904-2), PZ-24S (160-53904-3), PZ-24 (160-53904-4), PZ-40S (160-53904-5), PZ-40 (160-53904-6), TW-19-05 (160-53904-7), TW-19-06A (160-53904-8) and DUP-07 (160-53904-9) were analyzed for Radium-226 (GFPC). The samples were prepared on 5/29/2024 and analyzed on 6/21/2024.

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

Samples MW-14S (160-53904-1), PZ-23S (160-53904-2), PZ-24S (160-53904-3), PZ-24 (160-53904-4), PZ-40S (160-53904-5), PZ-40 (160-53904-6), TW-19-05 (160-53904-7), TW-19-06A (160-53904-8) and DUP-07 (160-53904-9) were analyzed for Radium-228 (GFPC). The samples were prepared on 4/30/2024 and analyzed on 5/23/2024.

The Ra-228 laboratory control sample (LCS) associated with batch 160-659258 recovered at 126%. The limits in our LIMS system at (75-125%) reflect the requirements of a regulatory agency that represents a large amount of our work. However, the samples associated with this LCS are not from this agency and are therefore held to our in-house statistical limits of 69-145%. The LCS is within criteria and no further action is required.

Eurofins St. Louis

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Supplemental

Job ID: 160-53904-1

**Job ID: 160-53904-1 (Continued)**

**Eurofins St. Louis**

## Method Ra226, Ra228 - Combined Radium-226 and Radium-228

Samples MW-14S (160-53904-1), PZ-23S (160-53904-2), PZ-24S (160-53904-3), PZ-24 (160-53904-4), PZ-40S (160-53904-5), PZ-40 (160-53904-6), TW-19-05 (160-53904-7), TW-19-06A (160-53904-8) and DUP-07 (160-53904-9) were analyzed for Combined Radium-226 and Radium-228. The samples were analyzed on 6/24/2024.

1

2

3

4

5

6

7

8

9

10

11

12

Eurofins St. Louis



# Chain of Custody Record



TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Regulatory Program:  DW  NPDES  RCRA  Other:

Project Manager: Emil Blaj  
Email: Emil.Blaj@cmsenergy.com  
Tel/Fax: 517-788-5888

**Client Contact**  
Consumers Energy, Laboratory Services  
135 W. Trail Street  
Jackson, MI 49201  
517-788-5888  
(xxx) xxx-xxxx FAX  
Project Name: JH Campbell Supplemental  
Project #: 24-0281  
P O # (PR24040552/PO4400121591)

**Site Contact:**  
Lab Contact: Jayna Await  
Date: \_\_\_\_\_  
Carrier: \_\_\_\_\_  
COC No: 1 of 1 COCs  
Sampler: CELS  
For Lab Use Only:  
Walk-in Client: \_\_\_\_\_  
Lab Sampling: \_\_\_\_\_  
Job / SDG No.: \_\_\_\_\_  
Sample Specific Notes: \_\_\_\_\_

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Preservative	
						Perform MS / MSD (Y / N)	Radium 226 (EPA 903.1)
MW-14S	04/16/24	1200	GW	GW	2	4	X
PZ-23S	04/16/24	1340	GW	GW	2	4	X
PZ-24S	04/16/24	1948	GW	GW	2	4	X
PZ-24	04/16/24	1755	GW	GW	2	4	X
PZ-40S	04/16/24	1103	GW	GW	2	4	X
PZ-40	04/16/24	0938	GW	GW	2	4	X
TW-19-05	04/16/24	1731	GW	GW	2	4	X
TW-19-06A	04/16/24	1930	GW	GW	2	4	X
DUP-07	04/16/24	-	GW	GW	2	4	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  Unknown

**Special Instructions/QC Requirements & Comments:**  
Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  
 Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

**Custody Seals Intact:**  Yes  No  
Relinquished by: *Y.*  
Relinquished by: *UFS*  
Relinquished by: \_\_\_\_\_  
Custody Seal No.: \_\_\_\_\_  
Received by: *UFS*  
Received by: *Summit Energy*  
Received in Laboratory by: \_\_\_\_\_  
Company: *CONSUMERS ENERGY*  
Company: *UFS*  
Company: \_\_\_\_\_  
Company: *EPSC*  
Company: \_\_\_\_\_  
Date/Time: *04/24/24*  
Date/Time: \_\_\_\_\_  
Date/Time: \_\_\_\_\_  
Date/Time: *4/24/24 0930*  
Date/Time: \_\_\_\_\_

# Login Sample Receipt Checklist

Client: Consumers Energy

Job Number: 160-53904-1

**Login Number: 53904**

**List Source: Eurofins St. Louis**

**List Number: 1**

**Creator: Worthington, Sierra M**

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.	False	Sample 9 had no time listed on the COC.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Definitions/Glossary

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

## Qualifiers

### Rad

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
U	Result is less than the sample detection limit.

## Glossary

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

# Method Summary

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

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

**Protocol References:**

- EPA = US Environmental Protection Agency
- None = None
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

**Laboratory References:**

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



# Sample Summary

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-53904-1	MW-14S	Water	04/16/24 12:00	04/26/24 09:30
160-53904-2	PZ-23S	Water	04/16/24 13:40	04/26/24 09:30
160-53904-3	PZ-24S	Water	04/16/24 19:48	04/26/24 09:30
160-53904-4	PZ-24	Water	04/16/24 17:55	04/26/24 09:30
160-53904-5	PZ-40S	Water	04/16/24 11:03	04/26/24 09:30
160-53904-6	PZ-40	Water	04/16/24 09:38	04/26/24 09:30
160-53904-7	TW-19-05	Water	04/16/24 17:31	04/26/24 09:30
160-53904-8	TW-19-06A	Water	04/16/24 19:30	04/26/24 09:30
160-53904-9	DUP-07	Water	04/16/24 00:00	04/26/24 09:30

1

2

3

4

5

6

7

8

9

10

11

12

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

## Client Sample ID: MW-14S

## Lab Sample ID: 160-53904-1

Date Collected: 04/16/24 12:00

Matrix: Water

Date Received: 04/26/24 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0103	U	0.0336	0.0336	1.00	0.0864	pCi/L	05/29/24 08:48	06/21/24 10:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	73.8		30 - 110					05/29/24 08:48	06/21/24 10:00	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0279	U	0.291	0.291	1.00	0.547	pCi/L	04/30/24 08:07	05/23/24 12:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.4		30 - 110					04/30/24 08:07	05/23/24 12:09	1
Y Carrier	74.4		30 - 110					04/30/24 08:07	05/23/24 12:09	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0177	U	0.293	0.293	5.00	0.547	pCi/L		06/24/24 16:53	1

## Client Sample ID: PZ-23S

## Lab Sample ID: 160-53904-2

Date Collected: 04/16/24 13:40

Matrix: Water

Date Received: 04/26/24 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0664	U	0.0618	0.0621	1.00	0.0922	pCi/L	05/29/24 08:48	06/21/24 10:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.3		30 - 110					05/29/24 08:48	06/21/24 10:00	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.671		0.380	0.385	1.00	0.545	pCi/L	04/30/24 08:07	05/23/24 12:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.7		30 - 110					04/30/24 08:07	05/23/24 12:09	1
Y Carrier	81.5		30 - 110					04/30/24 08:07	05/23/24 12:09	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

**Client Sample ID: PZ-23S**  
Date Collected: 04/16/24 13:40  
Date Received: 04/26/24 09:30

**Lab Sample ID: 160-53904-2**  
Matrix: Water

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.737		0.385	0.390	5.00	0.545	pCi/L		06/24/24 16:53	1

**Client Sample ID: PZ-24S**  
Date Collected: 04/16/24 19:48  
Date Received: 04/26/24 09:30

**Lab Sample ID: 160-53904-3**  
Matrix: Water

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0485	U	0.0728	0.0730	1.00	0.125	pCi/L	05/29/24 08:48	06/21/24 10:14	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	76.0		30 - 110					05/29/24 08:48	06/21/24 10:14	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.801		0.454	0.460	1.00	0.658	pCi/L	04/30/24 08:07	05/23/24 12:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.5		30 - 110					04/30/24 08:07	05/23/24 12:10	1
Y Carrier	82.6		30 - 110					04/30/24 08:07	05/23/24 12:10	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.850		0.460	0.466	5.00	0.658	pCi/L		06/24/24 16:53	1

**Client Sample ID: PZ-24**  
Date Collected: 04/16/24 17:55  
Date Received: 04/26/24 09:30

**Lab Sample ID: 160-53904-4**  
Matrix: Water

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0404	U	0.0630	0.0631	1.00	0.109	pCi/L	05/29/24 08:48	06/21/24 10:15	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	80.8		30 - 110					05/29/24 08:48	06/21/24 10:15	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

**Client Sample ID: PZ-24**

**Lab Sample ID: 160-53904-4**

Date Collected: 04/16/24 17:55

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.568	U	0.414	0.418	1.00	0.630	pCi/L	04/30/24 08:07	05/23/24 12:07	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.0		30 - 110					04/30/24 08:07	05/23/24 12:07	1
Y Carrier	77.4		30 - 110					04/30/24 08:07	05/23/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.608	U	0.419	0.423	5.00	0.630	pCi/L		06/24/24 16:53	1

**Client Sample ID: PZ-40S**

**Lab Sample ID: 160-53904-5**

Date Collected: 04/16/24 11:03

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0405	U	0.0713	0.0713	1.00	0.125	pCi/L	05/29/24 08:48	06/21/24 10:15	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	80.8		30 - 110					05/29/24 08:48	06/21/24 10:15	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.421	U *	0.356	0.358	1.00	0.554	pCi/L	04/30/24 08:07	05/23/24 12:07	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.8		30 - 110					04/30/24 08:07	05/23/24 12:07	1
Y Carrier	80.0		30 - 110					04/30/24 08:07	05/23/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.462	U	0.363	0.365	5.00	0.554	pCi/L		06/24/24 16:53	1



# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

**Client Sample ID: PZ-40**

**Lab Sample ID: 160-53904-6**

Date Collected: 04/16/24 09:38

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0879	U	0.0736	0.0740	1.00	0.108	pCi/L	05/29/24 08:48	06/21/24 10:15	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	76.3		30 - 110					05/29/24 08:48	06/21/24 10:15	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.309	U	0.310	0.311	1.00	0.496	pCi/L	04/30/24 08:07	05/23/24 12:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.3		30 - 110					04/30/24 08:07	05/23/24 12:07	1
Y Carrier	83.0		30 - 110					04/30/24 08:07	05/23/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.397	U	0.319	0.320	5.00	0.496	pCi/L		06/24/24 16:53	1

**Client Sample ID: TW-19-05**

**Lab Sample ID: 160-53904-7**

Date Collected: 04/16/24 17:31

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.137		0.0762	0.0772	1.00	0.0913	pCi/L	05/29/24 08:48	06/21/24 10:15	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.5		30 - 110					05/29/24 08:48	06/21/24 10:15	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.159	U	0.380	0.381	1.00	0.666	pCi/L	04/30/24 08:07	05/23/24 12:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		30 - 110					04/30/24 08:07	05/23/24 12:07	1
Y Carrier	79.3		30 - 110					04/30/24 08:07	05/23/24 12:07	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

**Client Sample ID: TW-19-05**

**Lab Sample ID: 160-53904-7**

Date Collected: 04/16/24 17:31

Matrix: Water

Date Received: 04/26/24 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.296	U	0.388	0.389	5.00	0.666	pCi/L		06/24/24 16:53	1

**Client Sample ID: TW-19-06A**

**Lab Sample ID: 160-53904-8**

Date Collected: 04/16/24 19:30

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0907	U	0.0684	0.0689	1.00	0.0952	pCi/L	05/29/24 08:48	06/21/24 10:15	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	81.0		30 - 110					05/29/24 08:48	06/21/24 10:15	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.543	U	0.406	0.409	1.00	0.622	pCi/L	04/30/24 08:07	05/23/24 12:02	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	90.4		30 - 110					04/30/24 08:07	05/23/24 12:02	1
Y Carrier	78.5		30 - 110					04/30/24 08:07	05/23/24 12:02	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.633		0.412	0.415	5.00	0.622	pCi/L		06/24/24 16:53	1

**Client Sample ID: DUP-07**

**Lab Sample ID: 160-53904-9**

Date Collected: 04/16/24 00:00

Matrix: Water

Date Received: 04/26/24 09:30

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.123		0.0747	0.0755	1.00	0.0967	pCi/L	05/29/24 08:48	06/21/24 10:15	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	83.5		30 - 110					05/29/24 08:48	06/21/24 10:15	1

# Client Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

**Client Sample ID: DUP-07**  
**Date Collected: 04/16/24 00:00**  
**Date Received: 04/26/24 09:30**

**Lab Sample ID: 160-53904-9**  
**Matrix: Water**

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.597	U	0.410	0.414	1.00	0.610	pCi/L	04/30/24 08:07	05/23/24 13:21	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	92.1		30 - 110					04/30/24 08:07	05/23/24 13:21	1
Y Carrier	80.0		30 - 110					04/30/24 08:07	05/23/24 13:21	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.720</b>		0.417	0.421	5.00	0.610	pCi/L		06/24/24 16:53	1



# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

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

**Lab Sample ID: MB 160-663644/1-A**  
**Matrix: Water**  
**Analysis Batch: 667323**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 663644**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.08497	U	0.0640	0.0644	1.00	0.0883	pCi/L	05/29/24 08:48	06/21/24 09:56	1
Carrier	MB	MB	Limits				Prepared		Analyzed	
Ba Carrier	%Yield	Qualifier	30 - 110				05/29/24 08:48		06/21/24 09:56	
	82.8									

**Lab Sample ID: LCS 160-663644/2-A**  
**Matrix: Water**  
**Analysis Batch: 667323**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 663644**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	11.52		1.18	1.00	0.102	pCi/L	102	75 - 125
Carrier	LCS	LCS	Limits						
Ba Carrier	%Yield	Qualifier	30 - 110						
	88.3								

**Lab Sample ID: 380-93199-Q-4-F DU**  
**Matrix: Water**  
**Analysis Batch: 667440**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 663644**

Analyte	Sample	Sample	DU	DU	Total	RL	MDC	Unit	RER	RER
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					Limit
Radium-226	0.0717		0.1020		0.0738	1.00	0.0645	pCi/L	0.22	1
Carrier	DU	DU	Limits							
Ba Carrier	%Yield	Qualifier	30 - 110							
	86.5									

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

**Lab Sample ID: MB 160-659258/1-A**  
**Matrix: Water**  
**Analysis Batch: 663009**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 659258**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.5316	U	0.405	0.408	1.00	0.626	pCi/L	04/30/24 08:07	05/23/24 12:11	1
Carrier	MB	MB	Limits				Prepared		Analyzed	
Ba Carrier	%Yield	Qualifier	30 - 110				04/30/24 08:07		05/23/24 12:11	
	92.9									
Y Carrier	83.0		30 - 110				04/30/24 08:07		05/23/24 12:11	

# QC Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

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

**Lab Sample ID: LCS 160-659258/2-A**  
**Matrix: Water**  
**Analysis Batch: 663009**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 659258**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	
Radium-228	8.92	11.23		1.47	1.00	0.524	pCi/L	126	75 - 125	
<b>LCS LCS</b>										
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							
Ba Carrier	96.4		30 - 110							
Y Carrier	81.1		30 - 110							

**Lab Sample ID: 160-53903-A-3-B DU**  
**Matrix: Water**  
**Analysis Batch: 663010**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 659258**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
										1
Radium-228	0.450	U	0.7926		0.383	1.00	0.510	pCi/L	0.47	1
<b>DU DU</b>										
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							
Ba Carrier	96.7		30 - 110							
Y Carrier	82.2		30 - 110							

# QC Association Summary

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

## Rad

### Prep Batch: 659258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-53904-1	MW-14S	Total/NA	Water	PrecSep_0	
160-53904-2	PZ-23S	Total/NA	Water	PrecSep_0	
160-53904-3	PZ-24S	Total/NA	Water	PrecSep_0	
160-53904-4	PZ-24	Total/NA	Water	PrecSep_0	
160-53904-5	PZ-40S	Total/NA	Water	PrecSep_0	
160-53904-6	PZ-40	Total/NA	Water	PrecSep_0	
160-53904-7	TW-19-05	Total/NA	Water	PrecSep_0	
160-53904-8	TW-19-06A	Total/NA	Water	PrecSep_0	
160-53904-9	DUP-07	Total/NA	Water	PrecSep_0	
MB 160-659258/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-659258/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
160-53903-A-3-B DU	Duplicate	Total/NA	Water	PrecSep_0	

### Prep Batch: 663644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-53904-1	MW-14S	Total/NA	Water	PrecSep-21	
160-53904-2	PZ-23S	Total/NA	Water	PrecSep-21	
160-53904-3	PZ-24S	Total/NA	Water	PrecSep-21	
160-53904-4	PZ-24	Total/NA	Water	PrecSep-21	
160-53904-5	PZ-40S	Total/NA	Water	PrecSep-21	
160-53904-6	PZ-40	Total/NA	Water	PrecSep-21	
160-53904-7	TW-19-05	Total/NA	Water	PrecSep-21	
160-53904-8	TW-19-06A	Total/NA	Water	PrecSep-21	
160-53904-9	DUP-07	Total/NA	Water	PrecSep-21	
MB 160-663644/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-663644/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
380-93199-Q-4-F DU	Duplicate	Total/NA	Water	PrecSep-21	

# Tracer/Carrier Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Supplemental

Job ID: 160-53904-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
160-53904-1	MW-14S	73.8	
160-53904-2	PZ-23S	77.3	
160-53904-3	PZ-24S	76.0	
160-53904-4	PZ-24	80.8	
160-53904-5	PZ-40S	80.8	
160-53904-6	PZ-40	76.3	
160-53904-7	TW-19-05	83.5	
160-53904-8	TW-19-06A	81.0	
160-53904-9	DUP-07	83.5	
380-93199-Q-4-F DU	Duplicate	86.5	
LCS 160-663644/2-A	Lab Control Sample	88.3	
MB 160-663644/1-A	Method Blank	82.8	
<b>Tracer/Carrier Legend</b>			
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 (30-110)	Y (30-110)
160-53903-A-3-B DU	Duplicate	96.7	82.2
160-53904-1	MW-14S	96.4	74.4
160-53904-2	PZ-23S	95.7	81.5
160-53904-3	PZ-24S	84.5	82.6
160-53904-4	PZ-24	84.0	77.4
160-53904-5	PZ-40S	87.8	80.0
160-53904-6	PZ-40	86.3	83.0
160-53904-7	TW-19-05	89.1	79.3
160-53904-8	TW-19-06A	90.4	78.5
160-53904-9	DUP-07	92.1	80.0
LCS 160-659258/2-A	Lab Control Sample	96.4	81.1
MB 160-659258/1-A	Method Blank	92.9	83.0
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Emil Blaj  
Consumers Energy  
135 W Trail Street  
Jackson, Michigan 49201

Generated 11/27/2024 5:31:45 PM

**JOB DESCRIPTION**

JH Campbell Supplemental Wells

**JOB NUMBER**

160-55983-1



# Eurofins St. Louis

## Job Notes

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

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

## Authorization



Generated  
11/27/2024 5:31:45 PM

Authorized for release by  
Jayna Awalt, Project Manager II  
[Jayna.Awalt@et.eurofinsus.com](mailto:Jayna.Awalt@et.eurofinsus.com)  
Designee for  
Micha Korrinhizer, Project Manager  
[Micha.Korrinhizer@et.eurofinsus.com](mailto:Micha.Korrinhizer@et.eurofinsus.com)  
(314)298-8566



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Chain of Custody . . . . .	6
Receipt Checklists . . . . .	7
Definitions/Glossary . . . . .	8
Method Summary . . . . .	9
Sample Summary . . . . .	10
Client Sample Results . . . . .	11
QC Sample Results . . . . .	17
QC Association Summary . . . . .	20
Tracer Carrier Summary . . . . .	21

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Supplemental Wells

Job ID: 160-55983-1

**Job ID: 160-55983-1**

**Eurofins St. Louis**

## Job Narrative 160-55983-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method.

Eurofins Environment Testing attests to the validity of the laboratory data generated by Eurofins facilities reported herein. All analyses performed by Eurofins Environment Testing facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins Environment Testing's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

Calculations are performed before rounding to avoid round-off errors in calculated results.

Proper preservation was noted for the methods performed on these samples, unless otherwise detailed below.

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.

This laboratory report is confidential and is intended for the sole use of Eurofins Environment Testing and its client.

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

### Receipt

The samples were received on 10/24/2024 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved. The temperature of the cooler at receipt time was 19.6°C.

### Receipt Exceptions

The following sample was received at the laboratory without a sample collection time documented on the chain of custody: DUP-07 (160-55983-9). The laboratory was instructed to use a sample collection time of 12:00am. Samplers name is not on the COC. MW-14S (160-55983-1), PZ-23S (160-55983-2), PZ-24S (160-55983-3), PZ-24 (160-55983-4), PZ-40S (160-55983-5), PZ-40 (160-55983-6), TW-19-05 (160-55983-7), TW-19-06A (160-55983-8) and DUP-07 (160-55983-9)

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

Samples MW-14S (160-55983-1), PZ-23S (160-55983-2), PZ-24S (160-55983-3), PZ-24 (160-55983-4), PZ-40S (160-55983-5), PZ-40 (160-55983-6), TW-19-05 (160-55983-7), TW-19-06A (160-55983-8) and DUP-07 (160-55983-9) were analyzed for Radium-226 (GFPC). The samples were prepared on 10/28/2024 and analyzed on 11/19/2024.

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

Samples MW-14S (160-55983-1), PZ-23S (160-55983-2), PZ-24S (160-55983-3), PZ-24 (160-55983-4), PZ-40S (160-55983-5), PZ-40 (160-55983-6), TW-19-05 (160-55983-7), TW-19-06A (160-55983-8) and DUP-07 (160-55983-9) were analyzed for Radium-228 (GFPC). The samples were prepared on 10/28/2024 and 11/19/2024 and analyzed on 11/14/2024 and 11/27/2024.

### Radium-228 batch 685409

The original count of the laboratory control sample (LCS) for preparation batch 160-685409 and analytical batch 160-688581 recovered (155%) outside the upper acceptance limits for Radium-228. The LCS was recounted and passed within the established QC limits; however, the associated sample MW-14S (160-55983-1) was not recounted at the same time the LCS recounted. The LCS recount has been reported; therefore, the potential bias in the sample should be considered by the client when evaluating the data. There was insufficient sample to perform a re-extraction or re-analysis. Per client direction, the original sample result for MW-14S (160-55983-1) has been reported.

### Method Ra226\_Ra228 - Combined Radium-226 and Radium-228

Samples MW-14S (160-55983-1), PZ-23S (160-55983-2), PZ-24S (160-55983-3), PZ-24 (160-55983-4), PZ-40S (160-55983-5), PZ-40 (160-55983-6), TW-19-05 (160-55983-7), TW-19-06A (160-55983-8) and DUP-07 (160-55983-9) were analyzed for

Eurofins St. Louis

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Supplemental Wells

Job ID: 160-55983-1

**Job ID: 160-55983-1 (Continued)**

**Eurofins St. Louis**

Combined Radium-226 and Radium-228. The samples were analyzed on 11/27/2024.

1

2

3

4

5

6

7

8



9

10

11

12

# Chain of Custody Record

<b>Client Information</b> Client Contact: Emil Blaj Company: Consumers Energy Address: 135 W Trail Street City: Jackson State: MI, Zip: 49201 Phone: 517-788-5888 Email: emil.blaj@cmsenergy.com Project Name: JH Campbell Supplemental Wells Site:		Lab PW: Korrihizer, Micha L E-Mail: Micha.Korrihizer@et.eurofins.com Carrier Tracking No(s): State of Origin: COC No: 160-11904-5895.1 Page: Page 1 of 1 Job #:																																																																																																																	
Due Date Requested: TAT Requested (days): <b>22 BD</b> Compliance Project: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No PO #: PR #24101083 / PO4400121591 WO #: 24-0860 Project #: 24-0860 SSOV#:		<b>Analysis Requested</b>  160-55983 Chain of Custody Preservation Codes: e																																																																																																																	
<b>Sample Identification</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=comp, G=grab)</th> <th>Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)</th> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>903.0 - Radium-226 (GFPC)</th> <th>904.0 - Radium-228 (GFPC)</th> <th>Ra226Ra228_GFPC - Combined Ra-226/Ra-228 calculation</th> <th>Total Number of containers</th> <th>Special Instructions/Note:</th> </tr> </thead> <tbody> <tr> <td>10/15/24</td> <td>1611</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td>N</td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>1217</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>1708</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>1844</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>1451</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>1544</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>1841</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>1721</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>10/15/24</td> <td>-</td> <td></td> <td>Water</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>x</td> <td>x</td> <td></td> <td>2</td> <td></td> </tr> </tbody> </table>		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)	Ra226Ra228_GFPC - Combined Ra-226/Ra-228 calculation	Total Number of containers	Special Instructions/Note:	10/15/24	1611		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x	N	2		10/15/24	1217		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		10/15/24	1708		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		10/15/24	1844		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		10/15/24	1451		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		10/15/24	1544		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		10/15/24	1841		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		10/15/24	1721		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		10/15/24	-		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2		<b>Possible Hazard Identification</b> <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify) <b>EQUIS EDD for TRC</b> Date: 10/22/24 14:30 Company: CE		<b>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</b> <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:	
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)	Ra226Ra228_GFPC - Combined Ra-226/Ra-228 calculation	Total Number of containers	Special Instructions/Note:																																																																																																									
10/15/24	1611		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x	N	2																																																																																																										
10/15/24	1217		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
10/15/24	1708		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
10/15/24	1844		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
10/15/24	1451		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
10/15/24	1544		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
10/15/24	1841		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
10/15/24	1721		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
10/15/24	-		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	x	x		2																																																																																																										
Empty Kit Relinquished by:  Relinquished by:		Method of Shipment:																																																																																																																	
Relinquished by:		Received by: UPS Date/Time:																																																																																																																	
Relinquished by:		Received by: M. Penetta Date/Time: OCT 24 2024 09:50 Company: E-TAS-7L																																																																																																																	
Relinquished by:		Received by: Meadow Pinette Date/Time: Company:																																																																																																																	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																																																																																																																	

# Login Sample Receipt Checklist

Client: Consumers Energy

Job Number: 160-55983-1

**Login Number: 55983**

**List Source: Eurofins St. Louis**

**List Number: 1**

**Creator: Pinette, Meadow L**

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?	False	
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.	False	No time on COC or sample containers on sample 9
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Definitions/Glossary

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

## 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 Summary

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

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

**Protocol References:**

- EPA = US Environmental Protection Agency
- None = None
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

**Laboratory References:**

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





# Sample Summary

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-55983-1	MW-14S	Water	10/15/24 16:11	10/24/24 09:50
160-55983-2	PZ-23S	Water	10/15/24 12:17	10/24/24 09:50
160-55983-3	PZ-24S	Water	10/15/24 17:08	10/24/24 09:50
160-55983-4	PZ-24	Water	10/15/24 18:44	10/24/24 09:50
160-55983-5	PZ-40S	Water	10/15/24 14:51	10/24/24 09:50
160-55983-6	PZ-40	Water	10/15/24 15:44	10/24/24 09:50
160-55983-7	TW-19-05	Water	10/15/24 18:41	10/24/24 09:50
160-55983-8	TW-19-06A	Water	10/15/24 17:21	10/24/24 09:50
160-55983-9	DUP-07	Water	10/15/24 00:00	10/24/24 09:50

1

2

3

4

5

6

7

8

9

10

11

12

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

## Client Sample ID: MW-14S

## Lab Sample ID: 160-55983-1

Date Collected: 10/15/24 16:11

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0420	U	0.0884	0.0885	1.00	0.194	pCi/L	10/28/24 08:50	11/19/24 14:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.5		30 - 110					10/28/24 08:50	11/19/24 14:09	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.19		0.583	0.593	1.00	0.809	pCi/L	10/28/24 08:55	11/14/24 12:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.5		30 - 110					10/28/24 08:55	11/14/24 12:38	1
Y Carrier	78.9		30 - 110					10/28/24 08:55	11/14/24 12:38	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.15		0.590	0.600	5.00	0.809	pCi/L		11/27/24 17:01	1

## Client Sample ID: PZ-23S

## Lab Sample ID: 160-55983-2

Date Collected: 10/15/24 12:17

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0509	U	0.0862	0.0864	1.00	0.150	pCi/L	10/28/24 08:50	11/19/24 14:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.9		30 - 110					10/28/24 08:50	11/19/24 14:09	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.905		0.407	0.415	1.00	0.598	pCi/L	10/28/24 08:55	11/14/24 12:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.9		30 - 110					10/28/24 08:55	11/14/24 12:39	1
Y Carrier	84.1		30 - 110					10/28/24 08:55	11/14/24 12:39	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

**Client Sample ID: PZ-23S**

**Lab Sample ID: 160-55983-2**

Date Collected: 10/15/24 12:17

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.955		0.416	0.424	5.00	0.598	pCi/L		11/27/24 17:01	1

**Client Sample ID: PZ-24S**

**Lab Sample ID: 160-55983-3**

Date Collected: 10/15/24 17:08

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0743	U	0.104	0.104	1.00	0.176	pCi/L	10/28/24 08:50	11/19/24 14:09	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.0		30 - 110					10/28/24 08:50	11/19/24 14:09	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0352	U	0.462	0.462	1.00	0.874	pCi/L	11/19/24 08:45	11/27/24 12:05	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	85.8		30 - 110					11/19/24 08:45	11/27/24 12:05	1
Y Carrier	77.0		30 - 110					11/19/24 08:45	11/27/24 12:05	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0391	U	0.474	0.474	5.00	0.874	pCi/L		11/27/24 17:00	1

**Client Sample ID: PZ-24**

**Lab Sample ID: 160-55983-4**

Date Collected: 10/15/24 18:44

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0730	U	0.104	0.104	1.00	0.177	pCi/L	10/28/24 08:50	11/19/24 14:09	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	86.6		30 - 110					10/28/24 08:50	11/19/24 14:09	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

**Client Sample ID: PZ-24**  
Date Collected: 10/15/24 18:44  
Date Received: 10/24/24 09:50

**Lab Sample ID: 160-55983-4**  
Matrix: Water

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.00636	U	0.359	0.359	1.00	0.689	pCi/L	11/19/24 08:45	11/27/24 12:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.1		30 - 110					11/19/24 08:45	11/27/24 12:05	1
Y Carrier	78.5		30 - 110					11/19/24 08:45	11/27/24 12:05	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0667	U	0.374	0.374	5.00	0.689	pCi/L		11/27/24 17:00	1

**Client Sample ID: PZ-40S**  
Date Collected: 10/15/24 14:51  
Date Received: 10/24/24 09:50

**Lab Sample ID: 160-55983-5**  
Matrix: Water

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0174	U	0.0549	0.0549	1.00	0.127	pCi/L	10/28/24 08:50	11/19/24 14:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.2		30 - 110					10/28/24 08:50	11/19/24 14:09	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.773		0.483	0.488	1.00	0.714	pCi/L	10/28/24 08:55	11/14/24 12:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.2		30 - 110					10/28/24 08:55	11/14/24 12:40	1
Y Carrier	78.5		30 - 110					10/28/24 08:55	11/14/24 12:40	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.756		0.486	0.491	5.00	0.714	pCi/L		11/27/24 17:01	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

**Client Sample ID: PZ-40**

**Lab Sample ID: 160-55983-6**

Date Collected: 10/15/24 15:44

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0341	U	0.0968	0.0969	1.00	0.178	pCi/L	10/28/24 08:50	11/19/24 14:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.9		30 - 110					10/28/24 08:50	11/19/24 14:09	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0423	U	0.430	0.430	1.00	0.788	pCi/L	10/28/24 08:55	11/14/24 12:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.9		30 - 110					10/28/24 08:55	11/14/24 12:39	1
Y Carrier	80.0		30 - 110					10/28/24 08:55	11/14/24 12:39	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0765	U	0.441	0.441	5.00	0.788	pCi/L		11/27/24 17:01	1

**Client Sample ID: TW-19-05**

**Lab Sample ID: 160-55983-7**

Date Collected: 10/15/24 18:41

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.128		0.0885	0.0892	1.00	0.121	pCi/L	10/28/24 08:50	11/19/24 14:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.4		30 - 110					10/28/24 08:50	11/19/24 14:09	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.487		0.325	0.328	1.00	0.483	pCi/L	10/28/24 08:55	11/14/24 11:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.4		30 - 110					10/28/24 08:55	11/14/24 11:37	1
Y Carrier	85.6		30 - 110					10/28/24 08:55	11/14/24 11:37	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

**Client Sample ID: TW-19-05**

**Lab Sample ID: 160-55983-7**

Date Collected: 10/15/24 18:41

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.615		0.337	0.340	5.00	0.483	pCi/L		11/27/24 17:01	1

**Client Sample ID: TW-19-06A**

**Lab Sample ID: 160-55983-8**

Date Collected: 10/15/24 17:21

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0320	U	0.0751	0.0752	1.00	0.170	pCi/L	10/28/24 08:50	11/19/24 14:09	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.6		30 - 110					10/28/24 08:50	11/19/24 14:09	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.653		0.367	0.372	1.00	0.511	pCi/L	10/28/24 08:55	11/14/24 11:37	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.6		30 - 110					10/28/24 08:55	11/14/24 11:37	1
Y Carrier	79.6		30 - 110					10/28/24 08:55	11/14/24 11:37	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.621		0.375	0.380	5.00	0.511	pCi/L		11/27/24 17:01	1

**Client Sample ID: DUP-07**

**Lab Sample ID: 160-55983-9**

Date Collected: 10/15/24 00:00

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0292	U	0.0479	0.0480	1.00	0.123	pCi/L	10/28/24 08:50	11/19/24 14:09	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	93.2		30 - 110					10/28/24 08:50	11/19/24 14:09	1

Eurofins St. Louis

# Client Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

**Client Sample ID: DUP-07**  
**Date Collected: 10/15/24 00:00**  
**Date Received: 10/24/24 09:50**

**Lab Sample ID: 160-55983-9**  
**Matrix: Water**

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.168	U	0.266	0.267	1.00	0.454	pCi/L	10/28/24 08:55	11/14/24 11:38	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	93.2		30 - 110					10/28/24 08:55	11/14/24 11:38	1
Y Carrier	88.2		30 - 110					10/28/24 08:55	11/14/24 11:38	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.139	U	0.270	0.271	5.00	0.454	pCi/L		11/27/24 17:01	1



# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

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

**Lab Sample ID: MB 160-685406/1-A**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.04219	U	0.0735	0.0736	1.00	0.130	pCi/L	10/28/24 08:50	11/19/24 14:08	1
Carrier	MB MB		Limits			Prepared	Analyzed	Dil Fac		
	%Yield	Qualifier								
Ba Carrier	90.2		30 - 110			10/28/24 08:50	11/19/24 14:08	1		

**Lab Sample ID: LCS 160-685406/2-A**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	9.58	9.532		1.05	1.00	0.139	pCi/L	100	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits			Prepared	Analyzed	Dil Fac	
Ba Carrier	86.8		30 - 110			10/28/24 08:50	11/19/24 14:08	1	

**Lab Sample ID: 160-55983-1 DU**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: MW-14S**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	Sample Sample		DU	DU	Total	RL	MDC	Unit	RER	RER Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					
Radium-226	-0.0420	U	-0.01553	U	0.0695	1.00	0.148	pCi/L	0.17	1
Carrier	DU %Yield	DU Qualifier	Limits			Prepared	Analyzed	Dil Fac		
Ba Carrier	94.1		30 - 110			10/28/24 08:55	11/14/24 12:37	1		

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

**Lab Sample ID: MB 160-685409/1-A**  
**Matrix: Water**  
**Analysis Batch: 688581**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 685409**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.8472		0.528	0.533	1.00	0.791	pCi/L	10/28/24 08:55	11/14/24 12:37	1
Carrier	MB %Yield	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac		
Ba Carrier	90.2		30 - 110			10/28/24 08:55	11/14/24 12:37	1		
Y Carrier	80.0		30 - 110			10/28/24 08:55	11/14/24 12:37	1		



# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

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

**Lab Sample ID: LCS 160-685409/2-A**  
**Matrix: Water**  
**Analysis Batch: 688429**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 685409**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	
									75 - 125	
Radium-228	8.34	9.177		1.53	1.00	0.900	pCi/L	110	75 - 125	
<b>Carrier</b>		<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier		86.8		30 - 110						
Y Carrier		81.1		30 - 110						

**Lab Sample ID: 160-55983-1 DU**  
**Matrix: Water**  
**Analysis Batch: 688581**

**Client Sample ID: MW-14S**  
**Prep Type: Total/NA**  
**Prep Batch: 685409**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
										0.24
Radium-228	1.19		0.9230		0.519	1.00	0.750	pCi/L	0.24	1
<b>Carrier</b>		<b>DU %Yield</b>	<b>DU Qualifier</b>	<b>Limits</b>						
Ba Carrier		94.1		30 - 110						
Y Carrier		82.6		30 - 110						

**Lab Sample ID: MB 160-689277/1-A**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Carrier</b>		<b>MB %Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>		<b>Prepared</b>		<b>Analyzed</b>		<b>Dil Fac</b>
Ba Carrier		93.4		30 - 110		11/19/24 08:45		11/27/24 12:04		1
Y Carrier		78.5		30 - 110		11/19/24 08:45		11/27/24 12:04		1

**Lab Sample ID: LCS 160-689277/2-A**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	
									75 - 125	
Radium-228	8.31	10.10		1.41	1.00	0.544	pCi/L	122	75 - 125	
<b>Carrier</b>		<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier		85.0		30 - 110						
Y Carrier		78.1		30 - 110						

# QC Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

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

**Lab Sample ID: 380-122119-B-1-B DU**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-228	0.334	U	-0.02550	U	0.315	1.00	0.372	pCi/L	0.54	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	77.2		30 - 110
Y Carrier	78.9		30 - 110



# QC Association Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

## Rad

### Prep Batch: 685406

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55983-1	MW-14S	Total/NA	Water	PrecSep-21	
160-55983-2	PZ-23S	Total/NA	Water	PrecSep-21	
160-55983-3	PZ-24S	Total/NA	Water	PrecSep-21	
160-55983-4	PZ-24	Total/NA	Water	PrecSep-21	
160-55983-5	PZ-40S	Total/NA	Water	PrecSep-21	
160-55983-6	PZ-40	Total/NA	Water	PrecSep-21	
160-55983-7	TW-19-05	Total/NA	Water	PrecSep-21	
160-55983-8	TW-19-06A	Total/NA	Water	PrecSep-21	
160-55983-9	DUP-07	Total/NA	Water	PrecSep-21	
MB 160-685406/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-685406/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
160-55983-1 DU	MW-14S	Total/NA	Water	PrecSep-21	

### Prep Batch: 685409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55983-1	MW-14S	Total/NA	Water	PrecSep_0	
160-55983-2	PZ-23S	Total/NA	Water	PrecSep_0	
160-55983-5	PZ-40S	Total/NA	Water	PrecSep_0	
160-55983-6	PZ-40	Total/NA	Water	PrecSep_0	
160-55983-7	TW-19-05	Total/NA	Water	PrecSep_0	
160-55983-8	TW-19-06A	Total/NA	Water	PrecSep_0	
160-55983-9	DUP-07	Total/NA	Water	PrecSep_0	
MB 160-685409/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-685409/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
160-55983-1 DU	MW-14S	Total/NA	Water	PrecSep_0	

### Prep Batch: 689277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55983-3	PZ-24S	Total/NA	Water	PrecSep_0	
160-55983-4	PZ-24	Total/NA	Water	PrecSep_0	
MB 160-689277/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-689277/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
380-122119-B-1-B DU	Duplicate	Total/NA	Water	PrecSep_0	

# Tracer/Carrier Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Supplemental Wells

Job ID: 160-55983-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
160-55983-1	MW-14S	78.5	
160-55983-1 DU	MW-14S	94.1	
160-55983-2	PZ-23S	93.9	
160-55983-3	PZ-24S	87.0	
160-55983-4	PZ-24	86.6	
160-55983-5	PZ-40S	92.2	
160-55983-6	PZ-40	83.9	
160-55983-7	TW-19-05	92.4	
160-55983-8	TW-19-06A	84.6	
160-55983-9	DUP-07	93.2	
LCS 160-685406/2-A	Lab Control Sample	86.8	
MB 160-685406/1-A	Method Blank	90.2	
<b>Tracer/Carrier Legend</b>			
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 (30-110)	Y (30-110)
160-55983-1	MW-14S	78.5	78.9
160-55983-1 DU	MW-14S	94.1	82.6
160-55983-2	PZ-23S	93.9	84.1
160-55983-3	PZ-24S	85.8	77.0
160-55983-4	PZ-24	93.1	78.5
160-55983-5	PZ-40S	92.2	78.5
160-55983-6	PZ-40	83.9	80.0
160-55983-7	TW-19-05	92.4	85.6
160-55983-8	TW-19-06A	84.6	79.6
160-55983-9	DUP-07	93.2	88.2
380-122119-B-1-B DU	Duplicate	77.2	78.9
LCS 160-685409/2-A	Lab Control Sample	86.8	81.1
LCS 160-689277/2-A	Lab Control Sample	85.0	78.1
MB 160-685409/1-A	Method Blank	90.2	80.0
MB 160-689277/1-A	Method Blank	93.4	78.5
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Emil Blaj  
Consumers Energy  
135 W Trail Street  
Jackson, Michigan 49201

Generated 11/27/2024 5:36:02 PM

**JOB DESCRIPTION**

JH Campbell Background Wells

**JOB NUMBER**

160-55984-1

# Eurofins St. Louis

## Job Notes

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

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

## Authorization



Generated  
11/27/2024 5:36:02 PM

Authorized for release by  
Jayna Awalt, Project Manager II  
[Jayna.Awalt@et.eurofinsus.com](mailto:Jayna.Awalt@et.eurofinsus.com)  
Designee for  
Micha Korrinhizer, Project Manager  
[Micha.Korrinhizer@et.eurofinsus.com](mailto:Micha.Korrinhizer@et.eurofinsus.com)  
(314)298-8566



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Chain of Custody . . . . .	6
Receipt Checklists . . . . .	7
Definitions/Glossary . . . . .	8
Method Summary . . . . .	9
Sample Summary . . . . .	10
Client Sample Results . . . . .	11
QC Sample Results . . . . .	17
QC Association Summary . . . . .	20
Tracer Carrier Summary . . . . .	21

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Background Wells

Job ID: 160-55984-1

**Job ID: 160-55984-1**

**Eurofins St. Louis**

## Job Narrative 160-55984-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method.

Eurofins Environment Testing attests to the validity of the laboratory data generated by Eurofins facilities reported herein. All analyses performed by Eurofins Environment Testing facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins Environment Testing's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

Calculations are performed before rounding to avoid round-off errors in calculated results.

Proper preservation was noted for the methods performed on these samples, unless otherwise detailed below.

All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy or unless requested as wet weight by the client.

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.

The matrix for the Method Blank and LCS/LCSD is as close to the samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

The method blank (MB) z-score is within limits, unless stated otherwise below, and is stored in the level IV raw data.

This laboratory report is confidential and is intended for the sole use of Eurofins Environment Testing and its client.

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

### Receipt

The samples were received on 10/24/2024 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved. The temperature of the cooler at receipt time was 19.8°C.

### Receipt Exceptions

The following sample was received at the laboratory without a sample collection time documented on the chain of custody: DUP-01 (160-55984-7). The laboratory was instructed to use a sample collection time of 12:00am. Samplers name is not on the COC. JHC-MW-15023 (160-55984-1), JHC-MW-15024 (160-55984-2), JHC-MW-15025 (160-55984-3), JHC-MW-15026 (160-55984-4), JHC-MW-15027 (160-55984-5), JHC-MW-15028 (160-55984-6), DUP-01 (160-55984-7), FB-01 (160-55984-8) and EB-01 (160-55984-9)

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

Samples JHC-MW-15023 (160-55984-1), JHC-MW-15024 (160-55984-2), JHC-MW-15025 (160-55984-3), JHC-MW-15026 (160-55984-4), JHC-MW-15027 (160-55984-5), JHC-MW-15028 (160-55984-6), DUP-01 (160-55984-7), FB-01 (160-55984-8) and EB-01 (160-55984-9) were analyzed for Radium-226 (GFPC). The samples were prepared on 10/28/2024 and analyzed on 11/19/2024.

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

Samples JHC-MW-15023 (160-55984-1), JHC-MW-15024 (160-55984-2), JHC-MW-15025 (160-55984-3), JHC-MW-15026 (160-55984-4), JHC-MW-15027 (160-55984-5), JHC-MW-15028 (160-55984-6), DUP-01 (160-55984-7), FB-01 (160-55984-8) and EB-01 (160-55984-9) were analyzed for Radium-228 (GFPC). The samples were prepared on 10/28/2024 and 11/19/2024 and analyzed on 11/14/2024 and 11/27/2024.

Eurofins St. Louis



# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Background Wells

Job ID: 160-55984-1

**Job ID: 160-55984-1 (Continued)**

**Eurofins St. Louis**

**Method Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Samples JHC-MW-15023 (160-55984-1), JHC-MW-15024 (160-55984-2), JHC-MW-15025 (160-55984-3), JHC-MW-15026 (160-55984-4), JHC-MW-15027 (160-55984-5), JHC-MW-15028 (160-55984-6), DUP-01 (160-55984-7), FB-01 (160-55984-8) and EB-01 (160-55984-9) were analyzed for Combined Radium-226 and Radium-228. The samples were analyzed on 11/27/2024.

1

2

3

4

5

6

7

8

9

10

11

12

Eurofins St. Louis

# Chain of Custody Record



Environment Testing

**Client Information**  
 Client Contact: Emil Blaj  
 Company: Consumers Energy  
 Address: 135 W Trail Street, Jackson, MI, 49201  
 Phone: 517-788-5888  
 Email: emil.blaj@cmsenergy.com  
 Project Name: JH Campbell Background Wells  
 Site:

**Sampler:** Lab PM: Korrinhizer, Micha L  
 Phone: E-Mail: Micha. Korrinhizer@eurofins.com  
 PWSID:

**Carrier Tracking No(s):** 160-11904-5895.1  
**Page:** Page 1 of 1  
**Job #:**

**Analysis Requested**  
 Perform MS/MSD (Yes or No):  
 903.0 - Radium-226 (GFPc) [X] D  
 904.0 - Radium-228 (GFPc) [X] D  
 Ra226Ra228 GFPc - Combined Ra-226/Ra-228 calculation [X] N  
 Preservation Codes:  
 D - HNO3  
 N - None

**Due Date Requested:**  
 TAT Requested (days): 22 BD  
 Compliance Project:  Yes  No  
 PO #: PR #24101083 / PO4400121591  
 WO #: 24-0857  
 Project #: 24-0857  
 SSOW#:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=other)	Preservation Code:	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Radium-226 (GFPc)	904.0 - Radium-228 (GFPc)	Ra226Ra228 GFPc - Combined Ra-226/Ra-228 calculation	Total Number of Containers	Special Instructions/Note:
JHC-MW-15023	10/14/24	1706	Water	Water				X	X	N	2	
JHC-MW-15024	10/14/24	1856	Water	Water				X	X		2	
JHC-MW-15025	10/14/24	2011	Water	Water				X	X		2	
JHC-MW-15026	10/15/24	0856	Water	Water				X	X		2	
JHC-MW-15027	10/15/24	1031	Water	Water				X	X		2	
JHC-MW-15028	10/15/24	1150	Water	Water				X	X		2	
DUP-01	10/14/24		Water	Water				X	X		2	
FB-01	10/15/24	1222	Water	Water				X	X		2	
EB-01	10/15/24	1210	Water	Water				X	X		2	

**Other:**

**Barcode:** 160-55984 Chain of Custody

**Special Instructions/Note:**

**Possible Hazard Identification**  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Radiological  
 Deliverable Requested: I, II, III, IV, Other (specify)

**EQUIS EDD for TRC**  
 Empty Kit Relinquished by: *[Signature]* Date: 10/22/24 1430  
 Relinquished by: CE Company  
 Relinquished by: M. Pinette Company  
 Relinquished by: Meadow Pinette Company  
 Date/Time: OCT 24 2024 09:50  
 Date/Time: Company: E1457K  
 Date/Time: Company:

**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:

**Method of Shipment:**  
 Received by: UPS  
 Received by: M. Pinette  
 Received by: Meadow Pinette  
 Cooler Temperature(s) °C and Other Remarks:

**Custody Seal No.:**  
 Yes  No



# Login Sample Receipt Checklist

Client: Consumers Energy

Job Number: 160-55984-1

**Login Number: 55984**

**List Source: Eurofins St. Louis**

**List Number: 1**

**Creator: Pinette, Meadow L**

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?	False	Samplers name is not on the COC
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.	False	No ttime on COC or sample containers on sample 7
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	

# Definitions/Glossary

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

## 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 Summary

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

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

**Protocol References:**

- EPA = US Environmental Protection Agency
- None = None
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

**Laboratory References:**

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



# Sample Summary

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-55984-1	JHC-MW-15023	Water	10/14/24 17:06	10/24/24 09:50
160-55984-2	JHC-MW-15024	Water	10/14/24 18:56	10/24/24 09:50
160-55984-3	JHC-MW-15025	Water	10/14/24 20:11	10/24/24 09:50
160-55984-4	JHC-MW-15026	Water	10/15/24 08:56	10/24/24 09:50
160-55984-5	JHC-MW-15027	Water	10/15/24 10:31	10/24/24 09:50
160-55984-6	JHC-MW-15028	Water	10/15/24 11:50	10/24/24 09:50
160-55984-7	DUP-01	Water	10/14/24 00:00	10/24/24 09:50
160-55984-8	FB-01	Water	10/15/24 12:22	10/24/24 09:50
160-55984-9	EB-01	Water	10/15/24 12:10	10/24/24 09:50



# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

**Client Sample ID: JHC-MW-15023**

**Lab Sample ID: 160-55984-1**

Date Collected: 10/14/24 17:06

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0956	U	0.0891	0.0895	1.00	0.137	pCi/L	10/28/24 08:50	11/19/24 14:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.6		30 - 110					10/28/24 08:50	11/19/24 14:09	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.451	U	0.350	0.352	1.00	0.541	pCi/L	10/28/24 08:55	11/14/24 11:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.6		30 - 110					10/28/24 08:55	11/14/24 11:38	1
Y Carrier	80.4		30 - 110					10/28/24 08:55	11/14/24 11:38	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.546		0.361	0.363	5.00	0.541	pCi/L		11/27/24 17:01	1

**Client Sample ID: JHC-MW-15024**

**Lab Sample ID: 160-55984-2**

Date Collected: 10/14/24 18:56

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0662	U	0.104	0.104	1.00	0.178	pCi/L	10/28/24 08:50	11/19/24 14:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		30 - 110					10/28/24 08:50	11/19/24 14:09	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.467	U	0.384	0.386	1.00	0.601	pCi/L	10/28/24 08:55	11/14/24 11:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		30 - 110					10/28/24 08:55	11/14/24 11:38	1
Y Carrier	81.9		30 - 110					10/28/24 08:55	11/14/24 11:38	1

Eurofins St. Louis

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

**Client Sample ID: JHC-MW-15024**

**Lab Sample ID: 160-55984-2**

Date Collected: 10/14/24 18:56

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.533	U	0.398	0.400	5.00	0.601	pCi/L		11/27/24 17:01	1

**Client Sample ID: JHC-MW-15025**

**Lab Sample ID: 160-55984-3**

Date Collected: 10/14/24 20:11

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.128		0.0857	0.0864	1.00	0.112	pCi/L	10/28/24 08:50	11/19/24 17:24	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.5		30 - 110					10/28/24 08:50	11/19/24 17:24	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.586		0.386	0.390	1.00	0.573	pCi/L	10/28/24 08:55	11/14/24 11:38	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.5		30 - 110					10/28/24 08:55	11/14/24 11:38	1
Y Carrier	77.4		30 - 110					10/28/24 08:55	11/14/24 11:38	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.714		0.395	0.399	5.00	0.573	pCi/L		11/27/24 17:01	1

**Client Sample ID: JHC-MW-15026**

**Lab Sample ID: 160-55984-4**

Date Collected: 10/15/24 08:56

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0526	U	0.0663	0.0665	1.00	0.109	pCi/L	10/28/24 08:50	11/19/24 17:24	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	94.4		30 - 110					10/28/24 08:50	11/19/24 17:24	1



# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

**Client Sample ID: JHC-MW-15026**

**Lab Sample ID: 160-55984-4**

Date Collected: 10/15/24 08:56

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.497	U	0.394	0.397	1.00	0.617	pCi/L	10/28/24 08:55	11/14/24 11:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		30 - 110					10/28/24 08:55	11/14/24 11:38	1
Y Carrier	80.0		30 - 110					10/28/24 08:55	11/14/24 11:38	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.550	U	0.400	0.403	5.00	0.617	pCi/L		11/27/24 17:01	1

**Client Sample ID: JHC-MW-15027**

**Lab Sample ID: 160-55984-5**

Date Collected: 10/15/24 10:31

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0590	U	0.0633	0.0636	1.00	0.0985	pCi/L	10/28/24 08:50	11/19/24 17:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		30 - 110					10/28/24 08:50	11/19/24 17:24	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>0.828</b>		0.391	0.399	1.00	0.528	pCi/L	10/28/24 08:55	11/14/24 11:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		30 - 110					10/28/24 08:55	11/14/24 11:40	1
Y Carrier	81.1		30 - 110					10/28/24 08:55	11/14/24 11:40	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.887</b>		0.396	0.404	5.00	0.528	pCi/L		11/27/24 17:01	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

**Client Sample ID: JHC-MW-15028**

**Lab Sample ID: 160-55984-6**

Date Collected: 10/15/24 11:50

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0172	U	0.0594	0.0594	1.00	0.116	pCi/L	10/28/24 08:50	11/19/24 17:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		30 - 110					10/28/24 08:50	11/19/24 17:25	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.113	U	0.319	0.320	1.00	0.566	pCi/L	10/28/24 08:55	11/14/24 11:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		30 - 110					10/28/24 08:55	11/14/24 11:40	1
Y Carrier	79.3		30 - 110					10/28/24 08:55	11/14/24 11:40	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.130	U	0.324	0.325	5.00	0.566	pCi/L		11/27/24 17:01	1

**Client Sample ID: DUP-01**

**Lab Sample ID: 160-55984-7**

Date Collected: 10/14/24 00:00

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.00494	U	0.0520	0.0520	1.00	0.113	pCi/L	10/28/24 08:50	11/19/24 17:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.8		30 - 110					10/28/24 08:50	11/19/24 17:25	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.508	U	0.379	0.382	1.00	0.576	pCi/L	11/19/24 08:45	11/27/24 12:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		30 - 110					11/19/24 08:45	11/27/24 12:05	1
Y Carrier	76.6		30 - 110					11/19/24 08:45	11/27/24 12:05	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

**Client Sample ID: DUP-01**

**Lab Sample ID: 160-55984-7**

Date Collected: 10/14/24 00:00

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.503	U	0.383	0.386	5.00	0.576	pCi/L		11/27/24 17:00	1

**Client Sample ID: FB-01**

**Lab Sample ID: 160-55984-8**

Date Collected: 10/15/24 12:22

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00368	U	0.0544	0.0544	1.00	0.115	pCi/L	10/28/24 08:50	11/19/24 17:25	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	91.9		30 - 110					10/28/24 08:50	11/19/24 17:25	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.524	U	0.373	0.376	1.00	0.565	pCi/L	10/28/24 08:55	11/14/24 11:40	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	91.9		30 - 110					10/28/24 08:55	11/14/24 11:40	1
Y Carrier	78.1		30 - 110					10/28/24 08:55	11/14/24 11:40	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.527	U	0.377	0.380	5.00	0.565	pCi/L		11/27/24 17:01	1

**Client Sample ID: EB-01**

**Lab Sample ID: 160-55984-9**

Date Collected: 10/15/24 12:10

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00529	U	0.0553	0.0553	1.00	0.115	pCi/L	10/28/24 08:50	11/19/24 17:26	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.8		30 - 110					10/28/24 08:50	11/19/24 17:26	1

# Client Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

**Client Sample ID: EB-01**

**Lab Sample ID: 160-55984-9**

Date Collected: 10/15/24 12:10

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.285	U	0.280	0.281	1.00	0.447	pCi/L	10/28/24 08:55	11/14/24 11:40	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.8		30 - 110					10/28/24 08:55	11/14/24 11:40	1
Y Carrier	82.2		30 - 110					10/28/24 08:55	11/14/24 11:40	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.290	U	0.285	0.286	5.00	0.447	pCi/L		11/27/24 17:01	1



# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

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

**Lab Sample ID: MB 160-685406/1-A**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.04219	U	0.0735	0.0736	1.00	0.130	pCi/L	10/28/24 08:50	11/19/24 14:08	1
Carrier	MB MB		Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	%Yield	Qualifier						Prepared	Analyzed	Dil Fac
Ba Carrier	90.2		30 - 110					10/28/24 08:50	11/19/24 14:08	1

**Lab Sample ID: LCS 160-685406/2-A**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte		Spike Added	LCS	LCS	Total	RL	MDC	Unit	%Rec	%Rec Limits
			Result	Qual	Uncert. (2σ+/-)					
Radium-226		9.58	9.532		1.05	1.00	0.139	pCi/L	100	75 - 125
Carrier	LCS LCS		Limits							
Ba Carrier	%Yield	Qualifier								
Ba Carrier	86.8		30 - 110							

**Lab Sample ID: 160-55983-B-1-C DU**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	Sample Sample		DU	DU	Total	RL	MDC	Unit	RER	RER Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					
Radium-226	-0.0420	U	-0.01553	U	0.0695	1.00	0.148	pCi/L	0.17	1
Carrier	DU DU		Limits							
Ba Carrier	%Yield	Qualifier								
Ba Carrier	94.1		30 - 110							

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

**Lab Sample ID: MB 160-685409/1-A**  
**Matrix: Water**  
**Analysis Batch: 688581**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 685409**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.8472		0.528	0.533	1.00	0.791	pCi/L	10/28/24 08:55	11/14/24 12:37	1
Carrier	MB MB		Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	%Yield	Qualifier						Prepared	Analyzed	Dil Fac
Ba Carrier	90.2		30 - 110					10/28/24 08:55	11/14/24 12:37	1
Y Carrier	MB MB		Limits					Prepared	Analyzed	Dil Fac
Y Carrier	%Yield	Qualifier						Prepared	Analyzed	Dil Fac
Y Carrier	80.0		30 - 110					10/28/24 08:55	11/14/24 12:37	1

# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

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

**Lab Sample ID: LCS 160-685409/2-A**  
**Matrix: Water**  
**Analysis Batch: 688429**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 685409**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	
									Limits	
Radium-228	8.34	9.177		1.53	1.00	0.900	pCi/L	110	75 - 125	
<b>LCS LCS</b>										
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	86.8		30 - 110							
Y Carrier	81.1		30 - 110							

**Lab Sample ID: 160-55983-B-1-D DU**  
**Matrix: Water**  
**Analysis Batch: 688581**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 685409**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
										Limit
Radium-228	1.19		0.9230		0.519	1.00	0.750	pCi/L	0.24	1
<b>DU DU</b>										
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	94.1		30 - 110							
Y Carrier	82.6		30 - 110							

**Lab Sample ID: MB 160-689277/1-A**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
										Limit
Radium-228	0.7175		0.390	0.395	1.00	0.549	pCi/L	11/19/24 08:45	11/27/24 12:04	1
<b>MB MB</b>										
Carrier	%Yield	Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	93.4		30 - 110		11/19/24 08:45	11/27/24 12:04	1			
Y Carrier	78.5		30 - 110		11/19/24 08:45	11/27/24 12:04	1			

**Lab Sample ID: LCS 160-689277/2-A**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	
									Limits	
Radium-228	8.31	10.10		1.41	1.00	0.544	pCi/L	122	75 - 125	
<b>LCS LCS</b>										
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	85.0		30 - 110							
Y Carrier	78.1		30 - 110							

# QC Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

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

**Lab Sample ID: 380-122119-B-1-B DU**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-228	0.334	U	-0.02550	U	0.315	1.00	0.372	pCi/L	0.54	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	77.2		30 - 110
Y Carrier	78.9		30 - 110



# QC Association Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

## Rad

### Prep Batch: 685406

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55984-1	JHC-MW-15023	Total/NA	Water	PrecSep-21	
160-55984-2	JHC-MW-15024	Total/NA	Water	PrecSep-21	
160-55984-3	JHC-MW-15025	Total/NA	Water	PrecSep-21	
160-55984-4	JHC-MW-15026	Total/NA	Water	PrecSep-21	
160-55984-5	JHC-MW-15027	Total/NA	Water	PrecSep-21	
160-55984-6	JHC-MW-15028	Total/NA	Water	PrecSep-21	
160-55984-7	DUP-01	Total/NA	Water	PrecSep-21	
160-55984-8	FB-01	Total/NA	Water	PrecSep-21	
160-55984-9	EB-01	Total/NA	Water	PrecSep-21	
MB 160-685406/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-685406/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
160-55983-B-1-C DU	Duplicate	Total/NA	Water	PrecSep-21	

### Prep Batch: 685409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55984-1	JHC-MW-15023	Total/NA	Water	PrecSep_0	
160-55984-2	JHC-MW-15024	Total/NA	Water	PrecSep_0	
160-55984-3	JHC-MW-15025	Total/NA	Water	PrecSep_0	
160-55984-4	JHC-MW-15026	Total/NA	Water	PrecSep_0	
160-55984-5	JHC-MW-15027	Total/NA	Water	PrecSep_0	
160-55984-6	JHC-MW-15028	Total/NA	Water	PrecSep_0	
160-55984-8	FB-01	Total/NA	Water	PrecSep_0	
160-55984-9	EB-01	Total/NA	Water	PrecSep_0	
MB 160-685409/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-685409/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
160-55983-B-1-D DU	Duplicate	Total/NA	Water	PrecSep_0	

### Prep Batch: 689277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55984-7	DUP-01	Total/NA	Water	PrecSep_0	
MB 160-689277/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-689277/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
380-122119-B-1-B DU	Duplicate	Total/NA	Water	PrecSep_0	



# Tracer/Carrier Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Background Wells

Job ID: 160-55984-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
160-55983-B-1-C DU	Duplicate	94.1	
160-55984-1	JHC-MW-15023	95.6	
160-55984-2	JHC-MW-15024	88.0	
160-55984-3	JHC-MW-15025	87.5	
160-55984-4	JHC-MW-15026	94.4	
160-55984-5	JHC-MW-15027	88.3	
160-55984-6	JHC-MW-15028	90.5	
160-55984-7	DUP-01	99.8	
160-55984-8	FB-01	91.9	
160-55984-9	EB-01	96.8	
LCS 160-685406/2-A	Lab Control Sample	86.8	
MB 160-685406/1-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 (30-110)	Y (30-110)
160-55983-B-1-D DU	Duplicate	94.1	82.6
160-55984-1	JHC-MW-15023	95.6	80.4
160-55984-2	JHC-MW-15024	88.0	81.9
160-55984-3	JHC-MW-15025	87.5	77.4
160-55984-4	JHC-MW-15026	94.4	80.0
160-55984-5	JHC-MW-15027	88.3	81.1
160-55984-6	JHC-MW-15028	90.5	79.3
160-55984-7	DUP-01	89.1	76.6
160-55984-8	FB-01	91.9	78.1
160-55984-9	EB-01	96.8	82.2
380-122119-B-1-B DU	Duplicate	77.2	78.9
LCS 160-685409/2-A	Lab Control Sample	86.8	81.1
LCS 160-689277/2-A	Lab Control Sample	85.0	78.1
MB 160-685409/1-A	Method Blank	90.2	80.0
MB 160-689277/1-A	Method Blank	93.4	78.5

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

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Emil Blaj  
Consumers Energy  
135 W Trail Street  
Jackson, Michigan 49201

Generated 11/27/2024 5:38:56 PM

**JOB DESCRIPTION**

JH Campbell Pond A Wells

**JOB NUMBER**

160-55985-1

# Eurofins St. Louis

## Job Notes

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

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

## Authorization



Generated  
11/27/2024 5:38:56 PM

---

Authorized for release by  
Jayna Awalt, Project Manager II  
[Jayna.Awalt@et.eurofinsus.com](mailto:Jayna.Awalt@et.eurofinsus.com)  
Designee for  
Micha Korrinhizer, Project Manager  
[Micha.Korrinhizer@et.eurofinsus.com](mailto:Micha.Korrinhizer@et.eurofinsus.com)  
(314)298-8566



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Chain of Custody . . . . .	5
Receipt Checklists . . . . .	6
Definitions/Glossary . . . . .	7
Method Summary . . . . .	8
Sample Summary . . . . .	9
Client Sample Results . . . . .	10
QC Sample Results . . . . .	15
QC Association Summary . . . . .	19
Tracer Carrier Summary . . . . .	20

# Case Narrative

Client: Consumers Energy  
Project: JH Campbell Pond A Wells

Job ID: 160-55985-1

**Job ID: 160-55985-1**

**Eurofins St. Louis**

## Job Narrative 160-55985-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method.

Eurofins Environment Testing attests to the validity of the laboratory data generated by Eurofins facilities reported herein. All analyses performed by Eurofins Environment Testing facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins Environment Testing's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

Calculations are performed before rounding to avoid round-off errors in calculated results.

Proper preservation was noted for the methods performed on these samples, unless otherwise detailed below.

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.

This laboratory report is confidential and is intended for the sole use of Eurofins Environment Testing and its client.

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

### Receipt

The samples were received on 10/24/2024 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved. The temperature of the cooler at receipt time was 19.7°C.

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

Samples JHC-MW-15006 (160-55985-1), JHC-MW-15007R (160-55985-2), JHC-MW-15008R (160-55985-3), JHC-MW-15009R (160-55985-4), JHC-MW-15011R (160-55985-5), DUP-02 (160-55985-6), FB-02 (160-55985-7) and EB-02 (160-55985-8) were analyzed for Radium-226 (GFPC). The samples were prepared on 10/28/2024 and analyzed on 11/19/2024.

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

Samples JHC-MW-15006 (160-55985-1), JHC-MW-15007R (160-55985-2), JHC-MW-15008R (160-55985-3), JHC-MW-15009R (160-55985-4), JHC-MW-15011R (160-55985-5), DUP-02 (160-55985-6), FB-02 (160-55985-7) and EB-02 (160-55985-8) were analyzed for Radium-228 (GFPC). The samples were prepared on 10/28/2024 and 11/19/2024 and analyzed on 11/14/2024, 11/18/2024 and 11/27/2024.

### Method Ra226\_Ra228 - Combined Radium-226 and Radium-228

Samples JHC-MW-15006 (160-55985-1), JHC-MW-15007R (160-55985-2), JHC-MW-15008R (160-55985-3), JHC-MW-15009R (160-55985-4), JHC-MW-15011R (160-55985-5), DUP-02 (160-55985-6), FB-02 (160-55985-7) and EB-02 (160-55985-8) were analyzed for Combined Radium-226 and Radium-228. The samples were analyzed on 11/27/2024.

Eurofins St. Louis

# Chain of Custody Record

<b>Client Information</b>		Lab PM Korrinhizer, Micha L		Carrier Tracking Net(s) 160-11904-5895 1		COC No. 160-11904-5895 1	
Company Consumers Energy		E-Mail Micha.Korrinhizer@et.eurofins.com		State of Origin		Page Page 1 of 1	
Address 135 W Trail Street		PWSID		Analysis Requested		Job #	
City Jackson		Due Date Requested:		Preservation Codes: D - HNO3		Other:	
State, Zip MI, 49201		TAT Requested (days): 22 BD		Perform MS/MSD (Yes or No)		Total Number of containers	
Phone 517-788-5888		Compliance Project: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Field Filtered Sample (Yes or No)		Special Instructions/Note:	
Email emil.blaj@cmsenergy.com		PO # PR #24101083 / PO4400121591		903.0 - Radium-226 (GFPC)		Special Instructions/Note:	
Project Name JH Campbell Pond A Wells		WO # 24-0858		904.0 - Radium-228 (GFPC)		Special Instructions/Note:	
Site		Project # 24-0858		Ra226Ra228 GFPC - Combined Ra-226/Ra-228 calculation		Special Instructions/Note:	
		SSOW#				Special Instructions/Note:	
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=tissue, A=air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Special Instructions/Note:
JHC-MW-15006	10/14/24	1851	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
JHC-MW-15007R	10/14/24	1756	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
JHC-MW-15008R	10/14/24	1541	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
JHC-MW-15009R	10/14/24	1416	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
JHC-MW-15011R	10/14/24	1941	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
DUP-02	10/14/24	-	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
FB-02	10/14/24	1908	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
EB-02	10/14/24	2001	Water	Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
<p><b>Possible Hazard Identification</b>  <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological</p> <p>Deliverable Requested: I, II, III, IV, Other (specify) <b>EQUIS EDD for TRC</b></p> <p>Empty Kit Relinquished by: _____ Date: _____ Time: _____</p> <p>Relinquished by: _____ Date/Time: _____ Method of Shipment: _____</p> <p>Relinquished by: _____ Date/Time: _____ Received by: <b>UPS</b> Date/Time: _____ Company: _____</p> <p>Relinquished by: _____ Date/Time: _____ Received by: <b>M. Pinetta</b> Date/Time: <b>OCT 24 2024</b> Company: <b>ISO ETASTL</b></p> <p>Custody Seals Intact: _____ Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____</p> <p style="text-align: right;">△ Yes △ No</p>							



# Login Sample Receipt Checklist

Client: Consumers Energy

Job Number: 160-55985-1

**Login Number: 55985**

**List Source: Eurofins St. Louis**

**List Number: 1**

**Creator: Pinette, Meadow L**

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?	False	Samplers name is not on the COC
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.	False	No time on COC or sample containers for sample 6
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	

# Definitions/Glossary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

## 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 Summary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

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

**Protocol References:**

- EPA = US Environmental Protection Agency
- None = None
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

**Laboratory References:**

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



# Sample Summary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-55985-1	JHC-MW-15006	Water	10/14/24 18:51	10/24/24 09:50
160-55985-2	JHC-MW-15007R	Water	10/14/24 17:56	10/24/24 09:50
160-55985-3	JHC-MW-15008R	Water	10/14/24 15:41	10/24/24 09:50
160-55985-4	JHC-MW-15009R	Water	10/14/24 14:16	10/24/24 09:50
160-55985-5	JHC-MW-15011R	Water	10/14/24 19:41	10/24/24 09:50
160-55985-6	DUP-02	Water	10/14/24 00:00	10/24/24 09:50
160-55985-7	FB-02	Water	10/14/24 19:08	10/24/24 09:50
160-55985-8	EB-02	Water	10/14/24 20:01	10/24/24 09:50

1

2

3

4

5

6

7

8

9

10

11

12

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

**Client Sample ID: JHC-MW-15006**

**Lab Sample ID: 160-55985-1**

Date Collected: 10/14/24 18:51

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.147		0.0927	0.0937	1.00	0.123	pCi/L	10/28/24 08:50	11/19/24 17:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.6		30 - 110					10/28/24 08:50	11/19/24 17:26	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.329	U	0.281	0.282	1.00	0.438	pCi/L	10/28/24 08:55	11/14/24 11:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.6		30 - 110					10/28/24 08:55	11/14/24 11:40	1
Y Carrier	88.2		30 - 110					10/28/24 08:55	11/14/24 11:40	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.476		0.296	0.297	5.00	0.438	pCi/L		11/27/24 17:01	1

**Client Sample ID: JHC-MW-15007R**

**Lab Sample ID: 160-55985-2**

Date Collected: 10/14/24 17:56

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.345		0.126	0.130	1.00	0.122	pCi/L	10/28/24 08:50	11/19/24 17:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		30 - 110					10/28/24 08:50	11/19/24 17:26	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.734	U	0.515	0.519	1.00	0.779	pCi/L	11/19/24 08:45	11/27/24 12:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.1		30 - 110					11/19/24 08:45	11/27/24 12:06	1
Y Carrier	75.1		30 - 110					11/19/24 08:45	11/27/24 12:06	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

**Client Sample ID: JHC-MW-15007R**

**Lab Sample ID: 160-55985-2**

Date Collected: 10/14/24 17:56

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.08		0.530	0.535	5.00	0.779	pCi/L		11/27/24 17:00	1

**Client Sample ID: JHC-MW-15008R**

**Lab Sample ID: 160-55985-3**

Date Collected: 10/14/24 15:41

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.220	U	0.232	0.233	1.00	0.373	pCi/L	10/28/24 08:58	11/19/24 09:40	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	83.4		30 - 110					10/28/24 08:58	11/19/24 09:40	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.256	U	0.367	0.368	1.00	0.619	pCi/L	10/28/24 09:03	11/18/24 12:07	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	83.4		30 - 110					10/28/24 09:03	11/18/24 12:07	1
Y Carrier	74.8		30 - 110					10/28/24 09:03	11/18/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.476	U	0.434	0.436	5.00	0.619	pCi/L		11/27/24 17:03	1

**Client Sample ID: JHC-MW-15009R**

**Lab Sample ID: 160-55985-4**

Date Collected: 10/14/24 14:16

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.194	U	0.154	0.155	1.00	0.217	pCi/L	10/28/24 08:58	11/19/24 09:42	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.8		30 - 110					10/28/24 08:58	11/19/24 09:42	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

**Client Sample ID: JHC-MW-15009R**

**Lab Sample ID: 160-55985-4**

Date Collected: 10/14/24 14:16

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.629	U	0.453	0.456	1.00	0.690	pCi/L	10/28/24 09:03	11/18/24 12:07	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	87.8		30 - 110					10/28/24 09:03	11/18/24 12:07	1
Y Carrier	71.4		30 - 110					10/28/24 09:03	11/18/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.823		0.478	0.482	5.00	0.690	pCi/L		11/27/24 17:03	1

**Client Sample ID: JHC-MW-15011R**

**Lab Sample ID: 160-55985-5**

Date Collected: 10/14/24 19:41

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.233		0.166	0.168	1.00	0.226	pCi/L	10/28/24 08:58	11/19/24 09:42	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.1		30 - 110					10/28/24 08:58	11/19/24 09:42	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.327	U	0.413	0.415	1.00	0.687	pCi/L	10/28/24 09:03	11/18/24 12:07	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.1		30 - 110					10/28/24 09:03	11/18/24 12:07	1
Y Carrier	77.0		30 - 110					10/28/24 09:03	11/18/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.560	U	0.445	0.448	5.00	0.687	pCi/L		11/27/24 17:03	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

**Client Sample ID: DUP-02**  
Date Collected: 10/14/24 00:00  
Date Received: 10/24/24 09:50

**Lab Sample ID: 160-55985-6**  
Matrix: Water

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.262		0.162	0.164	1.00	0.197	pCi/L	10/28/24 08:58	11/19/24 09:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		30 - 110					10/28/24 08:58	11/19/24 09:42	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.730		0.404	0.409	1.00	0.573	pCi/L	10/28/24 09:03	11/18/24 12:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		30 - 110					10/28/24 09:03	11/18/24 12:07	1
Y Carrier	82.2		30 - 110					10/28/24 09:03	11/18/24 12:07	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.991		0.435	0.441	5.00	0.573	pCi/L		11/27/24 17:03	1

**Client Sample ID: FB-02**  
Date Collected: 10/14/24 19:08  
Date Received: 10/24/24 09:50

**Lab Sample ID: 160-55985-7**  
Matrix: Water

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0179	U	0.124	0.124	1.00	0.249	pCi/L	10/28/24 08:58	11/19/24 09:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		30 - 110					10/28/24 08:58	11/19/24 09:42	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.384	U	0.420	0.421	1.00	0.686	pCi/L	10/28/24 09:03	11/18/24 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		30 - 110					10/28/24 09:03	11/18/24 12:08	1
Y Carrier	79.3		30 - 110					10/28/24 09:03	11/18/24 12:08	1

# Client Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

**Client Sample ID: FB-02**

**Lab Sample ID: 160-55985-7**

Date Collected: 10/14/24 19:08

Matrix: Water

Date Received: 10/24/24 09:50

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.402	U	0.438	0.439	5.00	0.686	pCi/L		11/27/24 17:03	1

**Client Sample ID: EB-02**

**Lab Sample ID: 160-55985-8**

Date Collected: 10/14/24 20:01

Matrix: Water

Date Received: 10/24/24 09:50

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.142	U	0.145	0.145	1.00	0.227	pCi/L	10/28/24 08:58	11/19/24 09:42	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.3		30 - 110					10/28/24 08:58	11/19/24 09:42	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.174	U	0.280	0.280	1.00	0.478	pCi/L	10/28/24 09:03	11/18/24 12:08	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.3		30 - 110					10/28/24 09:03	11/18/24 12:08	1
Y Carrier	83.0		30 - 110					10/28/24 09:03	11/18/24 12:08	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.317	U	0.315	0.315	5.00	0.478	pCi/L		11/27/24 17:03	1

# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

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

**Lab Sample ID: MB 160-685406/1-A**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.04219	U	0.0735	0.0736	1.00	0.130	pCi/L	10/28/24 08:50	11/19/24 14:08	1
Carrier	MB MB		Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	%Yield	Qualifier	30 - 110					10/28/24 08:50	11/19/24 14:08	1

**Lab Sample ID: LCS 160-685406/2-A**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	9.58	9.532		1.05	1.00	0.139	pCi/L	100	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	86.8		30 - 110						

**Lab Sample ID: 160-55983-B-1-C DU**  
**Matrix: Water**  
**Analysis Batch: 689273**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 685406**

Analyte	Sample Sample		DU	DU	Total	RL	MDC	Unit	RER	RER Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					
Radium-226	-0.0420	U	-0.01553	U	0.0695	1.00	0.148	pCi/L		1
Carrier	DU %Yield	DU Qualifier	Limits							
Ba Carrier	94.1		30 - 110							

**Lab Sample ID: MB 160-685410/1-A**  
**Matrix: Water**  
**Analysis Batch: 689264**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 685410**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.07909	U	0.137	0.137	1.00	0.242	pCi/L	10/28/24 08:58	11/19/24 09:40	1
Carrier	MB MB		Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	%Yield	Qualifier	30 - 110					10/28/24 08:58	11/19/24 09:40	1

**Lab Sample ID: LCS 160-685410/2-A**  
**Matrix: Water**  
**Analysis Batch: 689264**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 685410**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	9.58	8.745		1.10	1.00	0.206	pCi/L	91	75 - 125

Eurofins St. Louis



# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

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

Lab Sample ID: LCS 160-685410/2-A  
Matrix: Water  
Analysis Batch: 689264

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 685410

	LCS	LCS	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	95.4		30 - 110

Lab Sample ID: 160-55986-A-9-C DU  
Matrix: Water  
Analysis Batch: 689273

Client Sample ID: Duplicate  
Prep Type: Total/NA  
Prep Batch: 685410

Analyte	Sample		DU		Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	Limit
	Result	Qual	Result	Qual						
Radium-226	0.302		0.3530		0.186	1.00	0.221	pCi/L	0.13	1

	DU	DU	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	103		30 - 110

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

Lab Sample ID: MB 160-685409/1-A  
Matrix: Water  
Analysis Batch: 688581

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 685409

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.8472		0.528	0.533	1.00	0.791	pCi/L	10/28/24 08:55	11/14/24 12:37	1

	MB	MB	Limits	Prepared	Analyzed	Dil Fac
Carrier	%Yield	Qualifier	Limits			
Ba Carrier	90.2		30 - 110	10/28/24 08:55	11/14/24 12:37	1
Y Carrier	80.0		30 - 110	10/28/24 08:55	11/14/24 12:37	1

Lab Sample ID: LCS 160-685409/2-A  
Matrix: Water  
Analysis Batch: 688429

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 685409

Analyte	Spike Added	LCS		Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
		Result	Qual						
Radium-228	8.34	9.177		1.53	1.00	0.900	pCi/L	110	75 - 125

	LCS	LCS	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	86.8		30 - 110
Y Carrier	81.1		30 - 110

Lab Sample ID: MB 160-685411/1-A  
Matrix: Water  
Analysis Batch: 689048

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 685411

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.9209		0.436	0.444	1.00	0.590	pCi/L	10/28/24 09:03	11/18/24 12:07	1

Eurofins St. Louis

# QC Sample Results

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

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

**Lab Sample ID: MB 160-685411/1-A**  
**Matrix: Water**  
**Analysis Batch: 689048**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 685411**

Carrier	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Yield	Qualifier				
Ba Carrier	84.4		30 - 110	10/28/24 09:03	11/18/24 12:07	1
Y Carrier	78.9		30 - 110	10/28/24 09:03	11/18/24 12:07	1

**Lab Sample ID: LCS 160-685411/2-A**  
**Matrix: Water**  
**Analysis Batch: 689048**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 685411**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits

Carrier	LCS LCS		Limits
	%Yield	Qualifier	
Ba Carrier	95.4		30 - 110
Y Carrier	83.4		30 - 110

**Lab Sample ID: 160-55986-A-9-D DU**  
**Matrix: Water**  
**Analysis Batch: 689048**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 685411**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit

Carrier	DU DU		Limits
	%Yield	Qualifier	
Ba Carrier	103		30 - 110
Y Carrier	83.7		30 - 110

**Lab Sample ID: MB 160-689277/1-A**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac

Carrier	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Yield	Qualifier				
Ba Carrier	93.4		30 - 110	11/19/24 08:45	11/27/24 12:04	1
Y Carrier	78.5		30 - 110	11/19/24 08:45	11/27/24 12:04	1

**Lab Sample ID: LCS 160-689277/2-A**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits

# QC Sample Results

Client: Consumers Energy  
 Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

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

**Lab Sample ID: LCS 160-689277/2-A**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Carrier	LCS	LCS	Limits
	%Yield	Qualifier	
Ba Carrier	85.0		30 - 110
Y Carrier	78.1		30 - 110

**Lab Sample ID: 380-122119-B-1-B DU**  
**Matrix: Water**  
**Analysis Batch: 690739**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 689277**

Analyte	Sample		DU		Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	Limit
	Result	Qual	Result	Qual						
Radium-228	0.334	U	-0.02550	U	0.315	1.00	0.372	pCi/L	0.54	1

Carrier	DU	DU	Limits
	%Yield	Qualifier	
Ba Carrier	77.2		30 - 110
Y Carrier	78.9		30 - 110

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

# QC Association Summary

Client: Consumers Energy  
Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

## Rad

### Prep Batch: 685406

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55985-1	JHC-MW-15006	Total/NA	Water	PrecSep-21	
160-55985-2	JHC-MW-15007R	Total/NA	Water	PrecSep-21	
MB 160-685406/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-685406/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
160-55983-B-1-C DU	Duplicate	Total/NA	Water	PrecSep-21	

### Prep Batch: 685409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55985-1	JHC-MW-15006	Total/NA	Water	PrecSep_0	
MB 160-685409/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-685409/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

### Prep Batch: 685410

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55985-3	JHC-MW-15008R	Total/NA	Water	PrecSep-21	
160-55985-4	JHC-MW-15009R	Total/NA	Water	PrecSep-21	
160-55985-5	JHC-MW-15011R	Total/NA	Water	PrecSep-21	
160-55985-6	DUP-02	Total/NA	Water	PrecSep-21	
160-55985-7	FB-02	Total/NA	Water	PrecSep-21	
160-55985-8	EB-02	Total/NA	Water	PrecSep-21	
MB 160-685410/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-685410/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
160-55986-A-9-C DU	Duplicate	Total/NA	Water	PrecSep-21	

### Prep Batch: 685411

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55985-3	JHC-MW-15008R	Total/NA	Water	PrecSep_0	
160-55985-4	JHC-MW-15009R	Total/NA	Water	PrecSep_0	
160-55985-5	JHC-MW-15011R	Total/NA	Water	PrecSep_0	
160-55985-6	DUP-02	Total/NA	Water	PrecSep_0	
160-55985-7	FB-02	Total/NA	Water	PrecSep_0	
160-55985-8	EB-02	Total/NA	Water	PrecSep_0	
MB 160-685411/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-685411/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
160-55986-A-9-D DU	Duplicate	Total/NA	Water	PrecSep_0	

### Prep Batch: 689277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-55985-2	JHC-MW-15007R	Total/NA	Water	PrecSep_0	
MB 160-689277/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-689277/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
380-122119-B-1-B DU	Duplicate	Total/NA	Water	PrecSep_0	

# Tracer/Carrier Summary

Client: Consumers Energy  
 Project/Site: JH Campbell Pond A Wells

Job ID: 160-55985-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
160-55983-B-1-C DU	Duplicate	94.1	
160-55985-1	JHC-MW-15006	96.6	
160-55985-2	JHC-MW-15007R	90.5	
160-55985-3	JHC-MW-15008R	83.4	
160-55985-4	JHC-MW-15009R	87.8	
160-55985-5	JHC-MW-15011R	84.1	
160-55985-6	DUP-02	85.3	
160-55985-7	FB-02	88.5	
160-55985-8	EB-02	99.3	
160-55986-A-9-C DU	Duplicate	103	
LCS 160-685406/2-A	Lab Control Sample	86.8	
LCS 160-685410/2-A	Lab Control Sample	95.4	
MB 160-685406/1-A	Method Blank	90.2	
MB 160-685410/1-A	Method Blank	84.4	

**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 (30-110)	Y (30-110)
160-55985-1	JHC-MW-15006	96.6	88.2
160-55985-2	JHC-MW-15007R	74.1	75.1
160-55985-3	JHC-MW-15008R	83.4	74.8
160-55985-4	JHC-MW-15009R	87.8	71.4
160-55985-5	JHC-MW-15011R	84.1	77.0
160-55985-6	DUP-02	85.3	82.2
160-55985-7	FB-02	88.5	79.3
160-55985-8	EB-02	99.3	83.0
160-55986-A-9-D DU	Duplicate	103	83.7
380-122119-B-1-B DU	Duplicate	77.2	78.9
LCS 160-685409/2-A	Lab Control Sample	86.8	81.1
LCS 160-685411/2-A	Lab Control Sample	95.4	83.4
LCS 160-689277/2-A	Lab Control Sample	85.0	78.1
MB 160-685409/1-A	Method Blank	90.2	80.0
MB 160-685411/1-A	Method Blank	84.4	78.9
MB 160-689277/1-A	Method Blank	93.4	78.5

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

# **Appendix B**

## **Data Quality Reviews**

# Laboratory Data Quality Review Groundwater Monitoring Event April 2024 Consumers Energy JH Campbell Background Wells

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the April 2024 sampling event. Samples were analyzed for total metals, anions, alkalinity, and total dissolved solids by CE Laboratory Services in Jackson, Michigan. Samples were analyzed for radium by Eurofins St. Louis, located in Earth City, Missouri. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 24-0278 and 160-53901-1.

During the April 2024 sampling event, a groundwater sample was collected from each of the following wells:

- JHC-MW-15023
- JHC-MW-15024
- JHC-MW-15025
- JHC-MW-15026
- JHC-MW-15027
- JHC-MW-15028

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Alkalinity (Total, Bicarbonate, Carbonate)	SM 2320B
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW846 6020B/7470A
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0/904.0

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

## Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020) and the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCS/LCSDs are used to assess the accuracy and precision of the analytical method using a clean matrix;

- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes;
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the total metals, anions, alkalinity, and TDS analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

## **Review Summary**

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- The reviewed Appendix III and IV constituents as well as alkalinity, iron, copper, magnesium, nickel, potassium, silver, sodium, vanadium, and zinc will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

## **QA/QC Sample Summary**

- Target analytes (radium only) were not detected in the method blanks.
- One equipment blank (EB-01) and one field blank (FB-01) were collected. Target analytes were not detected in these blank samples with the following exceptions.
  - Radium-226 (0.467 +/- 0.178 pCi/L) and radium-226/228 (0.678 +/- 0.358 pCi/L) were detected in sample FB-01 at the listed concentrations. Potential false positive exists for positive radium-226 and/or radium-226/228 results with normalized absolute differences <1.96, as summarized in Attachment A.
- LCS recoveries for target analytes (radium only) were within laboratory QC limits.



- MS and MSD analyses were performed on sample JHC-MW-15025 for total metals and anions. The recoveries were within the acceptance limits. Relative percent differences were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- Samples DUP-01/JHC-MW-15026 were submitted as the field duplicate pair with this data set; all criteria were met.
- Carrier recoveries were within 40-110%.

**Attachment A**

Summary of Data Non-Conformances for Groundwater Analytical Data  
JH Campbell Background- CCR Monitoring Program  
West Olive, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
JHC-MW-15027	4/15/2024	Radium-226 and Radium-226/228	Field blank contamination; potential false positive.
JHC-MW-15025	4/15/2024	Radium-226/228	

# Laboratory Data Quality Review Groundwater Monitoring Event October 2024 Consumers Energy JH Campbell Background Wells

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the October 2024 sampling event. Samples were analyzed for total metals, anions, alkalinity, and total dissolved solids by CE Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 24-0857.

During the October 2024 sampling event, a groundwater sample was collected from each of the following wells:

- JHC-MW-15023
- JHC-MW-15024
- JHC-MW-15025
- JHC-MW-15026
- JHC-MW-15027
- JHC-MW-15028

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Alkalinity (Total, Bicarbonate, Carbonate)	SM 2320B
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW846 6020B/7470A

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

## Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCS/LCSDs are used to assess the accuracy and precision of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;

- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes;
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the total metals, anions, alkalinity, and TDS analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

## **Review Summary**

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- The reviewed Appendix III and IV constituents as well as alkalinity, iron, copper, magnesium, nickel, potassium, silver, sodium, vanadium, and zinc will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

## **QA/QC Sample Summary**

- One equipment blank (EB-01) and one field blank (FB-01) were collected. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample JHC-MW-15025 for total metals and anions. The recoveries were within the acceptance limits. Relative percent differences were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- Samples DUP-01/JHC-MW-15023 were submitted as the field duplicate pair with this data set; all criteria were met.

# Laboratory Data Quality Review Groundwater Monitoring Event October 2024 Consumers Energy JH Campbell Pond A, GSI, and Supplemental Wells

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the October 2024 sampling event. Samples were analyzed for total and/or dissolved metals, anions, alkalinity, and total dissolved solids by CE Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 24-0859 and 24-0860.

During the October 2024 sampling event, a groundwater sample was collected from each of the following wells:

Pond A wells:

- JHC-MW-15006                      ■ JHC-MW-15007R                      ■ JHC-MW-15008R
- JHC-MW-15009R                      ■ JHC-MW-15011R

Supplemental wells:

- MW-14S                                  ■ PZ-23S                                  ■ PZ-24
- PZ-24S                                  ■ PZ-40                                  ■ PZ-40S
- TW-19-05                              ■ TW-19-06A

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Alkalinity (Total, Bicarbonate, Carbonate)	SM 2320B
Total Dissolved Solids (TDS)	SM 2540C
Total and/or Dissolved Metals	SW846 6020B/7470A

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

## Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;

- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCS/LCSDs are used to assess the accuracy and precision of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes;
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the total and dissolved metals, anions, alkalinity, and TDS analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

## **Review Summary**

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- The reviewed Appendix III and IV constituents as well as alkalinity, iron, copper, magnesium, nickel, potassium, silver, sodium, vanadium, and zinc will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

## **QA/QC Sample Summary**

- One equipment blank (EB-02) and one field blank (FB-02) were collected. Target analytes were not detected in these blank samples.

- MS and MSD analyses were performed on samples JHC-MW-15007R and TW-19-06A for total metals and anions. The recoveries were within the acceptance limits. Relative percent differences were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- Samples DUP-02/JHC-MW-15008R and DUP-07/PZ-23S were submitted as the field duplicate pairs with this data set; all criteria were met.

# Laboratory Data Quality Review Groundwater Monitoring Event April 2024 Consumers Energy JH Campbell Pond A and Supplemental Wells

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the April 2024 sampling event. Samples were analyzed for total and/or dissolved metals, anions, alkalinity, and total dissolved solids by CE Laboratory Services in Jackson, Michigan. Samples were analyzed for radium by Eurofins St. Louis, located in Earth City, Missouri. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 24-0279, 24-0281, 160-53903-1, and 160-53904-1.

During the April 2024 sampling event, a groundwater sample was collected from each of the following wells:

Pond A wells:

- JHC-MW-15006
- JHC-MW-15007R
- JHC-MW-15008R
- JHC-MW-15009R
- JHC-MW-15011R

Supplemental wells:

- MW-14S
- PZ-23S
- PZ-24
- PZ-24S
- PZ-40
- PZ-40S
- TW-19-05
- TW-19-06A

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Alkalinity (Total, Bicarbonate, Carbonate)	SM 2320B
Total Dissolved Solids (TDS)	SM 2540C
Total and/or Dissolved Metals	SW846 6020B/7470A
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0/904.0

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

## Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2020) and the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:



- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCS/LCSDs are used to assess the accuracy and precision of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes;
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the total and dissolved metals, anions, alkalinity, and TDS analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

## **Review Summary**

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- The reviewed Appendix III and IV constituents as well as alkalinity will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

## QA/QC Sample Summary

- Sample DUP-02 was preserved by the laboratory upon arrival for radium; however, the sample was prepared for analysis more than 16 hours after preservation. No impact on the data usability.
- Target analytes (radium only) were not detected in the method blanks.
- One equipment blank (EB-02) and one field blank (FB-02) were collected. Target analytes were not detected in these blank samples.
- LCS recoveries for target analytes (radium only) were within laboratory QC limits with the following exception.
  - The percent recovery (%R) (4%) for radium-226 in the LCS (LCS 160-659257/2-A) associated with sample JHC-MW-15008R was below the laboratory QC limits. The laboratory noted in the case narrative that this LCS was inadvertently not spiked. Therefore, accuracy for radium-226 in sample JHC-MW-15008R could not be evaluated.
  - The %R (126%) for radium-228 in LCS (LCS 160-659258/2-A) associated with all samples in SDG 160-53904-1 and samples JHC-MW15006, JHC-MW-15007R, JHC-MW-15008R, JHC-MW-15009R, JHC-MW-15011R, DUP-02, FB-02, and EB-02 in SDG 160-53903-1 was above the laboratory QC limits. Therefore, the positive results for radium-228 in the associated samples should be considered estimated with a potential high bias, as summarized in the attached table, Attachment A. However, it should be noted that the laboratory indicated in the case narrative that this recovery was within their in-house limits. Only the limits used in the QC section of the report were used to evaluate the data.
- MS and MSD analyses were performed on samples JHC-MW-15007R and TW-19-06A for total metals and anions. The recoveries were within the acceptance limits. Relative percent differences were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- A laboratory duplicate analysis was performed on sample JHC-MW-15008R for radium-226 and radium-228; all criteria were met.
- Samples DUP-02/JHC-MW-15009R and DUP-07/PZ-24S were submitted as the field duplicate pairs with this data set; all criteria were met with the following exception.
  - The relative percent difference for TDS (40.9%) was >30% in field duplicate pair DUP-07/PZ-24S. Therefore, the positive results for TDS should be considered estimated in all groundwater samples from SDG 24-0281, as summarized in the attached table, Attachment A.
- Carrier recoveries were within 40-110%.

**Attachment A**

Summary of Data Non-Conformances for Groundwater Analytical Data  
JH Campbell Pond A and Supplemental Wells  
West Olive, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
PZ-23S	4/16/2024	Radium-228	High laboratory control sample recovery; potential high bias exists for the listed results.
PZ-24S	4/16/2024		
JHC-MW-15009R	4/16/2024		
MW-14S	4/16/2024	Total dissolved solids	Field duplicate variability (relative percent difference above criteria); potential uncertainty exists for the listed results.
PZ-23S	4/17/2024		
PZ-24S	4/16/2024		
PZ-24	4/16/2024		
PZ-40S	4/17/2024		
PZ-40	4/17/2024		
TW-19-05	4/16/2024		
TW-19-06A	4/16/2024		
DUP-07	4/16/2024		

# **Appendix C**

## **April 2024 Assessment Monitoring Statistical Evaluation**

## Technical Memorandum

---

**Date:** July 31, 2024

**To:** Harold D. Register, Jr., Consumers Energy

**From:** Sarah Holmstrom, TRC  
Kristin Lowery, TRC  
Henry Schnaidt, TRC

**Project No.:** 514398.0000.0000 Phase 1 Task 2

**Subject:** Statistical Evaluation of April 2024 Assessment Monitoring Sampling Event, JH Campbell Bottom Ash Pond A CCR Unit, Consumers Energy Company, West Olive, Michigan

---

Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule<sup>1</sup> at the JH Campbell Power Plant (JHC) Bottom Ash Pond A. The first semiannual assessment monitoring event of 2024 was conducted from April 15 through 17, 2024. In accordance with §257.95, the assessment monitoring data must be compared to Groundwater Protection Standards (GWPSs) to determine whether or not Appendix IV constituents are detected at statistically significant levels above the GWPSs. GWPSs were established in accordance with §257.95(h), as detailed in the October 15, 2018 Groundwater Protection Standards technical memorandum, which was also included in the 2018 Annual Groundwater Monitoring Report (2018 Annual Report) (TRC, January 2019). The following narrative describes the methods that were employed for comparisons to the GWPSs. The results obtained and the Sanitas™ output files are included as an attachment.

The statistical evaluation of the first semiannual assessment monitoring event for 2024 indicates that no constituents are present at statistically significant levels exceeding the GWPSs in downgradient monitoring wells at the Pond A CCR Unit.

<u>Constituent</u>	<u>GWPS</u>	<u># Downgradient Wells Observed</u>
--------------------	-------------	--------------------------------------

No constituents are present at statistically significant levels above the GWPSs.

These results are generally consistent with the results of the previous assessment monitoring data statistical evaluation, with no new statistically significant levels above the GWPSs. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

---

<sup>1</sup> USEPA final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) published April 17, 2015, as amended.

## Technical Memorandum

### Assessment Monitoring Statistical Evaluation

The downgradient compliance well network at Pond A consists of five wells (JHC-MW-15006, JHC-MW-15007R, JHC-MW-15008R, JHC-MW-15009R and JHC-MW-150011R) located south and east of Pond A. As discussed in the *2019 Annual Groundwater Monitoring and Corrective Action Report and Fourth Quarter 2019 Hydrogeological Monitoring Report* for the Pond A CCR Unit dated January 2020, monitoring well JHC-MW-15008 was decommissioned and replacement monitoring well JHC-MW-15008R was installed in June 2019. As detailed in the *2021 Annual Groundwater Monitoring and Corrective Action Report, JH Campbell Power Plant, Pond A* (TRC, January 2022), monitoring wells JHC-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned and replacement monitoring wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed in July 2021 and JHC-MW-15010 was removed from the monitoring program. For the purposes of statistical evaluation, the data sets from the replacement monitoring wells have been pooled with the former monitoring wells given that the wells were replaced to reset the screens at a lower elevation and data integrity was maintained before and after replacement. Use of the combined dataset is denoted with the “/R” to denote data from the original and replacement well are being used in the analysis.

Following the first semiannual assessment monitoring sampling event for 2024, compliance well data for Pond A were evaluated in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, October 2017). An assessment monitoring program was developed to evaluate concentrations of CCR constituents present in the uppermost aquifer relative to acceptable levels (i.e. GWPSs). To evaluate whether or not a GWPS exceedance is statistically significant, the difference in concentration observed at the downgradient wells during a given assessment monitoring event compared to the GWPS must be large enough, after accounting for variability in the sample data, that the result is unlikely to have occurred merely by chance. Consistent with the Unified Guidance<sup>2</sup>, the preferred method for comparisons to a fixed standard is confidence limits. An exceedance of the standard occurs when the 99 percent lower confidence level of the downgradient data exceeds the GWPS. Based on the number of historical observations in the representative sample population, the sample mean, the sample standard deviation, and a selected confidence level (i.e. 99 percent), an upper and lower confidence limit is calculated. The actual mean concentration of the population, with 99 percent confidence, will fall between the lower and upper confidence limits.

The concentrations observed in the downgradient wells are deemed to be a statistically significant exceedance when the 99 percent lower confidence limit of the downgradient data exceeds the GWPS. If the confidence interval straddles the GWPS (i.e. the lower confidence level is below the GWPS but the upper confidence level is above), the statistical test result indicates that there is insufficient confidence that the measured concentrations are different from the GWPS and thus there is no compelling evidence that the measured concentration is a result of a release from the CCR unit versus the inherent variability of the sample data. This statistical approach is consistent with the statistical methods for assessment monitoring presented in §257.93(f) and (g). Statistical evaluation methodologies built into the CCR Rule, and numerous other federal rules, are key in determining whether or not individually measured data points represent a concentration increase over the baseline or a fixed standard (such as a GWPS in an assessment monitoring program).

---

<sup>2</sup> USEPA. 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Conservation and Recovery. EPA 530/R-09-007.

## Technical Memorandum

For each detected Appendix IV constituent, the concentrations for each well were first compared directly to the GWPS, as shown on Table 1. Constituent-well combinations that included a direct exceedance of the GWPS within the past eight monitoring events (October 2020 through April 2024 for JHC-MW-15006, JHC-MW-15008/R, and JHC-MW-15011/R and April 2019 through April 2024 for JHC-MW-15007/R and JHC-MW-15009/R) were retained for further analysis (Attachment 1). Direct comparison GWPS exceedances included the following constituent-well combinations:

- Selenium at JHC-MW-15008/R;
- Selenium at JHC-MW-15009/R; and,
- Arsenic and selenium at JHC-MW-15011/R.

Groundwater data for the constituent-well combinations with direct-comparison exceedances of a GWPS were then evaluated utilizing Sanitas™ statistical software. Sanitas™ is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the Sanitas™ statistical program, confidence limits were used to perform the statistical comparison of compliance data to a fixed standard. Parametric or non-parametric confidence intervals were calculated, as appropriate, for each of the CCR Appendix IV parameters using a 99 percent confidence level, i.e., a significance level ( $\alpha$ ) of 0.01. The following narrative describes the methods employed, the results obtained and the Sanitas™ output files are included as an attachment.

The statistical data evaluation included the following steps:

- Review of data quality checklists for the data sets;
- Graphical representation of the monitoring data as time versus concentration by well-constituent pair;
- Outlier testing of individual data points that appear from the graphical representations as potential outliers;
- Evaluation of visual trends apparent in the graphical representations for statistical significance;
- Evaluation of percentage of non-detects for each well-constituent pair;
- Distribution of the data; and
- Calculation of the confidence intervals for each cumulative dataset.

The results of these evaluations are presented and discussed below.

Data from each round were evaluated for completeness, overall quality, and usability and were deemed appropriate for the purposes of the CCR assessment monitoring program.

Initially, the results for these well-constituent pairs were observed visually for potential outliers and trends. No outliers were apparent. Visual decreasing trends were observed for arsenic in JH-MW-15011/R and selenium in JHC-MW-15008/R (time-series plots in Attachment 1); however, the trends were not statistically significant. Groundwater conditions are re-equilibrating following capping activities at Pond A that were completed in Summer 2019. Because hydrogeologic conditions are in the process of stabilizing, temporary trending and sporadic outlier data are not unexpected. Therefore, all data is used in the statistical evaluation.

## Technical Memorandum

The Sanitas™ software was then used to test compliance at the downgradient monitoring wells using the confidence interval method for the most recent eight compliance events. Eight independent sampling events provide the appropriate density of data as recommended per the Unified Guidance yet are collected recently enough to provide an indication of current condition. The tests were run with a per-well significance of  $\alpha = 0.01$ . The software outputs are included in Attachment 1 along with data reports showing the values used for the evaluation. Non-detect data was handled in accordance with the Stats Plan for the purposes of calculating the confidence intervals.

The Sanitas™ software generates an output that includes graphs of the parametric or non-parametric confidence intervals for each well along with notes on data transformations, as appropriate. Data distributions were as follows:

Distribution	Parameter-Well Combinations
Normal	Arsenic at JHC-MW-15011/R
Normalized by natural log transformation	Selenium at JHC-MW-15008/R
Normalized by square root transformation	Selenium at JHC-MW-15009/R and JHC-MW-15011/R

The confidence interval test compares the lower confidence limit to the GWPS. The statistical evaluation of the Appendix IV constituents shows no statistically significant exceedances of the GWPSs. Arsenic was identified at downgradient monitoring well JHC-MW-15011 at statistically significant levels exceeding the GWPS during the initial assessment monitoring event conducted in June 2018. As shown in Table 1 and Attachment 1, arsenic concentrations in this well declined in 2020 and 2021 and the lower confidence limit has been below the GWPS since the second semiannual event of 2021. Consumers Energy continues to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

### Attachments

Table 1	Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation
Attachment 1	Sanitas™ Output



# Table 1

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15006								
Sample Date:			10/22/2020	10/22/2020	4/13/2021	10/21/2021	4/14/2022	10/18/2022	4/11/2023	10/17/2023	4/16/2024
Constituent	Unit	GWPS									
<b>Appendix III</b>				Field Dup							
Boron	ug/L	NA	272	331	288	371	676	765	670	757	609
Calcium	mg/L	NA	87.2	84.3	82.0	84.5	59.2	67.2	68.8	75.7	67.8
Chloride	mg/L	NA	22.0	22.2	22.9	19.6	17.0	18.3	13.3	18.3	12.5
Fluoride	ug/L	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	253	251	257	217	101	179	98.3	204	80.6
Total Dissolved Solids	mg/L	NA	515	511	497	485	341	458	385	552	393
pH, Field	SU	NA	7.5	--	7.7	7.8	7.8	8.3	7.8	8.2	8.0
<b>Appendix IV</b>											
Antimony	ug/L	6	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	<b>10</b>	9	6	3	6	7	7	7	8	9
Barium	ug/L	2,000	382	194	188	211	139	151	144	162	157
Beryllium	ug/L	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	5	1	3	2	1	< 1	1	< 1	2
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	15	14	12	13	13	13	12	14	15
Mercury	ug/L	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	38	37	54	48	17	24	12	19	15
Radium-226/228	pCi/L	5.00	0.318	0.453	0.673	0.634	0.395	0.663	< 0.879	0.643	< 0.517
Selenium	ug/L	<b>50</b>	2	1	< 1	1	5	4	16	32	25
Thallium	ug/L	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15007 <sup>(3)</sup>					JHC-MW-15007R <sup>(3)</sup>						
Sample Date:			4/24/2019	10/9/2019 <sup>(2)</sup>	4/14/2020	10/22/2020 <sup>(2)</sup>	4/13/2021 <sup>(2)</sup>	10/21/2021	10/21/2021	4/14/2022	10/18/2022	4/11/2023	10/17/2023	4/16/2024
Constituent	Unit	GWPS						Field Dup						
<b>Appendix III</b>														
Boron	ug/L	NA	190	--	242	--	--	956	1,000	1,370	1,350	1,290	1,630	1,900
Calcium	mg/L	NA	79	--	62.1	--	--	68.5	72.6	66.5	69.5	77.9	68.3	56.6
Chloride	mg/L	NA	23	--	14.1	--	--	13.9	14.2	11.3	12.4	13.1	17	13.9
Fluoride	ug/L	NA	< 1,000	--	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	54	--	83.0	--	--	101	104	69.3	102	143	118	88.4
Total Dissolved Solids	mg/L	NA	360	--	336	--	--	418	419	355	430	475	453	414
pH, Field	SU	NA	7.4	--	7.0	--	--	8.0	--	8.1	8.0	7.7	7.9	8.0
<b>Appendix IV</b>														
Antimony	ug/L	6	< 1.0	--	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	<b>10</b>	4.0	--	3	--	--	7	7	8	7	5	7	6
Barium	ug/L	2,000	320	--	266	--	--	219	224	215	249	281	233	211
Beryllium	ug/L	4	< 1.0	--	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	< 0.20	--	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	35	--	2	--	--	1	2	2	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6.0	--	< 15	--	--	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	--	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1.0	--	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	12	--	14	--	--	13	13	16	14	15	14	15
Mercury	ug/L	2	< 0.20	--	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	7.2	--	< 5	--	--	16	16	14	18	23	27	52
Radium-226/228	pCi/L	5.00	0.609	--	< 0.456	--	--	0.583	0.483	0.780	0.786	< 0.608	0.862	0.925
Selenium	ug/L	<b>50</b>	4.1	--	22	--	--	4	4	2	7	4	9	8
Thallium	ug/L	2	< 2.0	--	< 2	--	--	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15008R <sup>(1)</sup>								
Sample Date:			10/22/2020	4/13/2021	4/13/2021	10/21/2021	4/14/2022	10/18/2022	4/10/2023	10/17/2023	4/16/2024
Constituent	Unit	GWPS									
<b>Appendix III</b>					Field Dup						
Boron	ug/L	NA	285	352	360	786	1,320	1,680	1,300	1,260	1,190
Calcium	mg/L	NA	109	85.4	87.0	77.2	61.6	71.6	75.7	52.9	56
Chloride	mg/L	NA	18.8	17.2	17.1	15.7	12.2	13.6	13.4	15.5	14.7
Fluoride	ug/L	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	215	185	186	112	80.3	85.3	107	67	80.2
Total Dissolved Solids	mg/L	NA	577	517	512	443	337	397	402	323	379
pH, Field	SU	NA	7.0	7.1	--	7.2	7.1	7.3	6.9	7.2	7.2
<b>Appendix IV</b>											
Antimony	ug/L	6	1	1	< 1	1	1	1	1	1	1
Arsenic	ug/L	<b>10</b>	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	216	200	195	167	151	167	172	121	142
Beryllium	ug/L	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	41	56	< 1	2	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	19	20	21	19	20	20	18	18	18
Mercury	ug/L	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	5	17	19	26	26	27	27	18	23
Radium-226/228	pCi/L	5.00	0.883	0.496	0.780	0.661	0.485	1.26	< 0.640	< 0.517	0.548
Selenium	ug/L	<b>50</b>	<b>68</b>	6	6	20	10	16	6	11	7
Thallium	ug/L	2	< 2	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15009 <sup>(3)</sup>							JHC-MW-15009R <sup>(3)</sup>									
Sample Date:			4/24/2019	4/24/2019	10/9/2019 <sup>(2)</sup>	4/14/2020	4/14/2020	10/22/2020 <sup>(2)</sup>	4/13/2021 <sup>(2)</sup>	10/21/2021	4/13/2022	10/18/2022	10/18/2022	4/10/2023	4/10/2023	10/17/2023	10/17/2023	4/16/2024	4/16/2024
Constituent	Unit	GWPS	Field Dup			Field Dup					Field Dup			Field Dup			Field Dup		
<b>Appendix III</b>				Field Dup			Field Dup					Field Dup			Field Dup			Field Dup	
Boron	ug/L	NA	200	190	--	874	881	--	--	1,680	1,670	928	969	1,010	1,010	1,230	1,250	2,120	2,080
Calcium	mg/L	NA	92	89	--	78.7	79.9	--	--	58.7	64.8	58.8	59.4	90.8	89.4	74.1	71.5	85.6	83.6
Chloride	mg/L	NA	17	16	--	6.95	6.78	--	--	12.1	15.4	13.3	13.3	9.24	9.88	11.2	11.2	7.46	7.74
Fluoride	ug/L	NA	< 1,000	< 1,000	--	< 1,000	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	130	130	--	49.1	49.9	--	--	25.7	38.3	28.1	28.3	57.8	57.9	33.1	32.9	55.7	58.8
Total Dissolved Solids	mg/L	NA	430	440	--	354	341	--	--	301	292	298	271	368	380	318	310	392	427
pH, Field	SU	NA	7.4	--	--	7.2	--	--	--	7.1	6.9	7.2	--	6.7	--	6.9	--	6.9	--
<b>Appendix IV</b>																			
Antimony	ug/L	6	< 1.0	< 1.0	--	1	1	--	--	< 1	< 1	1	< 1	2	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	<b>10</b>	< 1.0	< 1.0	--	< 1	< 1	--	--	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	360	360	--	307	298	--	--	286	206	225	234	281	282	273	270	342	332
Beryllium	ug/L	4	< 1.0	< 1.0	--	< 1	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	< 0.20	< 0.20	--	< 0.2	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	17	14	--	1	1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1
Cobalt	ug/L	15	< 6.0	< 6.0	--	< 15	< 15	--	--	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	--	< 1,000	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1.0	< 1.0	--	< 1	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	11	11	--	14	14	--	--	15	15	12	12	14	15	13	13	16	16
Mercury	ug/L	2	< 0.20	< 0.20	--	< 0.2	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	5.7	5.6	--	< 5	< 5	--	--	5	9	10	9	19	20	9	9	7	7
Radium-226/228	pCi/L	5.00	1.02	0.798	--	0.967	0.767	--	--	0.728	0.622	< 0.465	< 0.520	< 0.610	< 0.490	0.969	< 0.491	1.10	< 0.589
Selenium	ug/L	<b>50</b>	<b>61</b>	<b>63</b>	--	<b>77</b>	<b>79</b>	--	--	<b>62</b>	<b>7</b>	<b>58</b>	<b>64</b>	<b>64</b>	<b>63</b>	<b>155</b>	<b>155</b>	<b>242</b>	<b>238</b>
Thallium	ug/L	2	< 2.0	< 2.0	--	< 2	< 2	--	--	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**  
 ug/L - micrograms per liter; mg/L - milligrams per liter.  
 pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.  
 -- - not analyzed.  
 GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.  
**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.  
 All metals were analyzed as total unless otherwise specified.  
 (1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.  
 (2) Not sampled; insufficient amount of groundwater present to collect sample.  
 (3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15011 <sup>(3)</sup>		JHC-MW-15011R <sup>(3)</sup>						
Sample Date:			10/22/2020	4/13/2021	10/21/2021	4/13/2022	4/13/2022	10/18/2022	4/11/2023	10/17/2023	4/16/2024
Constituent	Unit	GWPS					Field Dup				
<b>Appendix III</b>											
Boron	ug/L	NA	4,120	5,070	2,150	3,780	3,910	3,050	2,310	3,420	3,400
Calcium	mg/L	NA	122	78.7	51.0	57.6	56.2	45.5	79.1	47.2	60.2
Chloride	mg/L	NA	3.79	2.65	13.5	14.6	14.6	9.79	8.05	8.27	6.83
Fluoride	ug/L	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	141	113	45.0	56.6	56.3	46.2	87.5	56.7	63.9
Total Dissolved Solids	mg/L	NA	546	359	195	276	269	253	373	238	335
pH, Field	SU	NA	7.6	7.2	8.0	7.0	--	7.7	6.8	7.0	7.0
<b>Appendix IV</b>											
Antimony	ug/L	6	2	< 1	< 1	1	1	< 1	2	< 1	2
Arsenic	ug/L	<b>10</b>	<b>22</b>	<b>13</b>	3	7	7	<b>11</b>	5	7	8
Barium	ug/L	2000	430	399	131	197	203	185	342	264	382
Beryllium	ug/L	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	0.5	0.8	< 0.2	0.2	0.2	< 0.2	0.2	< 0.2	0.3
Chromium	ug/L	100	< 1	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	17	14	< 10	18	19	16	23	17	23
Mercury	ug/L	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	< 5	8	13	16	15	16	21	19	18
Radium-226/228	pCi/L	5.00	0.497	0.923	0.585	0.434	0.402	< 0.462	< 0.552	0.547	0.674
Selenium	ug/L	<b>50</b>	<b>308</b>	<b>143</b>	4	40	40	<b>76</b>	<b>64</b>	<b>79</b>	<b>77</b>
Thallium	ug/L	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

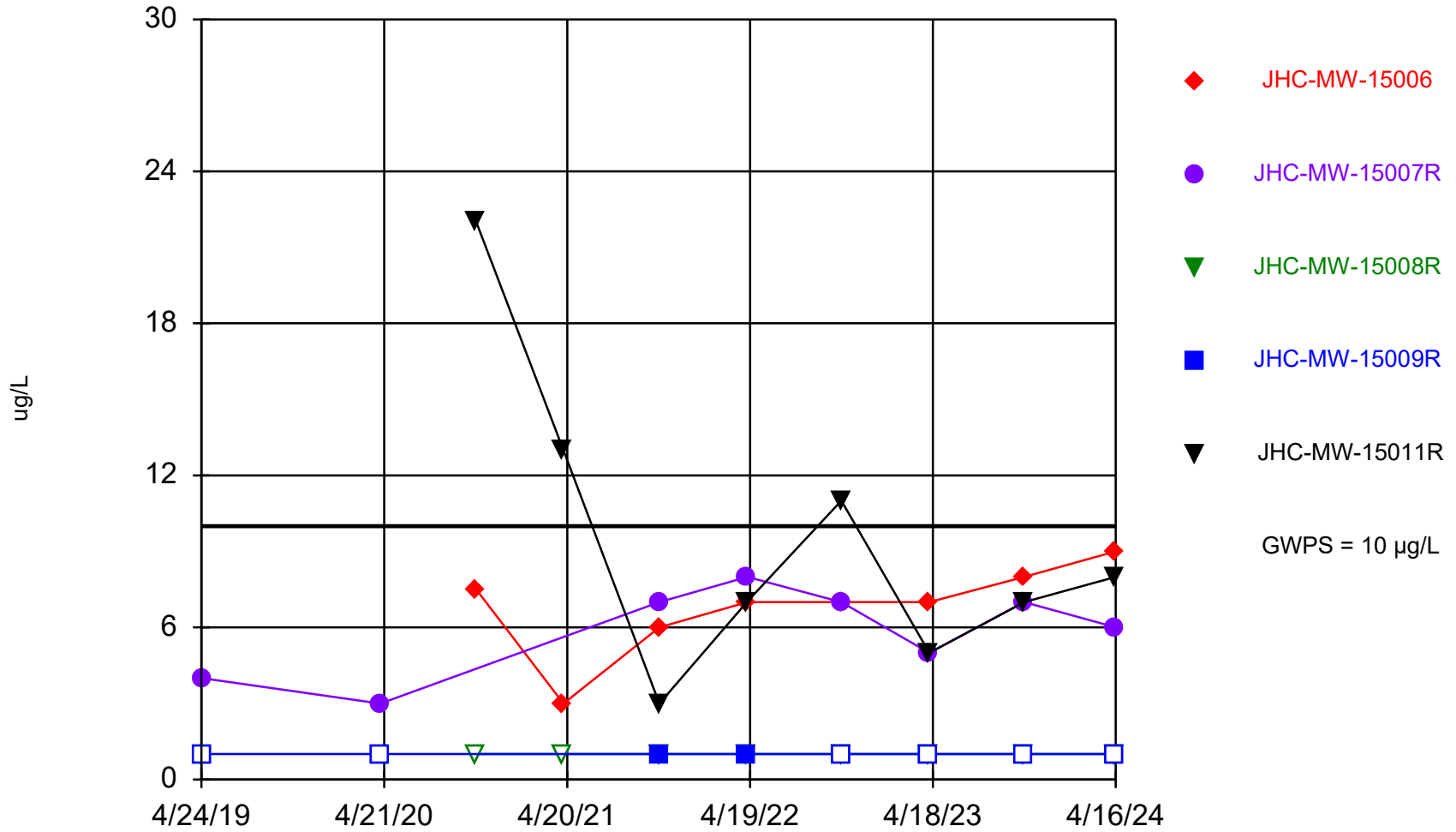
(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

# **Attachment 1**

## **Sanitas™ Output**

### Arsenic Comparison to GWPS

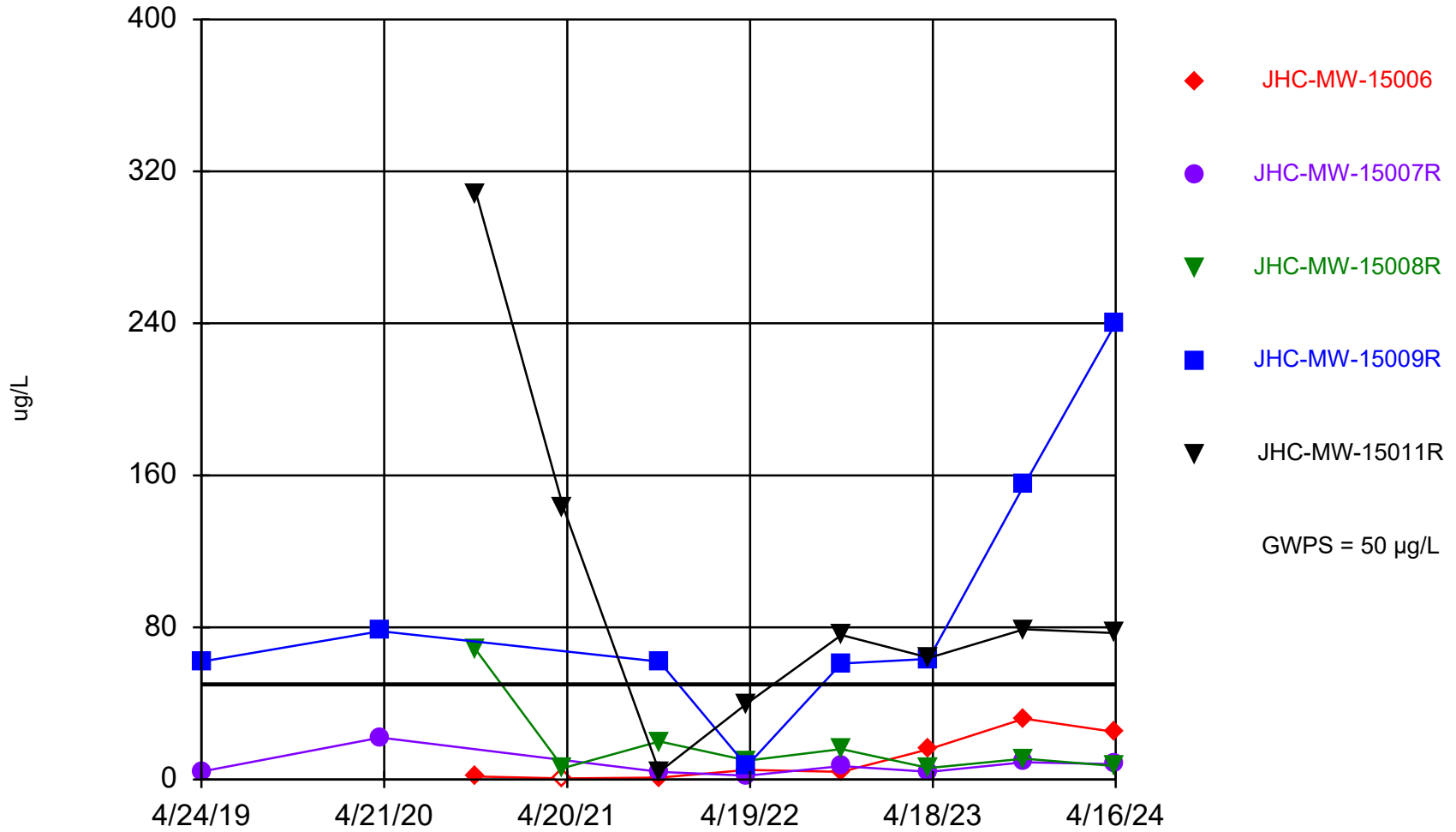


Time Series Analysis Run 6/11/2024 3:08 PM

Data: 2Q24\_JHC\_Sanitas



### Selenium Comparison to GWPS



Time Series Analysis Run 6/11/2024 3:12 PM

Data: 2Q24\_JHC\_Sanitas

# Summary Report

Constituent: Arsenic, Total Analysis Run 6/11/2024 3:11 PM  
Data: 2Q24\_JHC\_Sanitas

For observations made between 4/24/2019 and 4/16/2024, a summary of the selected data set:

Observations = 40  
 NDs = 35%  
 Wells = 5  
 Minimum Value = 1  
 Maximum Value = 22  
 Mean Value = 4.838  
 Median Value = 4.5  
 Standard Deviation = 4.357  
 Coefficient of Variation = 0.9006  
 Skewness = 1.627

<u>Well</u>	<u>#Obs.</u>	<u>NDs</u>	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	<u>Std.Dev.</u>	<u>CV</u>	<u>Skewness</u>
JHC-MW-15006	8	0%	3	9	6.813	7	1.772	0.26	-1.194
JHC-MW-15007R	8	0%	3	8	5.875	6.5	1.727	0.2939	-0.5088
JHC-MW-15008R	8	100%	1	1	1	1	0	0	NaN
JHC-MW-15009R	8	75%	1	1	1	1	0	0	NaN
JHC-MW-15011R	8	0%	3	22	9.5	7.5	5.952	0.6265	1.158

# Summary Report

Constituent: Selenium, Total Analysis Run 6/11/2024 3:12 PM  
Data: 2Q24\_JHC\_Sanitas

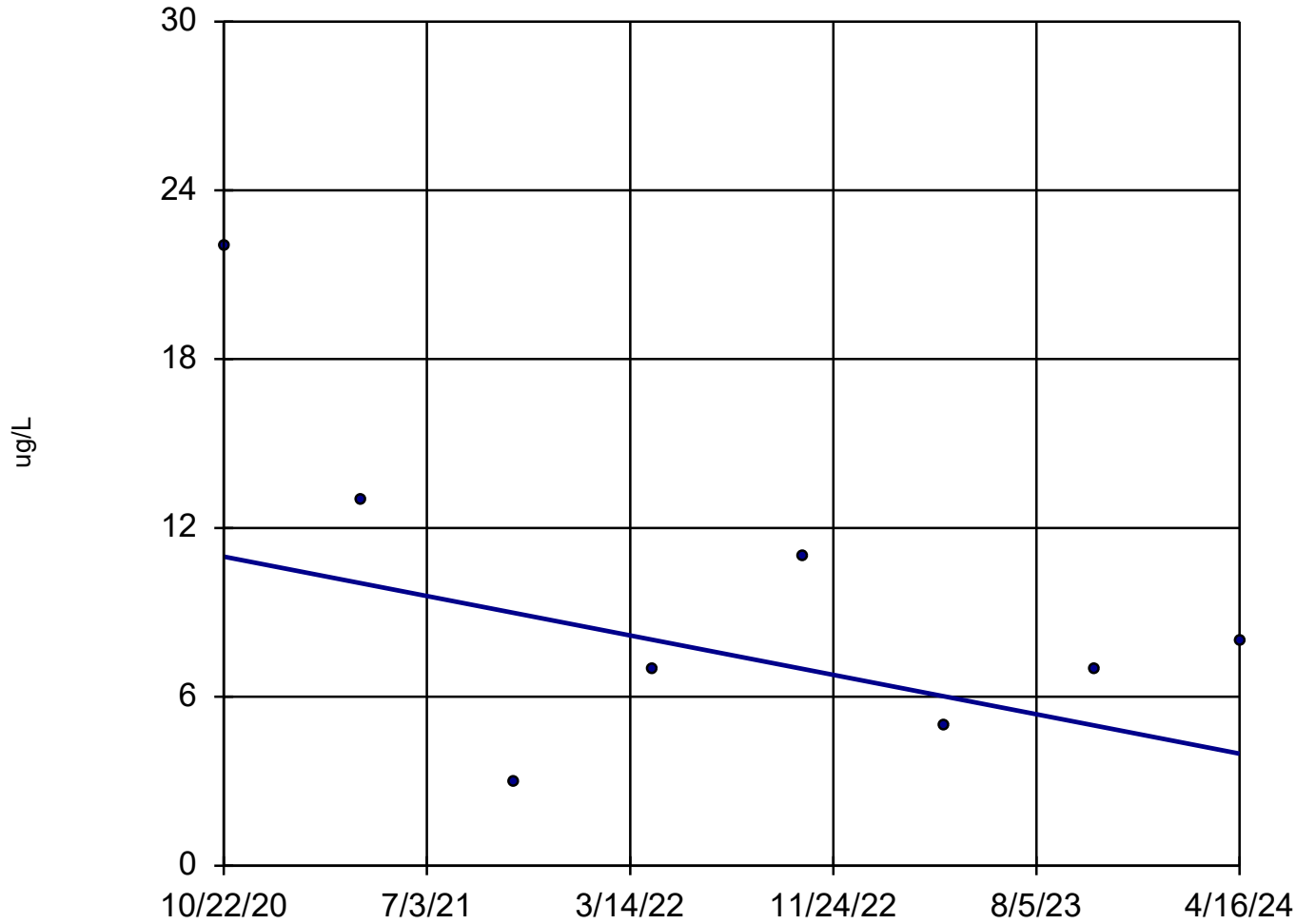
For observations made between 4/24/2019 and 4/16/2024, a summary of the selected data set:

Observations = 40  
NDs = 2%  
Wells = 5  
Minimum Value = 1  
Maximum Value = 308  
Mean Value = 45.23  
Median Value = 16  
Standard Deviation = 65.76  
Coefficient of Variation = 1.454  
Skewness = 2.434

<u>Well</u>	<u>#Obs.</u>	<u>NDs</u>	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	<u>Std.Dev.</u>	<u>CV</u>	<u>Skewness</u>
JHC-MW-15006	8	12%	1	32	10.69	4.5	12.17	1.139	0.821
JHC-MW-15007R	8	0%	2	22	7.513	5.55	6.317	0.8408	1.666
JHC-MW-15008R	8	0%	6	68	18	10.5	20.81	1.156	2.024
JHC-MW-15009R	8	0%	7	240	91.06	62.75	72.57	0.7969	1.148
JHC-MW-15011R	8	0%	4	308	98.88	76.5	93.17	0.9423	1.53

# Arsenic, Total

## JHC-MW-15011R



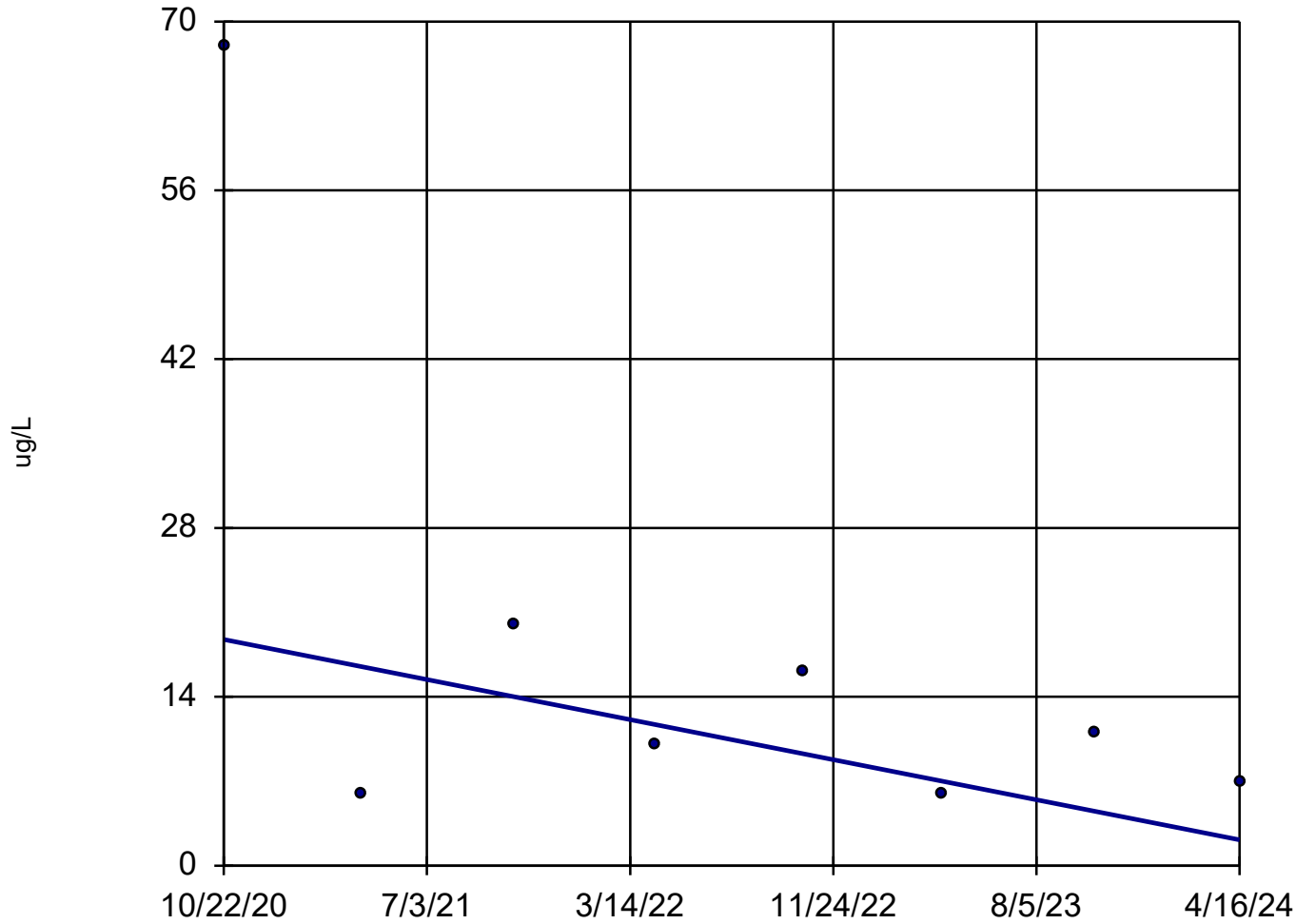
n = 8  
Slope = -2.008  
units per year.  
Mann-Kendall  
statistic = -7  
critical = -20  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Sen's Slope Estimator Analysis Run 6/11/2024 3:15 PM

Data: 2Q24\_JHC\_Sanitas

# Selenium, Total

## JHC-MW-15008R



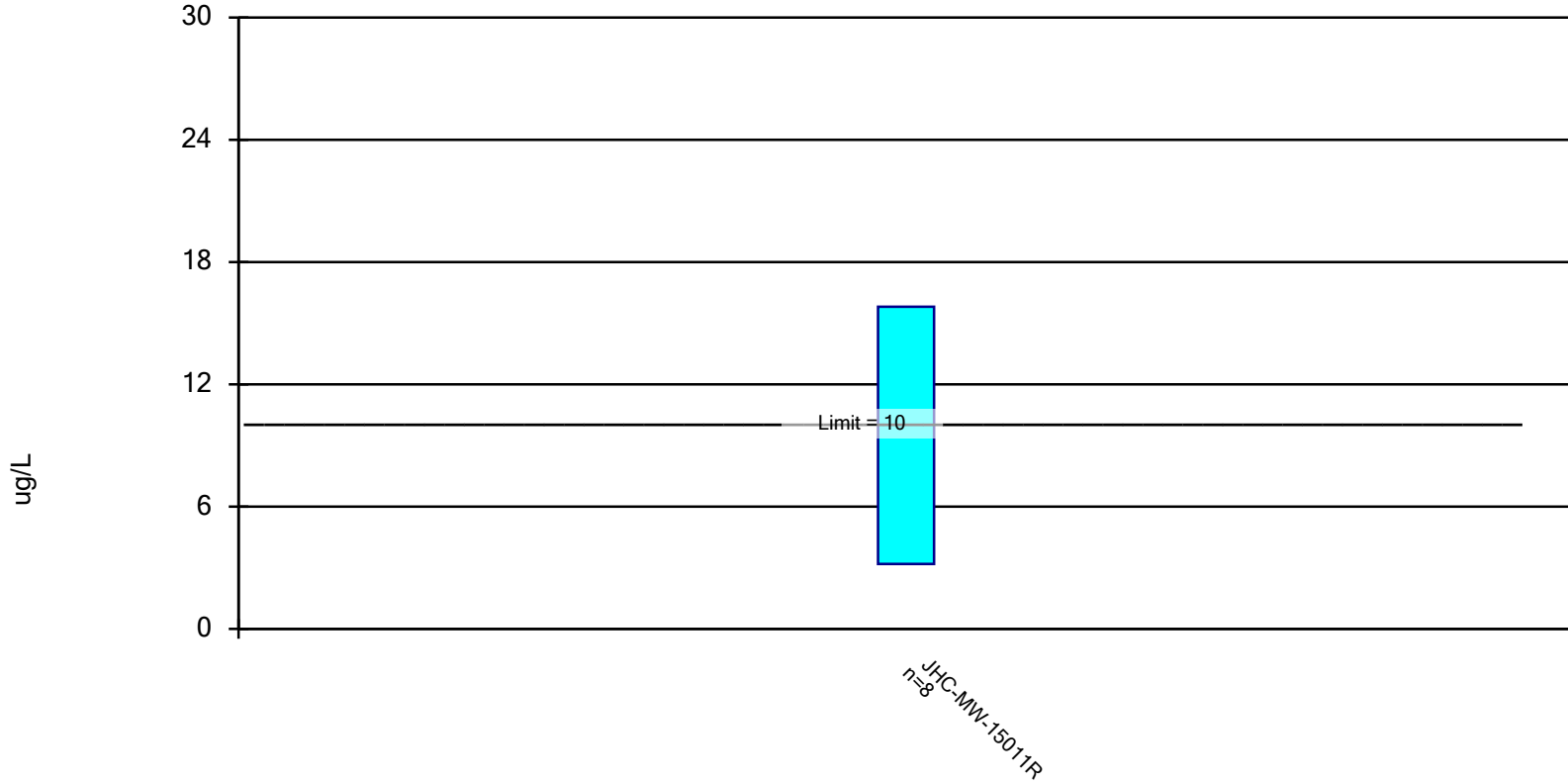
n = 8  
Slope = -4.769  
units per year.  
Mann-Kendall  
statistic = -9  
critical = -20  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Sen's Slope Estimator Analysis Run 6/11/2024 3:14 PM

Data: 2Q24\_JHC\_Sanitas

## Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, Total Analysis Run 6/11/2024 3:18 PM

Data: 2Q24\_JHC\_Sanitas

# Confidence Interval

Constituent: Arsenic, Total (ug/L) Analysis Run 6/11/2024 3:19 PM

Data: 2Q24\_JHC\_Sanitas

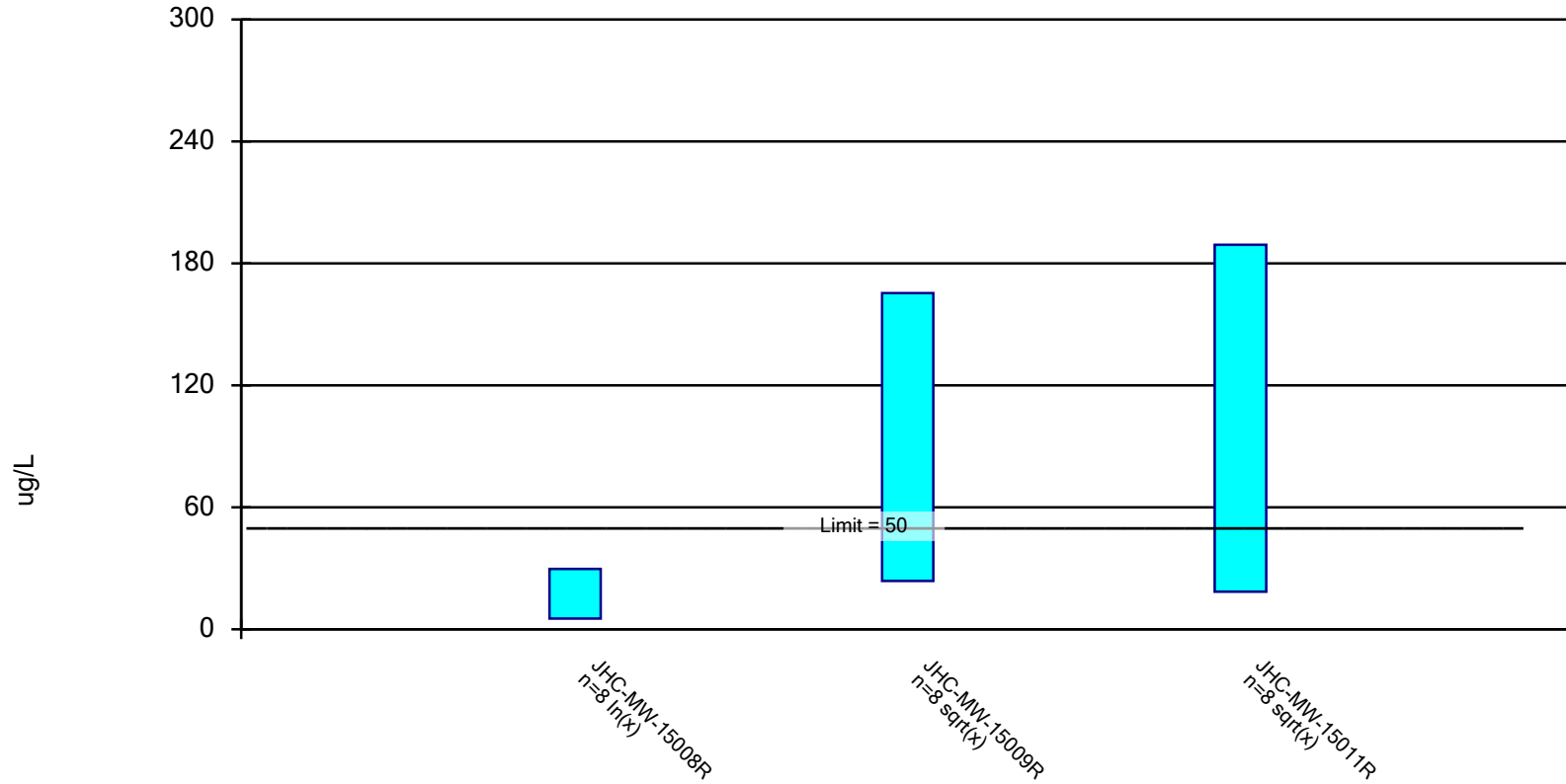
---

JHC-MW-15011R

10/22/2020	22
4/13/2021	13
10/21/2021	3
4/13/2022	7 (D)
10/18/2022	11
4/11/2023	5
10/17/2023	7
4/16/2024	8
Mean	9.5
Std. Dev.	5.952
Upper Lim.	15.81
Lower Lim.	3.191

## Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, Total Analysis Run 6/11/2024 3:33 PM

Data: 2Q24\_JHC\_Sanitas



# Confidence Interval

Constituent: Selenium, Total (ug/L) Analysis Run 6/11/2024 3:33 PM

Data: 2Q24\_JHC\_Sanitas

---

	JHC-MW-15008R	JHC-MW-15009R	JHC-MW-15011R
4/24/2019		62 (D)	
4/14/2020		78 (D)	
10/22/2020	68		308
4/13/2021	6 (D)		143
10/21/2021	20	62	4
4/13/2022		7	40 (D)
4/14/2022	10		
10/18/2022	16	61 (D)	76
4/10/2023	6	63.5 (D)	
4/11/2023			64
10/17/2023	11	155 (D)	79
4/16/2024	7	240 (D)	77
Mean	18	91.06	98.88
Std. Dev.	20.81	72.57	93.17
Upper Lim.	29.64	165.4	189.1
Lower Lim.	5.286	23.77	18.5

# **Appendix D**

## **October 2024 Assessment Monitoring Statistical Evaluation**

## Technical Memorandum

---

**Date:** January 30, 2025

**To:** Harold D. Register, Jr., Consumers Energy

**From:** Sarah Holmstrom, TRC  
Kristin Lowery, TRC  
Henry Schnaidt, TRC

**Project No.:** 553811.0000.0000 Phase 1 Task 2

**Subject:** Statistical Evaluation of October 2024 Assessment Monitoring Sampling Event, JH Campbell Bottom Ash Pond A CCR Unit, Consumers Energy Company, West Olive, Michigan

---

Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule<sup>1</sup> at the JH Campbell Power Plant Bottom Ash Pond A (Pond A). The second semiannual assessment monitoring event of 2024 was conducted from October 14 through 15, 2024. In accordance with §257.95, the assessment monitoring data must be compared to Groundwater Protection Standards (GWPSs) to determine whether or not Appendix IV constituents are detected at statistically significant levels above the GWPSs. GWPSs were established in accordance with §257.95(h), as detailed in the October 15, 2018 Groundwater Protection Standards technical memorandum, which was also included in the 2018 Annual Groundwater Monitoring Report (2018 Annual Report) (TRC, January 2019). The following narrative describes the methods that were employed for comparisons to the GWPSs. The results obtained and the Sanitas™ output files are included as an attachment.

The statistical evaluation of the second semiannual assessment monitoring event for 2024 indicates that no constituents are present at statistically significant levels exceeding the GWPSs in downgradient monitoring wells at the Pond A CCR Unit.

<u>Constituent</u>	<u>GWPS</u>	<u># Downgradient Wells Observed</u>
--------------------	-------------	--------------------------------------

No constituents are present at statistically significant levels above the GWPSs.

These results are generally consistent with the results of the previous assessment monitoring data statistical evaluation, with no new statistically significant levels above the GWPSs. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

---

<sup>1</sup> USEPA final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) published April 17, 2015, as amended.

## Technical Memorandum

### Assessment Monitoring Statistical Evaluation

The downgradient compliance well network at Pond A consists of five wells (JHC-MW-15006, JHC-MW-15007R, JHC-MW-15008R, JHC-MW-15009R and JHC-MW-150011R) located south and east of Pond A. As discussed in the *2019 Annual Groundwater Monitoring and Corrective Action Report and Fourth Quarter 2019 Hydrogeological Monitoring Report* for the Pond A CCR Unit dated January 2020, monitoring well JHC-MW-15008 was decommissioned and replacement monitoring well JHC-MW-15008R was installed in June 2019. As detailed in the *2021 Annual Groundwater Monitoring and Corrective Action Report, JH Campbell Power Plant, Pond A* (TRC, January 2022), monitoring wells JHC-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned and replacement monitoring wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed in July 2021 and JHC-MW-15010 was removed from the monitoring program. For the purposes of statistical evaluation, the data sets from the replacement monitoring wells have been pooled with the former monitoring wells given that the wells were replaced to reset the screens at a lower elevation and data integrity was maintained before and after replacement. Use of the combined dataset is denoted with the “/R” to denote data from the original and replacement well are being used in the analysis.

Following the second semiannual assessment monitoring sampling event for 2024, compliance well data for Pond A were evaluated in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, October 2017). An assessment monitoring program was developed to evaluate concentrations of CCR constituents present in the uppermost aquifer relative to acceptable levels (i.e. GWPSs). To evaluate whether or not a GWPS exceedance is statistically significant, the difference in concentration observed at the downgradient wells during a given assessment monitoring event compared to the GWPS must be large enough, after accounting for variability in the sample data, that the result is unlikely to have occurred merely by chance. Consistent with the Unified Guidance<sup>2</sup>, the preferred method for comparisons to a fixed standard is confidence limits. Based on the number of historical observations in the representative sample population, the sample mean, the sample standard deviation, and a selected confidence level (i.e. 99 percent), an upper and lower confidence limit is calculated. The actual mean concentration of the population, with 99 percent confidence, will fall between the lower and upper confidence limits.

The concentrations observed in the downgradient wells are deemed to be a statistically significant exceedance when the 99 percent lower confidence limit of the downgradient data exceeds the GWPS. If the confidence interval straddles the GWPS (i.e. the lower confidence level is below the GWPS but the upper confidence level is above), the statistical test result indicates that there is insufficient confidence that the measured concentrations are different from the GWPS. This statistical approach is consistent with the statistical methods for assessment monitoring presented in §257.93(f) and (g). Statistical evaluation methodologies built into the CCR Rule, and numerous other federal rules, are key in determining whether or not individually measured data points represent a concentration increase over the baseline or a fixed standard (such as a GWPS in an assessment monitoring program).

For each detected Appendix IV constituent, the concentrations for each well were first compared directly to the GWPS, as shown on Table 1. Constituent-well combinations that included a direct

---

<sup>2</sup> USEPA. 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Conservation and Recovery. EPA 530/R-09-007.

## Technical Memorandum

exceedance of the GWPS within the past eight monitoring events (April 2021 through October 2024 for JHC-MW-15006, JHC-MW-15008/R, and JHC-MW-15011/R and April 2020 through October 2024 for JHC-MW-15007/R and JHC-MW-15009/R) were retained for further analysis (Attachment 1). Direct comparison GWPS exceedances included the following constituent-well combinations:

- Arsenic at JHC-MW-15006,
- Selenium at JHC-MW-15009/R; and,
- Arsenic and selenium at JHC-MW-15011/R.

Groundwater data for the constituent-well combinations with direct-comparison exceedances of a GWPS were then evaluated utilizing Sanitas™ statistical software. Sanitas™ is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the Sanitas™ statistical program, confidence limits were used to perform the statistical comparison of compliance data to a fixed standard. Parametric or non-parametric confidence intervals were calculated, as appropriate, for each of the CCR Appendix IV parameters using a 99 percent confidence level, i.e., a significance level ( $\alpha$ ) of 0.01. The following narrative describes the methods employed, the results obtained and the Sanitas™ output files are included as an attachment.

The statistical data evaluation included the following steps:

- Review of data quality checklists for the data sets;
- Graphical representation of the monitoring data as time versus concentration by well-constituent pair;
- Outlier testing of individual data points that appear from the graphical representations as potential outliers;
- Evaluation of visual trends apparent in the graphical representations for statistical significance;
- Evaluation of percentage of non-detects for each well-constituent pair;
- Distribution of the data; and
- Calculation of the confidence intervals for each cumulative dataset.

The results of these evaluations are presented and discussed below.

Data from each round were evaluated for completeness, overall quality, and usability and were deemed appropriate for the purposes of the CCR assessment monitoring program.

Initially, the results for these well-constituent pairs were observed visually for potential outliers and trends. No outliers were apparent. A visually decreasing trend was observed for arsenic in JHC-MW-15011/R (time-series plots in Attachment 1); however, the trend was not statistically significant. Visually increasing trends were observed for arsenic in JHC-MW-15006 and selenium in JHC-MW-15009/R and JHC-MW-15011/R (time-series plots in Attachment 1). The increasing trend for arsenic in JHC-MW-15006 was statistically significant, while the increasing trends for selenium in JHC-MW-15009/R and JHC-MW-15011/R were not. Groundwater conditions are re-equilibrating following capping activities at Pond A that were completed in Summer 2019. Because hydrogeologic conditions are in the process of stabilizing, temporary trending and sporadic outlier data are not unexpected. Therefore, all data is used in the statistical evaluation.

## Technical Memorandum

The Sanitas™ software was then used to test compliance at the downgradient monitoring wells using the confidence interval method for the most recent eight compliance events. Eight independent sampling events provide the appropriate density of data as recommended per the Unified Guidance yet are collected recently enough to provide an indication of current condition. The tests were run with a per-well significance of  $\alpha = 0.01$ . The software outputs are included in Attachment 1 along with data reports showing the values used for the evaluation. Non-detect data was handled in accordance with the Stats Plan for the purposes of calculating the confidence intervals.

The Sanitas™ software generates an output that includes graphs of the parametric or non-parametric confidence intervals for each well along with notes on data transformations, as appropriate. Data distributions were as follows:

Distribution	Parameter-Well Combinations
Normal	Arsenic at JHC-MW-15006 and JHC-MW-15011/R Selenium at JHC-MW-15011/R
Normalized by square root transformation	Selenium at JHC-MW-15009/R

The confidence interval test compares the lower confidence limit to the GWPS. The statistical evaluation of the Appendix IV constituents shows no statistically significant exceedances of the GWPSs. Arsenic was identified at downgradient monitoring well JHC-MW-15011 at statistically significant levels exceeding the GWPS during the initial assessment monitoring event conducted in June 2018. As shown in Table 1 and Attachment 1, arsenic concentrations in this well declined in 2020 and 2021 and the lower confidence limit has been below the GWPS since the second semiannual event of 2021. Consumers Energy continues to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

### Attachments

Table 1	Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation
Attachment 1	Sanitas™ Output

# Table 1

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15006							
Sample Date:			4/13/2021	10/21/2021	4/14/2022	10/18/2022	4/11/2023	10/17/2023	4/16/2024	10/14/2024
Constituent	Unit	GWPS								
<b>Appendix III</b>										
Boron	ug/L	NA	288	371	676	765	670	757	609	695
Calcium	mg/L	NA	82.0	84.5	59.2	67.2	68.8	75.7	67.8	52.8
Chloride	mg/L	NA	22.9	19.6	17.0	18.3	13.3	18.3	12.5	17.0
Fluoride	ug/L	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	257	217	101	179	98.3	204	80.6	78.5
Total Dissolved Solids	mg/L	NA	497	485	341	458	385	552	393	308
pH, Field	SU	NA	7.7	7.8	7.8	8.3	7.8	8.2	8.0	8.5
<b>Appendix IV</b>										
Antimony	ug/L	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	<b>10</b>	3	6	7	7	7	8	9	<b>11</b>
Barium	ug/L	2,000	188	211	139	151	144	162	157	103
Beryllium	ug/L	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	3	2	1	< 1	1	< 1	2	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	12	13	13	13	12	14	15	13
Mercury	ug/L	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	54	48	17	24	12	19	15	30
Radium-226/228	pCi/L	5.00	0.673	0.634	0.395	0.663	< 0.879	0.643	< 0.517	0.476
Selenium	ug/L	<b>50</b>	< 1	1	5	4	16	32	25	5
Thallium	ug/L	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells

JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.



**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

		Sample Location:	JHC-MW-15007 <sup>(3)</sup>			JHC-MW-15007R <sup>(3)</sup>							
		Sample Date:	4/14/2020	10/22/2020 <sup>(2)</sup>	4/13/2021 <sup>(2)</sup>	10/21/2021	10/21/2021	4/14/2022	10/18/2022	4/11/2023	10/17/2023	4/16/2024	10/14/2024
Constituent	Unit	GWPS					Field Dup						
<b>Appendix III</b>													
Boron	ug/L	NA	242	--	--	956	1,000	1,370	1,350	1,290	1,630	1,900	1,500
Calcium	mg/L	NA	62.1	--	--	68.5	72.6	66.5	69.5	77.9	68.3	56.6	63.6
Chloride	mg/L	NA	14.1	--	--	13.9	14.2	11.3	12.4	13.1	17.0	13.9	17.0
Fluoride	ug/L	NA	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	83.0	--	--	101	104	69.3	102	143	118	88.4	91.4
Total Dissolved Solids	mg/L	NA	336	--	--	418	419	355	430	475	453	414	388
pH, Field	SU	NA	7.0	--	--	8.0	--	8.1	8.0	7.7	7.9	8.0	8.1
<b>Appendix IV</b>													
Antimony	ug/L	6	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	<b>10</b>	3	--	--	7	7	8	7	5	7	6	6
Barium	ug/L	2,000	266	--	--	219	224	215	249	281	233	211	212
Beryllium	ug/L	4	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	2	--	--	1	2	2	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	15	< 15	--	--	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	14	--	--	13	13	16	14	15	14	15	15
Mercury	ug/L	2	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	< 5	--	--	16	16	14	18	23	27	52	35
Radium-226/228	pCi/L	5.00	< 0.456	--	--	0.583	0.483	0.780	0.786	< 0.608	0.862	0.925	1.08
Selenium	ug/L	<b>50</b>	22	--	--	4	4	2	7	4	9	8	5
Thallium	ug/L	2	< 2	--	--	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells

JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15008R <sup>(1)</sup>									
Sample Date:			4/13/2021	4/13/2021	10/21/2021	4/14/2022	10/18/2022	4/10/2023	10/17/2023	4/16/2024	10/14/2024	10/14/2024
Constituent	Unit	GWPS										
<b>Appendix III</b>				Field Dup								Field Dup
Boron	ug/L	NA	352	360	786	1,320	1,680	1,300	1,260	1,190	1,780	1,840
Calcium	mg/L	NA	85.4	87.0	77.2	61.6	71.6	75.7	52.9	56.0	62.8	62.3
Chloride	mg/L	NA	17.2	17.1	15.7	12.2	13.6	13.4	15.5	14.7	14.4	14.3
Fluoride	ug/L	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	185	186	112	80.3	85.3	107	67	80.2	98.5	98.7
Total Dissolved Solids	mg/L	NA	517	512	443	337	397	402	323	379	380	372
pH, Field	SU	NA	7.1	--	7.2	7.1	7.3	6.9	7.2	7.2	7.3	--
<b>Appendix IV</b>												
Antimony	ug/L	6	1	< 1	1	1	1	1	1	1	1	1
Arsenic	ug/L	<b>10</b>	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	200	195	167	151	167	172	121	142	117	116
Beryllium	ug/L	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	41	56	< 1	2	< 1	< 1	< 1	1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	20	21	19	20	20	18	18	18	19	19
Mercury	ug/L	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	17	19	26	26	27	27	18	23	27	27
Radium-226/228	pCi/L	5.00	0.496	0.780	0.661	0.485	1.26	< 0.640	< 0.517	0.548	< 0.619	0.991
Selenium	ug/L	<b>50</b>	6	6	20	10	16	6	11	7	12	12
Thallium	ug/L	2	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location:			JHC-MW-15009 <sup>(3)</sup>				JHC-MW-15009R <sup>(3)</sup>											
Sample Date:			4/14/2020	4/14/2020	10/22/2020 <sup>(2)</sup>	4/13/2021 <sup>(2)</sup>	10/21/2021	4/13/2022	10/18/2022	10/18/2022	4/10/2023	4/10/2023	10/17/2023	10/17/2023	4/16/2024	4/16/2024	10/14/2024	
Constituent	Unit	GWPS																
Appendix III				Field Dup						Field Dup		Field Dup		Field Dup		Field Dup		
Boron	ug/L	NA	874	881	--	--	1,680	1,670	928	969	1,010	1,010	1,230	1,250	2,120	2,080	1,940	
Calcium	mg/L	NA	78.7	79.9	--	--	58.7	64.8	58.8	59.4	90.8	89.4	74.1	71.5	85.6	83.6	59.9	
Chloride	mg/L	NA	6.95	6.78	--	--	12.1	15.4	13.3	13.3	9.24	9.88	11.2	11.2	7.46	7.74	13.6	
Fluoride	ug/L	NA	< 1,000	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	
Sulfate	mg/L	NA	49.1	49.9	--	--	25.7	38.3	28.1	28.3	57.8	57.9	33.1	32.9	55.7	58.8	28.4	
Total Dissolved Solids	mg/L	NA	354	341	--	--	301	292	298	271	368	380	318	310	392	427	264	
pH, Field	SU	NA	7.2	--	--	--	7.1	6.9	7.2	--	6.7	--	6.9	--	6.9	--	7.0	
Appendix IV																		
Antimony	ug/L	6	1	1	--	--	< 1	< 1	1	< 1	2	< 1	< 1	< 1	< 1	< 1	< 1	
Arsenic	ug/L	<b>10</b>	< 1	< 1	--	--	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Barium	ug/L	2,000	307	298	--	--	286	206	225	234	281	282	273	270	342	332	249	
Beryllium	ug/L	4	< 1	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Cadmium	ug/L	5	< 0.2	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium	ug/L	100	1	1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	< 1	
Cobalt	ug/L	15	< 15	< 15	--	--	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	
Fluoride	ug/L	4,000	< 1,000	< 1,000	--	--	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	
Lead	ug/L	15	< 1	< 1	--	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Lithium	ug/L	40	14	14	--	--	15	15	12	12	14	15	13	13	16	16	12	
Mercury	ug/L	2	< 0.2	< 0.2	--	--	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Molybdenum	ug/L	100	< 5	< 5	--	--	5	9	10	9	19	20	9	9	7	7	9	
Radium-226/228	pCi/L	5.00	0.967	0.767	--	--	0.728	0.622	< 0.465	< 0.520	< 0.610	< 0.490	0.969	< 0.491	1.10	< 0.589	0.823	
Selenium	ug/L	<b>50</b>	<b>77</b>	<b>79</b>	--	--	<b>62</b>	7	<b>58</b>	<b>64</b>	<b>64</b>	<b>63</b>	<b>155</b>	<b>155</b>	<b>242</b>	<b>238</b>	<b>80</b>	
Thallium	ug/L	2	< 2	< 2	--	--	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

**Table 1**  
 Comparison of Groundwater Sampling Results to Groundwater Protection Standards for Statistical Evaluation  
 JH Campbell Pond A – RCRA CCR Monitoring Program  
 West Olive, Michigan

Sample Location: <b>JHC-MW-15011<sup>(3)</sup></b>			<b>JHC-MW-15011R<sup>(3)</sup></b>								
Sample Date:			4/13/2021	10/21/2021	4/13/2022	4/13/2022	10/18/2022	4/11/2023	10/17/2023	4/16/2024	10/14/2024
Constituent	Unit	GWPS									
<b>Appendix III</b>						Field Dup					
Boron	ug/L	NA	5,070	2,150	3,780	3,910	3,050	2,310	3,420	3,400	3,800
Calcium	mg/L	NA	78.7	51.0	57.6	56.2	45.5	79.1	47.2	60.2	47.6
Chloride	mg/L	NA	2.65	13.5	14.6	14.6	9.79	8.05	8.27	6.83	6.60
Fluoride	ug/L	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	NA	113	45.0	56.6	56.3	46.2	87.5	56.7	63.9	53.7
Total Dissolved Solids	mg/L	NA	359	195	276	269	253	373	238	335	225
pH, Field	SU	NA	7.2	8.0	7.0	--	7.7	6.8	7.0	7.0	6.9
<b>Appendix IV</b>											
Antimony	ug/L	6	< 1	< 1	1	1	< 1	2	< 1	2	< 1
Arsenic	ug/L	<b>10</b>	<b>13</b>	3	7	7	<b>11</b>	5	7	8	5
Barium	ug/L	2000	399	131	197	203	185	342	264	382	294
Beryllium	ug/L	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	0.8	< 0.2	0.2	0.2	< 0.2	0.2	< 0.2	0.3	< 0.2
Chromium	ug/L	100	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	40	14	< 10	18	19	16	23	17	23	17
Mercury	ug/L	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	100	8	13	16	15	16	21	19	18	11
Radium-226/228	pCi/L	5.00	0.923	0.585	0.434	0.402	< 0.462	< 0.552	0.547	0.674	< 0.687
Selenium	ug/L	<b>50</b>	<b>143</b>	4	40	40	<b>76</b>	<b>64</b>	<b>79</b>	<b>77</b>	<b>60</b>
Thallium	ug/L	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

**Notes:**

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

-- not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the Maximum Contaminant Level/Regional

Screening Level and Upper Tolerance Limit as established in TRC's Technical Memorandum dated October 15, 2018.

**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR Rules.

All metals were analyzed as total unless otherwise specified.

(1) JHC-MW-15008 was decommissioned on June 24, 2019. Replacement well JHC-MW-15008R was installed on June 25, 2019.

(2) Not sampled; insufficient amount of groundwater present to collect sample.

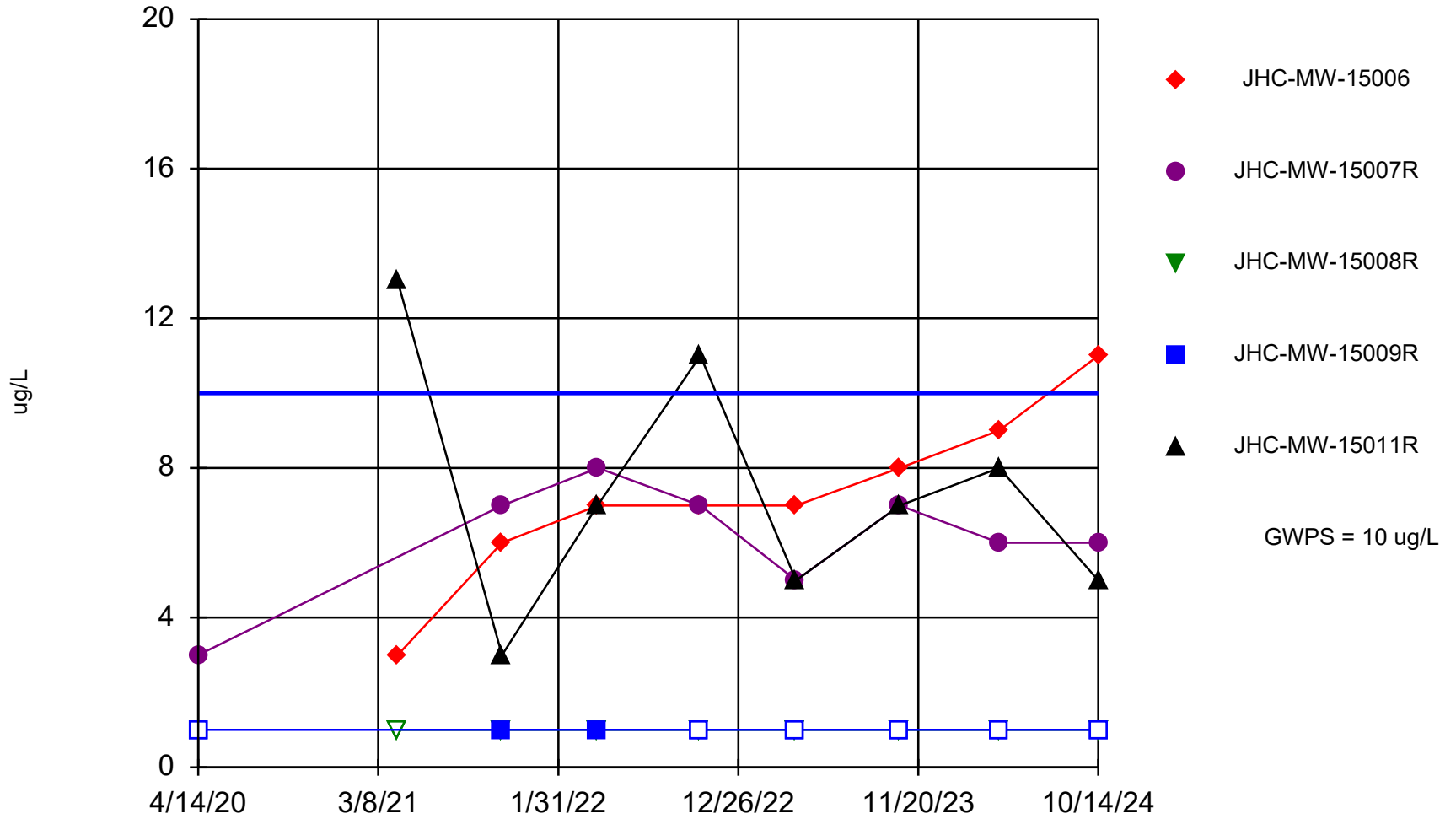
(3) JHCW-MW-15007, JHC-MW-15009, and JHC-MW-15011 were decommissioned in July 2021. Replacement wells

JHC-MW-15007R, JHC-MW-15009R, and JHC-MW-15011R were installed on July 20-22, 2021.

# **Attachment 1**

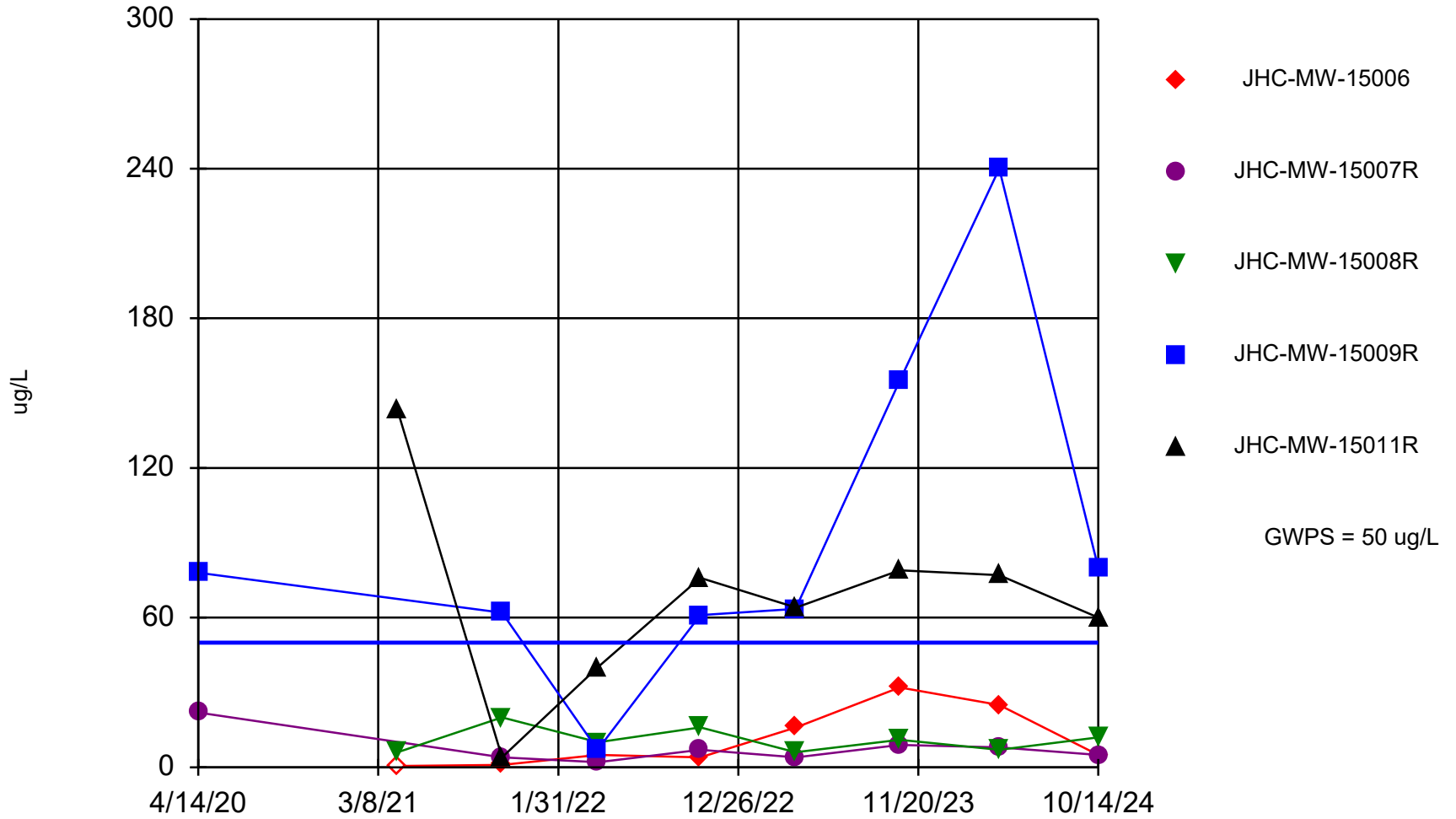
## **Sanitas™ Output**

### Arsenic Comparison to GWPS



Time Series Analysis Run 12/3/2024 10:05 PM  
Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

### Selenium Comparison to GWPS



Time Series Analysis Run 12/3/2024 10:08 PM  
Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

# Summary Report

Constituent: Arsenic, Total Analysis Run 12/3/2024 10:06 PM  
 Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

For observations made between 4/14/2020 and 10/14/2024, a summary of the selected data set:

Observations = 40  
 NDs = 35%  
 Wells = 5  
 Minimum Value = 1  
 Maximum Value = 13  
 Mean Value = 4.55  
 Median Value = 5  
 Standard Deviation = 3.486  
 Coefficient of Variation = 0.7661  
 Skewness = 0.4607

<u>Well</u>	<u>#Obs.</u>	<u>NDs</u>	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	<u>Std.Dev.</u>	<u>CV</u>	<u>Skewness</u>
JHC-MW-15006	8	0%	3	11	7.25	7	2.315	0.3192	-0.2494
JHC-MW-15007R	8	0%	3	8	6.125	6.5	1.553	0.2535	-0.9525
JHC-MW-15008R	8	100%	1	1	1	1	0	0	NaN
JHC-MW-15009R	8	75%	1	1	1	1	0	0	NaN
JHC-MW-15011R	8	0%	3	13	7.375	7	3.292	0.4464	0.4931



# Summary Report

Constituent: Selenium, Total Analysis Run 12/3/2024 10:10 PM  
 Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

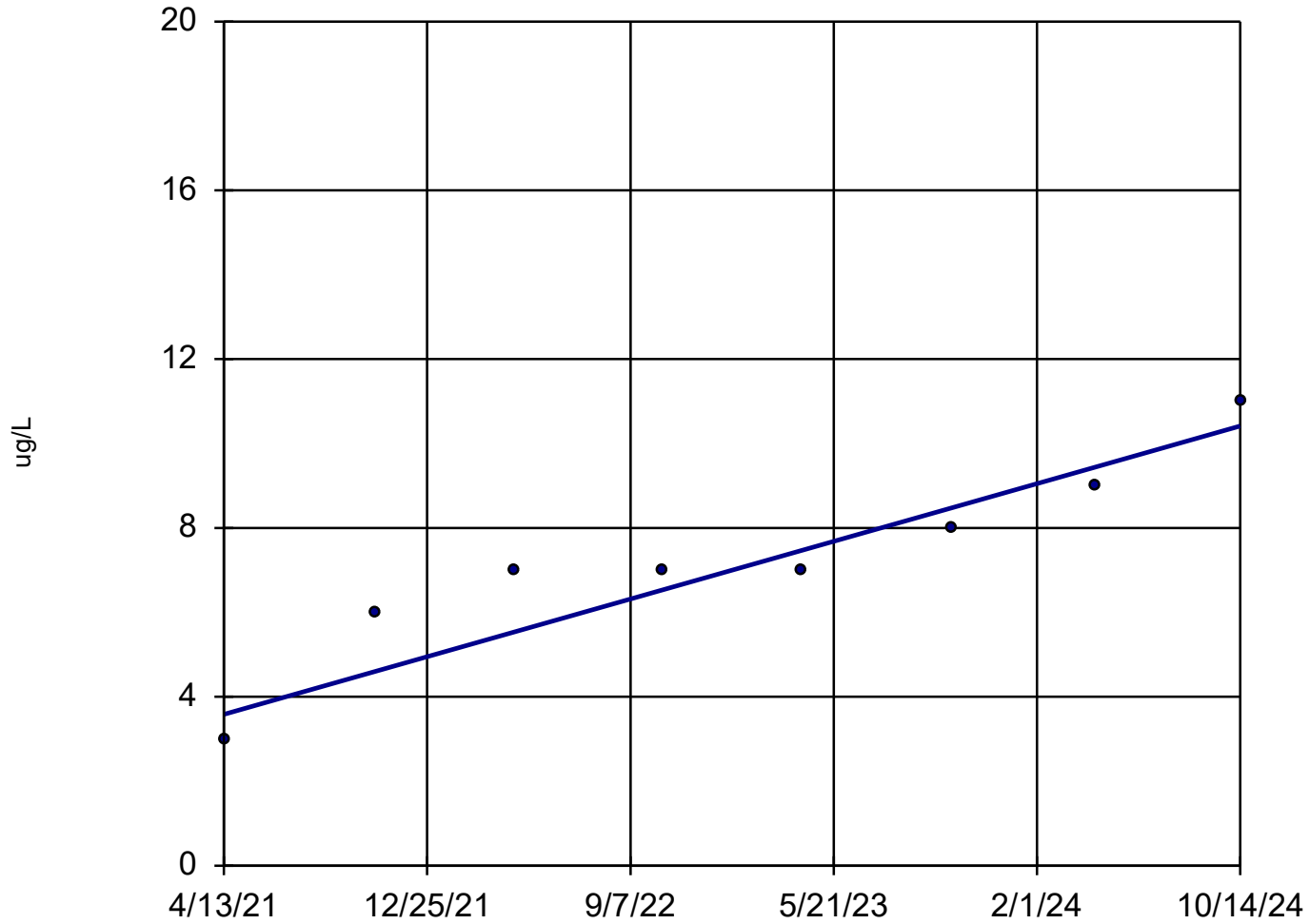
For observations made between 4/14/2020 and 10/14/2024, a summary of the selected data set:

Observations = 40  
 NDs = 2%  
 Wells = 5  
 Minimum Value = 1  
 Maximum Value = 240  
 Mean Value = 38.19  
 Median Value = 14  
 Standard Deviation = 50.38  
 Coefficient of Variation = 1.319  
 Skewness = 2.158

<u>Well</u>	<u>#Obs.</u>	<u>NDs</u>	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	<u>Std.Dev.</u>	<u>CV</u>	<u>Skewness</u>
JHC-MW-15006	8	12%	1	32	11.13	5	11.85	1.065	0.8249
JHC-MW-15007R	8	0%	2	22	7.625	6	6.255	0.8203	1.673
JHC-MW-15008R	8	0%	6	20	11	10.5	4.986	0.4532	0.6654
JHC-MW-15009R	8	0%	7	240	93.31	70.75	71.81	0.7696	1.093
JHC-MW-15011R	8	0%	4	143	67.88	70	39.37	0.5801	0.3599

# Arsenic, Total

## JHC-MW-15006

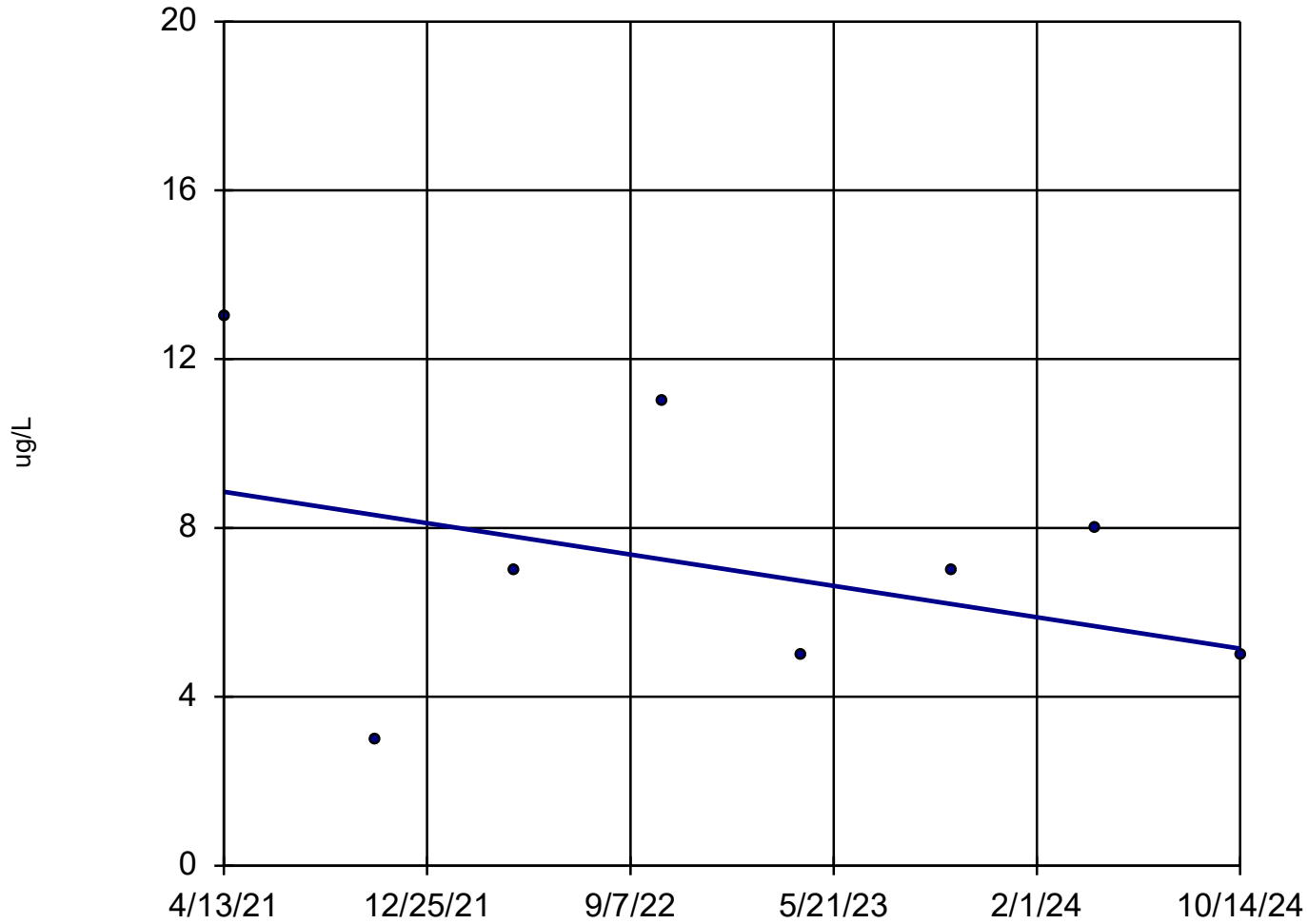


n = 8  
Slope = 1.949  
units per year.  
Mann-Kendall  
statistic = 25  
critical = 20  
Increasing trend  
significant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Sen's Slope Estimator Analysis Run 12/3/2024 10:06 PM  
Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

# Arsenic, Total

## JHC-MW-15011R

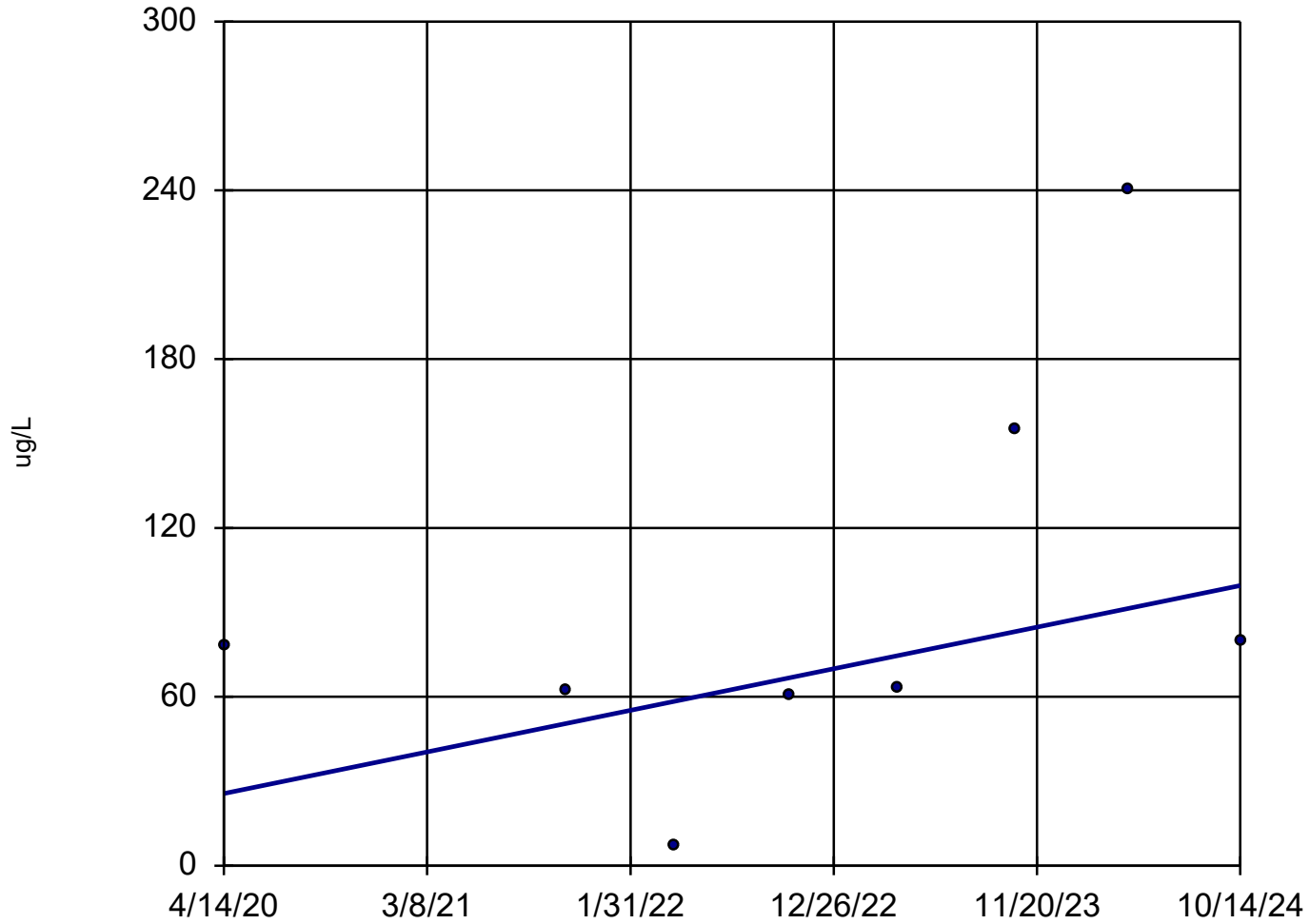


n = 8  
Slope = -1.059  
units per year.  
Mann-Kendall  
statistic = -4  
critical = -20  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Sen's Slope Estimator Analysis Run 12/3/2024 10:07 PM  
Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

# Selenium, Total

JHC-MW-15009R

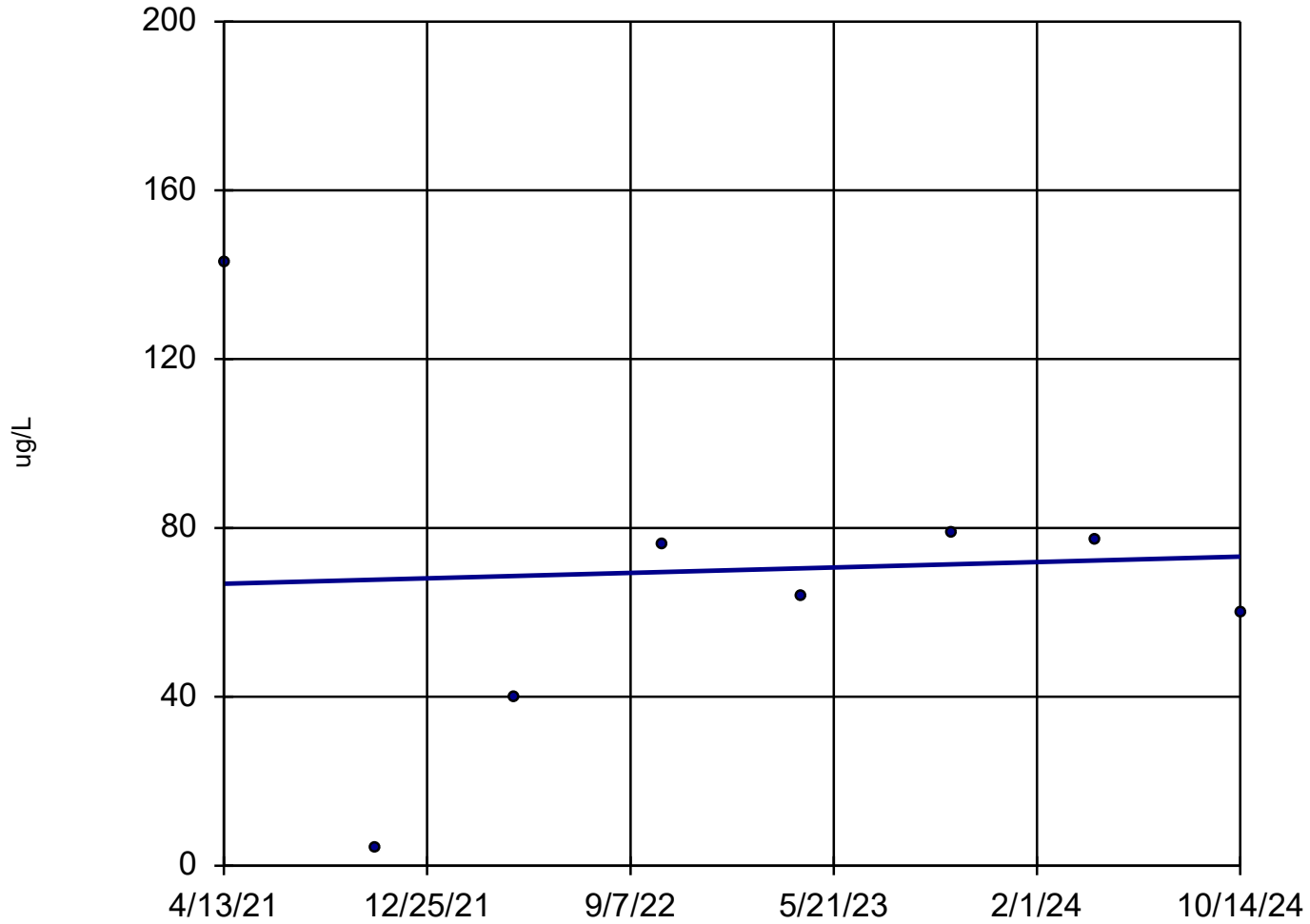


n = 8  
Slope = 16.42  
units per year.  
Mann-Kendall  
statistic = 12  
critical = 20  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Sen's Slope Estimator Analysis Run 12/3/2024 10:10 PM  
Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

# Selenium, Total

## JHC-MW-15011R

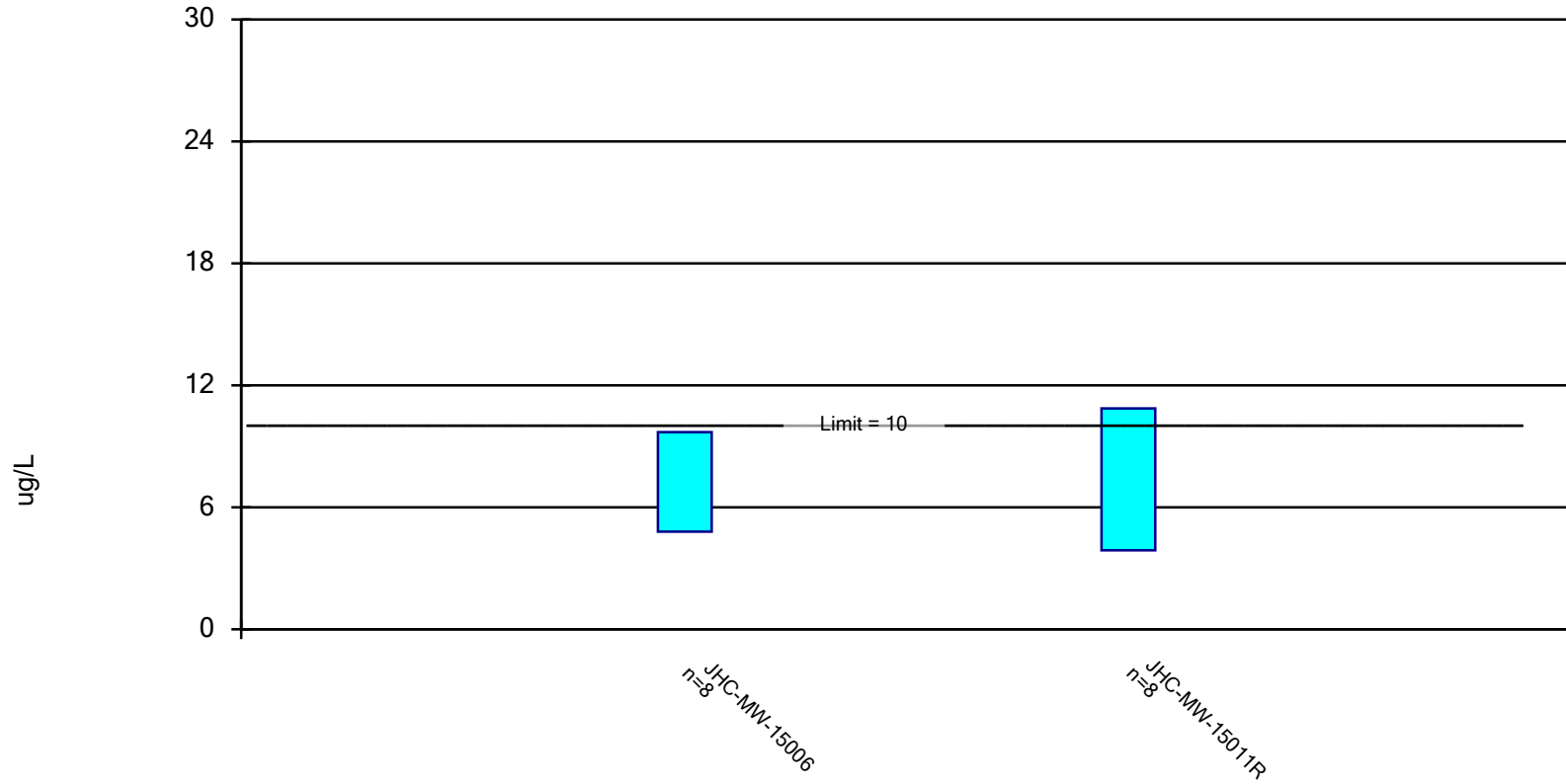


n = 8  
Slope = 1.838  
units per year.  
Mann-Kendall  
statistic = 2  
critical = 20  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Sen's Slope Estimator Analysis Run 12/3/2024 10:10 PM  
Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

## Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, Total Analysis Run 12/3/2024 10:13 PM

Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

# Confidence Interval

Constituent: Arsenic, Total (ug/L) Analysis Run 12/3/2024 10:14 PM

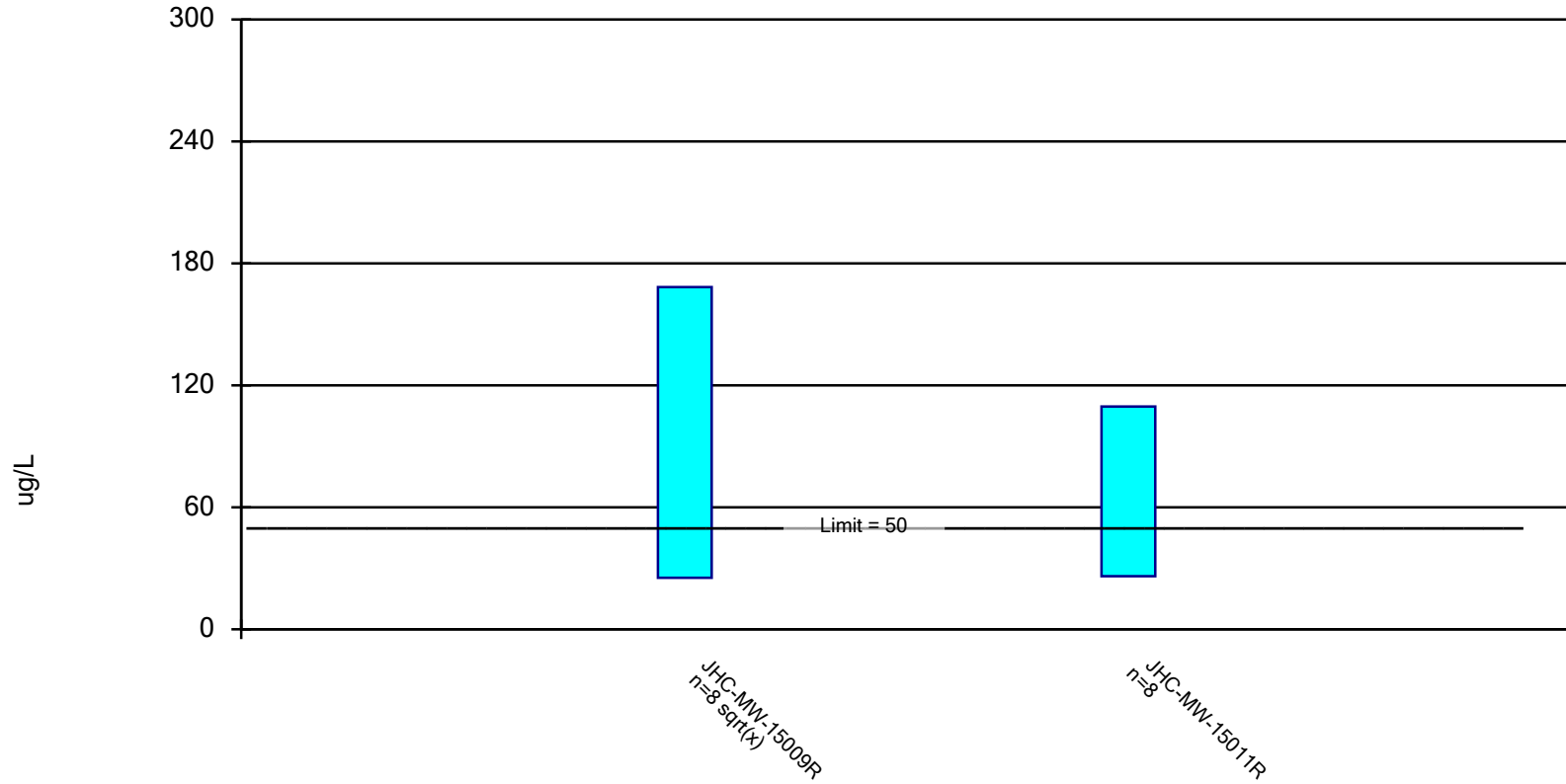
Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

---

	JHC-MW-15006	JHC-MW-15011R
4/13/2021	3	13
10/21/2021	6	3
4/13/2022		7 (D)
4/14/2022	7	
10/18/2022	7	11
4/11/2023	7	5
10/17/2023	8	7
4/16/2024	9	8
10/14/2024	11	5
Mean	7.25	7.375
Std. Dev.	2.315	3.292
Upper Lim.	9.703	10.86
Lower Lim.	4.797	3.885

## Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, Total Analysis Run 12/3/2024 10:13 PM

Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas



# Confidence Interval

Constituent: Selenium, Total (ug/L) Analysis Run 12/3/2024 10:14 PM

Client: Consumers Energy Data: 4Q24\_JHC\_Sanitas

---

	JHC-MW-15009R	JHC-MW-15011R
4/14/2020	78 (D)	
4/13/2021		143
10/21/2021	62	4
4/13/2022	7	40 (D)
10/18/2022	61 (D)	76
4/10/2023	63.5 (D)	
4/11/2023		64
10/17/2023	155 (D)	79
4/16/2024	240 (D)	77
10/14/2024	80	60
Mean	93.31	67.88
Std. Dev.	71.81	39.37
Upper Lim.	168.3	109.6
Lower Lim.	25.32	26.14

# Appendix E

## Semiannual Progress Report

January 30, 2025

Subject:  
Semiannual Progress Report - Selection of Remedy  
JH Campbell Pond A CCR Unit

This Semiannual Progress Report, prepared as a requirement of §257.97(a) of 40 CFR Parts 257 and 261, Disposal of Coal Combustion Residuals from Electric Utilities, under subtitle D of the Resource Conservation and Recovery Act (RCRA), also known as the Coal Combustion Residuals (CCR) Rule, describes progress toward selecting and designing remedies for the Pond A CCR unit that triggered Assessment of Corrective Measures (ACM) under the CCR Rule at the JH Campbell Solid Waste Disposal Area. Based on the schedule of self-implementation prescribed in the CCR Rule, a progress report is required to be prepared semiannually upon completion of the Assessment of Corrective Measures Report until the remedy is selected. It is noteworthy that remedy selection for the Pond A, prescribed by the CCR Rule, is being undertaken in coordination with a Michigan Department of Environment, Great Lakes, and Energy (EGLE) Consent Agreement 115-01-2018, which was executed on December 28, 2018.

Consumers Energy (CE) reported statistically significant exceedances above the groundwater protection standard (GWPS) for a single Appendix IV constituent, arsenic, in the “Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g)” (Consumers Energy Company, January 2019).

Unit with GWPS Exceedance	Constituent	# of Downgradient Wells Observed
Pond A	Arsenic	1 of 6

Subsequently, the Assessment of Corrective Measures Report (TRC, September 2019) was completed on September 11, 2019 for Pond A. Five remedial approaches were evaluated and presented based on source control by construction of a final cover and certifying the closure in place for Pond A.

Semi-annual progress reports have been completed by placing the document in the operating record and making it available on the CE public-facing website starting with the 2019 Annual Groundwater Monitoring and Corrective Action Report and Fourth Quarter Hydrogeological Monitoring Report (TRC, 2020).

## Assessment Activities

CE closed Pond A according to the “*JH Campbell Generating Facility Pond A Closure Plan, West Olive, Michigan*” (Golder, October 2016) and an updated closure plan detailing the final cover system was submitted to EGLE in February 2019. The state closure certification as required by Paragraph 4.2 of Consent Agreement WMRPD No. 115-01-2018 was approved by EGLE on November 25, 2019.

Increases in Appendix III constituents (e.g. boron) at multiple well locations and direct exceedances of the selenium GWPS in JHC-MW-15011R, JHC-MW-15009R, and JHC-MW-15008R that have not yet resulted in a statistically significant exceedance suggest a detectable influence from the immediately adjacent, upgradient, closed, pre-existing CCR units on-site. The closed, pre-existing units are not regulated under the RCRA CCR Rule, but remedial action is being taken under Consent Agreement WMRPD No. 115-01-2018. A remedial action plan (RAP) for these units was submitted to EGLE on September 30, 2021. In a letter sent June 10, 2022, CE committed to revising elements of the RAP based on comments received and ongoing discussion with EGLE.

## Conclusions

Arsenic at JHC-MW-15011/R continues to demonstrate attenuation in visual downward concentration trends. Nature and extent sampling data indicate that arsenic is not detected above the GWPS immediately downgradient from Pond A.

Groundwater monitoring data since the installation of the final cover indicates an observable influence from immediately adjacent, upgradient, closed, pre-existing units. Remedial action for the upgradient units is being taken under Consent Agreement WMRPD No. 115-01-2018.

## Remedy Selection Process

The ACM Report identified a final cover system as the primary corrective action for Pond A, but also considered five technically feasible groundwater management alternatives to address the potential for residual arsenic. The first alternative was to monitor post-source control groundwater concentration improvements (e.g. no additional measures required once source control was completed), but four other alternatives were retained in the event GWPS could not be achieved for all constituents in all monitoring wells in the groundwater monitoring system.

The remedy for Pond A will be formally selected per §257.97 once the selected option is reviewed and commented on by EGLE and a public meeting is conducted at least 30-days prior to the final selection as required under §257.96(e).

## **References**

Consumers Energy Company. January 14, 2019. Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g), JH Campbell Pond A CCR Unit.

Golder Associates. October 2016. JH Campbell Generating Facility Pond A Closure Plan, West Olive, Michigan. Prepared for Consumers Energy Company.

TRC Environmental Corporation. September 2019. Assessment of Corrective Measures, Consumers Energy Company JH Campbell Ponds 1-2 North and 1-2 South and Pond A Coal Combustion Residual Units. Prepared for Consumers Energy Company.