



# **2024 Annual Groundwater Monitoring and Correction Action Report**

**Coal Combustion Residue (CCR) Landfill  
Permit No. #70-SDP-06-82P**

Muscatine Power and Water

January 28, 2025

# Certification

Annual Groundwater Monitoring and Corrective Action Report for the MPW CCR Landfill

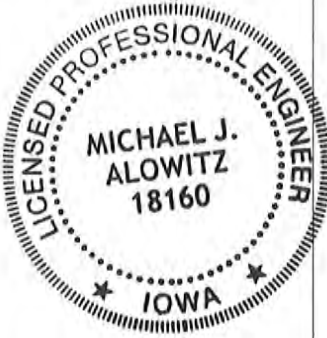

Permit No. 70-SDP-06-82P

CCR Landfill

Muscatine, Iowa

Muscatine Power and Water

I certify this Annual Groundwater Monitoring and Corrective Action Report meets the requirements of 40 CFR §257.90(e).

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.	
	 Michael J. Alowitz, P.E.	<u>1/28/2025</u> Date
	License Number:	<u>18160</u>
	My license renewal date is:	<u>December 31, 2026</u>
	Pages or sheets covered by this seal:	<u>Entire Document</u>

# Executive Summary

In compliance with 40 CFR §257.90(e)(6), this executive summary provides an overview of the current status of groundwater monitoring and corrective action programs for Muscatine Power and Water (MPW) coal combustion residue (CCR) Landfill in Muscatine, Iowa.

Item	Current Status
(e)(6)(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;	At the start of the current annual reporting period, this CCR unit was operating under the assessment monitoring program (40 CFR §257.95).
(e)(6)(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;	At the end of the current annual reporting period, this CCR unit was operating under the assessment monitoring program (40 CFR §257.95).
(e)(6)(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	<p>During the calendar year 2024 annual reporting period, statistically significant increases over background were detected for the following Appendix III constituents:</p> <ul style="list-style-type: none"> <li>– Boron at MW-14A, MW-15A, and MW-21</li> <li>– Calcium at MW-14A</li> <li>– Chloride at MW-5B</li> <li>– Sulfate at MW-14A</li> <li>– TDS at MW-14A</li> </ul>
(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	The assessment monitoring program for this CCR unit was initiated in March 2018.
(e)(6)(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:	No results were identified at a statistically significantly level above groundwater protection standards for appendix IV parameters during the 2024 monitoring period.
(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;	No SSIs were identified for Appendix IV parameters.
(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Assessment of corrective measures is not initiated for this CCR unit.

Item	Current Status
(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	No public meeting has been conducted or planned because the CCR unit is not subject to corrective measures.
(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Corrective measures have not been initiated for this CCR unit.
(e)(6)(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	No corrective measures are required.
(e)(6)(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	No remedial activities are required.

# Contents

<b>Certification</b>	<b>i</b>
<b>Executive Summary</b>	<b>ii</b>
<b>1. Introduction</b>	<b>1</b>
<b>2. Groundwater Monitoring Activities</b>	<b>1</b>
2.1 Groundwater Monitoring Network	1
2.2 Monitoring Well Inspection	2
2.3 Sample Collection	2
2.4 Analytical Parameters	2
<b>3. Groundwater Flow Conditions</b>	<b>2</b>
3.1 Horizontal Groundwater Flow	3
3.2 Horizontal Hydraulic Gradient and Groundwater Flow Velocity	3
3.3 Vertical Hydraulic Gradient	3
3.4 Monitoring Well Network Assessment	3
<b>4. Groundwater Monitoring</b>	<b>4</b>
4.1 Statistical Analysis Approach	4
4.2 Discussion of Findings	5
4.2.1 2016-2017 Groundwater Monitoring	5
4.2.2 2018-2023 Groundwater Monitoring	5
4.2.3 2024 Groundwater Monitoring	5
4.3 Comparison to Groundwater Protection Standards	6
4.3.1 Appendix III Analytes	6
4.3.2 Appendix IV Analytes	7
<b>5. Conclusions and Recommendations</b>	<b>7</b>
5.1 Groundwater Flow and Evaluation of the Monitoring Network	7
5.2 Groundwater Quality	8
5.3 Recommendations	8
<b>6. References</b>	<b>8</b>

## Table index

Table 1	Summary of Monitoring Wells and Piezometers
Table 2	Summary of Groundwater Monitoring Events
Table 3	Appendix III Parameters (Detection Monitoring)
Table 4	Appendix IV Parameters (Assessment Monitoring)
Table 5	Horizontal Groundwater Flow Velocity
Table 6	Overview of Detected Appendix IV Analytes in 2024

## Table index (cont'd)

Table 7	Groundwater Monitoring Program Summary
Table 8	Groundwater Protection Standards
Table 9	Vertical Hydraulic Gradients
Table 10	Analytical Data Summary

## Figure index

Figure 1	Site Location
Figure 2	Site Overview
Figure 3	Site Plan
Figure 4	Groundwater Contours April 15, 2024
Figure 5	Groundwater Contours September 12, 2024

## Appendices

Appendix A	Groundwater Sample Collection Records
Appendix B	2024 Laboratory Analytical Data
Appendix C	Groundwater Statistical Analysis
Appendix D	Current and Historical Analytical Results

# 1. Introduction

This Annual Groundwater Monitoring and Correction Action Report (AGWMCAR) was prepared by GHD Services Inc. on behalf of Muscatine Power and Water (MPW) in compliance with the Federal Coal Combustion Residual (CCR) Rule (40 CFR Part 257) for the MPW CCR Landfill. The approximate 80-acre landfill site is located in the SW¼ of Section 16, Township 76 North, Range 3 West in Muscatine County (Figure 1). A site overview is provided on Figure 2.

MPW initiated baseline groundwater monitoring in accordance with the Federal CCR rule in June 2015. The initial eight rounds of baseline sampling and analysis were completed prior to the October 17, 2017, deadline established in the Federal CCR Rule (40 CFR § 257.94).

Two semiannual assessment monitoring events were conducted during 2024. The first event was conducted April 11-15, 2024, and the second event September 9-12, 2024. The 2024 semiannual assessment monitoring events were completed in accordance with 40 CFR §257.

The uppermost aquifer in the vicinity of the CCR Landfill consists of a glacial till and clayey silt. No perched water zones have been observed. The water table elevation fluctuates with regional changes and varies with topography and native stream flow patterns on the CCR Landfill site. A clay-rich glacial till functions as a lower confining limit and overlies a carbonate bedrock. The depth to bedrock is 335 feet based on a water well drilled at the Site maintenance shop located southwest of the monofill (Figure 3). Additional geologic details are included in the Groundwater Monitoring System and Sampling and Analysis Program (HR Green, 2017a).

## 2. Groundwater Monitoring Activities

### 2.1 Groundwater Monitoring Network

The routine groundwater monitoring network (Table 1) consists of 16 monitoring wells (denoted by MW-X) and one piezometer (PZ-5). Monitoring well MW-12 is screened in the lower confining unit glacial till; all other monitoring wells are screened in the Uppermost Aquifer. The piezometer is screened in CCR. Monitoring wells MW-8, MW-10, MW-22, and MW-23 are classified as background locations while monitoring wells MW-4A/4B, MW-5B, MW-6A, MW-14A, MW-15A, and MW-21 are downgradient monitoring locations. Monitoring wells MW-11, MW-12, MW-24, MW-26, and MW-27 are typically only used as water level gaging locations. The monitoring locations are shown in Figure 3.

There were no changes in the monitoring system program during the 2024 reporting period.

Monitoring well MW-22 was installed in 2018 to provide an additional background quality monitoring point. MW-23 was added as a background well in 2020.

Monitoring well MW-13 was determined to be an ineffective monitoring point and was abandoned in April 2019 following Iowa Department of Natural Resources (IDNR) approval. In March 2019, bentonite was observed in the casing of MW-18A, indicating damage to the point where it could no longer be used, and was subsequently abandoned in August 2019. Monitoring well MW-4A was damaged, abandoned, and replaced with MW-4B in 2020. No other monitoring wells under the federal monitoring program have been decommissioned or abandoned since 2020.

There are facility monitoring wells which are not part of the current Federal CCR groundwater monitoring system because under §257.95(f-g) there has been no statistical trigger to further characterize the nature of a release. These other wells were installed to comply with separate monitoring requirements established under State of Iowa CCR rule [567] IAC Chapter 103 and per IDNR request and include: MW-24 installed in 2018, and MW-26 and MW-27 installed in 2020.

Downgradient monitoring wells MW-4A/4B, MW-5B, and MW-6A are closely clustered within approximately 250 feet of each other; other downgradient locations are approximately 300-400 feet apart. Groundwater samples are used to assess the potential impacts of the MPW CCR Landfill on surrounding groundwater. Groundwater elevation data are used to identify upgradient and downgradient monitoring points. Well construction details are provided in Table 1.

## 2.2 Monitoring Well Inspection

During each sampling event, the monitoring wells are inspected, and conditions of concern documented. Monitoring wells are maintained with a cap and lockable protective casing. Observations include the condition of the protective casing/vault and surrounding ground surface. Monitoring wells in the groundwater monitoring system consist of 2-inch nominal inner-diameter polyvinyl chloride (PVC) casing and screen. The well pads for MW-4B, MW-26, and MW-27 were observed to need repair or replacement. This work is planned for 2025.

## 2.3 Sample Collection

Low-flow sampling was conducted using dedicated tubing and a peristaltic pump to purge water and collect samples. Prior to sample collection, the temperature, conductivity, pH, oxidation-reduction potential (ORP), dissolved oxygen, and turbidity of the purge water were measured using a calibrated multiparameter water quality instrument. The readings were recorded on well sampling records. Upon stabilization, unfiltered samples were collected in laboratory-supplied containers. Copies of the groundwater sampling records for the 2024 events are included in Appendix A. Field duplicate samples were collected for quality assurance/quality control purposes from MW-22 during the April 2024 event, and from MW-10 and MW-22 during the September 2024 event.

## 2.4 Analytical Parameters

A summary of groundwater sampling events is provided in Table 2. Groundwater samples were analyzed for the parameters specified in 40 CFR Part 257 Appendix III and Appendix IV (Table 3 and 4, respectively) for the two semiannual assessment monitoring events completed in 2024.

The laboratory analyses were conducted by Eurofins Environment Testing North Central, LLC (Eurofins) in Cedar Falls, Iowa with the exception of the radium 226 and 228 (combined) analyses which were conducted by Eurofins in St. Louis, Missouri. Analyses were conducted by the laboratory in accordance with the procedures and methods described in the United States Environmental Protection Agency (USEPA) Manual SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (September 1986)," as updated and/or in accordance with other approved testing procedures. Eurofins provided prepared sample containers for each monitoring event. Analytical reports from each sampling event report total (i.e., unfiltered) sample results in accordance with the Federal CCR rule.

Table 2 summarizes the number of groundwater samples collected for analysis from each monitoring well, the dates the samples were collected, and whether the sample was required by the baseline, detection monitoring, or assessment monitoring programs.

# 3. Groundwater Flow Conditions

Groundwater levels were measured during each monitoring event. Piezometer PZ-5 was dry during each monitoring event in 2024. Groundwater elevations are presented in Table 1. Field depth to water measurements are included in Appendix A on sample collection records for those wells where samples are collected.



### 3.1 Horizontal Groundwater Flow

Groundwater flow maps were prepared using water level measurements from each monitoring event (Figures 4 and 5). The overall groundwater flow direction is generally southward, mimicking topography and surface water flow patterns. Groundwater flows from the west and east toward the center of the Site before flowing southward toward the Farm Pond (the northern extent of this pond is shown on Figures 4 and 5).

### 3.2 Horizontal Hydraulic Gradient and Groundwater Flow Velocity

Hydraulic conductivity data for the alluvial aquifer are estimated at 1.0E-5 to 1.0E-4 centimeters per second (cm/s) or 0.008 to 0.08 meters per day (m/d) (HR Green, 2017a). For calculation purposes, a hydraulic conductivity of 0.04 m/d is assumed.

The average linear groundwater velocity at the water table was estimated based on hydraulic conductivity, horizontal gradient, and the estimated porosity of the formation using the following equation:

$$V = Ki/n$$

Where V equals the average linear velocity; K equals the hydraulic conductivity (0.04 m/day); i equals the average horizontal hydraulic gradient; and n equals the effective porosity (estimated at 0.3). The average linear groundwater velocity at the shallow alluvial aquifer was estimated to range between 0.002 m/day (approximately 2 feet per year) for both of the 2024 monitoring events. The estimated horizontal gradients and average linear groundwater flow velocities for each of the monitoring events is summarized in Table 5.

### 3.3 Vertical Hydraulic Gradient

Water levels measured in monitoring well pairs MW-8/MW-9, MW-10/MW-11, and MW-11/MW-12 during the two 2024 gauging events, where both wells in each nest were gauged, were used to calculate vertical hydraulic gradients. The vertical hydraulic gradients were calculated by the following equation:

$$\frac{\text{Water Elevation in Deep Well} - \text{Water Elevation in Shallow Well}}{\text{Elevation of Middle of Saturated Zone of Shallow Well Screen} - \text{Elevation of Middle of Saturated Zone of Deep Well Screen}}$$

The difference in groundwater elevations between nested pairs of wells is variable, ranging from 0.24 (at the MW-11/MW-12 well pair during the September 2024 gauging event) to a maximum difference of 6.42 feet (at the MW-8/MW-9 well pair during the April 2024 gauging event).

The vertical hydraulic gradients ranged from -0.41 (downward-directed flow) in well cluster MW-8/MW-9 (April 2024) to 0.04 (upward-directed flow) in well clusters MW-10/MW-11 (April 2024).

Vertical gradients were in the upward direction during both 2024 gauging events at well clusters MW-10/MW-11. The vertical gradient was in the downward direction during the 2024 monitoring events at well cluster MW-8/MW-9. Vertical gradient was downward in April 2024 monitoring event, and then upward in September 2024 monitoring event at well cluster MW-11/MW-12. The vertical hydraulic gradients for each monitoring event are summarized in Table 9.

### 3.4 Monitoring Well Network Assessment

The MPW CCR Landfill groundwater monitoring network meets the Federal CCR rule requirements of having at least one upgradient monitoring well and three downgradient monitoring wells, and the groundwater monitoring network meets the design and construction requirements of 40 CFR §257.91. Monitoring wells MW-8, MW-10, MW-22, and MW-23 have been identified as upgradient sampling locations.

## 4. Groundwater Monitoring

Groundwater sample collection records for the 2024 monitoring events are provided in Appendix A. The associated laboratory reports are provided in Appendix B. Statistical analysis of the analytical data was performed by Groundwater Stats Consulting (GW Stats). Statistical analysis, historic and current data, graphs, and supporting information are provided in GW Stats' report in Appendix C.

As part of assessment and reporting requirements under the Federal CCR rule, the groundwater monitoring data are subjected to statistical evaluation to demonstrate compliance with monitoring goals. Evaluation components include:

- Statistical summaries for the data sets obtained (on a per-well, per-parameter basis)
- Preparation of trend plots (concentration vs. time)
- Inter-well comparisons (downgradient vs. upgradient)
- Intra-well comparisons (vs. baseline conditions at a given well)

The statistical methods used in these evaluation steps for the MPW CCR Landfill are presented in the Groundwater Monitoring System and Sampling and Analysis Program (GWMSSAP) document (HR Green, 2017a). The procedures in the MSSAP were selected in accordance with the Federal CCR rule, using methodology presented in the USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance (Unified Guidance) (USEPA, 2009). The present evaluation uses the statistical methods presented therein to evaluate monitoring data from groundwater samples collected during the 2024 assessment monitoring events.

Originally, baseline monitoring under the Federal CCR rule occurred at the MPW CCR Landfill during eight monitoring events conducted between June 2016 and August 2017. For background monitoring well MW-22, the baseline period was March 2018 to April 2021 and for background well MW-23, the baseline period was June 2018 to September 2021. Baseline and other sampling event history are summarized in Table 2.

### 4.1 Statistical Analysis Approach

Groundwater monitoring at MPW CCR Landfill is currently conducted under assessment monitoring per the Federal CCR rule. The 2024 assessment monitoring data are presented in Appendix C and Appendix D. During both 2024 semiannual assessment monitoring events all Appendix III and Appendix IV parameters were analyzed in accordance with 40 CFR §257.95(d)(1).

No single method of statistical analysis is appropriate for each groundwater constituent dataset; instead, the statistical methods selected for use are dependent upon the data and distributions and should consider the specific constituents and the nature of local hydrogeologic conditions. Depending on characteristics of the site and the groundwater monitoring data, a mix of inter-well (comparison vs. upgradient conditions) and intra-well (comparison vs. baseline) tests may be warranted. The statistical methods used for the inter-well and intra-well approaches are selected based on these factors as well as consideration of natural temporal or spatial variability of the concentrations of the groundwater constituents.

The analyzed data were used to calculate statistical limits for each well/constituent pair where there are a significant quantity of results above the reporting limit. Statistical calculations were performed by Groundwater Stats using industry standard SANITAS™ Statistical Software, an EPA-compliant package (EPA, 2009). The full procedure is as detailed in the GWMSSAP (HR Green, 2017a).

The statistical report dated December 12, 2024, incorporates data collected through 2024 and the corresponding statistical analyses, including narratives, background limits, prediction limits, statistically significant increases (SSI), trend tests, confidence intervals, statistically significant levels (SSL), and groundwater protection standards (GWPS), and time-series plots is provided in Appendix C and discussed below.

## 4.2 Discussion of Findings

Groundwater at the MPW CCR Landfill has been analyzed under the Federal CCR rule since 2016. The first two years of data were to collect baseline samples. Sampling history is described in the following subsections.

Appendix III constituents include boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS). Appendix IV constituents include antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226+228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium.

### 4.2.1 2016-2017 Groundwater Monitoring

Establishment of background water quality occurred by testing all wells for Appendix III and IV constituents during the period of June 2016 through August 2017 (8 sampling events, spaced to capture seasonality), following which the detection monitoring program was initiated.

The first detection monitoring event was on October 16, 2017, where Appendix III constituents were tested. An initial 22 well/constituent pairs were determined to exceed their respective statistical limits (Groundwater Stats Consulting, November 15, 2017), which are called initial SSIs, above background concentration.

A resampling event for the 22 well/constituent pairs was conducted on November 28, 2017, to confirm that each is in fact an SSI and not a false positive. Based on re-sampling and statistical analysis there were 3 false positives (calcium, sulfate, and TDS at MW-13) and 19 confirmed SSIs (Groundwater Stats Consulting, December 19, 2017).

Under §257.95(a), the confirmed SSI directed the facility transition into assessment monitoring beginning in 2018.

### 4.2.2 2018-2023 Groundwater Monitoring

Assessment monitoring commenced in 2018 with the analysis of Appendix III and IV constituents. The events were conducted in the spring and fall of each year. These events satisfy the requirement of semiannual and assessment monitoring. Specifically, assessment monitoring was initiated at the March 6, 2018, event, where the full Appendix III and Appendix IV constituent lists were tested.

### 4.2.3 2024 Groundwater Monitoring

Assessment monitoring was completed in 2024 for Appendix III and IV constituents. The events were conducted in April and September of 2024. These events satisfy the requirement of semiannual and assessment monitoring requirements. Detected Appendix IV parameters are identified in Table 6.

Table 7 provides a current groundwater monitoring program summary including:

1. The current monitoring program status,
2. Planned change in monitoring program status for the next sampling event,
3. Confirmed statistically significant increases (SSI) over background,
4. Statistically significant trends,
5. Statistically significant level (SSL) over a groundwater protection standard (GWPS), and
6. Upcoming sampling dates and constituents (as best as can be determined at this point in time).

The information shown in Table 7 shows that the concentrations of several constituents remain at a statistically significant increase above background (i.e., SSI), but that Appendix IV analytes (including fluoride) are below the GWPS, that is, there were no SSLs identified. GWPSs are shown in Table 8 along with background concentrations.

The facility is required to continue assessment monitoring in 2025, as shown in Table 3, due to detections above background concentrations at multiple well locations.

In summary, the current-year review indicates:

1. Monitoring wells remain viable sampling points as they are physically intact (pending repair of multiple well pads), void of excessive sediment, and provide the anticipated recharge during sampling, with the exception of MW-13 and MW-18A which were abandoned in 2019, and MW-4A which was abandoned and replaced with MW-4B in 2020.
2. The primary groundwater flow path is from the west and east toward the center of the Site before flowing southward toward the Farm Pond. (Figures 4 and 5).
3. Analytical results indicate the landfill's primary impact on groundwater quality is from Appendix III constituents, including boron, calcium, chloride, sulfate, and TDS in the immediate area downgradient of the active landfill (MW-14A and MW-15A) and vicinity of the sediment runoff control pond (MW-5B and MW-21).

## 4.3 Comparison to Groundwater Protection Standards

During the April and September 2024 semiannual assessment monitoring events, Appendix III and Appendix IV parameters were analyzed. The 2024 sample results are compared to the Groundwater Protection Standards (GWPSs), as described in 40 CFR §257.95(h):

*(h) The owner or operator of the CCR unit must establish a groundwater protection standard for each constituent in appendix IV to this part detected in the groundwater. The groundwater protection standard shall be:*

*(1) For constituents for which a maximum contaminant level (MCL) has been established under §§141.62 and 141.66 of this title, the MCL for that constituent;*

*(2) For the following constituents:*

*(i) Cobalt 6 micrograms per liter ( $\mu\text{g}/\text{l}$ )*

*(ii) Lead 15  $\mu\text{g}/\text{l}$ ;*

*(iii) Lithium 40  $\mu\text{g}/\text{l}$ ; and*

*(iv) Molybdenum 100  $\mu\text{g}/\text{l}$ .*

*(3) For constituents for which the background level is higher than the levels identified under paragraphs (h)(1) and (h)(2) of this section, the background concentration.*

The resulting site-specific GWPS values for Appendix IV parameters at the Site are summarized in Table 8. Comparisons of the 2024 monitoring data to the GWPS values are presented below for Appendix III and Appendix IV parameters.

### 4.3.1 Appendix III Analytes

- Boron: No MCL has been established for boron. The maximum boron concentration detected during 2024 was 17.7 milligrams per liter (mg/L) at MW-14A.
- Calcium: No MCL has been established for calcium. The maximum calcium concentration detected during 2024 was 344 mg/L at MW-14A.
- Chloride: No MCL has been established for chloride. The maximum chloride concentration detected during 2024 was 40.5 mg/L at MW-5B.
- Fluoride: Fluoride has an MCL of 4 mg/L and is included on both the Appendix III and Appendix IV analyte lists. All fluoride levels were non-detect during any sampling event in 2024.
- pH: No MCL has been established for pH. The highest and lowest pH recorded during the 2024 monitoring events were 7.6 (at MW-4B and MW-15A) and 6.9 (at MW-21).
- Sulfate: No MCL has been established for sulfate. The maximum sulfate concentration detected during 2024 was 1160 mg/L at monitoring well MW-14A.
- TDS: No MCL has been established for TDS. The maximum TDS concentration detected during 2024 was 1,830 mg/L at monitoring well MW-14A.

## 4.3.2 Appendix IV Analytes

- Antimony: No detectable concentrations of antimony were reported in any of the samples collected during the 2024 monitoring events. The statistical background limit calculated for antimony is 0.002 mg/L which is below the established MCL of 0.006 mg/L.
- Arsenic: Arsenic has an MCL of 0.01 mg/L. The maximum arsenic concentration detected during 2024 was 0.00749 mg/L at MW-22.
- Barium: Barium was detected in all monitored wells during the 2024 monitoring events; however, the detected levels were below the MCL for barium (2.0 mg/L) with a maximum concentration of 0.271 mg/L at upgradient well MW-22.
- Beryllium: No detectable concentrations of beryllium were reported in any of the samples collected during 2024. The beryllium reporting limit is 0.001 mg/L, which is below the established MCL (0.004 mg/L).
- Cadmium: Cadmium was not detected in any of the samples collected in the 2024 monitoring events. The statistical background limit calculated for cadmium is 0.0001 mg/L, which is below the established MCL (0.005).
- Chromium: Chromium was detected only in MW-21 with a concentration of 0.00657, which is above the background limit of 0.005, but below the established MCL of 0.1 mg/L.
- Cobalt: The GWPS for cobalt in groundwater at the Site is 0.006, the maximum cobalt concentration detected during the 2024 event was 0.00216 at upgradient well MW-8.
- Lead: The established CCR rule GWPS for lead is 0.015 mg/L with the background limit for Site calculated at 0.002 mg/L. No detectable concentrations of lead were reported in any of the samples collected during 2024.
- Lithium: No MCL has been established for lithium; the CCR rule GWPS is 0.04 mg/L. Lithium was detected at a maximum concentration of 0.0194, which is below the GWPS.
- Mercury: Mercury has an MCL of 0.002, and a background limit set at 0.0002 mg/L. There were no detections of mercury in any of the samples collected during the 2024 monitoring period.
- Molybdenum: There is no MCL established for molybdenum, the GWPS is 0.1 mg/L and there is a background limit of 0.0082 mg/L. Upgradient monitoring well MW-22 had the maximum detection with a concentration of 0.00578 mg/L, which is below the MCL.
- Radium 226 and 228 (combined): Combined radium levels were detected in many of the wells; however, detected concentrations were below the MCL of 5 picocuries per liter (pCi/L) and most were below the background limit of 1.15 pCi/L. MW-4B, MW-5B, and MW-22 did have levels at or above the background limit, at 1.30 pCi/L, 1.57 pCi/L and 2.48 pCi/L respectively.
- Selenium: Selenium has an established MCL of 0.05 mg/L. The background limit for selenium is 0.005 mg/L. Selenium was only detected in the fall 2024 sample from MW-21, at a concentration of 0.00666 mg/L.
- Thallium: Thallium has an established MCL of 0.002 mg/L and a background limit of 0.001 mg/L. There was no thallium detected in any sample taken during the 2024 monitoring period.

## 5. Conclusions and Recommendations

This AGWMCAR documents groundwater monitoring conducted at the Site during the 2024 reporting period. During the reporting period, two assessment monitoring events were completed at the site.

### 5.1 Groundwater Flow and Evaluation of the Monitoring Network

The groundwater flow was consistent through the spring and fall 2024 monitoring events, with flow direction generally towards the runoff pond west of the landfill area and then south off site. The groundwater contour maps

(Figures 4 and 5) indicate the monitoring network is sufficient and has appropriately located background and downgradient well locations.

## 5.2 Groundwater Quality

Monitoring data from samples collected during the past year (April and September 2024 assessment monitoring events) were evaluated. The key findings of the evaluation are:

- Inter-well comparisons – below is a summary of well/constituent pairs that had at least one observation outside of upgradient background conditions during the 2024 monitoring period. Confirmed SSIs were identified for:
  - **Boron** at MW-14A, MW-15A, and MW-21
  - **Calcium** at MW-14A
  - **Chloride** at MW-5B
  - **Sulfate** at MW-14A
  - **TDS** at MW-14A

Statistical analysis indicates that the concentrations of multiple constituents remain above background limits (see SSI on Table 7), however, during 2024 there were no Appendix IV constituents that exhibited a statistically significant level (SSL) above a GWPS. As such this site will continue in assessment monitoring.

## 5.3 Recommendations

Based on the evaluation findings, the MPW Site remains in assessment monitoring. No changes to the monitoring network or sampling procedures are necessary.

## 6. References

Green Environmental Services (GES), November 21, 1991. Coal Combustion Residue Landfill Development Plans and Supporting Documentation, Muscatine Power and Water; and Supplemental Plan Sheets 16 and 18 dated January 29, 1993.

Green Environmental Services (GES), October 25, 1991. Hydrogeologic Evaluation of the Muscatine Power and Water Coal Combustion Residue Landfill.

Green Environmental Services (GES), June 1990. Hydrogeologic Evaluation Work Plan for the Muscatine Power and Water Coal Combustion Residue Landfill.

GHD, January 26, 2024. 2023 Annual Groundwater Monitoring and Correction Action Report, Coal Combustion Residue (CCR) Landfill Permit No. #70-SDP-06-82P, Muscatine Power and Water.

Groundwater Stats Consulting, November 17, 2022. Summary of statistical analysis used to establish baseline water quality, SSI and SSL. Includes the analysis of 19 sample events conducted from June 2016 through September 2022.

HR Green, 2023. 2022 Annual Groundwater Monitoring and Corrective Action Report. January 2023.

HR Green, January, 2021. Annual Water Quality Report, addressing State of Iowa [567] IAC Chapter 103 rule and landfill operating permit requirements.

HR Green, December 23, 2022. Annual Inspection Report, Muscatine Power & Water, CCR Landfill.

HR Green, December 19, 2022. Annual CCR Fugitive Dust Control Report, Muscatine Power & Water, CCR Landfill.

HR Green, October 17, 2021. Run-On and Run-Off Control System Plan, Muscatine Power & Water, CCR Landfill.

HR Green, April 22, 2019. Existing Final Cover Verification Report, Muscatine Power & Water, CCR Landfill.

HR Green, December 5, 2018. CCR Fugitive Dust Prevention and Control Plan, Muscatine Power & Water, CCR Landfill (original October 19, 2015).

HR Green, 2017a. Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill (original May 18, 2016). May 2, 2017.

HR Green, June 2017b. Procedure for Groundwater and Surface Water Sampling. (Updated November 2018.)

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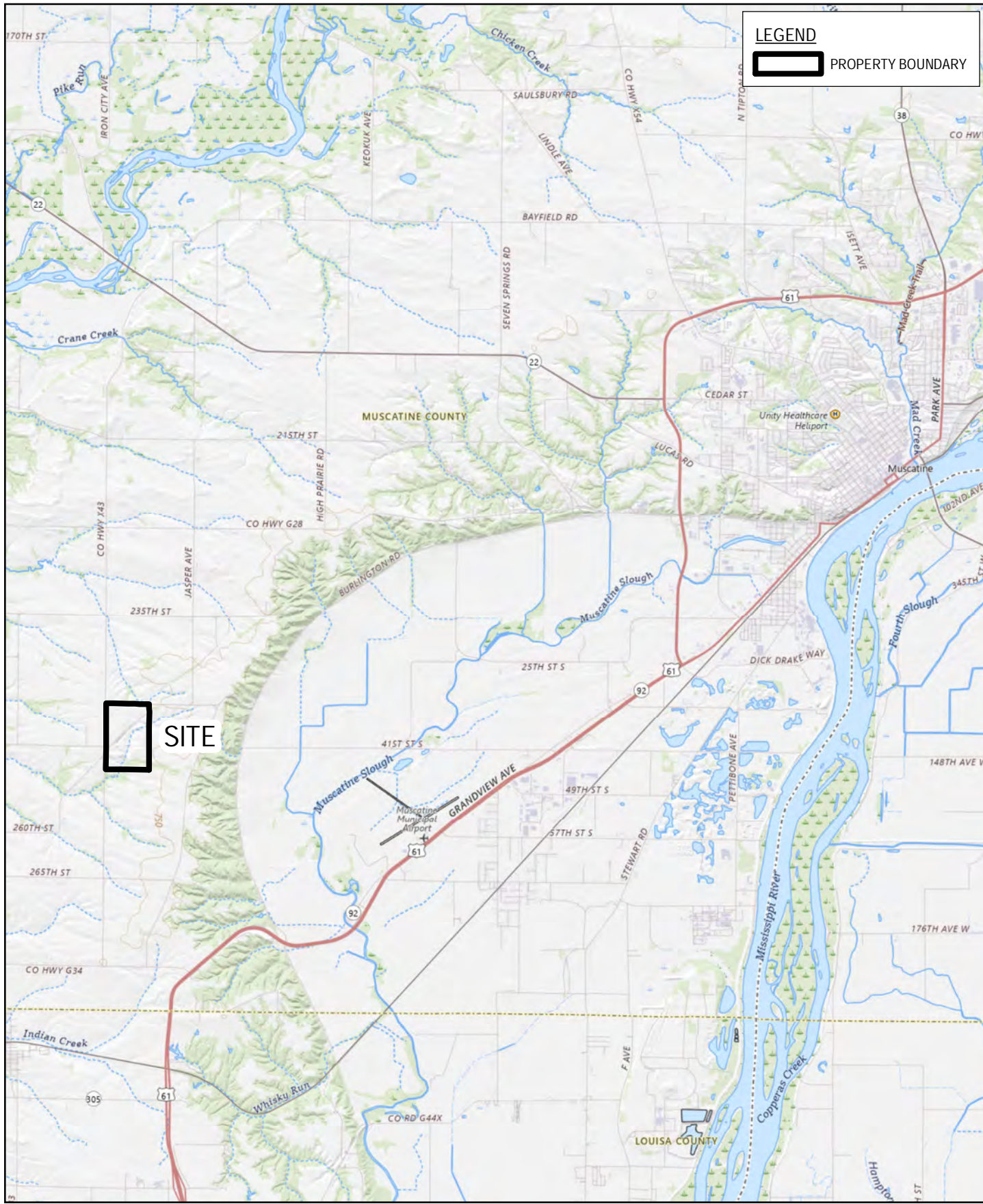
U.S. Environmental Protection Agency (EPA), March 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Resource Conservation and Recovery Program Implementation and Information Division, U.S. EPA, Washington, DC. EPA 530/R-09-007.

# Figures

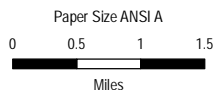


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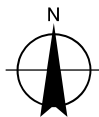
 PROPERTY BOUNDARY



**SITE**



Map Projection: Transverse Mercator  
 Horizontal Datum: NAD 1983 2011  
 Grid: NAD 1983 (2011) 1aRCS zone 14

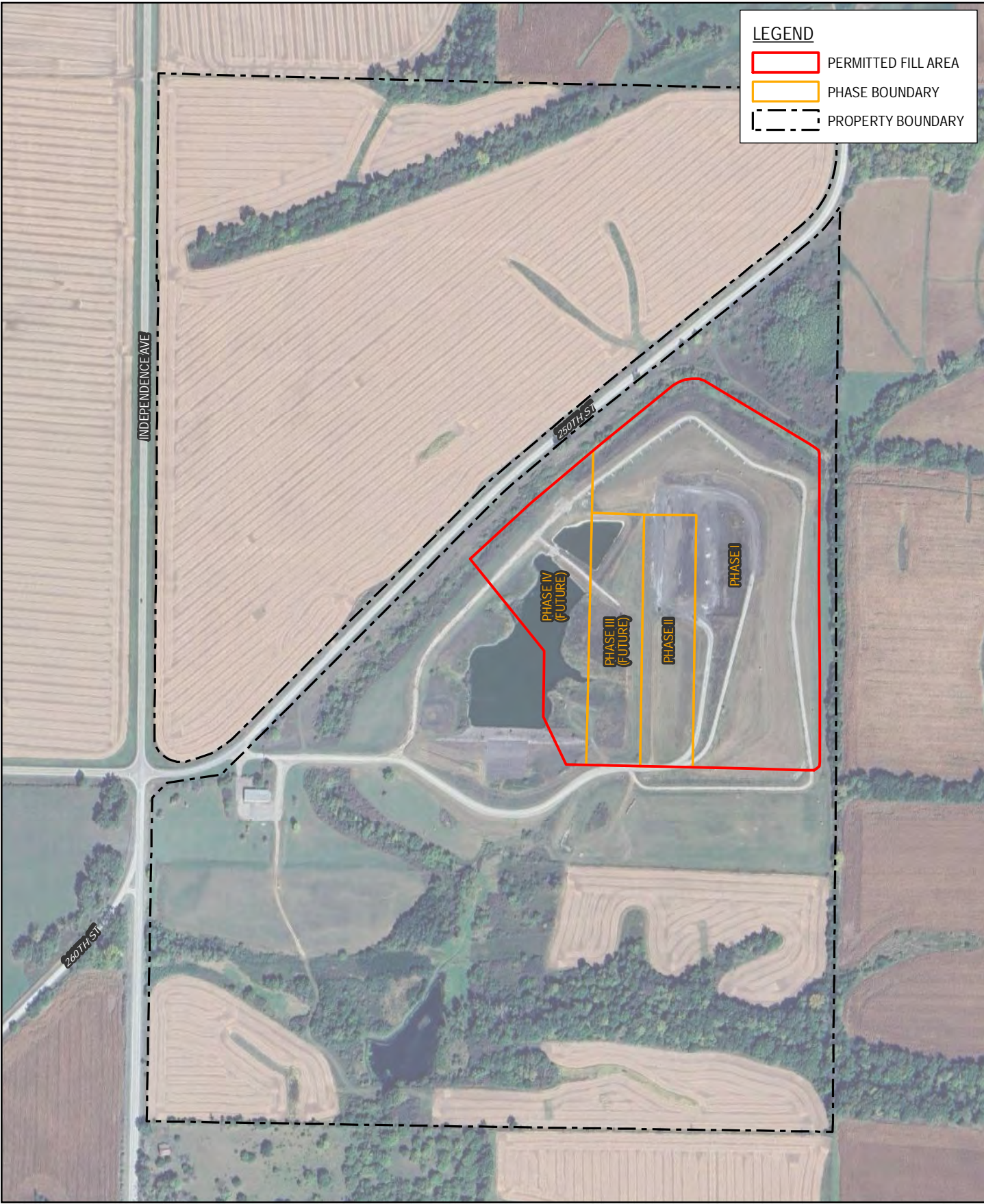


MUSCATINE POWER AND WATER  
 CCR LANDFILL  
 MUSCATINE, IOWA

Project No. 12606359  
 Revision No. -  
 Date 12/19/2024

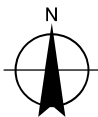
**SITE LOCATION**

**FIGURE 1**



Paper Size ANSI A  
 0 100 200 300 400 500  
 Feet

Map Projection: Transverse Mercator  
 Horizontal Datum: NAD 1983 2011  
 Grid: NAD 1983 (2011) IARCS zone 14

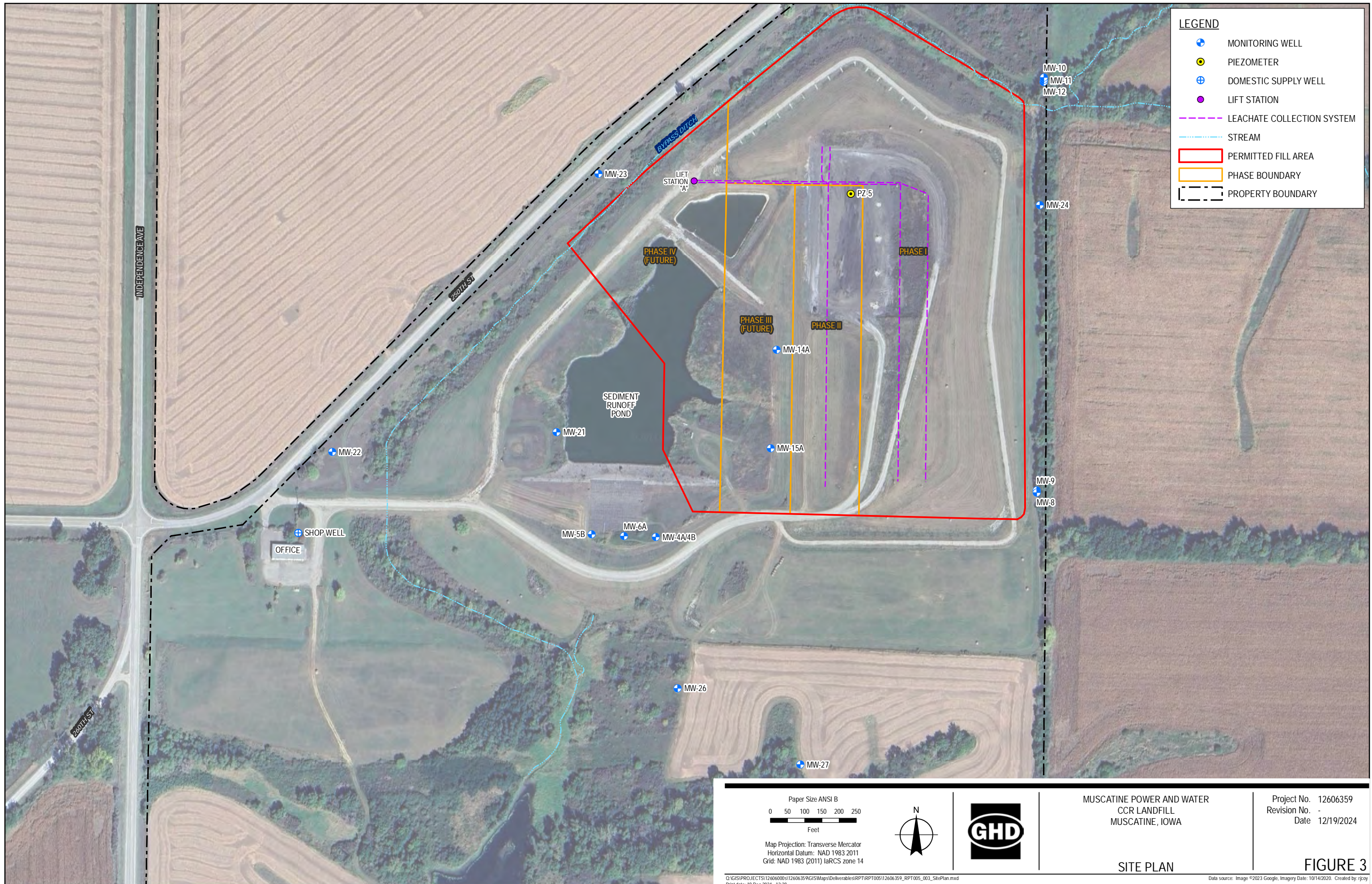


MUSCATINE POWER AND WATER  
 CCR LANDFILL  
 MUSCATINE, IOWA

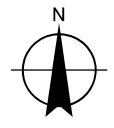
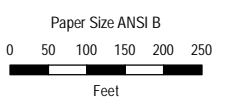
Project No. 12606359  
 Revision No. -  
 Date 12/19/2024

SITE OVERVIEW

FIGURE 2



- LEGEND**
- + MONITORING WELL
  - PIEZOMETER
  - ⊕ DOMESTIC SUPPLY WELL
  - LIFT STATION
  - LEACHATE COLLECTION SYSTEM
  - STREAM
  - PERMITTED FILL AREA
  - PHASE BOUNDARY
  - PROPERTY BOUNDARY

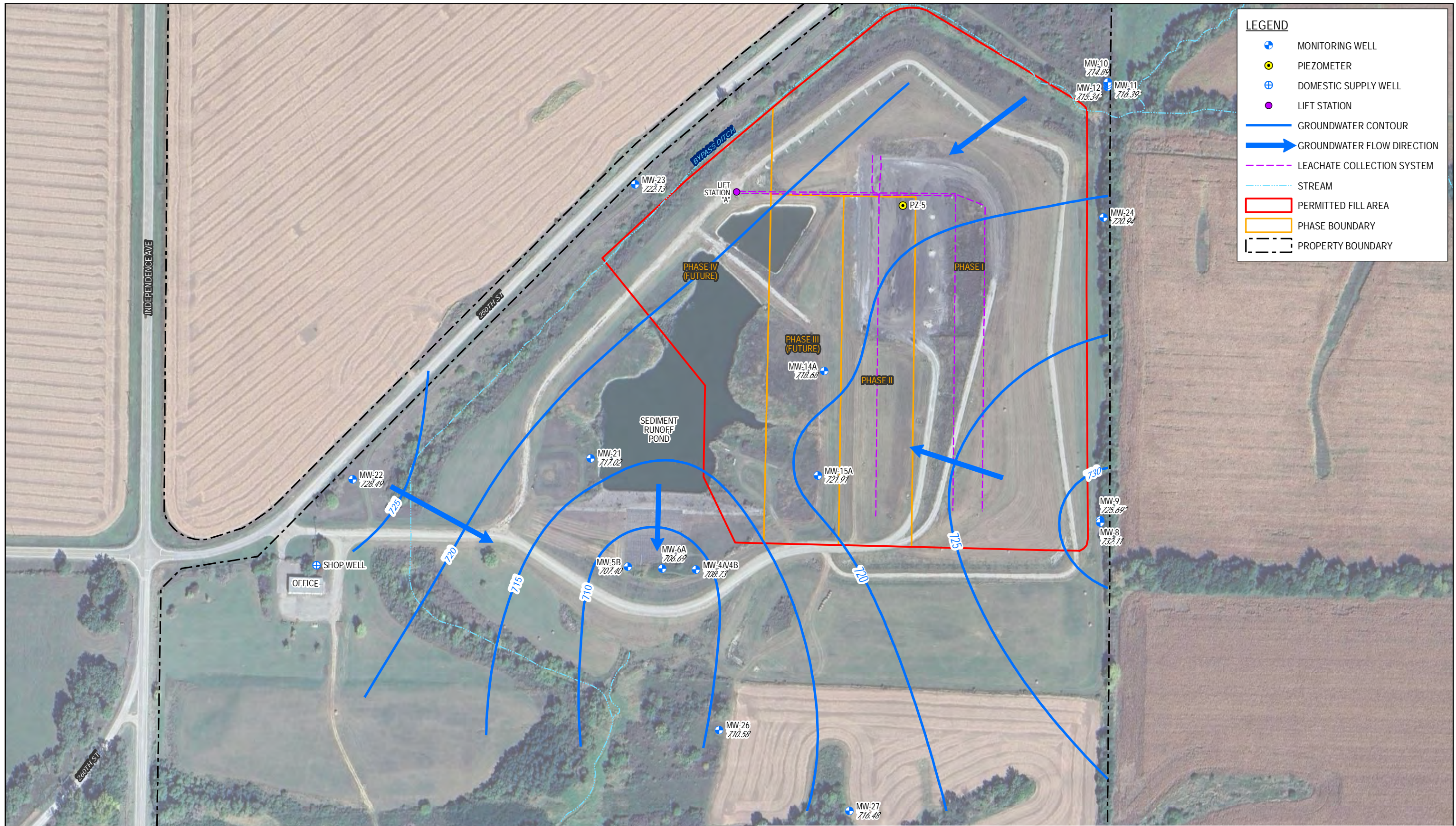


MUSCATINE POWER AND WATER  
CCR LANDFILL  
MUSCATINE, IOWA

Project No. 12606359  
Revision No. -  
Date 12/19/2024

SITE PLAN

FIGURE 3



**LEGEND**

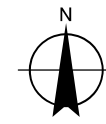
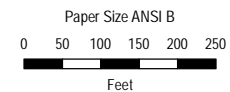
- ⊕ MONITORING WELL
- PIEZOMETER
- ⊕ DOMESTIC SUPPLY WELL
- LIFT STATION
- GROUNDWATER CONTOUR
- ➔ GROUNDWATER FLOW DIRECTION
- - - LEACHATE COLLECTION SYSTEM
- - - STREAM
- PERMITTED FILL AREA
- PHASE BOUNDARY
- PROPERTY BOUNDARY

**NOTES**

729.95 GROUNDWATER ELEVATION (FT AMSL)

MM NOT MEASURED

709.54\* NOT USED FOR CONTOUR INTERPRETATION



Map Projection: Transverse Mercator  
 Horizontal Datum: NAD 1983 2011  
 Grid: NAD 1983 (2011) 14RCS zone 14

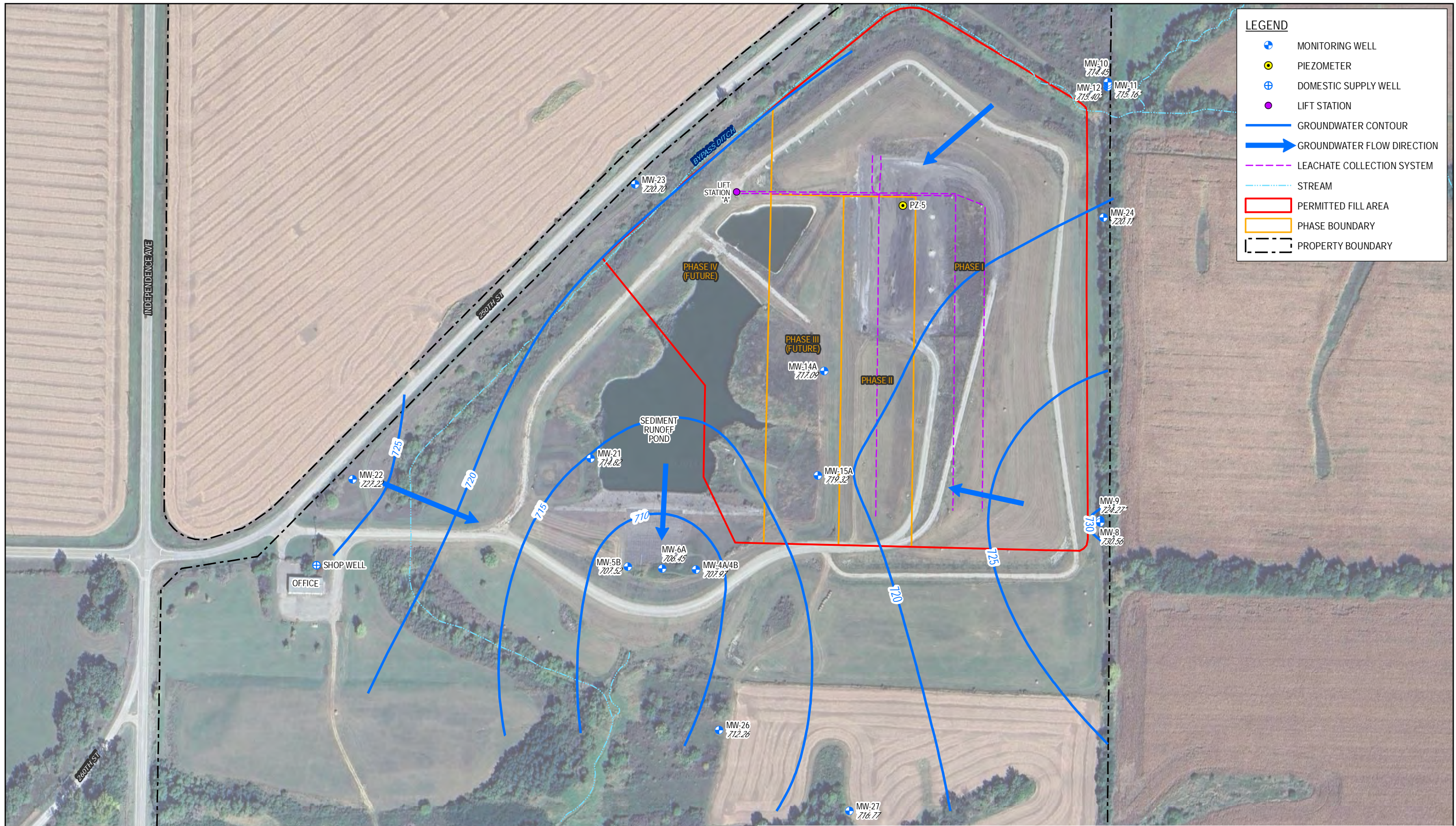


MUSCATINE POWER AND WATER  
 CCR LANDFILL  
 MUSCATINE, IOWA

**GROUNDWATER CONTOURS**  
 APRIL 15, 2024

Project No. 12606359  
 Revision No. -  
 Date 12/19/2024

**FIGURE 4**



**LEGEND**

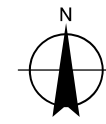
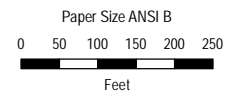
- + MONITORING WELL
- PIEZOMETER
- ⊕ DOMESTIC SUPPLY WELL
- LIFT STATION
- GROUNDWATER CONTOUR
- ➔ GROUNDWATER FLOW DIRECTION
- - - LEACHATE COLLECTION SYSTEM
- - - STREAM
- PERMITTED FILL AREA
- PHASE BOUNDARY
- PROPERTY BOUNDARY

**NOTES**

729.95 GROUNDWATER ELEVATION (FT AMSL)

MM NOT MEASURED

709.54\* NOT USED FOR CONTOUR INTERPRETATION



Map Projection: Transverse Mercator  
 Horizontal Datum: NAD 1983 2011  
 Grid: NAD 1983 (2011) 14RCS zone 14

MUSCATINE POWER AND WATER  
 CCR LANDFILL  
 MUSCATINE, IOWA

**GROUNDWATER CONTOURS**  
 SEPTEMBER 12, 2024

Project No. 12606359  
 Revision No. -  
 Date 12/19/2024

**FIGURE 5**

# Tables

**Table 1**  
**Summary of Monitoring Wells and Piezometers**  
**2024 Groundwater Monitoring and Corrective Action Report**  
**Muscataine Power and Water CCR Landfill**  
**Permit No. #70-SDP-06-82P**

Well ID	State Plane <sup>(1)</sup>		WELL CONSTRUCTION <sup>(2)</sup>					Function	Hydrogeologic Unit	WATER LEVELS (Feet, amsl) <sup>(3)</sup>				
	Northing	Easting	Elevation		Well Depth	Screen Length	Screened Lithology			Low	High	Vertical Gradient <sup>(4)</sup>	4/15/2024	9/12/2024
			Top of Well Casing	Ground										
PZ-5	511,495	2,269,505	729.63	727	10.00	1	CCR	Piezometer	CCR	DRY	DRY	NA	DRY	DRY
MW-4B <sup>(5)</sup>	510,484	2,268,975	715.87	712.04	24.70	10	Clay, Silt	Monitoring	Uppermost Aquifer	705.73	710.01	NA	708.73	707.97
MW-5B	510,485	2,268,777	709.10	706.73	25.30	10	Silt, Clay	Monitoring	Uppermost Aquifer	704.07	708.31	NA	707.40	707.52
MW-6A	510,482	2,268,871	708.92	706.49	25.35	10	Silt, Sand	Monitoring	Uppermost Aquifer	704.47	706.82	NA	706.69	706.45
MW-8	510,639	2,270,068	747.36	744.37	42.95	10	Till	Monitoring	Uppermost Aquifer	727.50	737.74	NA	732.11	730.56
MW-9	510,646	2,270,068	747.12	744.40	58.74	10	Till	Piezometer	Uppermost Aquifer	721.96	729.75	NA	725.69	724.27
MW-10	511,846	2,270,058	718.51	716.32	20.32	10	Silt, Till	Monitoring	Uppermost Aquifer	710.89	715.10	NA	714.89	714.45
MW-11	511,840	2,270,058	718.34	716.00	55.97	10	Till, Sand	Piezometer	Uppermost Aquifer	712.87	718.34	NA	716.39	715.16
MW-12	511,833	2,270,057	717.75	715.40	86.42	5	Till	Piezometer	Lower Confining Unit	713.13	717.75	NA	715.34	715.4
MW-14A	511,035	2,269,301	729.00	726.19	20.50	10	Silt, Till, Clay	Monitoring	Uppermost Aquifer	712.59	719.96	NA	718.68	717.09
MW-15A	510,748	2,269,291	729.99	727.12	20.50	10	Silt, Clay	Monitoring	Uppermost Aquifer	713.83	722.40	NA	721.91	719.32
MW-21	510,779	2,268,668	725.75	722.81	22.20	10	Silt, Clay	Monitoring	Uppermost Aquifer	713.16	721.01	NA	717.02	714.82
MW-22	510,704	2,268,017	744.27	741.13	41	10	Clay Till	Monitoring	Uppermost Aquifer	726.9	731.18	NA	728.49	727.22
MW-23	511,532	2,268,770	726.90	723.73	25	10	Clay Till	Assessment	Uppermost Aquifer	718.47	723.02	NA	722.13	720.70
MW-24	511,476	2,270,056	735.32	732.10	20	10	Clay Till	Assessment	Uppermost Aquifer	716.11	725.83	NA	720.94	720.11
MW-26	510,044	2,269,037	731.08	727.35	38.27	10	Clay Till	Assessment	Uppermost Aquifer	709.68	712.91	NA	710.58	712.26
MW-27	509,830	2,269,401	730.26	726.26	19.44	10	Sand Clay	Assessment	Uppermost Aquifer	714.47	718.43	NA	716.48	716.77

(1) State Plane coordinates from MP&W in email dated 1/20/16 and 6/28/18. MPW has transitioned away from Site System coordinates-see 2017 AWQR Table I-1.

(2) DNR original well construction forms. Top of casings at piezometers re-surveyed May 2018.

(3) Period of record: 2002-2024 (for wells installed during a portion or the entire duration)

(4) Well clusters are MW-8/MW-9 and MW-10/11/12.

(5) MW-4A was damaged and replaced by MW-4B in 2020

(6) MW-13 and MW-18A abandoned in 2019 and MW-25 abandoned in 2020.

NA not applicable; **bold** low or high recorded during 2024.

Table 2

**Summary of Groundwater Monitoring Events  
2024 Groundwater Monitoring and Corrective Action Report  
Muscatine Power and Water CCR Landfill  
Permit No. #70-SDP-06-82P**

<b>Sampling Dates Well Function</b>	<b>MW-4A/MW-4B Downgradient</b>	<b>MW-5B Downgradient</b>	<b>MW-6A Downgradient</b>	<b>MW-8 Upgradient</b>	<b>MW-10 Upgradient</b>	<b>MW-13 Downgradient</b>
June 6, 2016	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
August 15, 2016	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
October 10, 2016	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
December 12, 2016	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
February 17, 2017	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
April 17, 2017	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
June 19, 2017	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
August 7, 2017	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
October 16, 2017	Detection	Detection	Detection	Detection	Detection	Detection
November 28, 2017	-	Supplemental	-	-	-	Supplemental
March 6, 2018	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
June 19, 2018	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
June 30, 2018	-	-	-	-	-	-
August 29-30, 2018	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
March 18, 2019	Assessment	Assessment	Assessment	Assessment	Assessment	-
August 6, 2019	Assessment	Assessment	Assessment	Assessment	Assessment	-
April 7, 2020	Assessment	Assessment	Assessment	Assessment	Assessment	-
September 18, 2020	-	-	-	-	-	-
September 24, 2020	Assessment	Assessment	Assessment	Assessment	Assessment	-
April 6, 2021	Assessment	Assessment	Assessment	Assessment	Assessment	-
September 1, 2021	Assessment	Assessment	Assessment	Assessment	Assessment	-
April 20, 2022	Assessment	Assessment	Assessment	Assessment	Assessment	-
September 14, 2022	Assessment	Assessment	Assessment	Assessment	Assessment	-
April 11-12, 2023	Assessment	Assessment	Assessment	Assessment	Assessment	-
September 18-20, 2023	Assessment	Assessment	Assessment	Assessment	Assessment	-
April 15, 2024	Assessment	Assessment	Assessment	Assessment	Assessment	-
September 12, 2024	Assessment	Assessment	Assessment	Assessment	Assessment	-
<b>Number of Samples</b>						
Appendix III Analytes	24	24	24	24	24	12
Appendix IV Analytes	23	23	23	23	23	11



**Summary of Groundwater Monitoring Events**  
**2024 Groundwater Monitoring and Corrective Action Report**  
**Muscatine Power and Water CCR Landfill**  
**Permit No. #70-SDP-06-82P**

<b>Sampling Dates</b> <b>Well Function</b>	<b>MW-14A</b> Downgradient	<b>MW-15A</b> Downgradient	<b>MW-18A</b> Downgradient	<b>MW-21</b> Downgradient	<b>MW-22 <sup>(2)</sup></b> Upgradient	<b>MW-23 <sup>(2)</sup></b> Upgradient
June 6, 2016	Baseline	Baseline	Baseline	Baseline	-	-
August 15, 2016	Baseline	Baseline	Baseline	Baseline	-	-
October 10, 2016	Baseline	Baseline	Baseline	Baseline	-	-
December 12, 2016	Baseline	Baseline	Baseline	Baseline	-	-
February 17, 2017	Baseline	Baseline	Baseline	Baseline	-	-
April 17, 2017	Baseline	Baseline	Baseline	Baseline	-	-
June 19, 2017	Baseline	Baseline	Baseline	Baseline	-	-
August 7, 2017	Baseline	Baseline	Baseline	Baseline	-	-
October 16, 2017	Detection	Detection	Detection	Detection	-	-
November 28, 2017	Supplemental	Supplemental	Supplemental	Supplemental	-	-
March 6, 2018	Assessment	Assessment	Assessment	Assessment	Baseline	-
June 19, 2018	Assessment	Assessment	Assessment	Assessment	Baseline	-
June 30, 2018	-	-	-	-	-	Baseline
August 29-30, 2018	Assessment	Assessment	Assessment	Assessment	Baseline	Baseline
March 18, 2019	Assessment	Assessment	-	Assessment	Baseline	Baseline
August 6, 2019	Assessment	Assessment	-	Assessment	Baseline	Baseline
April 7, 2020	Assessment	Assessment	-	Assessment	Baseline	Baseline
September 18, 2020	-	-	-	-	Baseline	Baseline
September 24, 2020	Assessment	Assessment	-	Assessment	-	-
April 6, 2021	Assessment	Assessment	-	Assessment	Baseline	Baseline
September 1, 2021	Assessment	Assessment	-	Assessment	Detection	Baseline
April 20, 2022	Assessment	Assessment	-	Assessment	Assessment	Assessment
September 14, 2022	Assessment	Assessment	-	Assessment	Assessment	Assessment
April 11-12, 2023	Assessment	Assessment	-	Assessment	Assessment	Assessment
September 18-20, 2023	Assessment	Assessment	-	Assessment	Assessment	Assessment
April 15, 2024	Assessment	Assessment	-	Assessment	Assessment	Assessment
September 12, 2024	Assessment	Assessment	-	Assessment	Assessment	Assessment

**Number of Samples**

Appendix III Analytes	24	24	12	24	15	14
Appendix IV Analytes	23	23	11	23	14	13

**Notes:**

1. Baseline monitoring events include analysis of both Appendix III (Detection Monitoring) and Appendix IV (Assessment Monitoring) analytes.
2. Detection monitoring events include the analysis of Appendix III (Detection Monitoring) analytes only.
3. Assessment monitoring events include analysis of Appendix III (Detection Monitoring) and Appendix IV (Assessment Monitoring) analytes.
4. MW-22 installed in February 2018 as an additional background well.
5. MW-13 and MW-18A were decommissioned in 2019 due to damage and site construction following IDNR approval.

**Appendix III Parameters (Detection Monitoring)**  
**2024 Groundwater Monitoring and Corrective Action Report**  
**Muscatine Power and Water CCR Landfill**  
**Permit No. #70-SDP-06-82P**

<b>Analyte</b>	<b>Analytical Method</b>
Boron	EPA 6020A
Calcium	EPA 6020A
Chloride	EPA 9056A
Fluoride	EPA 9056A
pH	SM 4500 H+B
Sulfate	EPA 9056A
Total Dissolved Solids (TDS)	SM 2540C

**Appendix IV Parameters (Assessment Monitoring)**  
**2024 Groundwater Monitoring and Corrective Action Report**  
**Muscatine Power and Water CCR Landfill**  
**Permit No. #70-SDP-06-82P**

<b>Analyte</b>	<b>Analytical Method</b>
Antimony	EPA 6020A
Arsenic	EPA 6020A
Barium	EPA 6020A
Beryllium	EPA 6020A
Cadmium	EPA 6020A
Chromium	EPA 6020A
Cobalt	EPA 6020A
Fluoride	EPA 9056A
Lead	EPA 6020A
Lithium	EPA 6020A
Mercury	EPA 7470A
Molybdenum	EPA 6020A
Selenium	EPA 6020A
Thallium	EPA 6020A
Radium 226 and 228 combined	EPA 9315/9320

**Horizontal Groundwater Flow Velocity**  
**2024 Groundwater Monitoring and Corrective Action Report**  
**Muscatine Power and Water CCR Landfill**  
**Permit No. #70-SDP-06-82P**

<b>Date</b>	<b>Monitoring Wells</b>	<b>Horizontal Hydraulic Gradient (unitless)</b>	<b>Average Linear Groundwater Flow Velocity (meters/day)</b>	<b>Average Linear Groundwater Flow Velocity (feet/year)</b>
4/15/2024	MW-8, MW-15A	0.014	0.002	2
9/12/2024	MW-8, MW-15A	0.015	0.002	2

**Notes:**

Velocity calculated for given well pair assuming effective porosity of 0.3 and mean hydraulic conductivity of 0.04 meters per day.

**Overview of Detected Appendix IV Analytes in 2024  
2024 Groundwater Monitoring and Corrective Action Report  
Muscatine Power and Water CCR Landfill  
Permit No. #70-SDP-06-82P**

<b>MW-</b>	<b>4A/4B</b>	<b>5B</b>	<b>6A</b>	<b>8</b>	<b>10</b>	<b>14A</b>	<b>15A</b>	<b>21</b>	<b>22</b>	<b>23</b>
Arsenic				X	X				X	
Barium	X	X	X	X	X	X	X	X	X	X
Chromium								X		
Cobalt	X			X	X					
Fluoride										
Lead										
Lithium								X		
Mercury										
Molybdenum				X	X				X	
Selenium								X		
Combined Radium 226+226	X	X	X	X	X	X			X	

Table 7

**Groundwater Monitoring Program Summary  
2024 Groundwater Monitoring and Corrective Action Report  
Muscatine Power and Water CCR Landfill  
Permit No. #70-SDP-06-82P**

Monitoring Well	Current Monitoring Program Status	Planned Change in Monitoring Program Status For The Next Sampling Event	Confirmed Statistically Significant Increase (SSI) Over Background	Statistically Significant Trends	Statistically Significant Level (SSL) Over GWPS	Upcoming Sampling Dates And Constituents			
						Resample	Semiannual Assessment Monitoring: April 2025	Semiannual Assessment Monitoring: September 2025	Others TBD, if needed
PZ-4	Water level	None	NA	NA	NA	NA	NA	NA	
MW-4A / MW-4B	Assessment	None	None	None	None	NA	Appendix III & IV	Appendix III & IV	
MW-5B	Assessment	None	Chloride	Downward: Chloride	None	NA	Appendix III & IV	Appendix III & IV	
MW-6A	Assessment	None	None	None	None	NA	Appendix III & IV	Appendix III & IV	
MW-8	Background	None	None	Downward: Calcium, Sulfate, TDS	None	NA	Appendix III & IV	Appendix III & IV	
MW-9	Water level	None	NA	NA	NA	NA	NA	NA	
MW-10	Background	None	None	Downward: TDS	None	NA	Appendix III & IV	Appendix III & IV	
MW-11	Water level	None	NA	NA	NA	NA	NA	NA	
MW-12	Water level	None	NA	NA	NA	NA	NA	NA	
MW-13	Abandoned <sup>(1)</sup>	None	NA	NA	NA	NA	NA	NA	
MW-14A	Assessment	None	Boron, calcium, sulfate, TDS	None	None	NA	Appendix III & IV	Appendix III & IV	
MW-15A	Assessment	None	Boron	Downward: Boron	None	NA	Appendix III & IV	Appendix III & IV	
MW-18A	Abandoned <sup>(1)</sup>	None	NA	NA	NA	NA	NA	NA	
MW-21	Assessment	None	Boron	None	None	NA	Appendix III & IV	Appendix III & IV	
MW-22	Background	None	None	Upward: Sulfate; Downward: Chloride	None	NA	Appendix III & IV	Appendix III & IV	
MW-23	Background	None	None	Upward: Chloride; Downward: Sulfate	None	NA	Appendix III & IV	Appendix III & IV	
MW-24	Water level	None	NA	NA	NA	NA	NA	NA	
MW-26	Water level	None	NA	NA	NA	NA	NA	NA	
MW-27	Water level	None	NA	NA	NA	NA	NA	NA	

Notes:

Assessment monitoring program triggered upon receipt of confirmed (by resample) SSI on December 19, 2017 and continuing SSI in 2018.

SSI = Statistically Significant Increase above background.

SSL = Statistically Significant Level above a groundwater protection standard (GWPS).

NA = Not Applicable.

(1) MW-13 and MW-18A were plugged and abandoned in 2019 due to damage and site construction following IDNR approval.

**Groundwater Protection Standards**  
**2024 Groundwater Monitoring and Corrective Action Report**  
**Muscatine Power and Water CCR Landfill**  
**Permit No. #70-SDP-06-82P**

<b>Constituent</b>	<b>Unit</b>	<b>MCL</b>	<b>40 CFR 247.95(h)(2)</b>	<b>Statistical Background Limit</b>	<b>GWPS</b>
Antimony	(mg/L)	0.006	-	0.002	0.006
Arsenic	(mg/L)	0.01	-	0.00784	0.01
Barium	(mg/L)	2	-	0.271	2
Beryllium	(mg/L)	0.004	-	0.001	0.004
Cadmium	(mg/L)	0.005	-	0.0002	0.005
Chromium	(mg/L)	0.1	-	0.005	0.1
Cobalt	(mg/L)	N/A	0.006	0.00558	0.006
Combined Radium	(pCi/L)	5	-	2.48	5
Fluoride	(mg/L)	4	-	1	4
Lead	(mg/L)	0.015	-	0.00204	0.015
Lithium	(mg/L)	N/A	0.04	0.01	0.04
Mercury	(mg/L)	0.002	-	0.0002	0.002
Molybdenum	(mg/L)	N/A	0.1	0.00822	0.1
Selenium	(mg/L)	0.05	-	0.005	0.05
Thallium	(mg/L)	0.002	-	0.001	0.002

## Notes:

All metals as total recoverable.

MCL: Maximum Contaminant Level.

CFR: Code of Federal Regulations.

Statistical Background Limit: Groundwater Stats Consulting, 12/12/2024.

GWPS: Ground Water Protection Standard.

Table 9

**Vertical Hydraulic Gradients<sup>a</sup> (ft/ft)**  
**2024 Groundwater Monitoring and Corrective Action Report**  
**Muscatine Power and Water CCR Landfill**  
**Permit No. #70-SDP-06-82P**

Well Cluster	Vertical Gradient	
	April 2024	October 2024
<i>Shallow/Deep</i>		
MW-8/MW-9	-0.407	-0.399
MW-10/MW-11	0.042	0.020
MW-11/MW-12	0.031	0.007

## Notes:

<sup>a</sup> Positive hydraulic gradients indicate upward-directed flow, and negative hydraulic gradients indicate downward-directed flow.  
ft/ft - Foot per foot.



**Table 10**  
**Analytical Data Summary**  
**2024 Annual Water Quality Report**  
**Muscatine Power & Water - CCR**  
**Permit No. 70-SDP-06-82P**

Constituent (CAS #)	Sample Date	Units	MW-8 Bkgrnd	MW-10 Bkgrnd	MW-22 Bkgrnd	MW-23 Bkgrnd	MW-4B DwnGrad	MW-5B DwnGrad	MW-6A DwnGrad	MW-13 Abandone	MW-14A DwnGrad	MW-15A DwnGrad	MW-18 Abandone	MW-21 DwnGrad
Aluminum (Total) (7429-90-5) SDWR = 0.05 - 0.2	10/10/2016	mg/l	<0.05	<b>0.0826</b>			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	8/7/2017	mg/l	<0.05	<0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	3/6/2018	mg/l	<0.05	<0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<b>0.0832</b>
	8/27/2018	mg/l	<0.05	<0.05			<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5
	3/18/2019	mg/l	<0.05	<0.05	<0.05	<b>0.644</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05
	8/6/2019	mg/l	<0.05	<0.05	<0.05	<b>0.253</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05
	4/10/2020	mg/l	<0.05	<0.05	<0.05	<b>0.552</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05
	9/18/2020	mg/l	<0.05	<0.05	<0.05	<0.05	<b>0.475</b>	<0.05	<0.05		<0.05	<0.05		<0.05
	4/6/2021	mg/l	<0.05	<0.05	<0.05	<b>0.39</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05
	9/1/2021	mg/l	<0.05	<0.05	<0.05	<b>0.135</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05
	4/20/2022	mg/l	<0.05	<0.05	<0.05	<b>0.478</b>	<0.05	<0.05	<0.05		<b>0.111</b>	<0.05		<0.05
	9/14/2022	mg/l	<0.05	<0.05	<0.05	<b>0.142</b>	<0.05	<0.05	<0.05		<b>0.119</b>	<0.05		<0.05
	4/12/2023	mg/l	<0.05	<0.05	<0.05	<b>0.233</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05
	9/20/2023	mg/l	<0.05	<0.05	<0.05	<b>0.105</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05
4/15/2024	mg/l	<0.05	<0.05	<0.05	<b>0.243</b>	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05	
9/11/2024	mg/l	<0.05	<0.05	<0.05	0.168	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05	
Arsenic (Total) (7440-38-2) MCL = 0.01	10/10/2016	mg/l	<0.002	<b>0.00328</b>			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	8/7/2017	mg/l	<0.002	<b>0.00317</b>			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	3/6/2018	mg/l	<0.002	<0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<b>0.00265</b>	<0.002
	8/27/2018	mg/l	<0.002	<b>0.0036</b>			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	3/18/2019	mg/l	<0.002	<b>0.0056</b>	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	8/6/2019	mg/l	<0.002	<b>0.00784</b>	<0.002	<0.002	<0.002	<0.002	<0.002		<0.008	<0.002		<0.002
	4/10/2020	mg/l	<0.002	<b>0.00697</b>	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/18/2020	mg/l	<0.002	<b>0.00748</b>	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	4/6/2021	mg/l	<0.002	<b>0.00393</b>	<b>0.00289</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/1/2021	mg/l	<0.002	<b>0.00781</b>	<b>0.00267</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	4/20/2022	mg/l	<0.002	<b>0.00371</b>	<b>0.00340</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/14/2022	mg/l	<0.002	<b>0.00497</b>	<b>0.00285</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	4/12/2023	mg/l	<b>0.00247</b>	<b>0.00224</b>	<b>0.00421</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/20/2023	mg/l	<0.002	<b>0.0</b>	<b>0.0</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
4/15/2024	mg/l	<b>0.00390</b>	<0.002	<b>0.00634</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002	
9/11/2024	mg/l	<b>0.00466</b>	<b>0.00525</b>	<b>0.00749</b>	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002	

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Barium (Total) (7440-39-3) MCL = 2	10/10/2016	mg/l	0.1	0.1630			0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.1
	8/7/2017	mg/l	0.1	0.2			0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0
	3/6/2018	mg/l	0.1	0.1			0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0148
	8/27/2018	mg/l	0.1	0.2			0.1	0.4	0.2	0.1	0.0	0.0	0.0	0.1
	3/18/2019	mg/l	0.1	0.2	0.2	0.092	0.2	0.3	0.2		0.0	0.0		0.1
	8/6/2019	mg/l	0.1	0.2	0.2	0.064	0.1	0.3	0.2		0.0	0.0		0.1
	4/10/2020	mg/l	0.1	0.2	0.2	0.065	0.2	0.3	0.2		0.0	0.0		0.0
	9/18/2020	mg/l	0.1	0.2	0.2	0.0	0.147	0.2	0.2		0.0	0.0		0.0
	4/6/2021	mg/l	0.1	0.2	0.2	0.06	0.169	0.3	0.2		0.0	0.0		0.0
	9/1/2021	mg/l	0.1	0.2	0.2	0.050	0.186	0.2	0.2		0.0	0.0		0.0
	4/20/2022	mg/l	0.1	0.2	0.2	0.057	0.2	0.3	0.2		0.033	0.0		0.0
	9/14/2022	mg/l	0.0703	0.223	0.243	0.0507	0.188	0.253	0.229		0.034	0.0327		0.0447
	4/12/2023	mg/l	0.07	0.19	0.227	0.0518	0.173	0.237	0.246		0.032	0.0299		0.031
	9/20/2023	mg/l	0.0782	0.233	0.256	0.0533	0.181	0.274	0.222		0.0348	0.0338		0.0559
4/15/2024	mg/l	0.0857	0.193	0.271		0.168	0.243	0.235		0.0323	0.0353		0.031	
9/11/2024	mg/l	0.0944	0.219	0.268	0.0521	0.184	0.258	0.249		0.0338	0.0335		0.0555	
Beryllium (Total) (7440-41-7) MCL = 0.004	10/10/2016	mg/l	<0.001	<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	8/7/2017	mg/l	<0.001	<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	3/6/2018	mg/l	<0.001	<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	8/27/2018	mg/l	<0.001	<0.001			<0.001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001
	3/18/2019	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	8/6/2019	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.004	<0.001		<0.001
	4/10/2020	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	9/18/2020	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	4/6/2021	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	9/1/2021	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	4/20/2022	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	9/14/2022	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	4/12/2023	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
	9/20/2023	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001
4/15/2024	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	
9/11/2024	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	

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Boron (Total) (7440-42-8) HAL = 6	10/10/2016	mg/l	<0.2	<0.2			<0.2	<0.2	<0.2	74.8	19.3	17.9	14.3	8.45
	8/7/2017	mg/l	<0.2	<0.2			<0.2	<0.2	<0.2	2.72	13	14.7	10.8	7.05
	3/6/2018	mg/l	<0.2	<0.2			0.66	<0.2	<0.2	21.7	11	9.8	8.81	0.885
	8/27/2018	mg/l	<0.2	<0.2			<0.2	<0.2	<0.2	1.45	14	14.6	10.5	1.36
	3/18/2019	mg/l	<0.2	<0.2	0.299	<0.2	<0.2	<0.2	<0.2		15.5	8.35		6.95
	8/6/2019	mg/l	0.205	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		17.6	7.56		8.46
	4/10/2020	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		17.4	10.6		6.76
	9/18/2020	mg/l	<0.1	<0.1	0.263	0.15	<0.1	<0.1	<0.1		19.5	14.5		6.82
	4/6/2021	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		17.2	10.3		5.24
	9/1/2021	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		17.1	11.1		5.88
	4/20/2022	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		15.2	6.98		3.57
	9/14/2022	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		15.1	10.4		3.69
	4/12/2023	mg/l	<0.1	<0.1	0.247	0.145	<0.1	<0.1	<0.1		14.8	5.80		3.35
	9/20/2023	mg/l	<0.1	<0.1	0.207	0.128	<0.1	<0.1	<0.1		18.1	9.28		4.42
4/15/2024	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		15.2	5.8		2.31	
9/11/2024	mg/l	<0.1	<0.1	0.243	0.126	<0.1	<0.1	<0.1		17.7	8.5		3.68	
Calcium (Total) (7440-70-2) MCL = NA	10/10/2016	mg/l	118	83.3			89.3	140	75.7	276	308	203	280	185
	8/7/2017	mg/l	91.3	85.5			89.7	139	71.2	95.4	296	206	258	163
	3/6/2018	mg/l	74.7	77.3			95.8	134	74.1	149	278	229	191	25.1
	8/27/2018	mg/l	83.6	85.4			91.3	146	73.3	93.1	309	155	223	78.7
	3/18/2019	mg/l	97.6	76.3	91.6	59.7	99.7	134	73.2		290	118		142
	8/6/2019	mg/l	132	78.9	83.8	59.5	93.8	139	80.9		255	111		145
	4/10/2020	mg/l	92.4	75.4	80.9	61	89.6	117	85.1		245	163		104
	9/18/2020	mg/l	77.7	74.2	75.5	52.1	89	108	87.9		244	134		101
	4/6/2021	mg/l	81.2	78.8	78.4	56.3	94.1	104	87.6		259	128		79.5
	9/1/2021	mg/l	78.3	80	79.4	56.1	95.1	108	90.6		270	125		93.5
	4/20/2022	mg/l	69.6	90.4	80.2	54	106	117	96.5		289	127		97.5
	9/14/2022	mg/l	76.8	82	79.6	54.5	92.3	117	89		301	132		88.2
	4/12/2023	mg/l	78.2	83.7	80.4	55.3	91.3	107	95.4		318	110		76.0
	9/20/2023	mg/l	79.4	84.7	79	56	90.4	115	82.1		291	126		96.0
4/15/2024	mg/l	84.2	96.2	83.1	59.7	97.7	112	92.4		344	118		59.9	
9/11/2024	mg/l	88.6	97.8	84.3	58	102	123	99.4		327	129		96.6	

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Chloride (16887-00-6) SDWR = 250	10/10/2016	mg/l	16.2	<5			13.6	66.0	<5	29.8	37.0	17.6	35.3	24.4
	8/7/2017	mg/l	14.0	<5			13.2	64.0	<5	9.6	32.9	15.4	27.0	16.1
	3/6/2018	mg/l	14.5	<5			8.8	68.2	5.3	19.9	37.4	24.2	27.1	<5
	8/27/2018	mg/l	15.6	<5			19.4	70.8	<5	7.2	33.1	10.1	26.9	<5
	3/18/2019	mg/l	16.1	<5	27.6	10.5	16.0	55.0	<5		25.8	8.5		8.3
	8/6/2019	mg/l	17.1	<5	26.9	13.8	15.6	64.1	<5		22.1	9.9		14.0
	4/10/2020	mg/l	17.2	<5	24.8	15.7	14.8	44.0	12.2		22.5	13.0		8.1
	9/18/2020	mg/l	14.7	<5	23.2	14.4	15.100	41.0	15.6		22.8	8.6		7.2
	4/6/2021	mg/l	22.3	<5	28.1	21.4	22.900	42.7	19.3		27.1	15.0		5.1
	9/1/2021	mg/l	16.3	<5	20.0	15.2	16.700	37.6	17.4		23.2	8.9		6.6
	4/20/2022	mg/l	15.8	<5	20.2	16.9	20.8	38.1	14.2		25.500	7.7		7.2
	9/14/2022	mg/l	16.7	<5	7.04	16.2	16.8	39	13.3		22.4	8.29		18
	4/12/2023	mg/l	17.9	5.86	18.2	17.7	18	38.7	15.4		20.3	7.3		5.93
	9/20/2023	mg/l	19.9	<5.00	18.4	19.2	17.4	41.8	12.2		20.9	8.41		8.23
4/15/2024	mg/l	17.2	<5.00	15.8	19.2	18.1	39.3	15.5		16.4	7.01		<5.00	
9/11/2024	mg/l	20.1	9.65	16.6	21.7	14.6	40.5	14.4		16.3	7.41		13.5	
Cobalt (Total) (7440-48-4) 40CFR§257.95(h)(2) = 0.006	10/10/2016	mg/l	<0.0005	0.000520			<0.0005	<0.0005	<0.0005	0.00179	<0.0005	<0.0005	<0.0005	<0.0005
	8/7/2017	mg/l	0.00051	0.0007			<0.0005	<0.0005	<0.0005	0.000686	<0.0005	<0.0005	<0.0005	<0.0005
	3/6/2018	mg/l	<0.0005	0.00063			<0.0005	<0.0005	<0.0005	0.000964	<0.0005	<0.0005	<0.0005	<0.0005
	8/27/2018	mg/l	<0.0005	0.00088			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	3/18/2019	mg/l	0.00177	0.00078	<0.0005	0.00176	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	8/6/2019	mg/l	0.00558	0.000572	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.002	<0.0005		<0.0005
	4/10/2020	mg/l	0.000517	0.000581	<0.0005	0.000817	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/18/2020	mg/l	0.000738	0.000751	<0.0005	<0.0005	0.00147	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	4/6/2021	mg/l	0.000839	0.000752	<0.0005	0.000517	0.00132	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/1/2021	mg/l	0.001270	0.000576	<0.0005	<0.0005	0.00335	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	4/20/2022	mg/l	0.001430	0.001040	<0.0005	0.000561	0.00135	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/14/2022	mg/l	0.00164	0.00109	<0.0005	<0.0005	0.00459	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	4/12/2023	mg/l	0.001400	0.001420	<0.0005	<0.0005	0.00271	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/20/2023	mg/l	0.001260	0.000995	<0.0005	<0.0005	0.00374	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
4/15/2024	mg/l	0.0018	0.00122	<0.0005	<0.0005	0.00172	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	
9/11/2024	mg/l	0.00216	0.000977	<0.0005	<0.0005	0.0028	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	

**Table 10**  
**Analytical Data Summary**  
**2024 Annual Water Quality Report**  
**Muscatine Power & Water - CCR**  
**Permit No. 70-SDP-06-82P**

Constituent (CAS #)	Sample Date	Units	MW-8 Bkgrnd	MW-10 Bkgrnd	MW-22 Bkgrnd	MW-23 Bkgrnd	MW-4B DwnGrad	MW-5B DwnGrad	MW-6A DwnGrad	MW-13 Abandone	MW-14A DwnGrad	MW-15A DwnGrad	MW-18 Abandone	MW-21 DwnGrad
Copper (Total) (7440-50-8) MCL = 1.3	10/10/2016	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	8/7/2017	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	3/6/2018	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	8/27/2018	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	3/18/2019	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	8/6/2019	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.02	<0.005		<0.005
	4/10/2020	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	9/18/2020	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	4/6/2021	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	9/1/2021	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	4/20/2022	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	9/14/2022	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	4/12/2023	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	9/20/2023	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	4/15/2024	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
9/11/2024	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	
Fluoride (16984-48-8) MCL = 4	10/10/2016	mg/l	<0.5	<0.5			<0.5	<0.5	<0.5	<b>3.25</b>	<b>0.867</b>	<0.5	<b>0.791</b>	<0.5
	8/7/2017	mg/l	<0.05	<0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	3/6/2018	mg/l	<0.05	<0.5			<0.5	<0.5	<0.5	<b>2.08</b>	<0.5	<0.5	<0.5	<0.5
	8/27/2018	mg/l	<0.05	<0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	3/18/2019	mg/l	<0.05	<0.5	<0.5	<0.5	<b>0.771</b>	<0.5	<0.5		<0.5	<b>0.523</b>		<0.5
	8/6/2019	mg/l	<b>0.643</b>	<b>0.596</b>	<b>0.507</b>	<0.5	<b>0.525</b>	<0.5	<b>0.535</b>		<0.5	<b>0.625</b>		<0.5
	4/10/2020	mg/l	<b>0.864</b>	<0.5	<0.5	<0.5	<0.5	<0.5	<b>0.652</b>		<0.5	<0.5		<0.5
	9/18/2020	mg/l	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5		<0.5
	4/6/2021	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<b>0.5</b>		<0.5
	9/1/2021	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5		<0.5
	4/20/2022	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5		<0.5
	9/14/2022	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5		<0.5
	4/12/2023	mg/l	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00		<1.00	<1.00		<1.00
	9/20/2023	mg/l	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00		<1.00	<1.00		<1.00
	4/15/2024	mg/l	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00		<1.00	<1.00		<1.00
9/11/2024	mg/l	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00		<1.00	<1.00		<1.00	

**Table 10**  
**Analytical Data Summary**  
**2024 Annual Water Quality Report**  
**Muscatine Power & Water - CCR**  
**Permit No. 70-SDP-06-82P**

Constituent (CAS #)	Sample Date	Units	MW-8 Bkgrnd	MW-10 Bkgrnd	MW-22 Bkgrnd	MW-23 Bkgrnd	MW-4B DwnGrad	MW-5B DwnGrad	MW-6A DwnGrad	MW-13 Abandone	MW-14A DwnGrad	MW-15A DwnGrad	MW-18 Abandone	MW-21 DwnGrad
Iron (Total) (7439-89-6) SDWR = 0.3	10/10/2016	mg/l	<0.1	1.8			1.5	2.49	3.12	<0.1	<0.1	<0.1	<0.1	<0.1
	8/7/2017	mg/l	<0.1	1.58			1.68	2.51	3.09	0.408	<0.1	<0.1	<0.1	<0.1
	3/6/2018	mg/l	<0.1	0.177			0.267	2.43	3.05	0.263	<0.1	<0.1	<0.1	<0.1
	8/27/2018	mg/l	<0.1	1.75			1.63	2.6	3.13	0.86	<0.1	0.102	0.144	<0.1
	3/18/2019	mg/l	<0.1	2.75	<0.1	0.674	1.97	3.08	3.07		<0.1	<0.1		<0.1
	8/6/2019	mg/l	<0.1	3.33	<0.1	0.231	1.61	2.6	3.39		<0.4	<0.4		<0.1
	4/10/2020	mg/l	<0.1	3.36	<0.1	0.485	5.55	1.88	3.47		<0.1	<0.1		<0.1
	9/18/2020	mg/l	<0.1	4.38	<0.1	<0.1	0.895	1.86	3.45		<0.1	<0.1		<0.1
	4/6/2021	mg/l	0.2	2.08	<0.1	0.3	<0.1	1.85	3.57		<0.1	<0.1		<0.1
	9/1/2021	mg/l	0.1	4.37	<0.1	0.1	<0.1	2.21	3.83		<0.1	<0.1		<0.1
	4/20/2022	mg/l	0.565	2.49	<0.1	0.492	<0.1	1.99	3.61		0.165	<0.1		<0.1
	9/14/2022	mg/l	0.609	2.70	<0.1	0.117	0.250	2.03	3.43		<0.1	<0.1		<0.1
	4/12/2023	mg/l	0.708	1.09	<0.1	0.210	0.423	1.83	3.43		<0.1	<0.1		<0.1
	9/20/2023	mg/l	0.451	2.45	<0.1	<0.1	0.559	2.18	3.09		<0.1	<0.1		<0.1
	4/15/2024	mg/l	1.29	0.982	<0.1	0.239	0.309	1.78	3.42		<0.1	<0.1		<0.1
9/11/2024	mg/l	1.53	2.86	0.189	0.16	0.797	2.06	3.6		<0.1	<0.1		<0.1	
Lead (Total) (7439-92-1) MCL = 0.015	10/10/2016	mg/l	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	8/7/2017	mg/l	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	3/6/2018	mg/l	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	8/27/2018	mg/l	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	3/18/2019	mg/l	<0.0005	<0.0005	<0.0005	0.00204	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	8/6/2019	mg/l	<0.0005	<0.0005	<0.0005	0.000663	<0.0005	<0.0005	<0.0005		<0.002	<0.0005		<0.0005
	4/10/2020	mg/l	<0.0005	<0.0005	<0.0005	0.00116	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/18/2020	mg/l	<0.0005	<0.0005	<0.0005	<0.0005	0.000532	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	4/6/2021	mg/l	<0.0005	<0.0005	<0.0005	0.000624	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/1/2021	mg/l	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	4/20/2022	mg/l	<0.0005	<0.0005	<0.0005	0.000596	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/14/2022	mg/l	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	4/12/2023	mg/l	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005
	9/20/2023	mg/l	<0.0005	<0.0005	<0.0005	<0.0005	0.000576	0.000627	<0.0005		<0.0005	<0.0005		<0.0005
	4/15/2024	mg/l	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005		<0.0005	<0.0005		<0.0005
9/11/2024	mg/l	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	

**Table 10**  
**Analytical Data Summary**  
**2024 Annual Water Quality Report**  
**Muscatine Power & Water - CCR**  
**Permit No. 70-SDP-06-82P**

Constituent (CAS #)	Sample Date	Units	MW-8 Bkgrnd	MW-10 Bkgrnd	MW-22 Bkgrnd	MW-23 Bkgrnd	MW-4B DwnGrad	MW-5B DwnGrad	MW-6A DwnGrad	MW-13 Abandone	MW-14A DwnGrad	MW-15A DwnGrad	MW-18 Abandone	MW-21 DwnGrad
Lithium 40CFR§257.95(h)(2) = 0.04	10/10/2016	mg/l	<0.05	<0.05				<0.05	<0.05	<0.150	<0.05	<0.05	<0.05	<0.05
	8/7/2017	mg/l	<0.05	<0.05				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	3/6/2018	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<b>0.0122</b>	<0.01	<0.0005	<0.0005	<0.01
	8/27/2018	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	3/18/2019	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.01		<0.01	<0.01		<b>0.0277</b>
	8/6/2019	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.01		<0.04	<0.01		<b>0.0279</b>
	4/10/2020	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01		<b>0.0213</b>
	9/18/2020	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01		<b>0.0225</b>
	4/6/2021	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01		<b>0.0198</b>
	9/1/2021	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01		<b>0.0233</b>
	4/20/2022	mg/l	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100		<b>0.0162</b>
	9/14/2022	mg/l	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100		<b>0.018</b>
	4/12/2023	mg/l	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100		<b>0.0143</b>
	9/20/2023	mg/l	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100		<b>0.0205</b>
4/15/2024	mg/l	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100		<b>0.0124</b>	
9/11/2024	mg/l	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100		<b>0.0194</b>	
Magnesium (Total) (7439-95-4) MCL = NA	10/10/2016	mg/l	<b>44.1</b>	<b>33.8</b>			<b>31.4</b>	<b>42</b>	<b>23.5</b>	<b>88</b>	<b>122</b>	<b>79.3</b>	<b>107</b>	<b>76.6</b>
	8/7/2017	mg/l	<b>36.4</b>	<b>37.8</b>			<b>33.4</b>	<b>43.8</b>	<b>24.7</b>	<b>34.9</b>	<b>124</b>	<b>86</b>	<b>99.6</b>	<b>72.1</b>
	3/6/2018	mg/l	<b>28.5</b>	<b>35.1</b>			<b>36.9</b>	<b>40.3</b>	<b>23.6</b>	<b>55.9</b>	<b>120</b>	<b>92</b>	<b>71.3</b>	<b>11.3</b>
	8/27/2018	mg/l	<b>31.8</b>	<b>33.4</b>			<b>32.6</b>	<b>44.6</b>	<b>23.6</b>	<b>33</b>	<b>145</b>	<b>63.4</b>	<b>81.5</b>	<b>34.1</b>
	3/18/2019	mg/l	<b>37.4</b>	<b>31.7</b>	<b>34.9</b>	<b>18.4</b>	<b>35.6</b>	<b>43.1</b>	<b>24.2</b>		<b>103</b>	<b>48.5</b>		<b>60.1</b>
	8/6/2019	mg/l	<b>50.1</b>	<b>30.0</b>	<b>33.0</b>	<b>24.7</b>	<b>34</b>	<b>42.8</b>	<b>25.4</b>		<b>103</b>	<b>46.9</b>		<b>62.5</b>
	4/10/2020	mg/l	<b>37.1</b>	<b>31.4</b>	<b>34.5</b>	<b>28.5</b>	<b>34</b>	<b>39.6</b>	<b>29.4</b>		<b>102</b>	<b>71</b>		<b>46.9</b>
	9/18/2020	mg/l	<b>31.8</b>	<b>31.9</b>	<b>31.1</b>	<b>24.3</b>	<b>33.2</b>	<b>36.6</b>	<b>28.5</b>		<b>104</b>	<b>59</b>		<b>45.6</b>
	4/6/2021	mg/l	<b>31.8</b>	<b>32.2</b>	<b>31.0</b>	<b>25.3</b>	<b>34.3</b>	<b>35.7</b>	<b>28.8</b>		<b>116</b>	<b>55.4</b>		<b>34.9</b>
	9/1/2021	mg/l	<b>31.0</b>	<b>31.3</b>	<b>31.4</b>	<b>24.8</b>	<b>35.6</b>	<b>35.2</b>	<b>29.6</b>		<b>119</b>	<b>54</b>		<b>40.8</b>
	4/20/2022	mg/l	<b>27.7</b>	<b>35.0</b>	<b>29.6</b>	<b>23.3</b>	<b>35.1</b>	<b>35.0</b>	<b>28.6</b>		<b>120.0</b>	<b>56.0</b>		<b>40.2</b>
	9/14/2022	mg/l	<b>30.1</b>	<b>33.3</b>	<b>31.8</b>	<b>24.6</b>	<b>33.6</b>	<b>36.8</b>	<b>29.4</b>		<b>122</b>	<b>56.1</b>		<b>39.1</b>
	4/12/2023	mg/l	<b>31.1</b>	<b>34.5</b>	<b>31.5</b>	<b>24.4</b>	<b>33.9</b>	<b>34.8</b>	<b>31.2</b>		<b>122.0</b>	<b>48.7</b>		<b>33.0</b>
	9/20/2023	mg/l	<b>31.5</b>	<b>34.7</b>	<b>32.0</b>	<b>25.4</b>	<b>33.6</b>	<b>37.6</b>	<b>27.2</b>		<b>122.0</b>	<b>54.0</b>		<b>42.8</b>
4/15/2024	mg/l	<b>32.7</b>	<b>41.5</b>	<b>33</b>	<b>26.6</b>	<b>35.6</b>	<b>36.5</b>	<b>31</b>		<b>135</b>	<b>51.6</b>		<b>24.9</b>	
9/11/2024	mg/l	<b>34.3</b>	<b>41.1</b>	<b>33.1</b>	<b>25.9</b>	<b>35.9</b>	<b>36.4</b>	<b>30.8</b>		<b>134</b>	<b>53.8</b>		<b>41.3</b>	

**Table 10**  
**Analytical Data Summary**  
**2024 Annual Water Quality Report**  
**Muscatine Power & Water - CCR**  
**Permit No. 70-SDP-06-82P**

Constituent (CAS #)	Sample Date	Units	MW-8 Bkgrnd	MW-10 Bkgrnd	MW-22 Bkgrnd	MW-23 Bkgrnd	MW-4B DwnGrad	MW-5B DwnGrad	MW-6A DwnGrad	MW-13 Abandone	MW-14A DwnGrad	MW-15A DwnGrad	MW-18 Abandone	MW-21 DwnGrad
Manganese (Total) (7439-95-5) SDWR = 0.05 / HAL = 0.3	10/10/2016	mg/l	0.28	0.151			0.133	0.69	0.0818	0.509	<0.01	<0.01	<0.01	<0.01
	8/7/2017	mg/l	0.237	0.166			0.132	0.689	0.0802	0.286	<0.01	<0.01	<0.01	<0.01
	3/6/2018	mg/l	0.201	0.0706			0.208	0.692	0.0866	0.512	<0.01	<0.01	<0.01	<0.01
	8/27/2018	mg/l	0.325	0.239			0.131	0.717	0.0805	0.305	<0.01	<0.01	0.0142	<0.01
	3/18/2019	mg/l	0.455	0.163	0.256	0.134	0.15	0.576	0.0839		<0.01	<0.01		<0.01
	8/6/2019	mg/l	0.758	0.177	1.74	0.0443	0.145	0.784	0.0941		<0.04	<0.01		<0.01
	4/10/2020	mg/l	0.119	0.184	0.0896	0.0718	0.13	0.492	0.103		<0.01	<0.01		<0.01
	9/18/2020	mg/l	0.652	0.251	1.36	0.0127	0.686	0.546	0.113		<0.01	<0.01		<0.01
	4/6/2021	mg/l	0.185	0.199	0.18	0.0634	1.39	0.467	0.109		<0.01	<0.01		<0.01
	9/1/2021	mg/l	0.663	0.221	1.27	0.0444	1.39	0.512	0.117		<0.01	<0.01		<0.01
	4/20/2022	mg/l	0.411	0.231	0.106	0.0588	0.91	0.454	0.112		0.0264	<0.01		<0.01
	9/14/2022	mg/l	0.749	0.31	0.795	0.0222	0.871	0.532	0.112		<0.01	<0.01		<0.01
	4/12/2023	mg/l	0.309	0.396	0.0633	0.0372	0.510	0.453	0.113		<0.01	<0.01		<0.01
	9/20/2023	mg/l	0.370	0.266	0.7670	0.0169	0.612	0.594	0.0995		<0.01	<0.01		<0.01
4/15/2024	mg/l	0.509	0.233	0.118	0.037	0.395	0.506	0.114		<0.01	<0.01		<0.01	
9/11/2024	mg/l	0.491	0.255	0.677	0.0301	0.491	0.554	0.118		<0.01	<0.01		<0.01	
Molybdenum (Total) (7439-98-7) 40CFR§257.95(h)(2) = 0.1	10/10/2016	mg/l	<0.002	<0.002			<0.002	<0.002	<0.002	0.0176	<0.002	<0.002	<0.002	<0.002
	8/7/2017	mg/l	<0.002	<0.002			<0.002	<0.002	<0.002	0.00329	<0.002	<0.002	<0.002	<0.002
	3/6/2018	mg/l	0.0022	<0.02			<0.002	<0.002	<0.002	0.00732	<0.002	<0.002	<0.002	<0.002
	8/27/2018	mg/l	0.00224	0.0022			<0.002	<0.002	<0.002	0.00278	<0.002	<0.002	<0.002	<0.002
	3/18/2019	mg/l	<0.002	0.00341	0.00263	<0.002	<0.002	0.00212	<0.002		<0.002	<0.002		<0.002
	8/6/2019	mg/l	<0.002	0.00219	0.00574	<0.002	<0.002	<0.002	<0.002		<0.008	<0.002		<0.002
	4/10/2020	mg/l	<0.002	0.00215	0.00297	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/18/2020	mg/l	<0.002	<0.002	0.00529	<0.002	0.00296	<0.002	<0.002		<0.002	<0.002		<0.002
	4/6/2021	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/1/2021	mg/l	0.00218	0.0	0.00558	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	4/20/2022	mg/l	<0.002	<0.002	0.0042	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/14/2022	mg/l	<0.002	<0.002	0.00446	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	4/12/2023	mg/l	<0.002	<0.002	0.00364	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
	9/20/2023	mg/l	<0.002	<0.002	0.00661	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002
4/15/2024	mg/l	<0.002	<0.002	0.00217	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002	
9/11/2024	mg/l	0.00205	0.00287	0.00578	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002	



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Radium 226 and 228 combined	10/10/2016	mg/l	0.35	0.694			0.674	0.428	0.512	1.14	0.523	0.286	0.711	0.817
	8/7/2017	mg/l	0.336	0.831			0.443	0.507	0.333	0.523	0.456	0.244	0.284	0.814
	3/6/2018	mg/l	0.668	0.276	0.257		0.45	0.959	0.618	0.785	0.258	0.123	0.384	0.358
	8/27/2018	mg/l												
	3/18/2019	mg/l	<0.217	<0.331	<0.343	1	0.436	0.568	0.481		<0.0223	<0.391		<0.287
	8/6/2019	mg/l												
	4/10/2020	mg/l	0.462	1.01	0.44	0.576	0.354	1.2	0.787		0.397			0.305
	9/18/2020	mg/l												
	4/6/2021	mg/l	0.208 U	0.488	0.547	0.296 U	0.0519 U	0.982	0.667		0.614	0.219 U		0.182 U
	9/1/2021	mg/l	0.296 U	1.32	0.522	0.794	1.08	1.29	1.12		0.684	0.362 U		0.499
	4/20/2022	mg/l	0.316 U	0.693	0.494	1.27	0.550 U	0.913	0.901		0.486 U	0.0289 U		0.171 U
	9/14/2022	mg/l	-0.0309 U	1.12	0.283 U	-0.195 U	0.836	0.363 U	0.599		0.0843 U	-0.159 U		-0.0783 U
	4/12/2023	mg/l	0.469 U	0.775	0.422 U	1.32	0.687	0.553	0.695		0.0651 U	0.727		0.678
	9/20/2023	mg/l	1.03	1.48	1.11	0.606 U	0.575 U	1.15	0.916		0.57	0.118 U		0.497 U
4/15/2024	mg/l	0.994	0.825	2.48	0.402 U	0.663	1.23	0.522		1.02	0.157 U		0.0684 U	
9/11/2024	mg/l	<0.606 U	0.555	0.674	<0.563 U	1.3	1.57	0.876		<0.603 U	<0.549 U		<0.586 U	
Selenium (Total) (7782-49-2) MCL = 0.05	10/10/2016	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	0.0364	0.00821	<0.005	<0.005	0.0137
	8/7/2017	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005	0.00759	<0.005	<0.005	0.0109
	3/6/2018	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	0.0195	<0.005	0.00502	<0.005	<0.005
	8/27/2018	mg/l	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005	0.00827	<0.005	<0.005	<0.005
	3/18/2019	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		0.00569	<0.005		0.0102
	8/6/2019	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.02	<0.005		0.0108
	4/10/2020	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		0.00632
	9/18/2020	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		0.00762
	4/6/2021	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	9/1/2021	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		0.00617
	4/20/2022	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		0.00634
	9/14/2022	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	4/12/2023	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005
	9/20/2023	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		0.0053
4/15/2024	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	
9/11/2024	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		0.00666	

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Strontium (Total) (7440-24-6) HAL = 4	10/10/2016	mg/l	0.338	0.156			0.103	0.193	0.156	0.342	0.279	0.185	0.325	0.291
	8/7/2017	mg/l	0.243	0.165			0.11	0.197	0.161	0.135	0.257	0.178	0.287	0.256
	3/6/2018	mg/l	0.209	0.159			0.137	0.2	0.172	0.243	0.241	0.191	0.225	0.0425
	8/27/2018	mg/l	0.198	0.197			0.107	0.212	0.161	0.139	0.266	0.14	0.257	0.133
	3/18/2019	mg/l	0.236	0.181	0.151	0.123	0.12	0.214	0.176		0.275	0.126		0.254
	8/6/2019	mg/l	0.323	0.199	0.133	0.0872	0.115	0.208	0.178		0.274	0.134		0.263
	4/10/2020	mg/l	0.233	0.19	0.129	0.0661	0.103	0.166	0.173		0.246	0.154		0.175
	9/18/2020	mg/l	0.176	0.19	0.108	0.0602	0.146	0.167	0.187		0.259	0.153		0.184
	4/6/2021	mg/l	0.188	0.18	0.130	0.0639	0.129	0.163	0.188		0.261	0.133		0.148
	9/1/2021	mg/l	0.172	0.23	0.115	0.068	0.14	0.17	0.204		0.282	0.136		0.178
	4/20/2022	mg/l	0.164	0.173	0.127	0.0595	0.122	0.168	0.194		0.247	0.149		0.169
	9/14/2022	mg/l	0.16	0.191	0.111	0.0592	0.101	0.167	0.184		0.266	0.127		0.155
	4/12/2023	mg/l	0.148	0.178	0.137	0.0526	0.0910	0.149	0.194		0.293	0.0985		0.153
	9/20/2023	mg/l	0.151	0.207	0.101	0.0601	0.0958	0.163	0.165		0.282	0.113		0.164
4/15/2024	mg/l	0.172	0.188	0.103	0.0585	0.0951	0.166	0.19		0.301	0.125		0.153	
9/11/2024	mg/l	0.181	0.197	0.106	0.0598	0.103	0.162	0.188		0.298	0.117		0.181	
Sulfate (14808-79-8) SDWR = 250	10/10/2016	mg/l	187	36.4			27.2	105	<5	1170	1010	607	855	603
	8/7/2017	mg/l	119	39			35.3	114	<5	99.4	1110	664	801	590
	3/6/2018	mg/l	87.3	51.4			162	122	<5	506	1110	824	624	53.7
	8/27/2018	mg/l	94.7	34.3			52.2	120	<5	72.7	1070	400	675	96.6
	3/18/2019	mg/l	223	42.8	134	26.2	48	85	<5		1050	351		442
	8/6/2019	mg/l	276	28.8	139	29.7	47	112	<5		837	327		529
	4/10/2020	mg/l	123	18.6	143	25.5	41.5	58.9	13.6		888	496		373
	9/18/2020	mg/l	100	36.5	151	25.8	46.9	61.9	19.1		924	403		356
	4/6/2021	mg/l	100	27.6	154	35.5	60.1	57.4	27.3		952	338		237
	9/1/2021	mg/l	83	32.3	154	25.8	50.2	53.7	22.7		1010	333		303
	4/20/2022	mg/l	72.8	48.3	158	25.4	58.4	44.7	18.9		1030	297		293
	9/14/2022	mg/l	67.1	31.2	220	23	49.5	49.9	16.4		978	319		151
	4/12/2023	mg/l	72.2	39.8	147	25.0	54.0	45.8	20.5		1150	254		215
	9/20/2023	mg/l	94.2	57.4	208	28.6	53.1	53.4	10.1		1440	365		303
4/15/2024	mg/l	65.7	49.6	160	21.8	56.1	46.3	18.1		1160	256		138	
9/11/2024	mg/l	68.9	59.9	161	23.8	65.8	50.4	16.3		1110	273		248	

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Total Suspended Solids	9/11/2024	mg/L	<b>2.25</b>	<b>386</b>				<b>520</b>	<b>382</b>		<b>1830</b>	<b>602</b>		<b>584</b>
Zinc (Total) (7440-66-6) HAL = 2 / SDWR = 5	10/10/2016	mg/l	<0.01	<0.01			<0.01	<0.01	<0.01	<b>0.0197</b>	<0.01	<0.01	<0.01	<0.01
	8/7/2017	mg/l	<0.02	<0.02			<0.02	<0.02	<0.02	<0.002	<0.02	<0.02	<0.02	<0.02
	3/6/2018	mg/l	<0.02	<0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	8/27/2018	mg/l	<0.02	<0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	3/18/2019	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	8/6/2019	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.08	<0.02		<0.02
	4/10/2020	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	9/18/2020	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	4/6/2021	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	9/1/2021	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	4/20/2022	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	9/14/2022	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	4/12/2023	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
	9/20/2023	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02
4/15/2024	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02		<0.02	
9/11/2024	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<b>0.022</b>	<0.02		<0.02	

Notes.  
**Bold** indicates reported detection  
MCL = USEPA Maximum Contaminant Level  
HAL = Health Advisory Level

NS - Not Sampled  
SS = Iowa Statewide Standards  
SDWR = Secondary Drinking Water Regulations (also kno

# Appendices

# **Appendix A**

## **Groundwater Sample Collection Records**









**LOW FLOW SAMPLING FORM**

DATE 4.12.24 WELL ID MW-08 SAMPLE DATE / TIME \_\_\_\_\_  
 SITE Muscatine Power & Water DTW 15.25 NOTE \_\_\_\_\_  
 PROJECT # Spring 2024 WELL DEPTH 43.02  
 WEATHER Windy clear 50° PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 38'  
15.75 mph

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
0920			15.25							
925			17.18	11.24	7.21	138	0.712	16.2	0.00	
930			18.60	11.25	7.11	125	0.707	11.7	0.00	
935			20.00	11.28	7.17	126	0.696	9.3	0.00	
940			20.73	11.29	7.21	167	0.660	3.1	2.01	
945			21.49	11.29	7.30	172	0.652	2.3	2.61	
950			21.93	11.34	7.34	169	0.652	2.2	3.87	
955			22.22	11.40	7.32	167	0.658	1.1	3.81	
1000			22.41	11.42	7.35	160	0.658	1.1	2.98	
1005			22.17	11.49	7.34	153	0.659	1.1	2.05	Adjusted tubing
1010			21.39	11.72	7.35	149	0.668	7.1	2.33	
1015			21.69	11.76	7.27	146	0.678	5.9	1.99	
1020			21.97	11.81	7.19	145	0.680	1.6	2.54	
1035			21.94	11.87	7.23	134	0.685	0.9	2.36	
1040			22.26	12.00	7.25	124	0.691	0.7	2.17	
1045			22.46	12.10	7.29	128	0.690	0.8	2.23	Sample Start
1115			23.17							Sample End

0.5-5.0 min 200-500 ml      minimize      +/- 0.1      +/-10 mV      +/- 3%      +/- 10%      +/- 10%      Limits  
 or +/-0.2 mg

*[Handwritten signature]*

# LOW FLOW SAMPLING FORM

DATE 4/11/24 WELL ID MW-10 SAMPLE DATE / TIME 4/11/24 1105  
 SITE Muscataine Power & Water DTW 3.62 NOTE \_\_\_\_\_  
 PROJECT # Spring 2024 WELL DEPTH 19.91  
 WEATHER 63°F, Partly Cloudy, 15 mph PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 15.5'

TIME	PURGE RATE(ml)	VOL REMOVED(nl)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES	
1020			3.62								
1025			3.70	15.67	6.53	389	0.663	17.1	0.48		
1030			3.78	14.19	7.12	193	0.631	13.7	0.25		
1035			3.78	13.81	6.96	163	0.640	13.7	0.00		
1040			3.78	13.55	6.92	150	0.649	13.8	0.00		
1045			3.78	13.42	7.01	129	0.659	8.8	0.00		
1050			3.78	13.45	6.97	125	0.661	8.7	0.00		
1055			3.78	13.48	7.03	117	0.663	8.2	0.00		
1100			3.78	13.09	7.11	109	0.673	8.8	0.00		
1105			3.78	12.95	7.05	108	0.680	8.2	0.00	Sample Start	
1120			3.80							Sample End	
										Preservative	# of Containers
										HCl	
										HNO <sub>3</sub>	3
										NaOH	
										None	1

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/-10 mV +/- 3% +/- 10% +/- 10% Limits  
 or +/-0.2 mg

# LOW FLOW SAMPLING FORM

DATE 4-15-24 WELL ID MW-14A SAMPLE DATE / TIME 4-15-24  
 SITE Muscataine Power & Water DTW 10.32 NOTE \_\_\_\_\_  
 PROJECT # Spring 2024 WELL DEPTH 20.65  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 15.5'

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
1345			10.32							
50			11.01	23.09	7.21	263	1.72	0.0	10.57	
55			11.40	20.82	7.07	273	1.98	0.0	3.68	
1400			11.72	20.46	7.01	278	1.79	2.3	3.66	
05			12.12	20.31	7.04	280	1.80	9.4	3.34	
10			12.47	20.21	7.05	282	1.80	10.7	3.60	
15			17.74	20.36	7.05	283	1.81	16.9	3.44	
20			13.07	20.36	7.07	284	1.81	10.1	3.30	
			14.15							
										Preservative
										# of Containers
										DUP-1
										HCl
										HNO <sub>3</sub>
										NaOH
										None

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/-10 mV +/- 3% +/- 10% +/- 10% Limits or +/-0.2 mg

# LOW FLOW SAMPLING FORM

DATE \_\_\_\_\_ WELL ID MW-15A SAMPLE DATE / TIME 4-15-24 1315  
 SITE Muscatine Power & Water DTW 8.08 NOTE \_\_\_\_\_  
 PROJECT # Spring 2024 WELL DEPTH 20.49  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 15'

TIME	PURGE RATE(ml)	VOL REMOVED(nl)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES										
<u>1245</u>			<u>8.08</u>																	
<u>50</u>			<u>9.23</u>	<u>24.95</u>	<u>7.49</u>	<u>221</u>	<u>12.826</u>	<u>6.0</u>	<u>4.80</u>											
<u>55</u>			<u>10.70</u>	<u>21.96</u>	<u>7.34</u>	<u>243</u>	<u>0.827</u>	<u>0.0</u>	<u>3.80</u>											
<u>1300</u>			<u>10.70</u>	<u>21.76</u>	<u>7.33</u>	<u>245</u>	<u>0.821</u>	<u>9.5</u>	<u>3.79</u>											
<u>05</u>			<u>10.70</u>	<u>21.27</u>	<u>7.24</u>	<u>252</u>	<u>0.834</u>	<u>11.1</u>	<u>3.70</u>											
<u>10</u>			<u>10.87</u>	<u>20.94</u>	<u>7.25</u>	<u>254</u>	<u>0.826</u>	<u>11.0</u>	<u>3.69</u>											
<u>15</u>			<u>11.10</u>	<u>20.62</u>	<u>7.22</u>	<u>257</u>	<u>0.827</u>	<u>10.9</u>	<u>3.58</u>	<u>Sample Start</u>										
<u>1348</u>			<u>12.11</u>							<u>Sample End</u>										
										<table border="1" style="float: right;"> <tr> <th>Preservative</th> <th># of Containers</th> </tr> <tr> <td>HCl</td> <td></td> </tr> <tr> <td>HNO<sub>3</sub></td> <td><u>3</u></td> </tr> <tr> <td>NaOH</td> <td></td> </tr> <tr> <td>None</td> <td><u>1</u></td> </tr> </table>	Preservative	# of Containers	HCl		HNO <sub>3</sub>	<u>3</u>	NaOH		None	<u>1</u>
Preservative	# of Containers																			
HCl																				
HNO <sub>3</sub>	<u>3</u>																			
NaOH																				
None	<u>1</u>																			

<i>0.5-5.0 min</i>	<i>200-500 ml</i>	<i>---</i>	<i>minimize</i>	<i>---</i>	<i>+/- 0.1</i>	<i>+/-10 mV</i>	<i>+/- 3%</i>	<i>+/- 10%</i>	<i>+/- 10%</i>	<i>or +/-0.2 mg</i>

Limits

# LOW FLOW SAMPLING FORM

DATE 4-12-24 WELL ID MW-21 SAMPLE DATE / TIME 4-12-26 1345  
 SITE Muscatine Power & Water DTW 8.73 NOTE \_\_\_\_\_  
 PROJECT # Spring 2024 WELL DEPTH 16.98 \_\_\_\_\_  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 17'

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES	
1315			8.73								
20			9.18	14.26	7.15	314	0.561	0.0	4.69		
25			9.25	13.63	7.03	315	0.571	0.0	4.62		
30			9.25	13.54	6.93	314	0.590	0.0	4.38		
35			9.25	13.49	6.88	319	0.596	0.0	4.18		
40			9.25	13.23	6.86	321	0.598	0.0	4.24		
45			9.25	13.22	6.86	322	0.598	0.0	4.26	Sample Start	
1410			9.25							Sample End	
										Preservative	# of Containers
										HCl	
										HNO <sub>3</sub>	3
										NaOH	
										None	1

0.5-5.0 min    200-500 ml    ---    minimize    ---    +/- 0.1    +/-10 mV    +/- 3%    +/- 10%    +/- 10%    Limits or +/-0.2 mg

# LOW FLOW SAMPLING FORM

DATE 4/11/24 WELL ID MW-22 SAMPLE DATE / TIME 4/11/24  
 SITE Muscataine Power & Water DTW 15.78 NOTE \_\_\_\_\_  
 PROJECT # Spring 2024 WELL DEPTH 43.23 measured  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 38'

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES		
1235			15.78									
1240			16.96	14.91	7.41	308	0.697	0.0	4.19	Replaced tubing		
1250			18.02	14.52	7.46	299	0.712	0.0	3.48			
1255			19.08	14.96	7.44	299	0.698	0.4	1.86			
1300			20.34	15.04	7.29	299	0.691	0.8	0.65			
1305			21.39	15.08	7.23	299	0.688	0.9	0.53			
1310			22.17	14.83	7.30	293	0.693	1.3	0.90			
1315			23.10	14.77	7.36	287	0.695	1.4	0.40			
1320			24.18	14.80	7.31	289	0.693	1.2	0.43	Sample Start		
			28.38							Sample End		
										Preservative	# of Containers	
										HCl		
										HNO <sub>3</sub>	3	
										NaOH		
										None	1	

0.5-5.0 min    200-500 ml    ---    minimize    ---    +/- 0.1    +/-10 mV    +/- 3%    +/- 10%    +/- 10%    Limits  
 or +/-0.2 mg

# LOW FLOW SAMPLING FORM

DATE 4/11/24 WELL ID MW-23 SAMPLE DATE / TIME 4/11/24 1205  
 SITE Muscataine Power & Water DTW 4.77 NOTE \_\_\_\_\_  
 PROJECT # Spring 2024 WELL DEPTH 19.24  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 38'

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	PH	ORP	SpecCond	Turbidity	DO	NOTES
1135			4.77							
1140			5.82	15.61	7.43	222	0.519	4.2	2.40	
1145			6.56	15.61	7.42	241	0.498	0.9	1.85	
1150			7.17	15.65	7.39	251	0.490	1.6	1.48	
1155			7.72	15.78	7.34	259	0.486	1.8	1.39	
1200			8.26	15.95	7.33	263	0.486	2.0	1.22	
1205			8.98	16.15	7.36	266	0.483	1.9	1.16	Sample SH-9
1230			10.75							Sample (C-)

Preservative	# of Containers
HCl	
HNO <sub>3</sub>	1
NaOH	
None	1

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/-10 mV +/- 3% +/- 10% +/- 10% Limits  
 or +/-0.2 mg

Site Name MPW

Weather \_\_\_\_\_

Date \_\_\_\_\_

Measured By \_\_\_\_\_

Well #	TOC Elevation	Water Level from TOC (in feet)	Well Depth	Water Level Elevation (in feet)	Well condition / Notes
MW-4A	713.45		---	713.45	---
MW-5B	709.10		---	709.10	---
MW-6A	708.92		---	708.92	---
MW-08	747.36		---	747.36	---
MW-10	718.51		---	718.51	---
MW-14A	729.00		---	729.00	---
MW-15A	729.99		---	729.99	
MW-21	725.75		---	725.75	---
MW-22	744.27		---	744.27	
MW-23	726.90		---	726.90	
MW-24	735.32		---	735.32	
MW-25	739.12		---	739.12	
MW-09	---	21.43	---	#VALUE!	---
MW-11	---	1.95	---	#VALUE!	---
MW-12	---	2.41	---	#VALUE!	---
LPZ-05	---			#VALUE!	



# LOW FLOW SAMPLING FORM

DATE 9-12-24 WELL ID MW-4B SAMPLE DATE / TIME 9-12-24  
 SITE Muscatine Power & Water DTW 7.90 NOTE \_\_\_\_\_  
 PROJECT # Fall 2024 WELL DEPTH 27.90 Bottom  
 WEATHER Clear Calm 75° PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES		
1030			7.90									
1035			8.93	24.47	7.12	-135	0.614	0.0	0.00			
110			9.05	24.00	7.04	-116	0.611	0.0	0.00			
43			8.30	23.66	7.03	-141	0.610	0.0	0.00			
50			9.45	23.54	7.02	-145	0.607	0.2	0.00			
55			9.64	23.34	7.03	-146	0.605	0.0	0.00	sk?		
1125			9.88							End		
										Preservative	# of Containers	
										HCl		
										HNO <sub>3</sub>		
										None		

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/-10 mV +/- 3% +/- 10% +/- 10% Limits  
 or +/-0.2 mg

# LOW FLOW SAMPLING FORM

DATE 9-12-24 WELL ID MWS13 SAMPLE DATE / TIME \_\_\_\_\_  
 SITE Muscatine Power & Water DTW 1.58 NOTE \_\_\_\_\_  
 PROJECT # \_\_\_\_\_ WELL DEPTH 24.86 \_\_\_\_\_  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES		
0905			1.58									
0910			2.15	20.38	6.14	-137	0.811	20.2	13.36			
15			2.17	19.43	6.48	-170	0.812	16.8	0.00			
20			2.19	19.60	6.57	-176	0.807	16.7	0.00			
25			2.21	19.75	6.66	-179	0.798	5.8	0.00			
0930			2.24	19.75	6.69	-180	0.800	4.4	0.00			
35			2.26	19.80	6.70	-180	0.799	1.8	0.00			
40			2.27	19.68	6.72	-180	0.801	8.1	0.00			
45			2.28	19.80	6.74	-180	0.798	1.9	0.00			
50			2.28	20.02	6.77	-181	0.797	1.6	0.00			
55			2.31	20.25	6.78	-181	0.793	6.6	0.00			
1000			2.32	20.18	6.80	-182	0.792	0.0	0.00			
1005			2.33	20.66	6.81	-182	0.781	0.0	0.00			
1035			2.38									
										Preservative	# of Containers	
										HCl		
										HNO <sub>3</sub>		
										None		

0.5-5.0 min   200-500 ml   ---   minimize   ---   +/- 0.1   +/-10 mV   +/- 3%   +/- 10%   +/- 10%   Limits  
 or +/-0.2 mg

# LOW FLOW SAMPLING FORM

DATE 9-12-24 WELL ID MW6A SAMPLE DATE / TIME 9-12-24 1120  
 SITE Muscatine Power & Water DTW 2.47 NOTE \_\_\_\_\_  
 PROJECT # \_\_\_\_\_ WELL DEPTH 25.18 \_\_\_\_\_  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
1100			2.47							
105			2.60	23.67	7.03	-166	0.595	0.0	0.00	
10			2.85	23.90	6.92	-171	0.583	0.0	0.00	
15			2.88	23.57	6.91	-176	0.577	0.0	0.00	
1120			2.91	24.01	6.90	-176	0.575	0.0	0.00	Sample Start
1150			2.99							Sample End

Preservative	# of Containers	
HCl		
HNO <sub>3</sub>		
None		

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/-10 mV +/- 3% +/- 10% +/- 10% Limits or +/-0.2 mg

MWA - 22.85

LOW FLOW SAMPLING FORM

DATE 9-11-24 WELL ID MW-8 SAMPLE DATE / TIME 9-11-24 1000  
 SITE Muscatine Power & Water DTW 16.80 NOTE \_\_\_\_\_  
 PROJECT # \_\_\_\_\_ WELL DEPTH 43.25 \_\_\_\_\_  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(m)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
900			16.80							
10			17.37	15.42	6.76	-133	0.695	51.1	0.00	Pause for silt
15			17.82	15.64	6.75	-132	0.698	23.2	0.00	
20			18.25	15.67	6.76	-125	0.695	22.3	0.00	
25			18.68	15.72	6.76	-131	0.692	19.2	0.00	
30			19.04	15.73	6.76	-133	0.694	19.6	0.00	
35			19.41	15.84	6.76	-135	0.699	23.1	0.00	
40			19.88	15.96	6.77	-137	0.705	18.3	0.00	
45			20.20	16.07	6.78	-138	0.702	4.6	0.00	
50			20.53	16.16	6.78	-139	0.697	2.2	0.00	
55			20.83	16.19	6.80	-140	0.686	1.9	0.00	
1000			21.02	16.25	6.81	-143	0.669	1.9	0.00	Sample Start
1050			22.21							Sample End

Preservative	# of Containers
HCl	
HNO <sub>3</sub>	
None	

0.5-5.0 min    200-500 ml    ---    minimize    ---    +/- 0.1    +/-10 mV    +/- 3%    +/- 10%    +/- 10%    Limits  
 or +/-0.2 mg



# LOW FLOW SAMPLING FORM

DATE 9-11-24 WELL ID MW-14A SAMPLE DATE / TIME 9-11-24 1320  
 SITE Muscatine Power & Water DTW 11.91 NOTE \_\_\_\_\_  
 PROJECT # fall 2024 WELL DEPTH 20.50 Bottom \_\_\_\_\_  
 WEATHER Clear Calm 78° PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES								
1250			11.91															
55			12.37	26.30	6.86	116	1.80	2.5	3.94									
1300			12.57	24.76	6.76	123	1.55	1.9	3.39									
1305			12.82	24.60	6.72	127	1.85	3.3	3.26									
10			13.03	24.63	6.71	129	1.85	2.3	3.16									
15			13.19	24.48	6.72	131	1.85	2.1	3.06									
20			13.40	24.99	6.70	133	1.83	1.9	3.08	sample start								
			14.73															
										<table border="1"> <thead> <tr> <th>Preservative</th> <th># of Containers</th> </tr> </thead> <tbody> <tr> <td>HCl</td> <td></td> </tr> <tr> <td>HNO<sub>3</sub></td> <td></td> </tr> <tr> <td>None</td> <td></td> </tr> </tbody> </table>	Preservative	# of Containers	HCl		HNO <sub>3</sub>		None	
Preservative	# of Containers																	
HCl																		
HNO <sub>3</sub>																		
None																		

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/-10 mV +/- 3% +/- 10% +/- 10% Limits or +/-0.2 mg



# LOW FLOW SAMPLING FORM

DATE 9-10-24 WELL ID MW-21 SAMPLE DATE / TIME 9-10-24 1350  
 SITE Muscatine Power & Water DTW 10.93 NOTE \_\_\_\_\_  
 PROJECT # \_\_\_\_\_ WELL DEPTH 22.10 Below  
 WEATHER Clear calm 80 PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(m)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
1325			10.93							
30/35			11.04	28.55	6.56	107	0.707	0.0	5.91	
40			11.08	27.49	6.41	115	0.720	0.0	2.18	
45			11.10	26.67	6.35	127	0.743	0.0	2.80	
50			11.17	26.80	6.30	127	0.741	0.0	2.70	
1420			11.19	26.61	6.28	131	0.743	0.0	2.64	Sample start
			11.27							Sample end
										Preservative
										# of Containers
										HCl
										HNO <sub>3</sub>
										None

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/-10 mV +/- 3% +/- 10% +/- 10% Limits or +/-0.2 mg



# LOW FLOW SAMPLING FORM

DATE 9-10-24 WELL ID MW-22 SAMPLE DATE / TIME 9-10-24 0915  
 SITE Muscatine Power & Water DTW 17.05 NOTE Qc2 1206  
 PROJECT # \_\_\_\_\_ WELL DEPTH 43.68  
 WEATHER \_\_\_\_\_ PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(m)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES	
0800			17.05								
05			17.66	17.64	6.27	3	0.668	0.0	8.31		
10			18.13	17.44	6.30	-10	0.671	0.0	7.69		
15			18.59	17.15	6.46	-26	0.653	0.0	7.19		
20			19.27	16.94	6.51	-29	0.648	0.0	4.76		
25			19.92	15.78	6.62	-30	0.656	0.0	4.32		
30			21.01	15.27	6.70	-33	0.661	0.0	4.10		
35			21.75	15.37	6.75	-38	0.654	0.0	3.82		
40			22.32	15.25	6.79	-44	0.657	0.0	3.73		
45			22.87	15.33	6.83	-56	0.657	0.0	3.54		
50			23.30	15.87	6.87	-76	0.647	0.0	3.22		
55			23.49	16.36	6.88	-83	0.644	0.0	3.07		
0900			23.65	16.81	6.90	-93	0.644	0.0	2.94		
05			23.90	17.06	6.93	-103	0.639	0.0	2.84		
0915			24.25	17.27	6.94	-101	0.636	0.0	2.86	Sample Start	
1000			26.67							Sample End	
1005										Qc2 Start	
1050			27.79							Qc2 End	
										Preservative	# of Containers
										HCl	
										HNO <sub>3</sub>	
										None	

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/- 10 mV +/- 3% +/- 10% +/- 10% Limits  
 or +/- 0.2 mg

# LOW FLOW SAMPLING FORM

DATE 9/10/24 WELL ID MW-23 SAMPLE DATE / TIME 9/10/24 1035  
 SITE Muscatine Power & Water DTW 6.20 NOTE \_\_\_\_\_  
 PROJECT # Fall 2024 WELL DEPTH 19.28 Bottom  
 WEATHER 75° clear calm PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE \_\_\_\_\_

TIME	PURGE RATE(ml)	VOL REMOVED(ml)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES		
10:00			6.70									
05			6.85	20.04	7.16	83	0.490	4.1	3.27			
10			7.52	19.46	7.04	100	0.485	1.6	2.49			
15			7.92	19.48	6.96	109	0.481	1.1	1.84			
20			8.38	19.53	6.89	113	0.477	0.9	1.62			
25			8.71	19.64	6.87	115	0.476	1.7	1.53			
30			9.05	19.78	6.82	117	0.475	0.9	1.40			
35			9.27	19.92	6.85	117	0.472	0.9	1.53	Sample Start 1035		
			11.18							Sample End 1110		
										Preservative	# of Containers	5
										HCl		
										HNO <sub>3</sub>		3
										None		2

0.5-5.0 min 200-500 ml --- minimize --- +/- 0.1 +/- 10 mV +/- 3% +/- 10% +/- 10% Limits or +/- 0.2 mg

# **Appendix B**

**2023 Laboratory Analytical Data**

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



# ANALYTICAL REPORT

## PREPARED FOR

Attn: Sam Bennett  
Muscatine Power & Water  
1700 Dick Drake Way  
PO BOX 899  
Muscatine, Iowa 52761

Generated 5/1/2024 2:02:03 PM

## JOB DESCRIPTION

Muscatine Power & Water CCR Landfill

## JOB NUMBER

310-279208-1

# Eurofins Cedar Falls

## Job Notes

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

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

## Authorization



Generated  
5/1/2024 2:02:03 PM

Authorized for release by  
Matthew Hummel, Project Manager I  
[Matthew.Hummel@et.eurofinsus.com](mailto:Matthew.Hummel@et.eurofinsus.com)  
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# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	9
Definitions . . . . .	20
QC Sample Results . . . . .	21
QC Association . . . . .	24
Chronicle . . . . .	27
Certification Summary . . . . .	31
Method Summary . . . . .	32
Chain of Custody . . . . .	33
Receipt Checklists . . . . .	40

# Case Narrative

Client: Muscatine Power & Water  
Project: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Job ID: 310-279208-1**

**Eurofins Cedar Falls**

## Job Narrative 310-279208-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- 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.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

### Receipt

The samples were received on 4/17/2024 8:45 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.6°C, 2.3°C and 2.3°C.

### HPLC/IC

Method 9056A\_ORGFM\_28D: The following samples were diluted due to the nature of the sample matrix: MW-4B (310-279208-1), MW-5B (310-279208-2), MW-6A (310-279208-3), MW-8 (310-279208-4), MW-10 (310-279208-5), MW-14A (310-279208-6), MW-15A (310-279208-7), MW-21 (310-279208-8), MW-22 (310-279208-9), MW-23 (310-279208-10), MW-24 (310-279208-11), MW-26 (310-279208-12), MW-27 (310-279208-13), DUP-1 (310-279208-14) and DUP-2 (310-279208-15). Elevated reporting limits (RLs) are provided.

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

### Metals

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

### General Chemistry

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

Eurofins Cedar Falls

# Sample Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-279208-1	MW-4B	Ground Water	04/15/24 09:00	04/17/24 08:45
310-279208-2	MW-5B	Ground Water	04/15/24 11:40	04/17/24 08:45
310-279208-3	MW-6A	Ground Water	04/15/24 09:55	04/17/24 08:45
310-279208-4	MW-8	Ground Water	04/12/24 10:45	04/17/24 08:45
310-279208-5	MW-10	Ground Water	04/11/24 11:05	04/17/24 08:45
310-279208-6	MW-14A	Ground Water	04/15/24 14:20	04/17/24 08:45
310-279208-7	MW-15A	Ground Water	04/15/24 13:15	04/17/24 08:45
310-279208-8	MW-21	Ground Water	04/12/24 13:45	04/17/24 08:45
310-279208-9	MW-22	Ground Water	04/11/24 13:20	04/17/24 08:45
310-279208-10	MW-23	Ground Water	04/11/24 12:05	04/17/24 08:45
310-279208-14	DUP-1	Ground Water	04/11/24 12:00	04/17/24 08:45

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



# Detection Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## Client Sample ID: MW-4B

## Lab Sample ID: 310-279208-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	18.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	56.1		5.00		mg/L	5		9056A	Total/NA
Barium	0.168		0.00200		mg/L	1		6020B	Total/NA
Calcium	97.7		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00172		0.000500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	392		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.6		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-5B

## Lab Sample ID: 310-279208-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	39.3		5.00		mg/L	5		9056A	Total/NA
Sulfate	46.3		5.00		mg/L	5		9056A	Total/NA
Barium	0.243		0.00200		mg/L	1		6020B	Total/NA
Calcium	112		0.500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	450		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-6A

## Lab Sample ID: 310-279208-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15.5		5.00		mg/L	5		9056A	Total/NA
Sulfate	18.1		5.00		mg/L	5		9056A	Total/NA
Barium	0.235		0.00200		mg/L	1		6020B	Total/NA
Calcium	92.4		0.500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	376		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-8

## Lab Sample ID: 310-279208-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	17.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	65.7		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00390		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0857		0.00200		mg/L	1		6020B	Total/NA
Calcium	84.2		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00180		0.000500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	362		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-10

## Lab Sample ID: 310-279208-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	49.6		5.00		mg/L	5		9056A	Total/NA
Barium	0.193		0.00200		mg/L	1		6020B	Total/NA
Calcium	96.2		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00122		0.000500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	382		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3		1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## Client Sample ID: MW-14A

## Lab Sample ID: 310-279208-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	1160		50.0		mg/L	50		9056A	Total/NA
Barium	0.0323		0.00200		mg/L	1		6020B	Total/NA
Boron	15.2		0.700		mg/L	7		6020B	Total/NA
Calcium	344		0.500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	1750		250		mg/L	1		SM 2540C	Total/NA
pH	7.3		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-15A

## Lab Sample ID: 310-279208-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	7.01		5.00		mg/L	5		9056A	Total/NA
Sulfate	256		5.00		mg/L	5		9056A	Total/NA
Barium	0.0353		0.00200		mg/L	1		6020B	Total/NA
Boron	5.80		0.400		mg/L	4		6020B	Total/NA
Calcium	118		0.500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	636		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.6		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-21

## Lab Sample ID: 310-279208-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	138		5.00		mg/L	5		9056A	Total/NA
Barium	0.0310		0.00200		mg/L	1		6020B	Total/NA
Boron	2.31		0.100		mg/L	1		6020B	Total/NA
Calcium	59.9		0.500		mg/L	1		6020B	Total/NA
Lithium	0.0124		0.0100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	366		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.0		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-22

## Lab Sample ID: 310-279208-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15.8		5.00		mg/L	5		9056A	Total/NA
Sulfate	160		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00634		0.00200		mg/L	1		6020B	Total/NA
Barium	0.271		0.00200		mg/L	1		6020B	Total/NA
Calcium	83.1		0.500		mg/L	1		6020B	Total/NA
Molybdenum	0.00217		0.00200		mg/L	1		6020B	Total/NA
Total Dissolved Solids	422		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.5		1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-23

## Lab Sample ID: 310-279208-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	19.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	21.8		5.00		mg/L	5		9056A	Total/NA
Barium	0.0547		0.00200		mg/L	1		6020B	Total/NA
Calcium	59.7		0.500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	274		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4		1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: DUP-1**

**Lab Sample ID: 310-279208-14**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.7		5.00		mg/L	5		9056A	Total/NA
Sulfate	162		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00781		0.00200		mg/L	1		6020B	Total/NA
Barium	0.273		0.00200		mg/L	1		6020B	Total/NA
Calcium	85.7		0.500		mg/L	1		6020B	Total/NA
Molybdenum	0.00375		0.00200		mg/L	1		6020B	Total/NA
Total Dissolved Solids	436		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4		1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-4B**

**Lab Sample ID: 310-279208-1**

Date Collected: 04/15/24 09:00

Matrix: Ground Water

Date Received: 04/17/24 08:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>18.1</b>		5.00		mg/L			04/19/24 12:57	5
Fluoride	<1.00		1.00		mg/L			04/19/24 12:57	5
<b>Sulfate</b>	<b>56.1</b>		5.00		mg/L			04/19/24 12:57	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:34	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:34	1
<b>Barium</b>	<b>0.168</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:34	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:34	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/25/24 15:34	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:34	1
<b>Calcium</b>	<b>97.7</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:34	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:34	1
<b>Cobalt</b>	<b>0.00172</b>		0.000500		mg/L		04/19/24 09:00	04/25/24 15:34	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:34	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:34	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:34	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:34	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:34	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/24/24 10:43	04/26/24 15:15	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>392</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.6</b>		1.0		SU			04/17/24 11:33	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-5B**  
 Date Collected: 04/15/24 11:40  
 Date Received: 04/17/24 08:45

**Lab Sample ID: 310-279208-2**  
 Matrix: Ground Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>39.3</b>		5.00		mg/L			04/19/24 13:34	5
Fluoride	<1.00		1.00		mg/L			04/19/24 13:34	5
<b>Sulfate</b>	<b>46.3</b>		5.00		mg/L			04/19/24 13:34	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:36	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:36	1
<b>Barium</b>	<b>0.243</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:36	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:36	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/25/24 15:36	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:36	1
<b>Calcium</b>	<b>112</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:36	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:36	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:36	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:36	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:36	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:36	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:36	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/22/24 08:06	04/26/24 14:32	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>450</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.4</b>		1.0		SU			04/17/24 11:34	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-6A**

**Lab Sample ID: 310-279208-3**

Date Collected: 04/15/24 09:55

Matrix: Ground Water

Date Received: 04/17/24 08:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>15.5</b>		5.00		mg/L			04/19/24 13:46	5
Fluoride	<1.00		1.00		mg/L			04/19/24 13:46	5
<b>Sulfate</b>	<b>18.1</b>		5.00		mg/L			04/19/24 13:46	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:38	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:38	1
<b>Barium</b>	<b>0.235</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:38	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:38	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/25/24 15:38	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:38	1
<b>Calcium</b>	<b>92.4</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:38	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:38	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:38	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:38	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:38	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:38	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:38	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:38	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/24/24 10:43	04/26/24 15:17	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>376</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.3</b>		1.0		SU			04/17/24 11:35	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-8**

**Lab Sample ID: 310-279208-4**

Date Collected: 04/12/24 10:45

Matrix: Ground Water

Date Received: 04/17/24 08:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>17.2</b>		5.00		mg/L			04/19/24 13:58	5
Fluoride	<1.00		1.00		mg/L			04/19/24 13:58	5
<b>Sulfate</b>	<b>65.7</b>		5.00		mg/L			04/19/24 13:58	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:40	1
<b>Arsenic</b>	<b>0.00390</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:40	1
<b>Barium</b>	<b>0.0857</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:40	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:40	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/25/24 15:40	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:40	1
<b>Calcium</b>	<b>84.2</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:40	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:40	1
<b>Cobalt</b>	<b>0.00180</b>		0.000500		mg/L		04/19/24 09:00	04/25/24 15:40	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:40	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:40	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:40	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:40	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:40	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/22/24 07:58	04/24/24 14:26	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>362</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.4</b>		1.0		SU			04/17/24 11:36	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-10**  
**Date Collected: 04/11/24 11:05**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-5**  
**Matrix: Ground Water**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			04/19/24 14:10	5
Fluoride	<1.00		1.00		mg/L			04/19/24 14:10	5
<b>Sulfate</b>	<b>49.6</b>		5.00		mg/L			04/19/24 14:10	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:42	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:42	1
<b>Barium</b>	<b>0.193</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:42	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:42	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/25/24 15:42	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:42	1
<b>Calcium</b>	<b>96.2</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:42	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:42	1
<b>Cobalt</b>	<b>0.00122</b>		0.000500		mg/L		04/19/24 09:00	04/25/24 15:42	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:42	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:42	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:42	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:42	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:42	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/22/24 07:58	04/24/24 15:11	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>382</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.3</b>		1.0		SU			04/17/24 11:37	1



# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-14A**

**Lab Sample ID: 310-279208-6**

Date Collected: 04/15/24 14:20

Matrix: Ground Water

Date Received: 04/17/24 08:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>16.4</b>		5.00		mg/L			04/19/24 14:22	5
Fluoride	<1.00		1.00		mg/L			04/19/24 14:22	5
<b>Sulfate</b>	<b>1160</b>		50.0		mg/L			04/20/24 09:22	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:53	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:53	1
<b>Barium</b>	<b>0.0323</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:53	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:53	1
<b>Boron</b>	<b>15.2</b>		0.700		mg/L		04/19/24 09:00	04/26/24 13:25	7
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:53	1
<b>Calcium</b>	<b>344</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:53	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:53	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:53	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:53	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:53	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:53	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:53	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:53	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/24/24 10:43	04/26/24 15:19	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>1750</b>		250		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.3</b>		1.0		SU			04/17/24 11:38	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-15A**

**Lab Sample ID: 310-279208-7**

Date Collected: 04/15/24 13:15

Matrix: Ground Water

Date Received: 04/17/24 08:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>7.01</b>		5.00		mg/L			04/20/24 09:34	5
Fluoride	<1.00		1.00		mg/L			04/20/24 09:34	5
<b>Sulfate</b>	<b>256</b>		5.00		mg/L			04/20/24 09:34	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:55	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:55	1
<b>Barium</b>	<b>0.0353</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:55	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:55	1
<b>Boron</b>	<b>5.80</b>		0.400		mg/L		04/19/24 09:00	04/26/24 13:29	4
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:55	1
<b>Calcium</b>	<b>118</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:55	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:55	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:55	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:55	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:55	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:55	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:55	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:55	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/24/24 10:43	04/26/24 15:21	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>636</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.6</b>		1.0		SU			04/17/24 11:39	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-21**  
 Date Collected: 04/12/24 13:45  
 Date Received: 04/17/24 08:45

**Lab Sample ID: 310-279208-8**  
 Matrix: Ground Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			04/19/24 16:24	5
Fluoride	<1.00		1.00		mg/L			04/19/24 16:24	5
<b>Sulfate</b>	<b>138</b>		5.00		mg/L			04/19/24 16:24	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:57	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:57	1
<b>Barium</b>	<b>0.0310</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 15:57	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:57	1
<b>Boron</b>	<b>2.31</b>		0.100		mg/L		04/19/24 09:00	04/26/24 13:32	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:57	1
<b>Calcium</b>	<b>59.9</b>		0.500		mg/L		04/19/24 09:00	04/25/24 15:57	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:57	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:57	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:57	1
<b>Lithium</b>	<b>0.0124</b>		0.0100		mg/L		04/19/24 09:00	04/25/24 15:57	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:57	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:57	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:57	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/22/24 08:06	04/26/24 14:21	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>366</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.0</b>		1.0		SU			04/17/24 11:40	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-22**  
 Date Collected: 04/11/24 13:20  
 Date Received: 04/17/24 08:45

**Lab Sample ID: 310-279208-9**  
 Matrix: Ground Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>15.8</b>		5.00		mg/L			04/19/24 16:36	5
Fluoride	<1.00		1.00		mg/L			04/19/24 16:36	5
<b>Sulfate</b>	<b>160</b>		5.00		mg/L			04/19/24 16:36	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 16:02	1
<b>Arsenic</b>	<b>0.00634</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 16:02	1
<b>Barium</b>	<b>0.271</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 16:02	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 16:02	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/26/24 13:39	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 16:02	1
<b>Calcium</b>	<b>83.1</b>		0.500		mg/L		04/19/24 09:00	04/25/24 16:02	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 16:02	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 16:02	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 16:02	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 16:02	1
<b>Molybdenum</b>	<b>0.00217</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 16:02	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 16:02	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 16:02	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/22/24 08:06	04/26/24 14:23	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>422</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.5</b>		1.0		SU			04/17/24 11:42	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-23**  
**Date Collected: 04/11/24 12:05**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-10**  
**Matrix: Ground Water**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>19.2</b>		5.00		mg/L			04/19/24 16:48	5
Fluoride	<1.00		1.00		mg/L			04/19/24 16:48	5
<b>Sulfate</b>	<b>21.8</b>		5.00		mg/L			04/19/24 16:48	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 16:04	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 16:04	1
<b>Barium</b>	<b>0.0547</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 16:04	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 16:04	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/26/24 13:43	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 16:04	1
<b>Calcium</b>	<b>59.7</b>		0.500		mg/L		04/19/24 09:00	04/25/24 16:04	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 16:04	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 16:04	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 16:04	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 16:04	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 16:04	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 16:04	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 16:04	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/24/24 10:43	04/26/24 15:23	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>274</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.4</b>		1.0		SU			04/17/24 11:47	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: DUP-1**  
 Date Collected: 04/11/24 12:00  
 Date Received: 04/17/24 08:45

**Lab Sample ID: 310-279208-14**  
 Matrix: Ground Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>16.7</b>		5.00		mg/L			04/19/24 17:37	5
Fluoride	<1.00		1.00		mg/L			04/19/24 17:37	5
<b>Sulfate</b>	<b>162</b>		5.00		mg/L			04/19/24 17:37	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 16:13	1
<b>Arsenic</b>	<b>0.00781</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 16:13	1
<b>Barium</b>	<b>0.273</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 16:13	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 16:13	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/26/24 13:57	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 16:13	1
<b>Calcium</b>	<b>85.7</b>		0.500		mg/L		04/19/24 09:00	04/25/24 16:13	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 16:13	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 16:13	1
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 16:13	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 16:13	1
<b>Molybdenum</b>	<b>0.00375</b>		0.00200		mg/L		04/19/24 09:00	04/25/24 16:13	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 16:13	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 16:13	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/24/24 10:43	04/26/24 15:25	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>436</b>		50.0		mg/L			04/18/24 18:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.4</b>		1.0		SU			04/17/24 11:51	1

# Definitions/Glossary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## Glossary

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

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-419441/3  
 Matrix: Water  
 Analysis Batch: 419441

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			04/19/24 12:33	1
Fluoride	<0.200		0.200		mg/L			04/19/24 12:33	1
Sulfate	<1.00		1.00		mg/L			04/19/24 12:33	1

Lab Sample ID: LCS 310-419441/4  
 Matrix: Water  
 Analysis Batch: 419441

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.02		mg/L		100	90 - 110
Fluoride	2.00	2.197		mg/L		110	90 - 110
Sulfate	10.0	10.41		mg/L		104	90 - 110

Lab Sample ID: 310-279208-1 MS  
 Matrix: Ground Water  
 Analysis Batch: 419441

Client Sample ID: MW-4B  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	18.1		25.0	41.69		mg/L		94	80 - 120
Fluoride	<1.00		5.00	5.320		mg/L		106	80 - 120
Sulfate	56.1		25.0	80.68		mg/L		98	80 - 120

Lab Sample ID: 310-279208-1 MSD  
 Matrix: Ground Water  
 Analysis Batch: 419441

Client Sample ID: MW-4B  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	18.1		25.0	41.66		mg/L		94	80 - 120	0	15
Fluoride	<1.00		5.00	5.524		mg/L		110	80 - 120	4	15
Sulfate	56.1		25.0	80.47		mg/L		98	80 - 120	0	15

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

Lab Sample ID: MB 310-419189/1-A  
 Matrix: Water  
 Analysis Batch: 419931

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 419189

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Antimony	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:06	1
Arsenic	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:06	1
Barium	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:06	1
Beryllium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:06	1
Boron	<0.100		0.100		mg/L		04/19/24 09:00	04/25/24 15:06	1
Cadmium	<0.000200		0.000200		mg/L		04/19/24 09:00	04/25/24 15:06	1
Calcium	<0.500		0.500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Chromium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Cobalt	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Copper	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Iron	<0.100		0.100		mg/L		04/19/24 09:00	04/25/24 15:06	1

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# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

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

**Lab Sample ID: MB 310-419189/1-A**  
**Matrix: Water**  
**Analysis Batch: 419931**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 419189**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	<0.000500		0.000500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Lithium	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:06	1
Magnesium	<0.500		0.500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Manganese	<0.0100		0.0100		mg/L		04/19/24 09:00	04/25/24 15:06	1
Molybdenum	<0.00200		0.00200		mg/L		04/19/24 09:00	04/25/24 15:06	1
Nickel	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Selenium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Strontium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:06	1
Thallium	<0.00100		0.00100		mg/L		04/19/24 09:00	04/25/24 15:06	1
Vanadium	<0.00500		0.00500		mg/L		04/19/24 09:00	04/25/24 15:06	1
Zinc	<0.0200		0.0200		mg/L		04/19/24 09:00	04/25/24 15:06	1

**Lab Sample ID: LCS 310-419189/2-A**  
**Matrix: Water**  
**Analysis Batch: 419931**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 419189**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	0.200	0.2215		mg/L		111	80 - 120
Antimony	0.200	0.2208		mg/L		110	80 - 120
Arsenic	0.200	0.2150		mg/L		107	80 - 120
Barium	0.100	0.1086		mg/L		109	80 - 120
Beryllium	0.100	0.1051		mg/L		105	80 - 120
Boron	0.200	0.2155		mg/L		108	80 - 120
Cadmium	0.100	0.1046		mg/L		105	80 - 120
Calcium	2.00	1.949		mg/L		97	80 - 120
Chromium	0.100	0.1039		mg/L		104	80 - 120
Cobalt	0.100	0.1130		mg/L		113	80 - 120
Copper	0.200	0.2166		mg/L		108	80 - 120
Iron	0.200	0.2332		mg/L		117	80 - 120
Lead	0.200	0.2173		mg/L		109	80 - 120
Lithium	0.200	0.2200		mg/L		110	80 - 120
Magnesium	2.00	2.140		mg/L		107	80 - 120
Manganese	0.100	0.1004		mg/L		100	80 - 120
Molybdenum	0.200	0.2212		mg/L		111	80 - 120
Nickel	0.200	0.2165		mg/L		108	80 - 120
Selenium	0.400	0.4169		mg/L		104	80 - 120
Strontium	0.200	0.2118		mg/L		106	80 - 120
Thallium	0.100	0.1135		mg/L		114	80 - 120
Vanadium	0.100	0.09626		mg/L		96	80 - 120
Zinc	0.200	0.1967		mg/L		98	80 - 120

**Lab Sample ID: 310-279208-8 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 419931**

**Client Sample ID: MW-21**  
**Prep Type: Total/NA**  
**Prep Batch: 419189**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Aluminum	<0.0500		<0.0500		mg/L		NC	20
Antimony	<0.00200		<0.00200		mg/L		NC	20
Arsenic	<0.00200		<0.00200		mg/L		NC	20

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# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

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

**Lab Sample ID: 310-279208-8 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 419931**

**Client Sample ID: MW-21**  
**Prep Type: Total/NA**  
**Prep Batch: 419189**

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Barium	0.0310		0.03103		mg/L		0	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Cadmium	<0.000200		<0.000200		mg/L		NC	20
Calcium	59.9		59.78		mg/L		0.2	20
Chromium	<0.00500		<0.00500		mg/L		NC	20
Cobalt	<0.000500		<0.000500		mg/L		NC	20
Copper	<0.00500		<0.00500		mg/L		NC	20
Iron	<0.100		<0.100		mg/L		NC	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Lithium	0.0124		0.01198		mg/L		4	20
Magnesium	24.9		24.83		mg/L		0.1	20
Manganese	<0.0100		<0.0100		mg/L		NC	20
Molybdenum	<0.00200		<0.00200		mg/L		NC	20
Nickel	<0.00500		<0.00500		mg/L		NC	20
Selenium	<0.00500		<0.00500		mg/L		NC	20
Strontium	0.153		0.1535		mg/L		0.5	20
Thallium	<0.00100		<0.00100		mg/L		NC	20
Vanadium	<0.00500		<0.00500		mg/L		NC	20
Zinc	<0.0200		<0.0200		mg/L		NC	20

**Lab Sample ID: 310-279208-8 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 420079**

**Client Sample ID: MW-21**  
**Prep Type: Total/NA**  
**Prep Batch: 419189**

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Boron	2.31		2.335		mg/L		1	20

# QC Association Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## HPLC/IC

### Analysis Batch: 419441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	9056A	
310-279208-2	MW-5B	Total/NA	Ground Water	9056A	
310-279208-3	MW-6A	Total/NA	Ground Water	9056A	
310-279208-4	MW-8	Total/NA	Ground Water	9056A	
310-279208-5	MW-10	Total/NA	Ground Water	9056A	
310-279208-6	MW-14A	Total/NA	Ground Water	9056A	
310-279208-6	MW-14A	Total/NA	Ground Water	9056A	
310-279208-7	MW-15A	Total/NA	Ground Water	9056A	
310-279208-8	MW-21	Total/NA	Ground Water	9056A	
310-279208-9	MW-22	Total/NA	Ground Water	9056A	
310-279208-10	MW-23	Total/NA	Ground Water	9056A	
310-279208-14	DUP-1	Total/NA	Ground Water	9056A	

## Metals

### Prep Batch: 419189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	3005A	
310-279208-2	MW-5B	Total/NA	Ground Water	3005A	
310-279208-3	MW-6A	Total/NA	Ground Water	3005A	
310-279208-4	MW-8	Total/NA	Ground Water	3005A	
310-279208-5	MW-10	Total/NA	Ground Water	3005A	
310-279208-6	MW-14A	Total/NA	Ground Water	3005A	
310-279208-7	MW-15A	Total/NA	Ground Water	3005A	
310-279208-8	MW-21	Total/NA	Ground Water	3005A	
310-279208-9	MW-22	Total/NA	Ground Water	3005A	
310-279208-10	MW-23	Total/NA	Ground Water	3005A	
310-279208-14	DUP-1	Total/NA	Ground Water	3005A	

### Prep Batch: 419378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-4	MW-8	Total/NA	Ground Water	7470A	
310-279208-5	MW-10	Total/NA	Ground Water	7470A	

### Prep Batch: 419379

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-2	MW-5B	Total/NA	Ground Water	7470A	
310-279208-8	MW-21	Total/NA	Ground Water	7470A	
310-279208-9	MW-22	Total/NA	Ground Water	7470A	

### Prep Batch: 419710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	7470A	
310-279208-3	MW-6A	Total/NA	Ground Water	7470A	
310-279208-6	MW-14A	Total/NA	Ground Water	7470A	
310-279208-7	MW-15A	Total/NA	Ground Water	7470A	
310-279208-10	MW-23	Total/NA	Ground Water	7470A	
310-279208-14	DUP-1	Total/NA	Ground Water	7470A	

# QC Association Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## Metals

### Analysis Batch: 419773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-4	MW-8	Total/NA	Ground Water	7470A	419378
310-279208-5	MW-10	Total/NA	Ground Water	7470A	419378

### Analysis Batch: 419931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	6020B	419189
310-279208-2	MW-5B	Total/NA	Ground Water	6020B	419189
310-279208-3	MW-6A	Total/NA	Ground Water	6020B	419189
310-279208-4	MW-8	Total/NA	Ground Water	6020B	419189
310-279208-5	MW-10	Total/NA	Ground Water	6020B	419189
310-279208-6	MW-14A	Total/NA	Ground Water	6020B	419189
310-279208-7	MW-15A	Total/NA	Ground Water	6020B	419189
310-279208-8	MW-21	Total/NA	Ground Water	6020B	419189
310-279208-9	MW-22	Total/NA	Ground Water	6020B	419189
310-279208-10	MW-23	Total/NA	Ground Water	6020B	419189
310-279208-14	DUP-1	Total/NA	Ground Water	6020B	419189

### Analysis Batch: 420030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	7470A	419710
310-279208-2	MW-5B	Total/NA	Ground Water	7470A	419379
310-279208-3	MW-6A	Total/NA	Ground Water	7470A	419710
310-279208-6	MW-14A	Total/NA	Ground Water	7470A	419710
310-279208-7	MW-15A	Total/NA	Ground Water	7470A	419710
310-279208-8	MW-21	Total/NA	Ground Water	7470A	419379
310-279208-9	MW-22	Total/NA	Ground Water	7470A	419379
310-279208-10	MW-23	Total/NA	Ground Water	7470A	419710
310-279208-14	DUP-1	Total/NA	Ground Water	7470A	419710

### Analysis Batch: 420079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-6	MW-14A	Total/NA	Ground Water	6020B	419189
310-279208-7	MW-15A	Total/NA	Ground Water	6020B	419189
310-279208-8	MW-21	Total/NA	Ground Water	6020B	419189
310-279208-9	MW-22	Total/NA	Ground Water	6020B	419189
310-279208-10	MW-23	Total/NA	Ground Water	6020B	419189
310-279208-14	DUP-1	Total/NA	Ground Water	6020B	419189

## General Chemistry

### Analysis Batch: 418997

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-2	MW-5B	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-3	MW-6A	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-4	MW-8	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-5	MW-10	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-6	MW-14A	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-7	MW-15A	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-8	MW-21	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-9	MW-22	Total/NA	Ground Water	SM 4500 H+ B	

Eurofins Cedar Falls

# QC Association Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## General Chemistry (Continued)

### Analysis Batch: 418997 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-10	MW-23	Total/NA	Ground Water	SM 4500 H+ B	
310-279208-14	DUP-1	Total/NA	Ground Water	SM 4500 H+ B	

### Analysis Batch: 419199

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	SM 2540C	
310-279208-2	MW-5B	Total/NA	Ground Water	SM 2540C	
310-279208-3	MW-6A	Total/NA	Ground Water	SM 2540C	
310-279208-4	MW-8	Total/NA	Ground Water	SM 2540C	
310-279208-5	MW-10	Total/NA	Ground Water	SM 2540C	
310-279208-6	MW-14A	Total/NA	Ground Water	SM 2540C	
310-279208-7	MW-15A	Total/NA	Ground Water	SM 2540C	
310-279208-8	MW-21	Total/NA	Ground Water	SM 2540C	
310-279208-9	MW-22	Total/NA	Ground Water	SM 2540C	
310-279208-10	MW-23	Total/NA	Ground Water	SM 2540C	
310-279208-14	DUP-1	Total/NA	Ground Water	SM 2540C	

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-4B**  
**Date Collected: 04/15/24 09:00**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-1**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 12:57
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:34
Total/NA	Prep	7470A			419710	A6US	EET CF	04/24/24 10:43
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 15:15
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:33

**Client Sample ID: MW-5B**  
**Date Collected: 04/15/24 11:40**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-2**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 13:34
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:36
Total/NA	Prep	7470A			419379	A6US	EET CF	04/22/24 08:06
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 14:32
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:34

**Client Sample ID: MW-6A**  
**Date Collected: 04/15/24 09:55**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-3**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 13:46
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:38
Total/NA	Prep	7470A			419710	A6US	EET CF	04/24/24 10:43
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 15:17
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:35

**Client Sample ID: MW-8**  
**Date Collected: 04/12/24 10:45**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-4**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 13:58
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:40
Total/NA	Prep	7470A			419378	A6US	EET CF	04/22/24 07:58
Total/NA	Analysis	7470A		1	419773	A6US	EET CF	04/24/24 14:26

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-8**  
**Date Collected: 04/12/24 10:45**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-4**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:36

**Client Sample ID: MW-10**  
**Date Collected: 04/11/24 11:05**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-5**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 14:10
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:42
Total/NA	Prep	7470A			419378	A6US	EET CF	04/22/24 07:58
Total/NA	Analysis	7470A		1	419773	A6US	EET CF	04/24/24 15:11
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:37

**Client Sample ID: MW-14A**  
**Date Collected: 04/15/24 14:20**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-6**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 14:22
Total/NA	Analysis	9056A		50	419441	QTZ5	EET CF	04/20/24 09:22
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		7	420079	NFT2	EET CF	04/26/24 13:25
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:53
Total/NA	Prep	7470A			419710	A6US	EET CF	04/24/24 10:43
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 15:19
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:38

**Client Sample ID: MW-15A**  
**Date Collected: 04/15/24 13:15**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-7**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/20/24 09:34
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		4	420079	NFT2	EET CF	04/26/24 13:29
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:55
Total/NA	Prep	7470A			419710	A6US	EET CF	04/24/24 10:43
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 15:21

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-15A**  
**Date Collected: 04/15/24 13:15**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-7**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:39

**Client Sample ID: MW-21**  
**Date Collected: 04/12/24 13:45**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-8**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 16:24
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	420079	NFT2	EET CF	04/26/24 13:32
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 15:57
Total/NA	Prep	7470A			419379	A6US	EET CF	04/22/24 08:06
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 14:21
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:40

**Client Sample ID: MW-22**  
**Date Collected: 04/11/24 13:20**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-9**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 16:36
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	420079	NFT2	EET CF	04/26/24 13:39
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 16:02
Total/NA	Prep	7470A			419379	A6US	EET CF	04/22/24 08:06
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 14:23
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:42

**Client Sample ID: MW-23**  
**Date Collected: 04/11/24 12:05**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-10**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 16:48
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	420079	NFT2	EET CF	04/26/24 13:43
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 16:04



# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

**Client Sample ID: MW-23**  
**Date Collected: 04/11/24 12:05**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-10**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	7470A			419710	A6US	EET CF	04/24/24 10:43
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 15:23
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:47

**Client Sample ID: DUP-1**  
**Date Collected: 04/11/24 12:00**  
**Date Received: 04/17/24 08:45**

**Lab Sample ID: 310-279208-14**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419441	QTZ5	EET CF	04/19/24 17:37
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	420079	NFT2	EET CF	04/26/24 13:57
Total/NA	Prep	3005A			419189	KM3E	EET CF	04/19/24 09:00
Total/NA	Analysis	6020B		1	419931	NFT2	EET CF	04/25/24 16:13
Total/NA	Prep	7470A			419710	A6US	EET CF	04/24/24 10:43
Total/NA	Analysis	7470A		1	420030	A6US	EET CF	04/26/24 15:25
Total/NA	Analysis	SM 2540C		1	419199	D7CP	EET CF	04/18/24 18:10
Total/NA	Analysis	SM 4500 H+ B		1	418997	W9YR	EET CF	04/17/24 11:51

**Laboratory References:**

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

# Accreditation/Certification Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

## Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

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

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3005A	Ground Water	Lithium

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

# Method Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-1

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

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

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

**Laboratory References:**

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





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310-279208 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Muscataine Power</u>			
City/State:	CITY	STATE	Project:
		<u>IA</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>4/17/24</u>	<u>0845</u>	<u>[Signature]</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>T</u>		Correction Factor (°C): <u>to 0</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>1.4</u>		Corrected Temp (°C): <u>1.4</u>	
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			

1  
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Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Muscatine Power</u>			
City/State:	CITY	STATE	Project:
		<u>IA</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>4/17/24</u>	<u>0845</u>	<u>[Signature]</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2 of 3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>0.0</u>
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.3</u>	Corrected Temp (°C):	<u>2.3</u>
• Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





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### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Muscatine Power</u>			
City/State:	CITY	STATE <u>IA</u>	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE <u>4/17/24</u>	TIME <u>0845</u>	Received By: <u>M</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>T</u>		Correction Factor (°C): <u>to 0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>2</u>		Corrected Temp (°C): <u>23</u>	
• Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			



**Eurofins Cedar Falls**

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

**Chain of Custody Record**

<p><b>Client Information</b>                  Company: Muscatine Power &amp; Water                  Address: 1700 Dick Drake Way                  City: Muscatine                  State Zip: IA, 52761                  Phone: 241397                  Email: sbennett@mpw.org and neil.hoskins@mpw.org                  Project Name: Muscatine Power &amp; Water CCR Landfill                  Site: Iowa</p>		<p><b>Sampler</b>                  Sam Bennett                  Phone: 563-262-3583                  E-Mail: shawn.hayes@testamericainc.com</p>		<p><b>Lab PM</b>                  Hayes, Shawn M</p>		<p>Carrier Tracking No(s):</p>		<p>COC No:</p>									
<p><b>Due Date Requested:</b>                  TAT Requested (days):                  PO #:                  WO #:                  TestAmerica Project #:</p>		<p><b>Analysis Requested</b></p>		<p>Preservation Codes:                  A - HCL                  B - NaOH                  C - Zn Acetate                  D - Nitric Acid                  E - NaHSO4                  F - MeOH                  G - Amchlor                  H - Ascorbic Acid                  I - Ice                  J - DI Water                  K - EDTA                  L - EDA                  Other</p>		<p>Special Instructions/Note:</p>		<p>Page: Job #:</p>									
<p><b>Sample Identification</b></p>		<p><b>Field Filtered Sample (Yes or No)</b></p>		<p><b>Perform MS/MSD (Yes or No)</b></p>		<p><b>6020A CCR Lish, 7470A Mercury</b></p>		<p><b>2540C TDS, SM4500_H+ pH</b></p>		<p><b>9056A Chloride, Fluoride, Sulfate</b></p>		<p><b>Radium-226</b></p>		<p><b>Radium-228</b></p>		<p><b>Total Number of containers</b></p>	
<p>Sample Date</p>		<p>Sample Time</p>		<p>Sample Type (C=Comp, G=grab)</p>		<p>Matrix (W=water, S=solid, O=water/oil, BT=Tissue, AA/AI)</p>		<p>Preservation Code:</p>		<p>D</p>		<p>N</p>		<p>X</p>		<p>X</p>	
MW-4B		4/15/24		0900		G		GW		X		X		X		X	
MW-5B		4/15/24		1140		G		GW		X		X		X		X	
MW-6A		4/15/24		0955		G		GW		X		X		X		X	
MW-8		4/12/24		1045		G		GW		X		X		X		X	
MW-10		4/11/24		1105		G		GW		X		X		X		X	
MW-14A		4/15/24		1420		G		GW		X		X		X		X	
MW-15A		4/15/24		1315		G		GW		X		X		X		X	
MW-21		4/12/24		1345		G		GW		X		X		X		X	
MW-22		4/11/24		1320		G		GW		X		X		X		X	
MW-23		4/11/24		1205		G		GW		X		X		X		X	
MW-24		4/12/24		0905		G		GW		X		X		X		X	
<p><b>Possible Hazard Identification</b>  <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological</p>										<p>Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p>		<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</p>		<p>Special Instructions/QC Requirements.</p>			
<p>Empty Kit Relinquished by</p>		<p>Date:</p>		<p>Time:</p>		<p>Method of Shipment</p>		<p>Received by</p>		<p>Date/Time:</p>		<p>Company</p>					
<p>Relinquished by</p>		<p>4-16-24</p>		<p>0830</p>		<p>Company</p>		<p>Received by</p>		<p>Date/Time:</p>		<p>Company</p>					
<p>Relinquished by</p>		<p></p>		<p></p>		<p>Company</p>		<p>Received by</p>		<p>Date/Time:</p>		<p>Company</p>					
<p>Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No</p>		<p>Custody Seal No</p>		<p>Cooler Temperature(s) °C and Other Remarks:</p>		<p></p>		<p></p>		<p></p>		<p></p>					







**Eurofins Cedar Falls**  
 3019 Venture Way  
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# Chain of Custody Record

<b>Client Information</b>		Sampler Sam Bennett		Lab PM: Hayes, Shawn M		COC No:	
Client Contact: Sam Bennett MP&W		Phone: 563-262-3583		E-Mail: shawn_hayes@testamericainc.com		Page:	
Company: Muscatine Power & Water		Due Date Requested		Analysis Requested		Job #:	
Address: 1700 Dick Drake Way		TAT Requested (days):		Performs MS/MSD (Yes or No)		Preservation Codes:	
City: Muscatine		PO #: 231623		Field Filtered Sample (Yes or No)		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other	
State Zip: IA, 52761		WG #:		6020 A State Metals List		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
Phone: sbennett@mpw.org and neil hoskins@mpw.org		TestAmerica Project #:		9056A Chloride, Fluoride, Sulfate		Special Instructions/Note:	
Email: sbennett@mpw.org and neil hoskins@mpw.org		Event: Spring 2023 Sampling		D N		Total Number of containers	
Project Name: Muscatine Power & Water State Landfill		Sample Date		X		Total Number of containers	
Site: Iowa		Sample Time		X		Total Number of containers	
Sample Identification		Sample Type (C=Comp, G=grab)		X		Total Number of containers	
MW-26		G		X		Total Number of containers	
MW-27		G		X		Total Number of containers	
Dup-1		G		X		Total Number of containers	
Dup-2		G		X		Total Number of containers	
Possible Hazard Identification		Preservation Code:		X		Total Number of containers	
<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		G		X		Total Number of containers	
Deliverable Requested I II III, IV Other (specify)		Matrix (W=water, S=solid, O=soil, BT=Tissue, A=air)		X		Total Number of containers	
Empty Kit Relinquished by:		Date:		X		Total Number of containers	
Relinquished by:		Date/Time:		X		Total Number of containers	
Relinquished by:		Date/Time:		X		Total Number of containers	
Relinquished by:		Date/Time:		X		Total Number of containers	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No		X		Total Number of containers	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		Method of Shipment		X		Total Number of containers	
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Received by:		X		Total Number of containers	
Special Instructions/QC Requirements:		Date/Time:		X		Total Number of containers	
Relinquished by:		Date/Time:		X		Total Number of containers	
Relinquished by:		Date/Time:		X		Total Number of containers	
Relinquished by:		Date/Time:		X		Total Number of containers	
Cooler Temperature(s) °C and Other Remarks:		Date/Time:		X		Total Number of containers	
Cooler Temperature(s) °C and Other Remarks:		Date/Time:		X		Total Number of containers	



**Eurofins Cedar Falls**

3019 Venture Way  
 Cedar Falls IA 50613  
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**Chain of Custody Record**

<b>Client Information</b>		Sampler Sam Bennett		Lab PM Hayes, Shawn M		Carrier Tracking No(s)		COC No:	
Client Contact: Sam Bennett MP&W		Phone: 563-262-3583		E-Mail: shawn.hayes@testamericainc.com				Page:	
Company: Muscatine Power & Water								Job #:	
Address: 1700 Dick Drake Way		Due Date Requested		Analysis Requested				Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other	
City: Muscatine		TAT Requested (days)		Perform MS/MSD (Yes or No)		Total Number of Containers		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
State, Zip: IA, 52761		PO #: 241397		Field Filtered Sample (Yes or No)					
Phone: 241397		WO #:		956A Chloride, Fluoride, Sulfate					
Email: sbennett@mpw.org and neil.hoskins@mpw.org		TestAmerica Project #:		602A State Metals List					
Project Name: Muscatine Power & Water State Landfill		Spring 2023 Sampling		ID					
Site: Iowa				N					
<b>Sample Identification</b>		<b>Sample Date</b>		<b>Sample Time</b>		<b>Sample Type (C=Comp, G=grab)</b>		<b>Matrix (W=water, S=solid, O=waste/oil, BT=tit, AU, A=Al)</b>	
MW-4B		4/15/24		0900		G		GW	
MW-5B		4/15/24		1140		G		GW	
MW-6A		4/15/24		0955		G		GW	
MW-8		4/12/24		1045		G		GW	
MW-10		4/11/24		1105		G		GW	
MW-14A		4/15/24		1420		G		GW	
MW-15A		4/15/24		1315		G		GW	
MW-21		4/12/24		1345		G		GW	
MW-22		4/11/24		1320		G		GW	
MW-23		4/11/24		1205		G		GW	
MW-24		4/12/24		0905		G		GW	
<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)									
Empty Kit Relinquished by									
Date:									
Relinquished by <i>NLS MHS</i>		Date: 4-16-24		Time: 0830		Company: MPW		Received by	
Relinquished by		Date/Time:		Company:		Received by		Date/Time:	
Relinquished by		Date/Time:		Company:		Received by		Date/Time: 4/17/24 0845	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No		Cooler Temperature(s) °C and Other Remarks:					



## Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-279208-1

**Login Number: 279208**

**List Source: Eurofins Cedar Falls**

**List Number: 1**

**Creator: Hummel, Matthew R**

Question	Answer	Comment
Radioactivity wasn't checked or is <= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	MWs 24, 26, 27 and DUP 2 are all state parameters only.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# ANALYTICAL REPORT

## PREPARED FOR

Attn: Sam Bennett  
Muscatine Power & Water  
1700 Dick Drake Way  
PO BOX 899  
Muscatine, Iowa 52761

Generated 5/22/2024 5:28:56 PM

## JOB DESCRIPTION

Muscatine Power & Water CCR Landfill

## JOB NUMBER

310-279208-2

# Eurofins Cedar Falls

## Job Notes

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

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

## Authorization



Generated  
5/22/2024 5:28:56 PM

Authorized for release by  
Matthew Hummel, Project Manager I  
[Matthew.Hummel@et.eurofinsus.com](mailto:Matthew.Hummel@et.eurofinsus.com)  
(319)595-2010

# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
Definitions . . . . .	18
QC Sample Results . . . . .	19
QC Association . . . . .	21
Chronicle . . . . .	22
Certification Summary . . . . .	25
Method Summary . . . . .	26
Chain of Custody . . . . .	27
Receipt Checklists . . . . .	36
Tracer Carrier Summary . . . . .	38



# Case Narrative

Client: Muscatine Power & Water  
Project: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Job ID: 310-279208-2**

**Eurofins Cedar Falls**

## Job Narrative 310-279208-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- 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.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

### Receipt

The samples were received on 4/17/2024 8:45 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.6°C, 2.3°C and 2.3°C.

### Gas Flow Proportional Counter

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

### Rad

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

Eurofins Cedar Falls

# Sample Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-279208-1	MW-4B	Ground Water	04/15/24 09:00	04/17/24 08:45
310-279208-2	MW-5B	Ground Water	04/15/24 11:40	04/17/24 08:45
310-279208-3	MW-6A	Ground Water	04/15/24 09:55	04/17/24 08:45
310-279208-4	MW-8	Ground Water	04/12/24 10:45	04/17/24 08:45
310-279208-5	MW-10	Ground Water	04/11/24 11:05	04/17/24 08:45
310-279208-6	MW-14A	Ground Water	04/15/24 14:20	04/17/24 08:45
310-279208-7	MW-15A	Ground Water	04/15/24 13:15	04/17/24 08:45
310-279208-8	MW-21	Ground Water	04/12/24 13:45	04/17/24 08:45
310-279208-9	MW-22	Ground Water	04/11/24 13:20	04/17/24 08:45
310-279208-10	MW-23	Ground Water	04/11/24 12:05	04/17/24 08:45
310-279208-14	DUP-1	Ground Water	04/11/24 12:00	04/17/24 08:45

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



## Detection Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-4B**

**Lab Sample ID: 310-279208-1**

No Detections.

**Client Sample ID: MW-5B**

**Lab Sample ID: 310-279208-2**

No Detections.

**Client Sample ID: MW-6A**

**Lab Sample ID: 310-279208-3**

No Detections.

**Client Sample ID: MW-8**

**Lab Sample ID: 310-279208-4**

No Detections.

**Client Sample ID: MW-10**

**Lab Sample ID: 310-279208-5**

No Detections.

**Client Sample ID: MW-14A**

**Lab Sample ID: 310-279208-6**

No Detections.

**Client Sample ID: MW-15A**

**Lab Sample ID: 310-279208-7**

No Detections.

**Client Sample ID: MW-21**

**Lab Sample ID: 310-279208-8**

No Detections.

**Client Sample ID: MW-22**

**Lab Sample ID: 310-279208-9**

No Detections.

**Client Sample ID: MW-23**

**Lab Sample ID: 310-279208-10**

No Detections.

**Client Sample ID: DUP-1**

**Lab Sample ID: 310-279208-14**

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-4B**

**Lab Sample ID: 310-279208-1**

Date Collected: 04/15/24 09:00

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.242		0.164	0.165	1.00	0.226	pCi/L	04/25/24 09:20	05/21/24 19:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		30 - 110					04/25/24 09:20	05/21/24 19:01	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.421	U	0.350	0.352	1.00	0.542	pCi/L	04/25/24 09:26	05/20/24 12:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		30 - 110					04/25/24 09:26	05/20/24 12:27	1
Y Carrier	70.7		30 - 110					04/25/24 09:26	05/20/24 12:27	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	0.663		0.387	0.389	5.00	0.542	pCi/L		05/22/24 08:31	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-5B**  
 Date Collected: 04/15/24 11:40  
 Date Received: 04/17/24 08:45

**Lab Sample ID: 310-279208-2**  
 Matrix: Ground Water

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.300	U	0.218	0.219	1.00	0.323	pCi/L	04/25/24 09:20	05/21/24 19:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.8		30 - 110					04/25/24 09:20	05/21/24 19:01	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.925		0.413	0.421	1.00	0.536	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.8		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	77.4		30 - 110					04/25/24 09:26	05/20/24 12:28	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	1.23		0.467	0.475	5.00	0.536	pCi/L		05/22/24 08:31	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-6A**

**Lab Sample ID: 310-279208-3**

Date Collected: 04/15/24 09:55

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.230	U	0.180	0.181	1.00	0.267	pCi/L	04/25/24 09:20	05/21/24 19:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		30 - 110					04/25/24 09:20	05/21/24 19:02	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.291	U	0.308	0.310	1.00	0.498	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	69.9		30 - 110					04/25/24 09:26	05/20/24 12:28	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	0.522		0.357	0.359	5.00	0.498	pCi/L		05/22/24 08:31	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-8**

**Lab Sample ID: 310-279208-4**

Date Collected: 04/12/24 10:45

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.162	U	0.203	0.204	1.00	0.337	pCi/L	04/25/24 09:20	05/21/24 19:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	61.2		30 - 110					04/25/24 09:20	05/21/24 19:30	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.831	U	0.611	0.616	1.00	0.933	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	61.2		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	73.3		30 - 110					04/25/24 09:26	05/20/24 12:28	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>0.994</b>		0.644	0.649	5.00	0.933	pCi/L		05/22/24 08:31	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-10**

**Lab Sample ID: 310-279208-5**

Date Collected: 04/11/24 11:05

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.220	U	0.161	0.162	1.00	0.230	pCi/L	04/25/24 09:20	05/21/24 19:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.9		30 - 110					04/25/24 09:20	05/21/24 19:30	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.616		0.385	0.389	1.00	0.562	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.9		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	76.3		30 - 110					04/25/24 09:26	05/20/24 12:28	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	0.835		0.417	0.421	5.00	0.562	pCi/L		05/22/24 08:31	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-14A**

**Lab Sample ID: 310-279208-6**

Date Collected: 04/15/24 14:20

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0657	U	0.117	0.117	1.00	0.207	pCi/L	04/25/24 09:20	05/21/24 19:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.2		30 - 110					04/25/24 09:20	05/21/24 19:30	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.954		0.381	0.391	1.00	0.475	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.2		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	81.1		30 - 110					04/25/24 09:26	05/20/24 12:28	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	1.02		0.399	0.408	5.00	0.475	pCi/L		05/22/24 08:31	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-15A**

**Lab Sample ID: 310-279208-7**

Date Collected: 04/15/24 13:15

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0414	U	0.127	0.127	1.00	0.237	pCi/L	04/25/24 09:20	05/21/24 19:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.9		30 - 110					04/25/24 09:20	05/21/24 19:30	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.116	U	0.299	0.299	1.00	0.530	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.9		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	77.8		30 - 110					04/25/24 09:26	05/20/24 12:28	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	0.157	U	0.325	0.325	5.00	0.530	pCi/L		05/22/24 08:31	1



# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-21**

**Lab Sample ID: 310-279208-8**

Date Collected: 04/12/24 13:45

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.150	U	0.136	0.137	1.00	0.206	pCi/L	04/25/24 09:20	05/21/24 19:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.0		30 - 110					04/25/24 09:20	05/21/24 19:30	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0821	U	0.231	0.231	1.00	0.467	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.0		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	82.2		30 - 110					04/25/24 09:26	05/20/24 12:28	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	0.0684	U	0.268	0.269	5.00	0.467	pCi/L		05/22/24 17:19	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-22**

**Lab Sample ID: 310-279208-9**

Date Collected: 04/11/24 13:20

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.421		0.182	0.186	1.00	0.198	pCi/L	04/25/24 09:20	05/21/24 19:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.7		30 - 110					04/25/24 09:20	05/21/24 19:30	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.06		0.532	0.564	1.00	0.555	pCi/L	04/25/24 09:26	05/20/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.7		30 - 110					04/25/24 09:26	05/20/24 12:28	1
Y Carrier	74.0		30 - 110					04/25/24 09:26	05/20/24 12:28	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	2.48		0.562	0.594	5.00	0.555	pCi/L		05/22/24 17:19	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-23**

**Lab Sample ID: 310-279208-10**

Date Collected: 04/11/24 12:05

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.202	U	0.168	0.169	1.00	0.253	pCi/L	04/25/24 09:20	05/21/24 19:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		30 - 110					04/25/24 09:20	05/21/24 19:30	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.200	U	0.363	0.363	1.00	0.623	pCi/L	04/25/24 09:26	05/20/24 12:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		30 - 110					04/25/24 09:26	05/20/24 12:44	1
Y Carrier	79.6		30 - 110					04/25/24 09:26	05/20/24 12:44	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	0.402	U	0.400	0.400	5.00	0.623	pCi/L		05/22/24 17:19	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: DUP-1**

**Lab Sample ID: 310-279208-14**

Date Collected: 04/11/24 12:00

Matrix: Ground Water

Date Received: 04/17/24 08:45

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.122	U	0.140	0.141	1.00	0.228	pCi/L	04/25/24 09:20	05/21/24 19:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.1		30 - 110					04/25/24 09:20	05/21/24 19:31	1

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.224	U	0.315	0.316	1.00	0.531	pCi/L	04/25/24 09:26	05/20/24 12:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.1		30 - 110					04/25/24 09:26	05/20/24 12:44	1
Y Carrier	78.9		30 - 110					04/25/24 09:26	05/20/24 12:44	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	0.346	U	0.345	0.346	5.00	0.531	pCi/L		05/22/24 17:19	1

# Definitions/Glossary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

## 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

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

## Method: 9315 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-658650/1-A**  
**Matrix: Water**  
**Analysis Batch: 662737**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 658650**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	-0.003212	U	0.122	0.122	1.00	0.249	pCi/L	04/25/24 09:20	05/21/24 19:01	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	98.0		30 - 110		04/25/24 09:20	05/21/24 19:01	1			

**Lab Sample ID: LCS 160-658650/2-A**  
**Matrix: Water**  
**Analysis Batch: 662737**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 658650**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	11.51		1.33	1.00	0.201	pCi/L	102	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	96.2		30 - 110						

**Lab Sample ID: 310-279208-4 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 662736**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 658650**

Analyte	Sample		DU		Total	RL	MDC	Unit	RER	RER Limit
	Result	Sample Qual	Result	DU Qual	Uncert. (2σ+/-)					
Radium-226	0.162	U	0.1371	U	0.159	1.00	0.259	pCi/L	0.07	1
Carrier	DU %Yield	DU Qualifier	Limits							
Ba Carrier	90.1		30 - 110							

## Method: 9320 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-658652/1-A**  
**Matrix: Water**  
**Analysis Batch: 662575**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 658652**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.1407	U	0.262	0.263	1.00	0.457	pCi/L	04/25/24 09:26	05/20/24 12:26	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	98.0		30 - 110		04/25/24 09:26	05/20/24 12:26	1			
Y Carrier	78.9		30 - 110		04/25/24 09:26	05/20/24 12:26	1			

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

## Method: 9320 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-658652/2-A**  
**Matrix: Water**  
**Analysis Batch: 662575**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 658652**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	
										Radium-228
<b>LCS LCS</b>										
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							
Ba Carrier	96.2		30 - 110							
Y Carrier	78.9		30 - 110							

**Lab Sample ID: 310-279208-4 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 662575**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 658652**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
<b>DU DU</b>										
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							
Ba Carrier	90.1		30 - 110							
Y Carrier	77.0		30 - 110							

# QC Association Summary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

## Rad

### Prep Batch: 658650

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	PrecSep-21	
310-279208-2	MW-5B	Total/NA	Ground Water	PrecSep-21	
310-279208-3	MW-6A	Total/NA	Ground Water	PrecSep-21	
310-279208-4	MW-8	Total/NA	Ground Water	PrecSep-21	
310-279208-5	MW-10	Total/NA	Ground Water	PrecSep-21	
310-279208-6	MW-14A	Total/NA	Ground Water	PrecSep-21	
310-279208-7	MW-15A	Total/NA	Ground Water	PrecSep-21	
310-279208-8	MW-21	Total/NA	Ground Water	PrecSep-21	
310-279208-9	MW-22	Total/NA	Ground Water	PrecSep-21	
310-279208-10	MW-23	Total/NA	Ground Water	PrecSep-21	
310-279208-14	DUP-1	Total/NA	Ground Water	PrecSep-21	
MB 160-658650/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-658650/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
310-279208-4 DU	MW-8	Total/NA	Ground Water	PrecSep-21	

### Prep Batch: 658652

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-279208-1	MW-4B	Total/NA	Ground Water	PrecSep_0	
310-279208-2	MW-5B	Total/NA	Ground Water	PrecSep_0	
310-279208-3	MW-6A	Total/NA	Ground Water	PrecSep_0	
310-279208-4	MW-8	Total/NA	Ground Water	PrecSep_0	
310-279208-5	MW-10	Total/NA	Ground Water	PrecSep_0	
310-279208-6	MW-14A	Total/NA	Ground Water	PrecSep_0	
310-279208-7	MW-15A	Total/NA	Ground Water	PrecSep_0	
310-279208-8	MW-21	Total/NA	Ground Water	PrecSep_0	
310-279208-9	MW-22	Total/NA	Ground Water	PrecSep_0	
310-279208-10	MW-23	Total/NA	Ground Water	PrecSep_0	
310-279208-14	DUP-1	Total/NA	Ground Water	PrecSep_0	
MB 160-658652/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-658652/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
310-279208-4 DU	MW-8	Total/NA	Ground Water	PrecSep_0	



# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-4B**

**Lab Sample ID: 310-279208-1**

Date Collected: 04/15/24 09:00

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662737	SCB	EET SL	05/21/24 19:01
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:27
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 08:31

**Client Sample ID: MW-5B**

**Lab Sample ID: 310-279208-2**

Date Collected: 04/15/24 11:40

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662737	SCB	EET SL	05/21/24 19:01
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 08:31

**Client Sample ID: MW-6A**

**Lab Sample ID: 310-279208-3**

Date Collected: 04/15/24 09:55

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662737	SCB	EET SL	05/21/24 19:02
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 08:31

**Client Sample ID: MW-8**

**Lab Sample ID: 310-279208-4**

Date Collected: 04/12/24 10:45

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:30
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 08:31

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-10**

**Lab Sample ID: 310-279208-5**

Date Collected: 04/11/24 11:05

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:30
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 08:31

**Client Sample ID: MW-14A**

**Lab Sample ID: 310-279208-6**

Date Collected: 04/15/24 14:20

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:30
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 08:31

**Client Sample ID: MW-15A**

**Lab Sample ID: 310-279208-7**

Date Collected: 04/15/24 13:15

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:30
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 08:31

**Client Sample ID: MW-21**

**Lab Sample ID: 310-279208-8**

Date Collected: 04/12/24 13:45

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:30
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 17:19

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Client Sample ID: MW-22**

**Lab Sample ID: 310-279208-9**

Date Collected: 04/11/24 13:20

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:30
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662575	SCB	EET SL	05/20/24 12:28
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 17:19

**Client Sample ID: MW-23**

**Lab Sample ID: 310-279208-10**

Date Collected: 04/11/24 12:05

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:30
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662554	SCB	EET SL	05/20/24 12:44
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 17:19

**Client Sample ID: DUP-1**

**Lab Sample ID: 310-279208-14**

Date Collected: 04/11/24 12:00

Matrix: Ground Water

Date Received: 04/17/24 08:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			658650	MLT	EET SL	04/25/24 09:20
Total/NA	Analysis	9315		1	662736	SCB	EET SL	05/21/24 19:31
Total/NA	Prep	PrecSep_0			658652	MLT	EET SL	04/25/24 09:26
Total/NA	Analysis	9320		1	662554	SCB	EET SL	05/20/24 12:44
Total/NA	Analysis	Ra226_Ra228		1	662916	FLC	EET SL	05/22/24 17:19

**Laboratory References:**

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

# Accreditation/Certification Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

## Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9315	PrecSep-21	Ground Water	Radium-226
9320	PrecSep_0	Ground Water	Radium-228
Ra226_Ra228		Ground Water	Combined Radium 226 + 228

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# Method Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	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:**

None = None

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

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

**Laboratory References:**

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





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310-279208 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Muscataine Power</u>			
City/State:	CITY	STATE	Project:
		<u>IA</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>4/17/24</u>	<u>0845</u>	<u>[Signature]</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>T</u>		Correction Factor (°C): <u>to 0</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>1.4</u>		Corrected Temp (°C): <u>1.4</u>	
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			

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Environment Testing  
America

Place COC scanning label  
here

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Muscatine Power</u>			
City/State:	CITY	STATE	Project:
		<u>IA</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>4/17/24</u>	<u>0845</u>	<u>[Signature]</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2 of 3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>0.0</u>
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.3</u>	Corrected Temp (°C):	<u>2.3</u>
• Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





Environment Testing  
America

Place COC scanning label  
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### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Muscatine Power</u>			
City/State:	CITY	STATE <u>IA</u>	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE <u>4/17/24</u>	TIME <u>0845</u>	Received By: <u>M</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>T</u>		Correction Factor (°C): <u>to 0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>2</u>		Corrected Temp (°C): <u>23</u>	
• Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





**Eurofins Cedar Falls**

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

**Chain of Custody Record**

<b>Client Information</b>		Sampler: Sam Bennett		Lab PM: Hayes, Shawn M		Carrier Tracking No(s):		COC No:	
Client Contact: Sam Bennett MP&W		Phone: 563-262-3583		E-Mail: shawn_hayes@testamericainc.com				Page:	
Company: Muscatine Power & Water		Address: 1700 Dick Drake Way		City: Muscatine		State Zip: IA, 52761		Job #:	
PO #: 241397		WO #: 241397		TesAmerica Project #:				Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other	
Email: sbennett@mpw.org and neil.hoskins@mpw.org		Project Name: Muscatine Power & Water CCR Landfill		Site: Iowa		Event: Spring 2023 Sampling		Total Number of containers	
<b>Sample Identification</b>		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=water/soil, BT=Tissue, AA/AI)	
		Sample Date		Sample Time		Sample Type		Matrix	
MW-4B		4/15/24		0900		G		GW	
MW-5B		4/15/24		1140		G		GW	
MW-6A		4/15/24		0955		G		GW	
MW-8		4/12/24		1045		G		GW	
MW-10		4/11/24		1105		G		GW	
MW-14A		4/15/24		1420		G		GW	
MW-15A		4/15/24		1315		G		GW	
MW-21		4/12/24		1345		G		GW	
MW-22		4/11/24		1320		G		GW	
MW-23		4/11/24		1205		G		GW	
MW-24		4/12/24		0905		G		GW	
<b>Possible Hazard Identification</b>		<input type="checkbox"/> Non-Hazard		<input type="checkbox"/> Flammable		<input type="checkbox"/> Skin Irritant		<input type="checkbox"/> Radiological	
Deliverable Requested I II III, IV Other (specify)		Poison B		Unknown					
Empty Kit Relinquished by		Date:		Time:		Method of Shipment		Archive For _____ Months	
Relinquished by: <i>Neil Hoskins</i>		Date/Time: 4-16-24 0830		Company: mpw		Received by:		Date/Time: _____ Company: _____	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time: _____ Company: _____	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time: 4/17/24 OS Company: _____	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No		Cooler Temperature(s) °C and Other Remarks:					



**Eurofins Cedar Falls**

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

**Chain of Custody Record**

<b>Client Information</b> Client Contact: Sam Bennett MP&W Company: Muscatine Power & Water Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: 231623 Email: sbennett@mpw.org and neil hoskins@mpw.org Project Name: Muscatine Power & Water CCR Landfill Site: Iowa		Lab PM: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com Due Date Requested: TAT Requested (days): PO #: 231623 WO #: Test/America Project #: Event: Spring 2023 Sampling		Sampler: Sam Bennett Phone: 563-262-3583 Carrier Tracking No(s): COC No: Page: Job #:	
Possible Hazard Identification <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		Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month ) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested I, II, III, IV, Other (specify)		Special Instructions/QC Requirements.			
Empty Kit Relinquished by		Method of Shipment			
Relinquished by		Date/Time:		Received by	
Relinquished by		Date/Time:		Received by	
Relinquished by		Date/Time:		Received by	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks.		Date/Time: 4/18/24 8:56 AM	



**Eurofins Cedar Falls**

3019 Venture Way  
 Cedar Falls IA 50613  
 Phone (319) 277-2401 Fax (319) 277-2425

**Chain of Custody Record**

<b>Client Information</b> Client Contact: Sam Bennett MP&W Company: Muscatine Power & Water Address: 1700 Dick Drake Way City: Muscatine State Zip: IA, 52761 Phone: 231623 Email: sbennett@mpw.org and neil hoskins@mpw.org Project Name: Muscatine Power & Water State Landfill Site: Iowa		Sampler: Sam Bennett Lab PM: Hayes, Shawn M Phone: 563-262-3583 E-Mail: shawn_hayes@testamericainc.com		Camer Tracking No(s): COC No: Page: Job #:	
Due Date Requested: TAT Requested (days): PO #: WG #: TestAmerica Project #:		<b>Analysis Requested</b>			
Event: Spring 2023 Sampling		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L EDA Other:			
Sample Identification MW-26 MW-27 Dup-1 Dup-2		Sample Date 4/12/24 4/12/24 4/11/24 4/12/24		Sample Time 1240 1200 1200 1200	
Matrix (W=water, S=solid, O=water/oil, BT=Tissue, A=air)		Sample Type (C=Comp, G=grab)		Preservation Code:	
Perform MS/MSD (Yes or No)		Field Filtered Sample (Yes or No)		9056A Chloride, Fluoride, Sulfate	
6020A State Metals List		D N		X X X X X	
Total Number of containers		Special Instructions/Note:			
Possible Hazard Identification <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)					
Empty Kit Relinquished by:					
Relinquished by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:	
Custody Seals Intact:		Custody Seal No		Cooler Temperature(s) °C and Other Remarks:	
Δ Yes Δ No		4/17/24 0845		1780	



**Eurofins Cedar Falls**

3019 Venture Way  
 Cedar Falls IA 50613  
 Phone (319) 277-2401 Fax (319) 277-2425

**Chain of Custody Record**

<b>Client Information</b>		Lab PM Hayes, Shawn M		Carrier Tracking No(s)		COC No:	
Client Contact: Sam Bennett MP&W Company: Muscatine Power & Water		Phone: 563-262-3583 E-Mail: shawn.hayes@testamericainc.com					
Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: 241397 PO #: 241397 WO #: TestAmerica Project #:		Due Date Requested TAT Requested (days) Spring 2023 Sampling		Analysis Requested Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 602A State Metals List <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 905A Chloride, Fluoride, Sulfate <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other	
Email: sbennett@mpw.org and neil.hoskins@mpw.org Project Name: Muscatine Power & Water State Landfill Site: Iowa		Sample Date Sample Time Sample Type (C=Comp, G=grab) Matrix (W=water, S=solid, O=waste/oil, BT=tit, AU, A=Al)		Preservation Code: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 X - EDTA Z - other (specify)		Special Instructions/Note. Total Number of containers	
Sample Identification MW-4B MW-5B MW-6A MW-8 MW-10 MW-14A MW-15A MW-21 MW-22 MW-23 MW-24		Sample Date Sample Time Sample Type Matrix		Preservation Code: G GW G GW G GW G GW G GW G GW G GW G GW G GW		Special Instructions/Note. Total Number of containers	
Possible Hazard Identification <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		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Special Instructions/QC Requirements.		Special Instructions/QC Requirements.	
Empty Kit Relinquished by Relinquished by Relinquished by Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Date: Date/Time: Date/Time: Date/Time: Date/Time:		Method of Shipment: Received by Received by Received by Cooler Temperature(s) °C and Other Remarks.		Company Company Company Company	



# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Lab PM: Hummel, Matthew R		Carrier Tracking No(s):		COC No: 310-71443.1																																																																																																																									
Client Contact: Shipping/Receiving		E-Mail: Matthew.Hummel@et.eurofins.com		State of Origin: Iowa		Page: Page 1 of 2																																																																																																																									
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State - Iowa		Job #		Preservation Codes: 310-279208-2																																																																																																																									
Address: 13715 Rider Trail North,		Due Date Requested: 5/22/2024		<b>Analysis Requested</b>																																																																																																																											
City: Earth City		TAT Requested (days):																																																																																																																													
State, Zip: MO, 63045		PO #		<table border="1"> <tr> <th>Sample Identification - Client ID (Lab ID)</th> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=comp, G=grab)</th> <th>Matrix (Water, Solid, Other)</th> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>9315_Ra226/PreSep_21 Standard Target</th> <th>9320_Ra228/PreSep_0 Standard Target</th> <th>Ra226Ra228_GFP/ (MOD) Local Method</th> <th>Total Number of Containers</th> <th>Special Instructions/Note:</th> </tr> <tr> <td>MW-4B (310-279208-1)</td> <td>4/15/24</td> <td>09:00 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-5B (310-279208-2)</td> <td>4/15/24</td> <td>11:40 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-6A (310-279208-3)</td> <td>4/15/24</td> <td>09:55 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-8 (310-279208-4)</td> <td>4/12/24</td> <td>10:45 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-10 (310-279208-5)</td> <td>4/11/24</td> <td>11:05 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-14A (310-279208-6)</td> <td>4/15/24</td> <td>14:20 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-15A (310-279208-7)</td> <td>4/15/24</td> <td>13:15 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-21 (310-279208-8)</td> <td>4/12/24</td> <td>13:45 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> <tr> <td>MW-22 (310-279208-9)</td> <td>4/11/24</td> <td>13:20 Central</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>2</td> <td></td> </tr> </table>				Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PreSep_21 Standard Target	9320_Ra228/PreSep_0 Standard Target	Ra226Ra228_GFP/ (MOD) Local Method	Total Number of Containers	Special Instructions/Note:	MW-4B (310-279208-1)	4/15/24	09:00 Central	Water	Water	X	X	X	X	X	2		MW-5B (310-279208-2)	4/15/24	11:40 Central	Water	Water	X	X	X	X	X	2		MW-6A (310-279208-3)	4/15/24	09:55 Central	Water	Water	X	X	X	X	X	2		MW-8 (310-279208-4)	4/12/24	10:45 Central	Water	Water	X	X	X	X	X	2		MW-10 (310-279208-5)	4/11/24	11:05 Central	Water	Water	X	X	X	X	X	2		MW-14A (310-279208-6)	4/15/24	14:20 Central	Water	Water	X	X	X	X	X	2		MW-15A (310-279208-7)	4/15/24	13:15 Central	Water	Water	X	X	X	X	X	2		MW-21 (310-279208-8)	4/12/24	13:45 Central	Water	Water	X	X	X	X	X	2		MW-22 (310-279208-9)	4/11/24	13:20 Central	Water	Water	X	X	X	X	X	2	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)					Matrix (Water, Solid, Other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PreSep_21 Standard Target	9320_Ra228/PreSep_0 Standard Target	Ra226Ra228_GFP/ (MOD) Local Method	Total Number of Containers	Special Instructions/Note:																																																																																																																
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MW-21 (310-279208-8)	4/12/24	13:45 Central	Water	Water	X	X	X	X	X	2																																																																																																																					
MW-22 (310-279208-9)	4/11/24	13:20 Central	Water	Water	X	X	X	X	X	2																																																																																																																					
Project Name: Muscatine Power & Water CCR Landfill		Project #: 31007856		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:																																																																																																																											
Site:		SSOW#:		Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month )																																																																																																																											
Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (Water, Solid, Other)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		9315_Ra226/PreSep_21 Standard Target		9320_Ra228/PreSep_0 Standard Target		Raz226Ra228_GFP/ (MOD) Local Method		Total Number of Containers		Special Instructions/Note:																																																																																																											

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





## Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-279208-2

**Login Number: 279208**

**List Source: Eurofins Cedar Falls**

**List Number: 1**

**Creator: Hummel, Matthew R**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	MWs 24, 26, 27 and DUP 2 are all state parameters only.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-279208-2

**Login Number: 279208**

**List Number: 2**

**Creator: Pinette, Meadow L**

**List Source: Eurofins St. Louis**

**List Creation: 04/19/24 02:06 PM**

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



# Tracer/Carrier Summary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

## Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
310-279208-1	MW-4B	94.7	
310-279208-2	MW-5B	86.8	
310-279208-3	MW-6A	101	
310-279208-4	MW-8	61.2	
310-279208-4 DU	MW-8	90.1	
310-279208-5	MW-10	90.9	
310-279208-6	MW-14A	95.2	
310-279208-7	MW-15A	93.9	
310-279208-8	MW-21	97.0	
310-279208-9	MW-22	95.7	
310-279208-10	MW-23	88.3	
310-279208-14	DUP-1	93.1	

**Tracer/Carrier Legend**  
 Ba = Ba Carrier

## Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
LCS 160-658650/2-A	Lab Control Sample	96.2	
MB 160-658650/1-A	Method Blank	98.0	

**Tracer/Carrier Legend**  
 Ba = Ba Carrier

## Method: 9320 - Radium-228 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
310-279208-1	MW-4B	94.7	70.7
310-279208-2	MW-5B	86.8	77.4
310-279208-3	MW-6A	101	69.9
310-279208-4	MW-8	61.2	73.3
310-279208-4 DU	MW-8	90.1	77.0
310-279208-5	MW-10	90.9	76.3
310-279208-6	MW-14A	95.2	81.1
310-279208-7	MW-15A	93.9	77.8
310-279208-8	MW-21	97.0	82.2
310-279208-9	MW-22	95.7	74.0
310-279208-10	MW-23	88.3	79.6
310-279208-14	DUP-1	93.1	78.9

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

# Tracer/Carrier Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-279208-2

**Method: 9320 - 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)
LCS 160-658652/2-A	Lab Control Sample	96.2	78.9
MB 160-658652/1-A	Method Blank	98.0	78.9

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

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# ANALYTICAL REPORT

## PREPARED FOR

Attn: Sam Bennett  
Muscatine Power & Water  
1700 Dick Drake Way  
PO BOX 899  
Muscatine, Iowa 52761

Generated 1/15/2025 9:59:56 AM

## JOB DESCRIPTION

Muscatine Power & Water CCR Landfill

## JOB NUMBER

310-290523-1

# Eurofins Cedar Falls

## Job Notes

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

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

## Authorization



Generated  
1/15/2025 9:59:56 AM

Authorized for release by  
Bob Michels, Project Manager I  
[Bob.Michels@et.eurofinsus.com](mailto:Bob.Michels@et.eurofinsus.com)  
(319)277-2401



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	6
Detection Summary . . . . .	7
Client Sample Results . . . . .	11
Definitions . . . . .	32
QC Sample Results . . . . .	33
QC Association . . . . .	40
Chronicle . . . . .	44
Certification Summary . . . . .	50
Method Summary . . . . .	51
Receipt Checklists . . . . .	52
Tracer Carrier Summary . . . . .	54

# Case Narrative

Client: Muscatine Power & Water  
Project: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Job ID: 310-290523-1**

**Eurofins Cedar Falls**

## Job Narrative 310-290523-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided 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.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

### Receipt

The samples were received on 9/13/2024 8:35 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.1°C, 1.2°C and 2.3°C.

### HPLC/IC

Method 9056A\_ORGFM\_28D: The following samples were diluted due to the nature of the sample matrix: MW-8 (310-290523-1), MW-10 (310-290523-2), MW-14A (310-290523-3), MW-15A (310-290523-4), MW-21 (310-290523-5), MW-22 (310-290523-6), MW-23 (310-290523-7), MW-24 (310-290523-8), MW-26 (310-290523-9), MW-27 (310-290523-10), QC1 (310-290523-11) and QC2 (310-290523-12). Elevated reporting limits (RLs) are provided.

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

### Metals

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

### General Chemistry

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

### Gas Flow Proportional Counter

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

Eurofins Cedar Falls

# Case Narrative

Client: Muscatine Power & Water  
Project: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Job ID: 310-290523-2**

**Eurofins Cedar Falls**

## Job Narrative 310-290523-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided 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.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

### Receipt

The samples were received on 9/13/2024 8:35 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.1°C, 1.2°C and 2.3°C.

### Rad

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

Eurofins Cedar Falls



# Sample Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-290523-1	MW-8	Ground Water	09/11/24 10:00	09/13/24 08:35
310-290523-2	MW-10	Ground Water	09/10/24 12:10	09/13/24 08:35
310-290523-3	MW-14A	Ground Water	09/11/24 13:20	09/13/24 08:35
310-290523-4	MW-15A	Ground Water	09/11/24 14:20	09/13/24 08:35
310-290523-5	MW-21	Ground Water	09/10/24 13:50	09/13/24 08:35
310-290523-6	MW-22	Ground Water	09/10/24 09:15	09/13/24 08:35
310-290523-7	MW-23	Ground Water	09/10/24 10:35	09/13/24 08:35
310-290523-8	MW-24	Ground Water	09/11/24 08:45	09/13/24 08:35
310-290523-9	MW-26	Ground Water	09/11/24 12:25	09/13/24 08:35
310-290523-10	MW-27	Ground Water	09/11/24 11:40	09/13/24 08:35
310-290523-11	QC1	Ground Water	09/10/24 12:00	09/13/24 08:35
310-290523-12	QC2	Ground Water	09/10/24 12:00	09/13/24 08:35

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# Detection Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Client Sample ID: MW-8

## Lab Sample ID: 310-290523-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	20.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	68.9		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00466		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0944		0.00200		mg/L	1		6020B	Total/NA
Calcium	88.6		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00216		0.000500		mg/L	1		6020B	Total/NA
Iron	1.53		0.100		mg/L	1		6020B	Total/NA
Magnesium	34.3		0.500		mg/L	1		6020B	Total/NA
Manganese	0.491		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	0.00205		0.00200		mg/L	1		6020B	Total/NA
Strontium	0.181		0.00100		mg/L	1		6020B	Total/NA
Total Suspended Solids	2.25		1.88		mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	320		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-10

## Lab Sample ID: 310-290523-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	9.65		5.00		mg/L	5		9056A	Total/NA
Sulfate	59.9		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00525		0.00200		mg/L	1		6020B	Total/NA
Barium	0.219		0.00200		mg/L	1		6020B	Total/NA
Calcium	97.8		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000977		0.000500		mg/L	1		6020B	Total/NA
Iron	2.86		0.100		mg/L	1		6020B	Total/NA
Magnesium	41.1		0.500		mg/L	1		6020B	Total/NA
Manganese	0.255		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	0.00287		0.00200		mg/L	1		6020B	Total/NA
Strontium	0.197		0.00100		mg/L	1		6020B	Total/NA
Total Suspended Solids	7.25		1.88		mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	386		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-14A

## Lab Sample ID: 310-290523-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.3		5.00		mg/L	5		9056A	Total/NA
Sulfate	1110		50.0		mg/L	50		9056A	Total/NA
Barium	0.0338		0.00200		mg/L	1		6020B	Total/NA
Boron	17.7		0.500		mg/L	5		6020B	Total/NA
Calcium	327		0.500		mg/L	1		6020B	Total/NA
Magnesium	134		2.50		mg/L	5		6020B	Total/NA
Strontium	0.298		0.00100		mg/L	1		6020B	Total/NA
Zinc	0.0220		0.0200		mg/L	1		6020B	Total/NA
Total Dissolved Solids	1830		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-15A

## Lab Sample ID: 310-290523-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	7.41		5.00		mg/L	5		9056A	Total/NA
Sulfate	273		5.00		mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Client Sample ID: MW-15A (Continued)

Lab Sample ID: 310-290523-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0335		0.00200		mg/L	1		6020B	Total/NA
Boron	8.50		0.400		mg/L	4		6020B	Total/NA
Calcium	129		0.500		mg/L	1		6020B	Total/NA
Magnesium	53.8		0.500		mg/L	1		6020B	Total/NA
Strontium	0.117		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	602		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-21

Lab Sample ID: 310-290523-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	13.5		5.00		mg/L	5		9056A	Total/NA
Sulfate	248		5.00		mg/L	5		9056A	Total/NA
Barium	0.0555		0.00200		mg/L	1		6020B	Total/NA
Boron	3.68		0.100		mg/L	1		6020B	Total/NA
Calcium	96.6		0.500		mg/L	1		6020B	Total/NA
Chromium	0.00657		0.00500		mg/L	1		6020B	Total/NA
Lithium	0.0194		0.0100		mg/L	1		6020B	Total/NA
Magnesium	41.3		0.500		mg/L	1		6020B	Total/NA
Selenium	0.00666		0.00500		mg/L	1		6020B	Total/NA
Strontium	0.181		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	584		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-22

Lab Sample ID: 310-290523-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.6		5.00		mg/L	5		9056A	Total/NA
Sulfate	161		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00749		0.00200		mg/L	1		6020B	Total/NA
Barium	0.268		0.00200		mg/L	1		6020B	Total/NA
Boron	0.243		0.100		mg/L	1		6020B	Total/NA
Calcium	84.3		0.500		mg/L	1		6020B	Total/NA
Iron	0.189		0.100		mg/L	1		6020B	Total/NA
Magnesium	33.1		0.500		mg/L	1		6020B	Total/NA
Manganese	0.677		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	0.00578		0.00200		mg/L	1		6020B	Total/NA
Strontium	0.106		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	396		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-23

Lab Sample ID: 310-290523-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	21.7		5.00		mg/L	5		9056A	Total/NA
Sulfate	23.8		5.00		mg/L	5		9056A	Total/NA
Aluminum	0.168		0.0500		mg/L	1		6020B	Total/NA
Barium	0.0521		0.00200		mg/L	1		6020B	Total/NA
Boron	0.126		0.100		mg/L	1		6020B	Total/NA
Calcium	58.0		0.500		mg/L	1		6020B	Total/NA
Iron	0.160		0.100		mg/L	1		6020B	Total/NA
Magnesium	25.9		0.500		mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Client Sample ID: MW-23 (Continued)

## Lab Sample ID: 310-290523-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Manganese	0.0301		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.0598		0.00100		mg/L	1		6020B	Total/NA
Total Suspended Solids	31.3		1.88		mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	260		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-24

## Lab Sample ID: 310-290523-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	22.8		5.00		mg/L	5		9056A	Total/NA
Sulfate	43.8		5.00		mg/L	5		9056A	Total/NA
Barium	0.0885		0.00200		mg/L	1		6020B	Total/NA
Calcium	73.6		0.500		mg/L	1		6020B	Total/NA
Magnesium	31.0		0.500		mg/L	1		6020B	Total/NA
Manganese	0.0111		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.0754		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	306		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-26

## Lab Sample ID: 310-290523-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	17.3		5.00		mg/L	5		9056A	Total/NA
Sulfate	234		5.00		mg/L	5		9056A	Total/NA
Barium	0.0643		0.00200		mg/L	1		6020B	Total/NA
Boron	4.19		0.100		mg/L	1		6020B	Total/NA
Calcium	126		0.500		mg/L	1		6020B	Total/NA
Lithium	0.0108		0.0100		mg/L	1		6020B	Total/NA
Magnesium	45.3		0.500		mg/L	1		6020B	Total/NA
Manganese	0.0458		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.127		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	622		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.7	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-27

## Lab Sample ID: 310-290523-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	85.0		5.00		mg/L	5		9056A	Total/NA
Aluminum	0.0529		0.0500		mg/L	1		6020B	Total/NA
Barium	0.0795		0.00200		mg/L	1		6020B	Total/NA
Boron	3.02		0.100		mg/L	1		6020B	Total/NA
Calcium	63.1		0.500		mg/L	1		6020B	Total/NA
Magnesium	27.9		0.500		mg/L	1		6020B	Total/NA
Manganese	0.0168		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.113		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	290		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: QC1

## Lab Sample ID: 310-290523-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	9.86		5.00		mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Client Sample ID: QC1 (Continued)

## Lab Sample ID: 310-290523-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	60.8		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00450		0.00200		mg/L	1		6020B	Total/NA
Barium	0.207		0.00200		mg/L	1		6020B	Total/NA
Boron	0.100		0.100		mg/L	1		6020B	Total/NA
Calcium	97.2		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000935		0.000500		mg/L	1		6020B	Total/NA
Iron	2.59		0.100		mg/L	1		6020B	Total/NA
Magnesium	40.8		0.500		mg/L	1		6020B	Total/NA
Manganese	0.247		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.191		0.00100		mg/L	1		6020B	Total/NA
Total Suspended Solids	7.33		5.00		mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	398		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: QC2

## Lab Sample ID: 310-290523-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	156		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00685		0.00200		mg/L	1		6020B	Total/NA
Barium	0.260		0.00200		mg/L	1		6020B	Total/NA
Calcium	84.9		0.500		mg/L	1		6020B	Total/NA
Iron	0.165		0.100		mg/L	1		6020B	Total/NA
Magnesium	32.9		0.500		mg/L	1		6020B	Total/NA
Manganese	0.612		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	0.00590		0.00200		mg/L	1		6020B	Total/NA
Strontium	0.106		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	408		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.8	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-8**

**Lab Sample ID: 310-290523-1**

Date Collected: 09/11/24 10:00

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>20.1</b>		5.00		mg/L			09/19/24 12:35	5
Fluoride	<1.00		1.00		mg/L			09/19/24 12:35	5
<b>Sulfate</b>	<b>68.9</b>		5.00		mg/L			09/19/24 12:35	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 14:28	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 13:55	1
<b>Arsenic</b>	<b>0.00466</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Barium</b>	<b>0.0944</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 14:28	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 14:28	1
Boron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 14:28	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Calcium</b>	<b>88.6</b>		0.500		mg/L		09/17/24 09:30	09/30/24 14:28	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Cobalt</b>	<b>0.00216</b>		0.000500		mg/L		09/17/24 09:30	09/30/24 14:28	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Iron</b>	<b>1.53</b>		0.100		mg/L		09/17/24 09:30	09/30/24 14:28	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 14:28	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Magnesium</b>	<b>34.3</b>		0.500		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Manganese</b>	<b>0.491</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Molybdenum</b>	<b>0.00205</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 14:28	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:28	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:28	1
<b>Strontium</b>	<b>0.181</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 14:28	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 14:28	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:28	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 14:28	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:10	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Suspended Solids (USGS I-3765-85)</b>	<b>2.25</b>		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>320</b>		50.0		mg/L			09/16/24 21:05	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.3</b>	<b>HF</b>	1.0		SU			09/13/24 12:34	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.110	U	0.0693	0.0695	1.00	0.110	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		30 - 110					09/17/24 08:10	10/10/24 17:44	1

Eurofins Cedar Falls

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-8**  
**Date Collected: 09/11/24 10:00**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-1**  
**Matrix: Ground Water**

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.606	U	0.378	0.380	1.00	0.606	pCi/L	09/17/24 08:14	10/02/24 11:51	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	89.8		30 - 110					09/17/24 08:14	10/02/24 11:51	1
Y Carrier	79.6		30 - 110					09/17/24 08:14	10/02/24 11:51	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	<0.606	U	0.384	0.386	5.00	0.606	pCi/L		01/14/25 16:49	1

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

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-10**  
 Date Collected: 09/10/24 12:10  
 Date Received: 09/13/24 08:35

**Lab Sample ID: 310-290523-2**  
 Matrix: Ground Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>9.65</b>		5.00		mg/L			09/19/24 12:47	5
Fluoride	<1.00		1.00		mg/L			09/19/24 12:47	5
<b>Sulfate</b>	<b>59.9</b>		5.00		mg/L			09/19/24 12:47	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 14:56	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:01	1
<b>Arsenic</b>	<b>0.00525</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Barium</b>	<b>0.219</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 14:56	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 14:56	1
Boron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 14:56	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Calcium</b>	<b>97.8</b>		0.500		mg/L		09/17/24 09:30	09/30/24 14:56	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Cobalt</b>	<b>0.000977</b>		0.000500		mg/L		09/17/24 09:30	09/30/24 14:56	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Iron</b>	<b>2.86</b>		0.100		mg/L		09/17/24 09:30	09/30/24 14:56	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 14:56	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Magnesium</b>	<b>41.1</b>		0.500		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Manganese</b>	<b>0.255</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Molybdenum</b>	<b>0.00287</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 14:56	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:56	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:56	1
<b>Strontium</b>	<b>0.197</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 14:56	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 14:56	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:56	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 14:56	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:13	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Suspended Solids (USGS I-3765-85)</b>	<b>7.25</b>		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>386</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.3</b>	<b>HF</b>	1.0		SU			09/13/24 12:35	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.355</b>		0.120	0.124	1.00	0.121	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
<i>Ba Carrier</i>	92.3		30 - 110					09/17/24 08:10	10/10/24 17:44	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-10**  
**Date Collected: 09/10/24 12:10**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-2**  
**Matrix: Ground Water**

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.466	U	0.277	0.278	1.00	0.466	pCi/L	09/17/24 08:14	10/02/24 11:51	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	92.3		30 - 110					09/17/24 08:14	10/02/24 11:51	1
Y Carrier	78.9		30 - 110					09/17/24 08:14	10/02/24 11:51	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>0.555</b>		0.302	0.304	5.00	0.466	pCi/L		01/14/25 16:49	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-14A**

**Lab Sample ID: 310-290523-3**

Date Collected: 09/11/24 13:20

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>16.3</b>		5.00		mg/L			09/19/24 12:59	5
Fluoride	<1.00		1.00		mg/L			09/19/24 12:59	5
<b>Sulfate</b>	<b>1110</b>		50.0		mg/L			09/19/24 15:37	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:00	1
Antimony	<0.00800		0.00800		mg/L		09/17/24 09:30	10/02/24 14:03	4
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:00	1
<b>Barium</b>	<b>0.0338</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:00	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:00	1
<b>Boron</b>	<b>17.7</b>		0.500		mg/L		09/17/24 09:30	10/03/24 13:24	5
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:00	1
<b>Calcium</b>	<b>327</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:00	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:00	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:00	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:00	1
Iron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:00	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:00	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:00	1
<b>Magnesium</b>	<b>134</b>		2.50		mg/L		09/17/24 09:30	10/03/24 13:24	5
Manganese	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:00	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:00	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:00	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:00	1
<b>Strontium</b>	<b>0.298</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:00	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:00	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:00	1
<b>Zinc</b>	<b>0.0220</b>		0.0200		mg/L		09/17/24 09:30	09/30/24 15:00	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:19	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>1830</b>		50.0		mg/L			09/16/24 21:05	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.2</b>	<b>HF</b>	1.0		SU			09/13/24 12:36	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.143</b>		0.0979	0.0988	1.00	0.142	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.3		30 - 110					09/17/24 08:10	10/10/24 17:44	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-14A**

**Lab Sample ID: 310-290523-3**

Date Collected: 09/11/24 13:20

Matrix: Ground Water

Date Received: 09/13/24 08:35

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.603	U	0.352	0.352	1.00	0.603	pCi/L	09/17/24 08:14	10/02/24 11:51	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	94.3		30 - 110					09/17/24 08:14	10/02/24 11:51	1
Y Carrier	80.7		30 - 110					09/17/24 08:14	10/02/24 11:51	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	<0.603	U	0.365	0.366	5.00	0.603	pCi/L		01/14/25 16:49	1



# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-15A**

**Lab Sample ID: 310-290523-4**

Date Collected: 09/11/24 14:20

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.41		5.00		mg/L			09/19/24 13:12	5
Fluoride	<1.00		1.00		mg/L			09/19/24 13:12	5
Sulfate	273		5.00		mg/L			09/19/24 13:12	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Antimony	<0.00800		0.00800		mg/L		09/17/24 09:30	10/02/24 14:05	4
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:04	1
Barium	0.0335		0.00200		mg/L		09/17/24 09:30	09/30/24 15:04	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:04	1
Boron	8.50		0.400		mg/L		09/17/24 09:30	10/02/24 14:05	4
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:04	1
Calcium	129		0.500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Iron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:04	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:04	1
Magnesium	53.8		0.500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Manganese	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:04	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:04	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Strontium	0.117		0.00100		mg/L		09/17/24 09:30	09/30/24 15:04	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:04	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:04	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:04	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:21	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>602</b>		50.0		mg/L			09/16/24 21:05	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	7.2	HF	1.0		SU			09/13/24 12:37	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.146	U	0.0784	0.0784	1.00	0.146	pCi/L	09/17/24 08:10	10/10/24 17:45	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.3		30 - 110					09/17/24 08:10	10/10/24 17:45	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-15A**

**Lab Sample ID: 310-290523-4**

Date Collected: 09/11/24 14:20

Matrix: Ground Water

Date Received: 09/13/24 08:35

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.549	U	0.338	0.340	1.00	0.549	pCi/L	09/17/24 08:14	10/02/24 11:53	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	96.3		30 - 110					09/17/24 08:14	10/02/24 11:53	1
Y Carrier	81.9		30 - 110					09/17/24 08:14	10/02/24 11:53	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	<0.549	U	0.347	0.349	5.00	0.549	pCi/L		01/14/25 16:49	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-21**  
 Date Collected: 09/10/24 13:50  
 Date Received: 09/13/24 08:35

**Lab Sample ID: 310-290523-5**  
 Matrix: Ground Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>13.5</b>		5.00		mg/L			09/19/24 13:24	5
Fluoride	<1.00		1.00		mg/L			09/19/24 13:24	5
<b>Sulfate</b>	<b>248</b>		5.00		mg/L			09/19/24 13:24	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:07	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:08	1
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Barium</b>	<b>0.0555</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:07	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Boron</b>	<b>3.68</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:07	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Calcium</b>	<b>96.6</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Chromium</b>	<b>0.00657</b>		0.00500		mg/L		09/17/24 09:30	09/30/24 15:07	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:07	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:07	1
Iron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:07	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Lithium</b>	<b>0.0194</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Magnesium</b>	<b>41.3</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:07	1
Manganese	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:07	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:07	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Selenium</b>	<b>0.00666</b>		0.00500		mg/L		09/17/24 09:30	09/30/24 15:07	1
<b>Strontium</b>	<b>0.181</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:07	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:07	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:07	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:07	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:28	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>584</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>6.9</b>	<b>HF</b>	1.0		SU			09/13/24 12:38	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.124	U	0.0855	0.0862	1.00	0.124	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.3		30 - 110					09/17/24 08:10	10/10/24 17:44	1

Eurofins Cedar Falls

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-21**  
**Date Collected: 09/10/24 13:50**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-5**  
**Matrix: Ground Water**

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.586	U	0.335	0.335	1.00	0.586	pCi/L	09/17/24 08:14	10/02/24 11:53	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	91.3		30 - 110					09/17/24 08:14	10/02/24 11:53	1
Y Carrier	75.1		30 - 110					09/17/24 08:14	10/02/24 11:53	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	<0.586	U	0.346	0.346	5.00	0.586	pCi/L		01/15/25 06:45	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-22**  
 Date Collected: 09/10/24 09:15  
 Date Received: 09/13/24 08:35

**Lab Sample ID: 310-290523-6**  
 Matrix: Ground Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>16.6</b>		5.00		mg/L			09/19/24 13:36	5
Fluoride	<1.00		1.00		mg/L			09/19/24 13:36	5
<b>Sulfate</b>	<b>161</b>		5.00		mg/L			09/19/24 13:36	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:11	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:19	1
<b>Arsenic</b>	<b>0.00749</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Barium</b>	<b>0.268</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:11	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Boron</b>	<b>0.243</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:11	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Calcium</b>	<b>84.3</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:11	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:11	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:11	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Iron</b>	<b>0.189</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:11	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:11	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Magnesium</b>	<b>33.1</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Manganese</b>	<b>0.677</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Molybdenum</b>	<b>0.00578</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:11	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:11	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:11	1
<b>Strontium</b>	<b>0.106</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:11	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:11	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:11	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:11	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:30	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>396</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.5</b>	<b>HF</b>	1.0		SU			09/13/24 12:39	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.185</b>		0.0989	0.100	1.00	0.129	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		30 - 110					09/17/24 08:10	10/10/24 17:44	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-22**  
**Date Collected: 09/10/24 09:15**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-6**  
**Matrix: Ground Water**

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.576	U	0.376	0.379	1.00	0.576	pCi/L	09/17/24 08:14	10/02/24 11:53	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	89.8		30 - 110					09/17/24 08:14	10/02/24 11:53	1
Y Carrier	77.8		30 - 110					09/17/24 08:14	10/02/24 11:53	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>0.674</b>		0.389	0.392	5.00	0.576	pCi/L		01/15/25 06:45	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-23**

**Lab Sample ID: 310-290523-7**

Date Collected: 09/10/24 10:35

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>21.7</b>		5.00		mg/L			09/19/24 13:48	5
Fluoride	<1.00		1.00		mg/L			09/19/24 13:48	5
<b>Sulfate</b>	<b>23.8</b>		5.00		mg/L			09/19/24 13:48	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Aluminum</b>	<b>0.168</b>		0.0500		mg/L		09/17/24 09:30	09/30/24 15:15	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:21	1
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:15	1
<b>Barium</b>	<b>0.0521</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:15	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:15	1
<b>Boron</b>	<b>0.126</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:15	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:15	1
<b>Calcium</b>	<b>58.0</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:15	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:15	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:15	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:15	1
<b>Iron</b>	<b>0.160</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:15	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:15	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:15	1
<b>Magnesium</b>	<b>25.9</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:15	1
<b>Manganese</b>	<b>0.0301</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:15	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:15	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:15	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:15	1
<b>Strontium</b>	<b>0.0598</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:15	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:15	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:15	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:15	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:32	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Suspended Solids (USGS I-3765-85)</b>	<b>31.3</b>		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>260</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.4</b>	<b>HF</b>	1.0		SU			09/13/24 12:40	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.116	U	0.0535	0.0535	1.00	0.116	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.5		30 - 110					09/17/24 08:10	10/10/24 17:44	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-23**  
**Date Collected: 09/10/24 10:35**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-7**  
**Matrix: Ground Water**

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.563	U	0.360	0.362	1.00	0.563	pCi/L	09/17/24 08:14	10/02/24 11:53	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	94.5		30 - 110					09/17/24 08:14	10/02/24 11:53	1
Y Carrier	90.5		30 - 110					09/17/24 08:14	10/02/24 11:53	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	<0.563	U	0.364	0.366	5.00	0.563	pCi/L		01/15/25 06:45	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-24**  
**Date Collected: 09/11/24 08:45**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-8**  
**Matrix: Ground Water**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>22.8</b>		5.00		mg/L			09/19/24 14:00	5
Fluoride	<1.00		1.00		mg/L			09/19/24 14:00	5
<b>Sulfate</b>	<b>43.8</b>		5.00		mg/L			09/19/24 14:00	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:23	1
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:18	1
<b>Barium</b>	<b>0.0885</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:18	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:18	1
Boron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:18	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:18	1
<b>Calcium</b>	<b>73.6</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Iron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:18	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:18	1
<b>Magnesium</b>	<b>31.0</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:18	1
<b>Manganese</b>	<b>0.0111</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:18	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:18	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:18	1
<b>Strontium</b>	<b>0.0754</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:18	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:18	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:18	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:18	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:34	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>306</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.4</b>	<b>HF</b>	1.0		SU			09/13/24 12:46	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-26**

**Lab Sample ID: 310-290523-9**

Date Collected: 09/11/24 12:25

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>17.3</b>		5.00		mg/L			09/19/24 14:12	5
Fluoride	<1.00		1.00		mg/L			09/19/24 14:12	5
<b>Sulfate</b>	<b>234</b>		5.00		mg/L			09/19/24 14:12	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:22	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:25	1
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:22	1
<b>Barium</b>	<b>0.0643</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:22	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:22	1
<b>Boron</b>	<b>4.19</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:22	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:22	1
<b>Calcium</b>	<b>126</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:22	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:22	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:22	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:22	1
Iron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:22	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:22	1
<b>Lithium</b>	<b>0.0108</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:22	1
<b>Magnesium</b>	<b>45.3</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:22	1
<b>Manganese</b>	<b>0.0458</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:22	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:22	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:22	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:22	1
<b>Strontium</b>	<b>0.127</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:22	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:22	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:22	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:22	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:36	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>622</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.7</b>	<b>HF</b>	1.0		SU			09/13/24 12:47	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-27**

**Lab Sample ID: 310-290523-10**

Date Collected: 09/11/24 11:40

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>27.2</b>		5.00		mg/L			09/19/24 14:48	5
Fluoride	<1.00		1.00		mg/L			09/19/24 14:48	5
<b>Sulfate</b>	<b>85.0</b>		5.00		mg/L			09/19/24 14:48	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Aluminum</b>	<b>0.0529</b>		0.0500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:27	1
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:26	1
<b>Barium</b>	<b>0.0795</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:26	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:26	1
<b>Boron</b>	<b>3.02</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:26	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:26	1
<b>Calcium</b>	<b>63.1</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Iron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:26	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:26	1
<b>Magnesium</b>	<b>27.9</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:26	1
<b>Manganese</b>	<b>0.0168</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:26	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:26	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:26	1
<b>Strontium</b>	<b>0.113</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:26	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:26	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:26	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:26	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:38	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>290</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>6.8</b>	<b>HF</b>	1.0		SU			09/13/24 12:48	1

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: QC1**

**Lab Sample ID: 310-290523-11**

Date Collected: 09/10/24 12:00

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.86		5.00		mg/L			09/19/24 15:00	5
Fluoride	<1.00		1.00		mg/L			09/19/24 15:00	5
Sulfate	60.8		5.00		mg/L			09/19/24 15:00	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:30	1
Arsenic	0.00450		0.00200		mg/L		09/17/24 09:30	09/30/24 15:44	1
Barium	0.207		0.00200		mg/L		09/17/24 09:30	09/30/24 15:44	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:44	1
Boron	0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:44	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:44	1
Calcium	97.2		0.500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Cobalt	0.000935		0.000500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Iron	2.59		0.100		mg/L		09/17/24 09:30	09/30/24 15:44	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:44	1
Magnesium	40.8		0.500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Manganese	0.247		0.0100		mg/L		09/17/24 09:30	09/30/24 15:44	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 15:44	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Strontium	0.191		0.00100		mg/L		09/17/24 09:30	09/30/24 15:44	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:44	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:44	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:44	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:40	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	7.33		5.00		mg/L			09/17/24 15:55	1
Total Dissolved Solids (SM 2540C)	398		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	7.2	HF	1.0		SU			09/13/24 12:41	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.397		0.123	0.128	1.00	0.113	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.6		30 - 110					09/17/24 08:10	10/10/24 17:44	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: QC1**

**Lab Sample ID: 310-290523-11**

Date Collected: 09/10/24 12:00

Matrix: Ground Water

Date Received: 09/13/24 08:35

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.721		0.415	0.420	1.00	0.597	pCi/L	09/17/24 08:14	10/02/24 11:53	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	89.6		30 - 110					09/17/24 08:14	10/02/24 11:53	1
Y Carrier	78.9		30 - 110					09/17/24 08:14	10/02/24 11:53	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	1.12		0.433	0.439	5.00	0.597	pCi/L		01/15/25 06:45	1

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- 14

# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: QC2**

**Lab Sample ID: 310-290523-12**

Date Collected: 09/10/24 12:00

Matrix: Ground Water

Date Received: 09/13/24 08:35

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>16.4</b>		5.00		mg/L			09/19/24 15:12	5
Fluoride	<1.00		1.00		mg/L			09/19/24 15:12	5
<b>Sulfate</b>	<b>156</b>		5.00		mg/L			09/19/24 15:12	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 15:51	1
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 14:34	1
<b>Arsenic</b>	<b>0.00685</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:51	1
<b>Barium</b>	<b>0.260</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:51	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:51	1
Boron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 15:51	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 15:51	1
<b>Calcium</b>	<b>84.9</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:51	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:51	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:51	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:51	1
<b>Iron</b>	<b>0.165</b>		0.100		mg/L		09/17/24 09:30	09/30/24 15:51	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 15:51	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 15:51	1
<b>Magnesium</b>	<b>32.9</b>		0.500		mg/L		09/17/24 09:30	09/30/24 15:51	1
<b>Manganese</b>	<b>0.612</b>		0.0100		mg/L		09/17/24 09:30	09/30/24 15:51	1
<b>Molybdenum</b>	<b>0.00590</b>		0.00200		mg/L		09/17/24 09:30	09/30/24 15:51	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:51	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:51	1
<b>Strontium</b>	<b>0.106</b>		0.00100		mg/L		09/17/24 09:30	09/30/24 15:51	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 15:51	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 15:51	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 15:51	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:43	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88		mg/L			09/17/24 15:55	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>408</b>		50.0		mg/L			09/16/24 20:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH (SM 4500 H+ B)</b>	<b>7.8</b>	<b>HF</b>	1.0		SU			09/13/24 12:44	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.229</b>		0.100	0.103	1.00	0.116	pCi/L	09/17/24 08:10	10/10/24 17:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.1		30 - 110					09/17/24 08:10	10/10/24 17:44	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: QC2**

**Lab Sample ID: 310-290523-12**

**Date Collected: 09/10/24 12:00**

**Matrix: Ground Water**

**Date Received: 09/13/24 08:35**

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.596	U	0.386	0.389	1.00	0.596	pCi/L	09/17/24 08:14	10/02/24 11:55	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	93.1		30 - 110					09/17/24 08:14	10/02/24 11:55	1
Y Carrier	75.5		30 - 110					09/17/24 08:14	10/02/24 11:55	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>0.716</b>		0.399	0.402	5.00	0.596	pCi/L		01/15/25 06:45	1

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# Definitions/Glossary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

### General Chemistry

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

### Rad

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

## Glossary

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

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-433822/3**  
**Matrix: Water**  
**Analysis Batch: 433822**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			09/19/24 09:58	1
Fluoride	<0.200		0.200		mg/L			09/19/24 09:58	1
Sulfate	<1.00		1.00		mg/L			09/19/24 09:58	1

**Lab Sample ID: LCS 310-433822/4**  
**Matrix: Water**  
**Analysis Batch: 433822**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.849		mg/L		98	90 - 110
Fluoride	2.00	2.045		mg/L		102	90 - 110
Sulfate	10.0	10.40		mg/L		104	90 - 110

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

**Lab Sample ID: MB 310-433329/1-A**  
**Matrix: Water**  
**Analysis Batch: 434788**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Arsenic	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 14:21	1
Barium	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 14:21	1
Beryllium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 14:21	1
Boron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 14:21	1
Cadmium	<0.000200		0.000200		mg/L		09/17/24 09:30	09/30/24 14:21	1
Calcium	<0.500		0.500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Chromium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Cobalt	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Copper	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Iron	<0.100		0.100		mg/L		09/17/24 09:30	09/30/24 14:21	1
Lead	<0.000500		0.000500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Lithium	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 14:21	1
Magnesium	<0.500		0.500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Manganese	<0.0100		0.0100		mg/L		09/17/24 09:30	09/30/24 14:21	1
Molybdenum	<0.00200		0.00200		mg/L		09/17/24 09:30	09/30/24 14:21	1
Nickel	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Selenium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Strontium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 14:21	1
Thallium	<0.00100		0.00100		mg/L		09/17/24 09:30	09/30/24 14:21	1
Vanadium	<0.00500		0.00500		mg/L		09/17/24 09:30	09/30/24 14:21	1
Zinc	<0.0200		0.0200		mg/L		09/17/24 09:30	09/30/24 14:21	1

**Lab Sample ID: MB 310-433329/1-A**  
**Matrix: Water**  
**Analysis Batch: 435065**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/17/24 09:30	10/02/24 13:51	1

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# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

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

**Lab Sample ID: LCS 310-433329/2-A**  
**Matrix: Water**  
**Analysis Batch: 434788**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	Limits
Aluminum	0.200	0.2079		mg/L		104		80 - 120
Arsenic	0.200	0.2288		mg/L		114		80 - 120
Barium	0.100	0.1070		mg/L		107		80 - 120
Beryllium	0.100	0.1038		mg/L		104		80 - 120
Boron	0.200	0.2037		mg/L		102		80 - 120
Cadmium	0.100	0.09901		mg/L		99		80 - 120
Calcium	2.00	2.067		mg/L		103		80 - 120
Chromium	0.100	0.1030		mg/L		103		80 - 120
Cobalt	0.100	0.1097		mg/L		110		80 - 120
Copper	0.200	0.2179		mg/L		109		80 - 120
Iron	0.200	0.2229		mg/L		111		80 - 120
Lead	0.200	0.2165		mg/L		108		80 - 120
Lithium	0.200	0.2132		mg/L		107		80 - 120
Magnesium	2.00	2.095		mg/L		105		80 - 120
Manganese	0.100	0.1074		mg/L		107		80 - 120
Molybdenum	0.200	0.2135		mg/L		107		80 - 120
Nickel	0.200	0.2171		mg/L		109		80 - 120
Selenium	0.400	0.3949		mg/L		99		80 - 120
Strontium	0.200	0.2073		mg/L		104		80 - 120
Thallium	0.100	0.09703		mg/L		97		80 - 120
Vanadium	0.100	0.1003		mg/L		100		80 - 120
Zinc	0.200	0.1998		mg/L		100		80 - 120

**Lab Sample ID: LCS 310-433329/2-A**  
**Matrix: Water**  
**Analysis Batch: 435065**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	Limits
Aluminum	0.200	0.2108		mg/L		105		80 - 120
Antimony	0.200	0.2302		mg/L		115		80 - 120

**Lab Sample ID: 310-290523-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 434788**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec	Limits
Aluminum	<0.0500		0.200	0.2077		mg/L		104		75 - 125
Arsenic	0.00466		0.200	0.2408		mg/L		118		75 - 125
Barium	0.0944		0.100	0.1967		mg/L		102		75 - 125
Beryllium	<0.00100		0.100	0.1047		mg/L		105		75 - 125
Boron	<0.100		0.200	0.2363		mg/L		118		75 - 125
Cadmium	<0.000200		0.100	0.1010		mg/L		101		75 - 125
Calcium	88.6		2.00	89.68	4	mg/L		56		75 - 125
Chromium	<0.00500		0.100	0.1021		mg/L		102		75 - 125
Cobalt	0.00216		0.100	0.1089		mg/L		107		75 - 125
Copper	<0.00500		0.200	0.2085		mg/L		104		75 - 125
Iron	1.53		0.200	1.630	4	mg/L		50		75 - 125
Lead	<0.000500		0.200	0.2109		mg/L		105		75 - 125
Lithium	<0.0100		0.200	0.2151		mg/L		106		75 - 125

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# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

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

**Lab Sample ID: 310-290523-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 434788**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Sample	Sample Qualifier	Spike Added	MS	MS	Unit	D	%Rec	%Rec	
	Result			Result	Qualifier				Limits	RPD
Magnesium	34.3		2.00	35.82	4	mg/L		76	75 - 125	
Manganese	0.491		0.100	0.5751	4	mg/L		84	75 - 125	
Molybdenum	0.00205		0.200	0.2079		mg/L		103	75 - 125	
Nickel	<0.00500		0.200	0.2071		mg/L		102	75 - 125	
Selenium	<0.00500		0.400	0.4242		mg/L		106	75 - 125	
Strontium	0.181		0.200	0.3879		mg/L		104	75 - 125	
Thallium	<0.00100		0.100	0.08189		mg/L		82	75 - 125	
Vanadium	<0.00500		0.100	0.1003		mg/L		100	75 - 125	
Zinc	<0.0200		0.200	0.1972		mg/L		99	75 - 125	

**Lab Sample ID: 310-290523-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 435065**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Sample	Sample Qualifier	Spike Added	MS	MS	Unit	D	%Rec	%Rec	
	Result			Result	Qualifier				Limits	RPD
Antimony	<0.00200		0.200	0.2353		mg/L		118	75 - 125	

**Lab Sample ID: 310-290523-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 434788**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Sample	Sample Qualifier	Spike Added	MSD	MSD	Unit	D	%Rec	%Rec		RPD	
	Result			Result	Qualifier				Limits	RPD	Limit	
Aluminum	<0.0500		0.200	0.2077		mg/L		104	75 - 125	0	20	
Arsenic	0.00466		0.200	0.2407		mg/L		118	75 - 125	0	20	
Barium	0.0944		0.100	0.1994		mg/L		105	75 - 125	1	20	
Beryllium	<0.00100		0.100	0.1037		mg/L		104	75 - 125	1	20	
Boron	<0.100		0.200	0.2438		mg/L		122	75 - 125	3	20	
Cadmium	<0.000200		0.100	0.1012		mg/L		101	75 - 125	0	20	
Calcium	88.6		2.00	89.73	4	mg/L		58	75 - 125	0	20	
Chromium	<0.00500		0.100	0.1025		mg/L		102	75 - 125	0	20	
Cobalt	0.00216		0.100	0.1085		mg/L		106	75 - 125	0	20	
Copper	<0.00500		0.200	0.2078		mg/L		104	75 - 125	0	20	
Iron	1.53		0.200	1.649	4	mg/L		60	75 - 125	1	20	
Lead	<0.000500		0.200	0.2094		mg/L		105	75 - 125	1	20	
Lithium	<0.0100		0.200	0.2125		mg/L		105	75 - 125	1	20	
Magnesium	34.3		2.00	35.89	4	mg/L		79	75 - 125	0	20	
Manganese	0.491		0.100	0.5861	4	mg/L		95	75 - 125	2	20	
Molybdenum	0.00205		0.200	0.2076		mg/L		103	75 - 125	0	20	
Nickel	<0.00500		0.200	0.2077		mg/L		103	75 - 125	0	20	
Selenium	<0.00500		0.400	0.4254		mg/L		106	75 - 125	0	20	
Strontium	0.181		0.200	0.3926		mg/L		106	75 - 125	1	20	
Thallium	<0.00100		0.100	0.07708		mg/L		77	75 - 125	6	20	
Vanadium	<0.00500		0.100	0.1002		mg/L		100	75 - 125	0	20	
Zinc	<0.0200		0.200	0.1970		mg/L		99	75 - 125	0	20	

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

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

**Lab Sample ID: 310-290523-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 435065**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits	Limit	
Aluminum	<0.0500		0.200	0.2147		mg/L		107	75 - 125	0	20
Antimony	<0.00200		0.200	0.2268		mg/L		113	75 - 125	4	20

**Lab Sample ID: 310-290523-11 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 434788**

**Client Sample ID: QC1**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD
	Result	Qualifier	Result	Qualifier				Limit
Aluminum	<0.0500		<0.0500		mg/L		NC	20
Arsenic	0.00450		0.004538		mg/L		0.9	20
Barium	0.207		0.2059		mg/L		0.4	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Boron	0.100		<0.100		mg/L		NC	20
Cadmium	<0.000200		<0.000200		mg/L		NC	20
Calcium	97.2		96.20		mg/L		1	20
Chromium	<0.00500		<0.00500		mg/L		NC	20
Cobalt	0.000935		0.0009040		mg/L		3	20
Copper	<0.00500		<0.00500		mg/L		NC	20
Iron	2.59		2.612		mg/L		0.7	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Lithium	<0.0100		<0.0100		mg/L		NC	20
Magnesium	40.8		40.78		mg/L		0.1	20
Manganese	0.247		0.2457		mg/L		0.4	20
Molybdenum	<0.00200		<0.00200		mg/L		NC	20
Nickel	<0.00500		<0.00500		mg/L		NC	20
Selenium	<0.00500		<0.00500		mg/L		NC	20
Strontium	0.191		0.1885		mg/L		1	20
Thallium	<0.00100		<0.00100		mg/L		NC	20
Vanadium	<0.00500		<0.00500		mg/L		NC	20
Zinc	<0.0200		<0.0200		mg/L		NC	20

**Lab Sample ID: 310-290523-11 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 435065**

**Client Sample ID: QC1**  
**Prep Type: Total/NA**  
**Prep Batch: 433329**

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD
	Result	Qualifier	Result	Qualifier				Limit
Antimony	<0.00200		<0.00200		mg/L		NC	20

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 310-433662/1-A**  
**Matrix: Water**  
**Analysis Batch: 433861**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433662**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.000200		0.000200		mg/L		09/19/24 13:55	09/20/24 15:06	1

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# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

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

**Lab Sample ID: LCS 310-433662/2-A**  
**Matrix: Water**  
**Analysis Batch: 433861**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433662**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001682		mg/L		101	80 - 120

**Lab Sample ID: 310-290523-2 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 433861**

**Client Sample ID: MW-10**  
**Prep Type: Total/NA**  
**Prep Batch: 433662**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.000200		0.00167	0.001625		mg/L		98	80 - 120

**Lab Sample ID: 310-290523-2 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 433861**

**Client Sample ID: MW-10**  
**Prep Type: Total/NA**  
**Prep Batch: 433662**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.000200		0.00167	0.001639		mg/L		98	80 - 120	1	20

## Method: I-3765-85 - Residue, Non-filterable (TSS)

**Lab Sample ID: MB 310-433438/1**  
**Matrix: Water**  
**Analysis Batch: 433438**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00		mg/L			09/17/24 15:55	1

**Lab Sample ID: LCS 310-433438/2**  
**Matrix: Water**  
**Analysis Batch: 433438**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	103.0		mg/L		103	81 - 116

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

**Lab Sample ID: MB 310-433336/1**  
**Matrix: Water**  
**Analysis Batch: 433336**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			09/16/24 20:09	1

**Lab Sample ID: LCS 310-433336/2**  
**Matrix: Water**  
**Analysis Batch: 433336**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	954.0		mg/L		95	88 - 110

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

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

Lab Sample ID: MB 310-433337/1  
 Matrix: Water  
 Analysis Batch: 433337

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			09/16/24 21:05	1

Lab Sample ID: LCS 310-433337/2  
 Matrix: Water  
 Analysis Batch: 433337

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	1000		mg/L		100	88 - 110

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-433123/29  
 Matrix: Water  
 Analysis Batch: 433123

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.1		SU		101	98 - 102

Lab Sample ID: 310-290523-12 DU  
 Matrix: Ground Water  
 Analysis Batch: 433123

Client Sample ID: QC2  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.8	HF	7.8		SU		0.1	20

## Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-679741/1-A  
 Matrix: Water  
 Analysis Batch: 683026

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 679741

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.143	U	0.0751	0.0751	1.00	0.143	pCi/L	09/17/24 08:10	10/10/24 15:13	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.8		30 - 110					09/17/24 08:10	10/10/24 15:13	1

Lab Sample ID: LCS 160-679741/2-A  
 Matrix: Water  
 Analysis Batch: 683028

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 679741

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	9.58	9.491		1.00	1.00	0.122	pCi/L	99	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	93.5		30 - 110						

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# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Method: 9320 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-679742/1-A**  
**Matrix: Water**  
**Analysis Batch: 681957**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 679742**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)							
Radium-228	<0.477	U	0.264	0.264	1.00	0.477	pCi/L	09/17/24 08:14	10/02/24 11:50	1	
Carrier	MB %Yield	MB Qualifier	Limits				Prepared		Analyzed		Dil Fac
Ba Carrier	97.8		30 - 110				09/17/24 08:14		10/02/24 11:50		1
Y Carrier	77.8		30 - 110				09/17/24 08:14		10/02/24 11:50		1

**Lab Sample ID: LCS 160-679742/2-A**  
**Matrix: Water**  
**Analysis Batch: 681957**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 679742**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-228	8.46	10.56		1.44	1.00	0.594	pCi/L	125	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	93.5		30 - 110						
Y Carrier	76.3		30 - 110						

# QC Association Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## HPLC/IC

### Analysis Batch: 433822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	9056A	
310-290523-2	MW-10	Total/NA	Ground Water	9056A	
310-290523-3	MW-14A	Total/NA	Ground Water	9056A	
310-290523-3	MW-14A	Total/NA	Ground Water	9056A	
310-290523-4	MW-15A	Total/NA	Ground Water	9056A	
310-290523-5	MW-21	Total/NA	Ground Water	9056A	
310-290523-6	MW-22	Total/NA	Ground Water	9056A	
310-290523-7	MW-23	Total/NA	Ground Water	9056A	
310-290523-8	MW-24	Total/NA	Ground Water	9056A	
310-290523-9	MW-26	Total/NA	Ground Water	9056A	
310-290523-10	MW-27	Total/NA	Ground Water	9056A	
310-290523-11	QC1	Total/NA	Ground Water	9056A	
310-290523-12	QC2	Total/NA	Ground Water	9056A	
MB 310-433822/3	Method Blank	Total/NA	Water	9056A	
LCS 310-433822/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 433329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	3005A	
310-290523-2	MW-10	Total/NA	Ground Water	3005A	
310-290523-3	MW-14A	Total/NA	Ground Water	3005A	
310-290523-4	MW-15A	Total/NA	Ground Water	3005A	
310-290523-5	MW-21	Total/NA	Ground Water	3005A	
310-290523-6	MW-22	Total/NA	Ground Water	3005A	
310-290523-7	MW-23	Total/NA	Ground Water	3005A	
310-290523-8	MW-24	Total/NA	Ground Water	3005A	
310-290523-9	MW-26	Total/NA	Ground Water	3005A	
310-290523-10	MW-27	Total/NA	Ground Water	3005A	
310-290523-11	QC1	Total/NA	Ground Water	3005A	
310-290523-12	QC2	Total/NA	Ground Water	3005A	
MB 310-433329/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-433329/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-290523-1 MS	MW-8	Total/NA	Ground Water	3005A	
310-290523-1 MSD	MW-8	Total/NA	Ground Water	3005A	
310-290523-11 DU	QC1	Total/NA	Ground Water	3005A	

### Prep Batch: 433662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	7470A	
310-290523-2	MW-10	Total/NA	Ground Water	7470A	
310-290523-3	MW-14A	Total/NA	Ground Water	7470A	
310-290523-4	MW-15A	Total/NA	Ground Water	7470A	
310-290523-5	MW-21	Total/NA	Ground Water	7470A	
310-290523-6	MW-22	Total/NA	Ground Water	7470A	
310-290523-7	MW-23	Total/NA	Ground Water	7470A	
310-290523-8	MW-24	Total/NA	Ground Water	7470A	
310-290523-9	MW-26	Total/NA	Ground Water	7470A	
310-290523-10	MW-27	Total/NA	Ground Water	7470A	
310-290523-11	QC1	Total/NA	Ground Water	7470A	

Eurofins Cedar Falls

# QC Association Summary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Metals (Continued)

### Prep Batch: 433662 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-12	QC2	Total/NA	Ground Water	7470A	
MB 310-433662/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-433662/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-290523-2 MS	MW-10	Total/NA	Ground Water	7470A	
310-290523-2 MSD	MW-10	Total/NA	Ground Water	7470A	

### Analysis Batch: 433861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	7470A	433662
310-290523-2	MW-10	Total/NA	Ground Water	7470A	433662
310-290523-3	MW-14A	Total/NA	Ground Water	7470A	433662
310-290523-4	MW-15A	Total/NA	Ground Water	7470A	433662
310-290523-5	MW-21	Total/NA	Ground Water	7470A	433662
310-290523-6	MW-22	Total/NA	Ground Water	7470A	433662
310-290523-7	MW-23	Total/NA	Ground Water	7470A	433662
310-290523-8	MW-24	Total/NA	Ground Water	7470A	433662
310-290523-9	MW-26	Total/NA	Ground Water	7470A	433662
310-290523-10	MW-27	Total/NA	Ground Water	7470A	433662
310-290523-11	QC1	Total/NA	Ground Water	7470A	433662
310-290523-12	QC2	Total/NA	Ground Water	7470A	433662
MB 310-433662/1-A	Method Blank	Total/NA	Water	7470A	433662
LCS 310-433662/2-A	Lab Control Sample	Total/NA	Water	7470A	433662
310-290523-2 MS	MW-10	Total/NA	Ground Water	7470A	433662
310-290523-2 MSD	MW-10	Total/NA	Ground Water	7470A	433662

### Analysis Batch: 434788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	6020B	433329
310-290523-2	MW-10	Total/NA	Ground Water	6020B	433329
310-290523-3	MW-14A	Total/NA	Ground Water	6020B	433329
310-290523-4	MW-15A	Total/NA	Ground Water	6020B	433329
310-290523-5	MW-21	Total/NA	Ground Water	6020B	433329
310-290523-6	MW-22	Total/NA	Ground Water	6020B	433329
310-290523-7	MW-23	Total/NA	Ground Water	6020B	433329
310-290523-8	MW-24	Total/NA	Ground Water	6020B	433329
310-290523-9	MW-26	Total/NA	Ground Water	6020B	433329
310-290523-10	MW-27	Total/NA	Ground Water	6020B	433329
310-290523-11	QC1	Total/NA	Ground Water	6020B	433329
310-290523-12	QC2	Total/NA	Ground Water	6020B	433329
MB 310-433329/1-A	Method Blank	Total/NA	Water	6020B	433329
LCS 310-433329/2-A	Lab Control Sample	Total/NA	Water	6020B	433329
310-290523-1 MS	MW-8	Total/NA	Ground Water	6020B	433329
310-290523-1 MSD	MW-8	Total/NA	Ground Water	6020B	433329
310-290523-11 DU	QC1	Total/NA	Ground Water	6020B	433329

### Analysis Batch: 435065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	6020B	433329
310-290523-2	MW-10	Total/NA	Ground Water	6020B	433329
310-290523-3	MW-14A	Total/NA	Ground Water	6020B	433329
310-290523-4	MW-15A	Total/NA	Ground Water	6020B	433329

Eurofins Cedar Falls

# QC Association Summary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Metals (Continued)

### Analysis Batch: 435065 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-5	MW-21	Total/NA	Ground Water	6020B	433329
310-290523-6	MW-22	Total/NA	Ground Water	6020B	433329
310-290523-7	MW-23	Total/NA	Ground Water	6020B	433329
310-290523-8	MW-24	Total/NA	Ground Water	6020B	433329
310-290523-9	MW-26	Total/NA	Ground Water	6020B	433329
310-290523-10	MW-27	Total/NA	Ground Water	6020B	433329
310-290523-11	QC1	Total/NA	Ground Water	6020B	433329
310-290523-12	QC2	Total/NA	Ground Water	6020B	433329
MB 310-433329/1-A	Method Blank	Total/NA	Water	6020B	433329
LCS 310-433329/2-A	Lab Control Sample	Total/NA	Water	6020B	433329
310-290523-1 MS	MW-8	Total/NA	Ground Water	6020B	433329
310-290523-1 MSD	MW-8	Total/NA	Ground Water	6020B	433329
310-290523-11 DU	QC1	Total/NA	Ground Water	6020B	433329

### Analysis Batch: 435215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-3	MW-14A	Total/NA	Ground Water	6020B	433329

## General Chemistry

### Analysis Batch: 433123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-2	MW-10	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-3	MW-14A	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-4	MW-15A	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-5	MW-21	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-6	MW-22	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-7	MW-23	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-8	MW-24	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-9	MW-26	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-10	MW-27	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-11	QC1	Total/NA	Ground Water	SM 4500 H+ B	
310-290523-12	QC2	Total/NA	Ground Water	SM 4500 H+ B	
LCS 310-433123/29	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-290523-12 DU	QC2	Total/NA	Ground Water	SM 4500 H+ B	

### Analysis Batch: 433336

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-2	MW-10	Total/NA	Ground Water	SM 2540C	
310-290523-5	MW-21	Total/NA	Ground Water	SM 2540C	
310-290523-6	MW-22	Total/NA	Ground Water	SM 2540C	
310-290523-7	MW-23	Total/NA	Ground Water	SM 2540C	
310-290523-8	MW-24	Total/NA	Ground Water	SM 2540C	
310-290523-9	MW-26	Total/NA	Ground Water	SM 2540C	
310-290523-10	MW-27	Total/NA	Ground Water	SM 2540C	
310-290523-11	QC1	Total/NA	Ground Water	SM 2540C	
310-290523-12	QC2	Total/NA	Ground Water	SM 2540C	
MB 310-433336/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-433336/2	Lab Control Sample	Total/NA	Water	SM 2540C	

# QC Association Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## General Chemistry

### Analysis Batch: 433337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	SM 2540C	
310-290523-3	MW-14A	Total/NA	Ground Water	SM 2540C	
310-290523-4	MW-15A	Total/NA	Ground Water	SM 2540C	
MB 310-433337/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-433337/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 433438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	I-3765-85	
310-290523-2	MW-10	Total/NA	Ground Water	I-3765-85	
310-290523-3	MW-14A	Total/NA	Ground Water	I-3765-85	
310-290523-4	MW-15A	Total/NA	Ground Water	I-3765-85	
310-290523-5	MW-21	Total/NA	Ground Water	I-3765-85	
310-290523-6	MW-22	Total/NA	Ground Water	I-3765-85	
310-290523-7	MW-23	Total/NA	Ground Water	I-3765-85	
310-290523-11	QC1	Total/NA	Ground Water	I-3765-85	
310-290523-12	QC2	Total/NA	Ground Water	I-3765-85	
MB 310-433438/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-433438/2	Lab Control Sample	Total/NA	Water	I-3765-85	

## Rad

### Prep Batch: 679741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	PrecSep-21	
310-290523-2	MW-10	Total/NA	Ground Water	PrecSep-21	
310-290523-3	MW-14A	Total/NA	Ground Water	PrecSep-21	
310-290523-4	MW-15A	Total/NA	Ground Water	PrecSep-21	
310-290523-5	MW-21	Total/NA	Ground Water	PrecSep-21	
310-290523-6	MW-22	Total/NA	Ground Water	PrecSep-21	
310-290523-7	MW-23	Total/NA	Ground Water	PrecSep-21	
310-290523-11	QC1	Total/NA	Ground Water	PrecSep-21	
310-290523-12	QC2	Total/NA	Ground Water	PrecSep-21	
MB 160-679741/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-679741/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 679742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290523-1	MW-8	Total/NA	Ground Water	PrecSep_0	
310-290523-2	MW-10	Total/NA	Ground Water	PrecSep_0	
310-290523-3	MW-14A	Total/NA	Ground Water	PrecSep_0	
310-290523-4	MW-15A	Total/NA	Ground Water	PrecSep_0	
310-290523-5	MW-21	Total/NA	Ground Water	PrecSep_0	
310-290523-6	MW-22	Total/NA	Ground Water	PrecSep_0	
310-290523-7	MW-23	Total/NA	Ground Water	PrecSep_0	
310-290523-11	QC1	Total/NA	Ground Water	PrecSep_0	
310-290523-12	QC2	Total/NA	Ground Water	PrecSep_0	
MB 160-679742/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-679742/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

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# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-8**  
**Date Collected: 09/11/24 10:00**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-1**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 12:35
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 14:28
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 13:55
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:10
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433337	MDU9	EET CF	09/16/24 21:05
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:34
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683026	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681958	SWS	EET SL	10/02/24 11:51
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/14/25 16:49

**Client Sample ID: MW-10**  
**Date Collected: 09/10/24 12:10**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-2**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 12:47
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 14:56
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:01
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:13
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:35
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683026	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681958	SWS	EET SL	10/02/24 11:51
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/14/25 16:49

**Client Sample ID: MW-14A**  
**Date Collected: 09/11/24 13:20**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-3**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 12:59
Total/NA	Analysis	9056A		50	433822	HE7K	EET CF	09/19/24 15:37

Eurofins Cedar Falls

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-14A**  
**Date Collected: 09/11/24 13:20**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-3**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:00
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		5	435215	NFT2	EET CF	10/03/24 13:24
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		4	435065	NFT2	EET CF	10/02/24 14:03
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:19
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433337	MDU9	EET CF	09/16/24 21:05
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:36
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683026	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681958	SWS	EET SL	10/02/24 11:51
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/14/25 16:49

**Client Sample ID: MW-15A**  
**Date Collected: 09/11/24 14:20**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-4**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 13:12
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:04
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		4	435065	NFT2	EET CF	10/02/24 14:05
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:21
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433337	MDU9	EET CF	09/16/24 21:05
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:37
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683026	FLC	EET SL	10/10/24 17:45
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681767	SWS	EET SL	10/02/24 11:53
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/14/25 16:49

**Client Sample ID: MW-21**  
**Date Collected: 09/10/24 13:50**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-5**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 13:24

Eurofins Cedar Falls

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-21**  
**Date Collected: 09/10/24 13:50**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-5**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:07
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:08
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:28
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:38
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683028	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681767	SWS	EET SL	10/02/24 11:53
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/15/25 06:45

**Client Sample ID: MW-22**  
**Date Collected: 09/10/24 09:15**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-6**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 13:36
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:11
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:19
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:30
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:39
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683028	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681767	SWS	EET SL	10/02/24 11:53
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/15/25 06:45

**Client Sample ID: MW-23**  
**Date Collected: 09/10/24 10:35**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-7**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 13:48
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:15



# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-23**  
**Date Collected: 09/10/24 10:35**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-7**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:21
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:32
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:40
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683028	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681767	SWS	EET SL	10/02/24 11:53
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/15/25 06:45

**Client Sample ID: MW-24**  
**Date Collected: 09/11/24 08:45**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-8**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 14:00
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:18
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:23
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:34
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:46

**Client Sample ID: MW-26**  
**Date Collected: 09/11/24 12:25**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-9**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 14:12
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:22
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:25
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:36
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:47

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: MW-27**  
**Date Collected: 09/11/24 11:40**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-10**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 14:48
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:26
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:27
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:38
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:48

**Client Sample ID: QC1**  
**Date Collected: 09/10/24 12:00**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-11**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 15:00
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:44
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:30
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:40
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:41
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683028	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681767	SWS	EET SL	10/02/24 11:53
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/15/25 06:45

**Client Sample ID: QC2**  
**Date Collected: 09/10/24 12:00**  
**Date Received: 09/13/24 08:35**

**Lab Sample ID: 310-290523-12**  
**Matrix: Ground Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433822	HE7K	EET CF	09/19/24 15:12
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	434788	NFT2	EET CF	09/30/24 15:51
Total/NA	Prep	3005A			433329	QTZ5	EET CF	09/17/24 09:30
Total/NA	Analysis	6020B		1	435065	NFT2	EET CF	10/02/24 14:34
Total/NA	Prep	7470A			433662	DHM5	EET CF	09/19/24 13:55
Total/NA	Analysis	7470A		1	433861	QTZ5	EET CF	09/20/24 15:43
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55

# Lab Chronicle

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Client Sample ID: QC2**

**Lab Sample ID: 310-290523-12**

**Date Collected: 09/10/24 12:00**

**Matrix: Ground Water**

**Date Received: 09/13/24 08:35**

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Analyst</u>	<u>Lab</u>	<u>Prepared or Analyzed</u>
Total/NA	Analysis	SM 2540C		1	433336	MDU9	EET CF	09/16/24 20:09
Total/NA	Analysis	SM 4500 H+ B		1	433123	W9YR	EET CF	09/13/24 12:44
Total/NA	Prep	PrecSep-21			679741	BCE	EET SL	09/17/24 08:10
Total/NA	Analysis	9315		1	683028	FLC	EET SL	10/10/24 17:44
Total/NA	Prep	PrecSep_0			679742	BCE	EET SL	09/17/24 08:14
Total/NA	Analysis	9320		1	681767	SWS	EET SL	10/02/24 11:55
Total/NA	Analysis	Ra226_Ra228		1	698063	SCB	EET SL	01/15/25 06:45

### Laboratory References:

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

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

# Accreditation/Certification Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

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

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3005A	Ground Water	Lithium

## Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9315	PrecSep-21	Ground Water	Radium-226
9320	PrecSep_0	Ground Water	Radium-228

# Method Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

#### Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

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

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

#### Laboratory References:

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

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

# Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-290523-2

SDG Number:

**Login Number: 290523**

**List Number: 1**

**Creator: Collins, Charlotte G**

**List Source: Eurofins Cedar Falls**

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

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.



# Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-290523-2

SDG Number:

**Login Number: 290523**

**List Number: 2**

**Creator: Worthington, Sierra M**

**List Source: Eurofins St. Louis**

**List Creation: 09/16/24 11:28 AM**

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?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <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	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.



# Tracer/Carrier Summary

Client: Muscatine Power & Water  
 Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

## Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
310-290523-1	MW-8	89.8	
310-290523-2	MW-10	92.3	
310-290523-3	MW-14A	94.3	
310-290523-4	MW-15A	96.3	
310-290523-5	MW-21	91.3	
310-290523-6	MW-22	89.8	
310-290523-7	MW-23	94.5	
310-290523-11	QC1	89.6	
310-290523-12	QC2	93.1	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

## Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
LCS 160-679741/2-A	Lab Control Sample	93.5	
MB 160-679741/1-A	Method Blank	97.8	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

## Method: 9320 - Radium-228 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
310-290523-1	MW-8	89.8	79.6
310-290523-2	MW-10	92.3	78.9
310-290523-3	MW-14A	94.3	80.7
310-290523-4	MW-15A	96.3	81.9
310-290523-5	MW-21	91.3	75.1
310-290523-6	MW-22	89.8	77.8
310-290523-7	MW-23	94.5	90.5
310-290523-11	QC1	89.6	78.9
310-290523-12	QC2	93.1	75.5
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

## Method: 9320 - 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)
LCS 160-679742/2-A	Lab Control Sample	93.5	76.3



# Tracer/Carrier Summary

Client: Muscatine Power & Water  
Project/Site: Muscatine Power & Water CCR Landfill

Job ID: 310-290523-1

**Method: 9320 - Radium-228 (GFPC) (Continued)**

**Matrix: Water**

**Prep Type: Total/NA**

## Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
MB 160-679742/1-A	Method Blank	97.8	77.8

### Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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



# ANALYTICAL REPORT

## PREPARED FOR

Attn: Sam Bennett  
Muscatine Power & Water  
1700 Dick Drake Way  
PO BOX 899  
Muscatine, Iowa 52761

Generated 10/16/2024 9:24:55 AM

## JOB DESCRIPTION

MPW CCR - Landfill Fall 2024

## JOB NUMBER

310-290691-1

# Eurofins Cedar Falls

## Job Notes

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

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

## Authorization



Generated  
10/16/2024 9:24:55 AM

Authorized for release by  
Bob Michels, Project Manager I  
[Bob.Michels@et.eurofinsus.com](mailto:Bob.Michels@et.eurofinsus.com)  
(319)277-2401



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	8
Definitions . . . . .	16
QC Sample Results . . . . .	17
QC Association . . . . .	21
Chronicle . . . . .	24
Certification Summary . . . . .	27
Method Summary . . . . .	28
Chain of Custody . . . . .	29
Receipt Checklists . . . . .	33
Tracer Carrier Summary . . . . .	35

# Case Narrative

Client: Muscatine Power & Water  
Project: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Job ID: 310-290691-1**

**Eurofins Cedar Falls**

## Job Narrative 310-290691-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided 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.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

### Receipt

The samples were received on 9/17/2024 8:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was -0.3°C.

### HPLC/IC

Method 9056A\_ORGFM\_28D: The following samples were diluted due to the nature of the sample matrix: MW-4B (310-290691-1), MW-5B (310-290691-2) and MW-6A (310-290691-3). Elevated reporting limits (RLs) are provided.

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

### Metals

Method 6020B: The following sample was diluted due to the nature of the sample matrix: Leachate (310-290691-4) at 100.0. Elevated reporting limits (RLs) are provided.

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

### General Chemistry

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

### Gas Flow Proportional Counter

Method 9320\_Ra228: Radium-228 batch 680337

The detection goal was not met for the following sample due to the reduced volume used in prep attributed to the presence of matrix interferences: Leachate (310-290691-4). Analytical results are reported with the detection limit achieved.

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

### Rad

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

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# Sample Summary

Client: Muscatine Power & Water  
Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-290691-1	MW-4B	Water	09/12/24 10:55	09/17/24 08:30
310-290691-2	MW-5B	Water	09/12/24 10:35	09/17/24 08:30
310-290691-3	MW-6A	Water	09/12/24 11:20	09/17/24 08:30
310-290691-4	Leachate	Water	09/12/24 12:35	09/17/24 08:30

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# Detection Summary

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Client Sample ID: MW-4B

## Lab Sample ID: 310-290691-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14.6		5.00		mg/L	5		9056A	Total/NA
Sulfate	65.8		5.00		mg/L	5		9056A	Total/NA
Barium	0.184		0.00200		mg/L	1		6020B	Total/NA
Calcium	102		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00280		0.000500		mg/L	1		6020B	Total/NA
Iron	0.797		0.100		mg/L	1		6020B	Total/NA
Magnesium	35.9		0.500		mg/L	1		6020B	Total/NA
Manganese	0.491		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.103		0.00100		mg/L	1		6020B	Total/NA
Total Dissolved Solids	410		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-5B

## Lab Sample ID: 310-290691-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	40.5		5.00		mg/L	5		9056A	Total/NA
Sulfate	50.4		5.00		mg/L	5		9056A	Total/NA
Barium	0.258		0.00200		mg/L	1		6020B	Total/NA
Calcium	123		0.500		mg/L	1		6020B	Total/NA
Iron	2.06		0.100		mg/L	1		6020B	Total/NA
Magnesium	36.4		0.500		mg/L	1		6020B	Total/NA
Manganese	0.554		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.162		0.00100		mg/L	1		6020B	Total/NA
Total Suspended Solids	4.88		1.88		mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	520		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-6A

## Lab Sample ID: 310-290691-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	16.3		5.00		mg/L	5		9056A	Total/NA
Barium	0.249		0.00200		mg/L	1		6020B	Total/NA
Calcium	99.4		0.500		mg/L	1		6020B	Total/NA
Iron	3.60		0.100		mg/L	1		6020B	Total/NA
Magnesium	30.8		0.500		mg/L	1		6020B	Total/NA
Manganese	0.118		0.0100		mg/L	1		6020B	Total/NA
Strontium	0.188		0.00100		mg/L	1		6020B	Total/NA
Total Suspended Solids	8.25		1.88		mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	382		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: Leachate

## Lab Sample ID: 310-290691-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	55.0		5.00		mg/L	5		9056A	Total/NA
Fluoride	2.47		1.00		mg/L	5		9056A	Total/NA
Sulfate	4840		50.0		mg/L	50		9056A	Total/NA
Antimony	0.00312		0.00200		mg/L	1		6020B	Total/NA
Arsenic	1.64		0.0800		mg/L	40		6020B	Total/NA
Barium	0.0241		0.00200		mg/L	1		6020B	Total/NA
Boron	70.4		4.00		mg/L	40		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

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# Detection Summary

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: Leachate (Continued)**

**Lab Sample ID: 310-290691-4**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	531		10.0		mg/L	20		6020B	Total/NA
Lithium	0.330		0.0400		mg/L	4		6020B	Total/NA
Magnesium	48.2		10.0		mg/L	20		6020B	Total/NA
Manganese	0.458		0.200		mg/L	20		6020B	Total/NA
Molybdenum	0.775		0.0400		mg/L	20		6020B	Total/NA
Strontium	4.02		0.00400		mg/L	4		6020B	Total/NA
Total Suspended Solids	3.25		1.88		mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	7880		250		mg/L	1		SM 2540C	Total/NA
pH	8.8	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.





# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-4B**

**Lab Sample ID: 310-290691-1**

Date Collected: 09/12/24 10:55

Matrix: Water

Date Received: 09/17/24 08:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14.6		5.00		mg/L			09/24/24 12:21	5
Fluoride	<1.00		1.00		mg/L			09/24/24 12:21	5
Sulfate	65.8		5.00		mg/L			09/24/24 12:21	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Antimony	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:41	1
Arsenic	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:41	1
Barium	0.184		0.00200		mg/L		09/18/24 09:00	09/19/24 13:41	1
Beryllium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/23/24 18:21	1
Boron	<0.100		0.100		mg/L		09/18/24 09:00	09/24/24 15:28	1
Cadmium	<0.000200		0.000200		mg/L		09/18/24 09:00	09/23/24 18:21	1
Calcium	102		0.500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Chromium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Cobalt	0.00280		0.000500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Copper	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Iron	0.797		0.100		mg/L		09/18/24 09:00	09/19/24 13:41	1
Lead	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Lithium	<0.0100		0.0100		mg/L		09/18/24 09:00	09/23/24 18:21	1
Magnesium	35.9		0.500		mg/L		09/18/24 09:00	09/23/24 18:21	1
Manganese	0.491		0.0100		mg/L		09/18/24 09:00	09/23/24 18:21	1
Molybdenum	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:41	1
Nickel	<0.00500		0.00500		mg/L		09/18/24 09:00	09/23/24 18:21	1
Selenium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Strontium	0.103		0.00100		mg/L		09/18/24 09:00	09/19/24 13:41	1
Thallium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/19/24 13:41	1
Vanadium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:41	1
Zinc	<0.0200		0.0200		mg/L		09/18/24 09:00	09/19/24 13:41	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/26/24 13:00	09/26/24 16:30	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88		mg/L			09/18/24 11:05	1
<b>Total Dissolved Solids (SM 2540C)</b>	<b>410</b>		50.0		mg/L			09/18/24 19:55	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	7.5	HF	1.0		SU			09/17/24 10:36	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.166		0.107	0.108	1.00	0.149	pCi/L	09/20/24 09:04	10/14/24 23:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.6		30 - 110					09/20/24 09:04	10/14/24 23:43	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-4B**

**Lab Sample ID: 310-290691-1**

Date Collected: 09/12/24 10:55

Matrix: Water

Date Received: 09/17/24 08:30

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.13		0.453	0.464	1.00	0.585	pCi/L	09/20/24 09:10	10/09/24 12:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.6		30 - 110					09/20/24 09:10	10/09/24 12:05	1
Y Carrier	83.7		30 - 110					09/20/24 09:10	10/09/24 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	1.30		0.465	0.476	5.00	0.585	pCi/L		10/15/24 11:30	1



# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-5B**

**Lab Sample ID: 310-290691-2**

Date Collected: 09/12/24 10:35

Matrix: Water

Date Received: 09/17/24 08:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	40.5		5.00		mg/L			09/24/24 12:33	5
Fluoride	<1.00		1.00		mg/L			09/24/24 12:33	5
Sulfate	50.4		5.00		mg/L			09/24/24 12:33	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Antimony	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:43	1
Arsenic	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:43	1
Barium	0.258		0.00200		mg/L		09/18/24 09:00	09/19/24 13:43	1
Beryllium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/23/24 18:24	1
Boron	<0.100		0.100		mg/L		09/18/24 09:00	09/24/24 15:30	1
Cadmium	<0.000200		0.000200		mg/L		09/18/24 09:00	09/23/24 18:24	1
Calcium	123		0.500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Chromium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Cobalt	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Copper	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Iron	2.06		0.100		mg/L		09/18/24 09:00	09/19/24 13:43	1
Lead	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Lithium	<0.0100		0.0100		mg/L		09/18/24 09:00	09/23/24 18:24	1
Magnesium	36.4		0.500		mg/L		09/18/24 09:00	09/23/24 18:24	1
Manganese	0.554		0.0100		mg/L		09/18/24 09:00	09/23/24 18:24	1
Molybdenum	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:43	1
Nickel	<0.00500		0.00500		mg/L		09/18/24 09:00	09/23/24 18:24	1
Selenium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Strontium	0.162		0.00100		mg/L		09/18/24 09:00	09/19/24 13:43	1
Thallium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/19/24 13:43	1
Vanadium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:43	1
Zinc	<0.0200		0.0200		mg/L		09/18/24 09:00	09/19/24 13:43	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/26/24 13:00	09/26/24 16:32	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	4.88		1.88		mg/L			09/18/24 11:05	1
Total Dissolved Solids (SM 2540C)	520		50.0		mg/L			09/18/24 19:55	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	7.3	HF	1.0		SU			09/17/24 10:35	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.264		0.122	0.124	1.00	0.147	pCi/L	09/20/24 09:04	10/14/24 23:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		30 - 110					09/20/24 09:04	10/14/24 23:43	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-5B**

**Lab Sample ID: 310-290691-2**

Date Collected: 09/12/24 10:35

Matrix: Water

Date Received: 09/17/24 08:30

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.31		0.459	0.475	1.00	0.550	pCi/L	09/20/24 09:10	10/09/24 12:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		30 - 110					09/20/24 09:10	10/09/24 12:05	1
Y Carrier	78.9		30 - 110					09/20/24 09:10	10/09/24 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	1.57		0.475	0.491	5.00	0.550	pCi/L		10/15/24 11:30	1



# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-6A**

**Lab Sample ID: 310-290691-3**

Date Collected: 09/12/24 11:20

Matrix: Water

Date Received: 09/17/24 08:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14.4		5.00		mg/L			09/24/24 12:44	5
Fluoride	<1.00		1.00		mg/L			09/24/24 12:44	5
Sulfate	16.3		5.00		mg/L			09/24/24 12:44	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Antimony	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:45	1
Arsenic	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:45	1
Barium	0.249		0.00200		mg/L		09/18/24 09:00	09/19/24 13:45	1
Beryllium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/23/24 18:28	1
Boron	<0.100		0.100		mg/L		09/18/24 09:00	09/24/24 15:32	1
Cadmium	<0.000200		0.000200		mg/L		09/18/24 09:00	09/23/24 18:28	1
Calcium	99.4		0.500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Chromium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Cobalt	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Copper	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Iron	3.60		0.100		mg/L		09/18/24 09:00	09/19/24 13:45	1
Lead	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Lithium	<0.0100		0.0100		mg/L		09/18/24 09:00	09/23/24 18:28	1
Magnesium	30.8		0.500		mg/L		09/18/24 09:00	09/23/24 18:28	1
Manganese	0.118		0.0100		mg/L		09/18/24 09:00	09/23/24 18:28	1
Molybdenum	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 13:45	1
Nickel	<0.00500		0.00500		mg/L		09/18/24 09:00	09/23/24 18:28	1
Selenium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Strontium	0.188		0.00100		mg/L		09/18/24 09:00	09/19/24 13:45	1
Thallium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/19/24 13:45	1
Vanadium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:45	1
Zinc	<0.0200		0.0200		mg/L		09/18/24 09:00	09/19/24 13:45	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/26/24 13:00	09/26/24 16:34	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	8.25		1.88		mg/L			09/18/24 11:05	1
Total Dissolved Solids (SM 2540C)	382		50.0		mg/L			09/18/24 19:55	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	7.5	HF	1.0		SU			09/17/24 10:32	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.180		0.113	0.114	1.00	0.154	pCi/L	09/20/24 09:04	10/14/24 23:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.6		30 - 110					09/20/24 09:04	10/14/24 23:43	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-6A**

**Lab Sample ID: 310-290691-3**

Date Collected: 09/12/24 11:20

Matrix: Water

Date Received: 09/17/24 08:30

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.696		0.442	0.447	1.00	0.652	pCi/L	09/20/24 09:10	10/09/24 12:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.6		30 - 110					09/20/24 09:10	10/09/24 12:05	1
Y Carrier	78.5		30 - 110					09/20/24 09:10	10/09/24 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	0.876		0.456	0.461	5.00	0.652	pCi/L		10/15/24 11:30	1



# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: Leachate**

**Lab Sample ID: 310-290691-4**

Date Collected: 09/12/24 12:35

Matrix: Water

Date Received: 09/17/24 08:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	55.0		5.00		mg/L			09/24/24 12:56	5
Fluoride	2.47		1.00		mg/L			09/24/24 12:56	5
Sulfate	4840		50.0		mg/L			09/24/24 14:52	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<5.00		5.00		mg/L		09/18/24 09:00	10/01/24 13:13	100
Antimony	0.00312		0.00200		mg/L		09/18/24 09:00	09/19/24 13:47	1
Arsenic	1.64		0.0800		mg/L		09/18/24 09:00	09/27/24 17:15	40
Barium	0.0241		0.00200		mg/L		09/18/24 09:00	09/19/24 13:47	1
Beryllium	<0.00400		0.00400		mg/L		09/18/24 09:00	09/23/24 18:32	4
Boron	70.4		4.00		mg/L		09/18/24 09:00	09/27/24 17:15	40
Cadmium	<0.000800		0.000800		mg/L		09/18/24 09:00	09/23/24 18:32	4
Calcium	531		10.0		mg/L		09/18/24 09:00	09/24/24 15:34	20
Chromium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 13:47	1
Cobalt	<0.0500		0.0500		mg/L		09/18/24 09:00	10/01/24 13:13	100
Copper	<0.100		0.100		mg/L		09/18/24 09:00	09/24/24 15:34	20
Iron	<0.400		0.400		mg/L		09/18/24 09:00	09/23/24 18:32	4
Lead	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 13:47	1
Lithium	0.330		0.0400		mg/L		09/18/24 09:00	09/23/24 18:32	4
Magnesium	48.2		10.0		mg/L		09/18/24 09:00	09/24/24 15:34	20
Manganese	0.458		0.200		mg/L		09/18/24 09:00	09/24/24 15:34	20
Molybdenum	0.775		0.0400		mg/L		09/18/24 09:00	09/24/24 15:34	20
Nickel	<0.0200		0.0200		mg/L		09/18/24 09:00	09/23/24 18:32	4
Selenium	<0.100		0.100		mg/L		09/18/24 09:00	09/24/24 15:34	20
Strontium	4.02		0.00400		mg/L		09/18/24 09:00	09/23/24 18:32	4
Thallium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/19/24 13:47	1
Vanadium	<0.100		0.100		mg/L		09/18/24 09:00	09/24/24 15:34	20
Zinc	<0.400		0.400		mg/L		09/18/24 09:00	09/24/24 15:34	20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/26/24 13:00	09/26/24 16:36	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	3.25		1.88		mg/L			09/18/24 11:05	1
Total Dissolved Solids (SM 2540C)	7880		250		mg/L			09/18/24 19:55	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	8.8	HF	1.0		SU			09/17/24 10:34	1

**Method: SW846 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.59		0.479	0.532	1.00	0.313	pCi/L	09/20/24 09:04	10/14/24 23:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.2		30 - 110					09/20/24 09:04	10/14/24 23:43	1

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# Client Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: Leachate**

**Lab Sample ID: 310-290691-4**

Date Collected: 09/12/24 12:35

Matrix: Water

Date Received: 09/17/24 08:30

**Method: SW846 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.95	G	1.02	1.03	1.00	1.44	pCi/L	09/20/24 09:10	10/09/24 12:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.2		30 - 110					09/20/24 09:10	10/09/24 12:05	1
Y Carrier	76.6		30 - 110					09/20/24 09:10	10/09/24 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	4.54		1.13	1.16	5.00	1.44	pCi/L		10/15/24 11:30	1





# Definitions/Glossary

Client: Muscatine Power & Water  
Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Qualifiers

### General Chemistry

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

### Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
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

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-434244/3**  
**Matrix: Water**  
**Analysis Batch: 434244**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			09/24/24 09:27	1
Fluoride	<0.200		0.200		mg/L			09/24/24 09:27	1
Sulfate	<1.00		1.00		mg/L			09/24/24 09:27	1

**Lab Sample ID: LCS 310-434244/4**  
**Matrix: Water**  
**Analysis Batch: 434244**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.690		mg/L		97	90 - 110
Fluoride	2.00	1.889		mg/L		94	90 - 110
Sulfate	10.0	10.00		mg/L		100	90 - 110

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

**Lab Sample ID: MB 310-433443/1-A**  
**Matrix: Water**  
**Analysis Batch: 433771**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433443**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Antimony	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 12:36	1
Arsenic	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 12:36	1
Barium	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 12:36	1
Beryllium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/19/24 12:36	1
Boron	<0.100		0.100		mg/L		09/18/24 09:00	09/19/24 12:36	1
Calcium	<0.500		0.500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Chromium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Cobalt	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Copper	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Iron	<0.100		0.100		mg/L		09/18/24 09:00	09/19/24 12:36	1
Lead	<0.000500		0.000500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Lithium	<0.0100		0.0100		mg/L		09/18/24 09:00	09/19/24 12:36	1
Molybdenum	<0.00200		0.00200		mg/L		09/18/24 09:00	09/19/24 12:36	1
Selenium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Strontium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/19/24 12:36	1
Thallium	<0.00100		0.00100		mg/L		09/18/24 09:00	09/19/24 12:36	1
Vanadium	<0.00500		0.00500		mg/L		09/18/24 09:00	09/19/24 12:36	1
Zinc	<0.0200		0.0200		mg/L		09/18/24 09:00	09/19/24 12:36	1

**Lab Sample ID: MB 310-433443/1-A**  
**Matrix: Water**  
**Analysis Batch: 434059**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433443**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	<0.000200		0.000200		mg/L		09/18/24 09:00	09/23/24 16:50	1
Magnesium	<0.500		0.500		mg/L		09/18/24 09:00	09/23/24 16:50	1
Manganese	<0.0100		0.0100		mg/L		09/18/24 09:00	09/23/24 16:50	1
Nickel	<0.00500		0.00500		mg/L		09/18/24 09:00	09/23/24 16:50	1

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# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

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

**Lab Sample ID: LCS 310-433443/2-A**  
**Matrix: Water**  
**Analysis Batch: 433771**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433443**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	0.200	0.2147		mg/L		107	80 - 120
Antimony	0.200	0.2206		mg/L		110	80 - 120
Arsenic	0.200	0.2209		mg/L		110	80 - 120
Barium	0.100	0.1070		mg/L		107	80 - 120
Beryllium	0.100	0.1064		mg/L		106	80 - 120
Boron	0.200	0.2112		mg/L		106	80 - 120
Calcium	2.00	2.075		mg/L		104	80 - 120
Chromium	0.100	0.09961		mg/L		100	80 - 120
Cobalt	0.100	0.1014		mg/L		101	80 - 120
Copper	0.200	0.2102		mg/L		105	80 - 120
Iron	0.200	0.2175		mg/L		109	80 - 120
Lead	0.200	0.2130		mg/L		106	80 - 120
Lithium	0.200	0.2218		mg/L		111	80 - 120
Molybdenum	0.200	0.2161		mg/L		108	80 - 120
Selenium	0.400	0.4106		mg/L		103	80 - 120
Strontium	0.200	0.2058		mg/L		103	80 - 120
Thallium	0.100	0.1031		mg/L		103	80 - 120
Vanadium	0.100	0.1062		mg/L		106	80 - 120
Zinc	0.200	0.2045		mg/L		102	80 - 120

**Lab Sample ID: LCS 310-433443/2-A**  
**Matrix: Water**  
**Analysis Batch: 434059**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433443**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cadmium	0.100	0.09573		mg/L		96	80 - 120
Magnesium	2.00	2.144		mg/L		107	80 - 120
Manganese	0.100	0.1048		mg/L		105	80 - 120
Nickel	0.200	0.2031		mg/L		102	80 - 120

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 310-434284/1-A**  
**Matrix: Water**  
**Analysis Batch: 434462**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 434284**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.000200		0.000200		mg/L		09/26/24 13:00	09/26/24 16:19	1

**Lab Sample ID: LCS 310-434284/2-A**  
**Matrix: Water**  
**Analysis Batch: 434462**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 434284**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001613		mg/L		97	80 - 120

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-433545/1  
 Matrix: Water  
 Analysis Batch: 433545

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00		mg/L			09/18/24 11:05	1

Lab Sample ID: LCS 310-433545/2  
 Matrix: Water  
 Analysis Batch: 433545

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	105.0		mg/L		105	81 - 116

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

Lab Sample ID: MB 310-433602/1  
 Matrix: Water  
 Analysis Batch: 433602

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			09/18/24 19:55	1

Lab Sample ID: LCS 310-433602/2  
 Matrix: Water  
 Analysis Batch: 433602

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	1038		mg/L		104	88 - 110

Lab Sample ID: 310-290691-1 DU  
 Matrix: Water  
 Analysis Batch: 433602

Client Sample ID: MW-4B  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	410		396.0		mg/L		3	16

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-433387/1  
 Matrix: Water  
 Analysis Batch: 433387

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

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

Lab Sample ID: 310-290691-3 DU  
 Matrix: Water  
 Analysis Batch: 433387

Client Sample ID: MW-6A  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.5	HF	7.5		SU		0.1	20

# QC Sample Results

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Method: 9315 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-680336/1-A**  
**Matrix: Water**  
**Analysis Batch: 683516**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 680336**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	<0.137	U	0.0783	0.0784	1.00	0.137	pCi/L	09/20/24 09:04	10/14/24 09:12	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	89.6		30 - 110		09/20/24 09:04	10/14/24 09:12	1			

**Lab Sample ID: LCS 160-680336/2-A**  
**Matrix: Water**  
**Analysis Batch: 683516**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 680336**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-226	9.58	10.16		1.13	1.00	0.189	pCi/L	106	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	84.6		30 - 110						

## Method: 9320 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-680337/1-A**  
**Matrix: Water**  
**Analysis Batch: 682743**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 680337**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.6426		0.407	0.411	1.00	0.602	pCi/L	09/20/24 09:10	10/09/24 11:58	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	89.6		30 - 110		09/20/24 09:10	10/09/24 11:58	1			
Y Carrier	79.3		30 - 110		09/20/24 09:10	10/09/24 11:58	1			

**Lab Sample ID: LCS 160-680337/2-A**  
**Matrix: Water**  
**Analysis Batch: 682743**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 680337**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-228	8.44	9.823		1.39	1.00	0.594	pCi/L	116	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	84.6		30 - 110						
Y Carrier	79.6		30 - 110						

# QC Association Summary

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## HPLC/IC

### Analysis Batch: 434244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	9056A	
310-290691-2	MW-5B	Total/NA	Water	9056A	
310-290691-3	MW-6A	Total/NA	Water	9056A	
310-290691-4	Leachate	Total/NA	Water	9056A	
310-290691-4	Leachate	Total/NA	Water	9056A	
MB 310-434244/3	Method Blank	Total/NA	Water	9056A	
LCS 310-434244/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 433443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	3005A	
310-290691-2	MW-5B	Total/NA	Water	3005A	
310-290691-3	MW-6A	Total/NA	Water	3005A	
310-290691-4	Leachate	Total/NA	Water	3005A	
MB 310-433443/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-433443/2-A	Lab Control Sample	Total/NA	Water	3005A	

### Analysis Batch: 433771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	6020B	433443
310-290691-2	MW-5B	Total/NA	Water	6020B	433443
310-290691-3	MW-6A	Total/NA	Water	6020B	433443
310-290691-4	Leachate	Total/NA	Water	6020B	433443
MB 310-433443/1-A	Method Blank	Total/NA	Water	6020B	433443
LCS 310-433443/2-A	Lab Control Sample	Total/NA	Water	6020B	433443

### Analysis Batch: 434059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	6020B	433443
310-290691-2	MW-5B	Total/NA	Water	6020B	433443
310-290691-3	MW-6A	Total/NA	Water	6020B	433443
310-290691-4	Leachate	Total/NA	Water	6020B	433443
MB 310-433443/1-A	Method Blank	Total/NA	Water	6020B	433443
LCS 310-433443/2-A	Lab Control Sample	Total/NA	Water	6020B	433443

### Analysis Batch: 434220

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	6020B	433443
310-290691-2	MW-5B	Total/NA	Water	6020B	433443
310-290691-3	MW-6A	Total/NA	Water	6020B	433443
310-290691-4	Leachate	Total/NA	Water	6020B	433443

### Prep Batch: 434284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	7470A	
310-290691-2	MW-5B	Total/NA	Water	7470A	
310-290691-3	MW-6A	Total/NA	Water	7470A	
310-290691-4	Leachate	Total/NA	Water	7470A	
MB 310-434284/1-A	Method Blank	Total/NA	Water	7470A	

# QC Association Summary

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Metals (Continued)

### Prep Batch: 434284 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-434284/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 434462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	7470A	434284
310-290691-2	MW-5B	Total/NA	Water	7470A	434284
310-290691-3	MW-6A	Total/NA	Water	7470A	434284
310-290691-4	Leachate	Total/NA	Water	7470A	434284
MB 310-434284/1-A	Method Blank	Total/NA	Water	7470A	434284
LCS 310-434284/2-A	Lab Control Sample	Total/NA	Water	7470A	434284

### Analysis Batch: 434612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-4	Leachate	Total/NA	Water	6020B	433443

### Analysis Batch: 434925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-4	Leachate	Total/NA	Water	6020B	433443

## General Chemistry

### Analysis Batch: 433387

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	SM 4500 H+ B	
310-290691-2	MW-5B	Total/NA	Water	SM 4500 H+ B	
310-290691-3	MW-6A	Total/NA	Water	SM 4500 H+ B	
310-290691-4	Leachate	Total/NA	Water	SM 4500 H+ B	
LCS 310-433387/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-290691-3 DU	MW-6A	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 433545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	I-3765-85	
310-290691-2	MW-5B	Total/NA	Water	I-3765-85	
310-290691-3	MW-6A	Total/NA	Water	I-3765-85	
310-290691-4	Leachate	Total/NA	Water	I-3765-85	
MB 310-433545/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-433545/2	Lab Control Sample	Total/NA	Water	I-3765-85	

### Analysis Batch: 433602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	SM 2540C	
310-290691-2	MW-5B	Total/NA	Water	SM 2540C	
310-290691-3	MW-6A	Total/NA	Water	SM 2540C	
310-290691-4	Leachate	Total/NA	Water	SM 2540C	
MB 310-433602/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-433602/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-290691-1 DU	MW-4B	Total/NA	Water	SM 2540C	

# QC Association Summary

Client: Muscatine Power & Water  
Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Rad

### Prep Batch: 680336

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	PrecSep-21	
310-290691-2	MW-5B	Total/NA	Water	PrecSep-21	
310-290691-3	MW-6A	Total/NA	Water	PrecSep-21	
310-290691-4	Leachate	Total/NA	Water	PrecSep-21	
MB 160-680336/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-680336/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 680337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290691-1	MW-4B	Total/NA	Water	PrecSep_0	
310-290691-2	MW-5B	Total/NA	Water	PrecSep_0	
310-290691-3	MW-6A	Total/NA	Water	PrecSep_0	
310-290691-4	Leachate	Total/NA	Water	PrecSep_0	
MB 160-680337/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-680337/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	



# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-4B**  
**Date Collected: 09/12/24 10:55**  
**Date Received: 09/17/24 08:30**

**Lab Sample ID: 310-290691-1**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 12:21
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 18:21
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 13:41
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434220	NFT2	EET CF	09/24/24 15:28
Total/NA	Prep	7470A			434284	QTZ5	EET CF	09/26/24 13:00
Total/NA	Analysis	7470A		1	434462	QTZ5	EET CF	09/26/24 16:30
Total/NA	Analysis	I-3765-85		1	433545	DGU1	EET CF	09/18/24 11:05
Total/NA	Analysis	SM 2540C		1	433602	MDU9	EET CF	09/18/24 19:55
Total/NA	Analysis	SM 4500 H+ B		1	433387	W9YR	EET CF	09/17/24 10:36
Total/NA	Prep	PrecSep-21			680336	BCE	EET SL	09/20/24 09:04
Total/NA	Analysis	9315		1	683516	FLC	EET SL	10/14/24 23:43
Total/NA	Prep	PrecSep_0			680337	BCE	EET SL	09/20/24 09:10
Total/NA	Analysis	9320		1	682854	FLC	EET SL	10/09/24 12:05
Total/NA	Analysis	Ra226_Ra228		1	683555	EMH	EET SL	10/15/24 11:30

**Client Sample ID: MW-5B**  
**Date Collected: 09/12/24 10:35**  
**Date Received: 09/17/24 08:30**

**Lab Sample ID: 310-290691-2**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 12:33
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 18:24
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 13:43
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434220	NFT2	EET CF	09/24/24 15:30
Total/NA	Prep	7470A			434284	QTZ5	EET CF	09/26/24 13:00
Total/NA	Analysis	7470A		1	434462	QTZ5	EET CF	09/26/24 16:32
Total/NA	Analysis	I-3765-85		1	433545	DGU1	EET CF	09/18/24 11:05
Total/NA	Analysis	SM 2540C		1	433602	MDU9	EET CF	09/18/24 19:55
Total/NA	Analysis	SM 4500 H+ B		1	433387	W9YR	EET CF	09/17/24 10:35
Total/NA	Prep	PrecSep-21			680336	BCE	EET SL	09/20/24 09:04
Total/NA	Analysis	9315		1	683516	FLC	EET SL	10/14/24 23:43
Total/NA	Prep	PrecSep_0			680337	BCE	EET SL	09/20/24 09:10
Total/NA	Analysis	9320		1	682854	FLC	EET SL	10/09/24 12:05
Total/NA	Analysis	Ra226_Ra228		1	683555	EMH	EET SL	10/15/24 11:30

# Lab Chronicle

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: MW-6A**  
**Date Collected: 09/12/24 11:20**  
**Date Received: 09/17/24 08:30**

**Lab Sample ID: 310-290691-3**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 12:44
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 18:28
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 13:45
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434220	NFT2	EET CF	09/24/24 15:32
Total/NA	Prep	7470A			434284	QTZ5	EET CF	09/26/24 13:00
Total/NA	Analysis	7470A		1	434462	QTZ5	EET CF	09/26/24 16:34
Total/NA	Analysis	I-3765-85		1	433545	DGU1	EET CF	09/18/24 11:05
Total/NA	Analysis	SM 2540C		1	433602	MDU9	EET CF	09/18/24 19:55
Total/NA	Analysis	SM 4500 H+ B		1	433387	W9YR	EET CF	09/17/24 10:32
Total/NA	Prep	PrecSep-21			680336	BCE	EET SL	09/20/24 09:04
Total/NA	Analysis	9315		1	683516	FLC	EET SL	10/14/24 23:43
Total/NA	Prep	PrecSep_0			680337	BCE	EET SL	09/20/24 09:10
Total/NA	Analysis	9320		1	682854	FLC	EET SL	10/09/24 12:05
Total/NA	Analysis	Ra226_Ra228		1	683555	EMH	EET SL	10/15/24 11:30

**Client Sample ID: Leachate**  
**Date Collected: 09/12/24 12:35**  
**Date Received: 09/17/24 08:30**

**Lab Sample ID: 310-290691-4**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 12:56
Total/NA	Analysis	9056A		50	434244	HE7K	EET CF	09/24/24 14:52
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		4	434059	NFT2	EET CF	09/23/24 18:32
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		40	434612	ZRI4	EET CF	09/27/24 17:15
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		100	434925	NFT2	EET CF	10/01/24 13:13
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 13:47
Total/NA	Prep	3005A			433443	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		20	434220	NFT2	EET CF	09/24/24 15:34
Total/NA	Prep	7470A			434284	QTZ5	EET CF	09/26/24 13:00
Total/NA	Analysis	7470A		1	434462	QTZ5	EET CF	09/26/24 16:36
Total/NA	Analysis	I-3765-85		1	433545	DGU1	EET CF	09/18/24 11:05
Total/NA	Analysis	SM 2540C		1	433602	MDU9	EET CF	09/18/24 19:55
Total/NA	Analysis	SM 4500 H+ B		1	433387	W9YR	EET CF	09/17/24 10:34
Total/NA	Prep	PrecSep-21			680336	BCE	EET SL	09/20/24 09:04
Total/NA	Analysis	9315		1	683516	FLC	EET SL	10/14/24 23:43

# Lab Chronicle

Client: Muscatine Power & Water  
Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

**Client Sample ID: Leachate**

**Lab Sample ID: 310-290691-4**

**Date Collected: 09/12/24 12:35**

**Matrix: Water**

**Date Received: 09/17/24 08:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep_0			680337	BCE	EET SL	09/20/24 09:10
Total/NA	Analysis	9320		1	682854	FLC	EET SL	10/09/24 12:05
Total/NA	Analysis	Ra226_Ra228		1	683555	EMH	EET SL	10/15/24 11:30

**Laboratory References:**

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

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



# Accreditation/Certification Summary

Client: Muscatine Power & Water  
Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

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

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3005A	Water	Lithium

## Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9315	PrecSep-21	Water	Radium-226
9320	PrecSep_0	Water	Radium-228
Ra226_Ra228		Water	Combined Radium 226 + 228

# Method Summary

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

**Protocol References:**

- None = None
- SM = "Standard Methods For The Examination Of Water And Wastewater"
- SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.
- USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

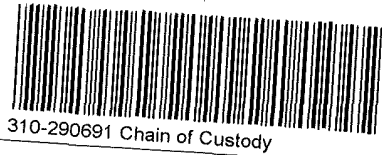
**Laboratory References:**

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





Environment Testing  
America



310-290691 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Muscataine Power + Water</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>9/17/24</u>	<u>0830</u>	<u>[Signature]</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>Y</u>	Correction Factor (°C):	<u>70</u>
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>-0.3</u>	Corrected Temp (°C):	<u>-0.3</u>
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login.			
<b>Additional Comments</b>			

**Eurofins Cedar Falls**

3019 Venture Way  
Cedar Falls IA 50613  
Phone (319) 277-2401 Fax (319) 277-2425

**Chain of Custody Record**

<b>Client Information</b>		Lab PM Michels, Bob		Carrier Tracking No(s):		COC No:	
Client Contact: Sam Bennett MP&W		Phone: 563-262-3583		E-Mail: bob.michels@et.eurofins.com		Page:	
Company: Muscatine Power & Water		Address: 1700 Dick Drake Way		City: Muscatine		State, Zip: IA, 52761	
Phone: 244222		PO #: 244222		WO #:		Email: sbennett@mpw.org and neil.hoskins@mpw.org	
Project Name: Muscatine Power & Water CCR Landfill		Test/America Project #: 310-290523		Event: Fall 2024 Sampling		Site: Iowa	
<b>Sample Identification</b>		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)	
MW-4B		9/12/24		1055		G	
MW-5B		9/12/24		1035		G	
MW-6A		9/12/24		1120		G	
MW-8						G	
MW-10						G	
MW-14A						G	
MW-15A						G	
MW-21						G	
MW-22						G	
MW-23						G	
MW-24						G	
<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		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		<b>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</b>	
Deliverable Requested I, II, III, IV, Other (specify)		Special Instructions/QC Requirements.		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)	
Empty Kit Relinquished by		Date		Time		Method of Shipment:	
Relinquished by <i>Sam Bennett</i>		Date/Time: 9-16-24		Company: <i>MPW</i>		Received by	
Relinquished by		Date/Time:		Company:		Received by	
Relinquished by		Date/Time:		Company:		Received by	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No		Cooler Temperature(s) °C and Other Remarks:		Date/Time: 9/17/24 0830	



**Eurofins Cedar Falls**

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

**Chain of Custody Record**

<b>Client Information</b>			Lab PM Michels, Bob		Carrier Tracking No(s):		COC No.	
Client Contact: Sam Bennett MP&W 563-262-3583			E-Mail: bob.michels@et.eurofins.com		Page:		Job #:	
Company: Muscatine Power & Water 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: 244222 244222 Email: sbennett@mpw.org and neil.hoskins@mpw.org Project Name: Muscatine Power & Water CCR Landfill Site: Iowa			Due Date Requested TAT Requested (days): PO #: WO #: Test/America Project #: 310-290523 Event: Fall 2024 Sampling		<b>Analysis Requested</b>		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify) Other:	
<b>Sample Identification</b>			Field Filtered Sample (Yes or No)		Form MS/MSD (Yes or No)		Total Number of Containers	
MW-26			X		X		X	
MW-27			X		X		X	
QC1			X		X		X	
QC2			X		X		X	
Leachate			X		X		X	
Special Instructions/Note:								
Possible Hazard Identification <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)			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Special Instructions/QC Requirements.			
Empty Kit Relinquished by:			Date		Time		Method of Shipment:	
Relinquished by: <i>Sam Bennett</i>			Date/Time: <i>9-16-24 0900</i>		Company: <i>Mtw</i>		Date/Time: _____ Company: _____	
Relinquished by:			Date/Time:		Company:		Date/Time: _____ Company: _____	
Relinquished by:			Date/Time:		Company:		Date/Time: <i>9/17/24 0830</i> Company: _____	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No			Custody Seal No		Cooler Temperature(s) °C and Other Remarks:			







<b>Client Information (Sub Contract Lab)</b>				Lab PM: <b>Michels, Bob C</b>			Carrier Tracking No(s): <b>310-76413.1</b>			COC No: <b>310-76413.1</b>							
Client Contact: <b>Shipping/Receiving</b>				E-Mail: <b>Bob Michels@t.eurofins.com</b>			State of Origin: <b>Iowa</b>			Page: <b>Page 1 of 1</b>							
Company: <b>TestAmerica Laboratories, Inc.</b>				Accreditations Required (See note): <b>State - Iowa</b>			Job #: <b>310-290691-1</b>			Preservation Codes:							
Address: <b>13715 Rider Trail North,</b>				<b>Analysis Requested</b>				Total Number of Containers			Other:						
City: <b>Earth City</b>																	
State, Zip: <b>MO, 63045</b>																	
Phone: <b>314-298-8566(Tel) 314-298-8757(Fax)</b>																	
Email:																	
Project Name: <b>MPW CCR - Landfill Fall 2024</b>																	
Site:																	
<b>Sample Identification - Client ID (Lab ID)</b>																	
Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (Water, Solid, Other/Both)		Field Filtered Sample (Yes or No)		Perform M5/MSD (Yes or No)		9320_Ra228/PreSep_0 Standard Target List		R226Ra228 GFCI / (MOD) Local Method		Special Instructions/Note:	
9/12/24		10:55 Central		G		Water		X		X		X		X		2	
9/12/24		10:35 Central		G		Water		X		X		X		X		2	
9/12/24		11:20 Central		G		Water		X		X		X		X		2	
9/12/24		12:35 Central		G		Water		X		X		X		X		2	
Leachate (310-290691-4)																	
MW-4B (310-290691-1)																	
MW-5B (310-290691-2)																	
MW-6A (310-290691-3)																	
<p>Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte &amp; accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/methods/analyte being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.</p>																	
<b>Possible Hazard Identification</b>																	
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:																	
<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>																	
Deliverable Requested: I, II, III, IV, Other (specify) <b>Primary Deliverable Rank: 2</b> Empty Kit Relinquished by: _____ Date: _____ Time: _____ Relinquished by: _____ Date/Time: _____ Company: <b>Suma Worthington</b> Relinquished by: _____ Date/Time: _____ Company: <b>SEP 18 2024 09:30</b> Relinquished by: _____ Date/Time: _____ Company: <b>61713L</b> Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No     Cooler Temperature(s) °C and Other Remarks: _____																	



## Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-290691-1

**Login Number: 290691**

**List Source: Eurofins Cedar Falls**

**List Number: 1**

**Creator: Homolar, Dana J**

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



## Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-290691-1

**Login Number: 290691**

**List Number: 2**

**Creator: Worthington, Sierra M**

**List Source: Eurofins St. Louis**

**List Creation: 09/18/24 11:54 AM**

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



# Tracer/Carrier Summary

Client: Muscatine Power & Water  
 Project/Site: MPW CCR - Landfill Fall 2024

Job ID: 310-290691-1

## Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
310-290691-1	MW-4B	87.6	
310-290691-2	MW-5B	90.3	
310-290691-3	MW-6A	82.6	
310-290691-4	Leachate	79.2	
LCS 160-680336/2-A	Lab Control Sample	84.6	
MB 160-680336/1-A	Method Blank	89.6	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

## Method: 9320 - Radium-228 (GFPC)

Matrix: Water

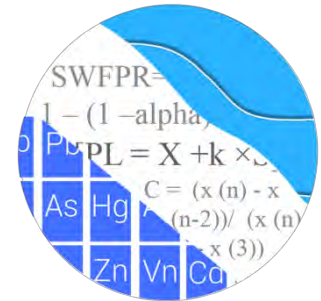
Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
310-290691-1	MW-4B	87.6	83.7
310-290691-2	MW-5B	90.3	78.9
310-290691-3	MW-6A	82.6	78.5
310-290691-4	Leachate	79.2	76.6
LCS 160-680337/2-A	Lab Control Sample	84.6	79.6
MB 160-680337/1-A	Method Blank	89.6	79.3
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

# **Appendix C**

## **Groundwater Statistical Analysis**

# GROUNDWATER STATS CONSULTING



December 12, 2024

GHD

Attn: Mr. Michael Alowitz  
11228 Aurora Avenue  
Des Moines Iowa 50322-7904

Re: Muscatine Power & Water –  
April & September 2024 Detection & Assessment Monitoring Report

Dear Mr. Alowitz,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data for the April and September 2024 sample event at the Muscatine Power & Water for the Coal Combustion Residuals (CCR) program. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began for the CCR program in June 2016 for all wells except newly installed well MW-22 which has been sampled since 2018. The monitoring well network at Muscatine Power & Water consists of the following:

- **Upgradient wells:** MW-8, MW-10, MW-22, and MW-23
- **Downgradient wells** MW-4B, MW-5B, MW-6A, MW-14A, MW-15A, and MW-21

The CCR program consists of the following constituents:

- **Appendix III** (Detection Monitoring) - boron, calcium, chloride, fluoride, pH, sulfate, and TDS
- **Appendix IV** (Assessment Monitoring) - antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was reviewed by Andrew Collins, Project Manager for Groundwater Stats Consulting.

When there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. A summary of downgradient well/constituent pairs with 100% non-detects follows this letter.

Time series plots for Appendix III and IV parameters at all wells are provided for the purpose of screening data at these wells (Figure A). Additionally, a separate section of box plots is included for all constituents at upgradient and downgradient wells (Figure B). The time series plots are used to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between all wells. Values in background which have been flagged as outliers may be seen in a lighter font and as a disconnected symbol on the graphs.

In earlier analyses, data at all wells were evaluated for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix III parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. Power curves were provided and demonstrated that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance. The EPA suggests the selected statistical method should provide at least 55% power at 3 standard deviations or at least 80% power at 4 standard deviations.

### **Summary of Statistical Methods – Appendix III Parameters:**

Based on the earlier evaluation described above, the following methods were selected:

- Interwell prediction limits, combined with a 1-of-2 resample plan for boron, calcium, chloride, fluoride, pH, sulfate, and TDS

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. While the false positive rate associated with the parametric limits is based on an annual 10% (5% per semi-annual event) as recommended by the EPA Unified Guidance (2009), the false positive rate associated with the nonparametric limits is dependent upon the available background sample size, number of future comparisons, and verification resample plan. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality.

After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-parametric prediction limits.

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data for parametric limits. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric prediction limits are used on data containing greater than 50% non-detects.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits is necessary to accommodate these types of changes. In the interwell case, prediction limits are updated with upgradient well data during each event after screening for any new outliers. In some cases, the earlier portion of data may be deselected prior to construction of limits to provide sensitive limits that will rapidly detect changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

### **Original Background Screening Summary – Conducted in October 2017**

Background data were originally screened in October 2017 for all parameters at each well for the constituents listed above, and the results of the screening were submitted during that time. A summary of the screening is discussed below.

#### Outlier Screening

Time series plots were used to initially screen for suspected outliers, trends, and seasonal patterns. Outliers and trends in background data result in increased variation and statistical limits that are not conservative from a regulatory perspective, if not addressed.

Box plots provide visual representation of variation within individual wells and between all wells. Data were further evaluated through the Analysis of Variance test to determine



whether observed variation is statistically significant, and guide the decision logic for determining an appropriate statistical limit as discussed below.

A handful of possible outliers were identified and formally tested using Tukey's box plot method. When outliers were confirmed, these values were flagged in the computer database with "o" in order to deselect prior to construction of statistical limits. Flagged values appear as a disconnected, lighter symbol on the time series graphs. A summary of Tukey's test results was included with the screening.

### Seasonality

No seasonal patterns were visually apparent in any of the detected data; therefore, no deseasonalizing adjustments were made to the data. When seasonal patterns are observed, data may be optionally deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release.

### Trend Testing

The Sen's Slope/Mann Kendall trend test was used to evaluate all proposed background data through August 2017 to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed a statistically significant decreasing trend for chloride in upgradient well MW-08. This trend was relatively low in magnitude when compared to average concentrations; therefore, no adjustments were made to the data sets. No other statistically significant trends were identified for any of the Appendix III parameters. The results of the trend tests were included with the screening.

### Determination of Statistical Methods

The Analysis of Variance (ANOVA), tolerance limits, and confidence intervals were used to identify the most appropriate statistical approach for Muscatine Power & Water. Based

on the results from the 2017 background screening, interwell methods were recommended initially in lieu of intrawell methods. Interwell tests compare downgradient well data to statistical limits constructed from pooled upgradient well data. This method is appropriate when average concentrations are similar across upgradient wells. Intrawell tests compare compliance data from a single well to screened historical data within the same well, and are appropriate when upgradient wells exhibit spatial variation; when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameters.

If further research identifies whether the elevated downgradient concentrations are likely the result of natural geological conditions or an off-site source, data would be re-evaluated to determine the most appropriate statistical Detection Monitoring method.

### **Statistical Evaluation – Appendix III Parameters – April & September 2024**

Interwell prediction limits were constructed as recommended in the CCR Rule (2015) and in the EPA Unified Guidance (2009), based on a 1-of-2 resample plan using pooled upgradient well data for all Appendix III parameters through April 2024 and September 2024 (Figures D and E, respectively). Interwell prediction limits pool upgradient well data to establish a background limit for an individual constituent. The April and September 2024 samples from each downgradient well are compared to the respective background limit to determine whether initial exceedances are present.

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of one additional sample to determine whether the initial exceedance is confirmed. When an independent resample confirms the initial exceedance, a statistically significant increase is identified and further research would be required to identify the cause of the exceedance (i.e., impact from the site, natural variation, or an off-site source). If the resample falls within the statistical limit, the initial exceedance is considered to be a false positive result and, therefore, no exceedance is noted and no further action is necessary. If no resample is collected, the original result is considered a confirmed exceedance.

Parametric prediction limits were constructed when background data followed a normal or transformed-normal distribution. Non-parametric prediction limits are provided for data sets with greater than 50% non-detects, and for data sets which do not follow a normal or transformed-normal distribution. A summary table of well/constituent pairs found to exceed their respective limits follows this letter and prediction limit exceedances were noted for the following well/constituent pairs:

#### April 2024

- Boron: MW-14A, MW-15A, and MW-21
- Calcium: MW-14A
- Chloride: MW-5B
- Sulfate: MW-14A
- TDS: MW-14A

#### September 2024

- Boron: MW-14A, MW-15A, and MW-21
- Calcium: MW-14A
- Chloride: MW-5B
- Sulfate: MW-14A
- TDS: MW-14A

#### Trend Tests

When prediction limit exceedances are identified in downgradient wells, data are further evaluated using the Sen's Slope/Mann Kendall trend test at the 99% confidence level to determine whether concentrations are statistically increasing, decreasing, or stable (Figure F). Upgradient wells are included in the trend analyses for all parameters found to exceed their prediction limit in downgradient wells to identify whether similar patterns exist upgradient of the site which is an indication of variability in groundwater unrelated to practices at the site. A summary of the trend test results follows this letter. Statistically significant trends were identified for the following well/constituent pairs:

#### Increasing:

- Chloride: MW-23 (upgradient)
- Sulfate: MW-22 (upgradient)

#### Decreasing:

- Boron: MW-15A
- Calcium: MW-08 (upgradient)
- Chloride: MW-22 (upgradient) and MW-5B
- Sulfate: MW-08 and MW-23 (both upgradient)
- TDS: MW-08 and MW-10 (both upgradient)

#### **Statistical Evaluation – Appendix IV – April & September 2024**

For Appendix IV parameters, confidence intervals for each downgradient well/constituent were compared against corresponding Groundwater Protection Standards (GWPS). GWPS

were developed as described below. Well/constituent pairs containing 100% non-detects do not require analysis. Note that no detections are present at any downgradient wells for antimony, arsenic, and beryllium. Data from upgradient wells for Appendix IV parameters are reassessed for outliers during each analysis. No additional outliers were identified and a summary of flagged outliers follows this report (Figure C).

### Interwell Upper Tolerance Limits

Parametric tolerance limits were used to calculate background limits from pooled upgradient well data through both April 2024 and September 2024 events for Appendix IV parameters, with a target of 95% confidence and 95% coverage, to determine background limits (Figure G). The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

### Groundwater Protection Standards

The background limits were compared to the Maximum Contaminant Levels (MCLs), CCR Rule-Specified levels, and background limits in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure H).

### Confidence Intervals

Confidence intervals were then constructed on downgradient wells with data through both April 2024 and September 2024 events for each of the Appendix IV parameters using the highest limit of the MCL, CCR Rule-Specified level, or background limit as discussed above (Figure I). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. No statistical exceedances were identified and a summary of the confidence interval results follows this letter.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for Muscatine Power & Water. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



Easton Rayner  
Groundwater Analyst



Andrew Collins  
Project Manager

# Table of Contents

Summary Tables	9
Figure A. Time Series	20
Figure B. Box Plots	126
Figure C. Outlier Summary	148
Figure D. Interwell Prediction Limits - April 2024	150
Figure E. Interwell Prediction Limits - September 2024	169
Figure F. Trend Tests - Prediction Limit Exceedances	198
Figure G. Upper Tolerance Limits	208
Figure H. Groundwater Protection Standards	218
Figure I. Confidence Intervals	220

# Summary Tables

# 100% Non-Detects: Appendix IV Downgradient

Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

---

Antimony (mg/L)

MW-14A, MW-15A, MW-21, MW-4B, MW-5B, MW-6A

Arsenic (mg/L)

MW-14A, MW-15A, MW-21, MW-4B, MW-5B, MW-6A

Beryllium (mg/L)

MW-14A, MW-15A, MW-21, MW-4B, MW-5B, MW-6A

Cadmium (mg/L)

MW-14A, MW-15A, MW-21, MW-6A

Chromium (mg/L)

MW-14A, MW-15A, MW-4B, MW-5B, MW-6A

Cobalt (mg/L)

MW-14A, MW-15A, MW-21, MW-5B, MW-6A

Lead (mg/L)

MW-14A, MW-15A, MW-6A

Lithium (mg/L)

MW-14A, MW-15A, MW-4B, MW-5B, MW-6A

Mercury (mg/L)

MW-14A, MW-15A, MW-21, MW-4B, MW-6A

Molybdenum (mg/L)

MW-14A, MW-15A, MW-6A

Selenium (mg/L)

MW-4B, MW-5B, MW-6A

Thallium (mg/L)

MW-14A, MW-15A, MW-21, MW-6A

# Interwell Prediction Limits - April 2024 - Significant Results

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 1:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-14A	0.322	n/a	4/15/2024	15.2	Yes	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.322	n/a	4/15/2024	5.8	Yes	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.322	n/a	4/12/2024	2.31	Yes	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	4/15/2024	344	Yes	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	4/15/2024	39.3	Yes	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	4/15/2024	1160	Yes	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	649.6	n/a	4/15/2024	1750	Yes	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2



# Interwell Prediction Limits - April 2024 - All Results

Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 1:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
<b>Boron (mg/L)</b>	<b>MW-14A</b>	<b>0.322</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>15.2</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>86.3</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-15A</b>	<b>0.322</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>5.8</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>86.3</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-21</b>	<b>0.322</b>	<b>n/a</b>	<b>4/12/2024</b>	<b>2.31</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>86.3</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (NDs) 1 of 2</b>
Boron (mg/L)	MW-4B	0.322	n/a	4/15/2024	0.1ND	No	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-5B	0.322	n/a	4/15/2024	0.1ND	No	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-6A	0.322	n/a	4/15/2024	0.1ND	No	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
<b>Calcium (mg/L)</b>	<b>MW-14A</b>	<b>152</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>344</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (normality) 1 of 2</b>
Calcium (mg/L)	MW-15A	152	n/a	4/15/2024	118	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-21	152	n/a	4/12/2024	59.9	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-4B	152	n/a	4/15/2024	97.7	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-5B	152	n/a	4/15/2024	112	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-6A	152	n/a	4/15/2024	92.4	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	4/15/2024	16.4	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-15A	30	n/a	4/15/2024	7.01	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-21	30	n/a	4/12/2024	5ND	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-4B	30	n/a	4/15/2024	18.1	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
<b>Chloride (mg/L)</b>	<b>MW-5B</b>	<b>30</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>39.3</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>28.77</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (normality) 1 of 2</b>
Chloride (mg/L)	MW-6A	30	n/a	4/15/2024	15.5	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-14A	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-15A	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-21	1	n/a	4/12/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-4B	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-5B	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-6A	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
pH (SU)	MW-14A	7.802	6.852	4/15/2024	7.3	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-15A	7.802	6.852	4/15/2024	7.6	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-21	7.802	6.852	4/12/2024	7	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-4B	7.802	6.852	4/15/2024	7.6	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-5B	7.802	6.852	4/15/2024	7.4	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-6A	7.802	6.852	4/15/2024	7.3	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
<b>Sulfate (mg/L)</b>	<b>MW-14A</b>	<b>366</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>1160</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (normality) 1 of 2</b>
Sulfate (mg/L)	MW-15A	366	n/a	4/15/2024	256	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-21	366	n/a	4/12/2024	138	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-4B	366	n/a	4/15/2024	56.1	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-5B	366	n/a	4/15/2024	46.3	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-6A	366	n/a	4/15/2024	18.1	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-14A</b>	<b>649.6</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>1750</b>	<b>Yes</b>	<b>72</b>	<b>7.381</b>	<b>0.6857</b>	<b>0</b>	<b>None</b>	<b>x^(1/3)</b>	<b>0.001254</b>	<b>Param Inter 1 of 2</b>
Total Dissolved Solids (mg/L)	MW-15A	649.6	n/a	4/15/2024	636	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-21	649.6	n/a	4/12/2024	366	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-4B	649.6	n/a	4/15/2024	392	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-5B	649.6	n/a	4/15/2024	450	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-6A	649.6	n/a	4/15/2024	376	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2

# Interwell Prediction Limits - September 2024 - Significant Results

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 12:53 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Obsrv.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-14A	0.322	n/a	9/11/2024	17.7	Yes	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.322	n/a	9/11/2024	8.5	Yes	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.322	n/a	9/10/2024	3.68	Yes	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	9/11/2024	327	Yes	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	9/12/2024	40.5	Yes	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	9/11/2024	1110	Yes	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	651.9	n/a	9/11/2024	1830	Yes	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2

# Interwell Prediction Limits - September 2024 - All Results

Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 12:53 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
<b>Boron (mg/L)</b>	<b>MW-14A</b>	<b>0.322</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>17.7</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>84.42</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-15A</b>	<b>0.322</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>8.5</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>84.42</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-21</b>	<b>0.322</b>	<b>n/a</b>	<b>9/10/2024</b>	<b>3.68</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>84.42</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (NDs) 1 of 2</b>
Boron (mg/L)	MW-4B	0.322	n/a	9/12/2024	0.1ND	No	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-5B	0.322	n/a	9/12/2024	0.1ND	No	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-6A	0.322	n/a	9/12/2024	0.1ND	No	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
<b>Calcium (mg/L)</b>	<b>MW-14A</b>	<b>152</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>327</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (normality) 1 of 2</b>
Calcium (mg/L)	MW-15A	152	n/a	9/11/2024	129	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-21	152	n/a	9/10/2024	96.6	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-4B	152	n/a	9/12/2024	102	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-5B	152	n/a	9/12/2024	123	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-6A	152	n/a	9/12/2024	99.4	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	9/11/2024	16.3	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-15A	30	n/a	9/11/2024	7.41	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-21	30	n/a	9/10/2024	13.5	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-4B	30	n/a	9/12/2024	14.6	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
<b>Chloride (mg/L)</b>	<b>MW-5B</b>	<b>30</b>	<b>n/a</b>	<b>9/12/2024</b>	<b>40.5</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>27.27</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (normality) 1 of 2</b>
Chloride (mg/L)	MW-6A	30	n/a	9/12/2024	14.4	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-14A	1	n/a	9/11/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-15A	1	n/a	9/11/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-21	1	n/a	9/10/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-4B	1	n/a	9/12/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-5B	1	n/a	9/12/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-6A	1	n/a	9/12/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
pH (SU)	MW-14A	7.792	6.866	9/11/2024	7.2	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-15A	7.792	6.866	9/11/2024	7.2	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-21	7.792	6.866	9/10/2024	6.9	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-4B	7.792	6.866	9/12/2024	7.5	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-5B	7.792	6.866	9/12/2024	7.3	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-6A	7.792	6.866	9/12/2024	7.5	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
<b>Sulfate (mg/L)</b>	<b>MW-14A</b>	<b>366</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>1110</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (normality) 1 of 2</b>
Sulfate (mg/L)	MW-15A	366	n/a	9/11/2024	273	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-21	366	n/a	9/10/2024	248	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-4B	366	n/a	9/12/2024	65.8	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-5B	366	n/a	9/12/2024	50.4	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-6A	366	n/a	9/12/2024	16.3	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-14A</b>	<b>651.9</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>1830</b>	<b>Yes</b>	<b>76</b>	<b>5.976</b>	<b>0.2709</b>	<b>0</b>	<b>None</b>	<b>ln(x)</b>	<b>0.001254</b>	<b>Param Inter 1 of 2</b>
Total Dissolved Solids (mg/L)	MW-15A	651.9	n/a	9/11/2024	602	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-21	651.9	n/a	9/10/2024	584	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-4B	651.9	n/a	9/12/2024	410	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-5B	651.9	n/a	9/12/2024	520	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-6A	651.9	n/a	9/12/2024	382	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2

# Trend Tests - Prediction Limit Exceedances - Significant Results

Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 12:56 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-15A	-1.395	-198	-111	Yes	25	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-08 (bg)	-4.322	-114	-105	Yes	24	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-22 (bg)	-2.242	-77	-53	Yes	15	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-23 (bg)	1.058	56	48	Yes	14	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5B	-4.247	-157	-111	Yes	25	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-08 (bg)	-14.03	-178	-105	Yes	24	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-22 (bg)	7.15	81	53	Yes	15	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-23 (bg)	-1.122	-54	-48	Yes	14	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-08 (bg)	-49.91	-176	-98	Yes	23	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-10 (bg)	-16.65	-116	-105	Yes	24	0	n/a	n/a	0.01	NP

# Trend Tests - Prediction Limit Exceedances - All Results

Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 12:56 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-08 (bg)	0	3	105	No	24	95.83	n/a	n/a	0.01	NP
Boron (mg/L)	MW-10 (bg)	0	0	105	No	24	100	n/a	n/a	0.01	NP
Boron (mg/L)	MW-14A	0.2089	45	111	No	25	0	n/a	n/a	0.01	NP
<b>Boron (mg/L)</b>	<b>MW-15A</b>	<b>-1.395</b>	<b>-198</b>	<b>-111</b>	<b>Yes</b>	<b>25</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Boron (mg/L)	MW-21	-0.2935	-72	-111	No	25	4	n/a	n/a	0.01	NP
Boron (mg/L)	MW-22 (bg)	0	19	53	No	15	60	n/a	n/a	0.01	NP
Boron (mg/L)	MW-23 (bg)	0	23	48	No	14	64.29	n/a	n/a	0.01	NP
<b>Calcium (mg/L)</b>	<b>MW-08 (bg)</b>	<b>-4.322</b>	<b>-114</b>	<b>-105</b>	<b>Yes</b>	<b>24</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Calcium (mg/L)	MW-10 (bg)	0.2249	19	105	No	24	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-1.168	-20	-111	No	25	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-22 (bg)	0.1239	3	53	No	15	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-23 (bg)	-1.14	-32	-48	No	14	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-08 (bg)	0.2664	68	105	No	24	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-10 (bg)	0	18	105	No	24	87.5	n/a	n/a	0.01	NP
<b>Chloride (mg/L)</b>	<b>MW-22 (bg)</b>	<b>-2.242</b>	<b>-77</b>	<b>-53</b>	<b>Yes</b>	<b>15</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Chloride (mg/L)</b>	<b>MW-23 (bg)</b>	<b>1.058</b>	<b>56</b>	<b>48</b>	<b>Yes</b>	<b>14</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Chloride (mg/L)</b>	<b>MW-5B</b>	<b>-4.247</b>	<b>-157</b>	<b>-111</b>	<b>Yes</b>	<b>25</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Sulfate (mg/L)</b>	<b>MW-08 (bg)</b>	<b>-14.03</b>	<b>-178</b>	<b>-105</b>	<b>Yes</b>	<b>24</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Sulfate (mg/L)	MW-10 (bg)	0.5948	28	105	No	24	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-14A	-4.303	-16	-111	No	25	0	n/a	n/a	0.01	NP
<b>Sulfate (mg/L)</b>	<b>MW-22 (bg)</b>	<b>7.15</b>	<b>81</b>	<b>53</b>	<b>Yes</b>	<b>15</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Sulfate (mg/L)</b>	<b>MW-23 (bg)</b>	<b>-1.122</b>	<b>-54</b>	<b>-48</b>	<b>Yes</b>	<b>14</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-08 (bg)</b>	<b>-49.91</b>	<b>-176</b>	<b>-98</b>	<b>Yes</b>	<b>23</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-10 (bg)</b>	<b>-16.65</b>	<b>-116</b>	<b>-105</b>	<b>Yes</b>	<b>24</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Total Dissolved Solids (mg/L)	MW-14A	-70.36	-91	-111	No	25	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-22 (bg)	-4.368	-37	-53	No	15	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-23 (bg)	-13.11	-42	-48	No	14	0	n/a	n/a	0.01	NP

# Upper Tolerance Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 12:58 PM

Constituent	Upper Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	0.002	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Arsenic (mg/L)	0.00784	n/a	n/a	n/a	75	56	n/a	0.02134	NP Inter(NDs)
Barium (mg/L)	0.271	n/a	n/a	n/a	75	0	n/a	0.02134	NP Inter(normality)
Beryllium (mg/L)	0.001	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Cadmium (mg/L)	0.0002	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Chromium (mg/L)	0.005	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Cobalt (mg/L)	0.00558	n/a	n/a	n/a	76	39.47	n/a	0.02028	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.48	n/a	n/a	n/a	61	0	n/a	0.04377	NP Inter(normality)
Fluoride (mg/L)	1	n/a	n/a	n/a	76	89.47	n/a	0.02028	NP Inter(NDs)
Lead (mg/L)	0.00204	n/a	n/a	n/a	75	90.67	n/a	0.02134	NP Inter(NDs)
Lithium (mg/L)	0.01	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Mercury (mg/L)	0.0002	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Molybdenum (mg/L)	0.00822	n/a	n/a	n/a	77	64.94	n/a	0.01926	NP Inter(NDs)
Selenium (mg/L)	0.005	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Thallium (mg/L)	0.001	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)

<b>MUSCATINE POWER &amp; WATER GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR Rule-Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.002	0.006
Arsenic, Total (mg/L)	0.01		0.0078	0.01
Barium, Total (mg/L)	2		0.27	2
Beryllium, Total (mg/L)	0.004		0.001	0.004
Cadmium, Total (mg/L)	0.005		0.0002	0.005
Chromium, Total (mg/L)	0.1		0.005	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.0056	0.006
Combined Radium, Total (pCi/L)	5		2.48	5
Fluoride, Total (mg/L)	4		1	4
Lead, Total (mg/L)	0.015		0.002	0.015
Lithium, Total (mg/L)	n/a	0.04	0.01	0.04
Mercury, Total (mg/L)	0.002		0.0002	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0082	0.1
Selenium, Total (mg/L)	0.05		0.005	0.05
Thallium, Total (mg/L)	0.002		0.001	0.002

\*MCL = Maximum Contaminant Level

\*CCR = Coal Combustion Residual

\*GWPS = Groundwater Protection Standard

# Confidence Intervals - All Results (No Significant)

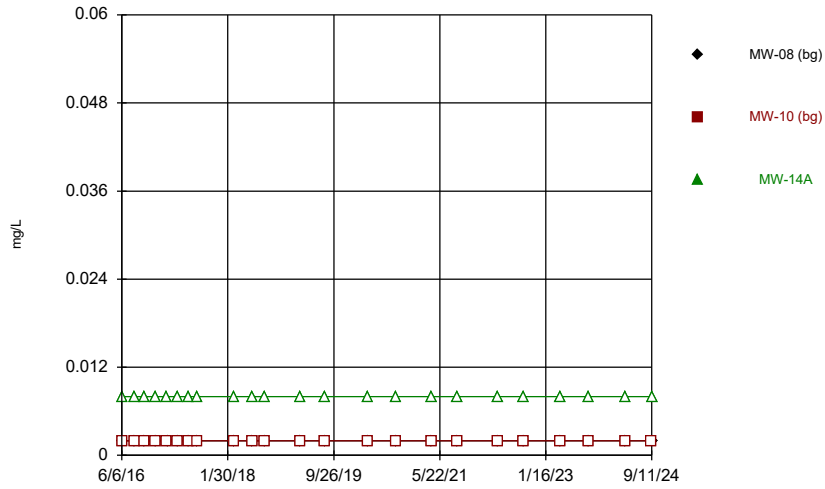
Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 1:09 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Barium (mg/L)	MW-14A	0.03631	0.03215	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-15A	0.03965	0.03478	2	No	22	0	No	0.01	Param.
Barium (mg/L)	MW-21	0.05372	0.03963	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-4B	0.1656	0.1413	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-5B	0.308	0.2687	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-6A	0.2286	0.2037	2	No	23	0	No	0.01	Param.
Cadmium (mg/L)	MW-4B	0.000285	0.0002	0.005	No	23	95.65	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-5B	0.000255	0.0002	0.005	No	23	95.65	No	0.01	NP (NDs)
Chromium (mg/L)	MW-21	0.006394	0.00558	0.1	No	23	21.74	No	0.01	Param.
Cobalt (mg/L)	MW-4B	0.00172	0.0005	0.006	No	23	56.52	No	0.01	NP (NDs)
Combined Radium 226 + 228 (pCi/L)	MW-14A	0.4974	0.1845	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-15A	0.3664	0.1299	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-21	0.4781	0.1778	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-4B	0.7811	0.4426	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-5B	1.09	0.7128	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-6A	0.7861	0.5038	5	No	19	0	No	0.01	Param.
Fluoride (mg/L)	MW-14A	1	0.867	4	No	23	91.3	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-15A	1	0.625	4	No	23	82.61	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-21	1	0.993	4	No	24	91.67	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-4B	1	0.801	4	No	24	83.33	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-5B	1.88	0.627	4	No	24	87.5	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-6A	1.89	0.814	4	No	24	79.17	No	0.01	NP (NDs)
Lead (mg/L)	MW-21	0.000633	0.0005	0.015	No	23	95.65	No	0.01	NP (NDs)
Lead (mg/L)	MW-4B	0.000532	0.0005	0.015	No	22	90.91	No	0.01	NP (NDs)
Lead (mg/L)	MW-5B	0.000627	0.0005	0.015	No	23	95.65	No	0.01	NP (NDs)
Lithium (mg/L)	MW-21	0.0205	0.01	0.04	No	23	43.48	No	0.01	NP (normality)
Mercury (mg/L)	MW-5B	0.000813	0.0002	0.002	No	23	95.65	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-21	0.00383	0.002	0.1	No	23	95.65	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-4B	0.00296	0.002	0.1	No	23	95.65	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-5B	0.00212	0.002	0.1	No	23	95.65	No	0.01	NP (NDs)
Selenium (mg/L)	MW-14A	0.00811	0.005	0.05	No	23	52.17	No	0.01	NP (NDs)
Selenium (mg/L)	MW-15A	0.00502	0.005	0.05	No	23	95.65	No	0.01	NP (NDs)
Selenium (mg/L)	MW-21	0.009469	0.006371	0.05	No	23	26.09	sqrt(x)	0.01	Param.
Thallium (mg/L)	MW-4B	0.00288	0.001	0.002	No	23	91.3	No	0.01	NP (NDs)
Thallium (mg/L)	MW-5B	0.00393	0.001	0.002	No	23	91.3	No	0.01	NP (NDs)



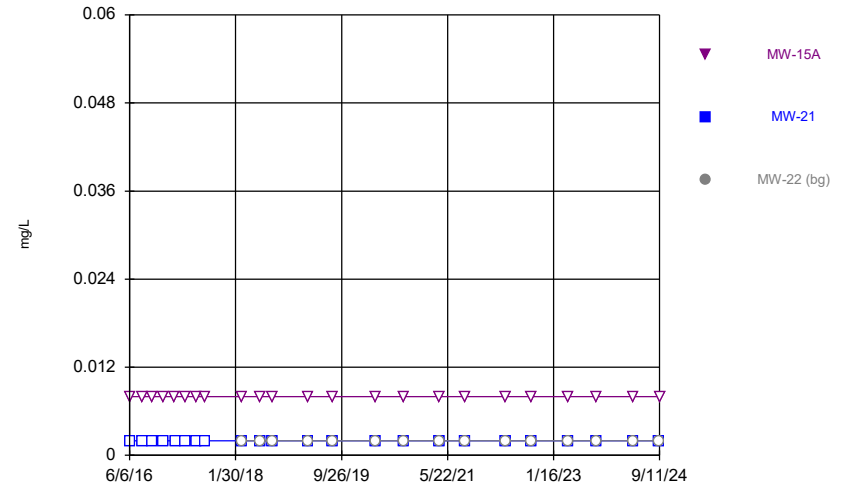
FIGURE A.

### Time Series



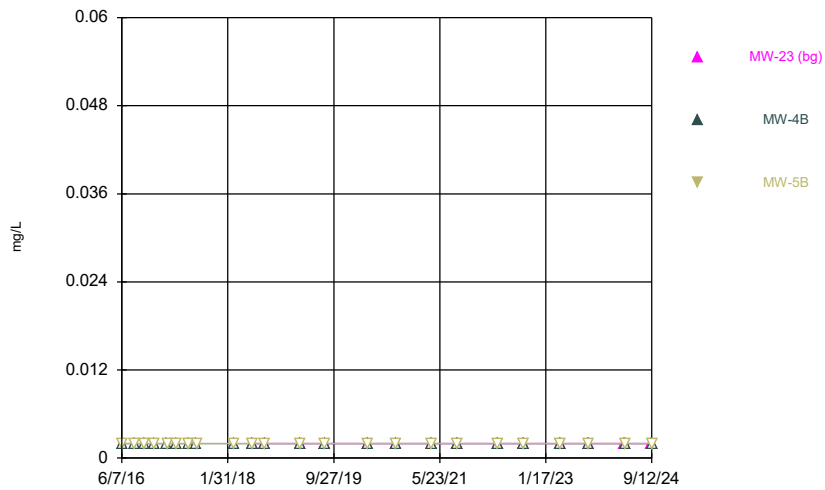
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### Time Series



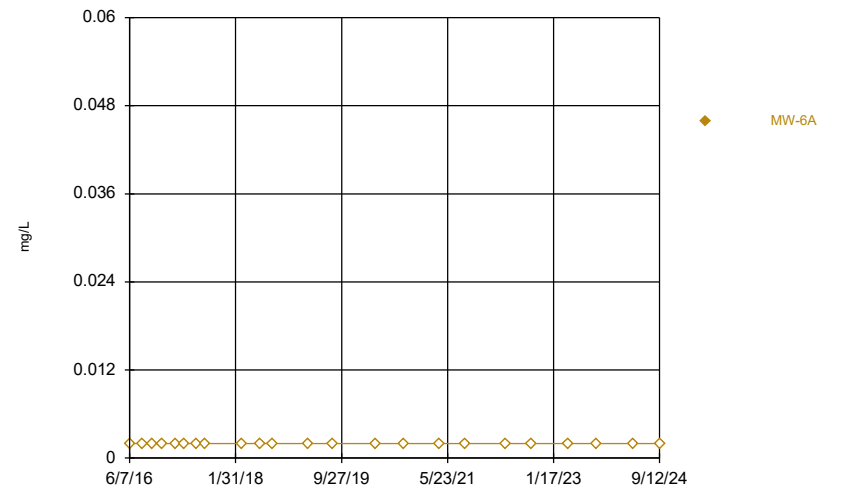
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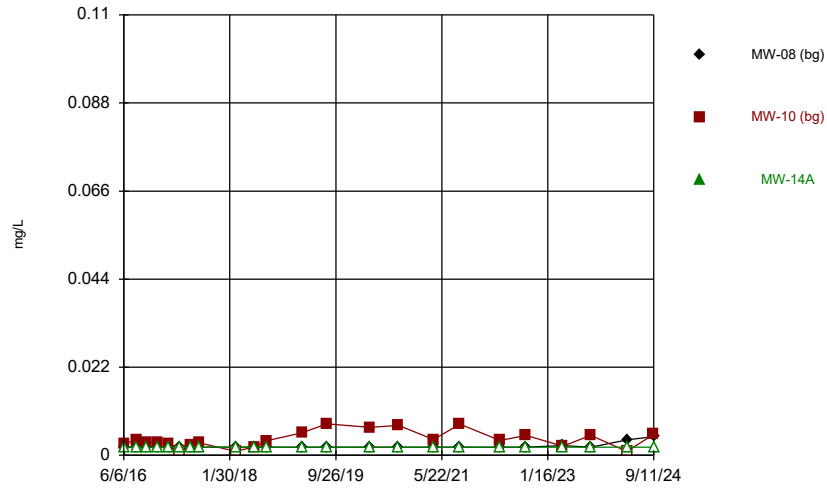
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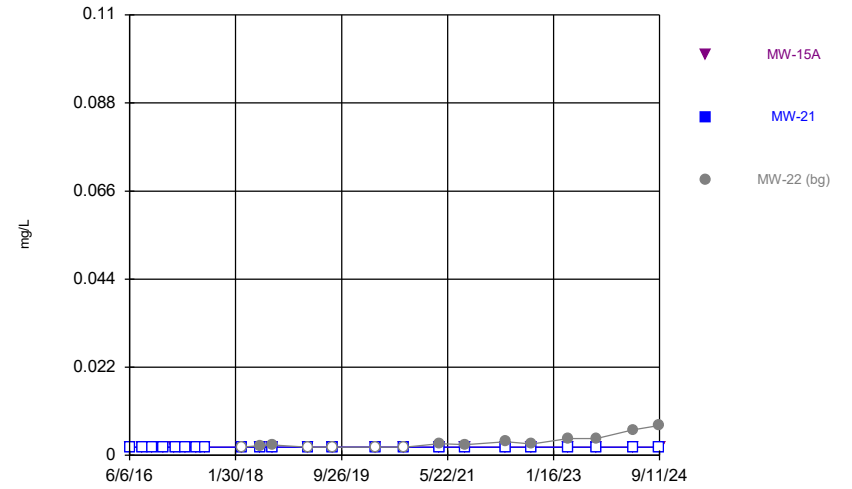
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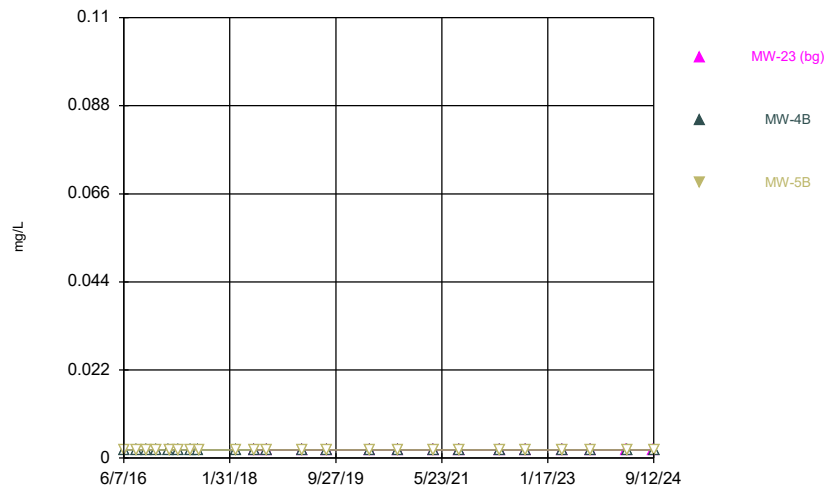
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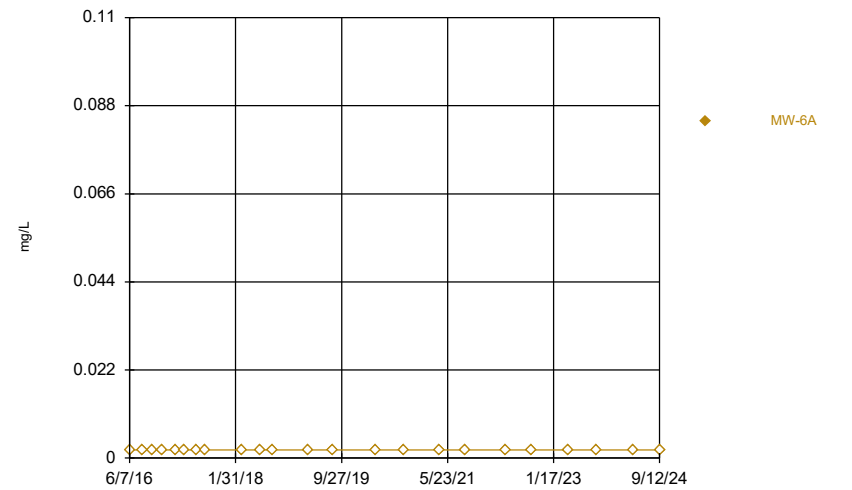
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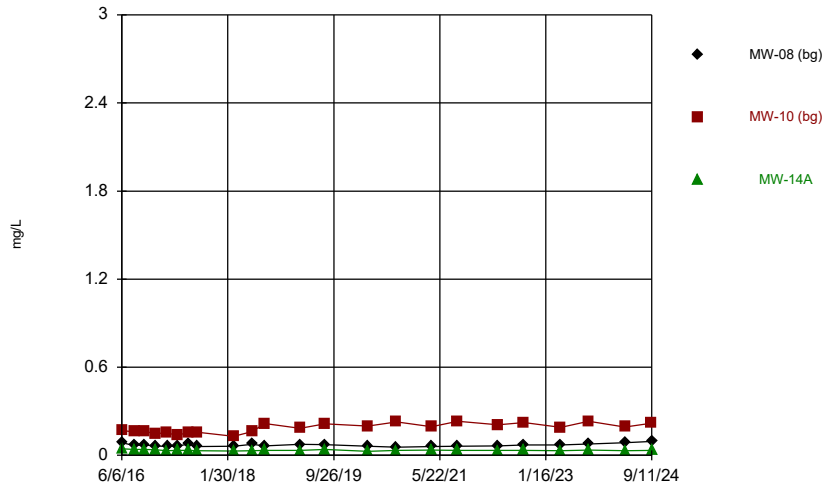
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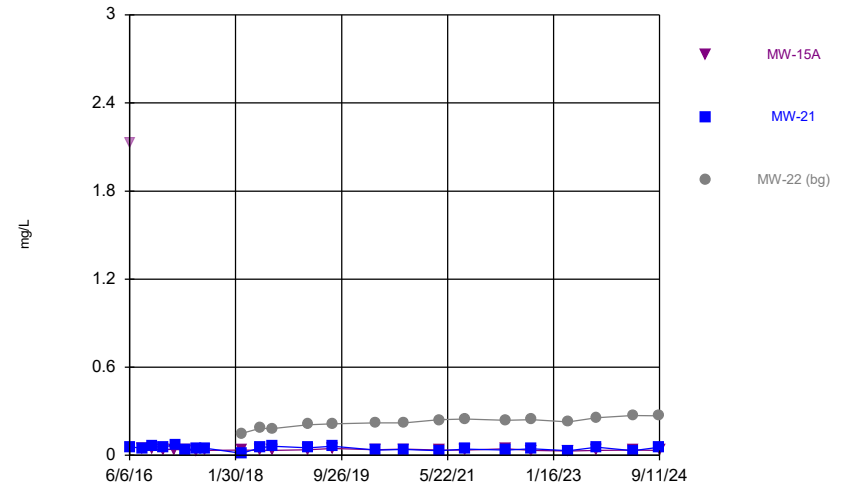
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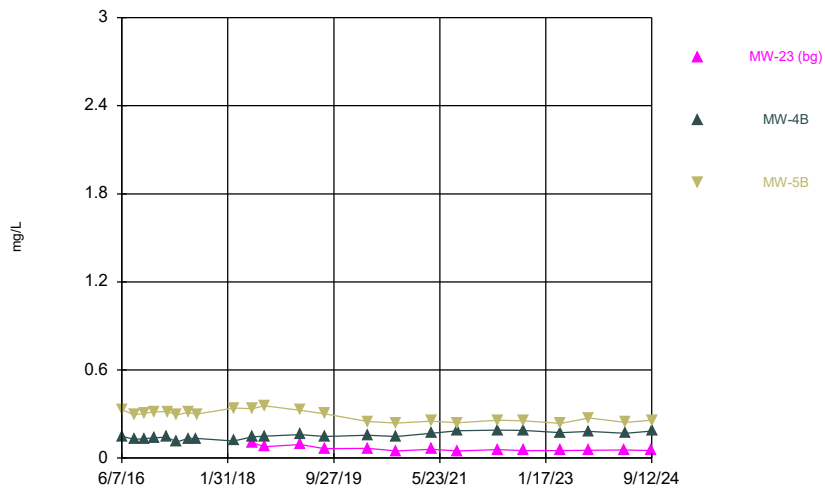
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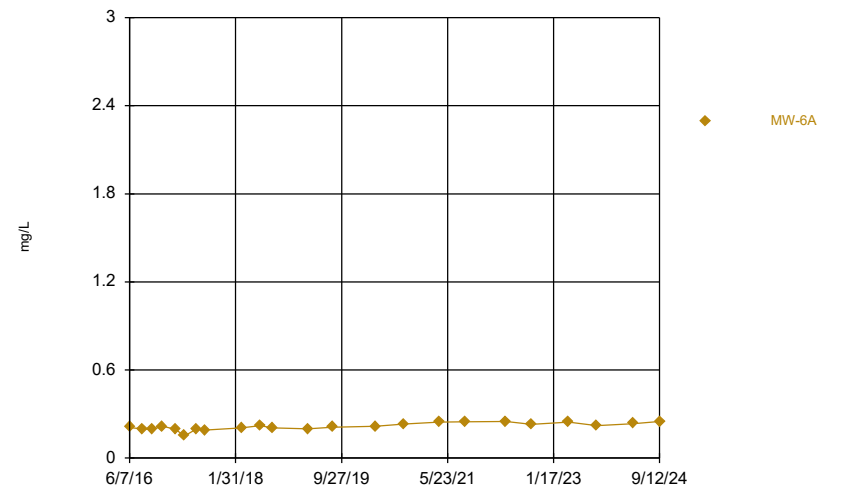
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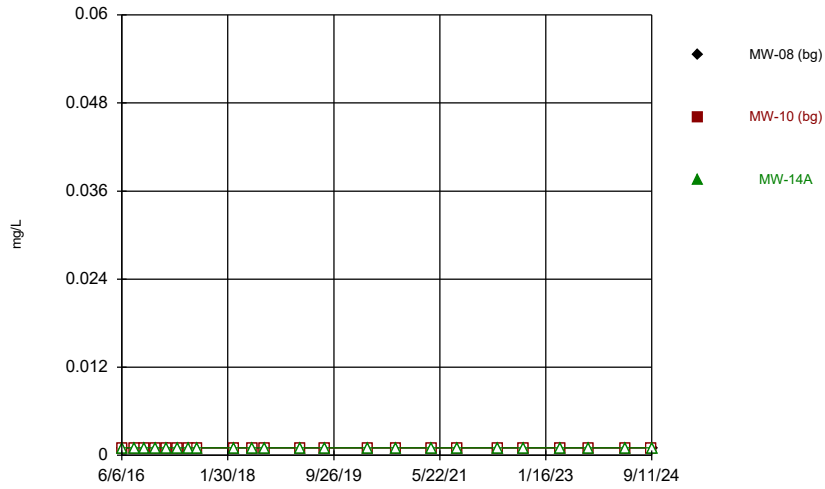
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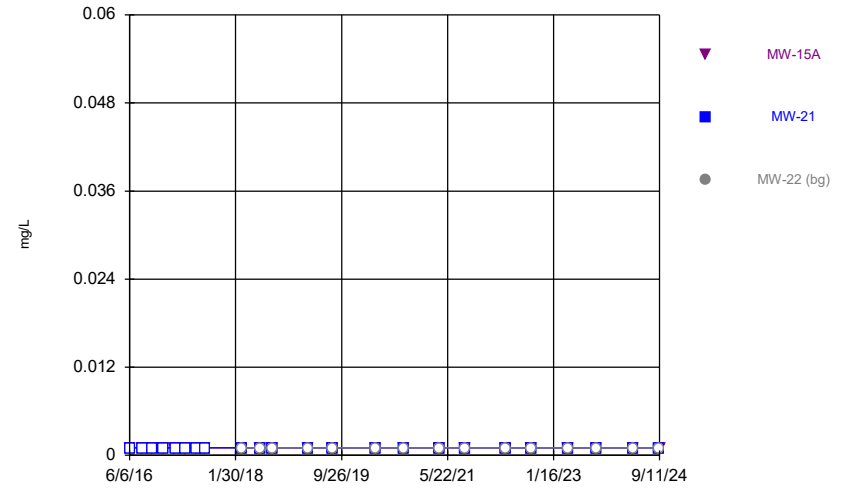
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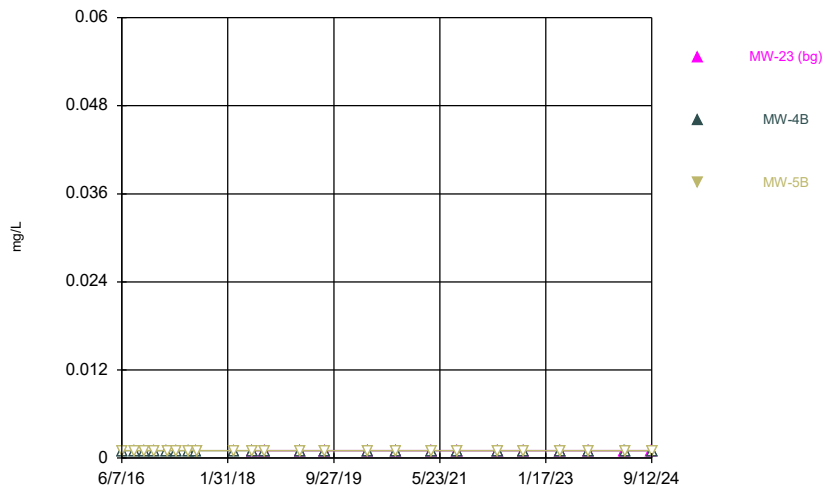
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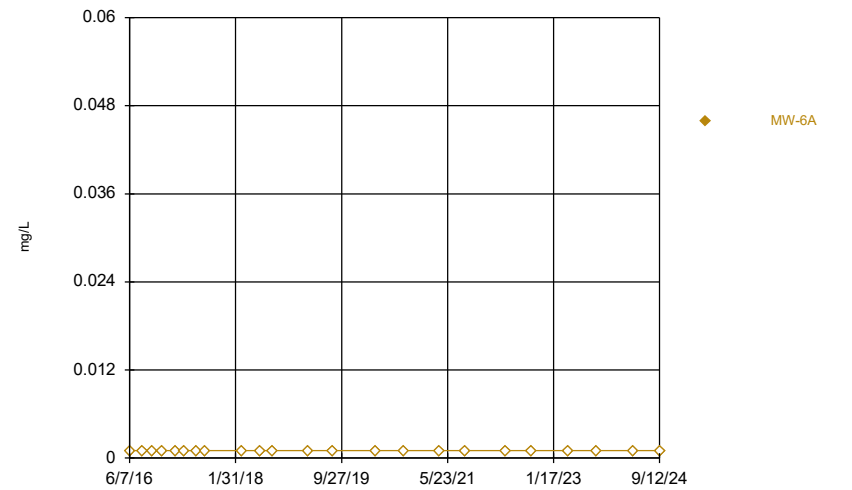
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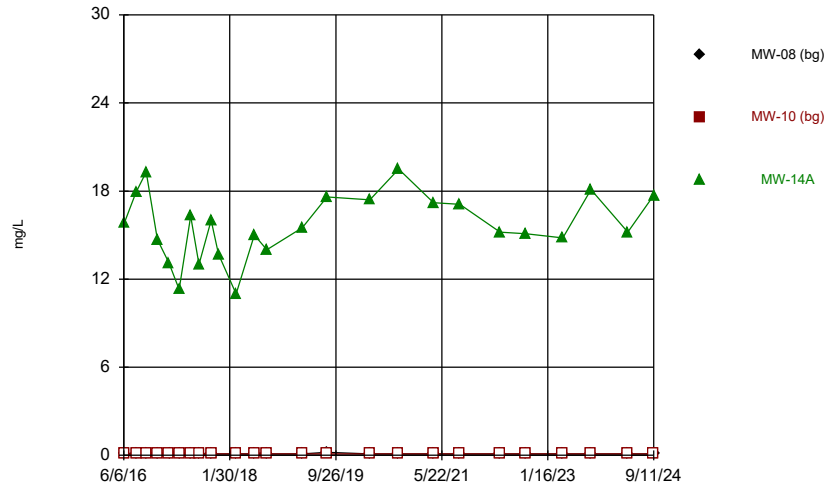
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### Time Series



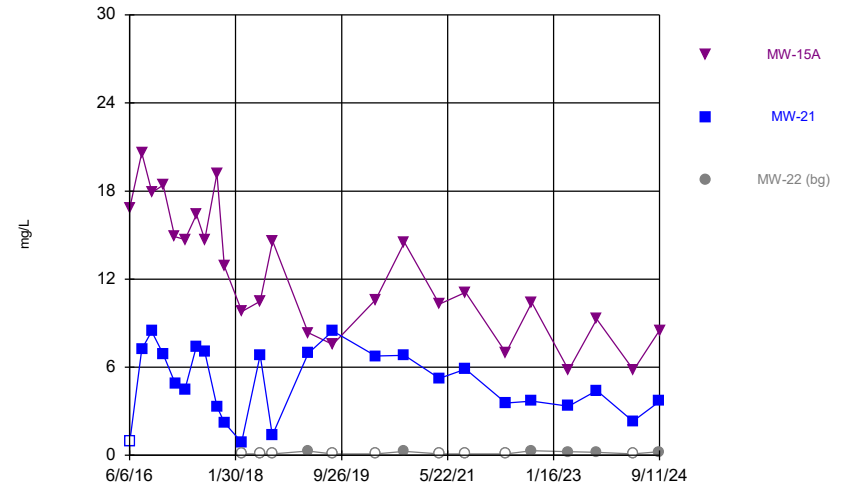
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Time Series



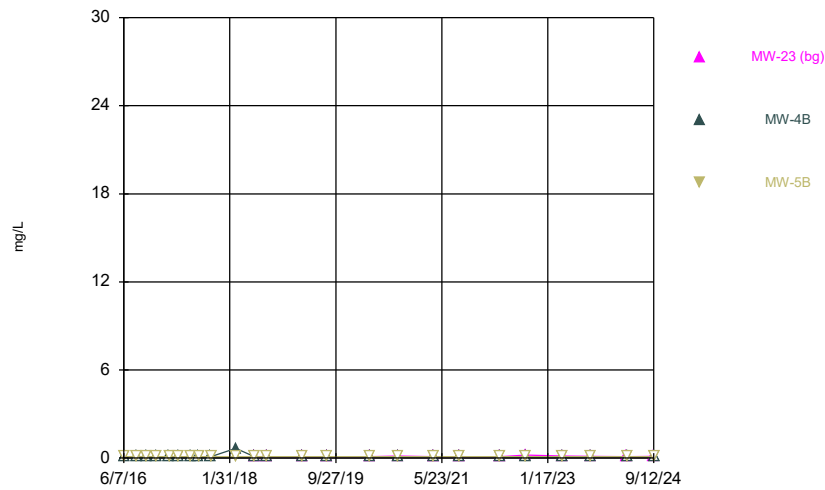
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Time Series



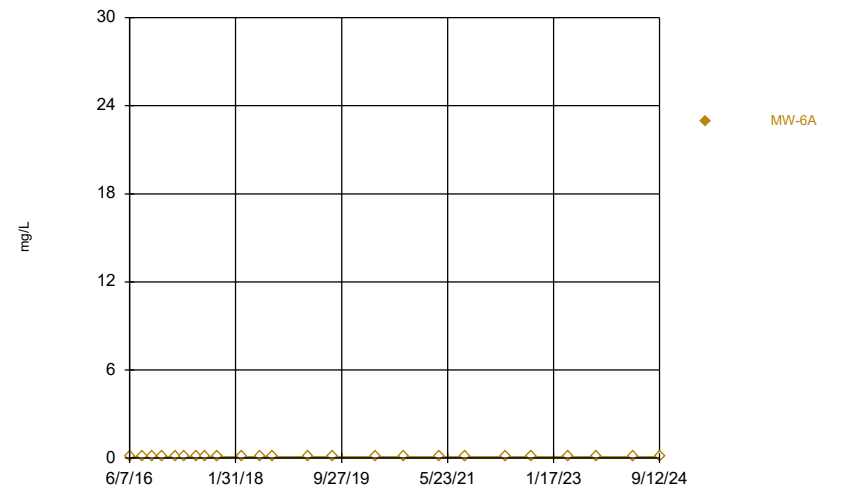
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Time Series



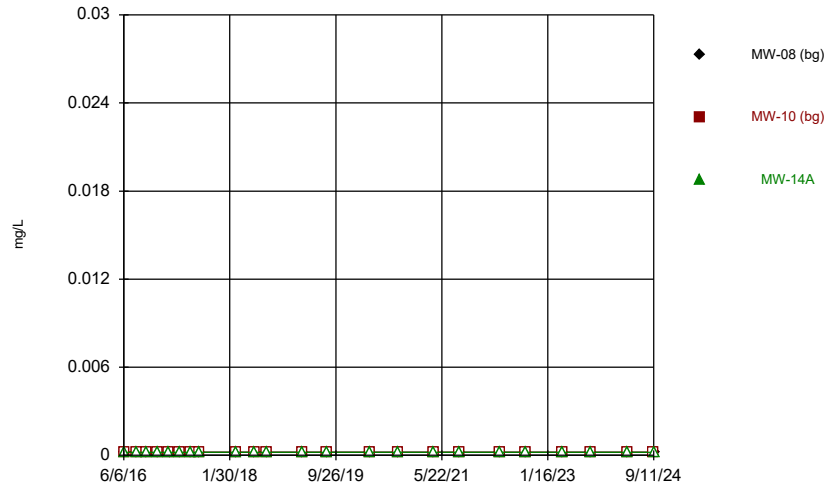
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Time Series



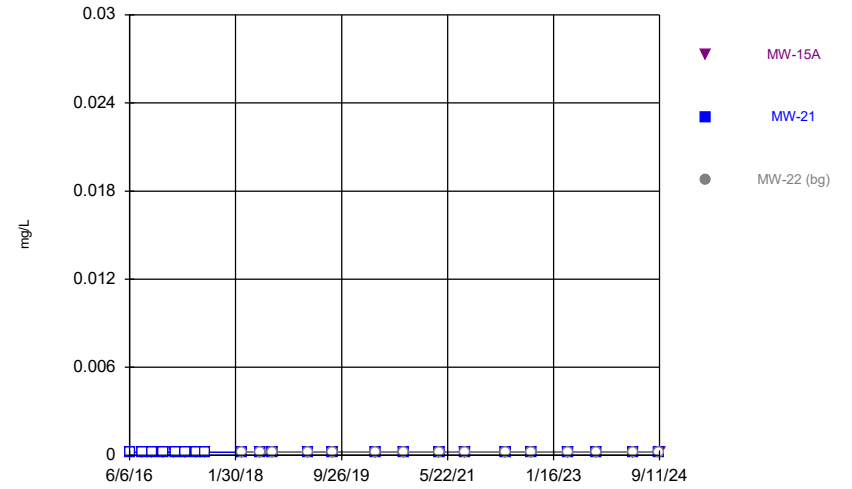
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### Time Series



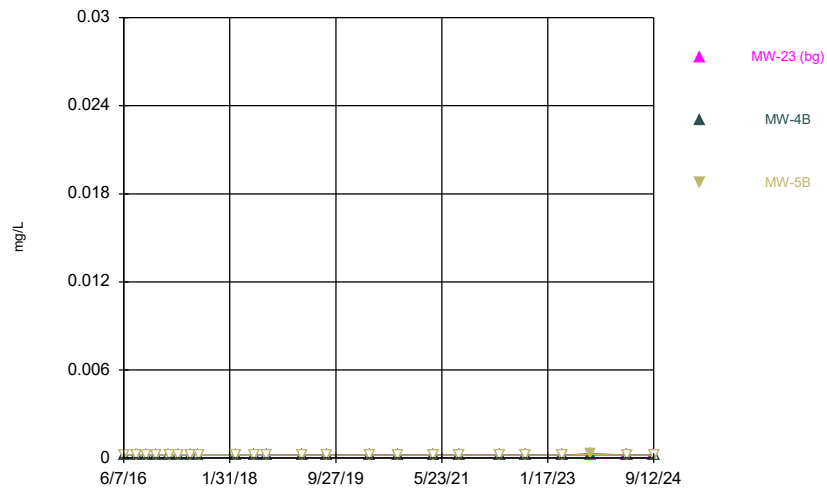
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



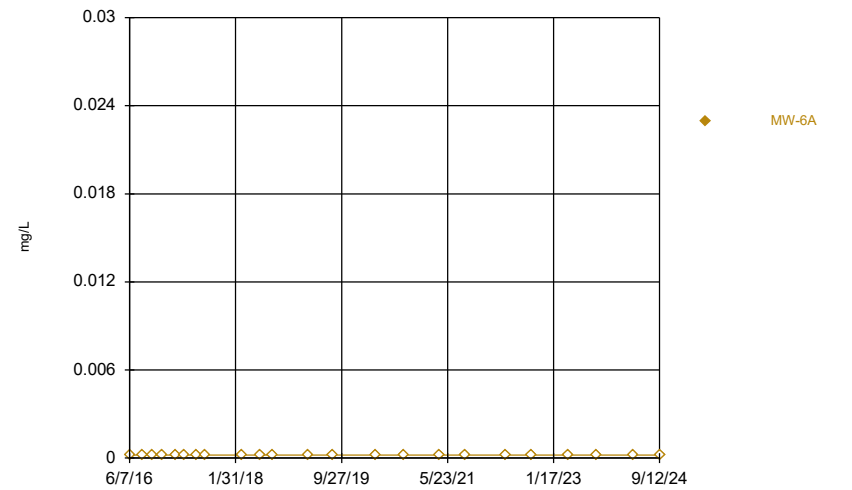
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



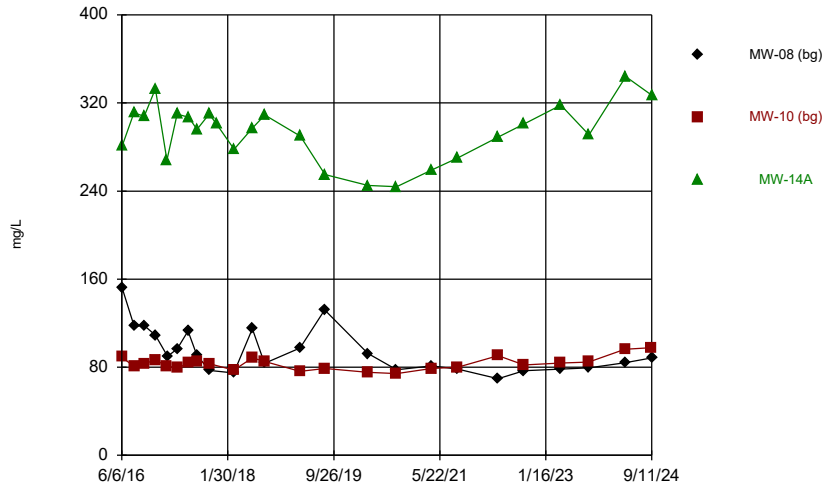
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



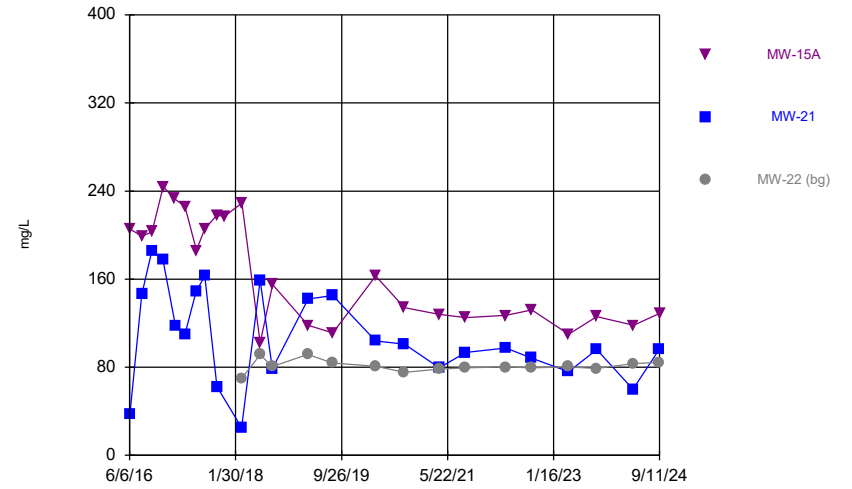
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



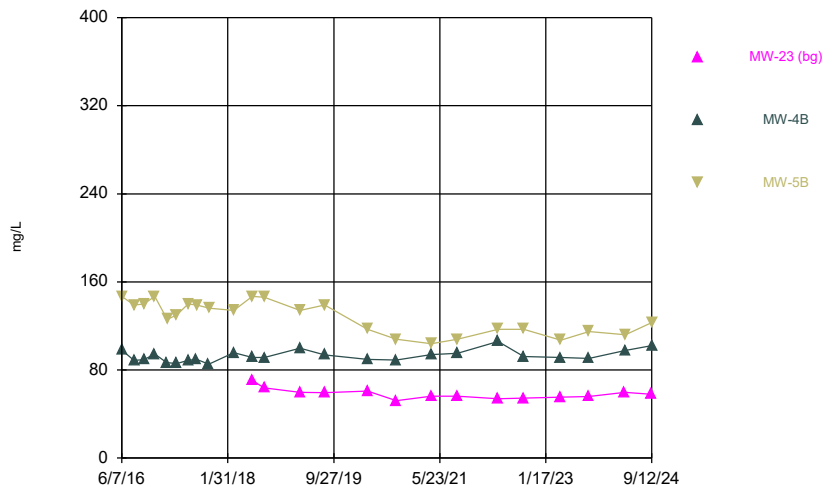
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



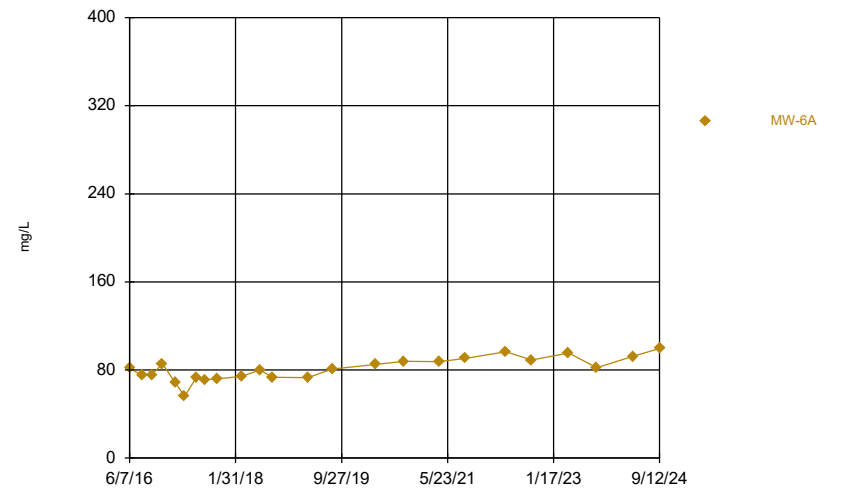
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



Constituent: Calcium Analysis Run 12/11/2024 1:19 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

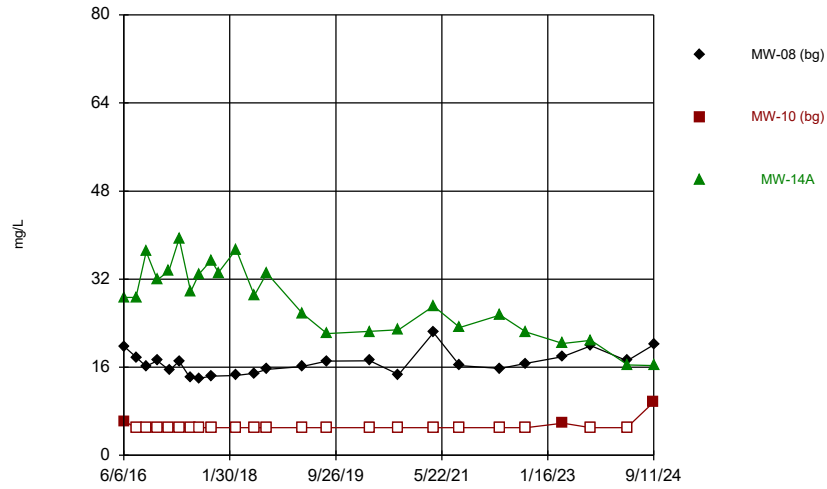
### Time Series



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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

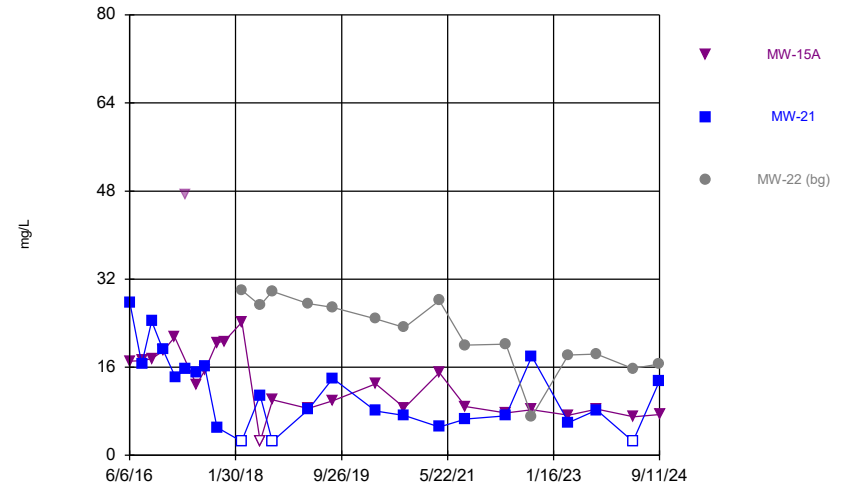


Time Series



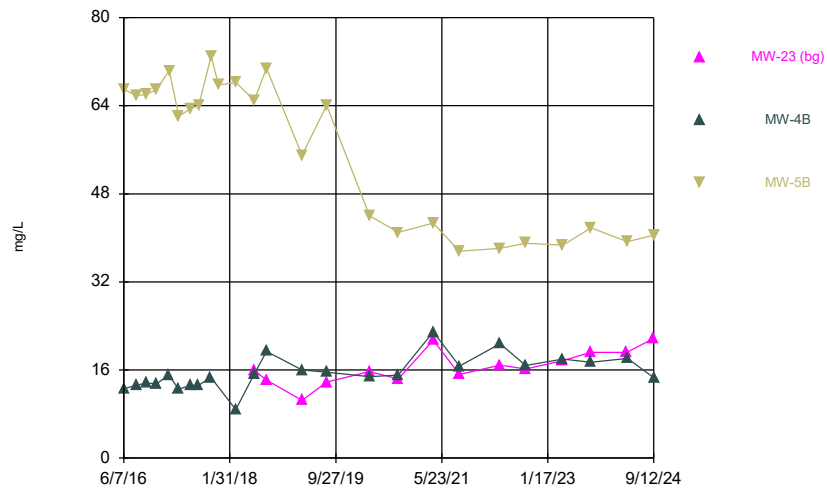
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



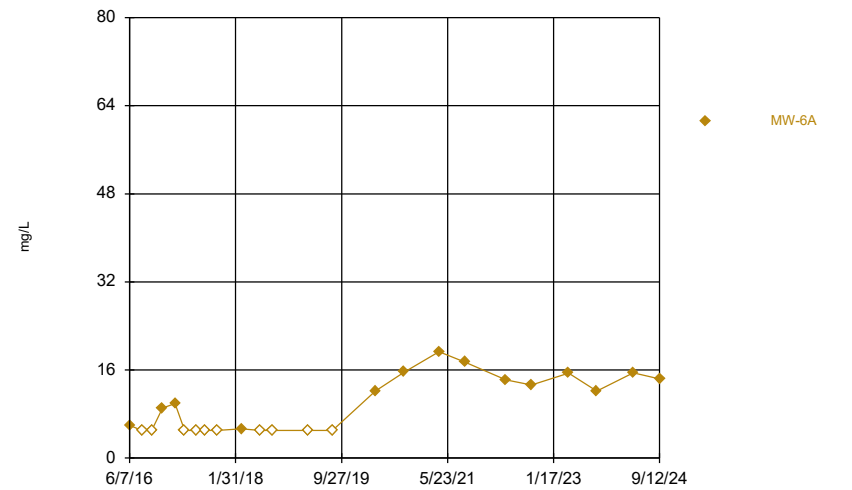
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



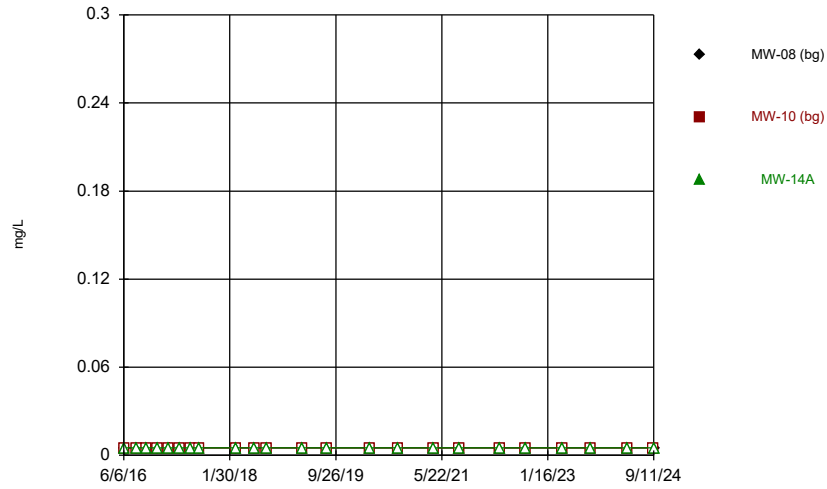
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



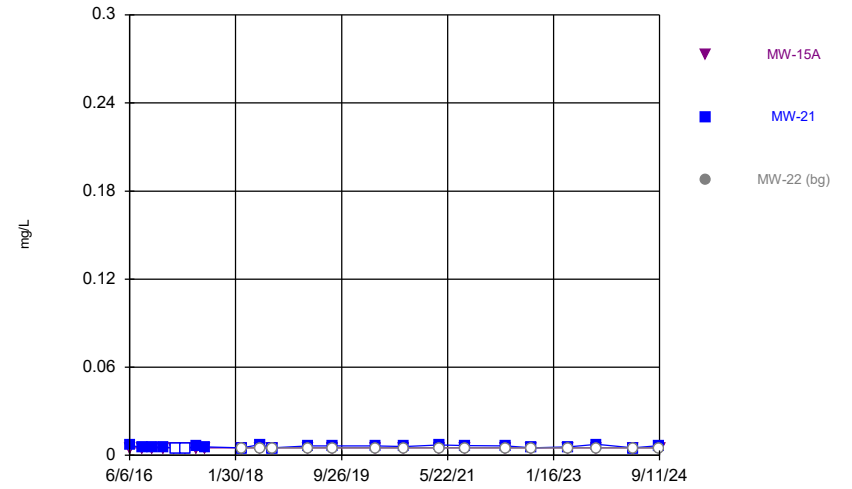
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



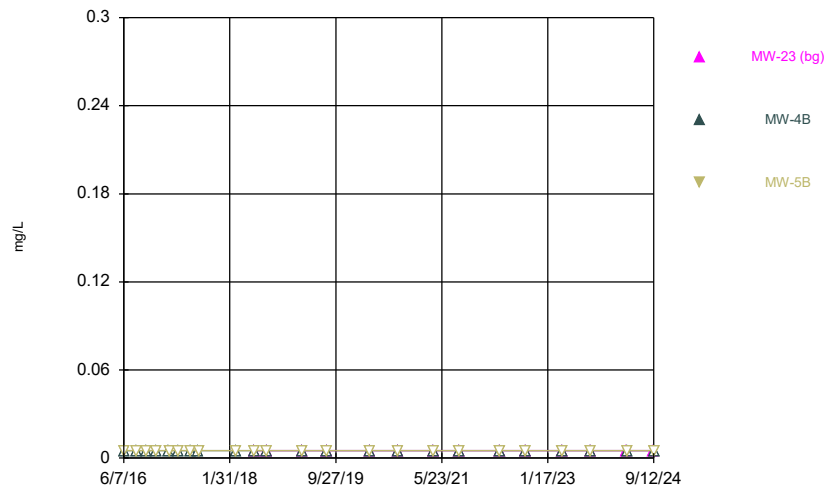
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



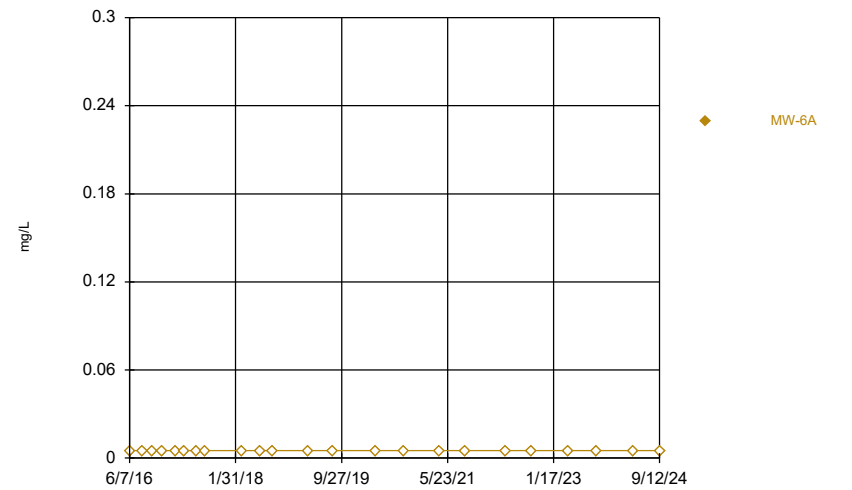
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



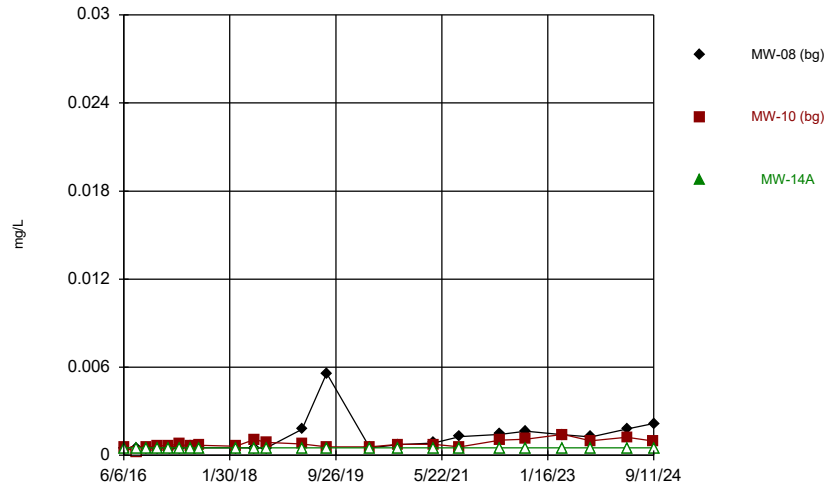
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



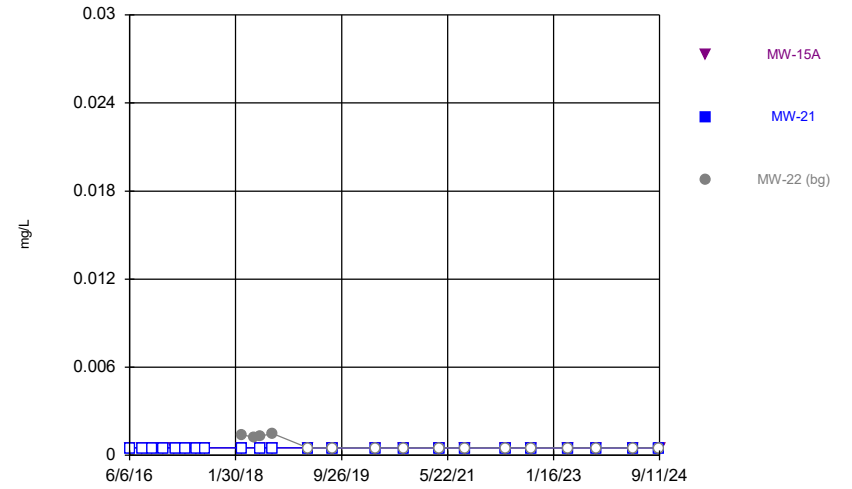
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



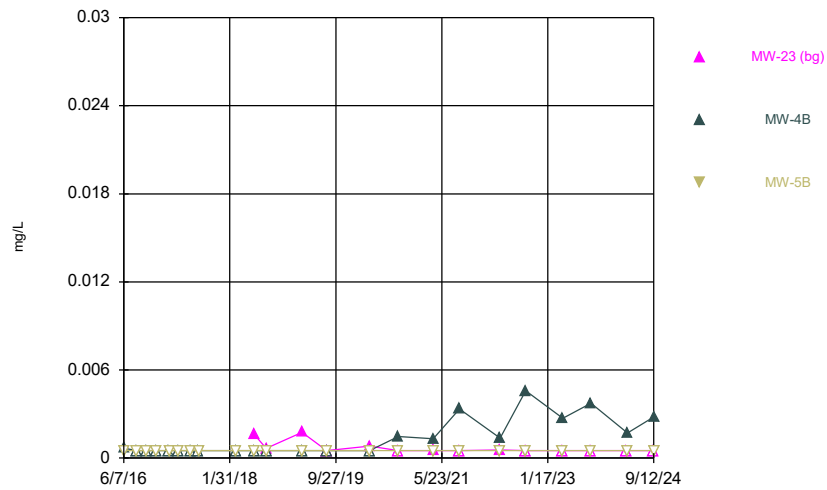
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



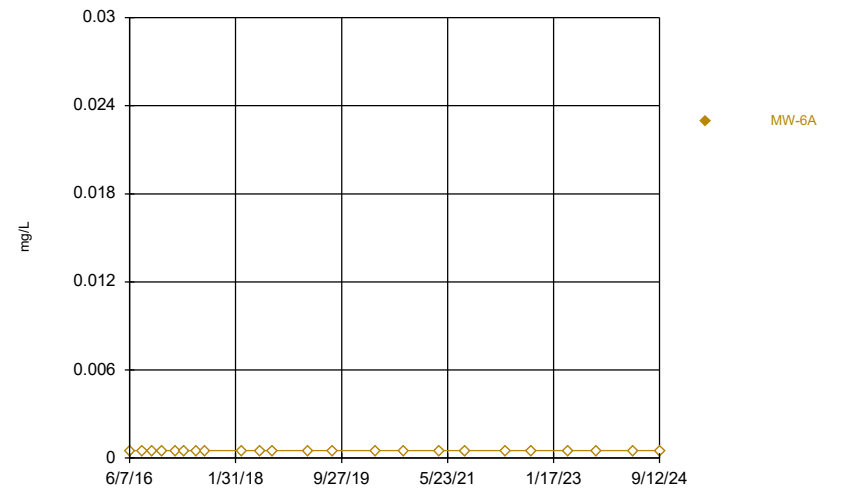
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



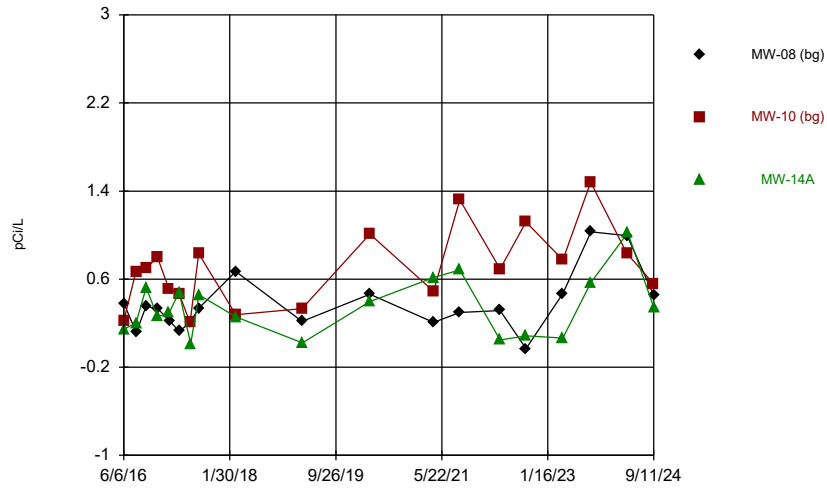
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



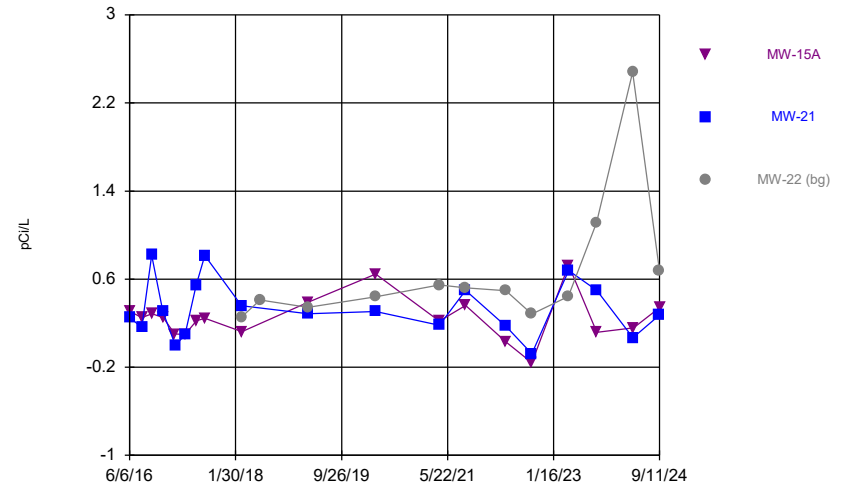
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



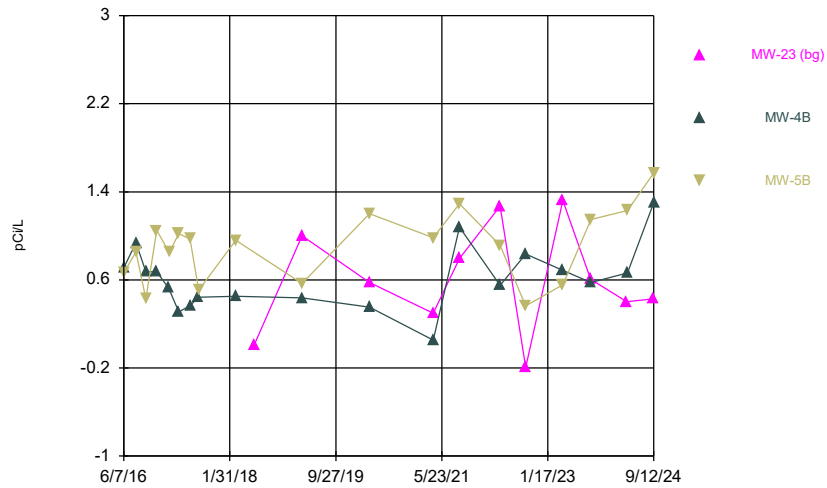
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



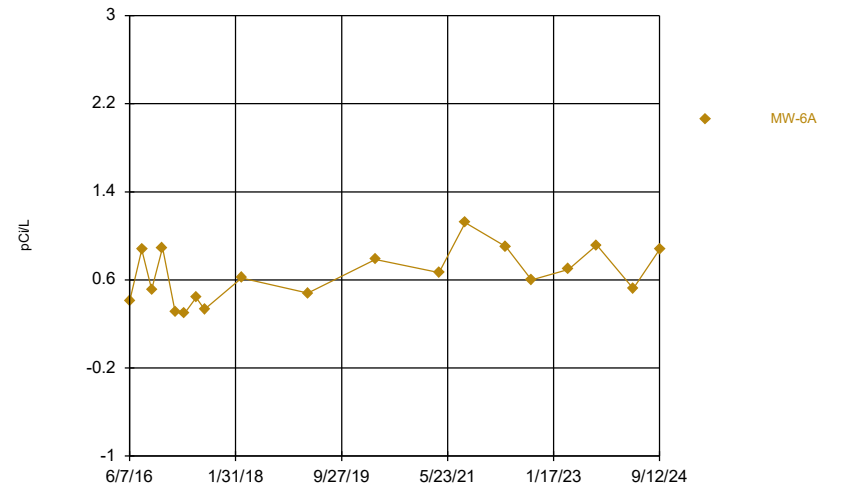
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



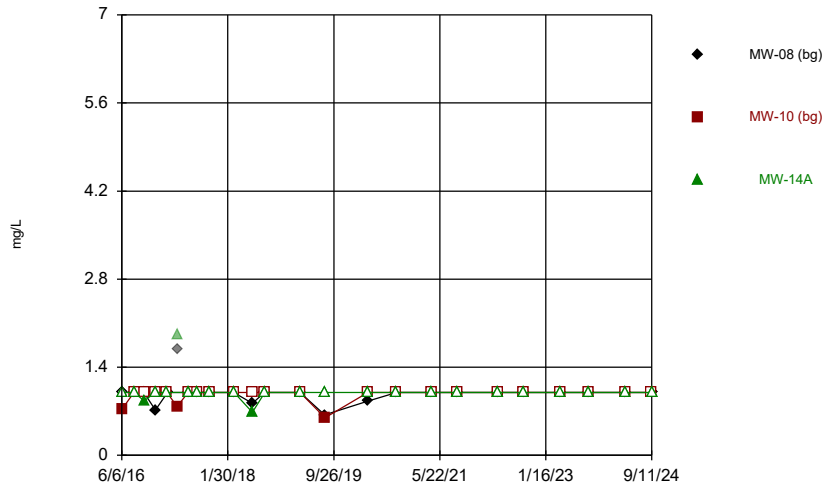
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



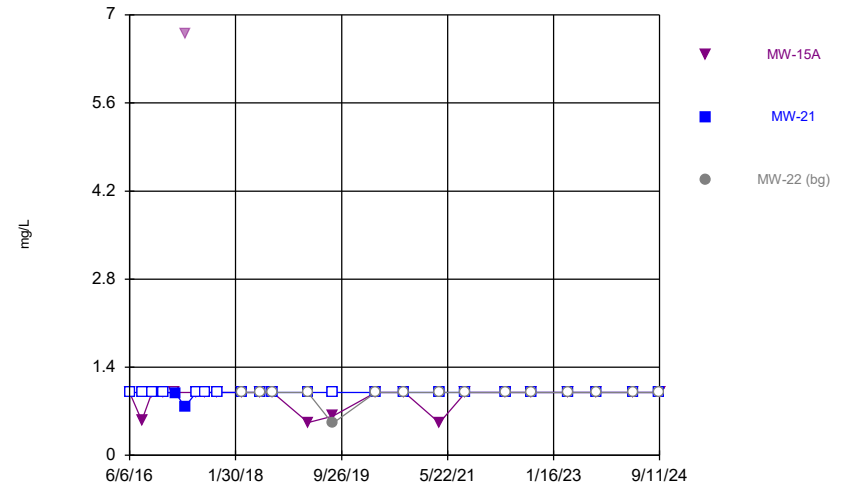
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



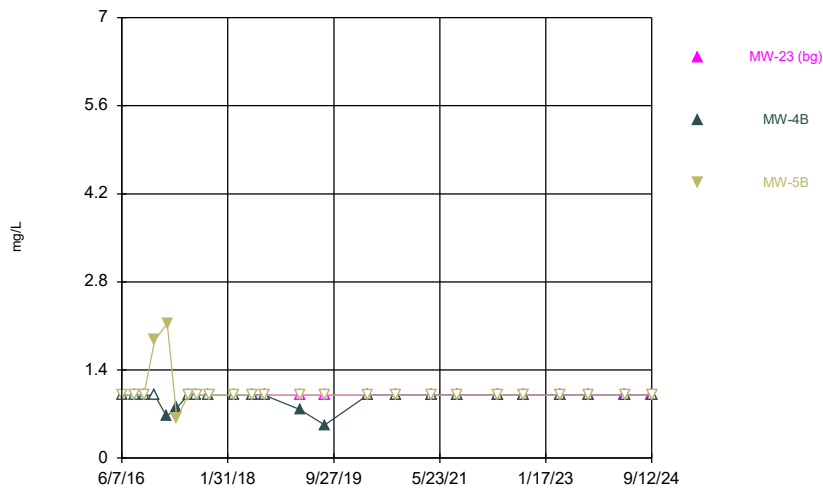
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 Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



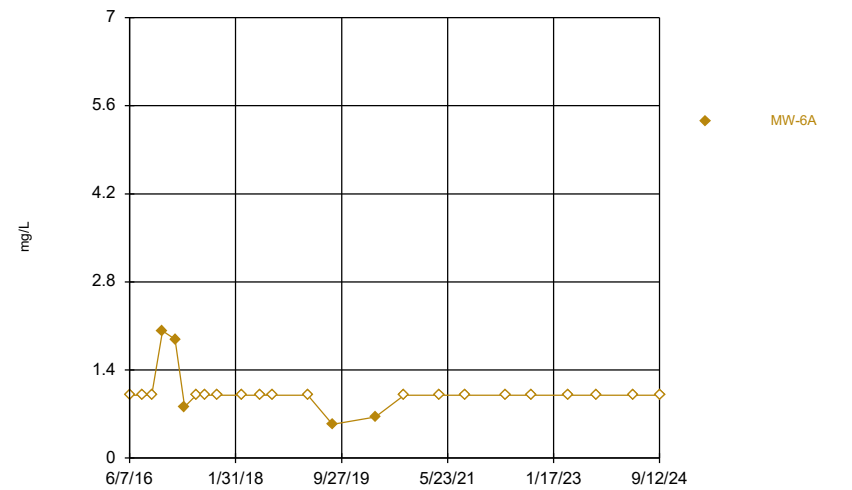
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Time Series



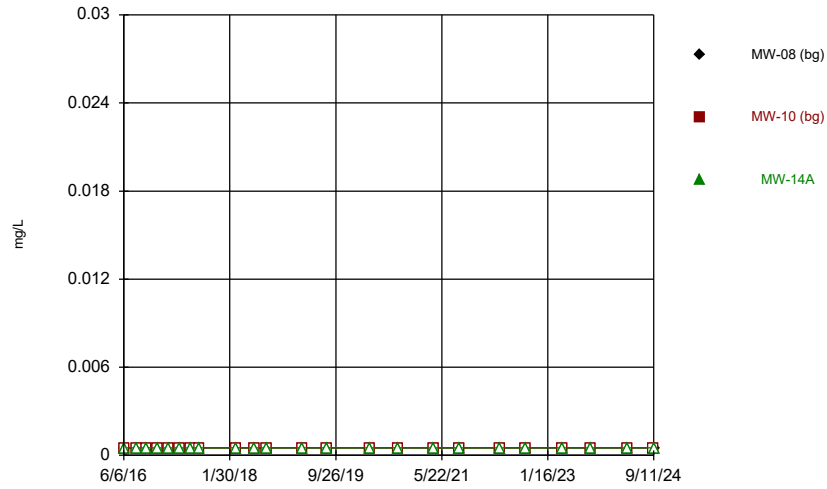
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Time Series



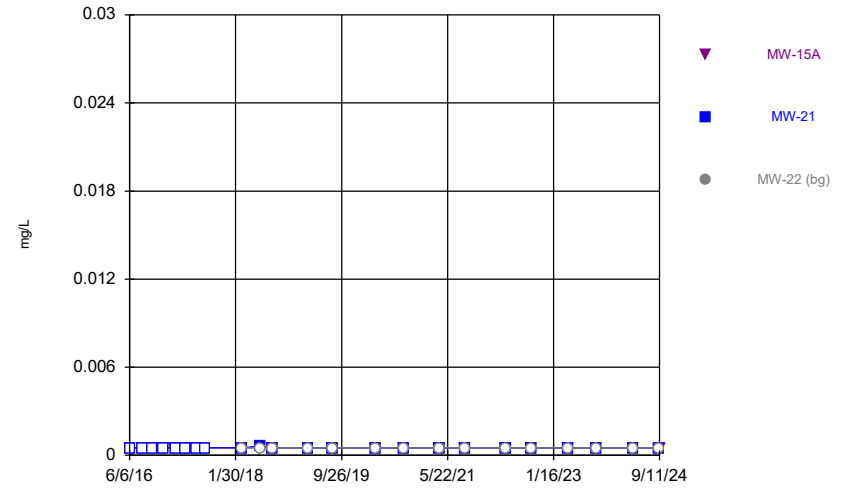
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### Time Series



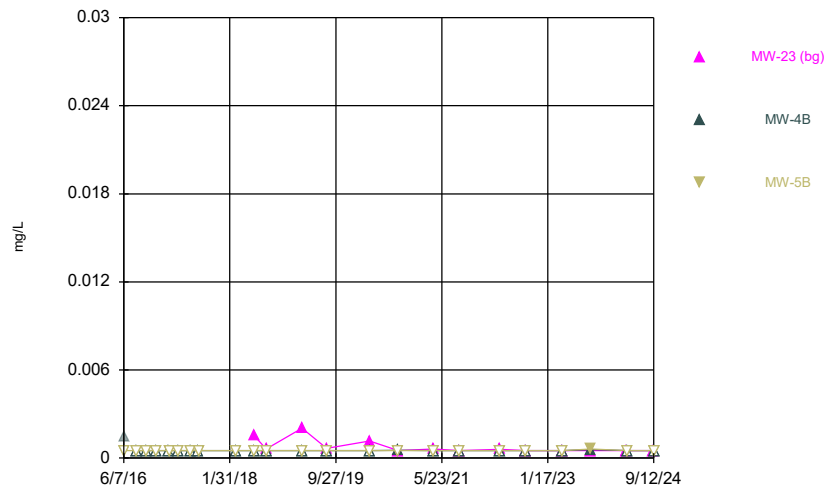
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### Time Series



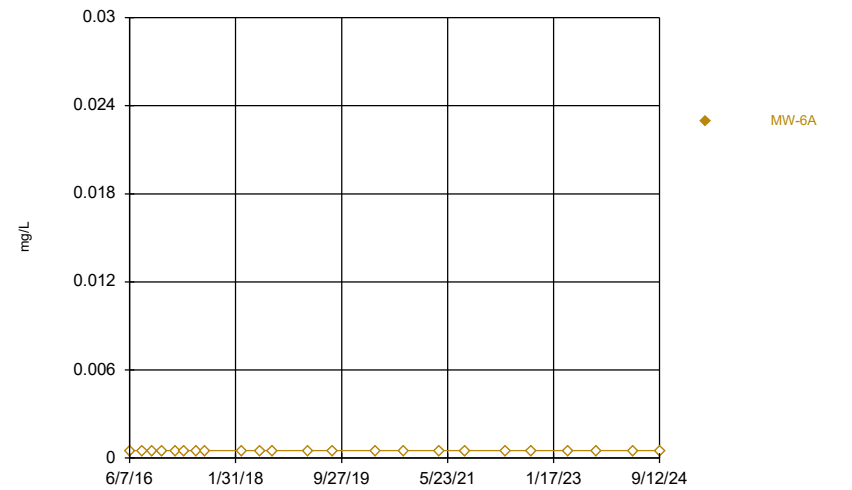
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### Time Series



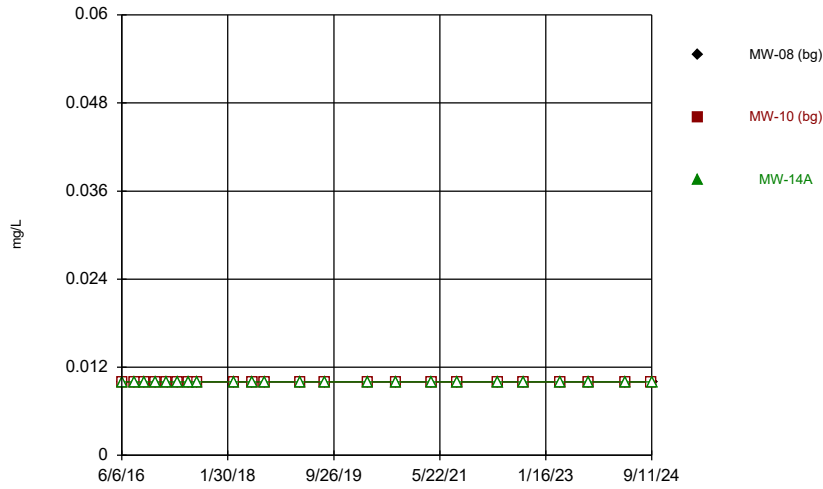
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### Time Series



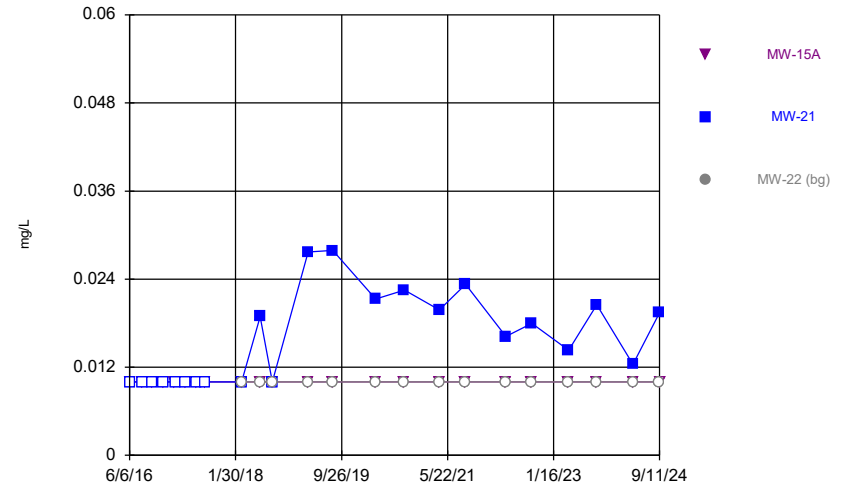
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### Time Series



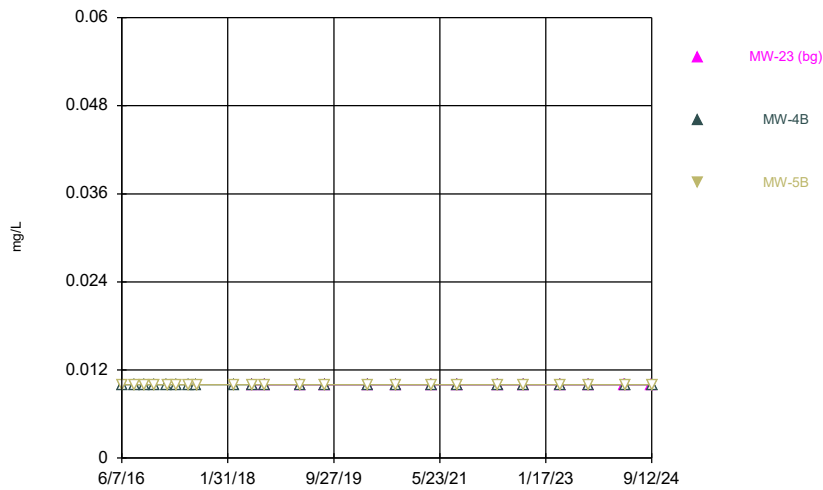
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### Time Series



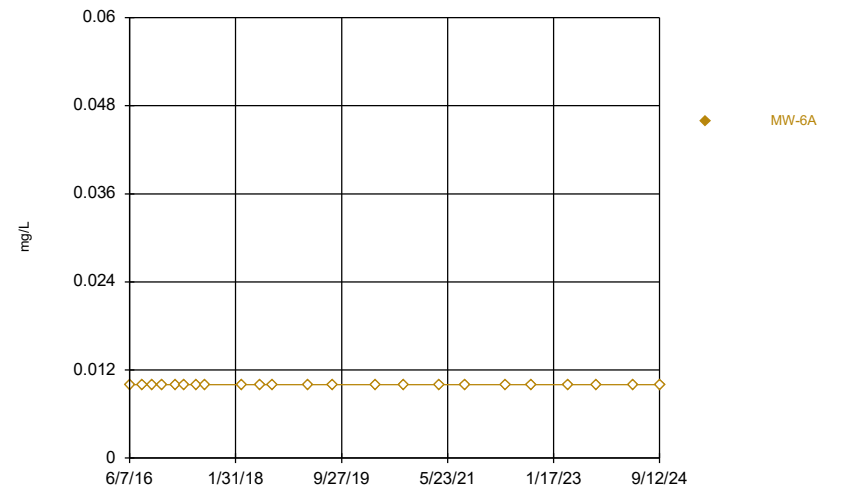
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### Time Series



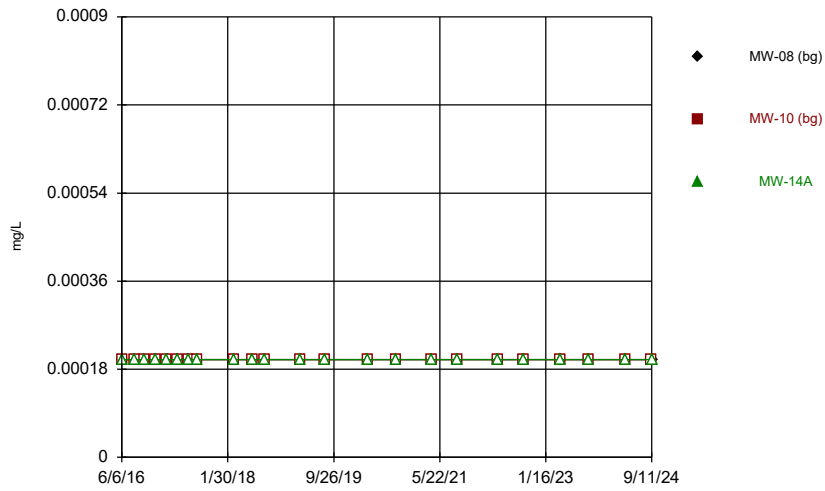
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### Time Series



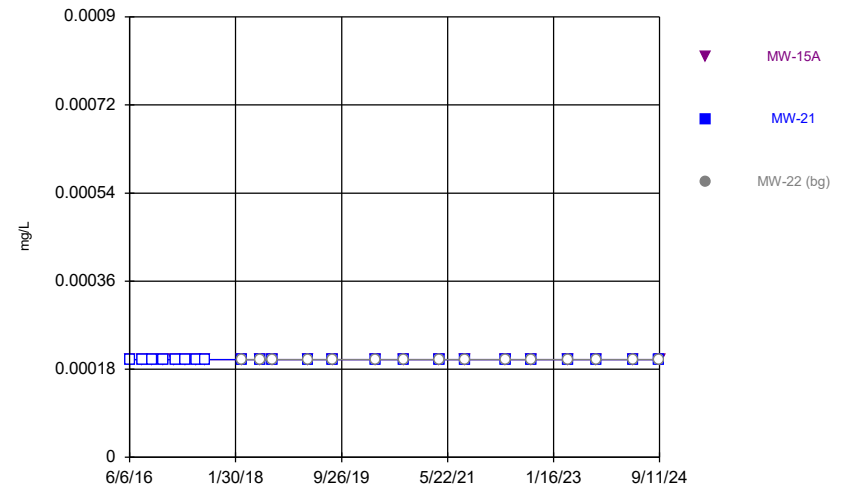
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



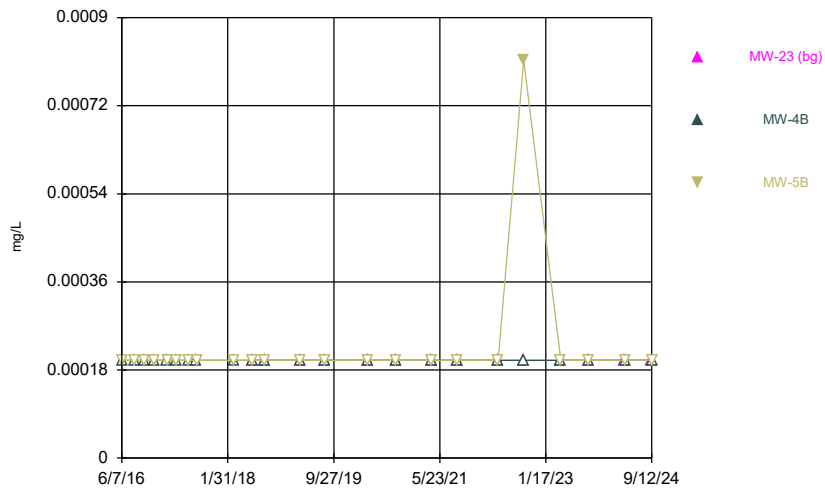
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### Time Series



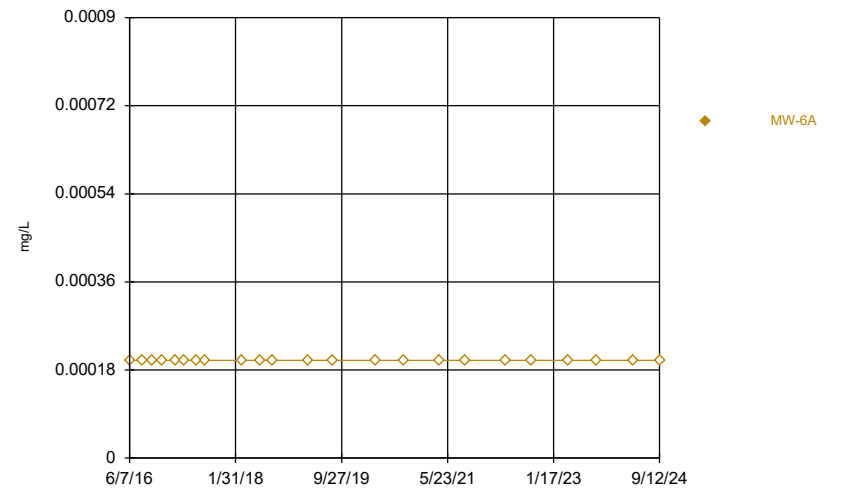
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



Constituent: Mercury Analysis Run 12/11/2024 1:20 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

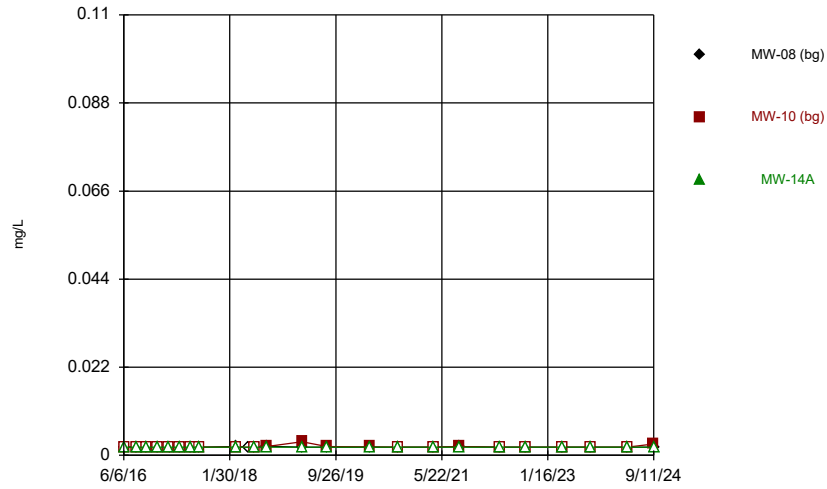
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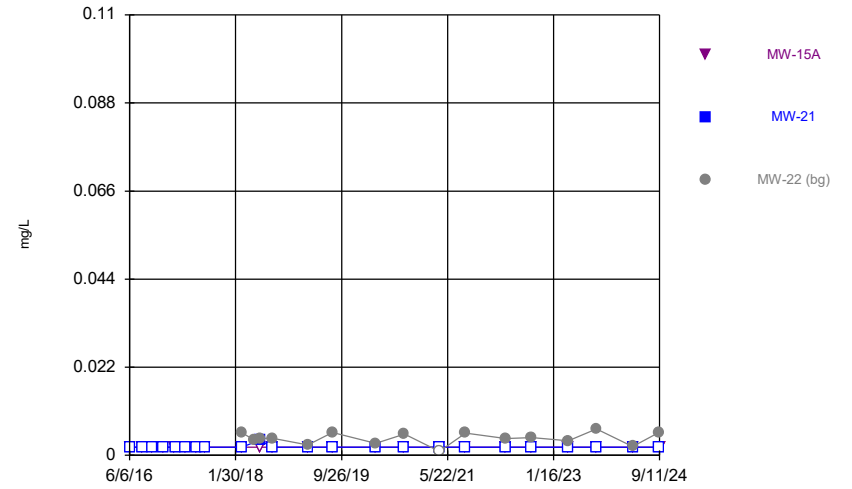


### Time Series



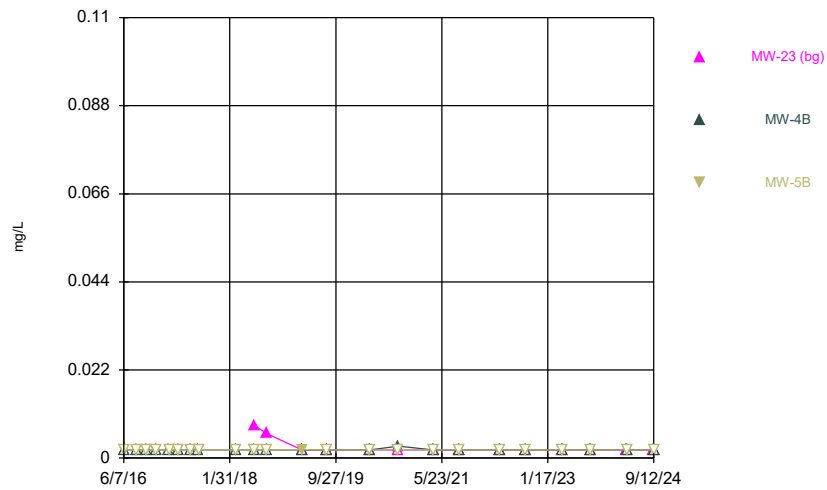
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### Time Series



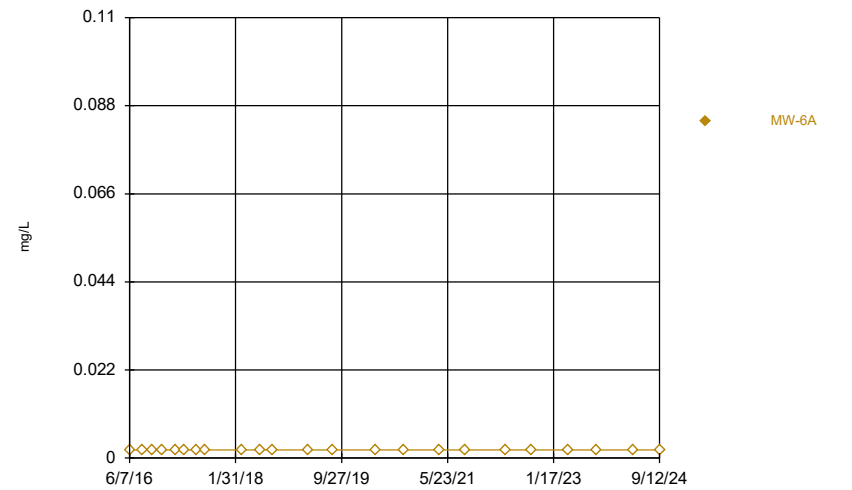
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### Time Series



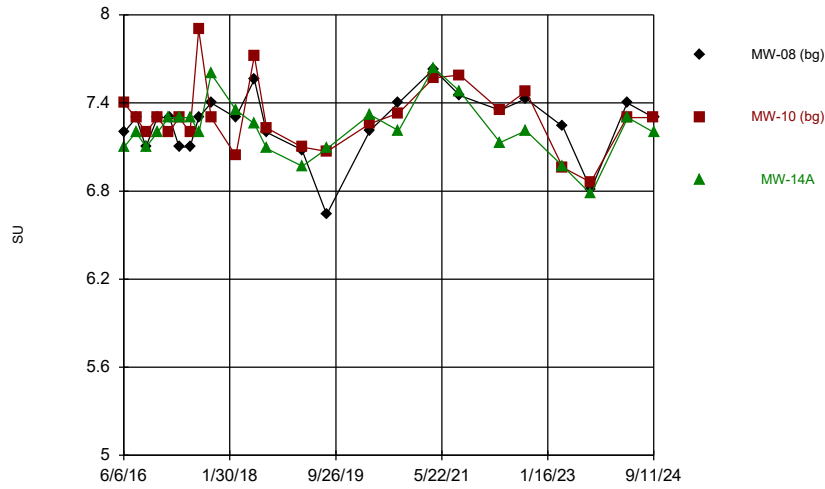
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### Time Series



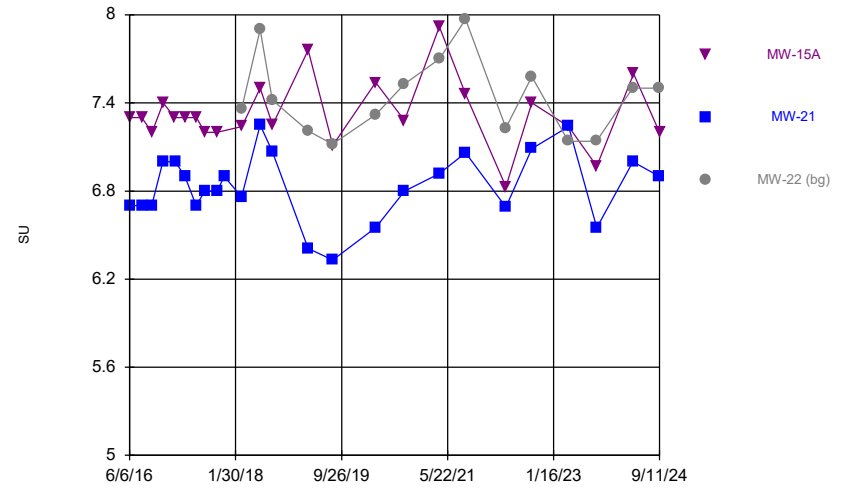
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



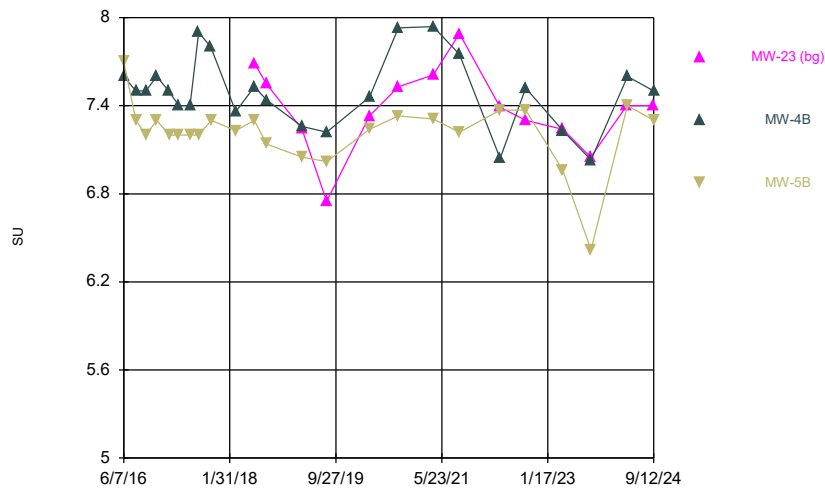
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



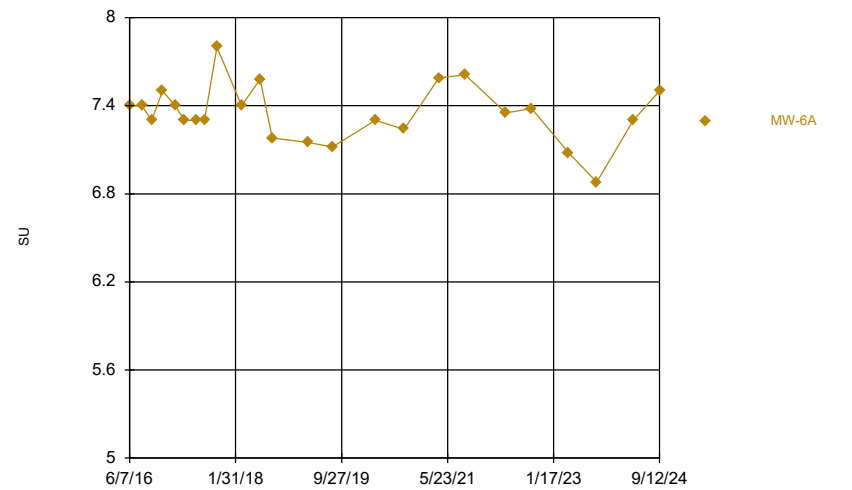
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



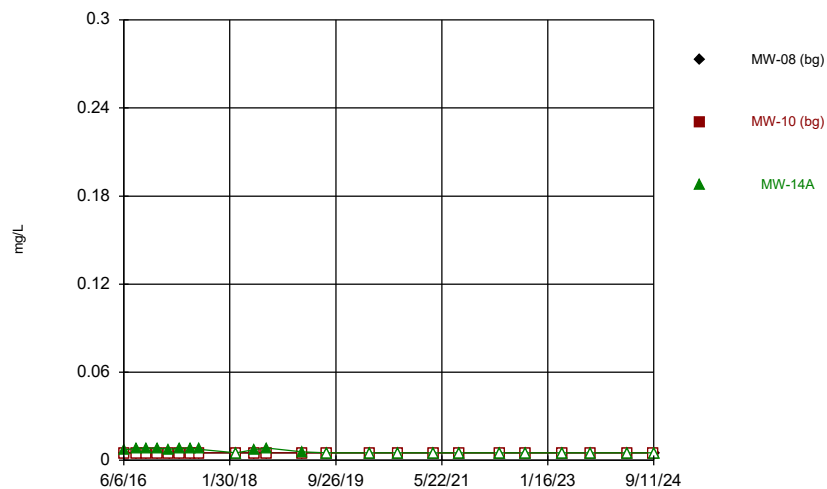
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



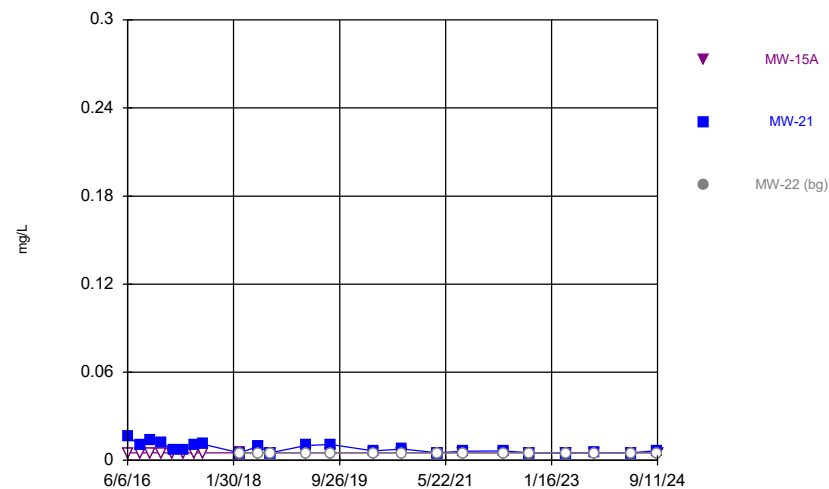
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



Constituent: Selenium Analysis Run 12/11/2024 1:20 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



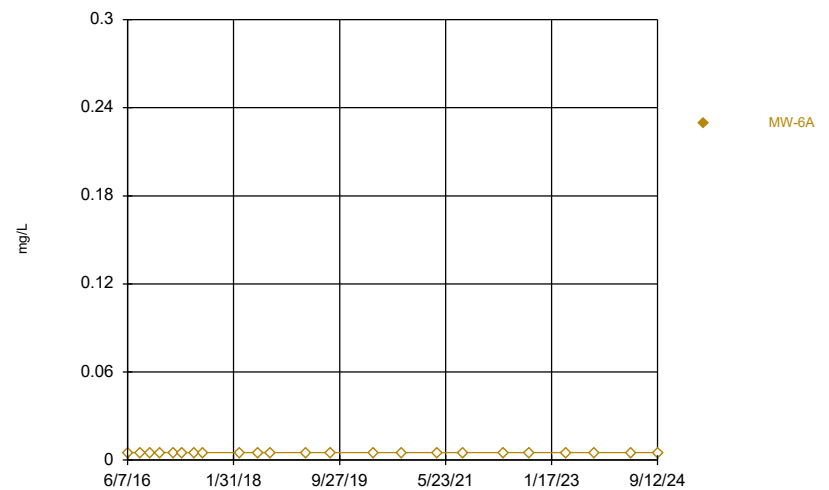
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



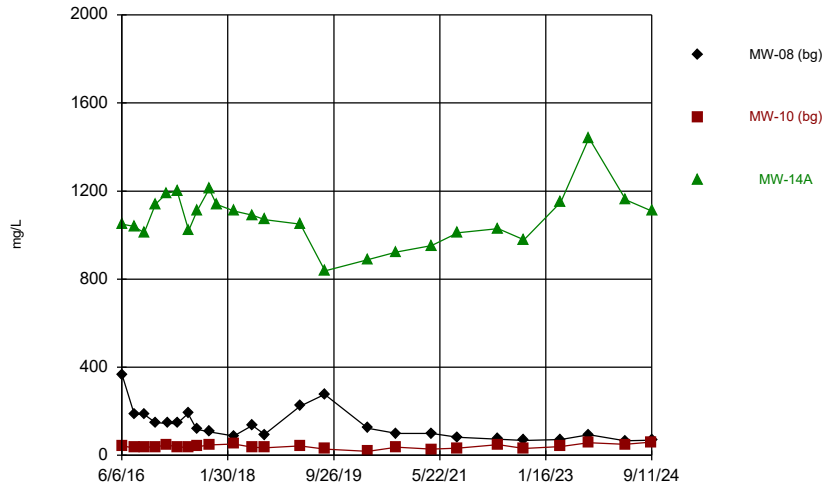
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



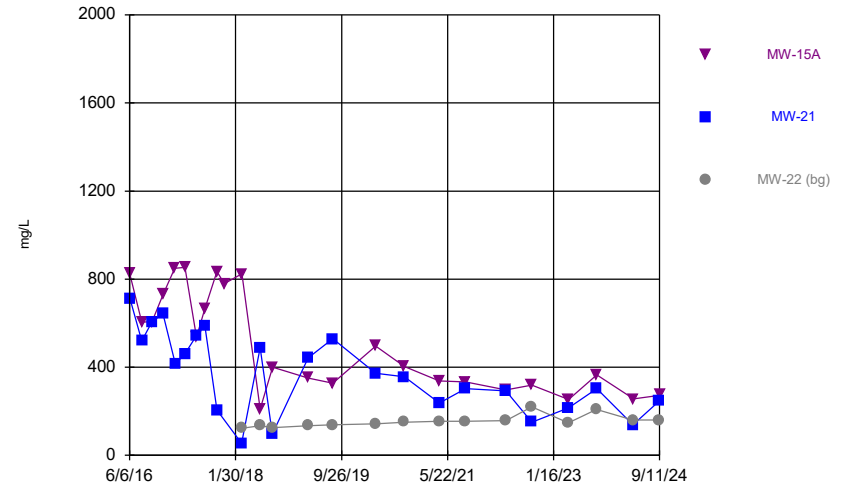
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



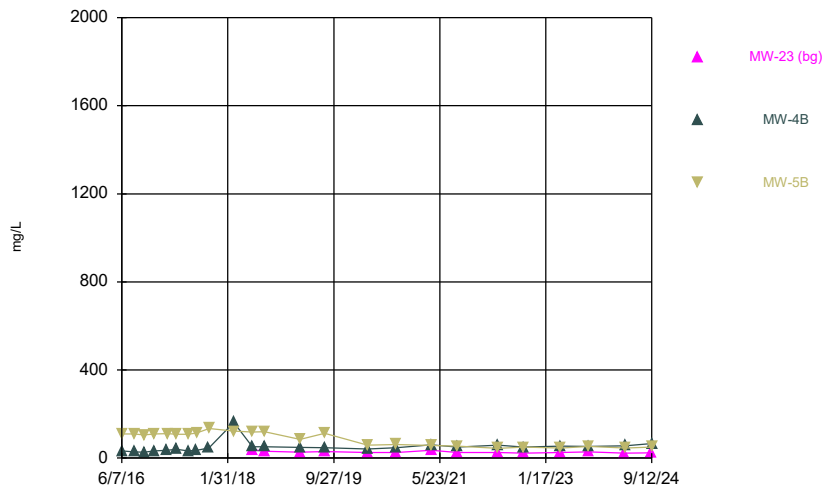
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



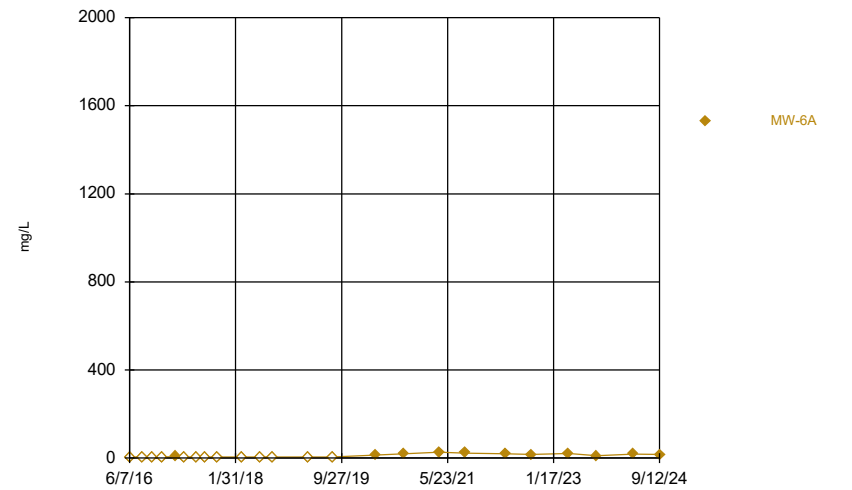
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



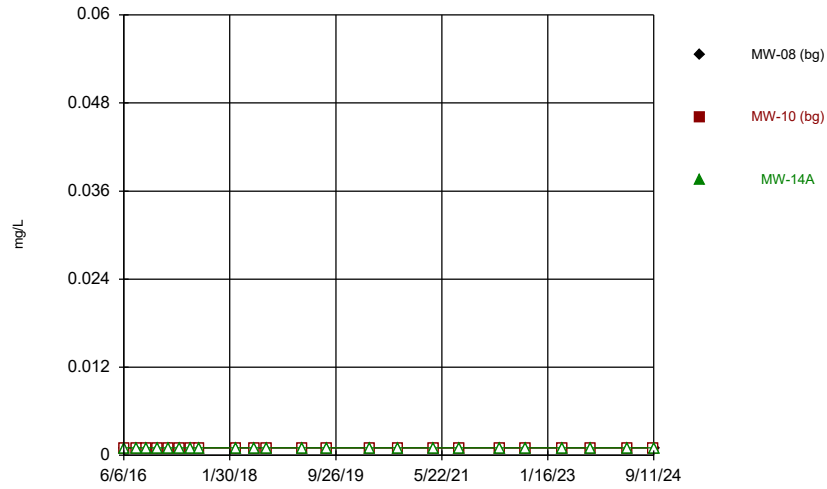
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



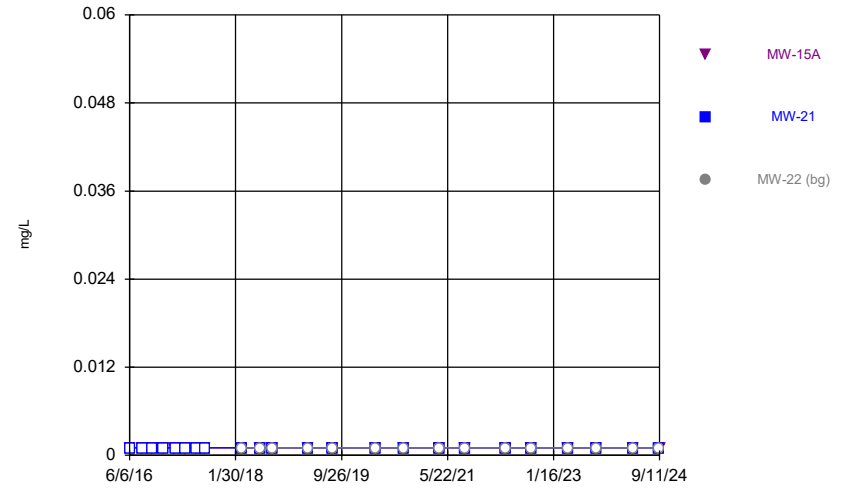
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



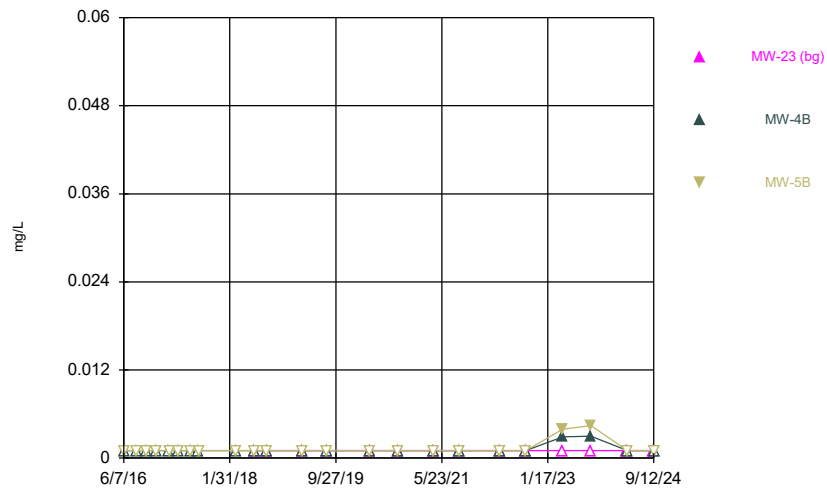
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### Time Series



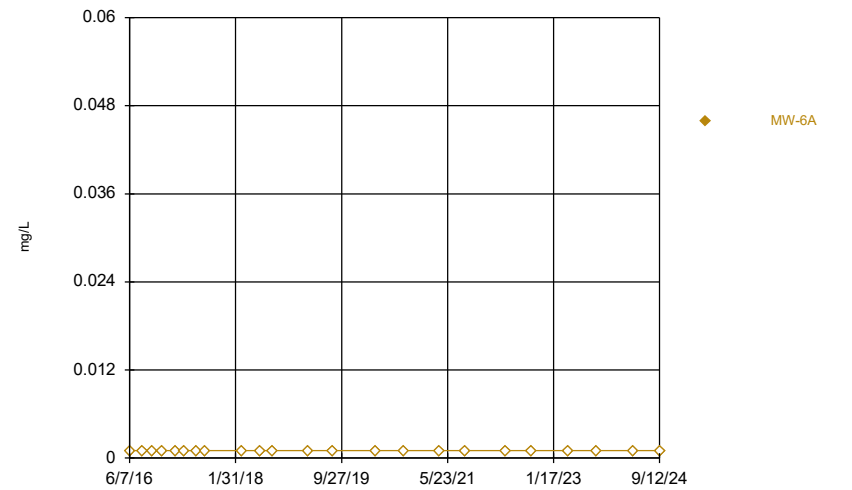
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### Time Series



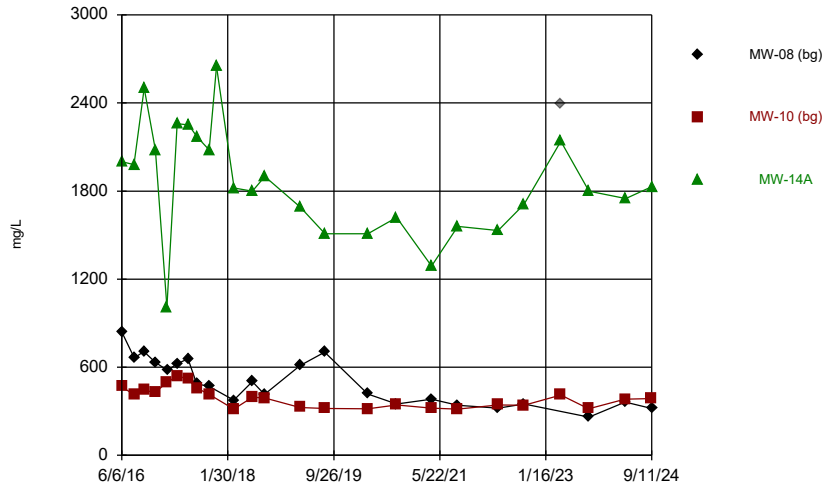
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### Time Series



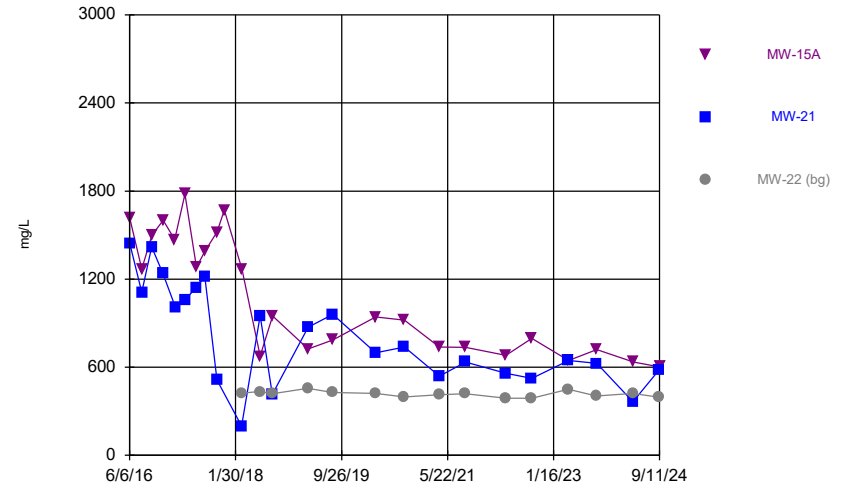
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### Time Series



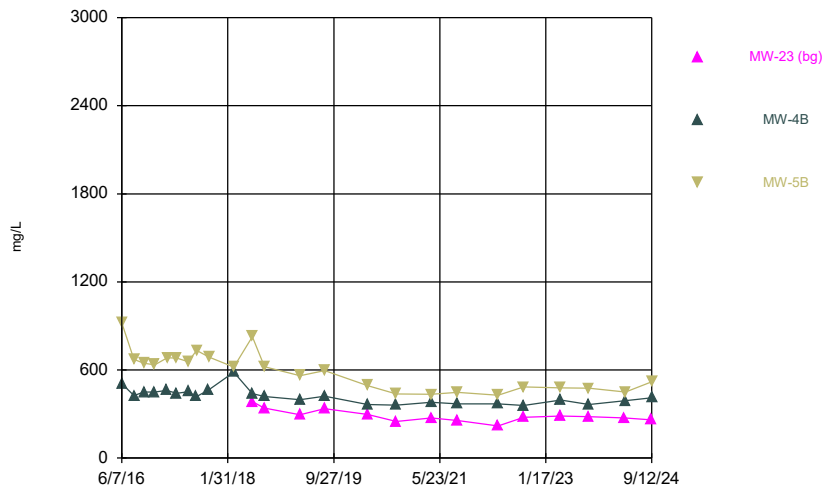
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



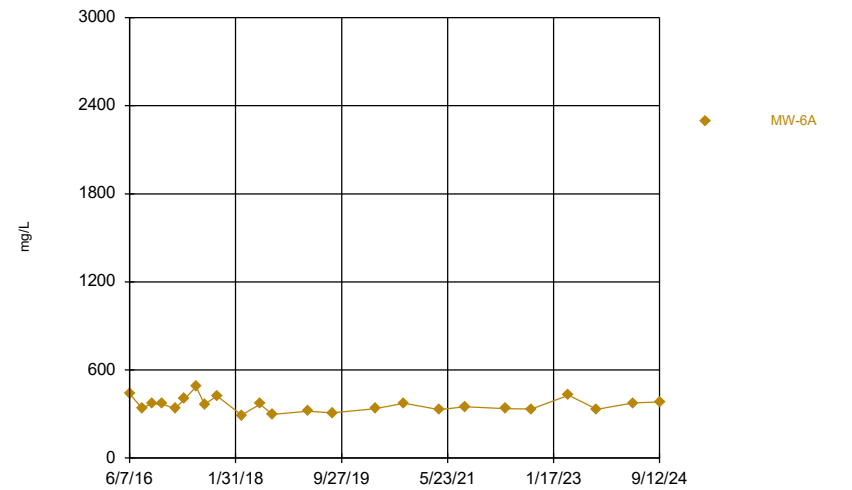
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



Constituent: Total Dissolved Solids Analysis Run 12/11/2024 1:20 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



Constituent: Total Dissolved Solids Analysis Run 12/11/2024 1:20 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

# Time Series

Constituent: Antimony (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.002	
6/7/2016	<0.002		
6/8/2016			<0.008
8/15/2016		<0.002	<0.008
8/16/2016	<0.002		
10/10/2016	<0.002	<0.002	
10/11/2016			<0.008
12/14/2016	<0.002	<0.002	<0.008
2/17/2017		<0.002	<0.008
2/21/2017	<0.002		
4/17/2017	<0.002	<0.002	<0.008
6/19/2017	<0.002	<0.002	
6/21/2017			<0.008
8/7/2017	<0.002	<0.002	
8/8/2017			<0.008
3/5/2018		<0.002	
3/6/2018	<0.002		
3/7/2018			<0.008
6/19/2018	<0.002	<0.002	
6/20/2018			<0.008
8/27/2018	<0.002	<0.002	
8/29/2018			<0.008
3/18/2019	<0.002		
3/19/2019		<0.002	
3/20/2019			<0.008
8/6/2019	<0.002		
8/7/2019		<0.002	<0.008
4/7/2020	<0.002	<0.002	<0.008
9/18/2020	<0.002	<0.002	<0.008
4/5/2021	<0.002	<0.002	<0.008
9/1/2021	<0.002	<0.002	<0.008
4/20/2022	<0.002	<0.002	<0.008
9/14/2022	<0.002	<0.002	<0.008
4/11/2023	<0.002		<0.008
4/12/2023		<0.002	
9/18/2023		<0.002	
9/19/2023	<0.002		<0.008
4/11/2024		<0.002	
4/12/2024	<0.002		
4/15/2024			<0.008
9/10/2024		<0.002	
9/11/2024	<0.002		<0.008

# Time Series

Constituent: Antimony (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.008		
6/8/2016		<0.002	
8/15/2016	<0.008	<0.002	
10/10/2016		<0.002	
10/11/2016	<0.008		
12/12/2016		<0.002	
12/14/2016	<0.008		
2/17/2017	<0.008		
2/21/2017		<0.002	
4/17/2017	<0.008		
4/18/2017		<0.002	
6/20/2017		<0.002	
6/21/2017	<0.008		
8/8/2017	<0.008	<0.002	
3/6/2018		<0.002	<0.002
3/7/2018	<0.008		
6/19/2018		<0.002	<0.002
6/20/2018	<0.008		
8/27/2018			<0.002
8/28/2018		<0.002	
8/29/2018	<0.008		
3/19/2019			<0.002
3/20/2019	<0.008	<0.002	
8/6/2019			<0.002
8/7/2019	<0.008	<0.002	
4/7/2020	<0.008	<0.002	<0.002
9/18/2020	<0.008	<0.002	<0.002
4/5/2021	<0.008	<0.002	<0.002
9/1/2021	<0.008	<0.002	<0.002
4/20/2022	<0.008	<0.002	<0.002
9/14/2022	<0.008	<0.002	<0.002
4/10/2023			<0.002
4/11/2023	<0.008	<0.002	
9/18/2023			<0.002
9/19/2023	<0.008	<0.002	
4/11/2024			<0.002
4/12/2024		<0.002	
4/15/2024	<0.008		
9/10/2024		<0.002	<0.002
9/11/2024	<0.008		



# Time Series

Constituent: Antimony (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.002	<0.002
8/16/2016		<0.002	<0.002
10/11/2016		<0.002	<0.002
12/12/2016		<0.002	<0.002
2/17/2017		<0.002	
2/21/2017			<0.002
4/17/2017		<0.002	<0.002
6/20/2017		<0.002	<0.002
8/7/2017		<0.002	
8/8/2017			<0.002
3/6/2018		<0.002	<0.002
6/20/2018	<0.002		
6/21/2018		<0.002	<0.002
8/27/2018	<0.002		
8/28/2018		<0.002	
8/29/2018			<0.002
3/19/2019	<0.002	<0.002	<0.002
8/6/2019	<0.002		
8/7/2019		<0.002	<0.002
4/7/2020	<0.002	<0.002	<0.002
9/18/2020	<0.002	<0.002	<0.002
4/5/2021	<0.002	<0.002	<0.002
9/1/2021	<0.002	<0.002	<0.002
4/20/2022	<0.002	<0.002	<0.002
9/14/2022	<0.002	<0.002	<0.002
4/12/2023	<0.002	<0.002	<0.002
9/18/2023	<0.002		
9/20/2023		<0.002	<0.002
4/11/2024	<0.002		
4/15/2024		<0.002	<0.002
9/10/2024	<0.002		
9/12/2024		<0.002	<0.002

# Time Series

Constituent: Antimony (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.002
8/16/2016	<0.002
10/11/2016	<0.002
12/12/2016	<0.002
2/21/2017	<0.002
4/17/2017	<0.002
6/21/2017	<0.002
8/8/2017	<0.002
3/6/2018	<0.002
6/21/2018	<0.002
8/29/2018	<0.002
3/19/2019	<0.002
8/7/2019	<0.002
4/7/2020	<0.002
9/18/2020	<0.002
4/5/2021	<0.002
9/1/2021	<0.002
4/20/2022	<0.002
9/14/2022	<0.002
4/12/2023	<0.002
9/20/2023	<0.002
4/15/2024	<0.002
9/12/2024	<0.002

# Time Series

Constituent: Arsenic (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		0.00298	
6/7/2016	<0.002		
6/8/2016			<0.002
8/15/2016		0.00369	<0.002
8/16/2016	<0.002		
10/10/2016	<0.002	0.00328	
10/11/2016			<0.002
12/14/2016	<0.002	0.00312	<0.002
2/17/2017		0.00298	<0.002
2/21/2017	<0.002		
4/17/2017	<0.002	<0.002	<0.002
6/19/2017	<0.002	0.00262	
6/21/2017			<0.002
8/7/2017	<0.002	0.00317	
8/8/2017			<0.002
3/5/2018		<0.002	
3/6/2018	<0.002		
3/7/2018			<0.002
6/19/2018	<0.002	0.00211	
6/20/2018			<0.002
8/27/2018	<0.002	0.0036	
8/29/2018			<0.002
3/18/2019	<0.002		
3/19/2019		0.0056	
3/20/2019			<0.002
8/6/2019	<0.002		
8/7/2019		0.00784	<0.002
4/7/2020	<0.002	0.00697	<0.002
9/18/2020	<0.002	0.00748	<0.002
4/5/2021	<0.002	0.00393	<0.002
9/1/2021	<0.002	0.00781	<0.002
4/20/2022	<0.002	0.00371	<0.002
9/14/2022	<0.002	0.00497	<0.002
4/11/2023	0.00247		<0.002
4/12/2023		0.00224	
9/18/2023		0.00501	
9/19/2023	<0.002		<0.002
4/11/2024		<0.002	
4/12/2024	0.0039		
4/15/2024			<0.002
9/10/2024		0.00525	
9/11/2024	0.00466		<0.002

# Time Series

Constituent: Arsenic (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.002		
6/8/2016		<0.002	
8/15/2016	<0.002	<0.002	
10/10/2016		<0.002	
10/11/2016	<0.002		
12/12/2016		<0.002	
12/14/2016	<0.002		
2/17/2017	<0.002		
2/21/2017		<0.002	
4/17/2017	<0.002		
4/18/2017		<0.002	
6/20/2017		<0.002	
6/21/2017	<0.002		
8/8/2017	<0.002	<0.002	
3/6/2018		<0.002	<0.002
3/7/2018	<0.002		
6/19/2018		<0.002	0.00245
6/20/2018	<0.002		
8/27/2018			0.00261
8/28/2018		<0.002	
8/29/2018	<0.002		
3/19/2019			<0.002
3/20/2019	<0.002	<0.002	
8/6/2019			<0.002
8/7/2019	<0.002	<0.002	
4/7/2020	<0.002	<0.002	<0.002
9/18/2020	<0.002	<0.002	<0.002
4/5/2021	<0.002	<0.002	0.00289
9/1/2021	<0.002	<0.002	0.00267
4/20/2022	<0.002	<0.002	0.0034
9/14/2022	<0.002	<0.002	0.00285
4/10/2023			0.00421
4/11/2023	<0.002	<0.002	
9/18/2023			0.00421
9/19/2023	<0.002	<0.002	
4/11/2024			0.00634
4/12/2024		<0.002	
4/15/2024	<0.002		
9/10/2024		<0.002	0.00749
9/11/2024	<0.002		

# Time Series

Constituent: Arsenic (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.002	<0.002
8/16/2016		<0.002	<0.002
10/11/2016		<0.002	<0.002
12/12/2016		<0.002	<0.002
2/17/2017		<0.002	
2/21/2017			<0.002
4/17/2017		<0.002	<0.002
6/20/2017		<0.002	<0.002
8/7/2017		<0.002	
8/8/2017			<0.002
3/6/2018		<0.002	<0.002
6/20/2018	<0.002		
6/21/2018		<0.002	<0.002
8/27/2018	<0.002		
8/28/2018		<0.002	
8/29/2018			<0.002
3/19/2019	<0.002	<0.002	<0.002
8/6/2019	<0.002		
8/7/2019		<0.002	<0.002
4/7/2020	<0.002	<0.002	<0.002
9/18/2020	<0.002	<0.002	<0.002
4/5/2021	<0.002	<0.002	<0.002
9/1/2021	<0.002	<0.002	<0.002
4/20/2022	<0.002	<0.002	<0.002
9/14/2022	<0.002	<0.002	<0.002
4/12/2023	<0.002	<0.002	<0.002
9/18/2023	<0.002		
9/20/2023		<0.002	<0.002
4/11/2024	<0.002		
4/15/2024		<0.002	<0.002
9/10/2024	<0.002		
9/12/2024		<0.002	<0.002

# Time Series

Constituent: Arsenic (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.002
8/16/2016	<0.002
10/11/2016	<0.002
12/12/2016	<0.002
2/21/2017	<0.002
4/17/2017	<0.002
6/21/2017	<0.002
8/8/2017	<0.002
3/6/2018	<0.002
6/21/2018	<0.002
8/29/2018	<0.002
3/19/2019	<0.002
8/7/2019	<0.002
4/7/2020	<0.002
9/18/2020	<0.002
4/5/2021	<0.002
9/1/2021	<0.002
4/20/2022	<0.002
9/14/2022	<0.002
4/12/2023	<0.002
9/20/2023	<0.002
4/15/2024	<0.002
9/12/2024	<0.002

# Time Series

Constituent: Barium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		0.168	
6/7/2016	0.0861		
6/8/2016			0.0443
8/15/2016		0.161	0.0402
8/16/2016	0.0671		
10/10/2016	0.0706	0.163	
10/11/2016			0.0391
12/14/2016	0.0645	0.15	0.0383
2/17/2017		0.151	0.0306
2/21/2017	0.0594 (F1)		
4/17/2017	0.0636	0.138	0.0341
6/19/2017	0.076	0.154	
6/21/2017			0.0338
8/7/2017	0.0596	0.157	
8/8/2017			0.031
3/5/2018		0.129	
3/6/2018	0.0617		
3/7/2018			0.0285
6/19/2018	0.0761	0.162	
6/20/2018			0.0314
8/27/2018	0.0649	0.216	
8/29/2018			0.0344
3/18/2019	0.0751		
3/19/2019		0.185	
3/20/2019			0.0328
8/6/2019	0.0733		
8/7/2019		0.215	0.0398
4/7/2020	0.0613	0.199	0.0266
9/18/2020	0.0549	0.227	0.0328
4/5/2021	0.0596	0.196	0.0355
9/1/2021	0.0623	0.233	0.0345
4/20/2022	0.0631	0.208	0.0327
9/14/2022	0.0703	0.223	0.034
4/11/2023	0.07		0.032
4/12/2023		0.19	
9/18/2023		0.233	
9/19/2023	0.0782		0.0348
4/11/2024		0.193	
4/12/2024	0.0857		
4/15/2024			0.0323
9/10/2024		0.219	
9/11/2024	0.0944		0.0338

# Time Series

Constituent: Barium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	2.13 (o)		
6/8/2016		0.0573	
8/15/2016	0.044	0.0482	
10/10/2016		0.0606	
10/11/2016	0.0426		
12/12/2016		0.056	
12/14/2016	0.0406		
2/17/2017	0.0402		
2/21/2017		0.0735	
4/17/2017	0.0364		
4/18/2017		0.0356	
6/20/2017		0.0461	
6/21/2017	0.0327		
8/8/2017	0.0338	0.0499	
3/6/2018		0.0148	0.15
3/7/2018	0.0352		
6/19/2018		0.0515	0.184
6/20/2018	0.0338		
8/27/2018			0.181
8/28/2018		0.0622	
8/29/2018	0.0335		
3/19/2019			0.209
3/20/2019	0.037	0.0511	
8/6/2019			0.215
8/7/2019	0.047	0.0624	
4/7/2020	0.0389	0.0352	0.222
9/18/2020	0.0416	0.0407	0.222
4/5/2021	0.0365	0.0309	0.242
9/1/2021	0.0355	0.0434	0.247
4/20/2022	0.0443	0.036	0.239
9/14/2022	0.0327	0.0447	0.243
4/10/2023			0.227
4/11/2023	0.0299	0.031	
9/18/2023			0.256
9/19/2023	0.0338	0.0559	
4/11/2024			0.271
4/12/2024		0.031	
4/15/2024	0.0353		
9/10/2024		0.0555	0.268
9/11/2024	0.0335		



# Time Series

Constituent: Barium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		0.15	0.331
8/16/2016		0.128	0.295
10/11/2016		0.131	0.304
12/12/2016		0.139	0.315
2/17/2017		0.143	
2/21/2017			0.316
4/17/2017		0.111	0.296
6/20/2017		0.133	0.31
8/7/2017		0.133	
8/8/2017			0.3
3/6/2018		0.117	0.341
6/20/2018	0.106		
6/21/2018		0.144	0.336
8/27/2018	0.0779		
8/28/2018		0.149	
8/29/2018			0.357
3/19/2019	0.0922	0.161	0.326
8/6/2019	0.0635		
8/7/2019		0.147	0.301
4/7/2020	0.0654	0.156	0.25
9/18/2020	0.0491	0.147	0.239
4/5/2021	0.0608	0.169	0.252
9/1/2021	0.0497	0.186	0.241
4/20/2022	0.0572	0.191	0.258
9/14/2022	0.0507	0.188	0.253
4/12/2023	0.0518	0.173	0.237
9/18/2023	0.0533		
9/20/2023		0.181	0.274
4/11/2024	0.0547		
4/15/2024		0.168	0.243
9/10/2024	0.0521		
9/12/2024		0.184	0.258

# Time Series

Constituent: Barium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	0.209
8/16/2016	0.199
10/11/2016	0.196
12/12/2016	0.216
2/21/2017	0.197
4/17/2017	0.152
6/21/2017	0.197
8/8/2017	0.19
3/6/2018	0.206
6/21/2018	0.222
8/29/2018	0.206
3/19/2019	0.2
8/7/2019	0.211
4/7/2020	0.216
9/18/2020	0.231
4/5/2021	0.245
9/1/2021	0.248
4/20/2022	0.249
9/14/2022	0.229
4/12/2023	0.246
9/20/2023	0.222
4/15/2024	0.235
9/12/2024	0.249

# Time Series

Constituent: Beryllium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.001	
6/7/2016	<0.001		
6/8/2016			<0.001
8/15/2016		<0.001	<0.001
8/16/2016	<0.001		
10/10/2016	<0.001	<0.001	
10/11/2016			<0.001
12/14/2016	<0.001	<0.001	<0.001
2/17/2017		<0.001	<0.001
2/21/2017	<0.001		
4/17/2017	<0.001	<0.001	<0.001
6/19/2017	<0.001	<0.001	
6/21/2017			<0.001
8/7/2017	<0.001	<0.001	
8/8/2017			<0.001
3/5/2018		<0.001	
3/6/2018	<0.001		
3/7/2018			<0.001
6/19/2018	<0.001	<0.001	
6/20/2018			<0.001
8/27/2018	<0.001	<0.001	
8/29/2018			<0.001
3/18/2019	<0.001		
3/19/2019		<0.001	
3/20/2019			<0.001
8/6/2019	<0.001		
8/7/2019		<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001
4/20/2022	<0.001	<0.001	<0.001
9/14/2022	<0.001	<0.001	<0.001
4/11/2023	<0.001		<0.001
4/12/2023		<0.001	
9/18/2023		<0.001	
9/19/2023	<0.001		<0.001
4/11/2024		<0.001	
4/12/2024	<0.001		
4/15/2024			<0.001
9/10/2024		<0.001	
9/11/2024	<0.001		<0.001

# Time Series

Constituent: Beryllium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.001		
6/8/2016		<0.001	
8/15/2016	<0.001	<0.001	
10/10/2016		<0.001	
10/11/2016	<0.001		
12/12/2016		<0.001	
12/14/2016	<0.001		
2/17/2017	<0.001		
2/21/2017		<0.001	
4/17/2017	<0.001		
4/18/2017		<0.001	
6/20/2017		<0.001	
6/21/2017	<0.001		
8/8/2017	<0.001	<0.001	
3/6/2018		<0.001	<0.001
3/7/2018	<0.001		
6/19/2018		<0.001	<0.001
6/20/2018	<0.001		
8/27/2018			<0.001
8/28/2018		<0.001	
8/29/2018	<0.001		
3/19/2019			<0.001
3/20/2019	<0.001	<0.001	
8/6/2019			<0.001
8/7/2019	<0.001	<0.001	
4/7/2020	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001
4/20/2022	<0.001	<0.001	<0.001
9/14/2022	<0.001	<0.001	<0.001
4/10/2023			<0.001
4/11/2023	<0.001	<0.001	
9/18/2023			<0.001
9/19/2023	<0.001	<0.001	
4/11/2024			<0.001
4/12/2024		<0.001	
4/15/2024	<0.001		
9/10/2024		<0.001	<0.001
9/11/2024	<0.001		

# Time Series

Constituent: Beryllium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.001	<0.001
8/16/2016		<0.001	<0.001
10/11/2016		<0.001	<0.001
12/12/2016		<0.001	<0.001
2/17/2017		<0.001	
2/21/2017			<0.001
4/17/2017		<0.001	<0.001
6/20/2017		<0.001	<0.001
8/7/2017		<0.001	
8/8/2017			<0.001
3/6/2018		<0.001	<0.001
6/20/2018	<0.001		
6/21/2018		<0.001	<0.001
8/27/2018	<0.001		
8/28/2018		<0.001	
8/29/2018			<0.001
3/19/2019	<0.001	<0.001	<0.001
8/6/2019	<0.001		
8/7/2019		<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001
4/20/2022	<0.001	<0.001	<0.001
9/14/2022	<0.001	<0.001	<0.001
4/12/2023	<0.001	<0.001	<0.001
9/18/2023	<0.001		
9/20/2023		<0.001	<0.001
4/11/2024	<0.001		
4/15/2024		<0.001	<0.001
9/10/2024	<0.001		
9/12/2024		<0.001	<0.001

# Time Series

Constituent: Beryllium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.001
8/16/2016	<0.001
10/11/2016	<0.001
12/12/2016	<0.001
2/21/2017	<0.001
4/17/2017	<0.001
6/21/2017	<0.001
8/8/2017	<0.001
3/6/2018	<0.001
6/21/2018	<0.001
8/29/2018	<0.001
3/19/2019	<0.001
8/7/2019	<0.001
4/7/2020	<0.001
9/18/2020	<0.001
4/5/2021	<0.001
9/1/2021	<0.001
4/20/2022	<0.001
9/14/2022	<0.001
4/12/2023	<0.001
9/20/2023	<0.001
4/15/2024	<0.001
9/12/2024	<0.001

# Time Series

Constituent: Boron (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.1	
6/7/2016	<0.1		
6/8/2016			15.8
8/15/2016		<0.1	17.9
8/16/2016	<0.1		
10/10/2016	<0.1	<0.1	
10/11/2016			19.3
12/14/2016	<0.1	<0.1	14.7
2/17/2017		<0.1	13.1
2/21/2017	<0.1		
4/17/2017	<0.1	<0.1	11.3
6/19/2017	<0.1	<0.1	
6/21/2017			16.3
8/7/2017	<0.1	<0.1	
8/8/2017			13
10/16/2017	<0.1	<0.1	
10/17/2017			16
11/28/2017			13.7 (R)
3/5/2018		<0.1	
3/6/2018	<0.1		
3/7/2018			11
6/19/2018	<0.1	<0.1	
6/20/2018			15
8/27/2018	<0.1	<0.1	
8/29/2018			14
3/18/2019	<0.1		
3/19/2019		<0.1	
3/20/2019			15.5
8/6/2019	0.205		
8/7/2019		<0.1	17.6
4/7/2020	<0.1	<0.1	17.4
9/18/2020	<0.1	<0.1	19.5
4/5/2021	<0.1	<0.1	17.2
9/1/2021	<0.1	<0.1	17.1
4/20/2022	<0.1	<0.1	15.2
9/14/2022	<0.1	<0.1	15.1
4/11/2023	<0.1		14.8
4/12/2023		<0.1	
9/18/2023		<0.1	
9/19/2023	<0.1		18.1
4/11/2024		<0.1	
4/12/2024	<0.1		
4/15/2024			15.2
9/10/2024		<0.1	
9/11/2024	<0.1		17.7

# Time Series

Constituent: Boron (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	16.8		
6/8/2016		<2	
8/15/2016	20.6	7.23	
10/10/2016		8.45	
10/11/2016	17.9		
12/12/2016		6.93	
12/14/2016	18.4		
2/17/2017	14.9		
2/21/2017		4.87	
4/17/2017	14.7		
4/18/2017		4.49	
6/20/2017		7.36	
6/21/2017	16.4		
8/8/2017	14.7	7.05	
10/16/2017		3.33	
10/17/2017	19.2		
11/28/2017	12.9 (R)	2.24 (R)	
3/6/2018		0.885	<0.1
3/7/2018	9.8		
6/19/2018		6.84	<0.1
6/20/2018	10.5		
8/27/2018			<0.1
8/28/2018		1.36	
8/29/2018	14.6		
3/19/2019			0.299
3/20/2019	8.35	6.95	
8/6/2019			<0.1
8/7/2019	7.56	8.46	
4/7/2020	10.6	6.76	<0.1
9/18/2020	14.5	6.82	0.263
4/5/2021	10.3	5.24	<0.1
9/1/2021	11.1	5.88	<0.1
4/20/2022	6.98	3.57	<0.1
9/14/2022	10.4	3.69	0.322
4/10/2023			0.247
4/11/2023	5.8	3.35	
9/18/2023			0.207
9/19/2023	9.28	4.42	
4/11/2024			<0.1
4/12/2024		2.31	
4/15/2024	5.8		
9/10/2024		3.68	0.243
9/11/2024	8.5		



# Time Series

Constituent: Boron (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.1	<0.1
8/16/2016		<0.1	<0.1
10/11/2016		<0.1	<0.1
12/12/2016		<0.1	<0.1
2/17/2017		<0.1	
2/21/2017			<0.1
4/17/2017		<0.1	<0.1
6/20/2017		<0.1	<0.1
8/7/2017		<0.1	
8/8/2017			<0.1
10/16/2017		<0.1	
10/17/2017			<0.1
3/6/2018		0.66	<0.1
6/20/2018	<0.1		
6/21/2018		<0.1	<0.1
8/27/2018	<0.1		
8/28/2018		<0.1	
8/29/2018			<0.1
3/19/2019	<0.1	<0.1	<0.1
8/6/2019	<0.1		
8/7/2019		<0.1	<0.1
4/7/2020	<0.1	<0.1	<0.1
9/18/2020	0.15	<0.1	<0.1
4/5/2021	<0.1	<0.1	<0.1
9/1/2021	<0.1	<0.1	<0.1
4/20/2022	<0.1	<0.1	<0.1
9/14/2022	0.204	<0.1	<0.1
4/12/2023	0.145	<0.1	<0.1
9/18/2023	0.128		
9/20/2023		<0.1	<0.1
4/11/2024	<0.1		
4/15/2024		<0.1	<0.1
9/10/2024	0.126		
9/12/2024		<0.1	<0.1

# Time Series

Constituent: Boron (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.1
8/16/2016	<0.1
10/11/2016	<0.1
12/12/2016	<0.1
2/21/2017	<0.1
4/17/2017	<0.1
6/21/2017	<0.1
8/8/2017	<0.1
10/17/2017	<0.1
3/6/2018	<0.1
6/21/2018	<0.1
8/29/2018	<0.1
3/19/2019	<0.1
8/7/2019	<0.1
4/7/2020	<0.1
9/18/2020	<0.1
4/5/2021	<0.1
9/1/2021	<0.1
4/20/2022	<0.1
9/14/2022	<0.1
4/12/2023	<0.1
9/20/2023	<0.1
4/15/2024	<0.1
9/12/2024	<0.1

# Time Series

Constituent: Cadmium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.0002	
6/7/2016	<0.0002		
6/8/2016			<0.0002
8/15/2016		<0.0002	<0.0002
8/16/2016	<0.0002		
10/10/2016	<0.0002	<0.0002	
10/11/2016			<0.0002
12/14/2016	<0.0002	<0.0002	<0.0002
2/17/2017		<0.0002	<0.0002
2/21/2017	<0.0002		
4/17/2017	<0.0002	<0.0002	<0.0002
6/19/2017	<0.0002	<0.0002	
6/21/2017			<0.0002
8/7/2017	<0.0002	<0.0002	
8/8/2017			<0.0002
3/5/2018		<0.0002	
3/6/2018	<0.0002		
3/7/2018			<0.0002
6/19/2018	<0.0002	<0.0002	
6/20/2018			<0.0002
8/27/2018	<0.0002	<0.0002	
8/29/2018			<0.0002
3/18/2019	<0.0002		
3/19/2019		<0.0002	
3/20/2019			<0.0002
8/6/2019	<0.0002		
8/7/2019		<0.0002	<0.0002
4/7/2020	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002
4/20/2022	<0.0002	<0.0002	<0.0002
9/14/2022	<0.0002	<0.0002	<0.0002
4/11/2023	<0.0002		<0.0002
4/12/2023		<0.0002	
9/18/2023		<0.0002	
9/19/2023	<0.0002		<0.0002
4/11/2024		<0.0002	
4/12/2024	<0.0002		
4/15/2024			<0.0002
9/10/2024		<0.0002	
9/11/2024	<0.0002		<0.0002

# Time Series

Constituent: Cadmium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.0002		
6/8/2016		<0.0002	
8/15/2016	<0.0002	<0.0002	
10/10/2016		<0.0002	
10/11/2016	<0.0002		
12/12/2016		<0.0002	
12/14/2016	<0.0002		
2/17/2017	<0.0002		
2/21/2017		<0.0002	
4/17/2017	<0.0002		
4/18/2017		<0.0002	
6/20/2017		<0.0002	
6/21/2017	<0.0002		
8/8/2017	<0.0002	<0.0002	
3/6/2018		<0.0002	<0.0002
3/7/2018	<0.0002		
6/19/2018		<0.0002	<0.0002
6/20/2018	<0.0002		
8/27/2018			<0.0002
8/28/2018		<0.0002	
8/29/2018	<0.0002		
3/19/2019			<0.0002
3/20/2019	<0.0002	<0.0002	
8/6/2019			<0.0002
8/7/2019	<0.0002	<0.0002	
4/7/2020	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002
4/20/2022	<0.0002	<0.0002	<0.0002
9/14/2022	<0.0002	<0.0002	<0.0002
4/10/2023			<0.0002
4/11/2023	<0.0002	<0.0002	
9/18/2023			<0.0002
9/19/2023	<0.0002	<0.0002	
4/11/2024			<0.0002
4/12/2024		<0.0002	
4/15/2024	<0.0002		
9/10/2024		<0.0002	<0.0002
9/11/2024	<0.0002		

# Time Series

Constituent: Cadmium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.0002	<0.0002
8/16/2016		<0.0002	<0.0002
10/11/2016		<0.0002	<0.0002
12/12/2016		<0.0002	<0.0002
2/17/2017		<0.0002	
2/21/2017			<0.0002
4/17/2017		<0.0002	<0.0002
6/20/2017		<0.0002	<0.0002
8/7/2017		<0.0002	
8/8/2017			<0.0002
3/6/2018		<0.0002	<0.0002
6/20/2018	<0.0002		
6/21/2018		<0.0002	<0.0002
8/27/2018	<0.0002		
8/28/2018		<0.0002	
8/29/2018			<0.0002
3/19/2019	<0.0002	<0.0002	<0.0002
8/6/2019	<0.0002		
8/7/2019		<0.0002	<0.0002
4/7/2020	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002
4/20/2022	<0.0002	<0.0002	<0.0002
9/14/2022	<0.0002	<0.0002	<0.0002
4/12/2023	<0.0002	<0.0002	<0.0002
9/18/2023	<0.0002		
9/20/2023		0.000285	0.000255
4/11/2024	<0.0002		
4/15/2024		<0.0002	<0.0002
9/10/2024	<0.0002		
9/12/2024		<0.0002	<0.0002

# Time Series

Constituent: Cadmium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.0002
8/16/2016	<0.0002
10/11/2016	<0.0002
12/12/2016	<0.0002
2/21/2017	<0.0002
4/17/2017	<0.0002
6/21/2017	<0.0002
8/8/2017	<0.0002
3/6/2018	<0.0002
6/21/2018	<0.0002
8/29/2018	<0.0002
3/19/2019	<0.0002
8/7/2019	<0.0002
4/7/2020	<0.0002
9/18/2020	<0.0002
4/5/2021	<0.0002
9/1/2021	<0.0002
4/20/2022	<0.0002
9/14/2022	<0.0002
4/12/2023	<0.0002
9/20/2023	<0.0002
4/15/2024	<0.0002
9/12/2024	<0.0002

# Time Series

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		89.3	
6/7/2016	152		
6/8/2016			281
8/15/2016		80.7	311
8/16/2016	117		
10/10/2016	118	83.3	
10/11/2016			308
12/14/2016	109	86.5	333
2/17/2017		81.2	268
2/21/2017	89.9		
4/17/2017	96.5	79.2	310
6/19/2017	113	83.6	
6/21/2017			307
8/7/2017	91.3	85.5	
8/8/2017			296
10/16/2017	77	83.3	
10/17/2017			310
11/28/2017			301 (R)
3/5/2018		77.3	
3/6/2018	74.7		
3/7/2018			278
6/19/2018	115	88.5	
6/20/2018			297
8/27/2018	83.6	85.4	
8/29/2018			309
3/18/2019	97.6		
3/19/2019		76.3	
3/20/2019			290
8/6/2019	132		
8/7/2019		78.9	255
4/7/2020	92.4	75.4	245
9/18/2020	77.7	74.2	244
4/5/2021	81.2	78.8	259
9/1/2021	78.3	80	270
4/20/2022	69.6	90.4	289
9/14/2022	76.8	82	301
4/11/2023	78.2		318
4/12/2023		83.7	
9/18/2023		84.7	
9/19/2023	79.4		291
4/11/2024		96.2	
4/12/2024	84.2		
4/15/2024			344
9/10/2024		97.8	
9/11/2024	88.6		327

# Time Series

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	206		
6/8/2016		37.2	
8/15/2016	199	146	
10/10/2016		185	
10/11/2016	203		
12/12/2016		178	
12/14/2016	244		
2/17/2017	233		
2/21/2017		118	
4/17/2017	226		
4/18/2017		110	
6/20/2017		149	
6/21/2017	186		
8/8/2017	206	163	
10/16/2017		62.3	
10/17/2017	218		
11/28/2017	217 (R)		
3/6/2018		25.1	69.8
3/7/2018	229		
6/19/2018		159	91.5
6/20/2018	102		
8/27/2018			80.7
8/28/2018		78.7	
8/29/2018	155		
3/19/2019			91.6
3/20/2019	118	142	
8/6/2019			83.8
8/7/2019	111	145	
4/7/2020	163	104	80.9
9/18/2020	134	101	75.5
4/5/2021	128	79.5	78.4
9/1/2021	125	93.5	79.4
4/20/2022	127	97.5	80.2
9/14/2022	132	88.2	79.6
4/10/2023			80.4
4/11/2023	110	76	
9/18/2023			79
9/19/2023	126	96	
4/11/2024			83.1
4/12/2024		59.9	
4/15/2024	118		
9/10/2024		96.6	84.3
9/11/2024	129		



# Time Series

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		98.2	147
8/16/2016		88.8	139
10/11/2016		89.3	140
12/12/2016		94.5	147
2/17/2017		86.8	
2/21/2017			126
4/17/2017		85.9	130
6/20/2017		88.7	140
8/7/2017		89.7	
8/8/2017			139
10/16/2017		85.3	
10/17/2017			136
3/6/2018		95.8	134
6/20/2018	70.5		
6/21/2018		91.4	147
8/27/2018	63.9		
8/28/2018		91.3	
8/29/2018			146
3/19/2019	59.7	99.7	134
8/6/2019	59.5		
8/7/2019		93.8	139
4/7/2020	61	89.6	117
9/18/2020	52.1	89	108
4/5/2021	56.3	94.1	104
9/1/2021	56.1	95.1	108
4/20/2022	54	106	117
9/14/2022	54.5	92.3	117
4/12/2023	55.3	91.3	107
9/18/2023	56		
9/20/2023		90.4	115
4/11/2024	59.7		
4/15/2024		97.7	112
9/10/2024	58		
9/12/2024		102	123

# Time Series

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	81.4
8/16/2016	75.4
10/11/2016	75.7
12/12/2016	85.6
2/21/2017	68.8
4/17/2017	56.3
6/21/2017	72.9
8/8/2017	71.2
10/17/2017	71.9
3/6/2018	74.1
6/21/2018	80.1
8/29/2018	73.3
3/19/2019	73.2
8/7/2019	80.9
4/7/2020	85.1
9/18/2020	87.9
4/5/2021	87.6
9/1/2021	90.6
4/20/2022	96.5
9/14/2022	89
4/12/2023	95.4
9/20/2023	82.1
4/15/2024	92.4
9/12/2024	99.4

# Time Series

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		6.22	
6/7/2016	19.8		
6/8/2016			28.7
8/15/2016		<5	28.7
8/16/2016	17.8		
10/10/2016	16.2	<5	
10/11/2016			37
12/14/2016	17.2	<5	31.9
2/17/2017		<5	33.5
2/21/2017	15.4		
4/17/2017	17.1	<5	39.4
6/19/2017	14.1	<5	
6/21/2017			29.7
8/7/2017	14	<5	
8/8/2017			32.9
10/16/2017	14.4	<5	
10/17/2017			35.4
11/28/2017			33.2 (R)
3/5/2018		<5	
3/6/2018	14.5		
3/7/2018			37.4
6/19/2018	14.9	<5	
6/20/2018			29
8/27/2018	15.6	<5	
8/29/2018			33.1
3/18/2019	16.1		
3/19/2019		<5	
3/20/2019			25.8
8/6/2019	17.1		
8/7/2019		<5	22.1
4/7/2020	17.2	<5	22.5
9/18/2020	14.7	<5	22.8
4/5/2021	22.3	<5	27.1
9/1/2021	16.3	<5	23.2
4/20/2022	15.8	<5	25.5
9/14/2022	16.7	<5	22.4
4/11/2023	17.9		20.3
4/12/2023		5.86	
9/18/2023		<5	
9/19/2023	19.9		20.9
4/11/2024		<5	
4/12/2024	17.2		
4/15/2024			16.4
9/10/2024		9.65	
9/11/2024	20.1		16.3

# Time Series

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	17.1		
6/8/2016		27.7	
8/15/2016	17.2	16.6	
10/10/2016		24.4	
10/11/2016	17.6		
12/12/2016		19.2	
12/14/2016	19		
2/17/2017	21.5		
2/21/2017		14.2	
4/17/2017	47.4 (o)		
4/18/2017		15.6	
6/20/2017		15.1	
6/21/2017	12.8		
8/8/2017	15.4	16.1	
10/16/2017		5.09	
10/17/2017	20.5		
11/28/2017	20.7 (R)		
3/6/2018		<5	30
3/7/2018	24.2		
6/19/2018		10.9	27.2
6/20/2018	<5		
8/27/2018			29.8
8/28/2018		<5	
8/29/2018	10.1		
3/19/2019			27.6
3/20/2019	8.54	8.3	
8/6/2019			26.9
8/7/2019	9.91	14	
4/7/2020	13	8.05	24.8
9/18/2020	8.63	7.21	23.2
4/5/2021	15	5.14	28.1
9/1/2021	8.86	6.58	20
4/20/2022	7.71	7.19	20.2
9/14/2022	8.29	18	7.04
4/10/2023			18.2
4/11/2023	7.3	5.93	
9/18/2023			18.4
9/19/2023	8.41	8.23	
4/11/2024			15.8
4/12/2024		<5	
4/15/2024	7.01		
9/10/2024		13.5	16.6
9/11/2024	7.41		

# Time Series

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		12.6	67
8/16/2016		13.2	65.9
10/11/2016		13.6	66
12/12/2016		13.5	67
2/17/2017		15.1	
2/21/2017			70.4
4/17/2017		12.5	62.1
6/20/2017		13.2	63.4
8/7/2017		13.2	
8/8/2017			64
10/16/2017		14.7	
10/17/2017			73
11/28/2017			67.8 (R)
3/6/2018		8.81	68.2
6/20/2018	15.9		
6/21/2018		15.3	65
8/27/2018	14.2		
8/28/2018		19.4	
8/29/2018			70.8
3/19/2019	10.5	16	55
8/6/2019	13.8		
8/7/2019		15.6	64.1
4/7/2020	15.7	14.8	44
9/18/2020	14.4	15.1	41
4/5/2021	21.4	22.9	42.7
9/1/2021	15.2	16.7	37.6
4/20/2022	16.9	20.8	38.1
9/14/2022	16.2	16.8	39
4/12/2023	17.7	18	38.7
9/18/2023	19.2		
9/20/2023		17.4	41.8
4/11/2024	19.2		
4/15/2024		18.1	39.3
9/10/2024	21.7		
9/12/2024		14.6	40.5

# Time Series

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	5.97
8/16/2016	<5
10/11/2016	<5
12/12/2016	9.08
2/21/2017	9.93
4/17/2017	<5
6/21/2017	<5
8/8/2017	<5
10/17/2017	<5
3/6/2018	5.33
6/21/2018	<5
8/29/2018	<5
3/19/2019	<5
8/7/2019	<5
4/7/2020	12.2
9/18/2020	15.6
4/5/2021	19.3
9/1/2021	17.4
4/20/2022	14.2
9/14/2022	13.3
4/12/2023	15.4
9/20/2023	12.2
4/15/2024	15.5
9/12/2024	14.4

# Time Series

Constituent: Chromium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.005	
6/7/2016	<0.005		
6/8/2016			<0.005
8/15/2016		<0.005	<0.005
8/16/2016	<0.005		
10/10/2016	<0.005	<0.005	
10/11/2016			<0.005
12/14/2016	<0.005	<0.005	<0.005
2/17/2017		<0.005	<0.005 (F2)
2/21/2017	<0.005		
4/17/2017	<0.005	<0.005	<0.005
6/19/2017	<0.005	<0.005	
6/21/2017			<0.005
8/7/2017	<0.005	<0.005	
8/8/2017			<0.005
3/5/2018		<0.005	
3/6/2018	<0.005		
3/7/2018			<0.005
6/19/2018	<0.005	<0.005	
6/20/2018			<0.005
8/27/2018	<0.005	<0.005	
8/29/2018			<0.005
3/18/2019	<0.005		
3/19/2019		<0.005	
3/20/2019			<0.005
8/6/2019	<0.005		
8/7/2019		<0.005	<0.005
4/7/2020	<0.005	<0.005	<0.005
9/18/2020	<0.005	<0.005	<0.005
4/5/2021	<0.005	<0.005	<0.005
9/1/2021	<0.005	<0.005	<0.005
4/20/2022	<0.005	<0.005	<0.005
9/14/2022	<0.005	<0.005	<0.005
4/11/2023	<0.005		<0.005
4/12/2023		<0.005	
9/18/2023		<0.005	
9/19/2023	<0.005		<0.005
4/11/2024		<0.005	
4/12/2024	<0.005		
4/15/2024			<0.005
9/10/2024		<0.005	
9/11/2024	<0.005		<0.005

# Time Series

Constituent: Chromium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.005		
6/8/2016		0.00694	
8/15/2016	<0.005	0.00538	
10/10/2016		0.00582	
10/11/2016	<0.005		
12/12/2016		0.00561	
12/14/2016	<0.005		
2/17/2017	<0.005		
2/21/2017		<0.005	
4/17/2017	<0.005		
4/18/2017		<0.005	
6/20/2017		0.00586	
6/21/2017	<0.005		
8/8/2017	<0.005	0.00572	
3/6/2018		<0.005	<0.005
3/7/2018	<0.005		
6/19/2018		0.00726	<0.005
6/20/2018	<0.005		
8/27/2018			<0.005
8/28/2018		<0.005	
8/29/2018	<0.005		
3/19/2019			<0.005
3/20/2019	<0.005	0.00647	
8/6/2019			<0.005
8/7/2019	<0.005	0.00637	
4/7/2020	<0.005	0.00644	<0.005
9/18/2020	<0.005	0.00589	<0.005
4/5/2021	<0.005	0.00708	<0.005
9/1/2021	<0.005	0.00659	<0.005
4/20/2022	<0.005	0.00636	<0.005
9/14/2022	<0.005	0.00505	<0.005
4/10/2023			<0.005
4/11/2023	<0.005	0.00577	
9/18/2023			<0.005
9/19/2023	<0.005	0.00752	
4/11/2024			<0.005
4/12/2024		<0.005	
4/15/2024	<0.005		
9/10/2024		0.00657	<0.005
9/11/2024	<0.005		



# Time Series

Constituent: Chromium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.005	<0.005
8/16/2016		<0.005	<0.005
10/11/2016		<0.005	<0.005
12/12/2016		<0.005	<0.005
2/17/2017		<0.005	
2/21/2017			<0.005
4/17/2017		<0.005	<0.005
6/20/2017		<0.005	<0.005
8/7/2017		<0.005	
8/8/2017			<0.005
3/6/2018		<0.005	<0.005
6/20/2018	<0.005		
6/21/2018		<0.005	<0.005
8/27/2018	<0.005		
8/28/2018		<0.005	
8/29/2018			<0.005
3/19/2019	<0.005	<0.005	<0.005
8/6/2019	<0.005		
8/7/2019		<0.005	<0.005
4/7/2020	<0.005	<0.005	<0.005
9/18/2020	<0.005	<0.005	<0.005
4/5/2021	<0.005	<0.005	<0.005
9/1/2021	<0.005	<0.005	<0.005
4/20/2022	<0.005	<0.005	<0.005
9/14/2022	<0.005	<0.005	<0.005
4/12/2023	<0.005	<0.005	<0.005
9/18/2023	<0.005		
9/20/2023		<0.005	<0.005
4/11/2024	<0.005		
4/15/2024		<0.005	<0.005
9/10/2024	<0.005		
9/12/2024		<0.005	<0.005

# Time Series

Constituent: Chromium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.005
8/16/2016	<0.005
10/11/2016	<0.005
12/12/2016	<0.005
2/21/2017	<0.005
4/17/2017	<0.005
6/21/2017	<0.005
8/8/2017	<0.005
3/6/2018	<0.005
6/21/2018	<0.005
8/29/2018	<0.005
3/19/2019	<0.005
8/7/2019	<0.005
4/7/2020	<0.005
9/18/2020	<0.005
4/5/2021	<0.005
9/1/2021	<0.005
4/20/2022	<0.005
9/14/2022	<0.005
4/12/2023	<0.005
9/20/2023	<0.005
4/15/2024	<0.005
9/12/2024	<0.005

# Time Series

Constituent: Cobalt (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		0.000555	
6/7/2016	<0.0005		
6/8/2016			<0.0005
8/15/2016		<0.0005	<0.0005
8/16/2016	<0.0005		
10/10/2016	<0.0005	0.000523	
10/11/2016			<0.0005
12/14/2016	<0.0005	0.000638	<0.0005
2/17/2017		0.000663	<0.0005
2/21/2017	<0.0005		
4/17/2017	<0.0005	0.000779	<0.0005
6/19/2017	0.000601	0.000621	
6/21/2017			<0.0005
8/7/2017	0.00051	0.000695	
8/8/2017			<0.0005
3/5/2018		0.000627	
3/6/2018	<0.0005		
3/7/2018			<0.0005
6/19/2018	<0.0005	0.00107	
6/20/2018			<0.0005
8/27/2018	<0.0005	0.00088	
8/29/2018			<0.0005
3/18/2019	0.00177		
3/19/2019		0.000783	
3/20/2019			<0.0005
8/6/2019	0.00558		
8/7/2019		0.000572	<0.0005
4/7/2020	0.000517	0.000581	<0.0005
9/18/2020	0.000738	0.000751	<0.0005
4/5/2021	0.000839	0.000752	<0.0005
9/1/2021	0.00127	0.000576	<0.0005
4/20/2022	0.00143	0.00104	<0.0005
9/14/2022	0.00164	0.00109	<0.0005
4/11/2023	0.0014		<0.0005
4/12/2023		0.00142	
9/18/2023		0.000995	
9/19/2023	0.00126		<0.0005
4/11/2024		0.00122	
4/12/2024	0.0018		
4/15/2024			<0.0005
9/10/2024		0.000977	
9/11/2024	0.00216		<0.0005

# Time Series

Constituent: Cobalt (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.0005		
6/8/2016		<0.0005	
8/15/2016	<0.0005	<0.0005	
10/10/2016		<0.0005	
10/11/2016	<0.0005		
12/12/2016		<0.0005	
12/14/2016	<0.0005		
2/17/2017	<0.0005		
2/21/2017		<0.0005	
4/17/2017	<0.0005		
4/18/2017		<0.0005	
6/20/2017		<0.0005	
6/21/2017	<0.0005		
8/8/2017	<0.0005	<0.0005	
3/6/2018		<0.0005	0.00142
3/7/2018	<0.0005		
5/14/2018			0.0012
6/19/2018		<0.0005	0.00129
6/20/2018	<0.0005		
8/27/2018			0.00149
8/28/2018		<0.0005	
8/29/2018	<0.0005		
3/19/2019			<0.0005
3/20/2019	<0.0005	<0.0005	
8/6/2019			<0.0005
8/7/2019	<0.0005	<0.0005	
4/7/2020	<0.0005	<0.0005	<0.0005
9/18/2020	<0.0005	<0.0005	<0.0005
4/5/2021	<0.0005	<0.0005	<0.0005
9/1/2021	<0.0005	<0.0005	<0.0005
4/20/2022	<0.0005	<0.0005	<0.0005
9/14/2022	<0.0005	<0.0005	<0.0005
4/10/2023			<0.0005
4/11/2023	<0.0005	<0.0005	
9/18/2023			<0.0005
9/19/2023	<0.0005	<0.0005	
4/11/2024			<0.0005
4/12/2024		<0.0005	
4/15/2024	<0.0005		
9/10/2024		<0.0005	<0.0005
9/11/2024	<0.0005		

# Time Series

Constituent: Cobalt (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		0.000681	<0.0005
8/16/2016		<0.0005	<0.0005
10/11/2016		<0.0005	<0.0005
12/12/2016		<0.0005	<0.0005
2/17/2017		<0.0005	
2/21/2017			<0.0005
4/17/2017		<0.0005	<0.0005
6/20/2017		<0.0005	<0.0005
8/7/2017		<0.0005	
8/8/2017			<0.0005
3/6/2018		<0.0005	<0.0005
6/20/2018	0.00161		
6/21/2018		<0.0005	<0.0005
8/27/2018	0.00066		
8/28/2018		<0.0005	
8/29/2018			<0.0005
3/19/2019	0.00176	<0.0005	<0.0005
8/6/2019	<0.0005		
8/7/2019		<0.0005	<0.0005
4/7/2020	0.000817	<0.0005	<0.0005
9/18/2020	<0.0005	0.00147	<0.0005
4/5/2021	0.000517	0.00132	<0.0005
9/1/2021	<0.0005	0.00335	<0.0005
4/20/2022	0.000561	0.00135	<0.0005
9/14/2022	<0.0005	0.00459	<0.0005
4/12/2023	<0.0005	0.00271	<0.0005
9/18/2023	<0.0005		
9/20/2023		0.00374	<0.0005
4/11/2024	<0.0005		
4/15/2024		0.00172	<0.0005
9/10/2024	<0.0005		
9/12/2024		0.0028	<0.0005

# Time Series

Constituent: Cobalt (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.0005
8/16/2016	<0.0005
10/11/2016	<0.0005
12/12/2016	<0.0005
2/21/2017	<0.0005
4/17/2017	<0.0005
6/21/2017	<0.0005
8/8/2017	<0.0005
3/6/2018	<0.0005
6/21/2018	<0.0005
8/29/2018	<0.0005
3/19/2019	<0.0005
8/7/2019	<0.0005
4/7/2020	<0.0005
9/18/2020	<0.0005
4/5/2021	<0.0005
9/1/2021	<0.0005
4/20/2022	<0.0005
9/14/2022	<0.0005
4/12/2023	<0.0005
9/20/2023	<0.0005
4/15/2024	<0.0005
9/12/2024	<0.0005

# Time Series

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		0.223 (U)	
6/7/2016	0.375 (U)		
6/8/2016			0.145 (U)
8/15/2016		0.668	0.202 (U)
8/16/2016	0.115 (U)		
10/10/2016	0.35 (U)	0.694	
10/11/2016			0.523
12/14/2016	0.336 (U)	0.799	0.26 (U)
2/17/2017		0.513	0.293 (U)
2/21/2017	0.221 (U)		
4/17/2017	0.126 (U)	0.47	0.48
6/19/2017	0.204 (U)	0.204 (U)	
6/21/2017			0.0131 (U)
8/7/2017	0.336 (U)	0.831	
8/8/2017			0.456
3/5/2018		0.276 (U)	
3/6/2018	0.668		
3/7/2018			0.258 (U)
3/18/2019	0.217 (U)		
3/19/2019		0.331 (U)	
3/20/2019			0.0223 (U)
4/7/2020	0.462	1.01	0.397 (U)
4/5/2021	0.208 (U)	0.488	0.614
9/1/2021	0.296 (U)	1.32	0.684
4/20/2022	0.316 (U)	0.693	0.0486 (U)
9/14/2022	-0.0309 (U)	1.12	0.0843 (U)
4/11/2023	0.469 (U)		0.0651 (U)
4/12/2023		0.775	
9/18/2023		1.48	
9/19/2023	1.03		0.57
4/11/2024		0.835	
4/12/2024	0.994		
4/15/2024			1.02
9/10/2024		0.555	
9/11/2024	0.4552 (U)		0.343 (U)

# Time Series

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	0.31 (U)		
6/8/2016		0.253 (U)	
8/15/2016	0.251 (U)	0.159 (U)	
10/10/2016		0.817	
10/11/2016	0.286 (U)		
12/12/2016		0.306 (U)	
12/14/2016	0.251 (U)		
2/17/2017	0.103 (U)		
2/21/2017		-0.000573 (U)	
4/17/2017	0.0966 (U)		
4/18/2017		0.0953 (U)	
6/20/2017		0.545	
6/21/2017	0.221 (U)		
8/8/2017	0.244 (U)	0.814	
3/6/2018		0.358	0.257 (U)
3/7/2018	0.123 (U)		
6/19/2018			0.412 (U)
3/19/2019			0.343 (U)
3/20/2019	0.391 (U)	0.287 (U)	
4/7/2020	0.645	0.305 (U)	0.44
4/5/2021	0.219 (U)	0.182 (U)	0.547
9/1/2021	0.362 (U)	0.499	0.522
4/20/2022	0.0289 (U)	0.171 (U)	0.494
9/14/2022	-0.159 (U)	-0.0783 (U)	0.283 (U)
4/10/2023			0.442 (U)
4/11/2023	0.727	0.678	
9/18/2023			1.11
9/19/2023	0.118 (U)	0.497 (U)	
4/11/2024			2.48
4/12/2024		0.0684 (U)	
4/15/2024	0.157 (U)		
9/10/2024		0.275 (U)	0.674
9/11/2024	0.34 (U)		



# Time Series

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		0.711 (U)	0.665
8/16/2016		0.938 (U)	0.854
10/11/2016		0.674	0.428 (U)
12/12/2016		0.672	1.05
2/17/2017		0.528	
2/21/2017			0.85
4/17/2017		0.309 (U)	1.02
6/20/2017		0.368	0.973
8/7/2017		0.443	
8/8/2017			0.507
3/6/2018		0.45	0.959
6/20/2018	0.0129 (U)		
3/19/2019	1	0.436	0.568
4/7/2020	0.576	0.354 (U)	1.2
4/5/2021	0.296 (U)	0.0519 (U)	0.982
9/1/2021	0.794	1.08	1.29
4/20/2022	1.27	0.55 (U)	0.913
9/14/2022	-0.195 (U)	0.836	0.363 (U)
4/12/2023	1.32	0.687	0.556
9/18/2023	0.606 (U)		
9/20/2023		0.575 (U)	1.15
4/11/2024	0.402 (U)		
4/15/2024		0.663	1.23
9/10/2024	0.4284 (U)		
9/12/2024		1.3	1.57

# Time Series

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	0.405
8/16/2016	0.876
10/11/2016	0.512
12/12/2016	0.894
2/21/2017	0.314 (U)
4/17/2017	0.298 (U)
6/21/2017	0.44
8/8/2017	0.333 (U)
3/6/2018	0.618
3/19/2019	0.481
4/7/2020	0.787
4/5/2021	0.667
9/1/2021	1.12
4/20/2022	0.901
9/14/2022	0.599
4/12/2023	0.695
9/20/2023	0.916
4/15/2024	0.522
9/12/2024	0.876

# Time Series

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		0.731	
6/7/2016	<1		
6/8/2016			<1
8/15/2016		<1	<1
8/16/2016	<1		
10/10/2016	<1	<1	
10/11/2016			0.867
12/14/2016	0.72	<1	<1
2/17/2017		<1	<1
2/21/2017	<1		
4/17/2017	1.69 (o)	0.774	1.93 (o)
6/19/2017	<1	<1	
6/21/2017			<1
8/7/2017	<1	<1	
8/8/2017			<1
10/16/2017	<1	<1	
10/17/2017			<1
3/5/2018		<1	
3/6/2018	<1		
3/7/2018			<1
6/19/2018	0.826	<1	
6/20/2018			0.684
8/27/2018	<1	<1	
8/29/2018			<1
3/18/2019	<1		
3/19/2019		<1	
3/20/2019			<1
8/6/2019	0.643		
8/7/2019		0.596	<1
4/7/2020	0.864	<1	<1
9/18/2020	<1	<1	<1
4/5/2021	<1	<1	<1
9/1/2021	<1	<1	<1
4/20/2022	<1	<1	<1
9/14/2022	<1	<1	<1
4/11/2023	<1		<1
4/12/2023		<1	
9/18/2023		<1	
9/19/2023	<1		<1
4/11/2024		<1	
4/12/2024	<1		
4/15/2024			<1
9/10/2024		<1	
9/11/2024	<1		<1

# Time Series

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<1		
6/8/2016		<1	
8/15/2016	0.549	<1	
10/10/2016		<1	
10/11/2016	<1		
12/12/2016		<1	
12/14/2016	<1		
2/17/2017	<1		
2/21/2017		0.993	
4/17/2017	6.7 (o)		
4/18/2017		0.768	
6/20/2017		<1	
6/21/2017	<1		
8/8/2017	<1	<1	
10/16/2017		<1	
10/17/2017	<1		
3/6/2018		<1	<1
3/7/2018	<1		
6/19/2018		<1	<1
6/20/2018	<1		
8/27/2018			<1
8/28/2018		<1	
8/29/2018	<1		
3/19/2019			<1
3/20/2019	0.523	<1	
8/6/2019			0.507
8/7/2019	0.625	<1	
4/7/2020	<1	<1	<1
9/18/2020	<1	<1	<1
4/5/2021	0.516	<1	<1
9/1/2021	<1	<1	<1
4/20/2022	<1	<1	<1
9/14/2022	<1	<1	<1
4/10/2023			<1
4/11/2023	<1	<1	
9/18/2023			<1
9/19/2023	<1	<1	
4/11/2024			<1
4/12/2024		<1	
4/15/2024	<1		
9/10/2024		<1	<1
9/11/2024	<1		

# Time Series

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<1	<1
8/16/2016		<1	<1
10/11/2016		<1	<1
12/12/2016		<1	1.88
2/17/2017		0.664	
2/21/2017			2.14
4/17/2017		0.801	0.627
6/20/2017		<1	<1
8/7/2017		<1	
8/8/2017			<1
10/16/2017		<1	
10/17/2017			<1
3/6/2018		<1	<1
6/20/2018	<1		
6/21/2018		<1	<1
8/27/2018	<1		
8/28/2018		<1	
8/29/2018			<1
3/19/2019	<1	0.771	<1
8/6/2019	<1		
8/7/2019		0.525	<1
4/7/2020	<1	<1	<1
9/18/2020	<1	<1	<1
4/5/2021	<1	<1	<1
9/1/2021	<1	<1	<1
4/20/2022	<1	<1	<1
9/14/2022	<1	<1	<1
4/12/2023	<1	<1	<1
9/18/2023	<1		
9/20/2023		<1	<1
4/11/2024	<1		
4/15/2024		<1	<1
9/10/2024	<1		
9/12/2024		<1	<1

# Time Series

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<1
8/16/2016	<1
10/11/2016	<1
12/12/2016	2.02
2/21/2017	1.89
4/17/2017	0.814
6/21/2017	<1
8/8/2017	<1
10/17/2017	<1
3/6/2018	<1
6/21/2018	<1
8/29/2018	<1
3/19/2019	<1
8/7/2019	0.535
4/7/2020	0.652
9/18/2020	<1
4/5/2021	<1
9/1/2021	<1
4/20/2022	<1
9/14/2022	<1
4/12/2023	<1
9/20/2023	<1
4/15/2024	<1
9/12/2024	<1

# Time Series

Constituent: Lead (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.0005	
6/7/2016	<0.0005		
6/8/2016			<0.0005
8/15/2016		<0.0005	<0.0005
8/16/2016	<0.0005		
10/10/2016	<0.0005	<0.0005	
10/11/2016			<0.0005
12/14/2016	<0.0005	<0.0005	<0.0005
2/17/2017		<0.0005	<0.0005
2/21/2017	<0.0005		
4/17/2017	<0.0005	<0.0005	<0.0005
6/19/2017	<0.0005	<0.0005	
6/21/2017			<0.0005
8/7/2017	<0.0005	<0.0005	
8/8/2017			<0.0005
3/5/2018		<0.0005	
3/6/2018	<0.0005		
3/7/2018			<0.0005
6/19/2018	<0.0005	<0.0005	
6/20/2018			<0.0005
8/27/2018	<0.0005	<0.0005	
8/29/2018			<0.0005
3/18/2019	<0.0005		
3/19/2019		<0.0005	
3/20/2019			<0.0005
8/6/2019	<0.0005		
8/7/2019		<0.0005	<0.0005
4/7/2020	<0.0005	<0.0005	<0.0005
9/18/2020	<0.0005	<0.0005	<0.0005
4/5/2021	<0.0005	<0.0005	<0.0005
9/1/2021	<0.0005	<0.0005	<0.0005
4/20/2022	<0.0005	<0.0005	<0.0005
9/14/2022	<0.0005	<0.0005	<0.0005
4/11/2023	<0.0005		<0.0005
4/12/2023		<0.0005	
9/18/2023		<0.0005	
9/19/2023	<0.0005		<0.0005
4/11/2024		<0.0005	
4/12/2024	<0.0005		
4/15/2024			<0.0005
9/10/2024		<0.0005	
9/11/2024	<0.0005		<0.0005

# Time Series

Constituent: Lead (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.0005		
6/8/2016		<0.0005	
8/15/2016	<0.0005	<0.0005	
10/10/2016		<0.0005	
10/11/2016	<0.0005		
12/12/2016		<0.0005	
12/14/2016	<0.0005		
2/17/2017	<0.0005		
2/21/2017		<0.0005	
4/17/2017	<0.0005		
4/18/2017		<0.0005	
6/20/2017		<0.0005	
6/21/2017	<0.0005		
8/8/2017	<0.0005	<0.0005	
3/6/2018		<0.0005	<0.0005
3/7/2018	<0.0005		
6/19/2018		0.000633	<0.0005
6/20/2018	<0.0005		
8/27/2018			<0.0005
8/28/2018		<0.0005	
8/29/2018	<0.0005		
3/19/2019			<0.0005
3/20/2019	<0.0005	<0.0005	
8/6/2019			<0.0005
8/7/2019	<0.0005	<0.0005	
4/7/2020	<0.0005	<0.0005	<0.0005
9/18/2020	<0.0005	<0.0005	<0.0005
4/5/2021	<0.0005	<0.0005	<0.0005
9/1/2021	<0.0005	<0.0005	<0.0005
4/20/2022	<0.0005	<0.0005	<0.0005
9/14/2022	<0.0005	<0.0005	<0.0005
4/10/2023			<0.0005
4/11/2023	<0.0005	<0.0005	
9/18/2023			<0.0005
9/19/2023	<0.0005	<0.0005	
4/11/2024			<0.0005
4/12/2024		<0.0005	
4/15/2024	<0.0005		
9/10/2024		<0.0005	<0.0005
9/11/2024	<0.0005		



# Time Series

Constituent: Lead (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		0.00147 (o)	<0.0005
8/16/2016		<0.0005	<0.0005
10/11/2016		<0.0005	<0.0005
12/12/2016		<0.0005	<0.0005
2/17/2017		<0.0005	
2/21/2017			<0.0005
4/17/2017		<0.0005	<0.0005
6/20/2017		<0.0005	<0.0005
8/7/2017		<0.0005	
8/8/2017			<0.0005
3/6/2018		<0.0005	<0.0005
6/20/2018	0.00151		
6/21/2018		<0.0005	<0.0005
8/27/2018	0.000626		
8/28/2018		<0.0005	
8/29/2018			<0.0005
3/19/2019	0.00204	<0.0005	<0.0005
8/6/2019	0.000663		
8/7/2019		<0.0005	<0.0005
4/7/2020	0.00116	<0.0005	<0.0005
9/18/2020	<0.0005	0.000532	<0.0005
4/5/2021	0.000624	<0.0005	<0.0005
9/1/2021	<0.0005	<0.0005	<0.0005
4/20/2022	0.000596	<0.0005	<0.0005
9/14/2022	<0.0005	<0.0005	<0.0005
4/12/2023	<0.0005	<0.0005	<0.0005
9/18/2023	<0.0005		
9/20/2023		0.000576	0.000627
4/11/2024	<0.0005		
4/15/2024		<0.0005	<0.0005
9/10/2024	<0.0005		
9/12/2024		<0.0005	<0.0005

# Time Series

Constituent: Lead (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.0005
8/16/2016	<0.0005
10/11/2016	<0.0005
12/12/2016	<0.0005
2/21/2017	<0.0005
4/17/2017	<0.0005
6/21/2017	<0.0005
8/8/2017	<0.0005
3/6/2018	<0.0005
6/21/2018	<0.0005
8/29/2018	<0.0005
3/19/2019	<0.0005
8/7/2019	<0.0005
4/7/2020	<0.0005
9/18/2020	<0.0005
4/5/2021	<0.0005
9/1/2021	<0.0005
4/20/2022	<0.0005
9/14/2022	<0.0005
4/12/2023	<0.0005
9/20/2023	<0.0005
4/15/2024	<0.0005
9/12/2024	<0.0005

# Time Series

Constituent: Lithium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.01	
6/7/2016	<0.01		
6/8/2016			<0.01
8/15/2016		<0.01	<0.01
8/16/2016	<0.01		
10/10/2016	<0.01	<0.01	
10/11/2016			<0.01
12/14/2016	<0.01	<0.01	<0.01
2/17/2017		<0.01	<0.01
2/21/2017	<0.01		
4/17/2017	<0.01	<0.01	<0.01
6/19/2017	<0.01	<0.01	
6/21/2017			<0.01
8/7/2017	<0.01	<0.01	
8/8/2017			<0.01
3/5/2018		<0.01	
3/6/2018	<0.01		
3/7/2018			<0.01
6/19/2018	<0.01	<0.01	
6/20/2018			<0.01
8/27/2018	<0.01	<0.01	
8/29/2018			<0.01
3/18/2019	<0.01		
3/19/2019		<0.01	
3/20/2019			<0.01
8/6/2019	<0.01		
8/7/2019		<0.01	<0.01
4/7/2020	<0.01	<0.01	<0.01
9/18/2020	<0.01	<0.01	<0.01
4/5/2021	<0.01	<0.01	<0.01
9/1/2021	<0.01	<0.01	<0.01
4/20/2022	<0.01	<0.01	<0.01
9/14/2022	<0.01	<0.01	<0.01
4/11/2023	<0.01		<0.01
4/12/2023		<0.01	
9/18/2023		<0.01	
9/19/2023	<0.01		<0.01
4/11/2024		<0.01	
4/12/2024	<0.01		
4/15/2024			<0.01
9/10/2024		<0.01	
9/11/2024	<0.01		<0.01

# Time Series

Constituent: Lithium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.01		
6/8/2016		<0.01	
8/15/2016	<0.01	<0.01	
10/10/2016		<0.01	
10/11/2016	<0.01		
12/12/2016		<0.01	
12/14/2016	<0.01		
2/17/2017	<0.01		
2/21/2017		<0.01	
4/17/2017	<0.01		
4/18/2017		<0.01	
6/20/2017		<0.01	
6/21/2017	<0.01		
8/8/2017	<0.01	<0.01	
3/6/2018		<0.01	<0.01
3/7/2018	<0.01		
6/19/2018		0.0189	<0.01
6/20/2018	<0.01		
8/27/2018			<0.01
8/28/2018		<0.01	
8/29/2018	<0.01		
3/19/2019			<0.01
3/20/2019	<0.01	0.0277	
8/6/2019			<0.01
8/7/2019	<0.01	0.0279	
4/7/2020	<0.01	0.0213	<0.01
9/18/2020	<0.01	0.0225	<0.01
4/5/2021	<0.01	0.0198	<0.01
9/1/2021	<0.01	0.0233	<0.01
4/20/2022	<0.01	0.0162	<0.01
9/14/2022	<0.01	0.018	<0.01
4/10/2023			<0.01
4/11/2023	<0.01	0.0143	
9/18/2023			<0.01
9/19/2023	<0.01	0.0205	
4/11/2024			<0.01
4/12/2024		0.0124	
4/15/2024	<0.01		
9/10/2024		0.0194	<0.01
9/11/2024	<0.01		

# Time Series

Constituent: Lithium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.01	<0.01
8/16/2016		<0.01	<0.01
10/11/2016		<0.01	<0.01
12/12/2016		<0.01	<0.01
2/17/2017		<0.01	
2/21/2017			<0.01
4/17/2017		<0.01	<0.01
6/20/2017		<0.01	<0.01
8/7/2017		<0.01	
8/8/2017			<0.01
3/6/2018		<0.01	<0.01
6/20/2018	<0.01		
6/21/2018		<0.01	<0.01
8/27/2018	<0.01		
8/28/2018		<0.01	
8/29/2018			<0.01
3/19/2019	<0.01	<0.01	<0.01
8/6/2019	<0.01		
8/7/2019		<0.01	<0.01
4/7/2020	<0.01	<0.01	<0.01
9/18/2020	<0.01	<0.01	<0.01
4/5/2021	<0.01	<0.01	<0.01
9/1/2021	<0.01	<0.01	<0.01
4/20/2022	<0.01	<0.01	<0.01
9/14/2022	<0.01	<0.01	<0.01
4/12/2023	<0.01	<0.01	<0.01
9/18/2023	<0.01		
9/20/2023		<0.01	<0.01
4/11/2024	<0.01		
4/15/2024		<0.01	<0.01
9/10/2024	<0.01		
9/12/2024		<0.01	<0.01

# Time Series

Constituent: Lithium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.01
8/16/2016	<0.01
10/11/2016	<0.01
12/12/2016	<0.01
2/21/2017	<0.01
4/17/2017	<0.01
6/21/2017	<0.01
8/8/2017	<0.01
3/6/2018	<0.01
6/21/2018	<0.01
8/29/2018	<0.01
3/19/2019	<0.01
8/7/2019	<0.01
4/7/2020	<0.01
9/18/2020	<0.01
4/5/2021	<0.01
9/1/2021	<0.01
4/20/2022	<0.01
9/14/2022	<0.01
4/12/2023	<0.01
9/20/2023	<0.01
4/15/2024	<0.01
9/12/2024	<0.01

# Time Series

Constituent: Mercury (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.0002	
6/7/2016	<0.0002		
6/8/2016			<0.0002
8/15/2016		<0.0002	<0.0002
8/16/2016	<0.0002		
10/10/2016	<0.0002	<0.0002	
10/11/2016			<0.0002
12/14/2016	<0.0002	<0.0002	<0.0002
2/17/2017		<0.0002	<0.0002
2/21/2017	<0.0002		
4/17/2017	<0.0002	<0.0002 (F1)	<0.0002
6/19/2017	<0.0002	<0.0002	
6/21/2017			<0.0002
8/7/2017	<0.0002	<0.0002	
8/8/2017			<0.0002
3/5/2018		<0.0002	
3/6/2018	<0.0002		
3/7/2018			<0.0002
6/19/2018	<0.0002	<0.0002	
6/20/2018			<0.0002
8/27/2018	<0.0002	<0.0002	
8/29/2018			<0.0002
3/18/2019	<0.0002		
3/19/2019		<0.0002	
3/20/2019			<0.0002
8/6/2019	<0.0002		
8/7/2019		<0.0002	<0.0002
4/7/2020	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002
4/20/2022	<0.0002	<0.0002	<0.0002
9/14/2022	<0.0002	<0.0002	<0.0002
4/11/2023	<0.0002		<0.0002
4/12/2023		<0.0002	
9/18/2023		<0.0002	
9/19/2023	<0.0002		<0.0002
4/11/2024		<0.0002	
4/12/2024	<0.0002		
4/15/2024			<0.0002
9/10/2024		<0.0002	
9/11/2024	<0.0002		<0.0002

# Time Series

Constituent: Mercury (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.0002		
6/8/2016		<0.0002	
8/15/2016	<0.0002	<0.0002	
10/10/2016		<0.0002	
10/11/2016	<0.0002		
12/12/2016		<0.0002	
12/14/2016	<0.0002		
2/17/2017	<0.0002		
2/21/2017		<0.0002	
4/17/2017	<0.0002		
4/18/2017		<0.0002	
6/20/2017		<0.0002	
6/21/2017	<0.0002		
8/8/2017	<0.0002	<0.0002	
3/6/2018		<0.0002	<0.0002
3/7/2018	<0.0002		
6/19/2018		<0.0002	<0.0002
6/20/2018	<0.0002		
8/27/2018			<0.0002
8/28/2018		<0.0002	
8/29/2018	<0.0002		
3/19/2019			<0.0002
3/20/2019	<0.0002	<0.0002	
8/6/2019			<0.0002
8/7/2019	<0.0002	<0.0002	
4/7/2020	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002
4/20/2022	<0.0002	<0.0002	<0.0002
9/14/2022	<0.0002	<0.0002	<0.0002
4/10/2023			<0.0002
4/11/2023	<0.0002	<0.0002	
9/18/2023			<0.0002
9/19/2023	<0.0002	<0.0002	
4/11/2024			<0.0002
4/12/2024		<0.0002	
4/15/2024	<0.0002		
9/10/2024		<0.0002	<0.0002
9/11/2024	<0.0002		



# Time Series

Constituent: Mercury (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.0002	<0.0002
8/16/2016		<0.0002	<0.0002
10/11/2016		<0.0002	<0.0002
12/12/2016		<0.0002	<0.0002
2/17/2017		<0.0002	
2/21/2017			<0.0002
4/17/2017		<0.0002	<0.0002
6/20/2017		<0.0002	<0.0002
8/7/2017		<0.0002	
8/8/2017			<0.0002
3/6/2018		<0.0002	<0.0002
6/20/2018	<0.0002		
6/21/2018		<0.0002	<0.0002
8/27/2018	<0.0002		
8/28/2018		<0.0002	
8/29/2018			<0.0002
3/19/2019	<0.0002	<0.0002	<0.0002
8/6/2019	<0.0002		
8/7/2019		<0.0002	<0.0002
4/7/2020	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002
4/20/2022	<0.0002	<0.0002	<0.0002
9/14/2022	<0.0002	<0.0002	0.000813
4/12/2023	<0.0002	<0.0002	<0.0002
9/18/2023	<0.0002		
9/20/2023		<0.0002	<0.0002
4/11/2024	<0.0002		
4/15/2024		<0.0002	<0.0002
9/10/2024	<0.0002		
9/12/2024		<0.0002	<0.0002

# Time Series

Constituent: Mercury (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.0002
8/16/2016	<0.0002
10/11/2016	<0.0002
12/12/2016	<0.0002
2/21/2017	<0.0002
4/17/2017	<0.0002
6/21/2017	<0.0002
8/8/2017	<0.0002
3/6/2018	<0.0002
6/21/2018	<0.0002
8/29/2018	<0.0002
3/19/2019	<0.0002
8/7/2019	<0.0002
4/7/2020	<0.0002
9/18/2020	<0.0002
4/5/2021	<0.0002
9/1/2021	<0.0002
4/20/2022	<0.0002
9/14/2022	<0.0002
4/12/2023	<0.0002
9/20/2023	<0.0002
4/15/2024	<0.0002
9/12/2024	<0.0002

# Time Series

Constituent: Molybdenum (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.002	
6/7/2016	<0.002		
6/8/2016			<0.002
8/15/2016		<0.002	<0.002
8/16/2016	<0.002		
10/10/2016	<0.002	<0.002	
10/11/2016			<0.002
12/14/2016	<0.002	<0.002	<0.002
2/17/2017		<0.002	<0.002
2/21/2017	<0.002		
4/17/2017	<0.002	<0.002	<0.002
6/19/2017	<0.002	<0.002	
6/21/2017			<0.002
8/7/2017	<0.002	<0.002	
8/8/2017			<0.002
3/5/2018		<0.002	
3/6/2018	0.0022		
3/7/2018			<0.002
5/14/2018	<0.002		
6/19/2018	<0.002	<0.002	
6/20/2018			<0.002
8/27/2018	0.00224	0.0022	
8/29/2018			<0.002
3/18/2019	<0.002		
3/19/2019		0.00341	
3/20/2019			<0.002
8/6/2019	<0.002		
8/7/2019		0.00219	<0.002
4/7/2020	<0.002	0.00215	<0.002
9/18/2020	<0.002	<0.002	<0.002
4/5/2021	<0.002	<0.002	<0.002
9/1/2021	0.00218	0.00217	<0.002
4/20/2022	<0.002	<0.002	<0.002
9/14/2022	<0.002	<0.002	<0.002
4/11/2023	<0.002		<0.002
4/12/2023		<0.002	
9/18/2023		<0.002	
9/19/2023	<0.002		<0.002
4/11/2024		<0.002	
4/12/2024	<0.002		
4/15/2024			<0.002
9/10/2024		0.00287	
9/11/2024	0.00205		<0.002

# Time Series

Constituent: Molybdenum (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.002		
6/8/2016		<0.002	
8/15/2016	<0.002	<0.002	
10/10/2016		<0.002	
10/11/2016	<0.002		
12/12/2016		<0.002	
12/14/2016	<0.002		
2/17/2017	<0.002		
2/21/2017		<0.002	
4/17/2017	<0.002		
4/18/2017		<0.002	
6/20/2017		<0.002	
6/21/2017	<0.002		
8/8/2017	<0.002	<0.002	
3/6/2018		<0.002	0.00568
3/7/2018	<0.002		
5/14/2018			0.00385
6/19/2018		0.00383	0.00423
6/20/2018	<0.002		
8/27/2018			0.00424
8/28/2018		<0.002	
8/29/2018	<0.002		
3/19/2019			0.00263
3/20/2019	<0.002	<0.002	
8/6/2019			0.00574
8/7/2019	<0.002	<0.002	
4/7/2020	<0.002	<0.002	0.00297
9/18/2020	<0.002	<0.002	0.00529
4/5/2021	<0.002	<0.002	<0.002
9/1/2021	<0.002	<0.002	0.00558
4/20/2022	<0.002	<0.002	0.0042
9/14/2022	<0.002	<0.002	0.00446
4/10/2023			0.00364
4/11/2023	<0.002	<0.002	
9/18/2023			0.00661
9/19/2023	<0.002	<0.002	
4/11/2024			0.00217
4/12/2024		<0.002	
4/15/2024	<0.002		
9/10/2024		<0.002	0.00578
9/11/2024	<0.002		

# Time Series

Constituent: Molybdenum (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.002	<0.002
8/16/2016		<0.002	<0.002
10/11/2016		<0.002	<0.002
12/12/2016		<0.002	<0.002
2/17/2017		<0.002	
2/21/2017			<0.002
4/17/2017		<0.002	<0.002
6/20/2017		<0.002	<0.002
8/7/2017		<0.002	
8/8/2017			<0.002
3/6/2018		<0.002	<0.002
6/20/2018	0.00822		
6/21/2018		<0.002	<0.002
8/27/2018	0.00617		
8/28/2018		<0.002	
8/29/2018			<0.002
3/19/2019	<0.002	<0.002	0.00212
8/6/2019	<0.002		
8/7/2019		<0.002	<0.002
4/7/2020	<0.002	<0.002	<0.002
9/18/2020	<0.002	0.00296	<0.002
4/5/2021	<0.002	<0.002	<0.002
9/1/2021	<0.002	<0.002	<0.002
4/20/2022	<0.002	<0.002	<0.002
9/14/2022	<0.002	<0.002	<0.002
4/12/2023	<0.002	<0.002	<0.002
9/18/2023	<0.002		
9/20/2023		<0.002	<0.002
4/11/2024	<0.002		
4/15/2024		<0.002	<0.002
9/10/2024	<0.002		
9/12/2024		<0.002	<0.002

# Time Series

Constituent: Molybdenum (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.002
8/16/2016	<0.002
10/11/2016	<0.002
12/12/2016	<0.002
2/21/2017	<0.002
4/17/2017	<0.002
6/21/2017	<0.002
8/8/2017	<0.002
3/6/2018	<0.002
6/21/2018	<0.002
8/29/2018	<0.002
3/19/2019	<0.002
8/7/2019	<0.002
4/7/2020	<0.002
9/18/2020	<0.002
4/5/2021	<0.002
9/1/2021	<0.002
4/20/2022	<0.002
9/14/2022	<0.002
4/12/2023	<0.002
9/20/2023	<0.002
4/15/2024	<0.002
9/12/2024	<0.002

# Time Series

Constituent: pH (SU) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		7.4	
6/7/2016	7.2		
6/8/2016			7.1
8/15/2016		7.3	7.2
8/16/2016	7.3		
10/10/2016	7.1	7.2	
10/11/2016			7.1
12/14/2016	7.3	7.3	7.2
2/17/2017		7.2	7.3
2/21/2017	7.3		
4/17/2017	7.1	7.3	7.3
6/19/2017	7.1	7.2	
6/21/2017			7.3
8/7/2017	7.3	7.9	
8/8/2017			7.2
10/16/2017	7.4	7.3	
10/17/2017			7.6
3/5/2018		7.04	
3/6/2018	7.3		
3/7/2018			7.35
6/19/2018	7.56	7.72	
6/20/2018			7.26
8/27/2018	7.2	7.23	
8/29/2018			7.09
3/19/2019	7.08	7.1	
3/20/2019			6.97
8/6/2019	6.64		
8/7/2019		7.07	7.09
4/7/2020	7.21	7.26	7.32
9/18/2020	7.4	7.33	7.21
4/5/2021	7.63	7.57	7.64
9/1/2021	7.45	7.59	7.48
4/20/2022	7.35	7.35	7.13
9/14/2022	7.43	7.48	7.21
4/11/2023	7.24		6.97
4/12/2023		6.96	
9/18/2023		6.86	
9/19/2023	6.81		6.78
4/11/2024		7.3	
4/12/2024	7.4		
4/15/2024			7.3
9/10/2024		7.3	
9/11/2024	7.3		7.2

# Time Series

Constituent: pH (SU) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	7.3		
6/8/2016		6.7	
8/15/2016	7.3	6.7	
10/10/2016		6.7	
10/11/2016	7.2		
12/12/2016		7	
12/14/2016	7.4		
2/17/2017	7.3		
2/21/2017		7	
4/17/2017	7.3		
4/18/2017		6.9	
6/20/2017		6.7	
6/21/2017	7.3		
8/8/2017	7.2	6.8	
10/16/2017		6.8	
10/17/2017	7.2		
11/28/2017		6.9 (R)	
3/6/2018		6.76	7.36
3/7/2018	7.24		
6/19/2018		7.25	7.9
6/20/2018	7.5		
8/27/2018			7.42
8/28/2018		7.07	
8/29/2018	7.25		
3/19/2019			7.21
3/20/2019	7.76	6.41	
8/6/2019			7.12
8/7/2019	7.11	6.33	
4/7/2020	7.54	6.55	7.32
9/18/2020	7.28	6.8	7.53
4/5/2021	7.92	6.92	7.7
9/1/2021	7.46	7.06	7.97
4/20/2022	6.83	6.69	7.23
9/14/2022	7.4	7.09	7.58
4/10/2023			7.14
4/11/2023	7.24	7.24	
9/18/2023			7.14
9/19/2023	6.97	6.55	
4/11/2024			7.5
4/12/2024		7	
4/15/2024	7.6		
9/10/2024		6.9	7.5
9/11/2024	7.2		



# Time Series

Constituent: pH (SU) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		7.6	7.7
8/16/2016		7.5	7.3
10/11/2016		7.5	7.2
12/12/2016		7.6	7.3
2/17/2017		7.5	
2/21/2017			7.2
4/17/2017		7.4	7.2
6/20/2017		7.4	7.2
8/7/2017		7.9	
8/8/2017			7.2
10/16/2017		7.8	
10/17/2017			7.3
3/6/2018		7.36	7.23
6/20/2018	7.69		
6/21/2018		7.53	7.3
8/27/2018	7.55		
8/28/2018		7.44	
8/29/2018			7.14
3/19/2019	7.24	7.26	7.05
8/6/2019	6.75		
8/7/2019		7.22	7.02
4/7/2020	7.33	7.46	7.24
9/18/2020	7.53	7.93	7.33
4/5/2021	7.61	7.94	7.31
9/1/2021	7.89	7.75	7.22
4/20/2022	7.39	7.04	7.37
9/14/2022	7.3	7.52	7.37
4/12/2023	7.24	7.23	6.96
9/18/2023	7.05		
9/20/2023		7.03	6.42
4/11/2024	7.4		
4/15/2024		7.6	7.4
9/10/2024	7.4		
9/12/2024		7.5	7.3

# Time Series

Constituent: pH (SU) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	7.4
8/16/2016	7.4
10/11/2016	7.3
12/12/2016	7.5
2/21/2017	7.4
4/17/2017	7.3
6/21/2017	7.3
8/8/2017	7.3
10/17/2017	7.8
3/6/2018	7.4
6/21/2018	7.58
8/29/2018	7.18
3/19/2019	7.15
8/7/2019	7.12
4/7/2020	7.3
9/18/2020	7.24
4/5/2021	7.59
9/1/2021	7.61
4/20/2022	7.35
9/14/2022	7.38
4/12/2023	7.08
9/20/2023	6.88
4/15/2024	7.3
9/12/2024	7.5

# Time Series

Constituent: Selenium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.005	
6/7/2016	<0.005		
6/8/2016			0.0071
8/15/2016		<0.005	0.00811
8/16/2016	<0.005		
10/10/2016	<0.005	<0.005	
10/11/2016			0.00821
12/14/2016	<0.005	<0.005	0.00834
2/17/2017		<0.005	0.00752
2/21/2017	<0.005		
4/17/2017	<0.005	<0.005	0.00823
6/19/2017	<0.005	<0.005	
6/21/2017			0.00829
8/7/2017	<0.005	<0.005	
8/8/2017			0.00759
3/5/2018		<0.005	
3/6/2018	<0.005		
3/7/2018			<0.005
6/19/2018	<0.005	<0.005	
6/20/2018			0.00739
8/27/2018	<0.005	<0.005	
8/29/2018			0.00827
3/18/2019	<0.005		
3/19/2019		<0.005	
3/20/2019			0.00569
8/6/2019	<0.005		
8/7/2019		<0.005	<0.005
4/7/2020	<0.005	<0.005	<0.005
9/18/2020	<0.005	<0.005	<0.005
4/5/2021	<0.005	<0.005	<0.005
9/1/2021	<0.005	<0.005	<0.005
4/20/2022	<0.005	<0.005	<0.005
9/14/2022	<0.005	<0.005	<0.005
4/11/2023	<0.005		<0.005
4/12/2023		<0.005	
9/18/2023		<0.005	
9/19/2023	<0.005		<0.005
4/11/2024		<0.005	
4/12/2024	<0.005		
4/15/2024			<0.005
9/10/2024		<0.005	
9/11/2024	<0.005		<0.005

# Time Series

Constituent: Selenium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.005		
6/8/2016		0.0165	
8/15/2016	<0.005	0.0103	
10/10/2016		0.0137	
10/11/2016	<0.005		
12/12/2016		0.0119	
12/14/2016	<0.005		
2/17/2017	<0.005		
2/21/2017		0.0074	
4/17/2017	<0.005		
4/18/2017		0.00674	
6/20/2017		0.0106	
6/21/2017	<0.005		
8/8/2017	<0.005	0.0109	
3/6/2018		<0.005	<0.005
3/7/2018	0.00502		
6/19/2018		0.00939	<0.005
6/20/2018	<0.005		
8/27/2018			<0.005
8/28/2018		<0.005	
8/29/2018	<0.005		
3/19/2019			<0.005
3/20/2019	<0.005	0.0102	
8/6/2019			<0.005
8/7/2019	<0.005	0.0108	
4/7/2020	<0.005	0.00632	<0.005
9/18/2020	<0.005	0.00762	<0.005
4/5/2021	<0.005	<0.005	<0.005
9/1/2021	<0.005	0.00617	<0.005
4/20/2022	<0.005	0.00634	<0.005
9/14/2022	<0.005	<0.005	<0.005
4/10/2023			<0.005
4/11/2023	<0.005	<0.005	
9/18/2023			<0.005
9/19/2023	<0.005	0.0053	
4/11/2024			<0.005
4/12/2024		<0.005	
4/15/2024	<0.005		
9/10/2024		0.00666	<0.005
9/11/2024	<0.005		

# Time Series

Constituent: Selenium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.005	<0.005
8/16/2016		<0.005	<0.005
10/11/2016		<0.005	<0.005
12/12/2016		<0.005	<0.005
2/17/2017		<0.005	
2/21/2017			<0.005
4/17/2017		<0.005	<0.005
6/20/2017		<0.005	<0.005
8/7/2017		<0.005	
8/8/2017			<0.005
3/6/2018		<0.005	<0.005
6/20/2018	<0.005		
6/21/2018		<0.005	<0.005
8/27/2018	<0.005		
8/28/2018		<0.005	
8/29/2018			<0.005
3/19/2019	<0.005	<0.005	<0.005
8/6/2019	<0.005		
8/7/2019		<0.005	<0.005
4/7/2020	<0.005	<0.005	<0.005
9/18/2020	<0.005	<0.005	<0.005
4/5/2021	<0.005	<0.005	<0.005
9/1/2021	<0.005	<0.005	<0.005
4/20/2022	<0.005	<0.005	<0.005
9/14/2022	<0.005	<0.005	<0.005
4/12/2023	<0.005	<0.005	<0.005
9/18/2023	<0.005		
9/20/2023		<0.005	<0.005
4/11/2024	<0.005		
4/15/2024		<0.005	<0.005
9/10/2024	<0.005		
9/12/2024		<0.005	<0.005

# Time Series

Constituent: Selenium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.005
8/16/2016	<0.005
10/11/2016	<0.005
12/12/2016	<0.005
2/21/2017	<0.005
4/17/2017	<0.005
6/21/2017	<0.005
8/8/2017	<0.005
3/6/2018	<0.005
6/21/2018	<0.005
8/29/2018	<0.005
3/19/2019	<0.005
8/7/2019	<0.005
4/7/2020	<0.005
9/18/2020	<0.005
4/5/2021	<0.005
9/1/2021	<0.005
4/20/2022	<0.005
9/14/2022	<0.005
4/12/2023	<0.005
9/20/2023	<0.005
4/15/2024	<0.005
9/12/2024	<0.005

# Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		42.1	
6/7/2016	366		
6/8/2016			1050
8/15/2016		33.8	1040
8/16/2016	187		
10/10/2016	187	36.4	
10/11/2016			1010
12/14/2016	149	38.4	1140
2/17/2017		47.3	1190
2/21/2017	145		
4/17/2017	145	38.3	1200
6/19/2017	190	35.4	
6/21/2017			1020
8/7/2017	119	39	
8/8/2017			1110
10/16/2017	106	46.9	
10/17/2017			1210
11/28/2017			1140 (R)
3/5/2018		51.4	
3/6/2018	87.3		
3/7/2018			1110
6/19/2018	136	37.3	
6/20/2018			1090
8/27/2018	94.7	34.3	
8/29/2018			1070
3/18/2019	223		
3/19/2019		42.8	
3/20/2019			1050
8/6/2019	276		
8/7/2019		28.8	837
4/7/2020	123	18.6	888
9/18/2020	100	36.5	924
4/5/2021	99.7	27.6	952
9/1/2021	82.7	32.3	1010
4/20/2022	72.8	48.3	1030
9/14/2022	67.1	31.2	978
4/11/2023	72.2		1150
4/12/2023		39.8	
9/18/2023		57.4	
9/19/2023	94.2		1440
4/11/2024		49.6	
4/12/2024	65.7		
4/15/2024			1160
9/10/2024		59.9	
9/11/2024	68.9		1110

# Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	827		
6/8/2016		713	
8/15/2016	605	520	
10/10/2016		603	
10/11/2016	607		
12/12/2016		645	
12/14/2016	732		
2/17/2017	849		
2/21/2017		415	
4/17/2017	853		
4/18/2017		461	
6/20/2017		541	
6/21/2017	537		
8/8/2017	664	590	
10/16/2017		206	
10/17/2017	835		
11/28/2017	779 (R)		
3/6/2018		53.7	123
3/7/2018	824		
6/19/2018		489	134
6/20/2018	210		
8/27/2018			125
8/28/2018		96.6	
8/29/2018	400		
3/19/2019			134
3/20/2019	351	442	
8/6/2019			139
8/7/2019	327	529	
4/7/2020	496	373	143
9/18/2020	403	356	151
4/5/2021	338	237	154
9/1/2021	333	303	154
4/20/2022	297	293	158
9/14/2022	319	151	220
4/10/2023			147
4/11/2023	254	215	
9/18/2023			208
9/19/2023	365	303	
4/11/2024			160
4/12/2024		138	
4/15/2024	256		
9/10/2024		248	161
9/11/2024	273		



# Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		32.2	109
8/16/2016		28.4	109
10/11/2016		27.2	105
12/12/2016		32.7	109
2/17/2017		36	
2/21/2017			111
4/17/2017		39.5	108
6/20/2017		33	108
8/7/2017		35.3	
8/8/2017			114
10/16/2017		45.4	
10/17/2017			135
3/6/2018		162	122
6/20/2018	38.4		
6/21/2018		51.3	119
8/27/2018	31.7		
8/28/2018		52.2	
8/29/2018			120
3/19/2019	26.2	48	85
8/6/2019	29.7		
8/7/2019		47	112
4/7/2020	25.5	41.5	58.9
9/18/2020	25.8	46.9	61.9
4/5/2021	35.5	60.1	57.4
9/1/2021	25.8	50.2	53.7
4/20/2022	25.4	58.4	44.7
9/14/2022	23	49.5	49.9
4/12/2023	25	54	45.8
9/18/2023	28.6		
9/20/2023		53.1	53.4
4/11/2024	21.8		
4/15/2024		56.1	46.3
9/10/2024	23.8		
9/12/2024		65.8	50.4

# Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<5
8/16/2016	<5
10/11/2016	<5
12/12/2016	<5
2/21/2017	5.94
4/17/2017	<5
6/21/2017	<5
8/8/2017	<5
10/17/2017	<5
3/6/2018	<5
6/21/2018	<5
8/29/2018	<5
3/19/2019	<5
8/7/2019	<5
4/7/2020	13.6
9/18/2020	19.1
4/5/2021	27.3
9/1/2021	22.7
4/20/2022	18.9
9/14/2022	16.4
4/12/2023	20.5
9/20/2023	10.1
4/15/2024	18.1
9/12/2024	16.3

# Time Series

Constituent: Thallium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		<0.001	
6/7/2016	<0.001		
6/8/2016			<0.001
8/15/2016		<0.001	<0.001
8/16/2016	<0.001		
10/10/2016	<0.001	<0.001	
10/11/2016			<0.001
12/14/2016	<0.001	<0.001	<0.001
2/17/2017		<0.001	<0.001
2/21/2017	<0.001		
4/17/2017	<0.001	<0.001	<0.001
6/19/2017	<0.001	<0.001	
6/21/2017			<0.001
8/7/2017	<0.001	<0.001	
8/8/2017			<0.001
3/5/2018		<0.001	
3/6/2018	<0.001		
3/7/2018			<0.001
6/19/2018	<0.001	<0.001	
6/20/2018			<0.001
8/27/2018	<0.001	<0.001	
8/29/2018			<0.001
3/18/2019	<0.001		
3/19/2019		<0.001	
3/20/2019			<0.001
8/6/2019	<0.001		
8/7/2019		<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001
4/20/2022	<0.001	<0.001	<0.001
9/14/2022	<0.001	<0.001	<0.001
4/11/2023	<0.001		<0.001
4/12/2023		<0.001	
9/18/2023		<0.001	
9/19/2023	<0.001		<0.001
4/11/2024		<0.001	
4/12/2024	<0.001		
4/15/2024			<0.001
9/10/2024		<0.001	
9/11/2024	<0.001		<0.001

# Time Series

Constituent: Thallium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	<0.001		
6/8/2016		<0.001	
8/15/2016	<0.001	<0.001	
10/10/2016		<0.001	
10/11/2016	<0.001		
12/12/2016		<0.001	
12/14/2016	<0.001		
2/17/2017	<0.001		
2/21/2017		<0.001	
4/17/2017	<0.001		
4/18/2017		<0.001	
6/20/2017		<0.001	
6/21/2017	<0.001		
8/8/2017	<0.001	<0.001	
3/6/2018		<0.001	<0.001
3/7/2018	<0.001		
6/19/2018		<0.001	<0.001
6/20/2018	<0.001		
8/27/2018			<0.001
8/28/2018		<0.001	
8/29/2018	<0.001		
3/19/2019			<0.001
3/20/2019	<0.001	<0.001	
8/6/2019			<0.001
8/7/2019	<0.001	<0.001	
4/7/2020	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001
4/20/2022	<0.001	<0.001	<0.001
9/14/2022	<0.001	<0.001	<0.001
4/10/2023			<0.001
4/11/2023	<0.001	<0.001	
9/18/2023			<0.001
9/19/2023	<0.001	<0.001	
4/11/2024			<0.001
4/12/2024		<0.001	
4/15/2024	<0.001		
9/10/2024		<0.001	<0.001
9/11/2024	<0.001		

# Time Series

Constituent: Thallium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		<0.001	<0.001
8/16/2016		<0.001	<0.001
10/11/2016		<0.001	<0.001
12/12/2016		<0.001	<0.001
2/17/2017		<0.001	
2/21/2017			<0.001
4/17/2017		<0.001	<0.001
6/20/2017		<0.001	<0.001
8/7/2017		<0.001	
8/8/2017			<0.001
3/6/2018		<0.001	<0.001
6/20/2018	<0.001		
6/21/2018		<0.001	<0.001
8/27/2018	<0.001		
8/28/2018		<0.001	
8/29/2018			<0.001
3/19/2019	<0.001	<0.001	<0.001
8/6/2019	<0.001		
8/7/2019		<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001
4/20/2022	<0.001	<0.001	<0.001
9/14/2022	<0.001	<0.001	<0.001
4/12/2023	<0.001	0.00288	0.00393
9/18/2023	<0.001		
9/20/2023		0.003	0.00442
4/11/2024	<0.001		
4/15/2024		<0.001	<0.001
9/10/2024	<0.001		
9/12/2024		<0.001	<0.001

# Time Series

Constituent: Thallium (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	<0.001
8/16/2016	<0.001
10/11/2016	<0.001
12/12/2016	<0.001
2/21/2017	<0.001
4/17/2017	<0.001
6/21/2017	<0.001
8/8/2017	<0.001
3/6/2018	<0.001
6/21/2018	<0.001
8/29/2018	<0.001
3/19/2019	<0.001
8/7/2019	<0.001
4/7/2020	<0.001
9/18/2020	<0.001
4/5/2021	<0.001
9/1/2021	<0.001
4/20/2022	<0.001
9/14/2022	<0.001
4/12/2023	<0.001
9/20/2023	<0.001
4/15/2024	<0.001
9/12/2024	<0.001

# Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A
6/6/2016		468	
6/7/2016	836		
6/8/2016			2000
8/15/2016		412	1980
8/16/2016	664		
10/10/2016	708	444	
10/11/2016			2500
12/14/2016	634	428	2080
2/17/2017		498	1010
2/21/2017	578		
4/17/2017	624	538	2260
6/19/2017	656	524	
6/21/2017			2250
8/7/2017	488	458	
8/8/2017			2170
10/16/2017	470	414	
10/17/2017			2080
11/28/2017			2650 (R)
3/5/2018		314	
3/6/2018	376		
3/7/2018			1820
6/19/2018	502	396	
6/20/2018			1800
8/27/2018	414	392	
8/29/2018			1900
3/18/2019	612		
3/19/2019		326	
3/20/2019			1690
8/6/2019	702		
8/7/2019		320	1510
4/7/2020	418	316	1510
9/18/2020	350	344	1620
4/5/2021	382	322	1290
9/1/2021	342	314	1560
4/20/2022	322	344	1530
9/14/2022	350	340	1710
4/11/2023	2390 (o)		2140
4/12/2023		410	
9/18/2023		318	
9/19/2023	260		1800
4/11/2024		382	
4/12/2024	362		
4/15/2024			1750
9/10/2024		386	
9/11/2024	320		1830

# Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-21	MW-22 (bg)
6/6/2016	1620		
6/8/2016		1440	
8/15/2016	1270	1110	
10/10/2016		1420	
10/11/2016	1500		
12/12/2016		1240	
12/14/2016	1600		
2/17/2017	1470		
2/21/2017		1010	
4/17/2017	1780		
4/18/2017		1060	
6/20/2017		1140	
6/21/2017	1280		
8/8/2017	1390	1220	
10/16/2017		514	
10/17/2017	1520		
11/28/2017	1670 (R)		
3/6/2018		200	424
3/7/2018	1270		
6/19/2018		952	434
6/20/2018	676		
8/27/2018			420
8/28/2018		416	
8/29/2018	948		
3/19/2019			456
3/20/2019	724	872	
8/6/2019			428
8/7/2019	786	960	
4/7/2020	942	698	422
9/18/2020	920	738	398
4/5/2021	738	540	412
9/1/2021	736	636	420
4/20/2022	682	558	388
9/14/2022	796	524	390
4/10/2023			450
4/11/2023	646	646	
9/18/2023			404
9/19/2023	720	626	
4/11/2024			422
4/12/2024		366	
4/15/2024	636		
9/10/2024		584	396
9/11/2024	602		



# Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-23 (bg)	MW-4B	MW-5B
6/7/2016		507	920
8/16/2016		426	672
10/11/2016		450	646
12/12/2016		450	636
2/17/2017		460	
2/21/2017			684
4/17/2017		442	680
6/20/2017		452	656
8/7/2017		420	
8/8/2017			734
10/16/2017		466	
10/17/2017			688
3/6/2018		586	620
6/20/2018	384		
6/21/2018		440	828
8/27/2018	340		
8/28/2018		420	
8/29/2018			622
3/19/2019	296	398	562
8/6/2019	336		
8/7/2019		422	596
4/7/2020	298	366	494
9/18/2020	250	360	436
4/5/2021	274	380	434
9/1/2021	256	370	448
4/20/2022	218	370	428
9/14/2022	278	358	484
4/12/2023	286	396	478
9/18/2023	282		
9/20/2023		364	476
4/11/2024	274		
4/15/2024		392	450
9/10/2024	260		
9/12/2024		410	520

# Time Series

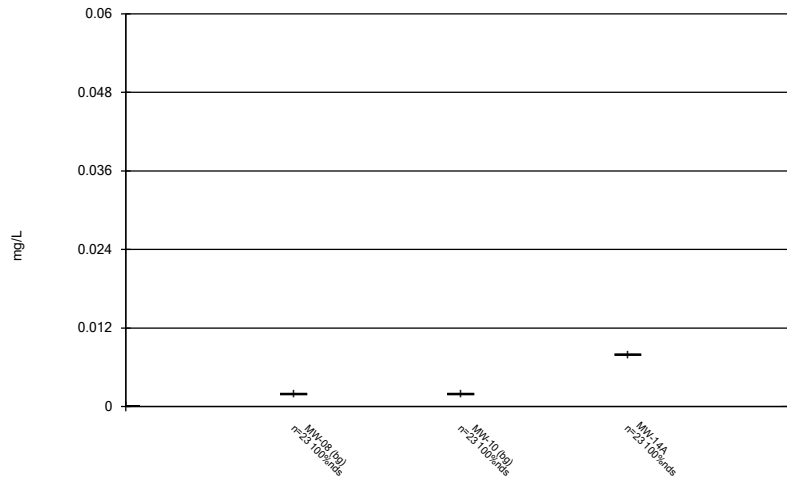
Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 1:21 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-6A
6/7/2016	440
8/16/2016	340
10/11/2016	370
12/12/2016	368
2/21/2017	336
4/17/2017	402
6/21/2017	486
8/8/2017	364
10/17/2017	424
3/6/2018	292
6/21/2018	368
8/29/2018	298
3/19/2019	320
8/7/2019	308
4/7/2020	336
9/18/2020	374
4/5/2021	330
9/1/2021	350
4/20/2022	336
9/14/2022	334
4/12/2023	428
9/20/2023	332
4/15/2024	376
9/12/2024	382

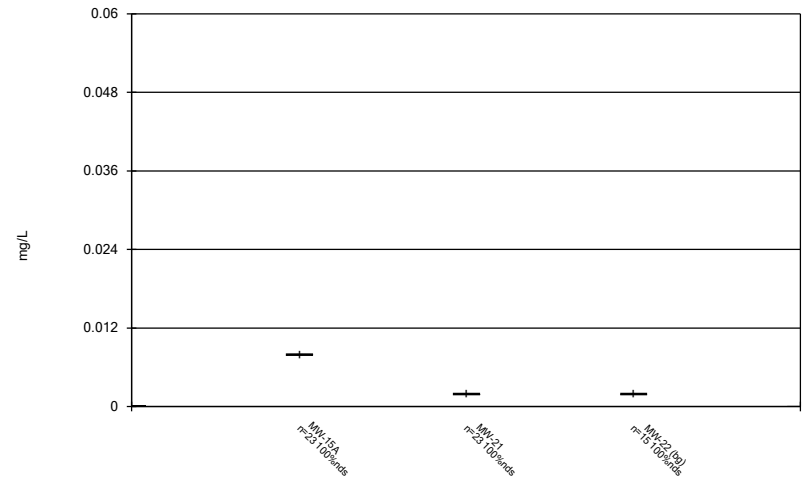
FIGURE B.

Box & Whiskers Plot



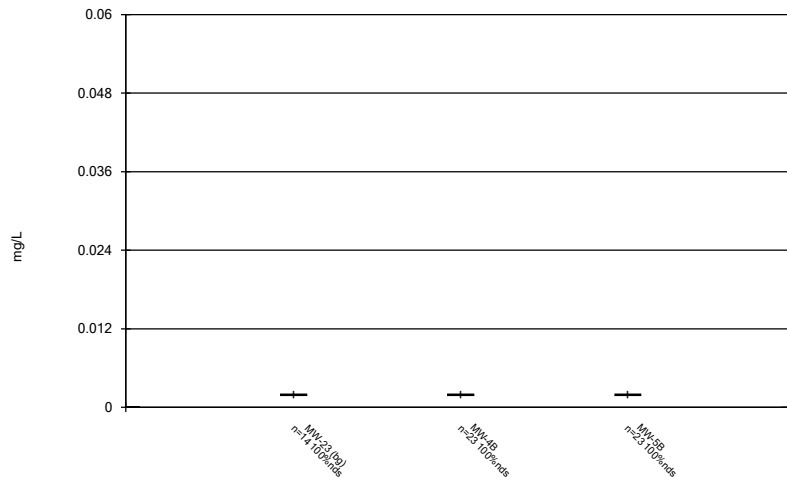
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



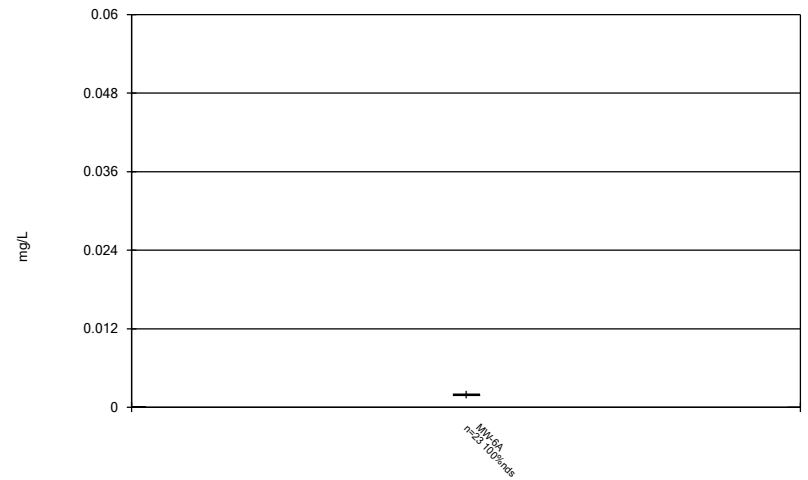
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Box & Whiskers Plot



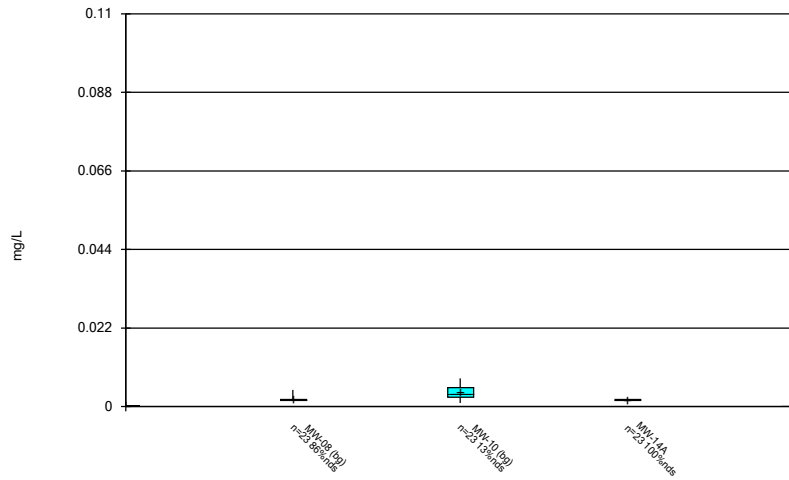
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Box & Whiskers Plot



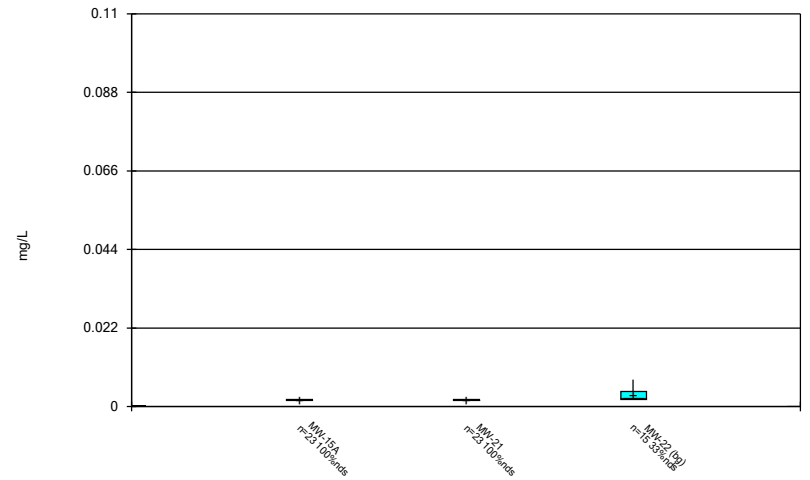
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Box & Whiskers Plot



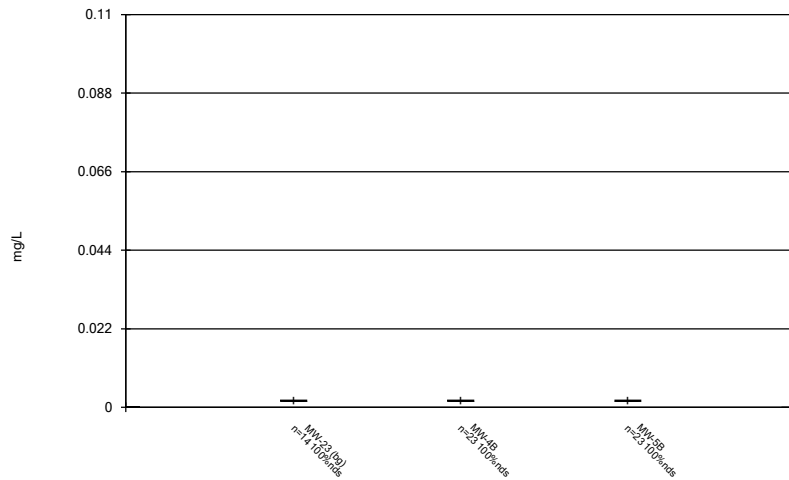
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Box & Whiskers Plot



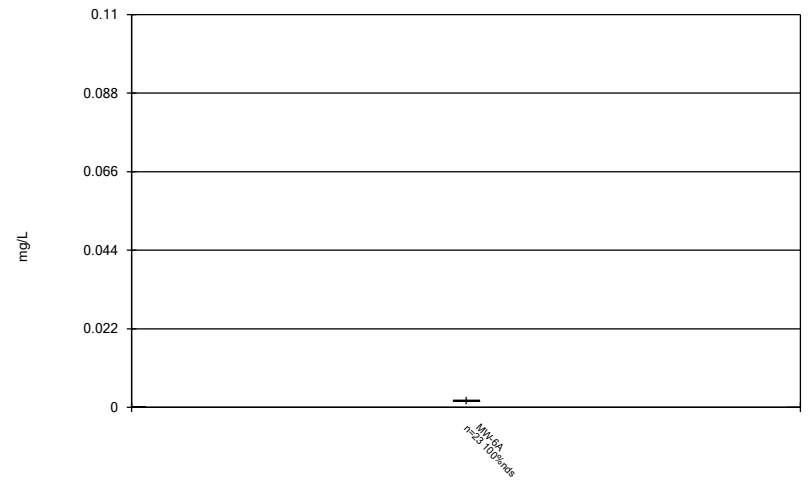
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Box & Whiskers Plot



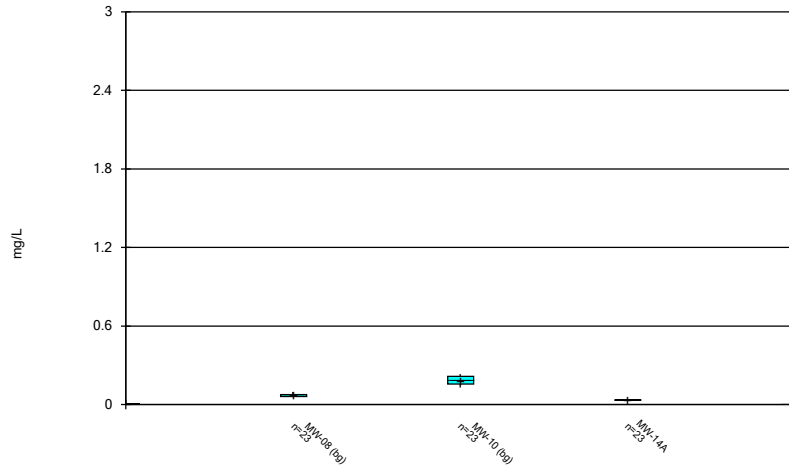
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Box & Whiskers Plot



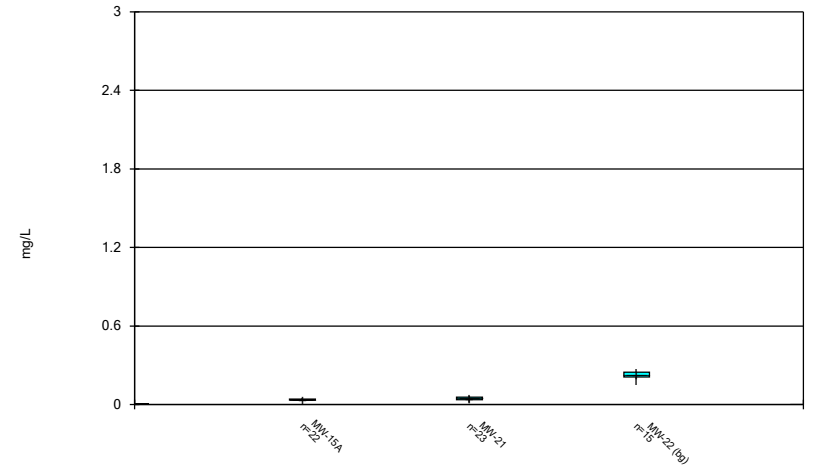
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Box & Whiskers Plot



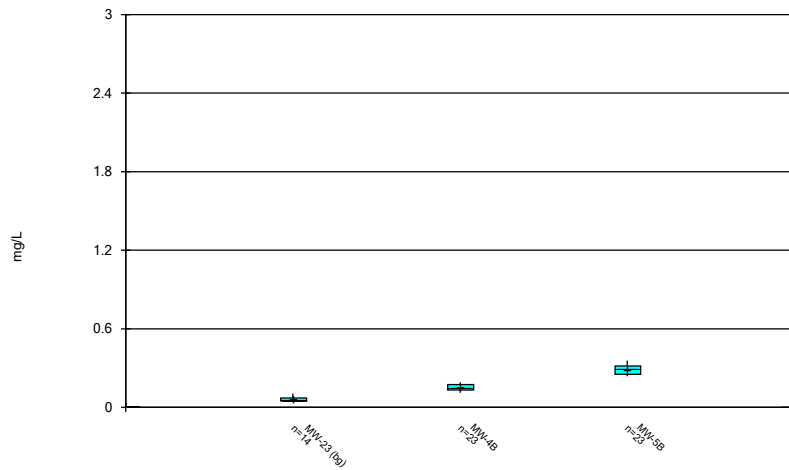
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Box & Whiskers Plot



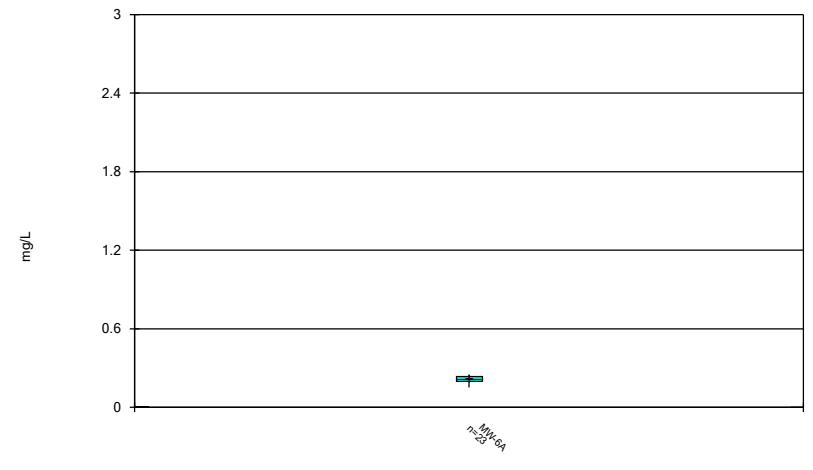
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Box & Whiskers Plot



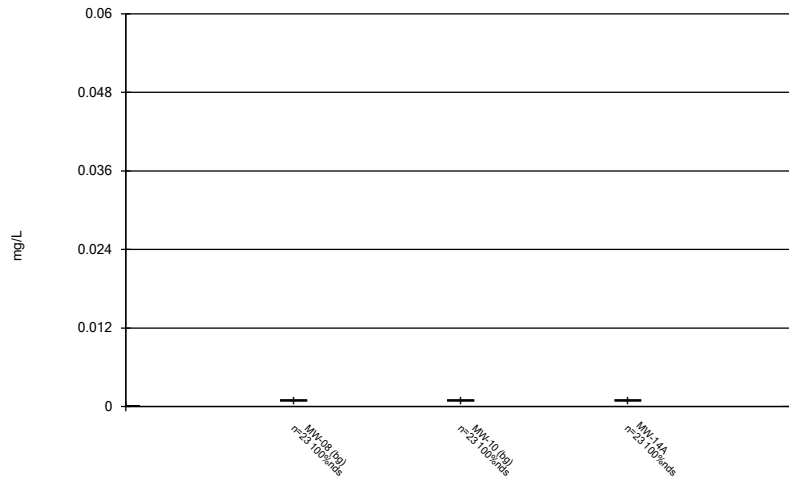
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



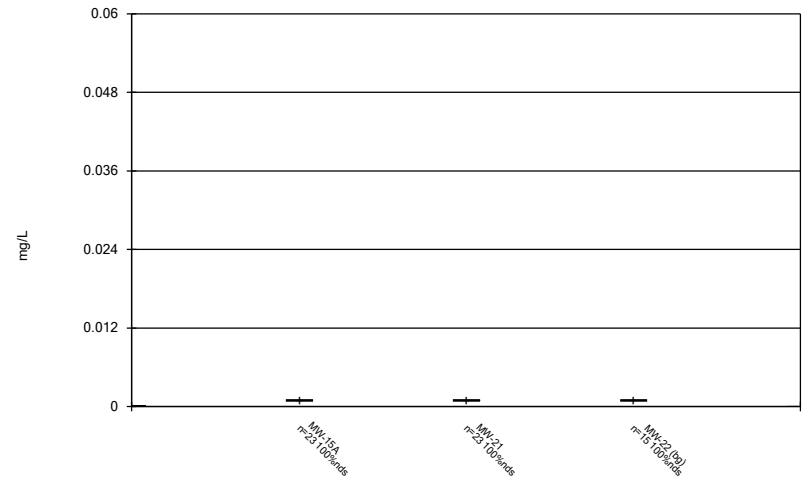
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Box & Whiskers Plot



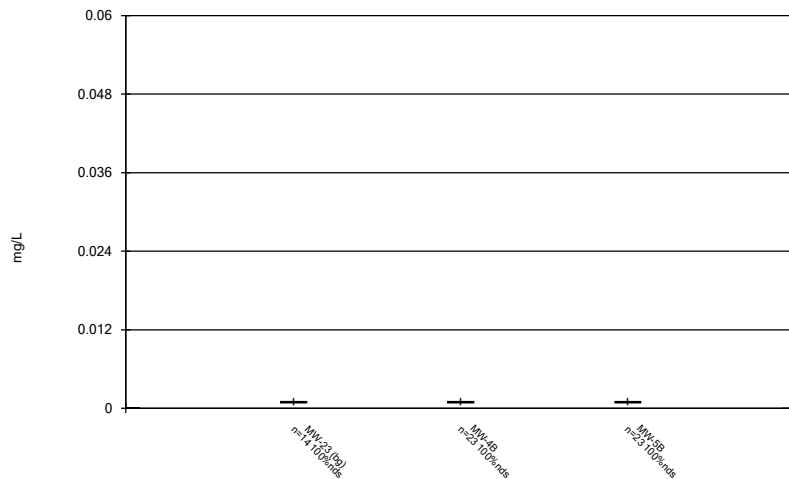
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Box & Whiskers Plot



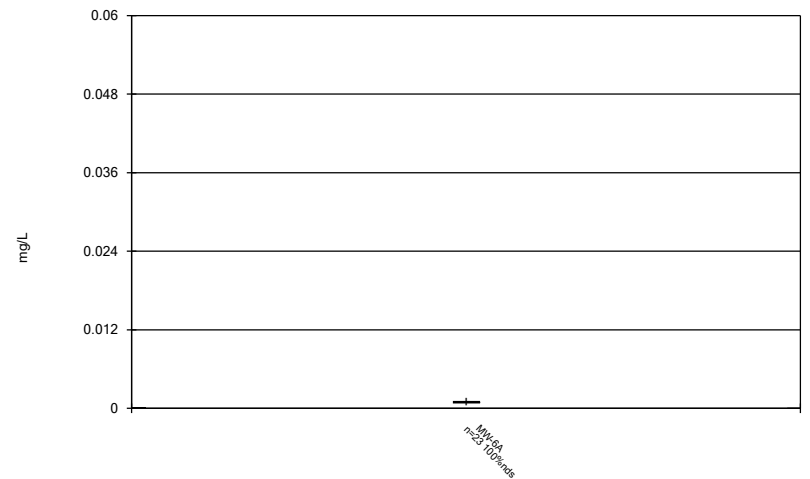
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Box & Whiskers Plot



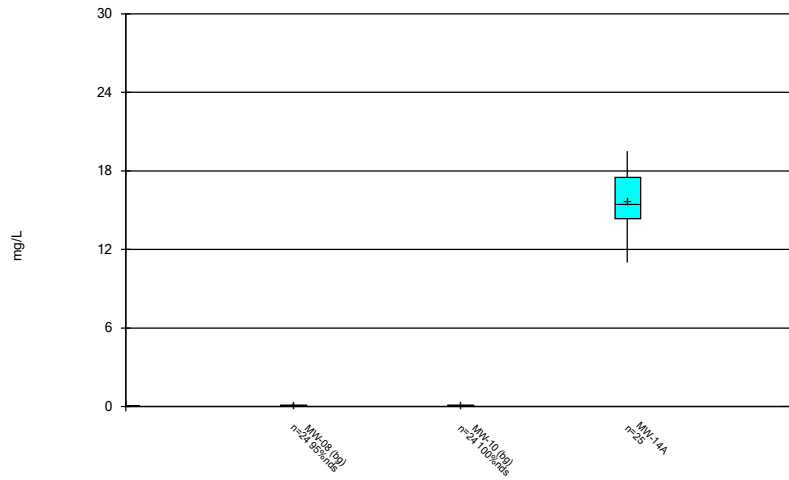
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Box & Whiskers Plot



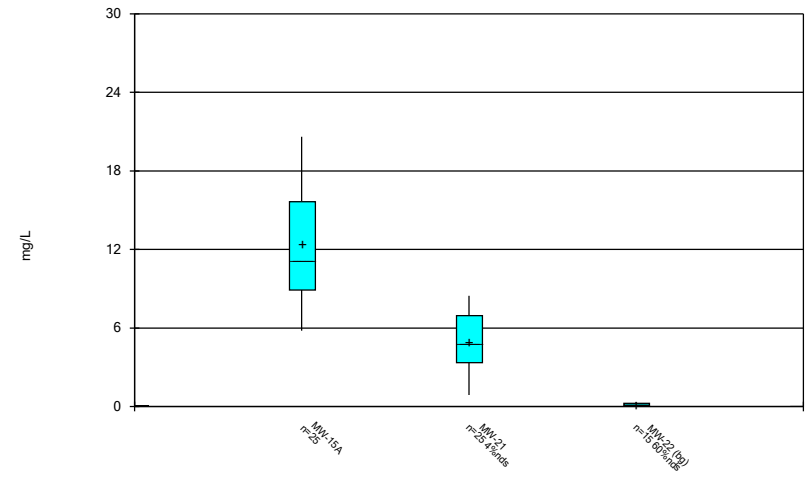
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Box & Whiskers Plot



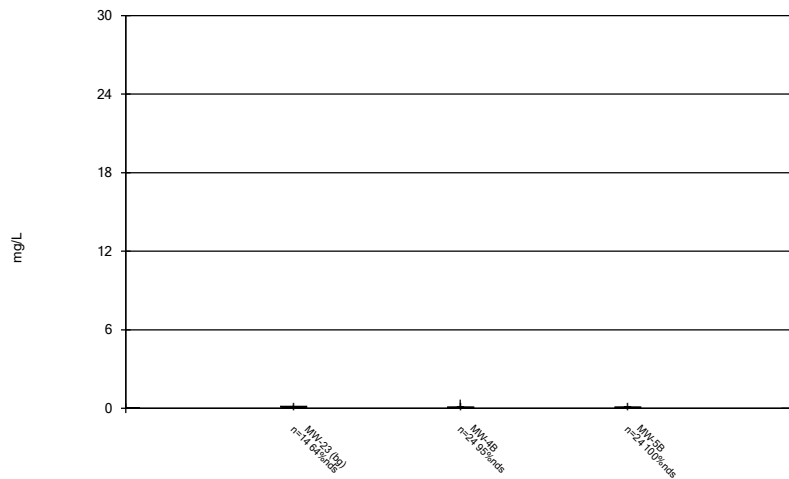
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Box & Whiskers Plot



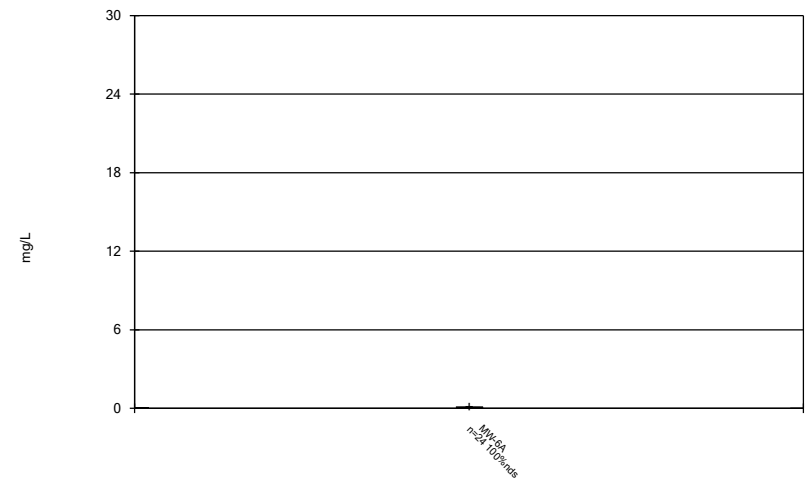
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Box & Whiskers Plot



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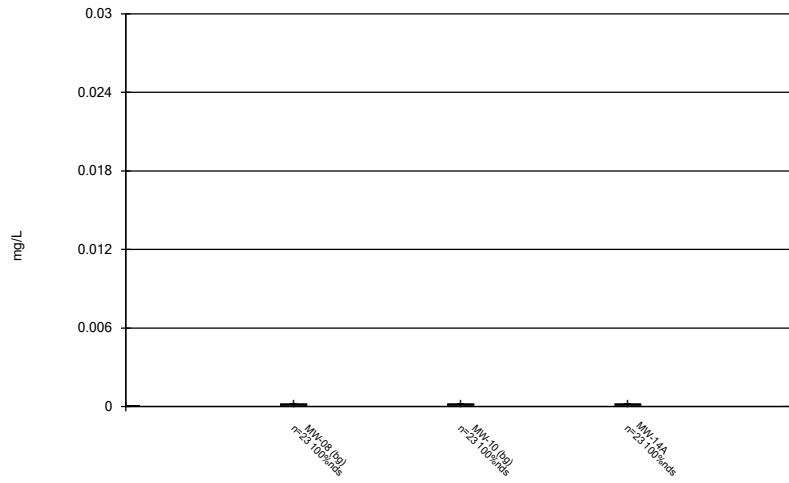
Box & Whiskers Plot



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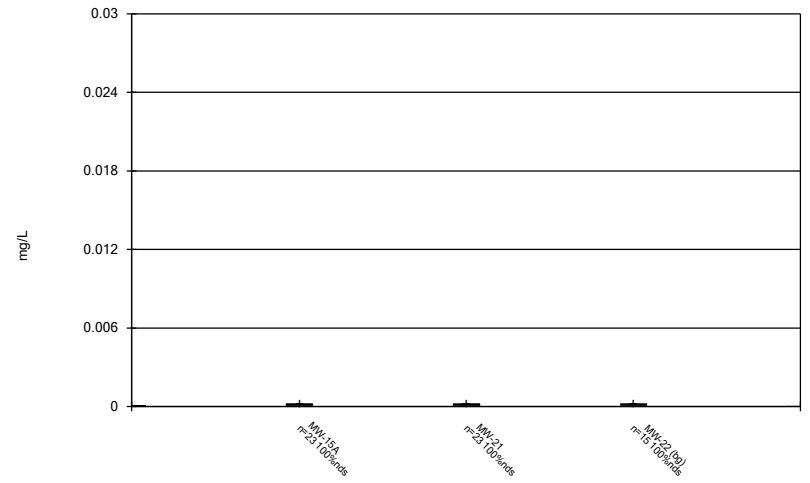


### Box & Whiskers Plot



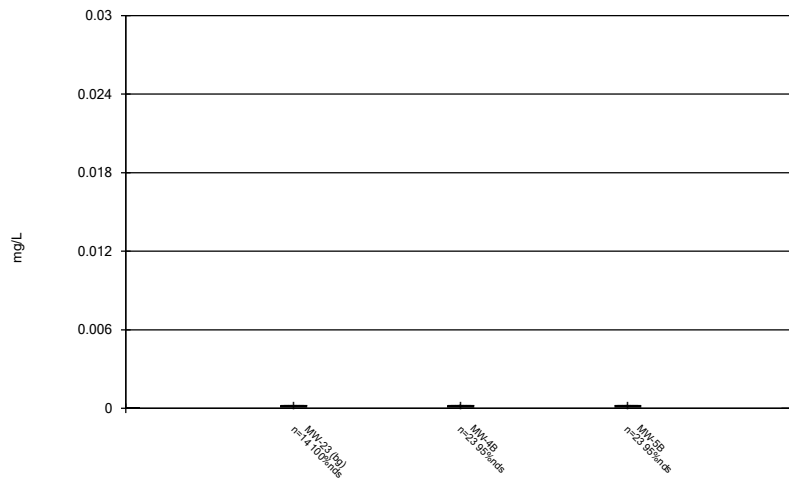
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### Box & Whiskers Plot



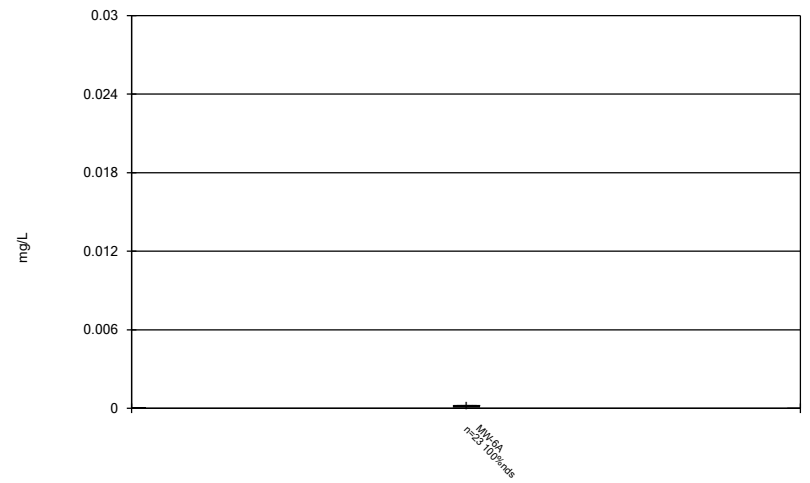
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### Box & Whiskers Plot



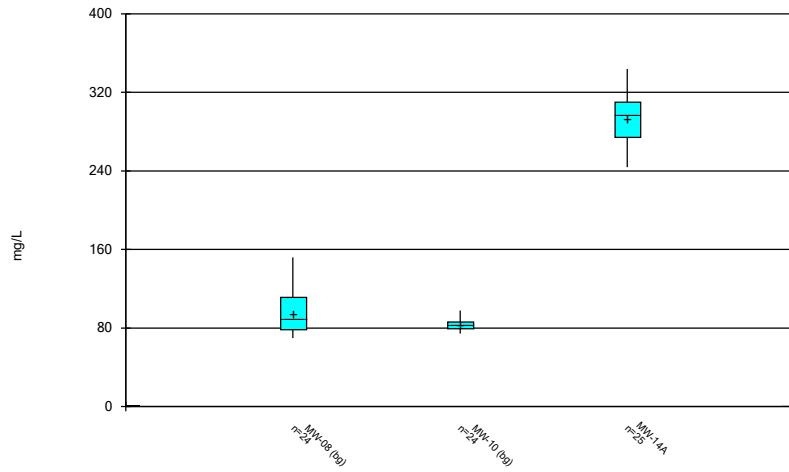
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### Box & Whiskers Plot



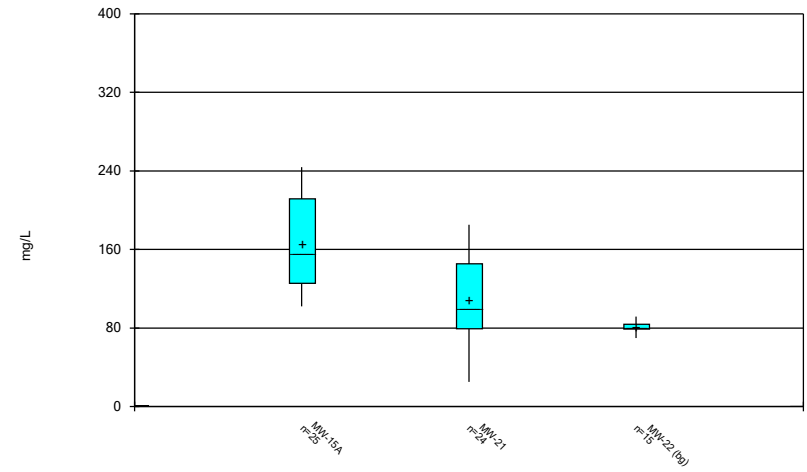
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Box & Whiskers Plot



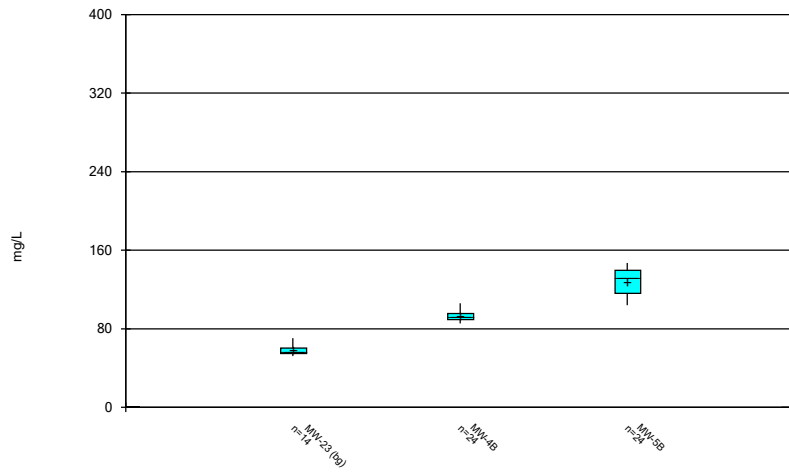
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Box & Whiskers Plot



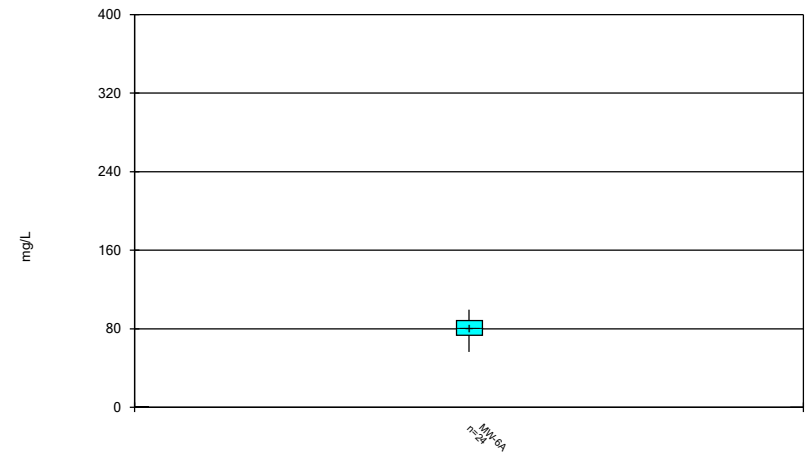
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Box & Whiskers Plot



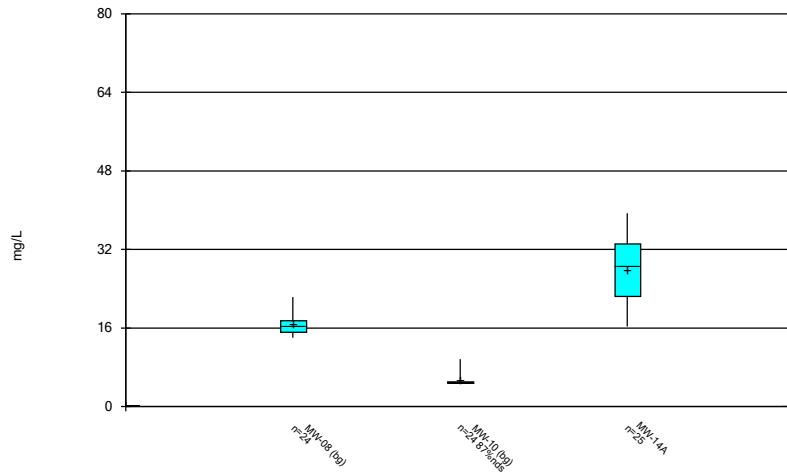
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Box & Whiskers Plot



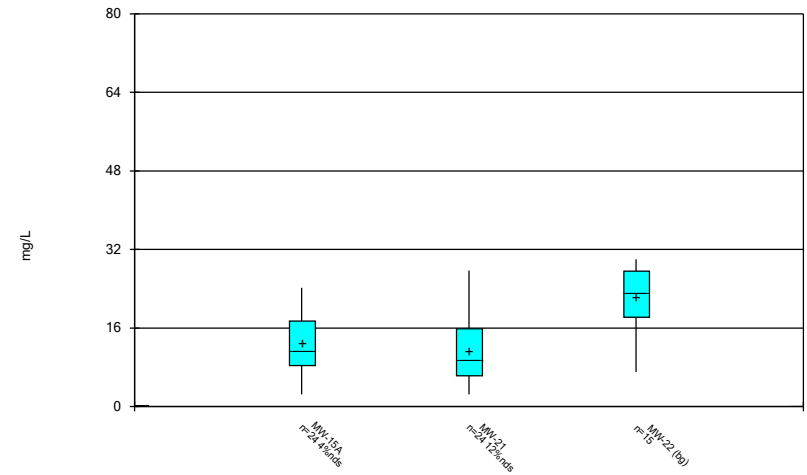
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Box & Whiskers Plot



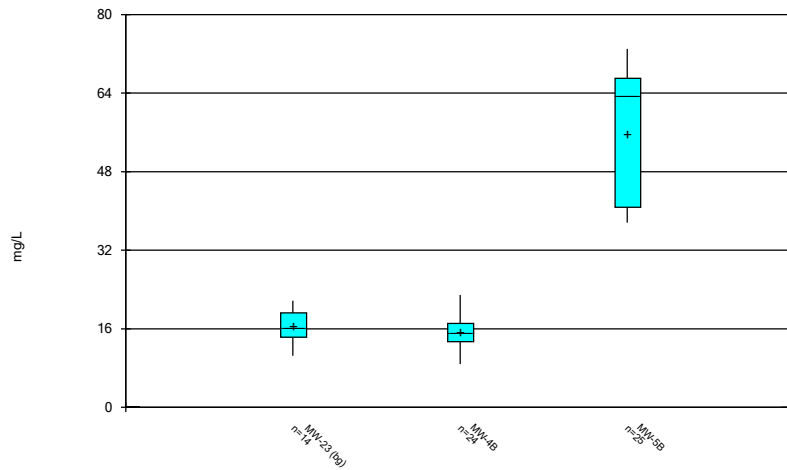
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



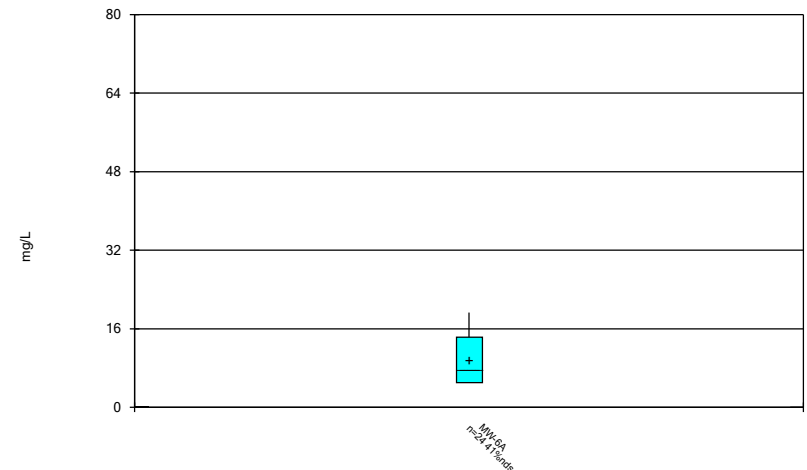
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



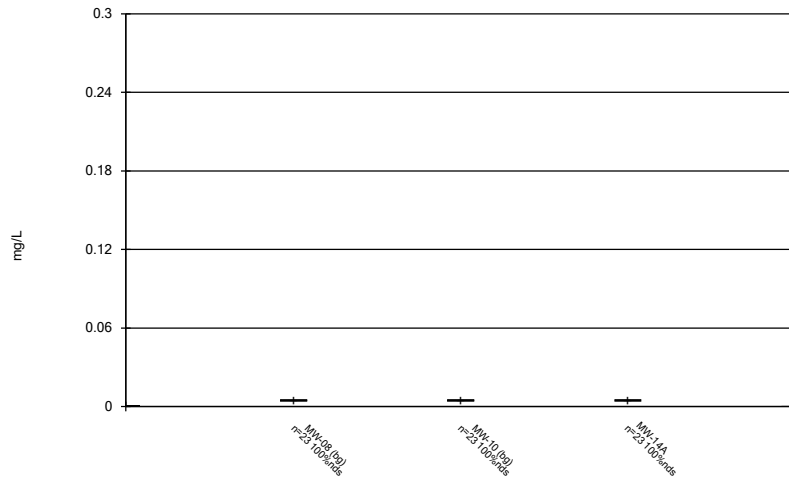
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Box & Whiskers Plot



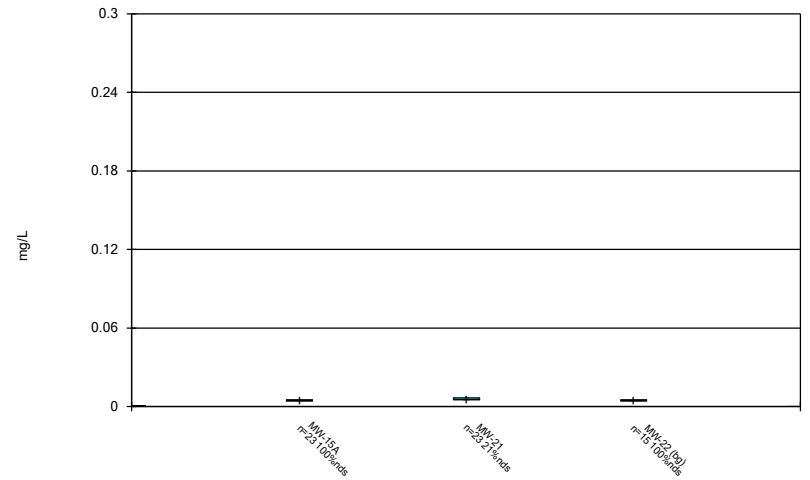
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Box & Whiskers Plot



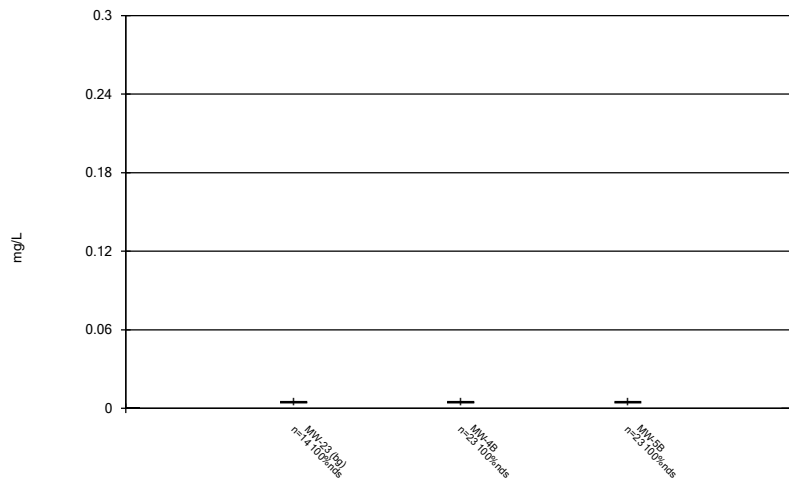
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



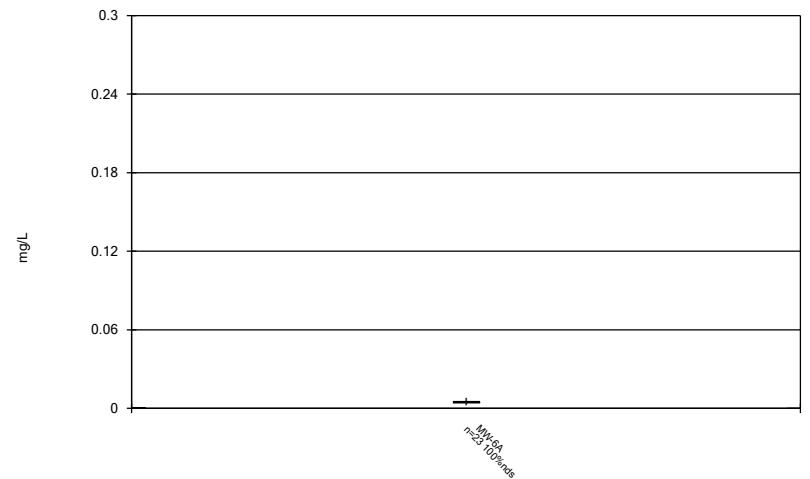
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Box & Whiskers Plot



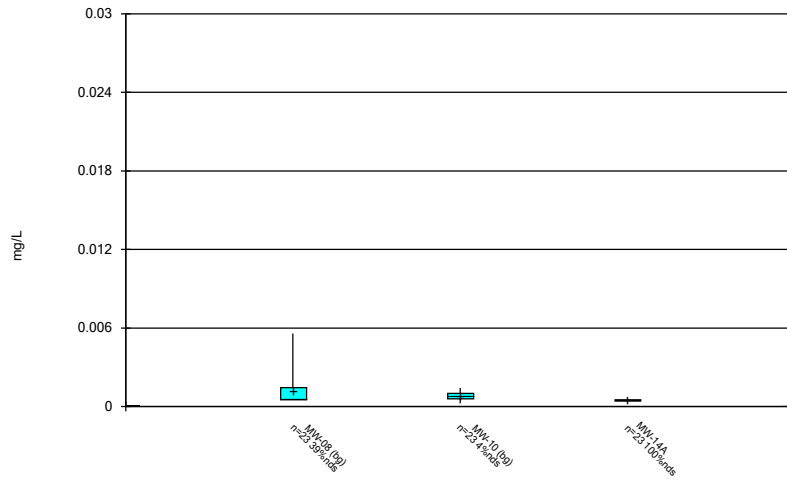
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



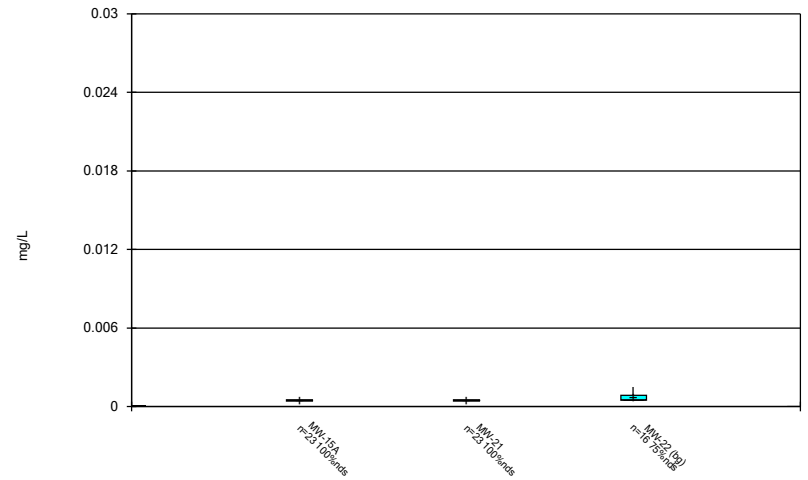
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Box & Whiskers Plot



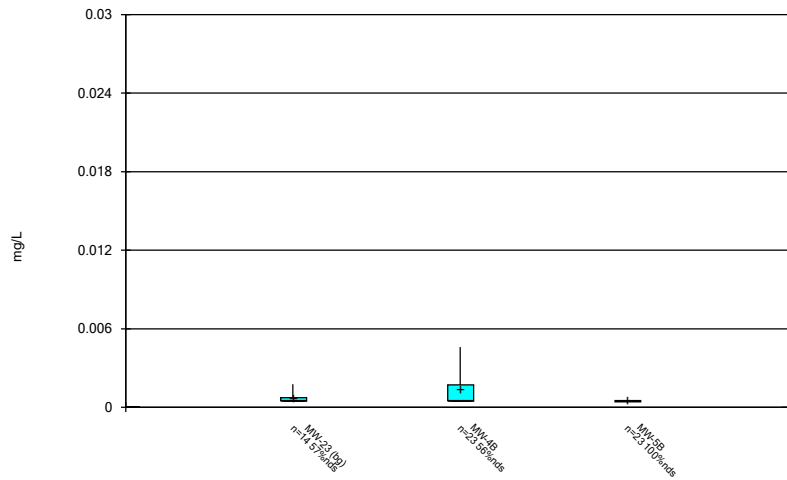
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



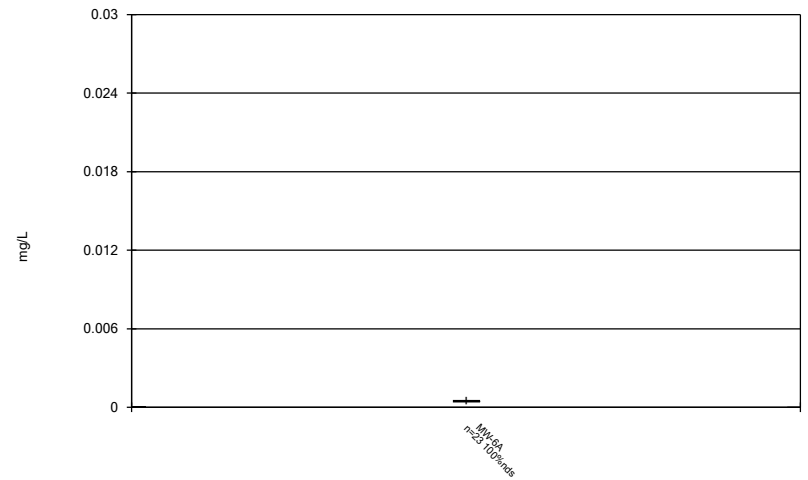
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



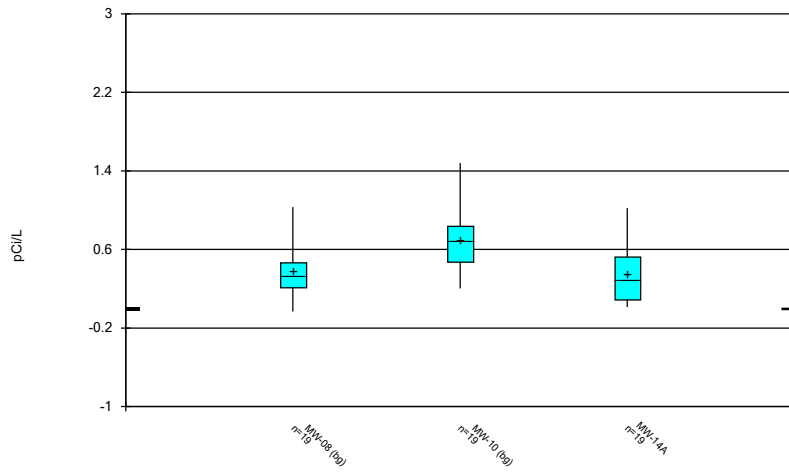
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



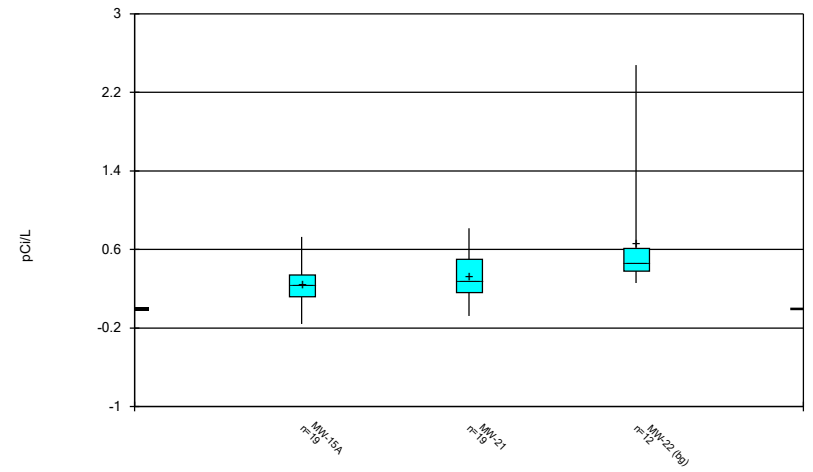
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Box & Whiskers Plot



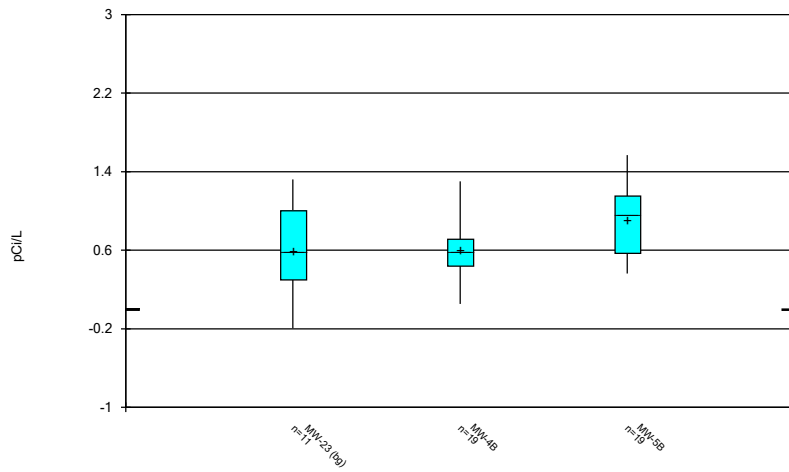
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



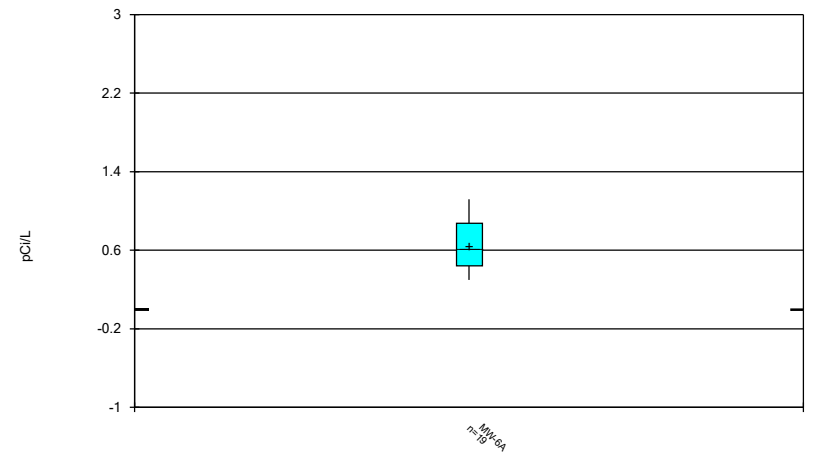
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Box & Whiskers Plot



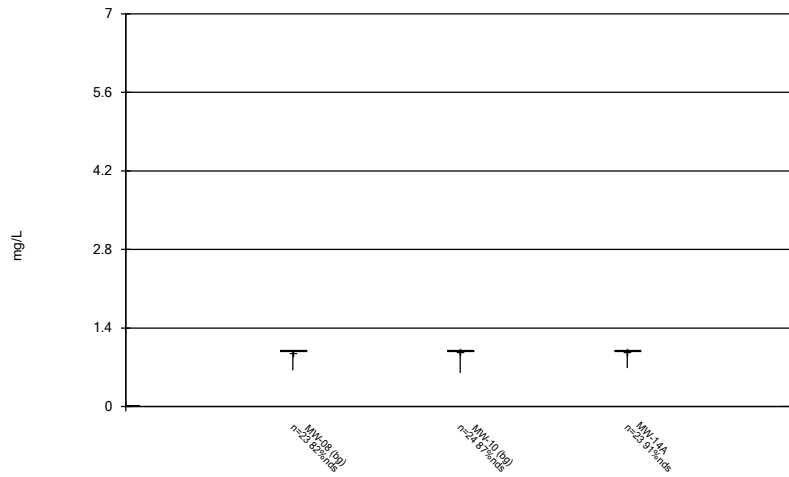
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



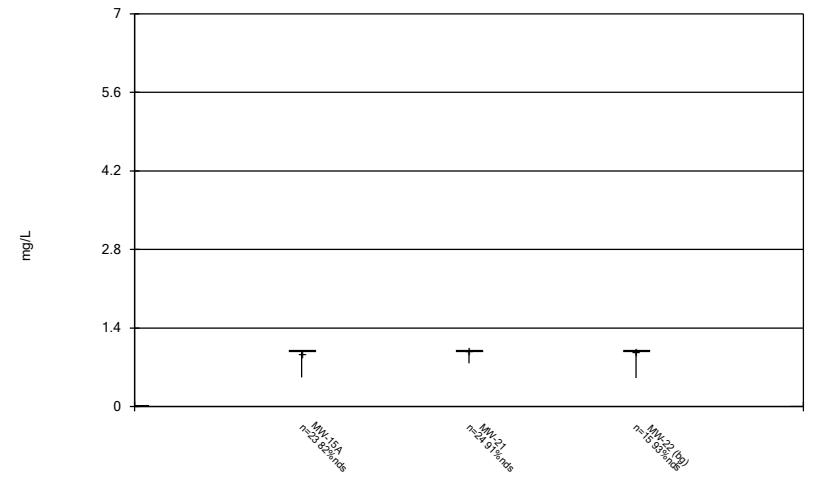
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



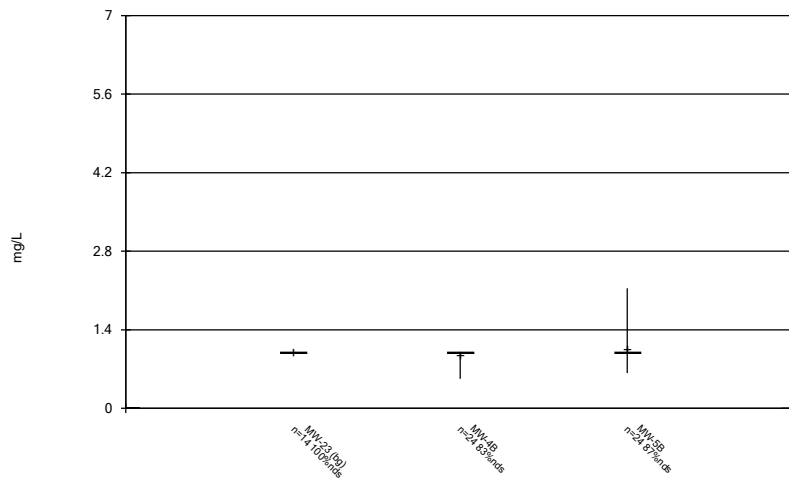
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



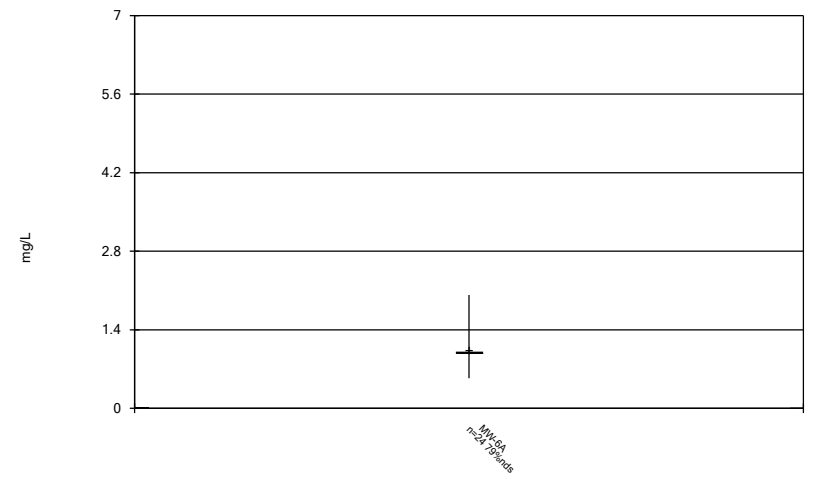
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



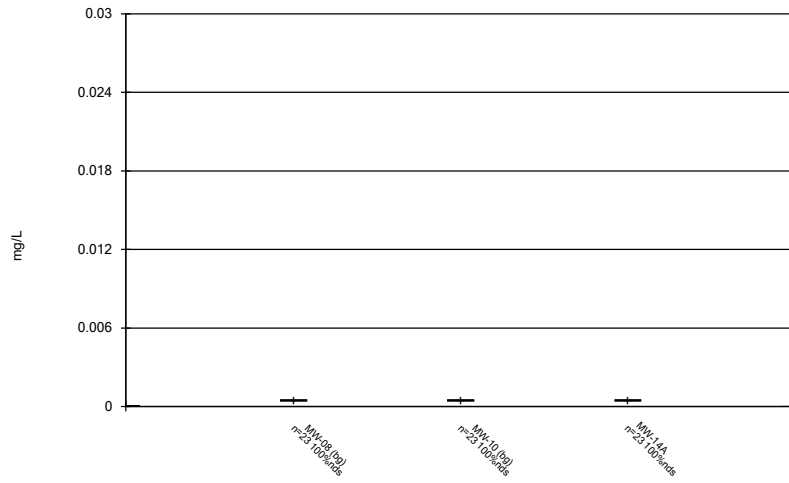
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



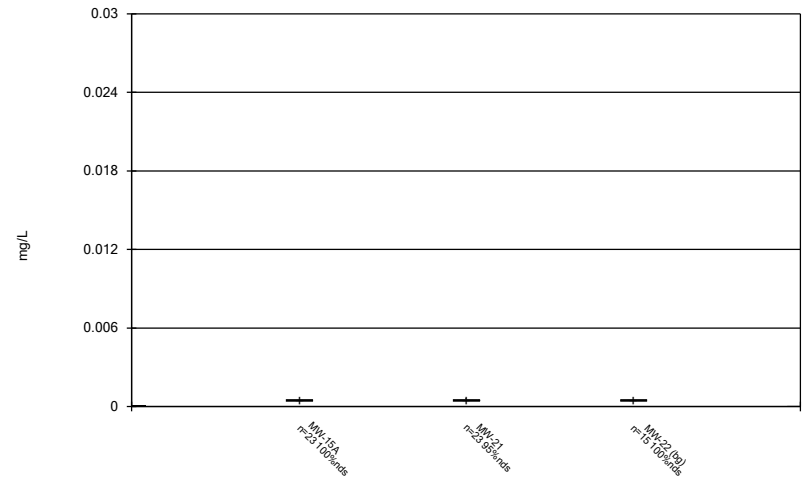
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



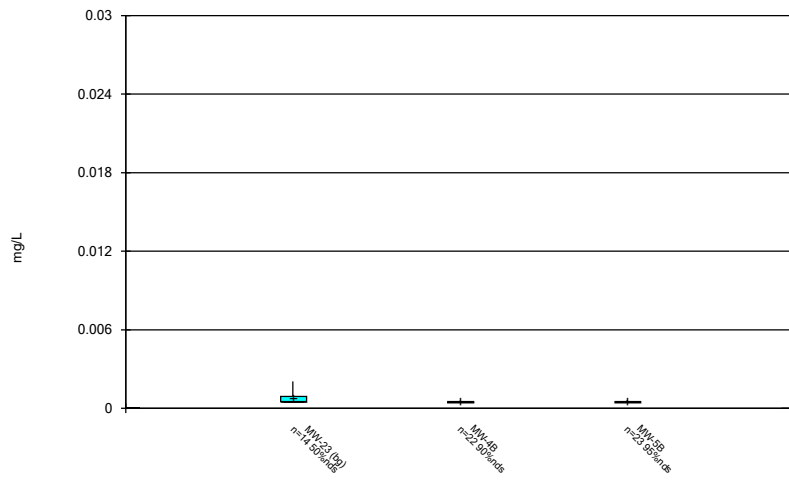
Constituent: Lead Analysis Run 12/11/2024 1:22 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



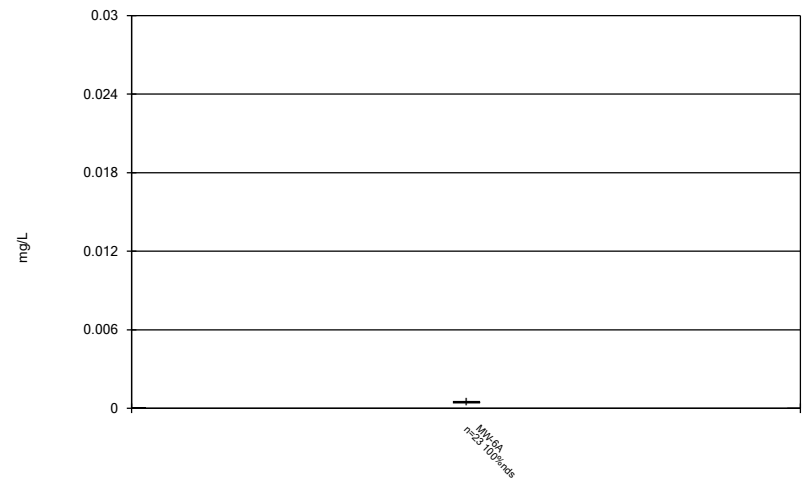
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



Constituent: Lead Analysis Run 12/11/2024 1:22 PM View: Federal Descriptive  
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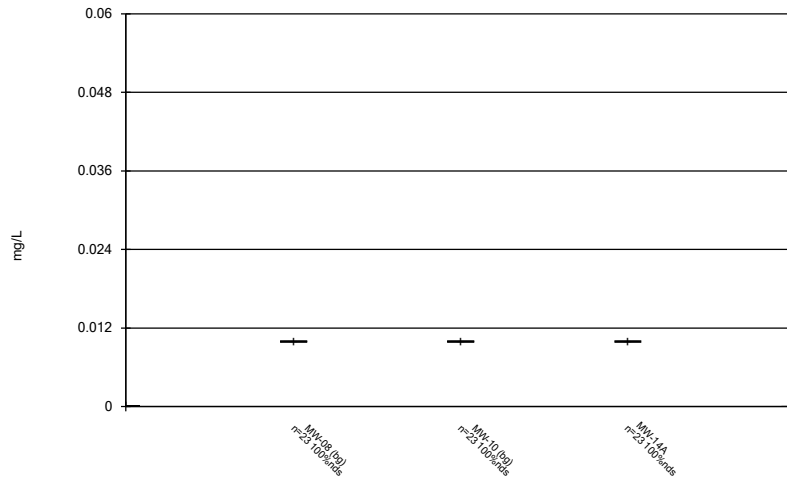
Box & Whiskers Plot



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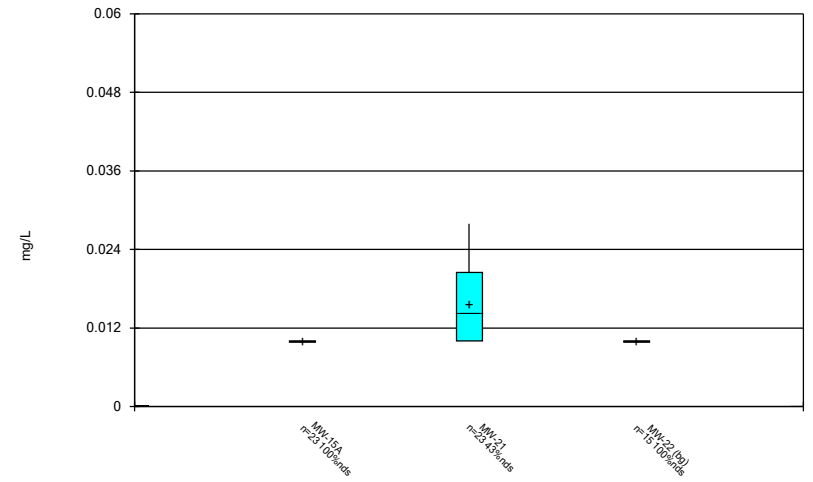


Box & Whiskers Plot



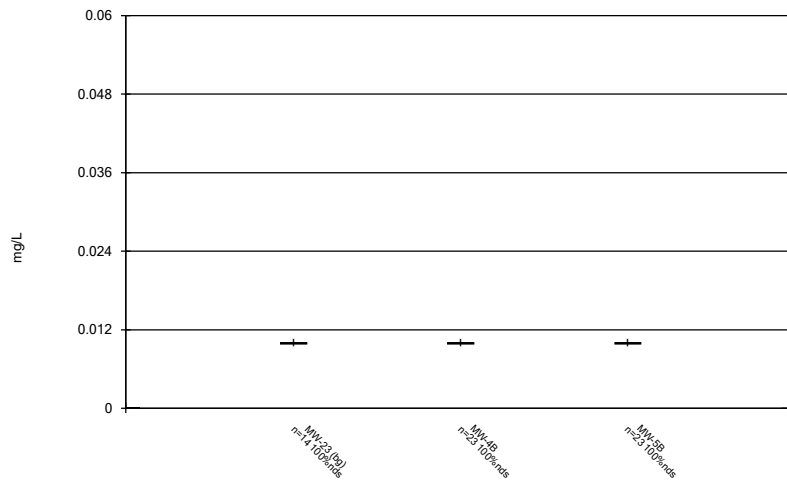
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Box & Whiskers Plot



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Box & Whiskers Plot



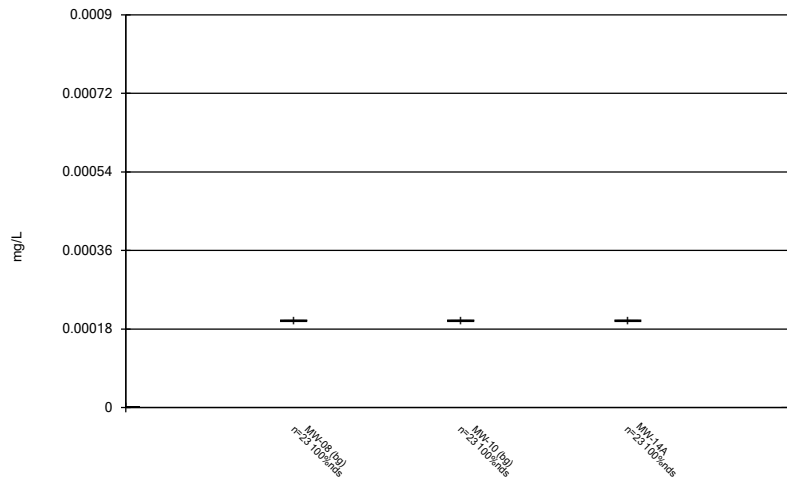
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Box & Whiskers Plot



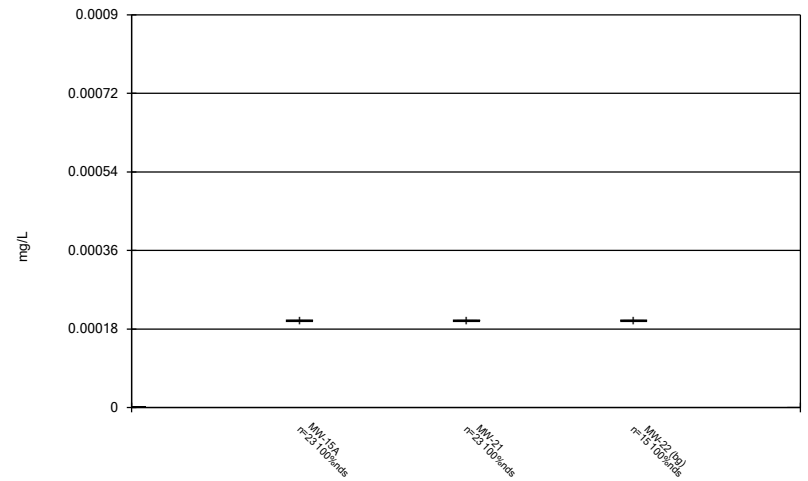
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Box & Whiskers Plot



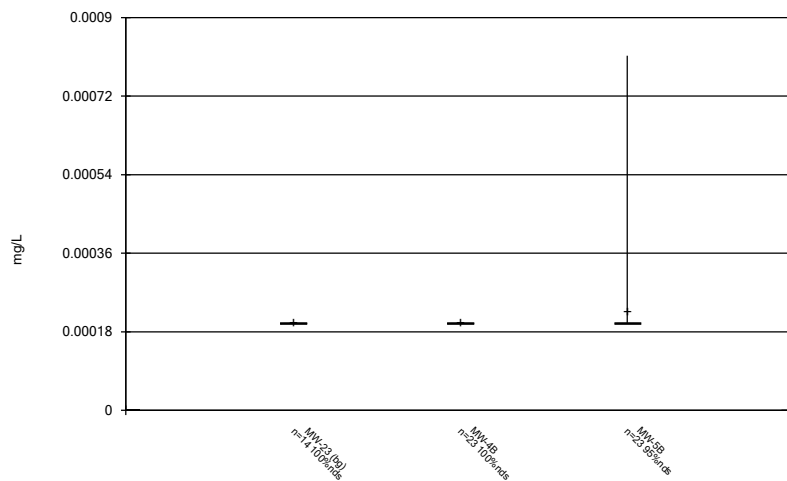
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Box & Whiskers Plot



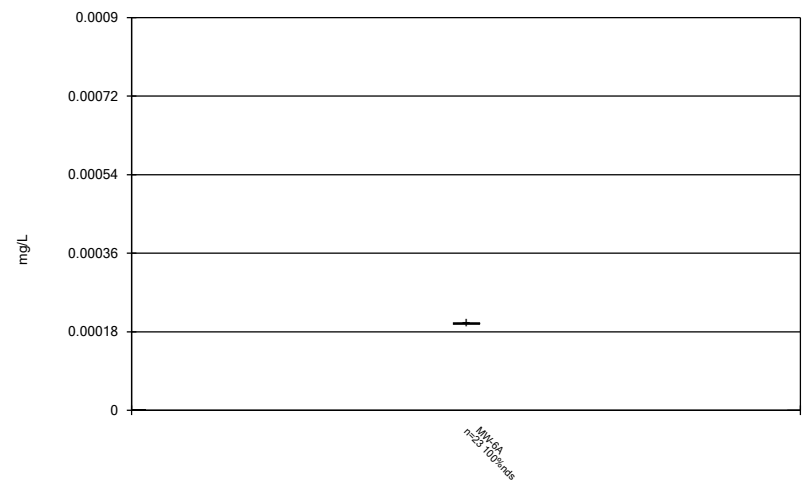
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Box & Whiskers Plot



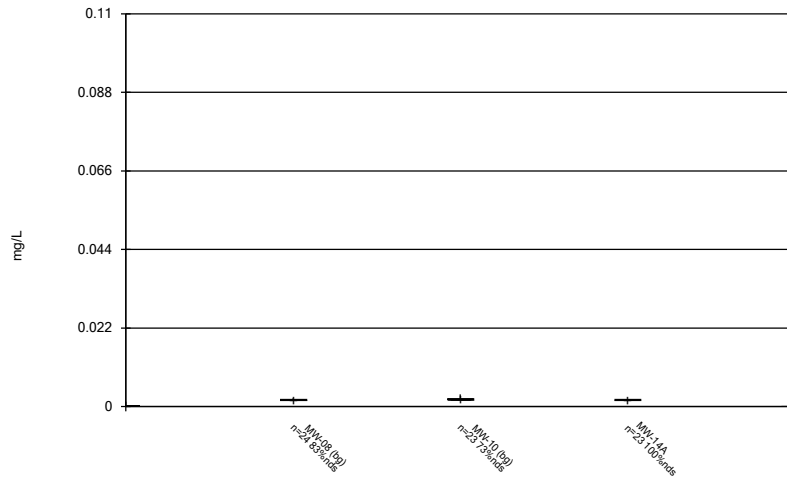
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Box & Whiskers Plot



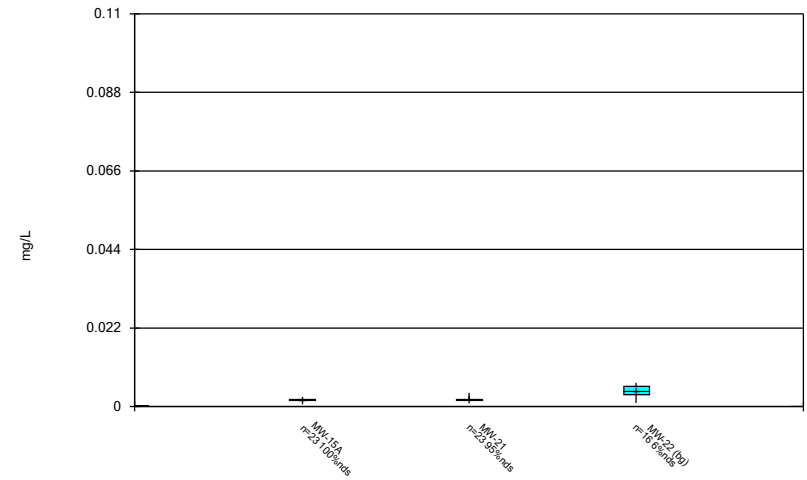
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Box & Whiskers Plot



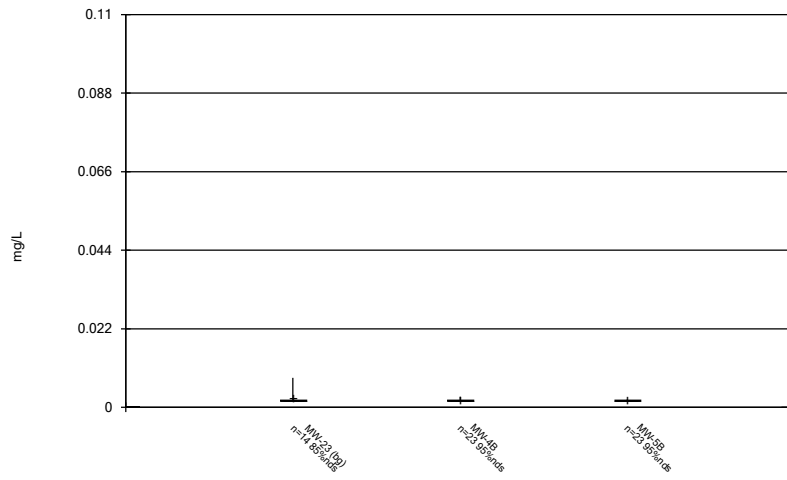
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Box & Whiskers Plot



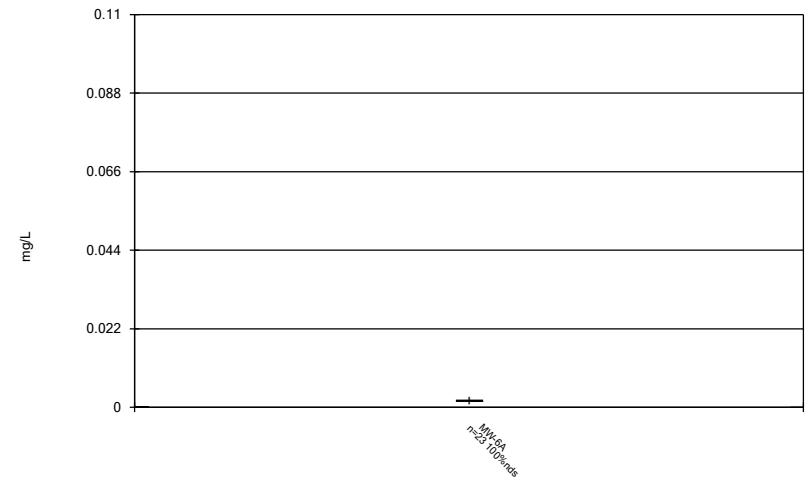
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Box & Whiskers Plot



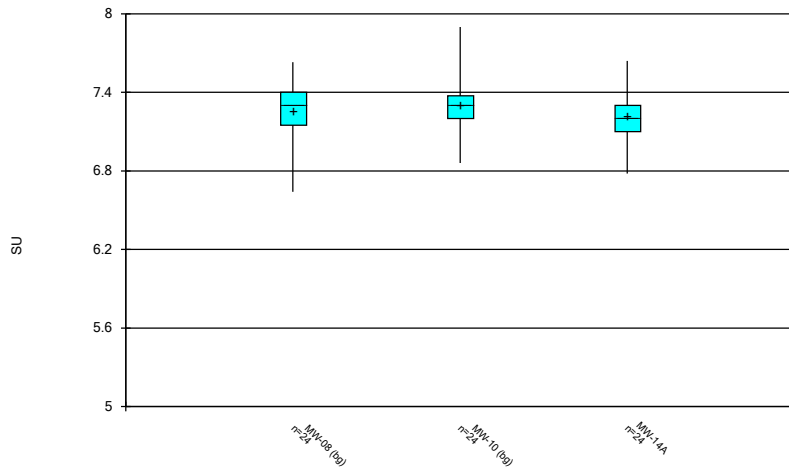
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Box & Whiskers Plot



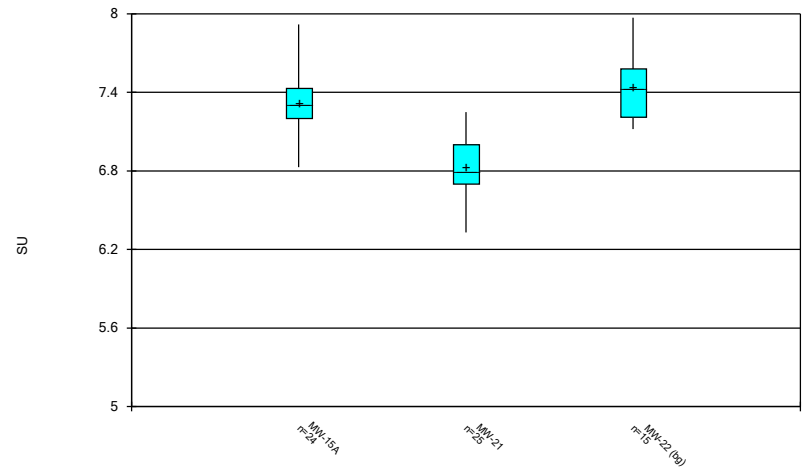
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Box & Whiskers Plot



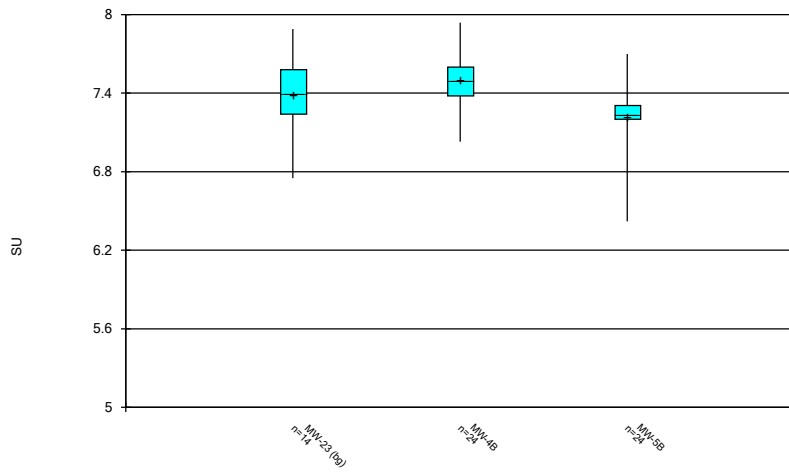
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



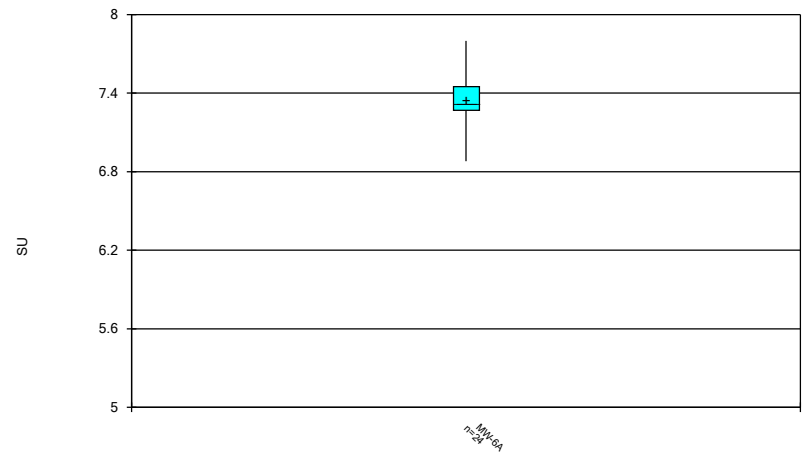
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Box & Whiskers Plot



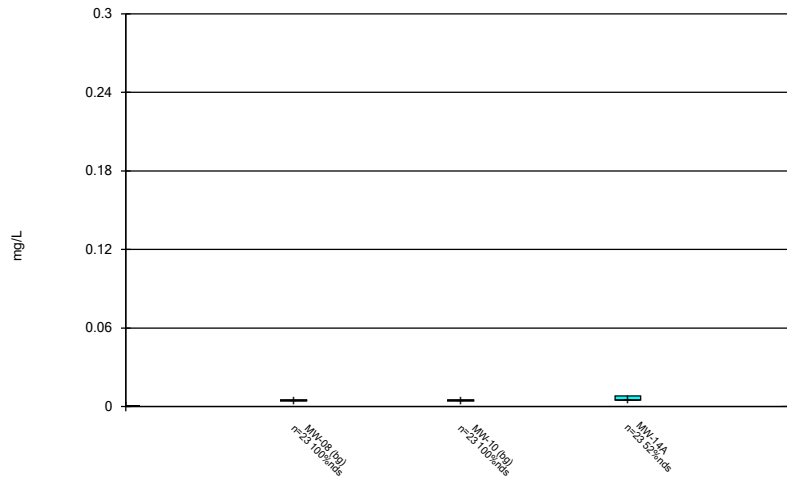
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Box & Whiskers Plot



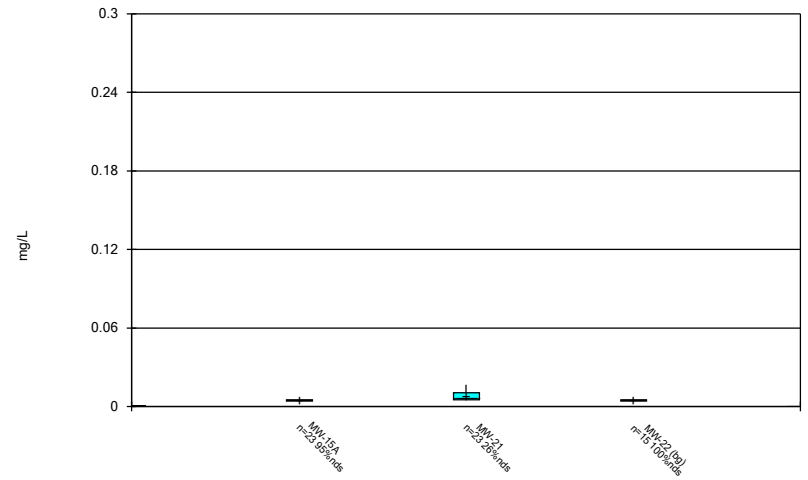
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Box & Whiskers Plot



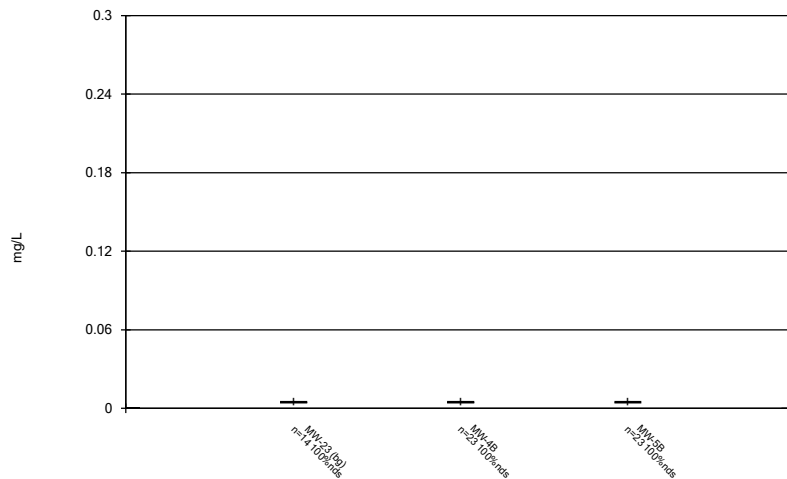
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Box & Whiskers Plot



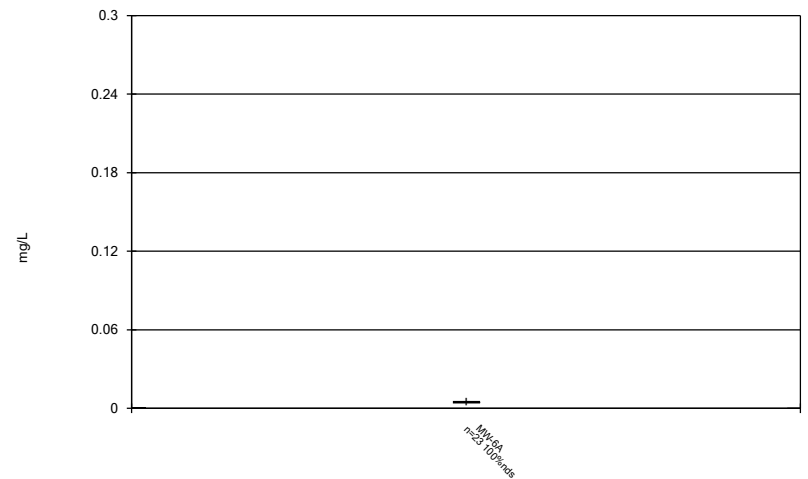
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Box & Whiskers Plot



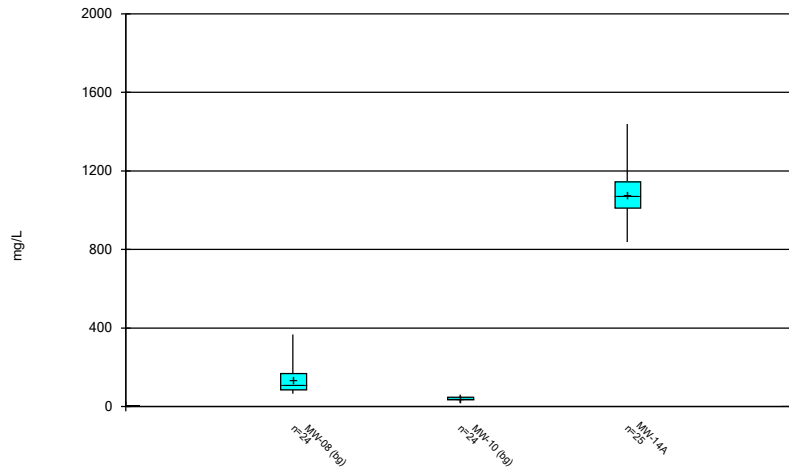
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Box & Whiskers Plot



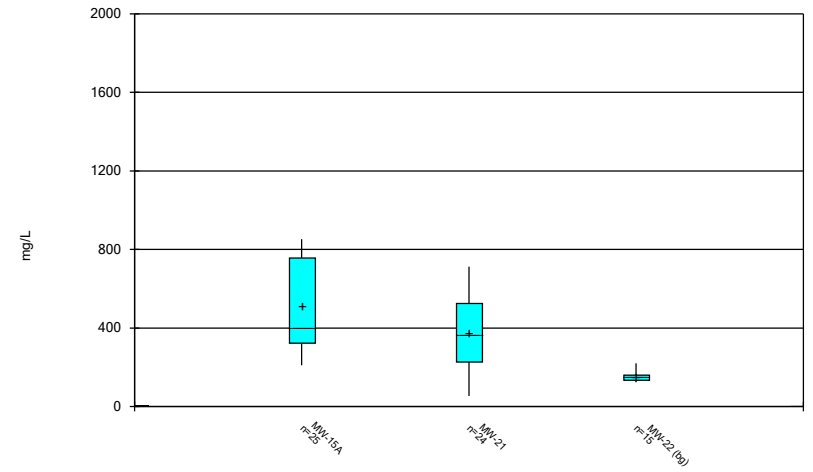
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Box & Whiskers Plot



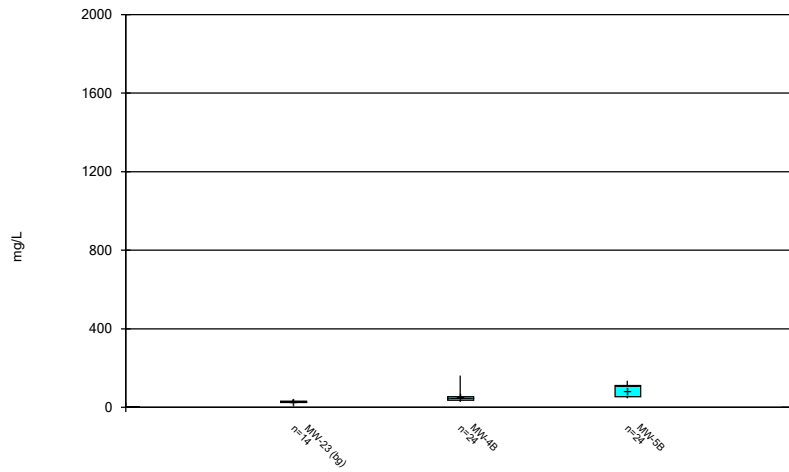
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Box & Whiskers Plot



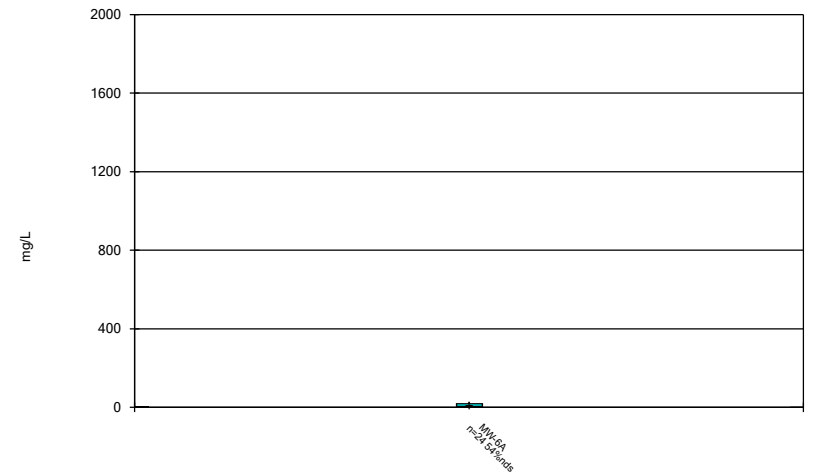
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Box & Whiskers Plot



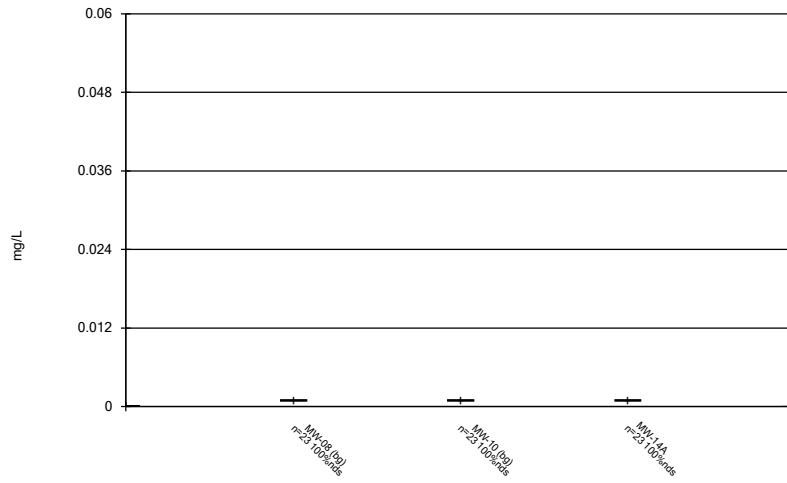
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Box & Whiskers Plot



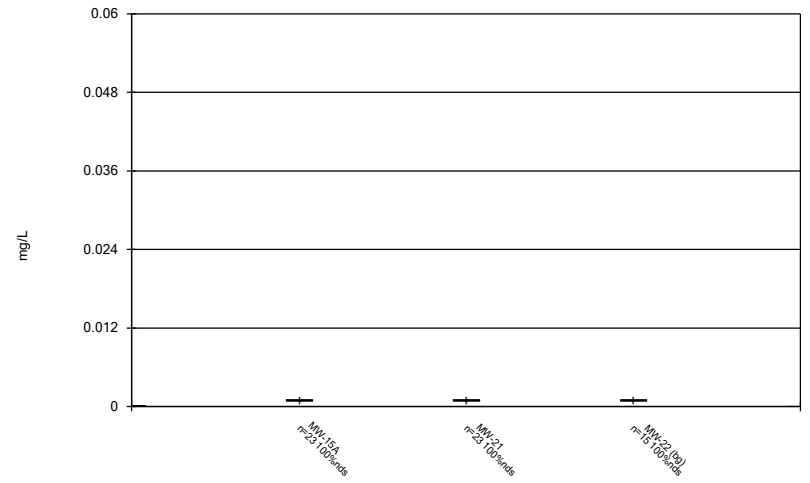
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Box & Whiskers Plot



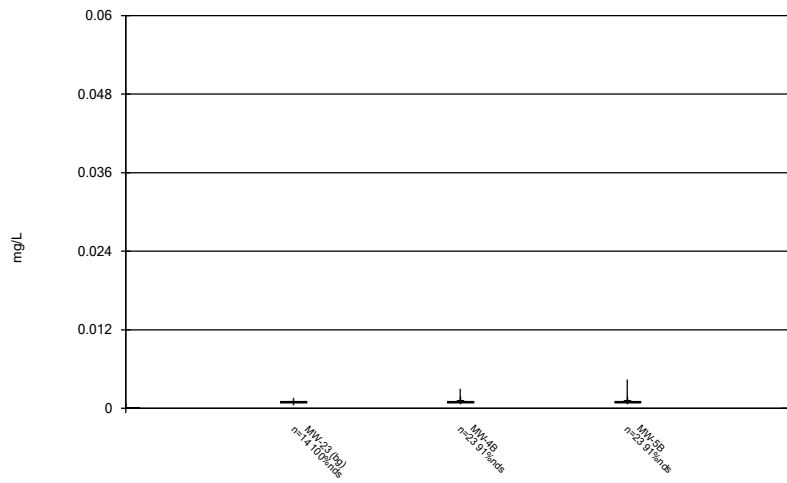
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Box & Whiskers Plot



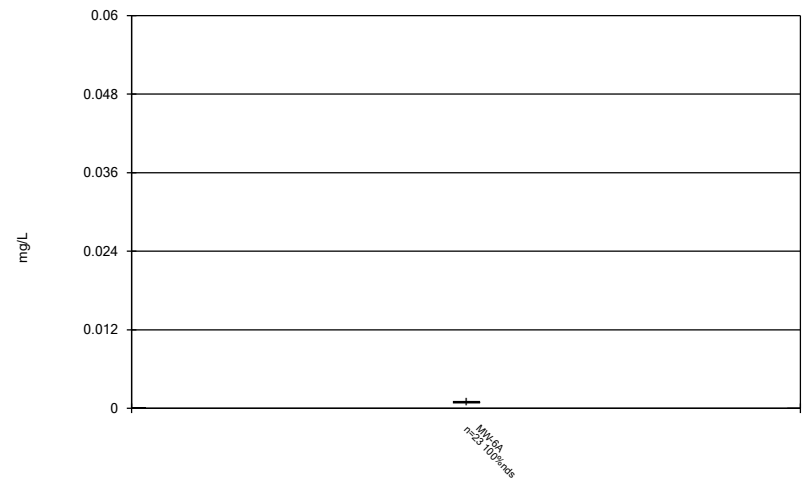
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Box & Whiskers Plot



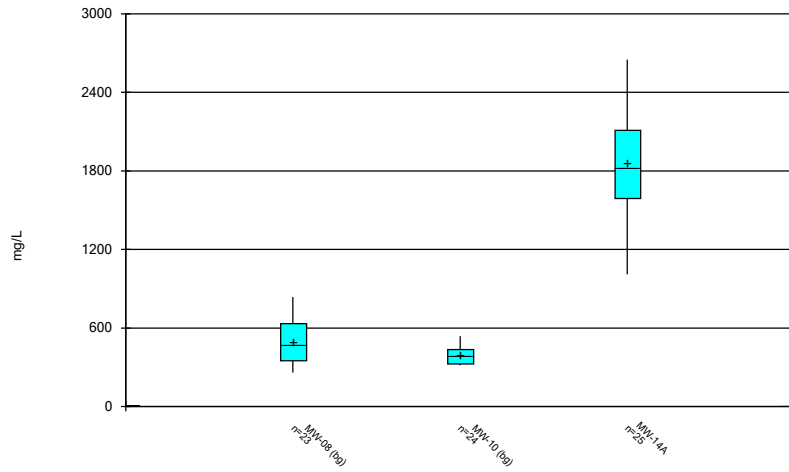
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Box & Whiskers Plot



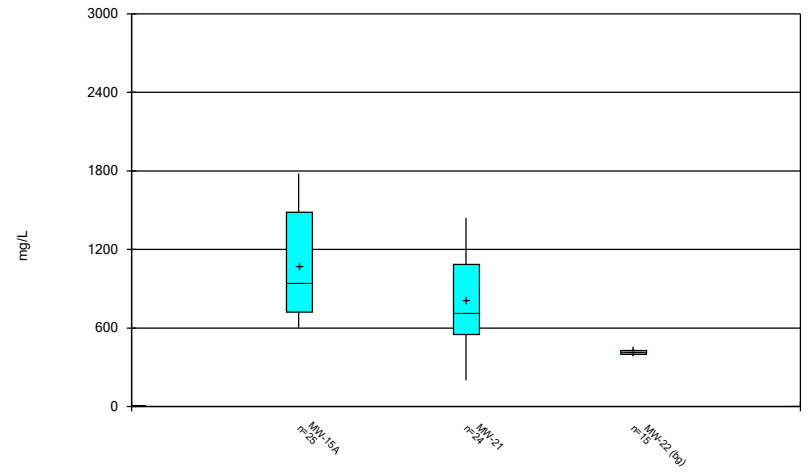
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Box & Whiskers Plot



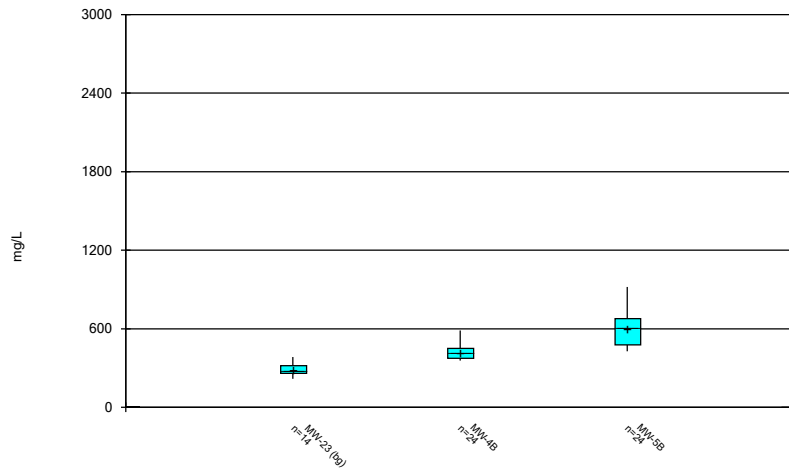
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Box & Whiskers Plot



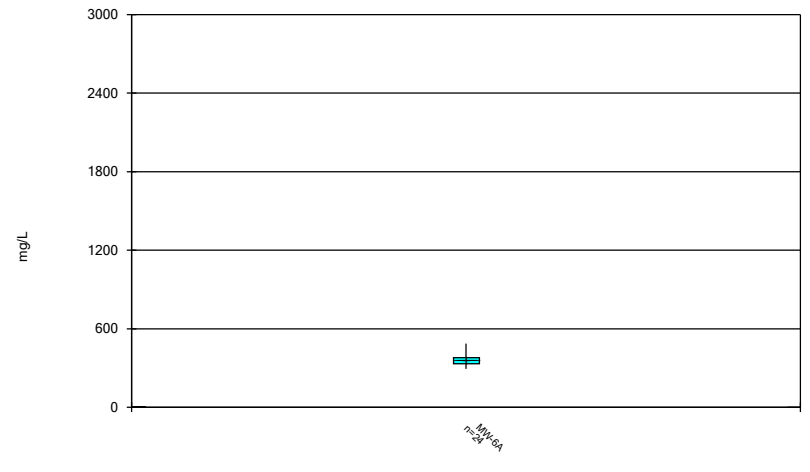
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Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 12/11/2024 1:23 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 12/11/2024 1:23 PM View: Federal Descriptive  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water



FIGURE C.

# Outlier Summary

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 1:24 PM

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	MW-15A Barium (mg/L)	MW-15A Chloride (mg/L)	MW-08 Fluoride (mg/L)	MW-14A Fluoride (mg/L)	MW-15A Fluoride (mg/L)	MW-4B Lead (mg/L)	MW-08 Total Dissolved Solids (mg/L)
6/6/2016	2.13 (o)						
6/7/2016					0.00147 (o)		
4/17/2017		47.4 (o)	1.69 (o)	1.93 (o)	6.7 (o)		
4/11/2023							2390 (o)

FIGURE D.

# Interwell Prediction Limits - April 2024 - Significant Results

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 1:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-14A	0.322	n/a	4/15/2024	15.2	Yes	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.322	n/a	4/15/2024	5.8	Yes	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.322	n/a	4/12/2024	2.31	Yes	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	4/15/2024	344	Yes	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	4/15/2024	39.3	Yes	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	4/15/2024	1160	Yes	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	649.6	n/a	4/15/2024	1750	Yes	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2

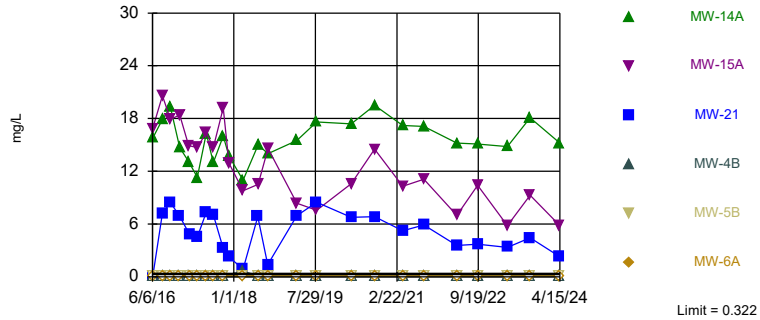
# Interwell Prediction Limits - April 2024 - All Results

Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 1:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
<b>Boron (mg/L)</b>	<b>MW-14A</b>	<b>0.322</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>15.2</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>86.3</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-15A</b>	<b>0.322</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>5.8</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>86.3</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-21</b>	<b>0.322</b>	<b>n/a</b>	<b>4/12/2024</b>	<b>2.31</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>86.3</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (NDs) 1 of 2</b>
Boron (mg/L)	MW-4B	0.322	n/a	4/15/2024	0.1ND	No	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-5B	0.322	n/a	4/15/2024	0.1ND	No	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-6A	0.322	n/a	4/15/2024	0.1ND	No	73	n/a	n/a	86.3	n/a	n/a	0.0003608	NP Inter (NDs) 1 of 2
<b>Calcium (mg/L)</b>	<b>MW-14A</b>	<b>152</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>344</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (normality) 1 of 2</b>
Calcium (mg/L)	MW-15A	152	n/a	4/15/2024	118	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-21	152	n/a	4/12/2024	59.9	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-4B	152	n/a	4/15/2024	97.7	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-5B	152	n/a	4/15/2024	112	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-6A	152	n/a	4/15/2024	92.4	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	4/15/2024	16.4	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-15A	30	n/a	4/15/2024	7.01	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-21	30	n/a	4/12/2024	5ND	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-4B	30	n/a	4/15/2024	18.1	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
<b>Chloride (mg/L)</b>	<b>MW-5B</b>	<b>30</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>39.3</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>28.77</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (normality) 1 of 2</b>
Chloride (mg/L)	MW-6A	30	n/a	4/15/2024	15.5	No	73	n/a	n/a	28.77	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-14A	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-15A	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-21	1	n/a	4/12/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-4B	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-5B	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-6A	1	n/a	4/15/2024	1ND	No	72	n/a	n/a	88.89	n/a	n/a	0.0003696	NP Inter (NDs) 1 of 2
pH (SU)	MW-14A	7.802	6.852	4/15/2024	7.3	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-15A	7.802	6.852	4/15/2024	7.6	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-21	7.802	6.852	4/12/2024	7	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-4B	7.802	6.852	4/15/2024	7.6	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-5B	7.802	6.852	4/15/2024	7.4	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-6A	7.802	6.852	4/15/2024	7.3	No	73	7.327	0.2548	0	None	No	0.0006268	Param Inter 1 of 2
<b>Sulfate (mg/L)</b>	<b>MW-14A</b>	<b>366</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>1160</b>	<b>Yes</b>	<b>73</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003608</b>	<b>NP Inter (normality) 1 of 2</b>
Sulfate (mg/L)	MW-15A	366	n/a	4/15/2024	256	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-21	366	n/a	4/12/2024	138	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-4B	366	n/a	4/15/2024	56.1	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-5B	366	n/a	4/15/2024	46.3	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-6A	366	n/a	4/15/2024	18.1	No	73	n/a	n/a	0	n/a	n/a	0.0003608	NP Inter (normality) 1 of 2
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-14A</b>	<b>649.6</b>	<b>n/a</b>	<b>4/15/2024</b>	<b>1750</b>	<b>Yes</b>	<b>72</b>	<b>7.381</b>	<b>0.6857</b>	<b>0</b>	<b>None</b>	<b>x^(1/3)</b>	<b>0.001254</b>	<b>Param Inter 1 of 2</b>
Total Dissolved Solids (mg/L)	MW-15A	649.6	n/a	4/15/2024	636	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-21	649.6	n/a	4/12/2024	366	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-4B	649.6	n/a	4/15/2024	392	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-5B	649.6	n/a	4/15/2024	450	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-6A	649.6	n/a	4/15/2024	376	No	72	7.381	0.6857	0	None	x^(1/3)	0.001254	Param Inter 1 of 2

Exceeds Limit: MW-14A, MW-15A, MW-21

Prediction Limit  
Interwell Non-parametric

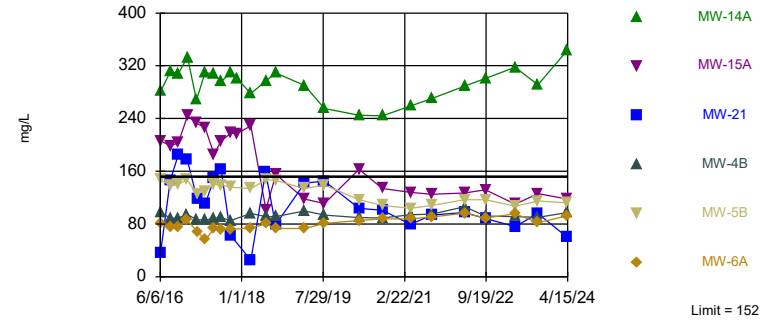


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 73 background values. 86.3% NDs. Annual per-constituent alpha = 0.004321. Individual comparison alpha = 0.0003608 (1 of 2). Comparing 6 points to limit.

Constituent: Boron Analysis Run 12/11/2024 1:17 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Exceeds Limit: MW-14A

Prediction Limit  
Interwell Non-parametric

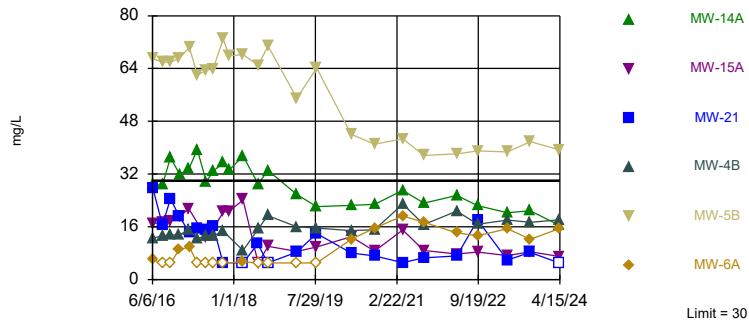


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 73 background values. Annual per-constituent alpha = 0.004321. Individual comparison alpha = 0.0003608 (1 of 2). Comparing 6 points to limit.

Constituent: Calcium Analysis Run 12/11/2024 1:17 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Exceeds Limit: MW-5B

Prediction Limit  
Interwell Non-parametric

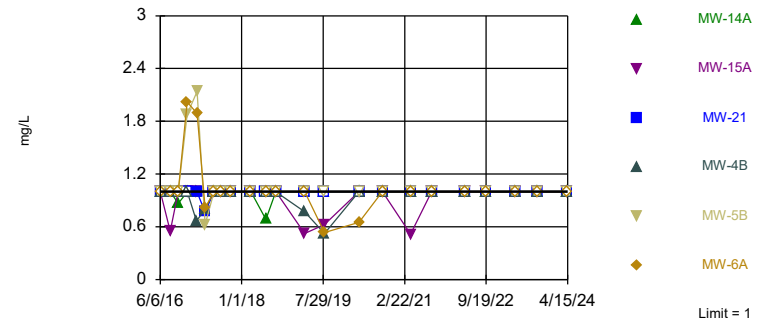


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 73 background values. 28.77% NDs. Annual per-constituent alpha = 0.004321. Individual comparison alpha = 0.0003608 (1 of 2). Comparing 6 points to limit.

Constituent: Chloride Analysis Run 12/11/2024 1:17 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Within Limit

Prediction Limit  
Interwell Non-parametric

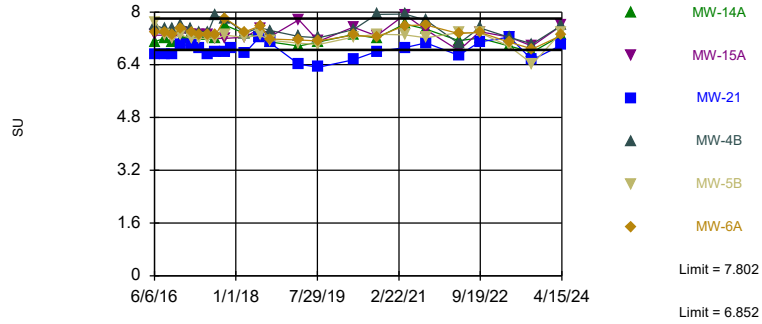


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 72 background values. 88.89% NDs. Annual per-constituent alpha = 0.004426. Individual comparison alpha = 0.0003696 (1 of 2). Comparing 6 points to limit.

Constituent: Fluoride Analysis Run 12/11/2024 1:17 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Within Limits

Prediction Limit  
Interwell Parametric



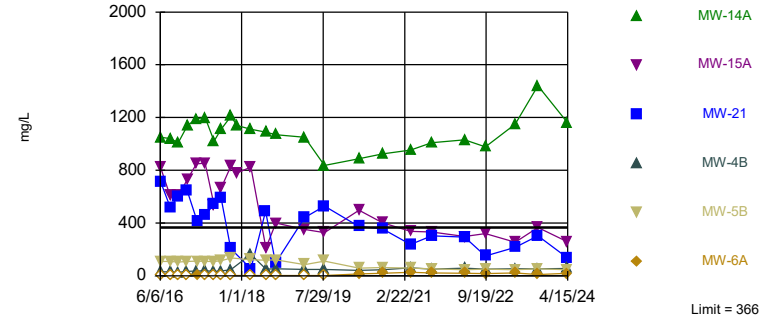
Background Data Summary: Mean=7.327, Std. Dev.=0.2548, n=73. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9676, critical = 0.956. Kappa = 1.865 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0006268. Comparing 6 points to limit.

Constituent: pH Analysis Run 12/11/2024 1:17 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Hollow symbols indicate censored values.

Exceeds Limit: MW-14A

Prediction Limit  
Interwell Non-parametric

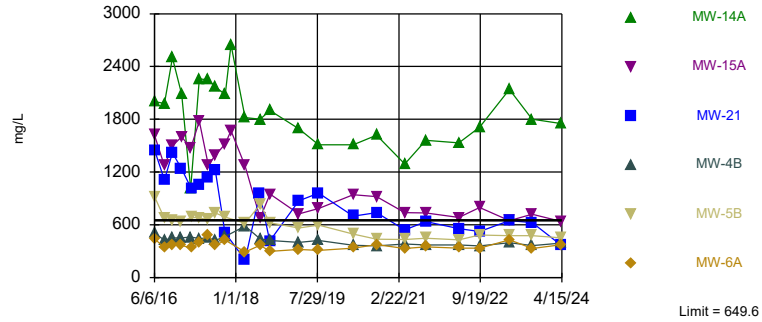


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 73 background values. Annual per-constituent alpha = 0.004321. Individual comparison alpha = 0.0003608 (1 of 2). Comparing 6 points to limit.

Constituent: Sulfate Analysis Run 12/11/2024 1:17 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Exceeds Limit: MW-14A

Prediction Limit  
Interwell Parametric



Background Data Summary (based on cube root transformation): Mean=7.381, Std. Dev.=0.6857, n=72. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9584, critical = 0.954. Kappa = 1.866 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Constituent: Total Dissolved Solids Analysis Run 12/11/2024 1:17 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

# Prediction Limit

Constituent: Boron (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-5B	MW-6A	MW-4B	MW-08 (bg)	MW-14A	MW-21	MW-22 (bg)
6/6/2016	<0.1	16.8							
6/7/2016			<0.1	<0.1	<0.1	<0.1			
6/8/2016							15.8	<0.1	
8/15/2016	<0.1	20.6					17.9	7.23	
8/16/2016			<0.1	<0.1	<0.1	<0.1			
10/10/2016	<0.1					<0.1		8.45	
10/11/2016		17.9	<0.1	<0.1	<0.1		19.3		
12/12/2016			<0.1	<0.1	<0.1			6.93	
12/14/2016	<0.1	18.4				<0.1	14.7		
2/17/2017	<0.1	14.9			<0.1		13.1		
2/21/2017			<0.1	<0.1		<0.1		4.87	
4/17/2017	<0.1	14.7	<0.1	<0.1	<0.1	<0.1	11.3		
4/18/2017								4.49	
6/19/2017	<0.1					<0.1			
6/20/2017			<0.1		<0.1			7.36	
6/21/2017		16.4		<0.1			16.3		
8/7/2017	<0.1				<0.1	<0.1			
8/8/2017		14.7	<0.1	<0.1			13	7.05	
10/16/2017	<0.1				<0.1	<0.1		3.33	
10/17/2017		19.2	<0.1	<0.1			16		
11/28/2017		12.9 (R)					13.7 (R)	2.24 (R)	
3/5/2018	<0.1								
3/6/2018			<0.1	<0.1	0.66	<0.1		0.885	<0.1
3/7/2018		9.8					11		
6/19/2018	<0.1					<0.1		6.84	<0.1
6/20/2018		10.5					15		
6/21/2018			<0.1	<0.1	<0.1				
8/27/2018	<0.1					<0.1			<0.1
8/28/2018					<0.1			1.36	
8/29/2018		14.6	<0.1	<0.1			14		
3/18/2019						<0.1			
3/19/2019	<0.1		<0.1	<0.1	<0.1				0.299
3/20/2019		8.35					15.5	6.95	
8/6/2019						0.205			<0.1
8/7/2019	<0.1	7.56	<0.1	<0.1	<0.1		17.6	8.46	
4/7/2020	<0.1	10.6	<0.1	<0.1	<0.1	<0.1	17.4	6.76	<0.1
9/18/2020	<0.1	14.5	<0.1	<0.1	<0.1	<0.1	19.5	6.82	0.263
4/5/2021	<0.1	10.3	<0.1	<0.1	<0.1	<0.1	17.2	5.24	<0.1
9/1/2021	<0.1	11.1	<0.1	<0.1	<0.1	<0.1	17.1	5.88	<0.1
4/20/2022	<0.1	6.98	<0.1	<0.1	<0.1	<0.1	15.2	3.57	<0.1
9/14/2022	<0.1	10.4	<0.1	<0.1	<0.1	<0.1	15.1	3.69	0.322
4/10/2023									0.247
4/11/2023		5.8				<0.1	14.8	3.35	
4/12/2023	<0.1		<0.1	<0.1	<0.1				
9/18/2023	<0.1								0.207
9/19/2023		9.28				<0.1	18.1	4.42	
9/20/2023			<0.1	<0.1	<0.1				
4/11/2024	<0.1								<0.1
4/12/2024						<0.1		2.31	
4/15/2024		5.8	<0.1	<0.1	<0.1		15.2		



# Prediction Limit

Constituent: Boron (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	<0.1
6/21/2018	
8/27/2018	<0.1
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	<0.1
3/20/2019	
8/6/2019	<0.1
8/7/2019	
4/7/2020	<0.1
9/18/2020	0.15
4/5/2021	<0.1
9/1/2021	<0.1
4/20/2022	<0.1
9/14/2022	0.204
4/10/2023	
4/11/2023	
4/12/2023	0.145
9/18/2023	0.128
9/19/2023	
9/20/2023	
4/11/2024	<0.1
4/12/2024	
4/15/2024	

# Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-21	MW-14A	MW-22 (bg)
6/6/2016	89.3	206							
6/7/2016			98.2	147	81.4	152			
6/8/2016							37.2	281	
8/15/2016	80.7	199					146	311	
8/16/2016			88.8	139	75.4	117			
10/10/2016	83.3					118	185		
10/11/2016		203	89.3	140	75.7			308	
12/12/2016			94.5	147	85.6		178		
12/14/2016	86.5	244				109		333	
2/17/2017	81.2	233	86.8					268	
2/21/2017				126	68.8	89.9	118		
4/17/2017	79.2	226	85.9	130	56.3	96.5		310	
4/18/2017							110		
6/19/2017	83.6					113			
6/20/2017			88.7	140			149		
6/21/2017		186			72.9			307	
8/7/2017	85.5		89.7			91.3			
8/8/2017		206		139	71.2		163	296	
10/16/2017	83.3		85.3			77	62.3		
10/17/2017		218		136	71.9			310	
11/28/2017		217 (R)						301 (R)	
3/5/2018	77.3								
3/6/2018			95.8	134	74.1	74.7	25.1		69.8
3/7/2018		229						278	
6/19/2018	88.5					115	159		91.5
6/20/2018		102						297	
6/21/2018			91.4	147	80.1				
8/27/2018	85.4					83.6			80.7
8/28/2018			91.3				78.7		
8/29/2018		155		146	73.3			309	
3/18/2019						97.6			
3/19/2019	76.3		99.7	134	73.2				91.6
3/20/2019		118					142	290	
8/6/2019						132			83.8
8/7/2019	78.9	111	93.8	139	80.9		145	255	
4/7/2020	75.4	163	89.6	117	85.1	92.4	104	245	80.9
9/18/2020	74.2	134	89	108	87.9	77.7	101	244	75.5
4/5/2021	78.8	128	94.1	104	87.6	81.2	79.5	259	78.4
9/1/2021	80	125	95.1	108	90.6	78.3	93.5	270	79.4
4/20/2022	90.4	127	106	117	96.5	69.6	97.5	289	80.2
9/14/2022	82	132	92.3	117	89	76.8	88.2	301	79.6
4/10/2023									80.4
4/11/2023		110				78.2	76	318	
4/12/2023	83.7		91.3	107	95.4				
9/18/2023	84.7								79
9/19/2023		126				79.4	96	291	
9/20/2023			90.4	115	82.1				
4/11/2024	96.2								83.1
4/12/2024						84.2	59.9		
4/15/2024		118	97.7	112	92.4			344	

# Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	70.5
6/21/2018	
8/27/2018	63.9
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	59.7
3/20/2019	
8/6/2019	59.5
8/7/2019	
4/7/2020	61
9/18/2020	52.1
4/5/2021	56.3
9/1/2021	56.1
4/20/2022	54
9/14/2022	54.5
4/10/2023	
4/11/2023	
4/12/2023	55.3
9/18/2023	56
9/19/2023	
9/20/2023	
4/11/2024	59.7
4/12/2024	
4/15/2024	

# Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-10 (bg)	MW-08 (bg)	MW-5B	MW-6A	MW-4B	MW-14A	MW-21	MW-22 (bg)
6/6/2016	17.1	6.22							
6/7/2016			19.8	67	5.97	12.6			
6/8/2016							28.7	27.7	
8/15/2016	17.2	<5					28.7	16.6	
8/16/2016			17.8	65.9	<5	13.2			
10/10/2016		<5	16.2					24.4	
10/11/2016	17.6			66	<5	13.6	37		
12/12/2016				67	9.08	13.5		19.2	
12/14/2016	19	<5	17.2				31.9		
2/17/2017	21.5	<5				15.1	33.5		
2/21/2017			15.4	70.4	9.93			14.2	
4/17/2017	47.4 (o)	<5	17.1	62.1	<5	12.5	39.4		
4/18/2017								15.6	
6/19/2017		<5	14.1						
6/20/2017				63.4		13.2		15.1	
6/21/2017	12.8				<5		29.7		
8/7/2017		<5	14			13.2			
8/8/2017	15.4			64	<5		32.9	16.1	
10/16/2017		<5	14.4			14.7		5.09	
10/17/2017	20.5			73	<5		35.4		
11/28/2017	20.7 (R)			67.8 (R)			33.2 (R)		
3/5/2018		<5							
3/6/2018			14.5	68.2	5.33	8.81		<5	30
3/7/2018	24.2						37.4		
6/19/2018		<5	14.9					10.9	27.2
6/20/2018	<5						29		
6/21/2018				65	<5	15.3			
8/27/2018		<5	15.6						29.8
8/28/2018						19.4		<5	
8/29/2018	10.1			70.8	<5		33.1		
3/18/2019			16.1						
3/19/2019		<5		55	<5	16			27.6
3/20/2019	8.54						25.8	8.3	
8/6/2019			17.1						26.9
8/7/2019	9.91	<5		64.1	<5	15.6	22.1	14	
4/7/2020	13	<5	17.2	44	12.2	14.8	22.5	8.05	24.8
9/18/2020	8.63	<5	14.7	41	15.6	15.1	22.8	7.21	23.2
4/5/2021	15	<5	22.3	42.7	19.3	22.9	27.1	5.14	28.1
9/1/2021	8.86	<5	16.3	37.6	17.4	16.7	23.2	6.58	20
4/20/2022	7.71	<5	15.8	38.1	14.2	20.8	25.5	7.19	20.2
9/14/2022	8.29	<5	16.7	39	13.3	16.8	22.4	18	7.04
4/10/2023									18.2
4/11/2023	7.3		17.9				20.3	5.93	
4/12/2023		5.86		38.7	15.4	18			
9/18/2023		<5							18.4
9/19/2023	8.41		19.9				20.9	8.23	
9/20/2023				41.8	12.2	17.4			
4/11/2024		<5							15.8
4/12/2024			17.2					<5	
4/15/2024	7.01			39.3	15.5	18.1	16.4		

# Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	15.9
6/21/2018	
8/27/2018	14.2
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	10.5
3/20/2019	
8/6/2019	13.8
8/7/2019	
4/7/2020	15.7
9/18/2020	14.4
4/5/2021	21.4
9/1/2021	15.2
4/20/2022	16.9
9/14/2022	16.2
4/10/2023	
4/11/2023	
4/12/2023	17.7
9/18/2023	19.2
9/19/2023	
9/20/2023	
4/11/2024	19.2
4/12/2024	
4/15/2024	

# Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-08 (bg)	MW-6A	MW-5B	MW-4B	MW-14A	MW-21	MW-22 (bg)
6/6/2016	0.731	<1							
6/7/2016			<1	<1	<1	<1			
6/8/2016							<1	<1	
8/15/2016	<1	0.549					<1	<1	
8/16/2016			<1	<1	<1	<1			
10/10/2016	<1		<1					<1	
10/11/2016		<1		<1	<1	<1	0.867		
12/12/2016				2.02	1.88	<1		<1	
12/14/2016	<1	<1	0.72				<1		
2/17/2017	<1	<1				0.664	<1		
2/21/2017			<1	1.89	2.14				0.993
4/17/2017	0.774	6.7 (o)	1.69 (o)	0.814	0.627	0.801	1.93 (o)		
4/18/2017									0.768
6/19/2017	<1		<1						
6/20/2017					<1	<1		<1	
6/21/2017		<1		<1			<1		
8/7/2017	<1		<1			<1			
8/8/2017		<1		<1	<1		<1	<1	
10/16/2017	<1		<1			<1		<1	
10/17/2017		<1		<1	<1		<1		
3/5/2018	<1								
3/6/2018			<1	<1	<1	<1		<1	<1
3/7/2018		<1					<1		
6/19/2018	<1		0.826					<1	<1
6/20/2018		<1					0.684		
6/21/2018				<1	<1	<1			
8/27/2018	<1		<1						<1
8/28/2018						<1		<1	
8/29/2018		<1		<1	<1		<1		
3/18/2019			<1						
3/19/2019	<1			<1	<1	0.771			<1
3/20/2019		0.523					<1	<1	
8/6/2019			0.643						0.507
8/7/2019	0.596	0.625		0.535	<1	0.525	<1	<1	
4/7/2020	<1	<1	0.864	0.652	<1	<1	<1	<1	<1
9/18/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1
4/5/2021	<1	0.516	<1	<1	<1	<1	<1	<1	<1
9/1/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1
4/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1
9/14/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1
4/10/2023									<1
4/11/2023		<1	<1				<1	<1	
4/12/2023	<1			<1	<1	<1			
9/18/2023	<1								<1
9/19/2023		<1	<1				<1	<1	
9/20/2023				<1	<1	<1			
4/11/2024	<1								<1
4/12/2024			<1					<1	
4/15/2024		<1		<1	<1	<1	<1		

# Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	<1
6/21/2018	
8/27/2018	<1
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	<1
3/20/2019	
8/6/2019	<1
8/7/2019	
4/7/2020	<1
9/18/2020	<1
4/5/2021	<1
9/1/2021	<1
4/20/2022	<1
9/14/2022	<1
4/10/2023	
4/11/2023	
4/12/2023	<1
9/18/2023	<1
9/19/2023	
9/20/2023	
4/11/2024	<1
4/12/2024	
4/15/2024	

# Prediction Limit

Constituent: pH (SU) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-21	MW-14A	MW-22 (bg)
6/6/2016	7.4	7.3							
6/7/2016			7.6	7.7	7.4	7.2			
6/8/2016							6.7	7.1	
8/15/2016	7.3	7.3					6.7	7.2	
8/16/2016			7.5	7.3	7.4	7.3			
10/10/2016	7.2					7.1	6.7		
10/11/2016		7.2	7.5	7.2	7.3			7.1	
12/12/2016			7.6	7.3	7.5		7		
12/14/2016	7.3	7.4				7.3		7.2	
2/17/2017	7.2	7.3	7.5					7.3	
2/21/2017				7.2	7.4	7.3	7		
4/17/2017	7.3	7.3	7.4	7.2	7.3	7.1		7.3	
4/18/2017							6.9		
6/19/2017	7.2					7.1			
6/20/2017			7.4	7.2			6.7		
6/21/2017		7.3			7.3			7.3	
8/7/2017	7.9		7.9			7.3			
8/8/2017		7.2		7.2	7.3		6.8	7.2	
10/16/2017	7.3		7.8			7.4	6.8		
10/17/2017		7.2		7.3	7.8			7.6	
11/28/2017							6.9 (R)		
3/5/2018	7.04								
3/6/2018			7.36	7.23	7.4	7.3	6.76		7.36
3/7/2018		7.24						7.35	
6/19/2018	7.72					7.56	7.25		7.9
6/20/2018		7.5						7.26	
6/21/2018			7.53	7.3	7.58				
8/27/2018	7.23					7.2			7.42
8/28/2018			7.44				7.07		
8/29/2018		7.25		7.14	7.18			7.09	
3/19/2019	7.1		7.26	7.05	7.15	7.08			7.21
3/20/2019		7.76					6.41	6.97	
8/6/2019						6.64			7.12
8/7/2019	7.07	7.11	7.22	7.02	7.12		6.33	7.09	
4/7/2020	7.26	7.54	7.46	7.24	7.3	7.21	6.55	7.32	7.32
9/18/2020	7.33	7.28	7.93	7.33	7.24	7.4	6.8	7.21	7.53
4/5/2021	7.57	7.92	7.94	7.31	7.59	7.63	6.92	7.64	7.7
9/1/2021	7.59	7.46	7.75	7.22	7.61	7.45	7.06	7.48	7.97
4/20/2022	7.35	6.83	7.04	7.37	7.35	7.35	6.69	7.13	7.23
9/14/2022	7.48	7.4	7.52	7.37	7.38	7.43	7.09	7.21	7.58
4/10/2023									7.14
4/11/2023		7.24				7.24	7.24	6.97	
4/12/2023	6.96		7.23	6.96	7.08				
9/18/2023	6.86								7.14
9/19/2023		6.97				6.81	6.55	6.78	
9/20/2023			7.03	6.42	6.88				
4/11/2024	7.3								7.5
4/12/2024						7.4	7		
4/15/2024		7.6	7.6	7.4	7.3			7.3	



# Prediction Limit

Constituent: pH (SU) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	7.69
6/21/2018	
8/27/2018	7.55
8/28/2018	
8/29/2018	
3/19/2019	7.24
3/20/2019	
8/6/2019	6.75
8/7/2019	
4/7/2020	7.33
9/18/2020	7.53
4/5/2021	7.61
9/1/2021	7.89
4/20/2022	7.39
9/14/2022	7.3
4/10/2023	
4/11/2023	
4/12/2023	7.24
9/18/2023	7.05
9/19/2023	
9/20/2023	
4/11/2024	7.4
4/12/2024	
4/15/2024	

# Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-21	MW-14A	MW-22 (bg)
6/6/2016	42.1	827							
6/7/2016			32.2	109	<5	366			
6/8/2016							713	1050	
8/15/2016	33.8	605					520	1040	
8/16/2016			28.4	109	<5	187			
10/10/2016	36.4					187	603		
10/11/2016		607	27.2	105	<5			1010	
12/12/2016			32.7	109	<5		645		
12/14/2016	38.4	732				149		1140	
2/17/2017	47.3	849	36					1190	
2/21/2017				111	5.94	145	415		
4/17/2017	38.3	853	39.5	108	<5	145		1200	
4/18/2017							461		
6/19/2017	35.4					190			
6/20/2017			33	108			541		
6/21/2017		537			<5			1020	
8/7/2017	39		35.3			119			
8/8/2017		664		114	<5		590	1110	
10/16/2017	46.9		45.4			106	206		
10/17/2017		835		135	<5			1210	
11/28/2017		779 (R)						1140 (R)	
3/5/2018	51.4								
3/6/2018			162	122	<5	87.3	53.7		123
3/7/2018		824						1110	
6/19/2018	37.3					136	489		134
6/20/2018		210						1090	
6/21/2018			51.3	119	<5				
8/27/2018	34.3					94.7			125
8/28/2018			52.2				96.6		
8/29/2018		400		120	<5			1070	
3/18/2019						223			
3/19/2019	42.8		48	85	<5				134
3/20/2019		351					442	1050	
8/6/2019						276			139
8/7/2019	28.8	327	47	112	<5		529	837	
4/7/2020	18.6	496	41.5	58.9	13.6	123	373	888	143
9/18/2020	36.5	403	46.9	61.9	19.1	100	356	924	151
4/5/2021	27.6	338	60.1	57.4	27.3	99.7	237	952	154
9/1/2021	32.3	333	50.2	53.7	22.7	82.7	303	1010	154
4/20/2022	48.3	297	58.4	44.7	18.9	72.8	293	1030	158
9/14/2022	31.2	319	49.5	49.9	16.4	67.1	151	978	220
4/10/2023									147
4/11/2023		254				72.2	215	1150	
4/12/2023	39.8		54	45.8	20.5				
9/18/2023	57.4								208
9/19/2023		365				94.2	303	1440	
9/20/2023			53.1	53.4	10.1				
4/11/2024	49.6								160
4/12/2024						65.7	138		
4/15/2024		256	56.1	46.3	18.1			1160	

# Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	38.4
6/21/2018	
8/27/2018	31.7
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	26.2
3/20/2019	
8/6/2019	29.7
8/7/2019	
4/7/2020	25.5
9/18/2020	25.8
4/5/2021	35.5
9/1/2021	25.8
4/20/2022	25.4
9/14/2022	23
4/10/2023	
4/11/2023	
4/12/2023	25
9/18/2023	28.6
9/19/2023	
9/20/2023	
4/11/2024	21.8
4/12/2024	
4/15/2024	

# Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-21	MW-14A	MW-22 (bg)
6/6/2016	468	1620							
6/7/2016			507	920	440	836			
6/8/2016							1440	2000	
8/15/2016	412	1270					1110	1980	
8/16/2016			426	672	340	664			
10/10/2016	444					708	1420		
10/11/2016		1500	450	646	370			2500	
12/12/2016			450	636	368		1240		
12/14/2016	428	1600				634		2080	
2/17/2017	498	1470	460					1010	
2/21/2017				684	336	578	1010		
4/17/2017	538	1780	442	680	402	624		2260	
4/18/2017							1060		
6/19/2017	524					656			
6/20/2017			452	656			1140		
6/21/2017		1280			486			2250	
8/7/2017	458		420			488			
8/8/2017		1390		734	364		1220	2170	
10/16/2017	414		466			470	514		
10/17/2017		1520		688	424			2080	
11/28/2017		1670 (R)						2650 (R)	
3/5/2018	314								
3/6/2018			586	620	292	376	200		424
3/7/2018		1270						1820	
6/19/2018	396					502	952		434
6/20/2018		676						1800	
6/21/2018			440	828	368				
8/27/2018	392					414			420
8/28/2018			420				416		
8/29/2018		948		622	298			1900	
3/18/2019						612			
3/19/2019	326		398	562	320				456
3/20/2019		724					872	1690	
8/6/2019						702			428
8/7/2019	320	786	422	596	308		960	1510	
4/7/2020	316	942	366	494	336	418	698	1510	422
9/18/2020	344	920	360	436	374	350	738	1620	398
4/5/2021	322	738	380	434	330	382	540	1290	412
9/1/2021	314	736	370	448	350	342	636	1560	420
4/20/2022	344	682	370	428	336	322	558	1530	388
9/14/2022	340	796	358	484	334	350	524	1710	390
4/10/2023									450
4/11/2023		646				2390 (o)	646	2140	
4/12/2023	410		396	478	428				
9/18/2023	318								404
9/19/2023		720				260	626	1800	
9/20/2023			364	476	332				
4/11/2024	382								422
4/12/2024						362	366		
4/15/2024		636	392	450	376			1750	

# Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 1:18 PM View: Federal Prediction Limits April

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	384
6/21/2018	
8/27/2018	340
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	296
3/20/2019	
8/6/2019	336
8/7/2019	
4/7/2020	298
9/18/2020	250
4/5/2021	274
9/1/2021	256
4/20/2022	218
9/14/2022	278
4/10/2023	
4/11/2023	
4/12/2023	286
9/18/2023	282
9/19/2023	
9/20/2023	
4/11/2024	274
4/12/2024	
4/15/2024	

FIGURE E.

# Interwell Prediction Limits - September 2024 - Significant Results

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 12:53 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Obsrv.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-14A	0.322	n/a	9/11/2024	17.7	Yes	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.322	n/a	9/11/2024	8.5	Yes	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.322	n/a	9/10/2024	3.68	Yes	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	9/11/2024	327	Yes	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	9/12/2024	40.5	Yes	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	9/11/2024	1110	Yes	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	651.9	n/a	9/11/2024	1830	Yes	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2

# Interwell Prediction Limits - September 2024 - All Results

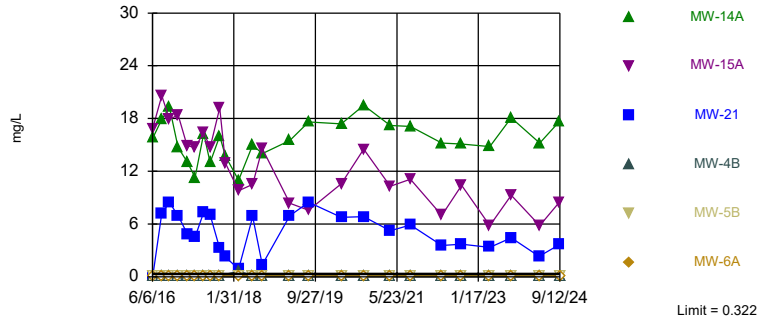
Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 12:53 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
<b>Boron (mg/L)</b>	<b>MW-14A</b>	<b>0.322</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>17.7</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>84.42</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-15A</b>	<b>0.322</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>8.5</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>84.42</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (NDs) 1 of 2</b>
<b>Boron (mg/L)</b>	<b>MW-21</b>	<b>0.322</b>	<b>n/a</b>	<b>9/10/2024</b>	<b>3.68</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>84.42</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (NDs) 1 of 2</b>
Boron (mg/L)	MW-4B	0.322	n/a	9/12/2024	0.1ND	No	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-5B	0.322	n/a	9/12/2024	0.1ND	No	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-6A	0.322	n/a	9/12/2024	0.1ND	No	77	n/a	n/a	84.42	n/a	n/a	0.0003254	NP Inter (NDs) 1 of 2
<b>Calcium (mg/L)</b>	<b>MW-14A</b>	<b>152</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>327</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (normality) 1 of 2</b>
Calcium (mg/L)	MW-15A	152	n/a	9/11/2024	129	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-21	152	n/a	9/10/2024	96.6	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-4B	152	n/a	9/12/2024	102	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-5B	152	n/a	9/12/2024	123	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-6A	152	n/a	9/12/2024	99.4	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	9/11/2024	16.3	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-15A	30	n/a	9/11/2024	7.41	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-21	30	n/a	9/10/2024	13.5	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-4B	30	n/a	9/12/2024	14.6	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
<b>Chloride (mg/L)</b>	<b>MW-5B</b>	<b>30</b>	<b>n/a</b>	<b>9/12/2024</b>	<b>40.5</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>27.27</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (normality) 1 of 2</b>
Chloride (mg/L)	MW-6A	30	n/a	9/12/2024	14.4	No	77	n/a	n/a	27.27	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-14A	1	n/a	9/11/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-15A	1	n/a	9/11/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-21	1	n/a	9/10/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-4B	1	n/a	9/12/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-5B	1	n/a	9/12/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-6A	1	n/a	9/12/2024	1ND	No	76	n/a	n/a	89.47	n/a	n/a	0.0003342	NP Inter (NDs) 1 of 2
pH (SU)	MW-14A	7.792	6.866	9/11/2024	7.2	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-15A	7.792	6.866	9/11/2024	7.2	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-21	7.792	6.866	9/10/2024	6.9	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-4B	7.792	6.866	9/12/2024	7.5	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-5B	7.792	6.866	9/12/2024	7.3	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-6A	7.792	6.866	9/12/2024	7.5	No	77	7.329	0.249	0	None	No	0.0006268	Param Inter 1 of 2
<b>Sulfate (mg/L)</b>	<b>MW-14A</b>	<b>366</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>1110</b>	<b>Yes</b>	<b>77</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0003254</b>	<b>NP Inter (normality) 1 of 2</b>
Sulfate (mg/L)	MW-15A	366	n/a	9/11/2024	273	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-21	366	n/a	9/10/2024	248	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-4B	366	n/a	9/12/2024	65.8	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-5B	366	n/a	9/12/2024	50.4	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-6A	366	n/a	9/12/2024	16.3	No	77	n/a	n/a	0	n/a	n/a	0.0003254	NP Inter (normality) 1 of 2
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-14A</b>	<b>651.9</b>	<b>n/a</b>	<b>9/11/2024</b>	<b>1830</b>	<b>Yes</b>	<b>76</b>	<b>5.976</b>	<b>0.2709</b>	<b>0</b>	<b>None</b>	<b>ln(x)</b>	<b>0.001254</b>	<b>Param Inter 1 of 2</b>
Total Dissolved Solids (mg/L)	MW-15A	651.9	n/a	9/11/2024	602	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-21	651.9	n/a	9/10/2024	584	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-4B	651.9	n/a	9/12/2024	410	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-5B	651.9	n/a	9/12/2024	520	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-6A	651.9	n/a	9/12/2024	382	No	76	5.976	0.2709	0	None	ln(x)	0.001254	Param Inter 1 of 2



Exceeds Limit: MW-14A, MW-15A, MW-21

### Prediction Limit Interwell Non-parametric

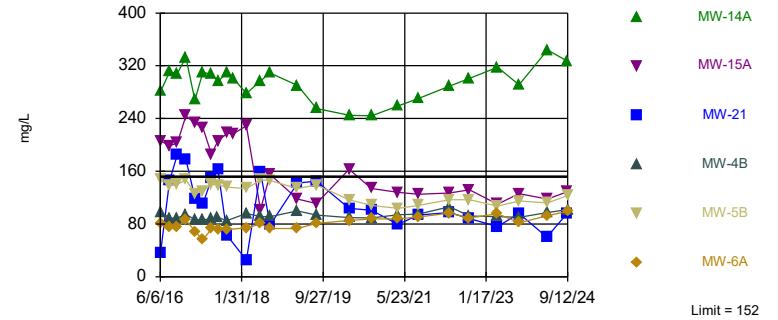


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 77 background values. 84.42% NDs. Annual per-constituent alpha = 0.003897. Individual comparison alpha = 0.0003254 (1 of 2). Comparing 6 points to limit.

Constituent: Boron Analysis Run 12/11/2024 12:47 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Exceeds Limit: MW-14A

### Prediction Limit Interwell Non-parametric

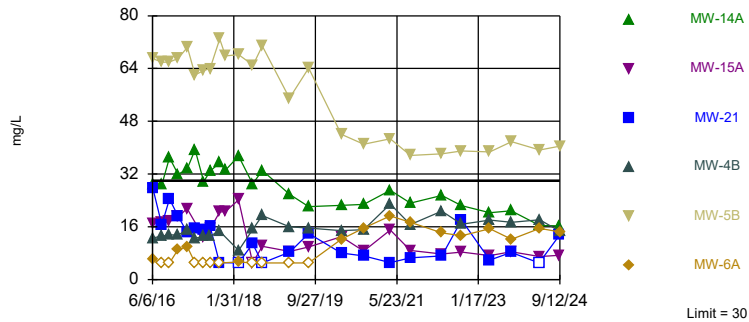


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 77 background values. Annual per-constituent alpha = 0.003897. Individual comparison alpha = 0.0003254 (1 of 2). Comparing 6 points to limit.

Constituent: Calcium Analysis Run 12/11/2024 12:47 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Exceeds Limit: MW-5B

### Prediction Limit Interwell Non-parametric

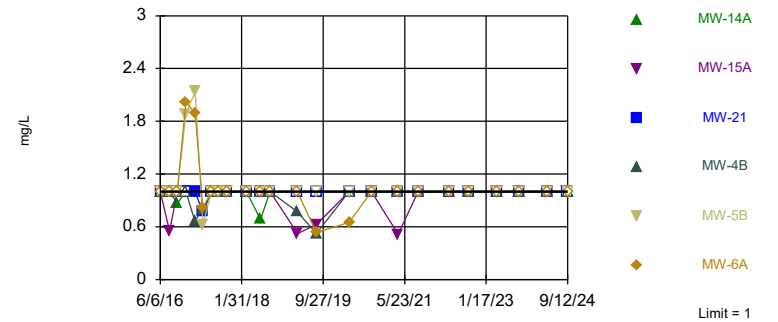


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 77 background values. 27.27% NDs. Annual per-constituent alpha = 0.003897. Individual comparison alpha = 0.0003254 (1 of 2). Comparing 6 points to limit.

Constituent: Chloride Analysis Run 12/11/2024 12:47 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Within Limit

### Prediction Limit Interwell Non-parametric

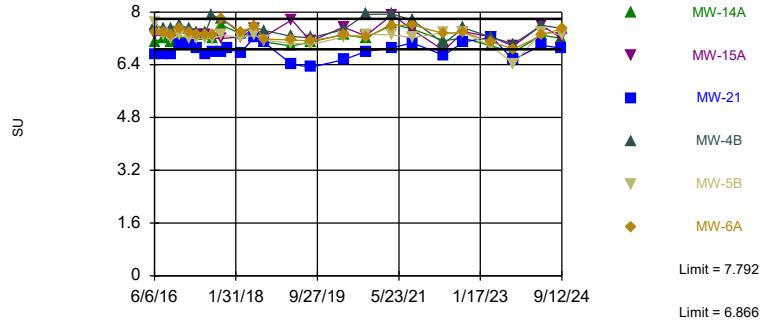


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 76 background values. 89.47% NDs. Annual per-constituent alpha = 0.004003. Individual comparison alpha = 0.0003342 (1 of 2). Comparing 6 points to limit.

Constituent: Fluoride Analysis Run 12/11/2024 12:47 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Within Limits

Prediction Limit  
Interwell Parametric



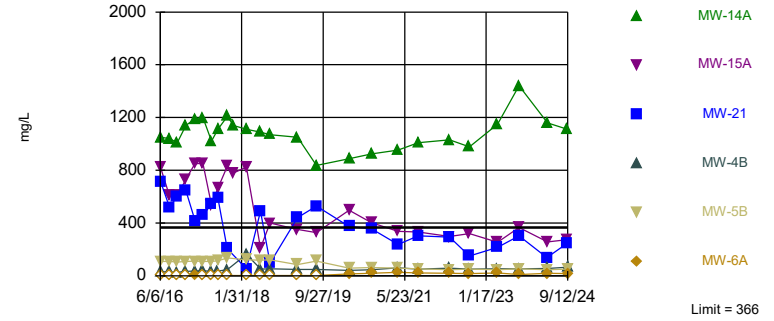
Background Data Summary: Mean=7.329, Std. Dev.=0.249, n=77. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9648, critical = 0.957. Kappa = 1.86 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0006268. Comparing 6 points to limit.

Constituent: pH Analysis Run 12/11/2024 12:47 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Hollow symbols indicate censored values.

Exceeds Limit: MW-14A

Prediction Limit  
Interwell Non-parametric

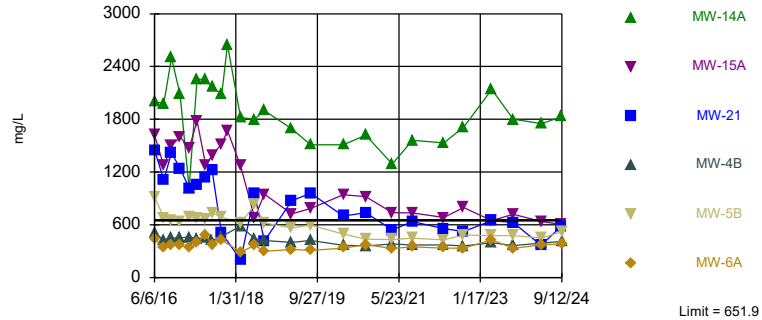


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 77 background values. Annual per-constituent alpha = 0.003897. Individual comparison alpha = 0.0003254 (1 of 2). Comparing 6 points to limit.

Constituent: Sulfate Analysis Run 12/11/2024 12:47 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Exceeds Limit: MW-14A

Prediction Limit  
Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=5.976, Std. Dev.=0.2709, n=76. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9741, critical = 0.957. Kappa = 1.861 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Constituent: Total Dissolved Solids Analysis Run 12/11/2024 12:47 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

# Prediction Limit

Constituent: Boron (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-6A	MW-08 (bg)	MW-5B	MW-14A	MW-21	MW-22 (bg)
6/6/2016	<0.1	16.8							
6/7/2016			<0.1	<0.1	<0.1	<0.1			
6/8/2016							15.8	<0.1	
8/15/2016	<0.1	20.6					17.9	7.23	
8/16/2016			<0.1	<0.1	<0.1	<0.1			
10/10/2016	<0.1				<0.1			8.45	
10/11/2016		17.9	<0.1	<0.1		<0.1	19.3		
12/12/2016			<0.1	<0.1		<0.1		6.93	
12/14/2016	<0.1	18.4			<0.1		14.7		
2/17/2017	<0.1	14.9	<0.1				13.1		
2/21/2017				<0.1	<0.1	<0.1		4.87	
4/17/2017	<0.1	14.7	<0.1	<0.1	<0.1	<0.1	11.3		
4/18/2017								4.49	
6/19/2017	<0.1				<0.1				
6/20/2017			<0.1			<0.1		7.36	
6/21/2017		16.4		<0.1			16.3		
8/7/2017	<0.1		<0.1		<0.1				
8/8/2017		14.7		<0.1		<0.1	13	7.05	
10/16/2017	<0.1		<0.1		<0.1			3.33	
10/17/2017		19.2		<0.1		<0.1	16		
11/28/2017		12.9 (R)					13.7 (R)	2.24 (R)	
3/5/2018	<0.1								
3/6/2018			0.66	<0.1	<0.1	<0.1		0.885	<0.1
3/7/2018		9.8					11		
6/19/2018	<0.1				<0.1			6.84	<0.1
6/20/2018		10.5					15		
6/21/2018			<0.1	<0.1		<0.1			
8/27/2018	<0.1				<0.1				<0.1
8/28/2018			<0.1					1.36	
8/29/2018		14.6		<0.1		<0.1	14		
3/18/2019					<0.1				
3/19/2019	<0.1		<0.1	<0.1		<0.1			0.299
3/20/2019		8.35					15.5	6.95	
8/6/2019					0.205				<0.1
8/7/2019	<0.1	7.56	<0.1	<0.1		<0.1	17.6	8.46	
4/7/2020	<0.1	10.6	<0.1	<0.1	<0.1	<0.1	17.4	6.76	<0.1
9/18/2020	<0.1	14.5	<0.1	<0.1	<0.1	<0.1	19.5	6.82	0.263
4/5/2021	<0.1	10.3	<0.1	<0.1	<0.1	<0.1	17.2	5.24	<0.1
9/1/2021	<0.1	11.1	<0.1	<0.1	<0.1	<0.1	17.1	5.88	<0.1
4/20/2022	<0.1	6.98	<0.1	<0.1	<0.1	<0.1	15.2	3.57	<0.1
9/14/2022	<0.1	10.4	<0.1	<0.1	<0.1	<0.1	15.1	3.69	0.322
4/10/2023									0.247
4/11/2023		5.8			<0.1		14.8	3.35	
4/12/2023	<0.1		<0.1	<0.1		<0.1			
9/18/2023	<0.1								0.207
9/19/2023		9.28			<0.1		18.1	4.42	
9/20/2023			<0.1	<0.1		<0.1			
4/11/2024	<0.1								<0.1
4/12/2024					<0.1			2.31	
4/15/2024		5.8	<0.1	<0.1		<0.1	15.2		
9/10/2024	<0.1							3.68	0.243
9/11/2024		8.5			<0.1		17.7		

# Prediction Limit

Constituent: Boron (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-10 (bg)	MW-15A	MW-4B	MW-6A	MW-08 (bg)	MW-5B	MW-14A	MW-21	MW-22 (bg)
9/12/2024			<0.1	<0.1		<0.1			

# Prediction Limit

Constituent: Boron (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	<0.1
6/21/2018	
8/27/2018	<0.1
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	<0.1
3/20/2019	
8/6/2019	<0.1
8/7/2019	
4/7/2020	<0.1
9/18/2020	0.15
4/5/2021	<0.1
9/1/2021	<0.1
4/20/2022	<0.1
9/14/2022	0.204
4/10/2023	
4/11/2023	
4/12/2023	0.145
9/18/2023	0.128
9/19/2023	
9/20/2023	
4/11/2024	<0.1
4/12/2024	
4/15/2024	
9/10/2024	0.126
9/11/2024	

# Prediction Limit

Constituent: Boron (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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MW-23 (bg)

9/12/2024

# Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-14A	MW-21	MW-22 (bg)
6/6/2016	89.3	206							
6/7/2016			98.2	147	81.4	152			
6/8/2016							281	37.2	
8/15/2016	80.7	199					311	146	
8/16/2016			88.8	139	75.4	117			
10/10/2016	83.3					118		185	
10/11/2016		203	89.3	140	75.7		308		
12/12/2016			94.5	147	85.6			178	
12/14/2016	86.5	244				109	333		
2/17/2017	81.2	233	86.8				268		
2/21/2017				126	68.8	89.9		118	
4/17/2017	79.2	226	85.9	130	56.3	96.5	310		
4/18/2017								110	
6/19/2017	83.6					113			
6/20/2017			88.7	140				149	
6/21/2017		186			72.9		307		
8/7/2017	85.5		89.7			91.3			
8/8/2017		206		139	71.2		296	163	
10/16/2017	83.3		85.3			77		62.3	
10/17/2017		218		136	71.9		310		
11/28/2017		217 (R)					301 (R)		
3/5/2018	77.3								
3/6/2018			95.8	134	74.1	74.7		25.1	69.8
3/7/2018		229					278		
6/19/2018	88.5					115		159	91.5
6/20/2018		102					297		
6/21/2018			91.4	147	80.1				
8/27/2018	85.4					83.6			80.7
8/28/2018			91.3					78.7	
8/29/2018		155		146	73.3		309		
3/18/2019						97.6			
3/19/2019	76.3		99.7	134	73.2				91.6
3/20/2019		118					290	142	
8/6/2019						132			83.8
8/7/2019	78.9	111	93.8	139	80.9		255	145	
4/7/2020	75.4	163	89.6	117	85.1	92.4	245	104	80.9
9/18/2020	74.2	134	89	108	87.9	77.7	244	101	75.5
4/5/2021	78.8	128	94.1	104	87.6	81.2	259	79.5	78.4
9/1/2021	80	125	95.1	108	90.6	78.3	270	93.5	79.4
4/20/2022	90.4	127	106	117	96.5	69.6	289	97.5	80.2
9/14/2022	82	132	92.3	117	89	76.8	301	88.2	79.6
4/10/2023									80.4
4/11/2023		110				78.2	318	76	
4/12/2023	83.7		91.3	107	95.4				
9/18/2023	84.7								79
9/19/2023		126				79.4	291	96	
9/20/2023			90.4	115	82.1				
4/11/2024	96.2								83.1
4/12/2024						84.2		59.9	
4/15/2024		118	97.7	112	92.4		344		
9/10/2024	97.8							96.6	84.3
9/11/2024		129				88.6	327		

# Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-14A	MW-21	MW-22 (bg)
9/12/2024			102	123	99.4				



# Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	70.5
6/21/2018	
8/27/2018	63.9
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	59.7
3/20/2019	
8/6/2019	59.5
8/7/2019	
4/7/2020	61
9/18/2020	52.1
4/5/2021	56.3
9/1/2021	56.1
4/20/2022	54
9/14/2022	54.5
4/10/2023	
4/11/2023	
4/12/2023	55.3
9/18/2023	56
9/19/2023	
9/20/2023	
4/11/2024	59.7
4/12/2024	
4/15/2024	
9/10/2024	58
9/11/2024	

# Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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MW-23 (bg)

9/12/2024

# Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-6A	MW-5B	MW-4B	MW-08 (bg)	MW-21	MW-14A	MW-22 (bg)
6/6/2016	6.22	17.1							
6/7/2016			5.97	67	12.6	19.8			
6/8/2016							27.7	28.7	
8/15/2016	<5	17.2					16.6	28.7	
8/16/2016			<5	65.9	13.2	17.8			
10/10/2016	<5					16.2	24.4		
10/11/2016		17.6	<5	66	13.6			37	
12/12/2016			9.08	67	13.5		19.2		
12/14/2016	<5	19				17.2		31.9	
2/17/2017	<5	21.5			15.1			33.5	
2/21/2017			9.93	70.4		15.4	14.2		
4/17/2017	<5	47.4 (o)	<5	62.1	12.5	17.1		39.4	
4/18/2017							15.6		
6/19/2017	<5					14.1			
6/20/2017				63.4	13.2		15.1		
6/21/2017		12.8	<5					29.7	
8/7/2017	<5				13.2	14			
8/8/2017		15.4	<5	64			16.1	32.9	
10/16/2017	<5				14.7	14.4	5.09		
10/17/2017		20.5	<5	73				35.4	
11/28/2017		20.7 (R)		67.8 (R)				33.2 (R)	
3/5/2018	<5								
3/6/2018			5.33	68.2	8.81	14.5	<5		30
3/7/2018		24.2						37.4	
6/19/2018	<5					14.9	10.9		27.2
6/20/2018		<5						29	
6/21/2018			<5	65	15.3				
8/27/2018	<5					15.6			29.8
8/28/2018					19.4		<5		
8/29/2018		10.1	<5	70.8				33.1	
3/18/2019						16.1			
3/19/2019	<5		<5	55	16				27.6
3/20/2019		8.54					8.3	25.8	
8/6/2019						17.1			26.9
8/7/2019	<5	9.91	<5	64.1	15.6		14	22.1	
4/7/2020	<5	13	12.2	44	14.8	17.2	8.05	22.5	24.8
9/18/2020	<5	8.63	15.6	41	15.1	14.7	7.21	22.8	23.2
4/5/2021	<5	15	19.3	42.7	22.9	22.3	5.14	27.1	28.1
9/1/2021	<5	8.86	17.4	37.6	16.7	16.3	6.58	23.2	20
4/20/2022	<5	7.71	14.2	38.1	20.8	15.8	7.19	25.5	20.2
9/14/2022	<5	8.29	13.3	39	16.8	16.7	18	22.4	7.04
4/10/2023									18.2
4/11/2023		7.3				17.9	5.93	20.3	
4/12/2023	5.86		15.4	38.7	18				
9/18/2023	<5								18.4
9/19/2023		8.41				19.9	8.23	20.9	
9/20/2023			12.2	41.8	17.4				
4/11/2024	<5								15.8
4/12/2024						17.2	<5		
4/15/2024		7.01	15.5	39.3	18.1			16.4	
9/10/2024	9.65						13.5		16.6
9/11/2024		7.41				20.1		16.3	

# Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-10 (bg)	MW-15A	MW-6A	MW-5B	MW-4B	MW-08 (bg)	MW-21	MW-14A	MW-22 (bg)
9/12/2024			14.4	40.5	14.6				

# Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	15.9
6/21/2018	
8/27/2018	14.2
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	10.5
3/20/2019	
8/6/2019	13.8
8/7/2019	
4/7/2020	15.7
9/18/2020	14.4
4/5/2021	21.4
9/1/2021	15.2
4/20/2022	16.9
9/14/2022	16.2
4/10/2023	
4/11/2023	
4/12/2023	17.7
9/18/2023	19.2
9/19/2023	
9/20/2023	
4/11/2024	19.2
4/12/2024	
4/15/2024	
9/10/2024	21.7
9/11/2024	

# Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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MW-23 (bg)

9/12/2024

# Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-6A	MW-4B	MW-5B	MW-08 (bg)	MW-21	MW-14A	MW-22 (bg)
6/6/2016	0.731	<1							
6/7/2016			<1	<1	<1	<1			
6/8/2016							<1	<1	
8/15/2016	<1	0.549					<1	<1	
8/16/2016			<1	<1	<1	<1			
10/10/2016	<1					<1	<1		
10/11/2016		<1	<1	<1	<1			0.867	
12/12/2016			2.02	<1	1.88		<1		
12/14/2016	<1	<1				0.72		<1	
2/17/2017	<1	<1		0.664				<1	
2/21/2017			1.89		2.14	<1	0.993		
4/17/2017	0.774	6.7 (o)	0.814	0.801	0.627	1.69 (o)		1.93 (o)	
4/18/2017							0.768		
6/19/2017	<1					<1			
6/20/2017				<1	<1		<1		
6/21/2017		<1	<1					<1	
8/7/2017	<1			<1		<1			
8/8/2017		<1	<1		<1		<1	<1	
10/16/2017	<1			<1		<1	<1		
10/17/2017		<1	<1		<1			<1	
3/5/2018	<1								
3/6/2018			<1	<1	<1	<1	<1		<1
3/7/2018		<1						<1	
6/19/2018	<1					0.826	<1		<1
6/20/2018		<1						0.684	
6/21/2018			<1	<1	<1				
8/27/2018	<1					<1			<1
8/28/2018				<1			<1		
8/29/2018		<1	<1		<1			<1	
3/18/2019						<1			
3/19/2019	<1		<1	0.771	<1				<1
3/20/2019		0.523					<1	<1	
8/6/2019						0.643			0.507
8/7/2019	0.596	0.625	0.535	0.525	<1		<1	<1	
4/7/2020	<1	<1	0.652	<1	<1	0.864	<1	<1	<1
9/18/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1
4/5/2021	<1	0.516	<1	<1	<1	<1	<1	<1	<1
9/1/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1
4/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1
9/14/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1
4/10/2023									<1
4/11/2023		<1				<1	<1	<1	
4/12/2023	<1		<1	<1	<1				
9/18/2023	<1								<1
9/19/2023		<1				<1	<1	<1	
9/20/2023			<1	<1	<1				
4/11/2024	<1								<1
4/12/2024						<1	<1		
4/15/2024		<1	<1	<1	<1			<1	
9/10/2024	<1						<1		<1
9/11/2024		<1				<1		<1	
9/12/2024			<1	<1	<1				

# Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	<1
6/21/2018	
8/27/2018	<1
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	<1
3/20/2019	
8/6/2019	<1
8/7/2019	
4/7/2020	<1
9/18/2020	<1
4/5/2021	<1
9/1/2021	<1
4/20/2022	<1
9/14/2022	<1
4/10/2023	
4/11/2023	
4/12/2023	<1
9/18/2023	<1
9/19/2023	
9/20/2023	
4/11/2024	<1
4/12/2024	
4/15/2024	
9/10/2024	<1
9/11/2024	
9/12/2024	



# Prediction Limit

Constituent: pH (SU) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-15A	MW-10 (bg)	MW-08 (bg)	MW-4B	MW-5B	MW-6A	MW-21	MW-14A	MW-22 (bg)
6/6/2016	7.3	7.4							
6/7/2016			7.2	7.6	7.7	7.4			
6/8/2016							6.7	7.1	
8/15/2016	7.3	7.3					6.7	7.2	
8/16/2016			7.3	7.5	7.3	7.4			
10/10/2016		7.2	7.1				6.7		
10/11/2016	7.2			7.5	7.2	7.3		7.1	
12/12/2016				7.6	7.3	7.5	7		
12/14/2016	7.4	7.3	7.3					7.2	
2/17/2017	7.3	7.2		7.5				7.3	
2/21/2017			7.3		7.2	7.4	7		
4/17/2017	7.3	7.3	7.1	7.4	7.2	7.3		7.3	
4/18/2017							6.9		
6/19/2017		7.2	7.1						
6/20/2017				7.4	7.2		6.7		
6/21/2017	7.3					7.3		7.3	
8/7/2017		7.9	7.3	7.9					
8/8/2017	7.2				7.2	7.3	6.8	7.2	
10/16/2017		7.3	7.4	7.8			6.8		
10/17/2017	7.2				7.3	7.8		7.6	
11/28/2017							6.9 (R)		
3/5/2018		7.04							
3/6/2018			7.3	7.36	7.23	7.4	6.76		7.36
3/7/2018	7.24							7.35	
6/19/2018		7.72	7.56				7.25		7.9
6/20/2018	7.5							7.26	
6/21/2018				7.53	7.3	7.58			
8/27/2018		7.23	7.2						7.42
8/28/2018				7.44			7.07		
8/29/2018	7.25				7.14	7.18		7.09	
3/19/2019		7.1	7.08	7.26	7.05	7.15			7.21
3/20/2019	7.76						6.41	6.97	
8/6/2019			6.64						7.12
8/7/2019	7.11	7.07		7.22	7.02	7.12	6.33	7.09	
4/7/2020	7.54	7.26	7.21	7.46	7.24	7.3	6.55	7.32	7.32
9/18/2020	7.28	7.33	7.4	7.93	7.33	7.24	6.8	7.21	7.53
4/5/2021	7.92	7.57	7.63	7.94	7.31	7.59	6.92	7.64	7.7
9/1/2021	7.46	7.59	7.45	7.75	7.22	7.61	7.06	7.48	7.97
4/20/2022	6.83	7.35	7.35	7.04	7.37	7.35	6.69	7.13	7.23
9/14/2022	7.4	7.48	7.43	7.52	7.37	7.38	7.09	7.21	7.58
4/10/2023									7.14
4/11/2023	7.24		7.24				7.24	6.97	
4/12/2023		6.96		7.23	6.96	7.08			
9/18/2023		6.86							7.14
9/19/2023	6.97		6.81				6.55	6.78	
9/20/2023				7.03	6.42	6.88			
4/11/2024		7.3							7.5
4/12/2024			7.4				7		
4/15/2024	7.6			7.6	7.4	7.3		7.3	
9/10/2024		7.3					6.9		7.5
9/11/2024	7.2		7.3					7.2	
9/12/2024				7.5	7.3	7.5			

# Prediction Limit

Constituent: pH (SU) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	7.69
6/21/2018	
8/27/2018	7.55
8/28/2018	
8/29/2018	
3/19/2019	7.24
3/20/2019	
8/6/2019	6.75
8/7/2019	
4/7/2020	7.33
9/18/2020	7.53
4/5/2021	7.61
9/1/2021	7.89
4/20/2022	7.39
9/14/2022	7.3
4/10/2023	
4/11/2023	
4/12/2023	7.24
9/18/2023	7.05
9/19/2023	
9/20/2023	
4/11/2024	7.4
4/12/2024	
4/15/2024	
9/10/2024	7.4
9/11/2024	
9/12/2024	

# Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-14A	MW-21	MW-22 (bg)
6/6/2016	42.1	827							
6/7/2016			32.2	109	<5	366			
6/8/2016							1050	713	
8/15/2016	33.8	605					1040	520	
8/16/2016			28.4	109	<5	187			
10/10/2016	36.4					187		603	
10/11/2016		607	27.2	105	<5		1010		
12/12/2016			32.7	109	<5			645	
12/14/2016	38.4	732				149	1140		
2/17/2017	47.3	849	36				1190		
2/21/2017				111	5.94	145		415	
4/17/2017	38.3	853	39.5	108	<5	145	1200		
4/18/2017								461	
6/19/2017	35.4					190			
6/20/2017			33	108				541	
6/21/2017		537			<5		1020		
8/7/2017	39		35.3			119			
8/8/2017		664		114	<5		1110	590	
10/16/2017	46.9		45.4			106		206	
10/17/2017		835		135	<5		1210		
11/28/2017		779 (R)					1140 (R)		
3/5/2018	51.4								
3/6/2018			162	122	<5	87.3		53.7	123
3/7/2018		824					1110		
6/19/2018	37.3					136		489	134
6/20/2018		210					1090		
6/21/2018			51.3	119	<5				
8/27/2018	34.3					94.7			125
8/28/2018			52.2					96.6	
8/29/2018		400		120	<5		1070		
3/18/2019						223			
3/19/2019	42.8		48	85	<5				134
3/20/2019		351					1050	442	
8/6/2019						276			139
8/7/2019	28.8	327	47	112	<5		837	529	
4/7/2020	18.6	496	41.5	58.9	13.6	123	888	373	143
9/18/2020	36.5	403	46.9	61.9	19.1	100	924	356	151
4/5/2021	27.6	338	60.1	57.4	27.3	99.7	952	237	154
9/1/2021	32.3	333	50.2	53.7	22.7	82.7	1010	303	154
4/20/2022	48.3	297	58.4	44.7	18.9	72.8	1030	293	158
9/14/2022	31.2	319	49.5	49.9	16.4	67.1	978	151	220
4/10/2023									147
4/11/2023		254				72.2	1150	215	
4/12/2023	39.8		54	45.8	20.5				
9/18/2023	57.4								208
9/19/2023		365				94.2	1440	303	
9/20/2023			53.1	53.4	10.1				
4/11/2024	49.6								160
4/12/2024						65.7		138	
4/15/2024		256	56.1	46.3	18.1		1160		
9/10/2024	59.9							248	161
9/11/2024		273				68.9	1110		

# Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-10 (bg)	MW-15A	MW-4B	MW-5B	MW-6A	MW-08 (bg)	MW-14A	MW-21	MW-22 (bg)
9/12/2024			65.8	50.4	16.3				

# Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	38.4
6/21/2018	
8/27/2018	31.7
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	26.2
3/20/2019	
8/6/2019	29.7
8/7/2019	
4/7/2020	25.5
9/18/2020	25.8
4/5/2021	35.5
9/1/2021	25.8
4/20/2022	25.4
9/14/2022	23
4/10/2023	
4/11/2023	
4/12/2023	25
9/18/2023	28.6
9/19/2023	
9/20/2023	
4/11/2024	21.8
4/12/2024	
4/15/2024	
9/10/2024	23.8
9/11/2024	

# Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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MW-23 (bg)

9/12/2024

# Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-4B	MW-6A	MW-5B	MW-08 (bg)	MW-14A	MW-21	MW-22 (bg)
6/6/2016	468	1620							
6/7/2016			507	440	920	836			
6/8/2016							2000	1440	
8/15/2016	412	1270					1980	1110	
8/16/2016			426	340	672	664			
10/10/2016	444					708		1420	
10/11/2016		1500	450	370	646		2500		
12/12/2016			450	368	636			1240	
12/14/2016	428	1600				634	2080		
2/17/2017	498	1470	460				1010		
2/21/2017				336	684	578		1010	
4/17/2017	538	1780	442	402	680	624	2260		
4/18/2017								1060	
6/19/2017	524					656			
6/20/2017			452		656			1140	
6/21/2017		1280		486			2250		
8/7/2017	458		420			488			
8/8/2017		1390		364	734		2170	1220	
10/16/2017	414		466			470		514	
10/17/2017		1520		424	688		2080		
11/28/2017		1670 (R)					2650 (R)		
3/5/2018	314								
3/6/2018			586	292	620	376		200	424
3/7/2018		1270					1820		
6/19/2018	396					502		952	434
6/20/2018		676					1800		
6/21/2018			440	368	828				
8/27/2018	392					414			420
8/28/2018			420					416	
8/29/2018		948		298	622		1900		
3/18/2019						612			
3/19/2019	326		398	320	562				456
3/20/2019		724					1690	872	
8/6/2019						702			428
8/7/2019	320	786	422	308	596		1510	960	
4/7/2020	316	942	366	336	494	418	1510	698	422
9/18/2020	344	920	360	374	436	350	1620	738	398
4/5/2021	322	738	380	330	434	382	1290	540	412
9/1/2021	314	736	370	350	448	342	1560	636	420
4/20/2022	344	682	370	336	428	322	1530	558	388
9/14/2022	340	796	358	334	484	350	1710	524	390
4/10/2023									450
4/11/2023		646				2390 (o)	2140	646	
4/12/2023	410		396	428	478				
9/18/2023	318								404
9/19/2023		720				260	1800	626	
9/20/2023			364	332	476				
4/11/2024	382								422
4/12/2024						362		366	
4/15/2024		636	392	376	450		1750		
9/10/2024	386							584	396
9/11/2024		602				320	1830		

# Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-10 (bg)	MW-15A	MW-4B	MW-6A	MW-5B	MW-08 (bg)	MW-14A	MW-21	MW-22 (bg)
9/12/2024			410	382	520				



# Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

MW-23 (bg)

6/6/2016	
6/7/2016	
6/8/2016	
8/15/2016	
8/16/2016	
10/10/2016	
10/11/2016	
12/12/2016	
12/14/2016	
2/17/2017	
2/21/2017	
4/17/2017	
4/18/2017	
6/19/2017	
6/20/2017	
6/21/2017	
8/7/2017	
8/8/2017	
10/16/2017	
10/17/2017	
11/28/2017	
3/5/2018	
3/6/2018	
3/7/2018	
6/19/2018	
6/20/2018	384
6/21/2018	
8/27/2018	340
8/28/2018	
8/29/2018	
3/18/2019	
3/19/2019	296
3/20/2019	
8/6/2019	336
8/7/2019	
4/7/2020	298
9/18/2020	250
4/5/2021	274
9/1/2021	256
4/20/2022	218
9/14/2022	278
4/10/2023	
4/11/2023	
4/12/2023	286
9/18/2023	282
9/19/2023	
9/20/2023	
4/11/2024	274
4/12/2024	
4/15/2024	
9/10/2024	260
9/11/2024	

# Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/11/2024 12:53 PM View: Federal Prediction Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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MW-23 (bg)

9/12/2024

FIGURE F.

# Trend Tests - Prediction Limit Exceedances - Significant Results

Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 12:56 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-15A	-1.395	-198	-111	Yes	25	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-08 (bg)	-4.322	-114	-105	Yes	24	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-22 (bg)	-2.242	-77	-53	Yes	15	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-23 (bg)	1.058	56	48	Yes	14	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5B	-4.247	-157	-111	Yes	25	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-08 (bg)	-14.03	-178	-105	Yes	24	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-22 (bg)	7.15	81	53	Yes	15	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-23 (bg)	-1.122	-54	-48	Yes	14	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-08 (bg)	-49.91	-176	-98	Yes	23	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-10 (bg)	-16.65	-116	-105	Yes	24	0	n/a	n/a	0.01	NP

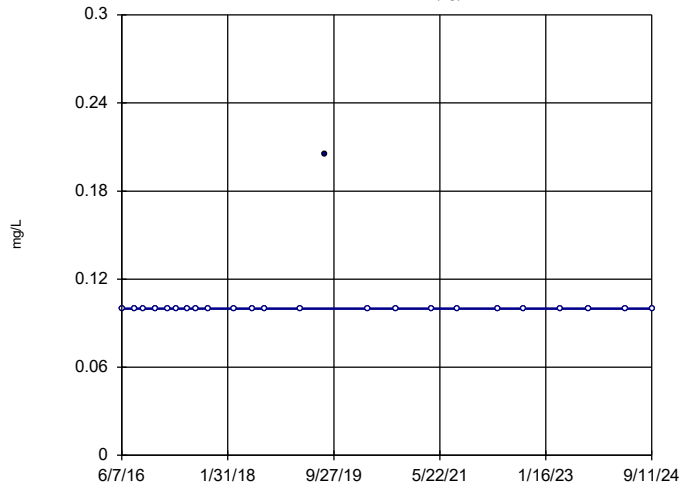
# Trend Tests - Prediction Limit Exceedances - All Results

Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water    Printed 12/11/2024, 12:56 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-08 (bg)	0	3	105	No	24	95.83	n/a	n/a	0.01	NP
Boron (mg/L)	MW-10 (bg)	0	0	105	No	24	100	n/a	n/a	0.01	NP
Boron (mg/L)	MW-14A	0.2089	45	111	No	25	0	n/a	n/a	0.01	NP
<b>Boron (mg/L)</b>	<b>MW-15A</b>	<b>-1.395</b>	<b>-198</b>	<b>-111</b>	<b>Yes</b>	<b>25</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Boron (mg/L)	MW-21	-0.2935	-72	-111	No	25	4	n/a	n/a	0.01	NP
Boron (mg/L)	MW-22 (bg)	0	19	53	No	15	60	n/a	n/a	0.01	NP
Boron (mg/L)	MW-23 (bg)	0	23	48	No	14	64.29	n/a	n/a	0.01	NP
<b>Calcium (mg/L)</b>	<b>MW-08 (bg)</b>	<b>-4.322</b>	<b>-114</b>	<b>-105</b>	<b>Yes</b>	<b>24</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Calcium (mg/L)	MW-10 (bg)	0.2249	19	105	No	24	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-1.168	-20	-111	No	25	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-22 (bg)	0.1239	3	53	No	15	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-23 (bg)	-1.14	-32	-48	No	14	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-08 (bg)	0.2664	68	105	No	24	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-10 (bg)	0	18	105	No	24	87.5	n/a	n/a	0.01	NP
<b>Chloride (mg/L)</b>	<b>MW-22 (bg)</b>	<b>-2.242</b>	<b>-77</b>	<b>-53</b>	<b>Yes</b>	<b>15</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Chloride (mg/L)</b>	<b>MW-23 (bg)</b>	<b>1.058</b>	<b>56</b>	<b>48</b>	<b>Yes</b>	<b>14</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Chloride (mg/L)</b>	<b>MW-5B</b>	<b>-4.247</b>	<b>-157</b>	<b>-111</b>	<b>Yes</b>	<b>25</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Sulfate (mg/L)</b>	<b>MW-08 (bg)</b>	<b>-14.03</b>	<b>-178</b>	<b>-105</b>	<b>Yes</b>	<b>24</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Sulfate (mg/L)	MW-10 (bg)	0.5948	28	105	No	24	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-14A	-4.303	-16	-111	No	25	0	n/a	n/a	0.01	NP
<b>Sulfate (mg/L)</b>	<b>MW-22 (bg)</b>	<b>7.15</b>	<b>81</b>	<b>53</b>	<b>Yes</b>	<b>15</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Sulfate (mg/L)</b>	<b>MW-23 (bg)</b>	<b>-1.122</b>	<b>-54</b>	<b>-48</b>	<b>Yes</b>	<b>14</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-08 (bg)</b>	<b>-49.91</b>	<b>-176</b>	<b>-98</b>	<b>Yes</b>	<b>23</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-10 (bg)</b>	<b>-16.65</b>	<b>-116</b>	<b>-105</b>	<b>Yes</b>	<b>24</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Total Dissolved Solids (mg/L)	MW-14A	-70.36	-91	-111	No	25	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-22 (bg)	-4.368	-37	-53	No	15	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-23 (bg)	-13.11	-42	-48	No	14	0	n/a	n/a	0.01	NP

### Sen's Slope Estimator

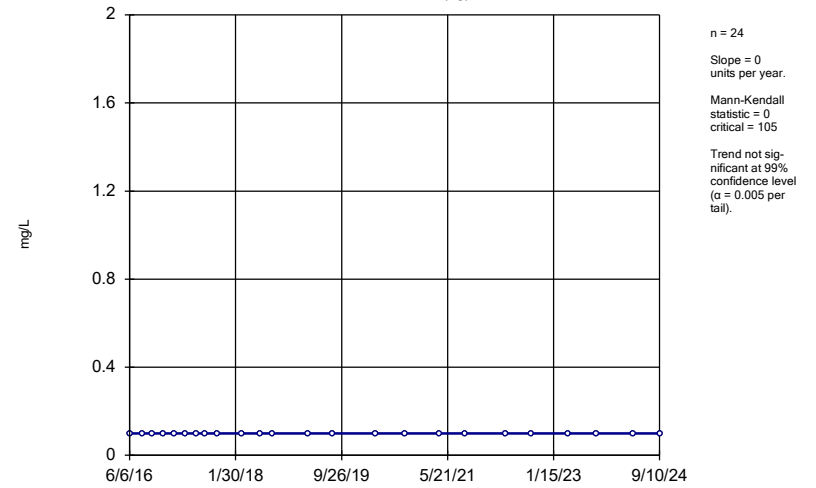
MW-08 (bg)



Constituent: Boron Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

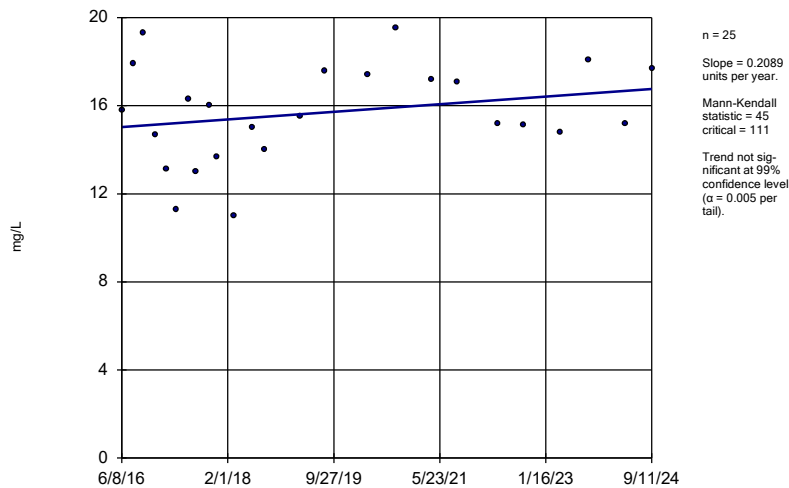
MW-10 (bg)



Constituent: Boron Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

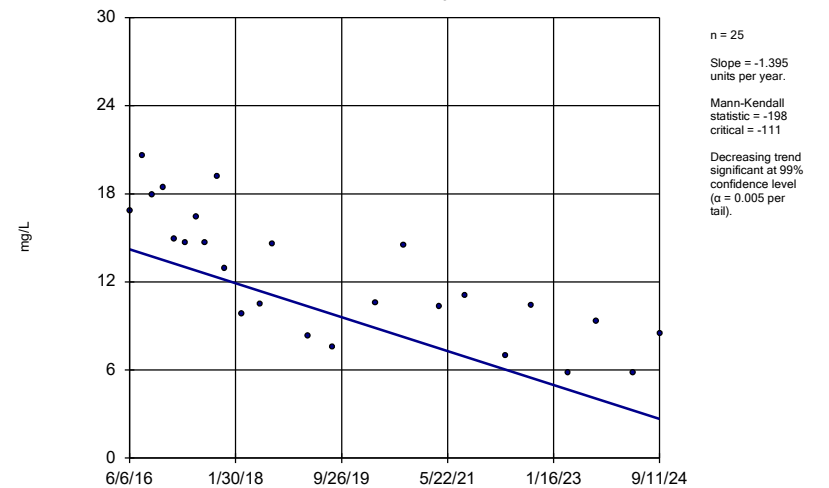
MW-14A



Constituent: Boron Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

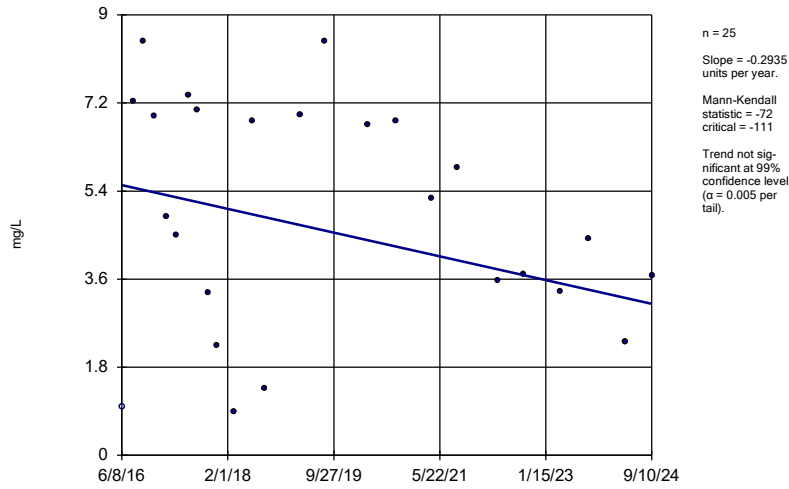
MW-15A



Constituent: Boron Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

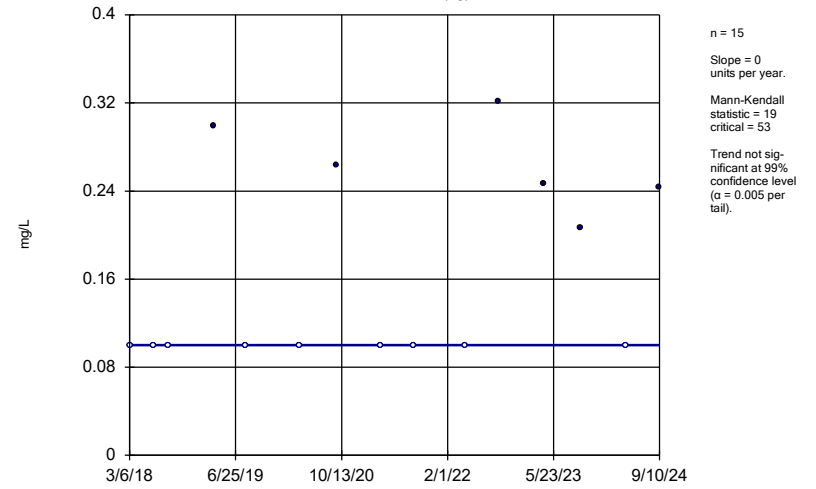
MW-21



Constituent: Boron Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

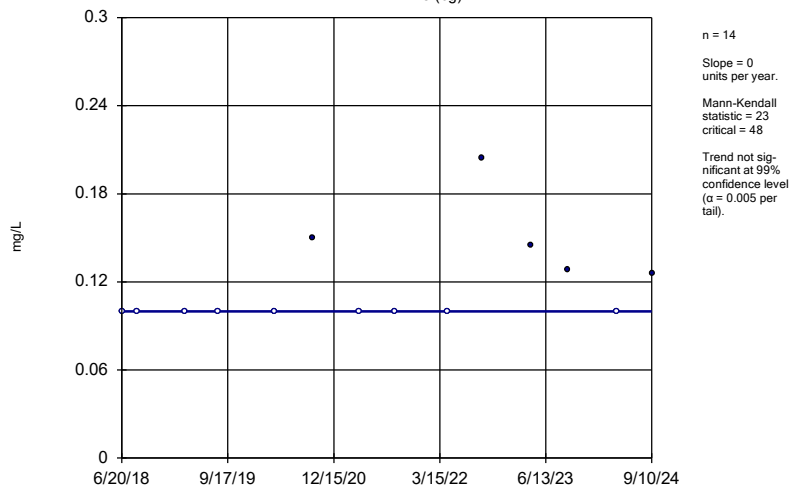
MW-22 (bg)



Constituent: Boron Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

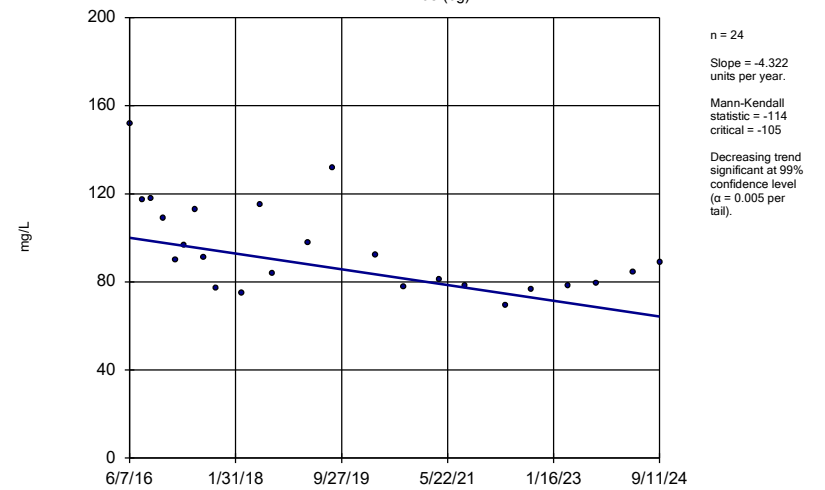
MW-23 (bg)



Constituent: Boron Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

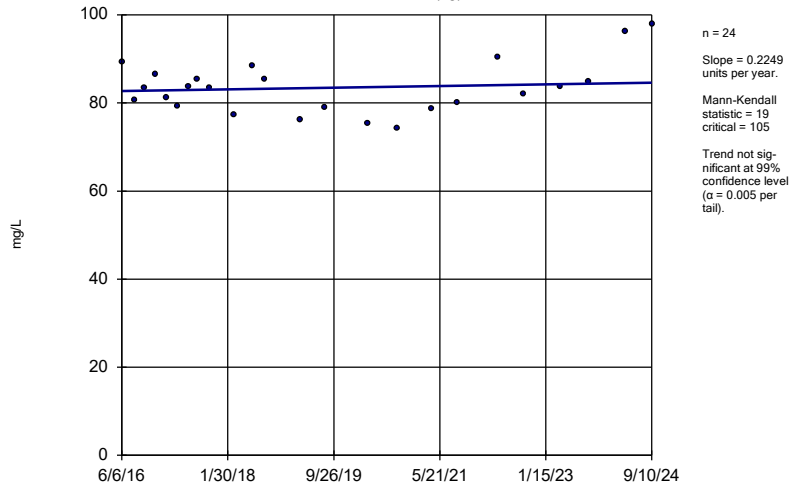
MW-08 (bg)



Constituent: Calcium Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

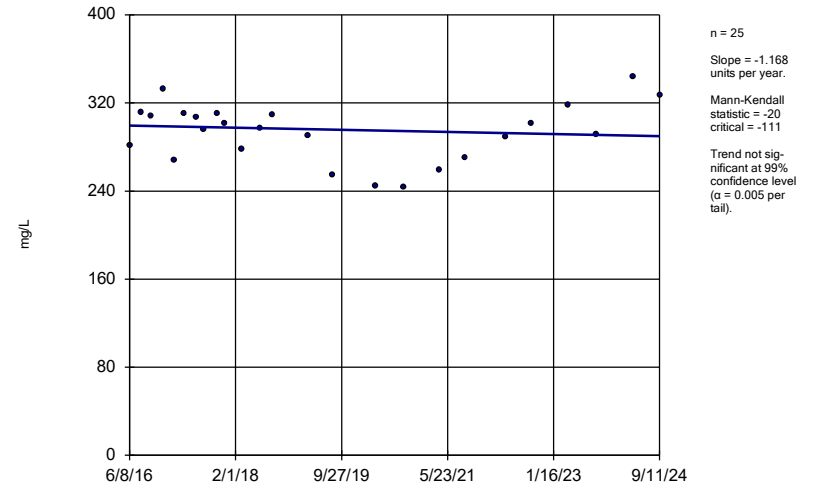
MW-10 (bg)



Constituent: Calcium Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

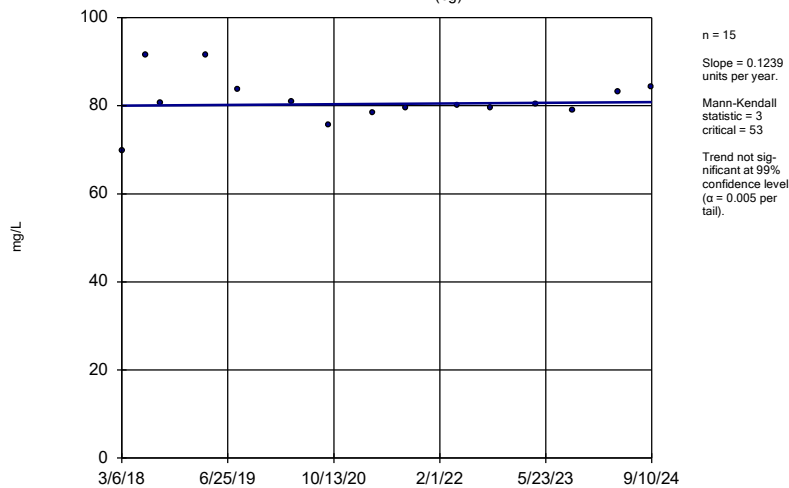
MW-14A



Constituent: Calcium Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

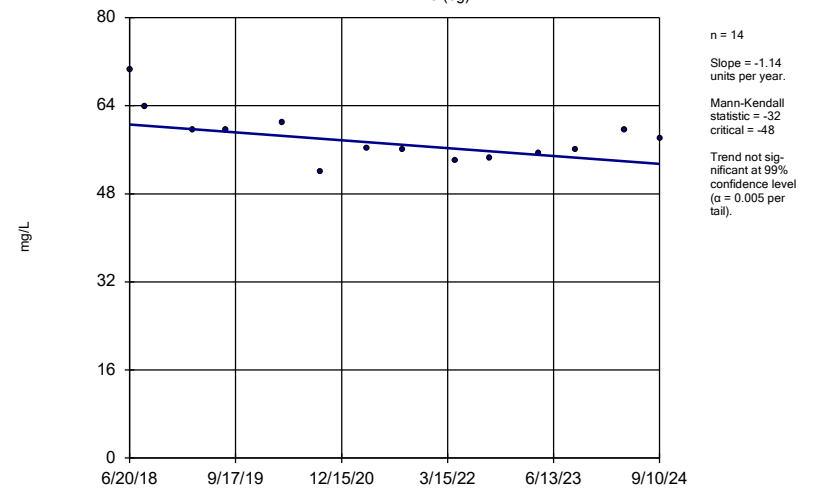
MW-22 (bg)



Constituent: Calcium Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-23 (bg)

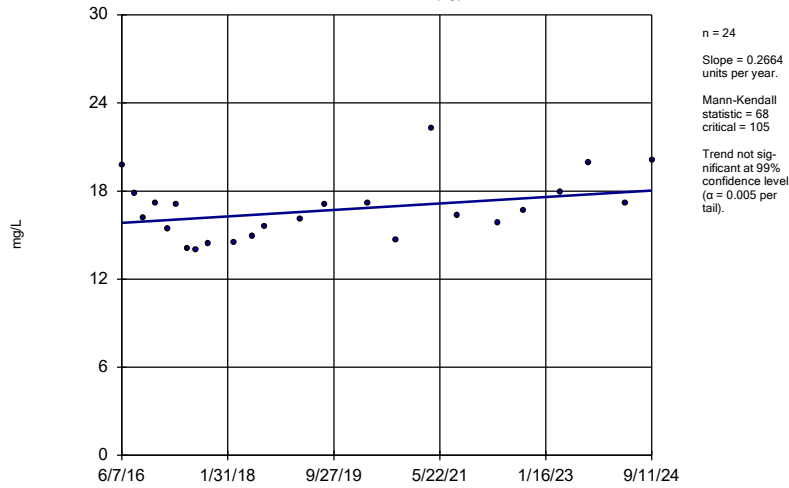


Constituent: Calcium Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water



### Sen's Slope Estimator

MW-08 (bg)

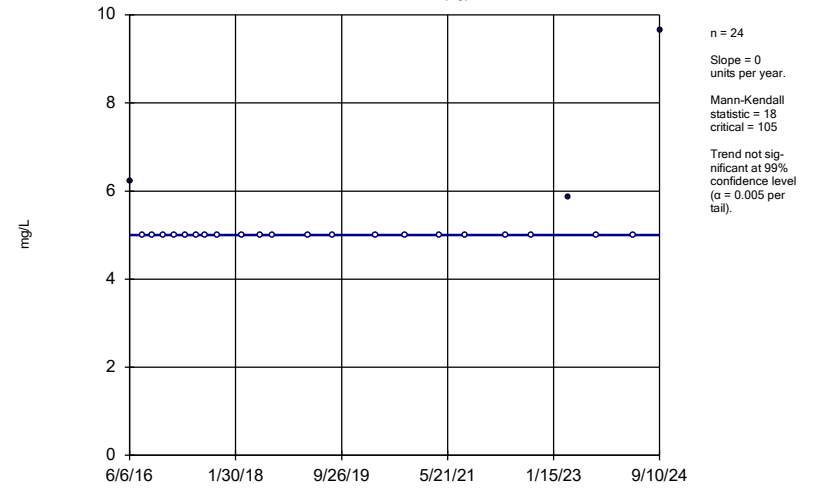


Constituent: Chloride Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Hollow symbols indicate censored values.

### Sen's Slope Estimator

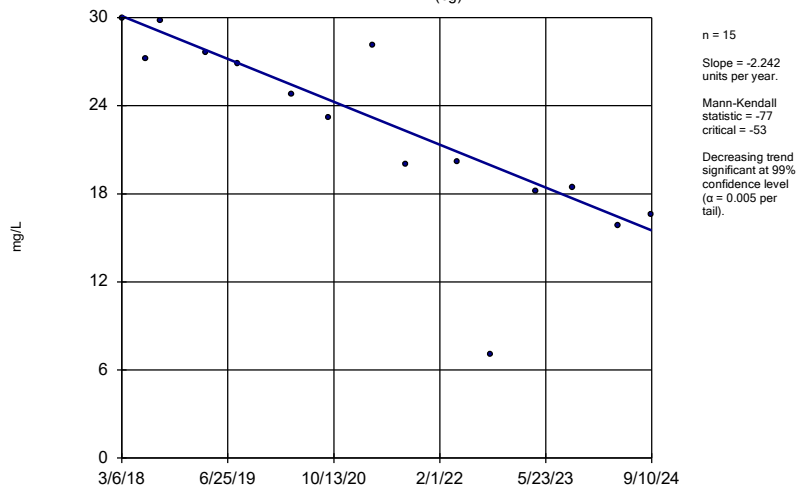
MW-10 (bg)



Constituent: Chloride Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

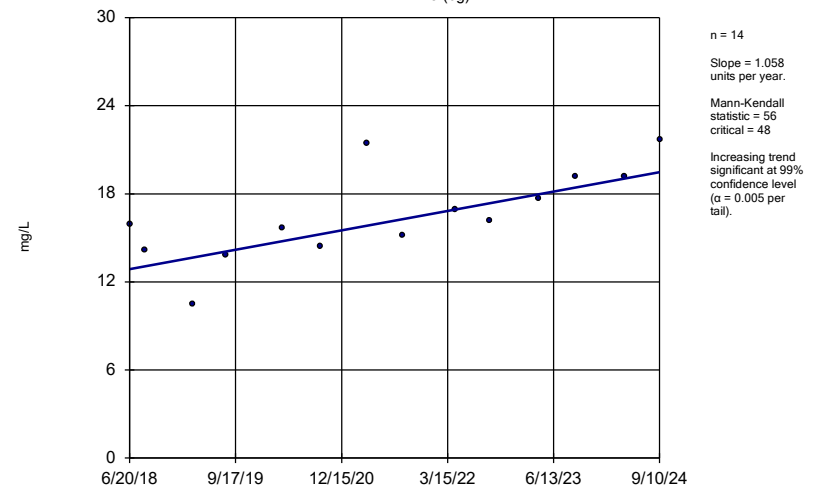
MW-22 (bg)



Constituent: Chloride Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

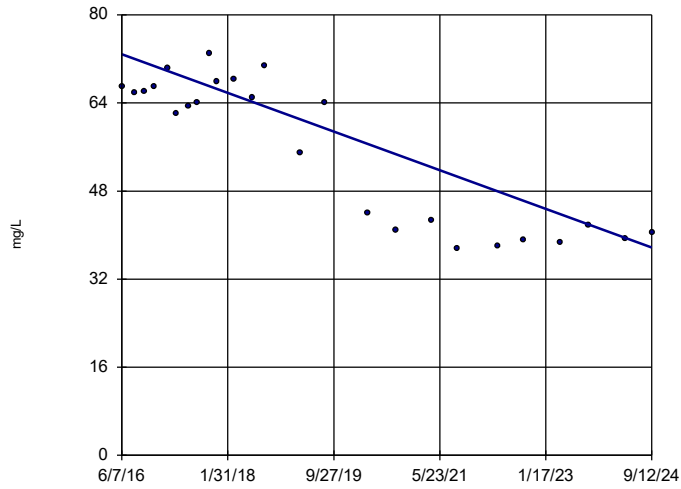
MW-23 (bg)



Constituent: Chloride Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-5B

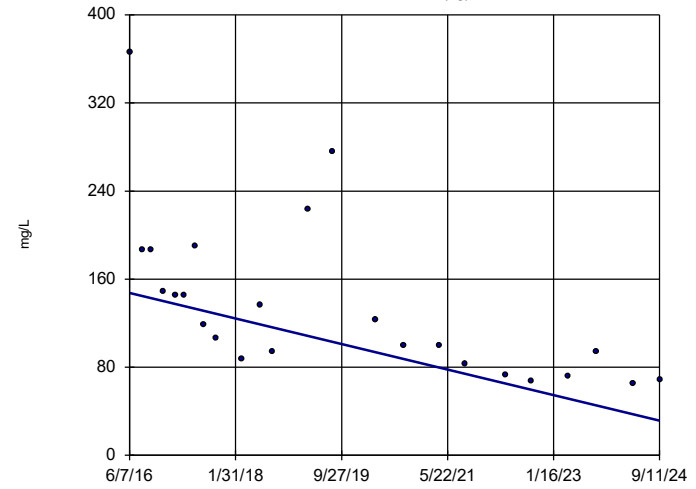


n = 25  
 Slope = -4.247  
 units per year.  
 Mann-Kendall  
 statistic = -157  
 critical = -111  
 Decreasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Chloride Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
 Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-08 (bg)

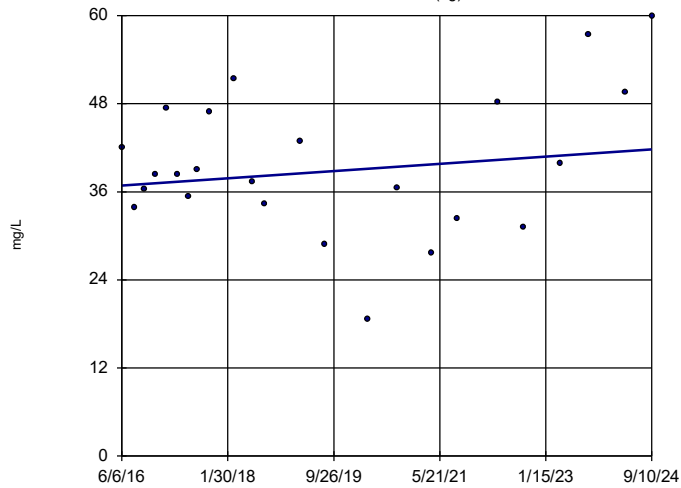


n = 24  
 Slope = -14.03  
 units per year.  
 Mann-Kendall  
 statistic = -178  
 critical = -105  
 Decreasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Sulfate Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
 Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-10 (bg)

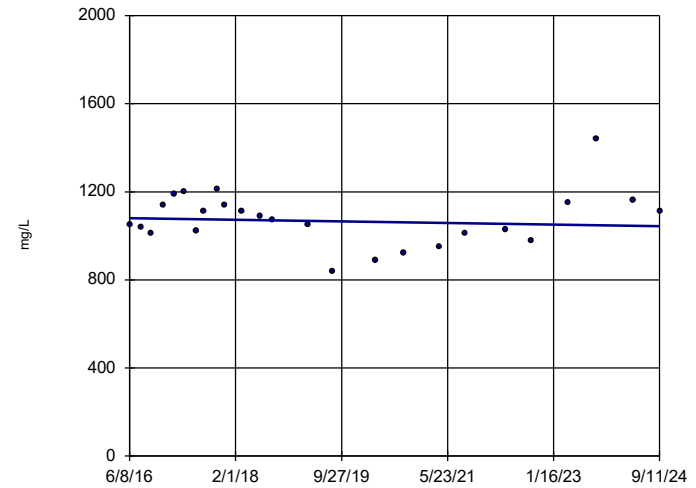


n = 24  
 Slope = 0.5948  
 units per year.  
 Mann-Kendall  
 statistic = 28  
 critical = 105  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Sulfate Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
 Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-14A

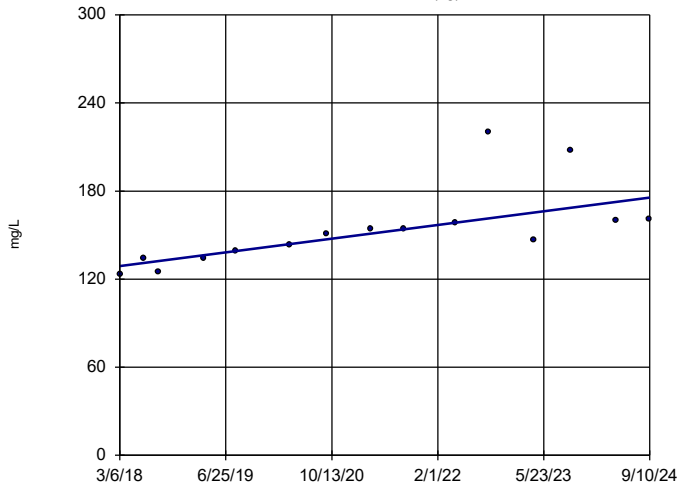


n = 25  
 Slope = -4.303  
 units per year.  
 Mann-Kendall  
 statistic = -16  
 critical = -111  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Sulfate Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
 Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-22 (bg)

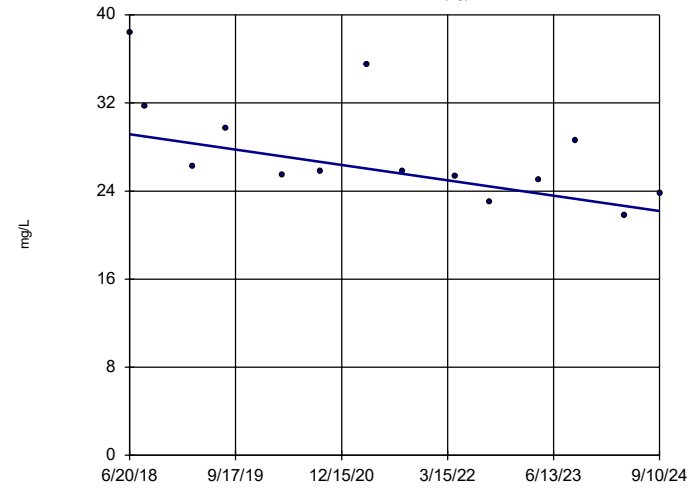


n = 15  
Slope = 7.15  
units per year.  
Mann-Kendall  
statistic = 81  
critical = 53  
Increasing trend  
significant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Sulfate Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-23 (bg)

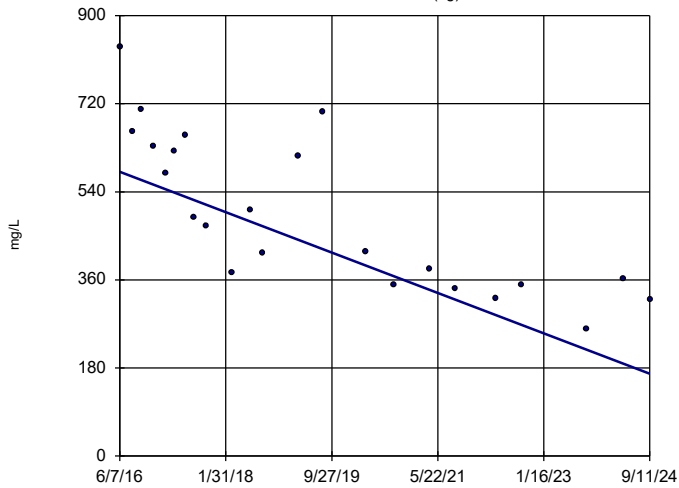


n = 14  
Slope = -1.122  
units per year.  
Mann-Kendall  
statistic = -54  
critical = -48  
Decreasing trend  
significant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Sulfate Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-08 (bg)

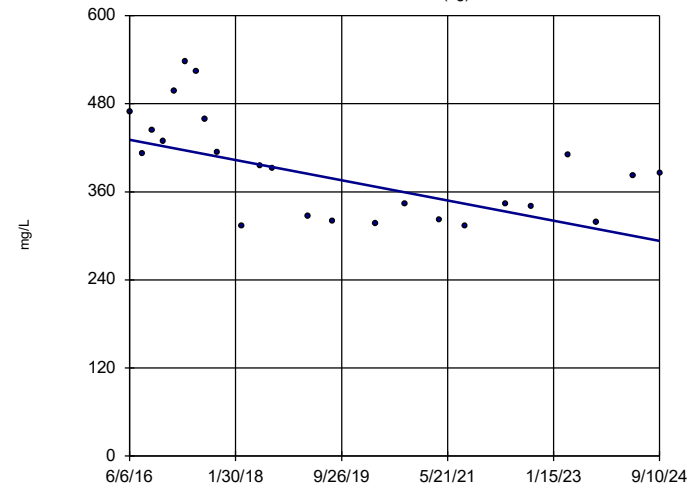


n = 23  
Slope = -49.91  
units per year.  
Mann-Kendall  
statistic = -176  
critical = -98  
Decreasing trend  
significant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Total Dissolved Solids Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-10 (bg)

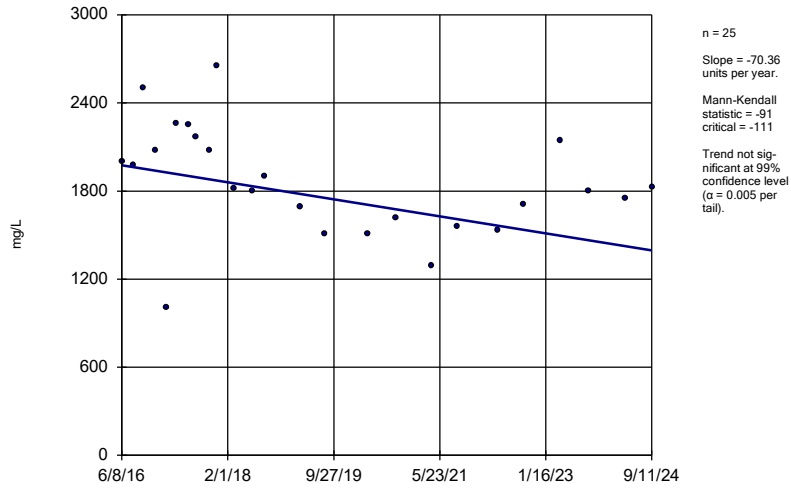


n = 24  
Slope = -16.65  
units per year.  
Mann-Kendall  
statistic = -116  
critical = -105  
Decreasing trend  
significant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Total Dissolved Solids Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

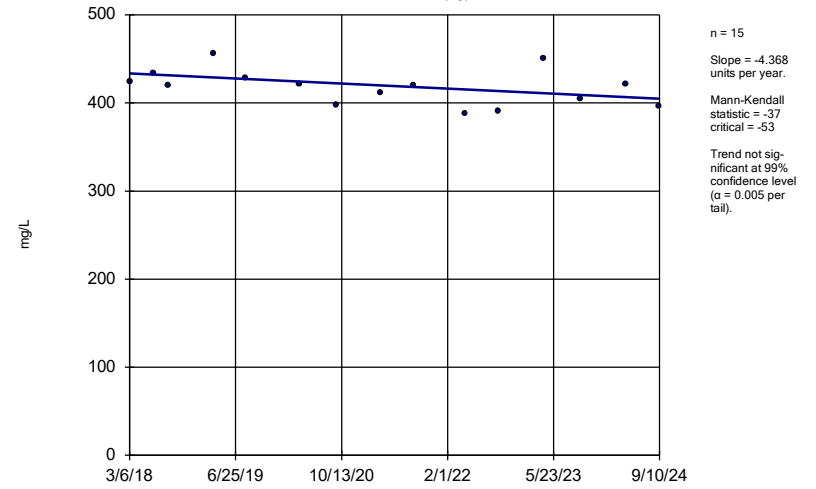
MW-14A



Constituent: Total Dissolved Solids Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

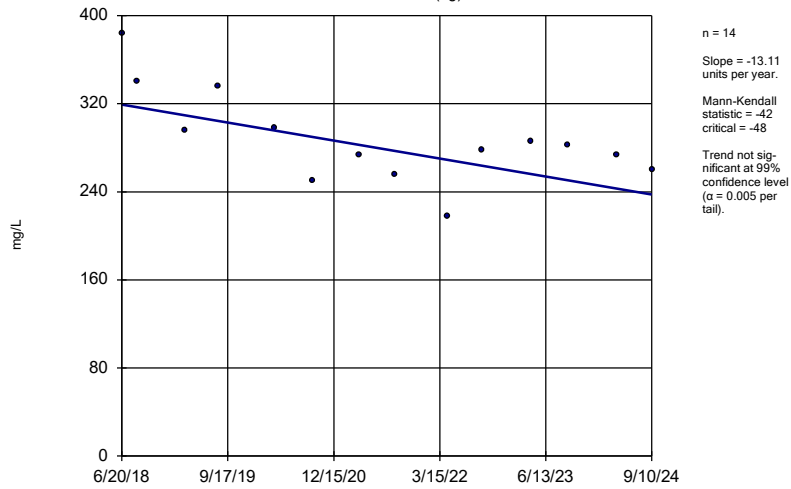
MW-22 (bg)



Constituent: Total Dissolved Solids Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Sen's Slope Estimator

MW-23 (bg)



Constituent: Total Dissolved Solids Analysis Run 12/11/2024 12:54 PM View: Federal Trend Tests  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

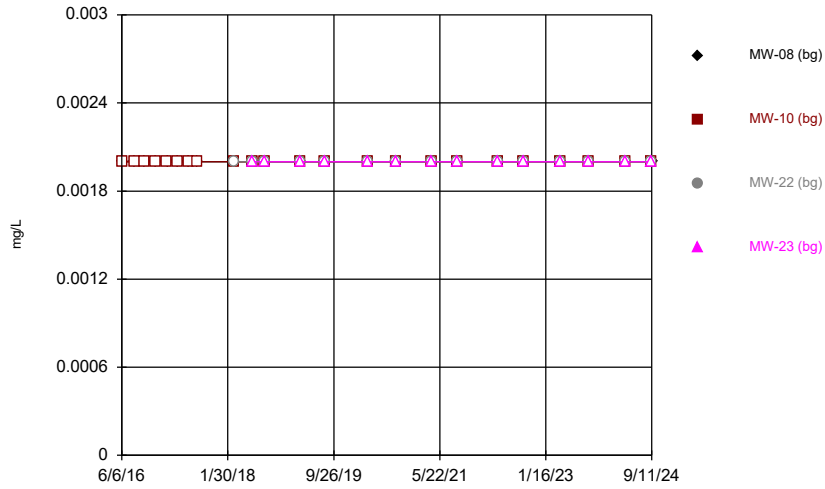
FIGURE G.

# Upper Tolerance Limits

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 12:58 PM

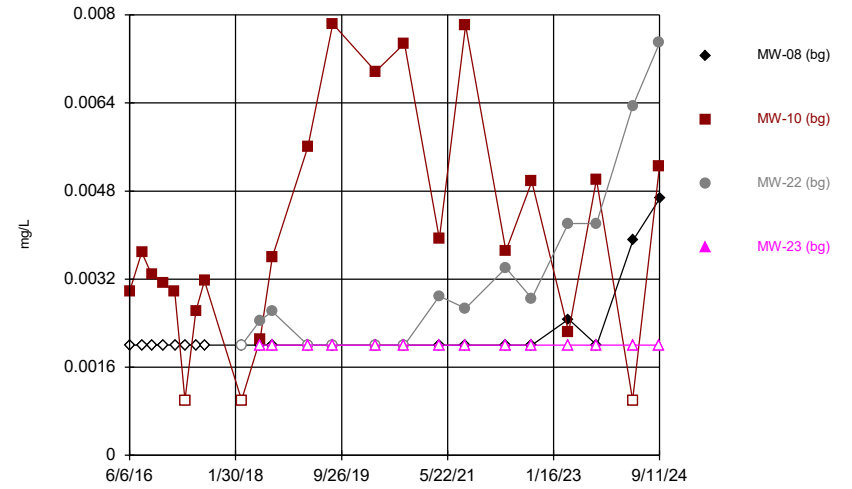
<u>Constituent</u>	<u>Upper Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony (mg/L)	0.002	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Arsenic (mg/L)	0.00784	n/a	n/a	n/a	75	56	n/a	0.02134	NP Inter(NDs)
Barium (mg/L)	0.271	n/a	n/a	n/a	75	0	n/a	0.02134	NP Inter(normality)
Beryllium (mg/L)	0.001	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Cadmium (mg/L)	0.0002	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Chromium (mg/L)	0.005	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Cobalt (mg/L)	0.00558	n/a	n/a	n/a	76	39.47	n/a	0.02028	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.48	n/a	n/a	n/a	61	0	n/a	0.04377	NP Inter(normality)
Fluoride (mg/L)	1	n/a	n/a	n/a	76	89.47	n/a	0.02028	NP Inter(NDs)
Lead (mg/L)	0.00204	n/a	n/a	n/a	75	90.67	n/a	0.02134	NP Inter(NDs)
Lithium (mg/L)	0.01	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Mercury (mg/L)	0.0002	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Molybdenum (mg/L)	0.00822	n/a	n/a	n/a	77	64.94	n/a	0.01926	NP Inter(NDs)
Selenium (mg/L)	0.005	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)
Thallium (mg/L)	0.001	n/a	n/a	n/a	75	100	n/a	0.02134	NP Inter(NDs)

Time Series



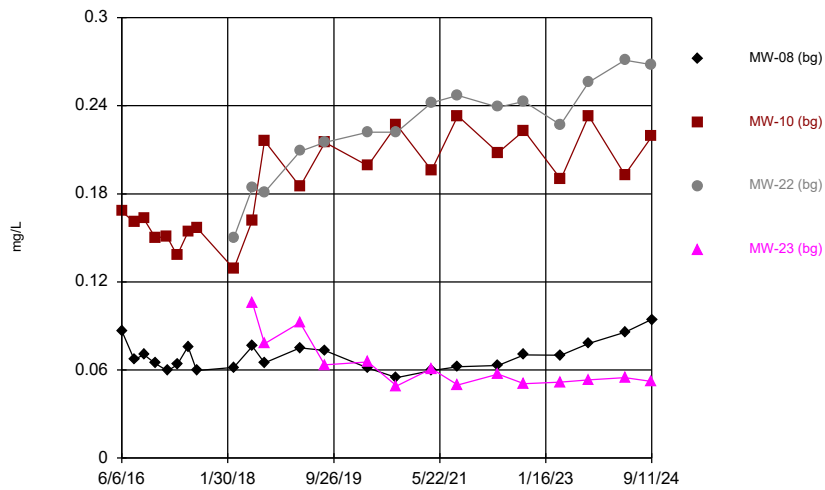
Constituent: Antimony Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



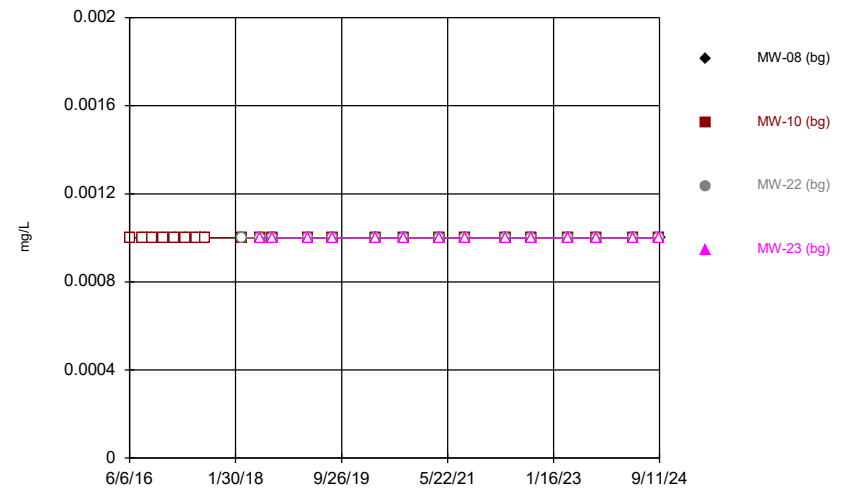
Constituent: Arsenic Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



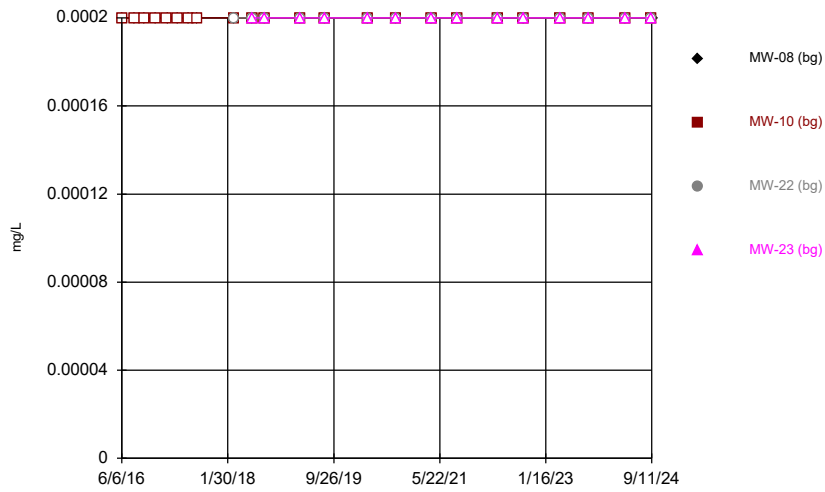
Constituent: Barium Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series

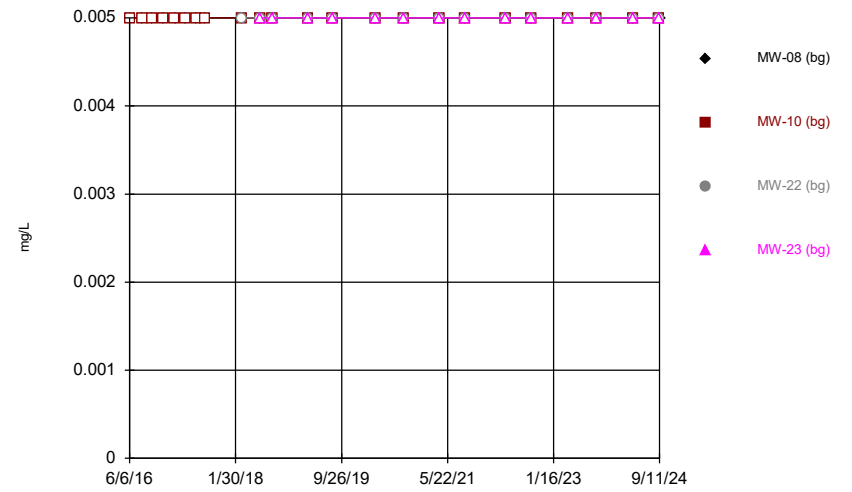


Constituent: Beryllium Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

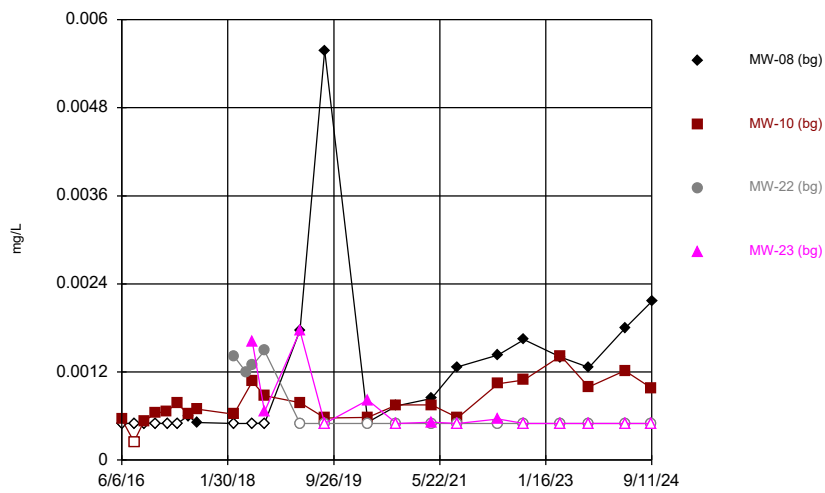
Time Series



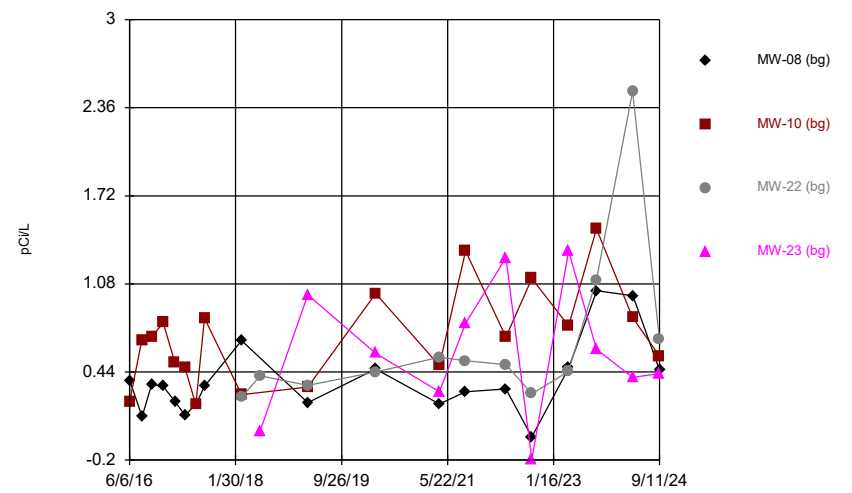
Time Series



Time Series

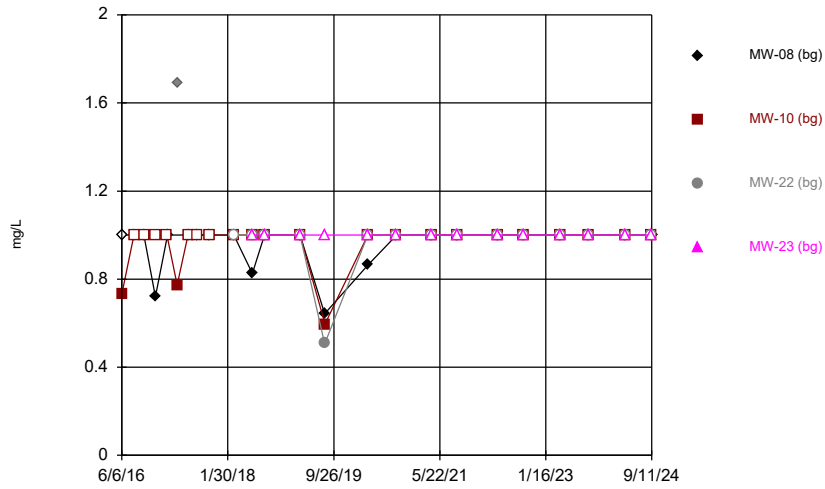


Time Series



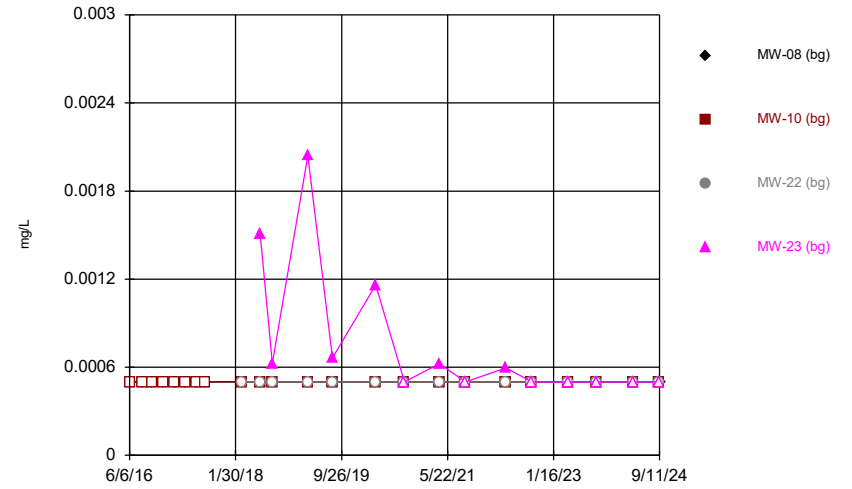


### Time Series



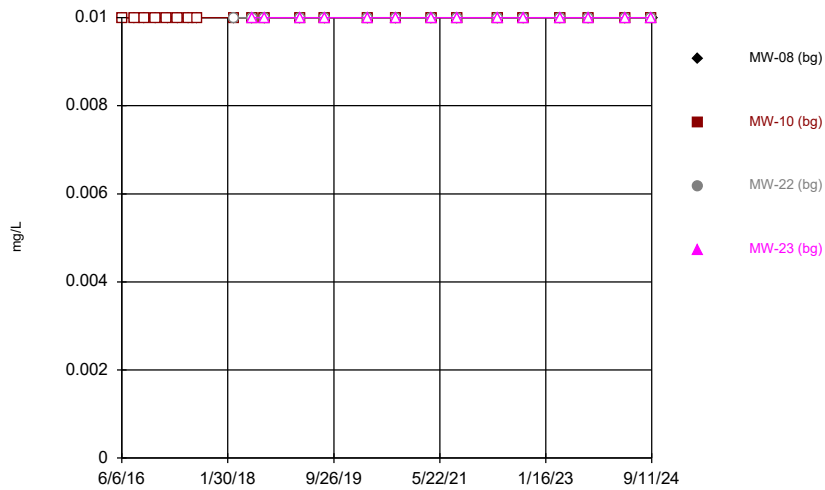
Constituent: Fluoride Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



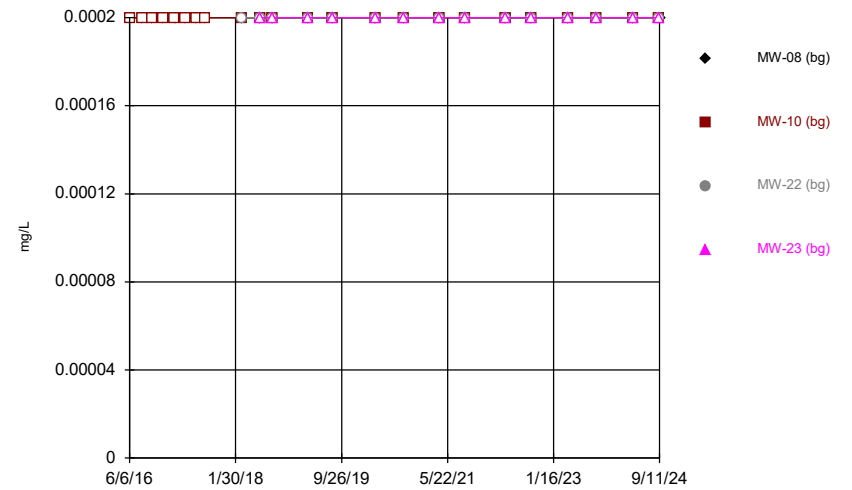
Constituent: Lead Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



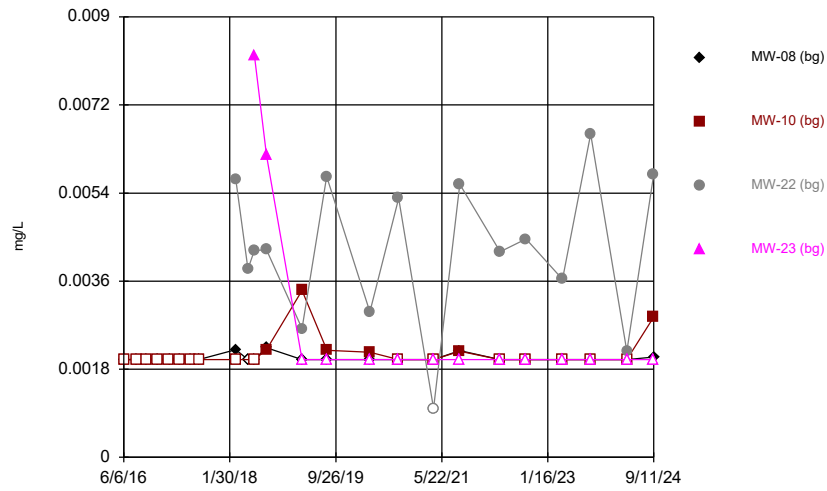
Constituent: Lithium Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Time Series



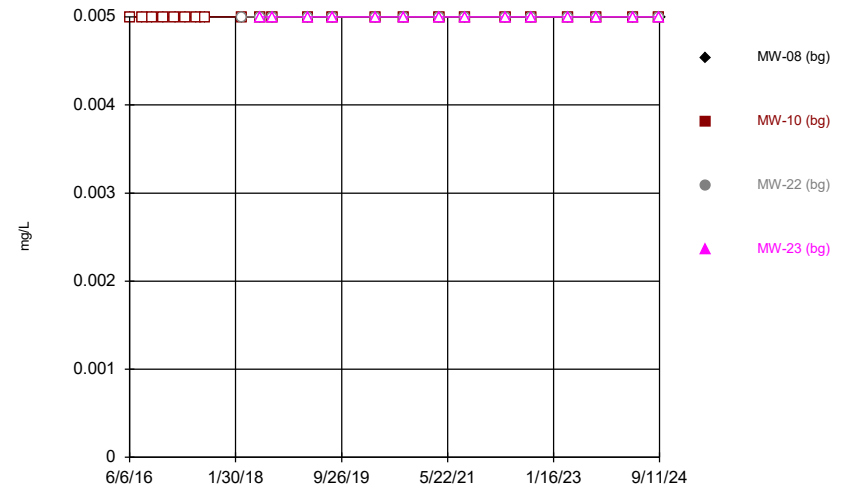
Constituent: Mercury Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



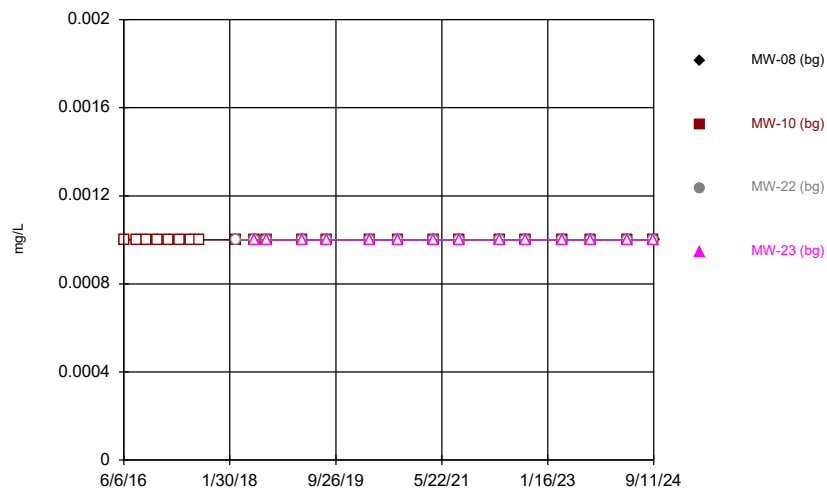
Constituent: Molybdenum Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



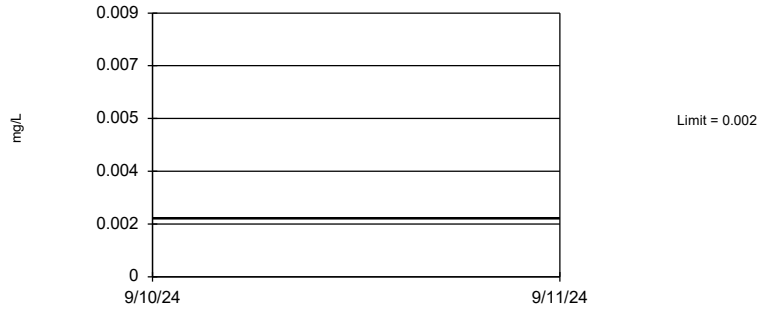
Constituent: Selenium Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

Time Series



Constituent: Thallium Analysis Run 12/11/2024 12:58 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

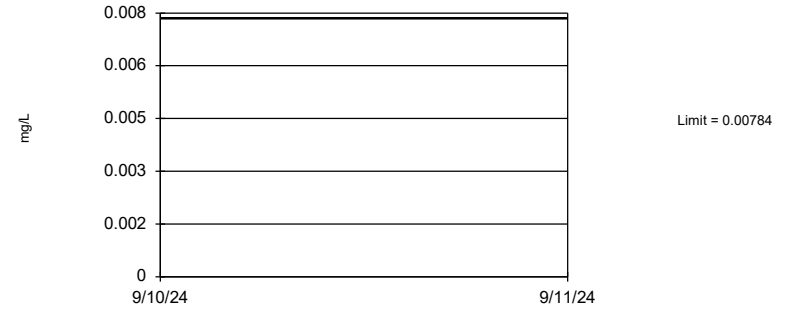
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Antimony Analysis Run 12/11/2024 12:56 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

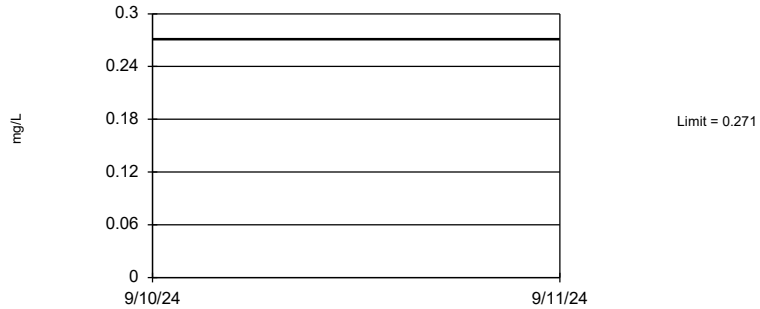
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 75 background values. 56% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Arsenic Analysis Run 12/11/2024 12:56 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

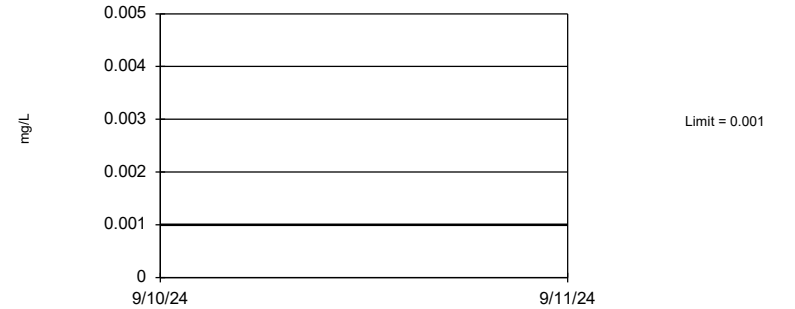
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 75 background values. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Barium Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

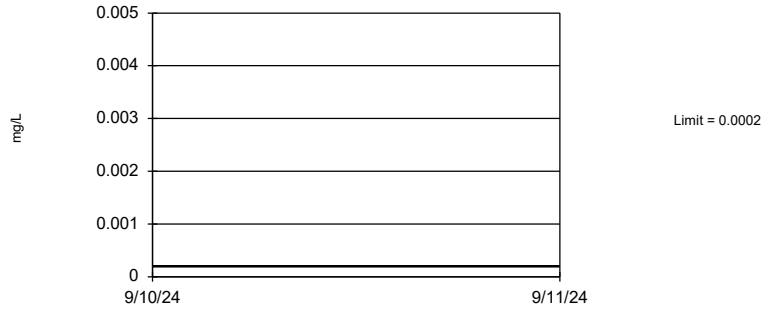
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Beryllium Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Cadmium Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

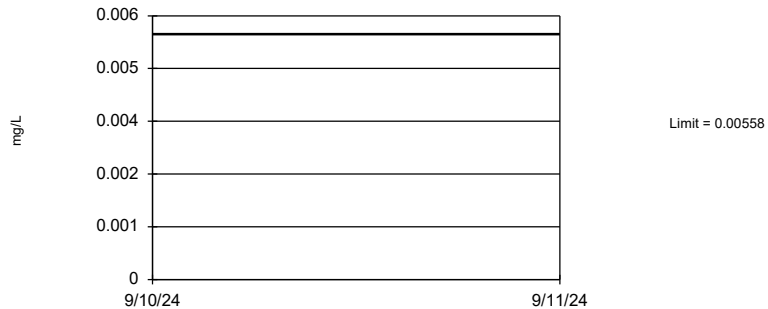
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Chromium Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 76 background values. 39.47% NDs. 93.95% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02028.

Constituent: Cobalt Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 61 background values. 92.77% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.04377.

Constituent: Combined Radium 226 + 228 Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Li  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

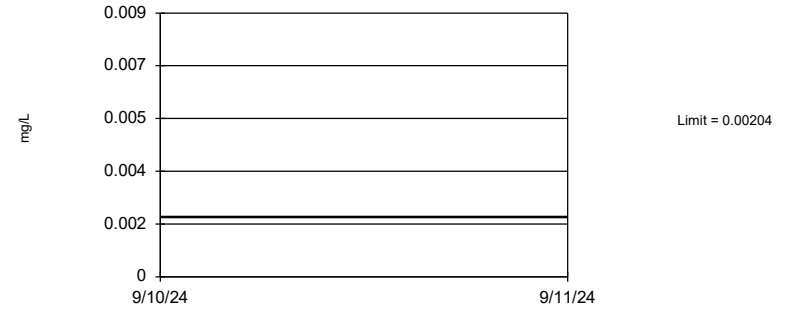
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 76 background values. 89.47% NDs. 93.95% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02028.

Constituent: Fluoride Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 75 background values. 90.67% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Lead Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

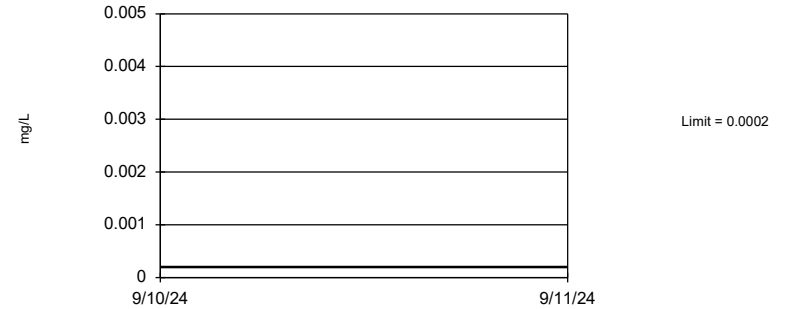
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Lithium Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

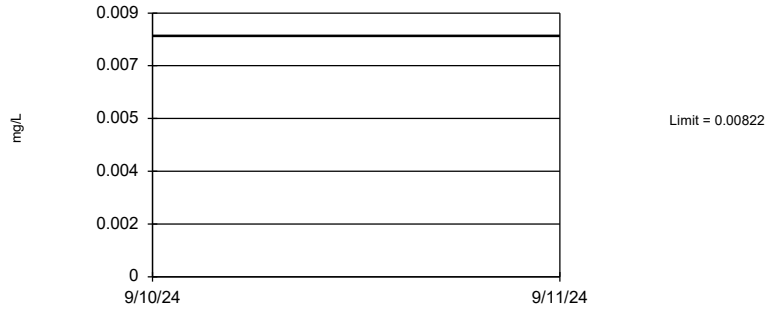
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Mercury Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 77 background values. 64.94% NDs. 94.34% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01926.

Constituent: Molybdenum Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Selenium Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. All background values were censored; limit is most recent reporting limit. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02134.

Constituent: Thallium Analysis Run 12/11/2024 12:57 PM View: Federal Tolerance Limits  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

FIGURE H.

<b>MUSCATINE POWER &amp; WATER GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR Rule-Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.002	0.006
Arsenic, Total (mg/L)	0.01		0.0078	0.01
Barium, Total (mg/L)	2		0.27	2
Beryllium, Total (mg/L)	0.004		0.001	0.004
Cadmium, Total (mg/L)	0.005		0.0002	0.005
Chromium, Total (mg/L)	0.1		0.005	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.0056	0.006
Combined Radium, Total (pCi/L)	5		2.48	5
Fluoride, Total (mg/L)	4		1	4
Lead, Total (mg/L)	0.015		0.002	0.015
Lithium, Total (mg/L)	n/a	0.04	0.01	0.04
Mercury, Total (mg/L)	0.002		0.0002	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0082	0.1
Selenium, Total (mg/L)	0.05		0.005	0.05
Thallium, Total (mg/L)	0.002		0.001	0.002

\*MCL = Maximum Contaminant Level

\*CCR = Coal Combustion Residual

\*GWPS = Groundwater Protection Standard



FIGURE I.

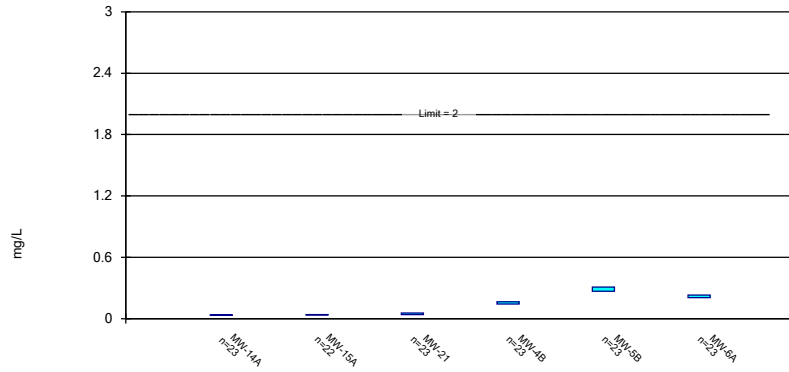
# Confidence Intervals - All Results (No Significant)

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water Printed 12/11/2024, 1:09 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Barium (mg/L)	MW-14A	0.03631	0.03215	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-15A	0.03965	0.03478	2	No	22	0	No	0.01	Param.
Barium (mg/L)	MW-21	0.05372	0.03963	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-4B	0.1656	0.1413	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-5B	0.308	0.2687	2	No	23	0	No	0.01	Param.
Barium (mg/L)	MW-6A	0.2286	0.2037	2	No	23	0	No	0.01	Param.
Cadmium (mg/L)	MW-4B	0.000285	0.0002	0.005	No	23	95.65	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-5B	0.000255	0.0002	0.005	No	23	95.65	No	0.01	NP (NDs)
Chromium (mg/L)	MW-21	0.006394	0.00558	0.1	No	23	21.74	No	0.01	Param.
Cobalt (mg/L)	MW-4B	0.00172	0.0005	0.006	No	23	56.52	No	0.01	NP (NDs)
Combined Radium 226 + 228 (pCi/L)	MW-14A	0.4974	0.1845	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-15A	0.3664	0.1299	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-21	0.4781	0.1778	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-4B	0.7811	0.4426	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-5B	1.09	0.7128	5	No	19	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-6A	0.7861	0.5038	5	No	19	0	No	0.01	Param.
Fluoride (mg/L)	MW-14A	1	0.867	4	No	23	91.3	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-15A	1	0.625	4	No	23	82.61	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-21	1	0.993	4	No	24	91.67	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-4B	1	0.801	4	No	24	83.33	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-5B	1.88	0.627	4	No	24	87.5	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-6A	1.89	0.814	4	No	24	79.17	No	0.01	NP (NDs)
Lead (mg/L)	MW-21	0.000633	0.0005	0.015	No	23	95.65	No	0.01	NP (NDs)
Lead (mg/L)	MW-4B	0.000532	0.0005	0.015	No	22	90.91	No	0.01	NP (NDs)
Lead (mg/L)	MW-5B	0.000627	0.0005	0.015	No	23	95.65	No	0.01	NP (NDs)
Lithium (mg/L)	MW-21	0.0205	0.01	0.04	No	23	43.48	No	0.01	NP (normality)
Mercury (mg/L)	MW-5B	0.000813	0.0002	0.002	No	23	95.65	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-21	0.00383	0.002	0.1	No	23	95.65	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-4B	0.00296	0.002	0.1	No	23	95.65	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-5B	0.00212	0.002	0.1	No	23	95.65	No	0.01	NP (NDs)
Selenium (mg/L)	MW-14A	0.00811	0.005	0.05	No	23	52.17	No	0.01	NP (NDs)
Selenium (mg/L)	MW-15A	0.00502	0.005	0.05	No	23	95.65	No	0.01	NP (NDs)
Selenium (mg/L)	MW-21	0.009469	0.006371	0.05	No	23	26.09	sqrt(x)	0.01	Param.
Thallium (mg/L)	MW-4B	0.00288	0.001	0.002	No	23	91.3	No	0.01	NP (NDs)
Thallium (mg/L)	MW-5B	0.00393	0.001	0.002	No	23	91.3	No	0.01	NP (NDs)

### Parametric Confidence Interval

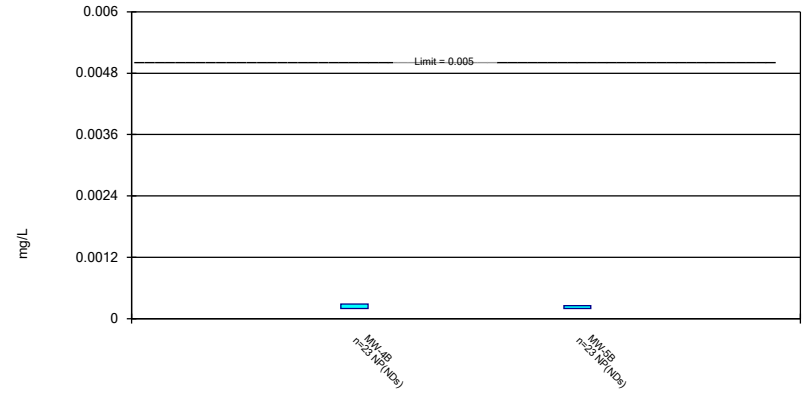
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

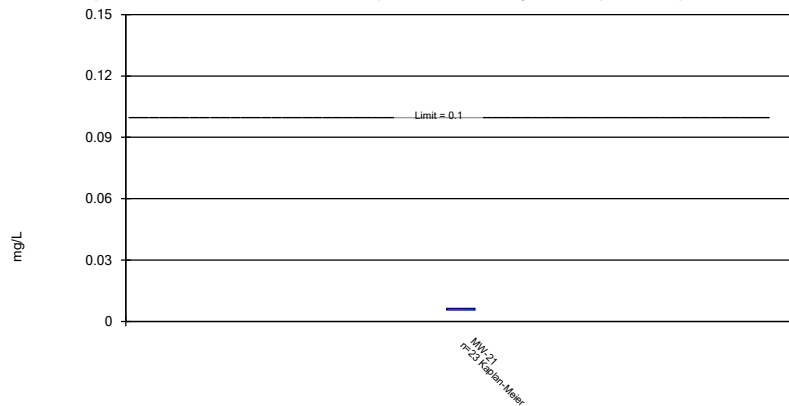
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Parametric Confidence Interval

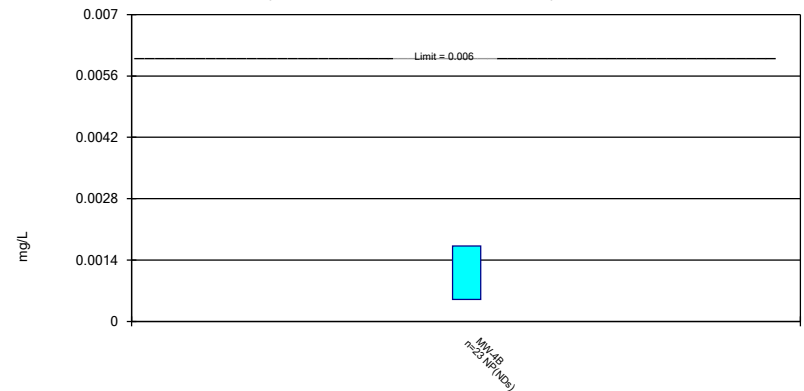
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

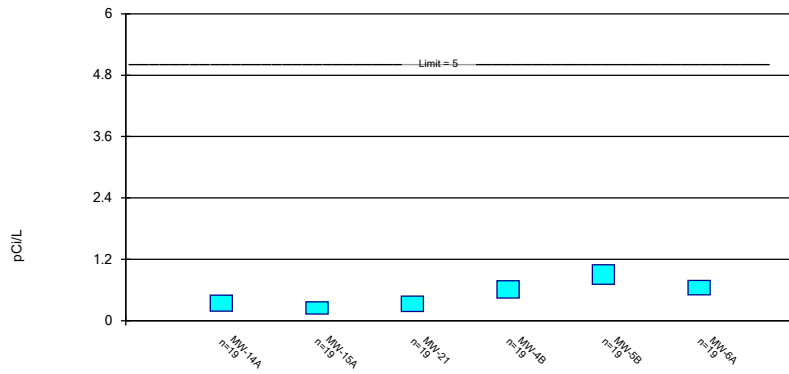
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cobalt Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Parametric Confidence Interval

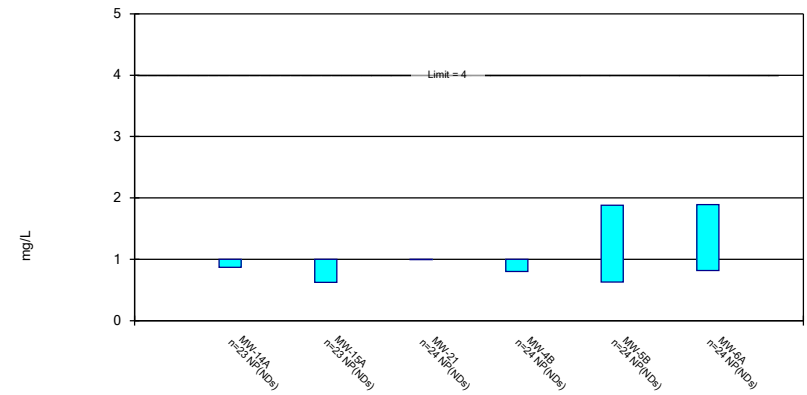
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 12/11/2024 1:08 PM View: Federal Confidence In Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

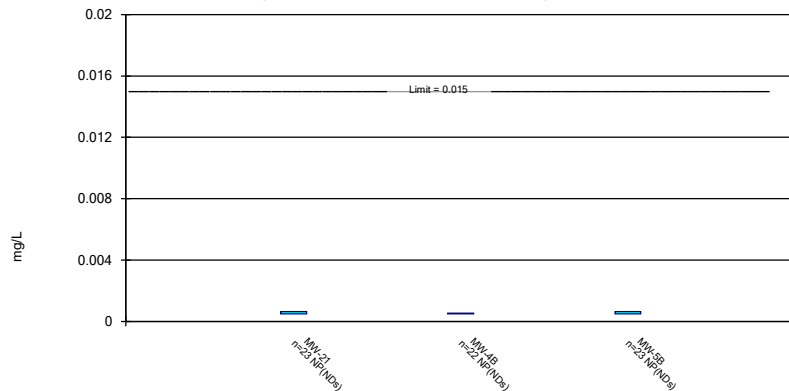
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

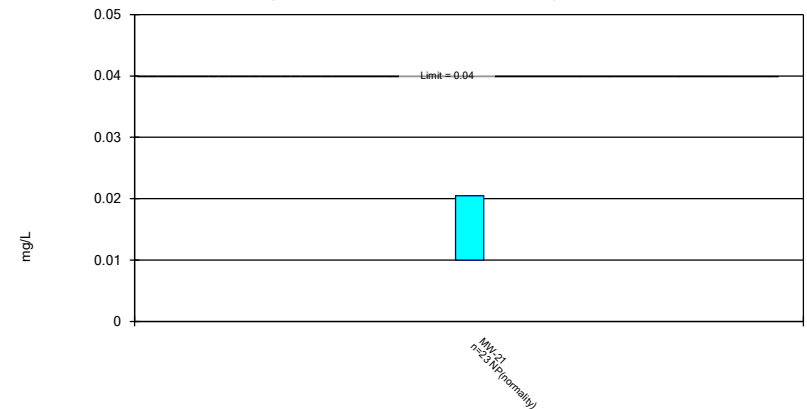
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

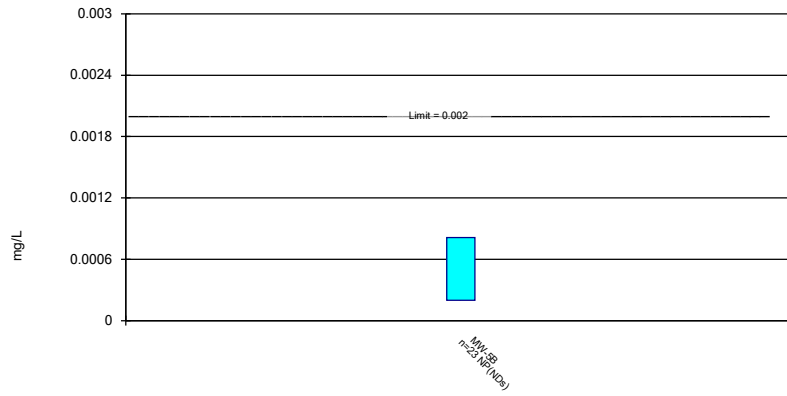
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lithium Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

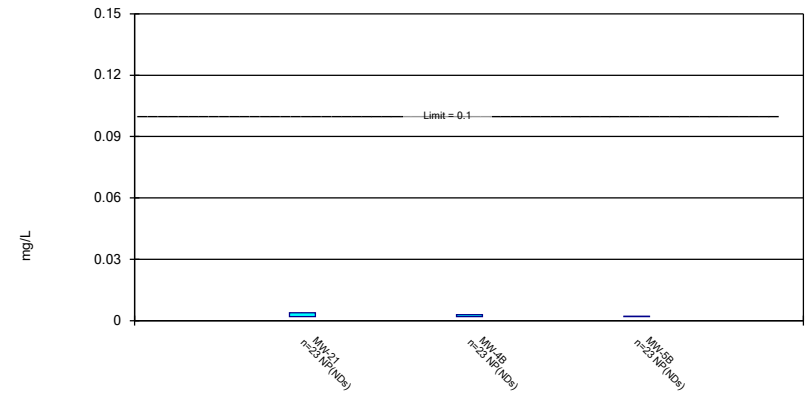
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

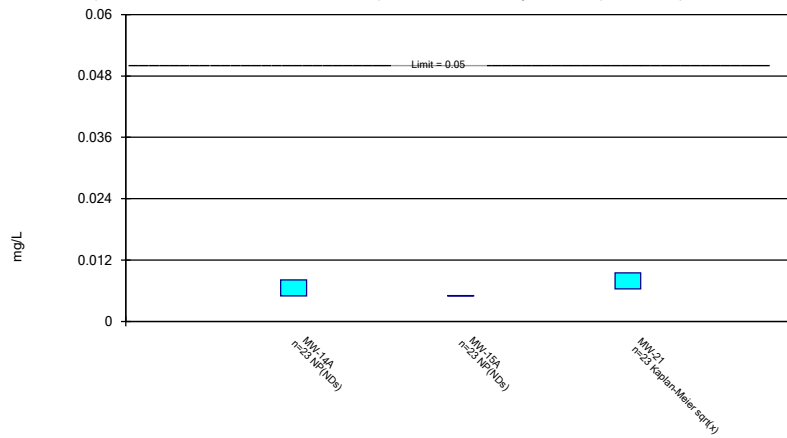
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Parametric and Non-Parametric (NP) Confidence Interval

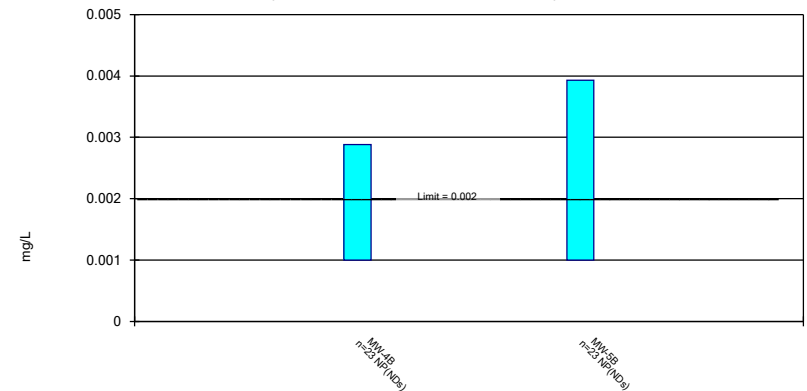
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

### Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium Analysis Run 12/11/2024 1:08 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

# Confidence Interval

Constituent: Barium (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-21	MW-4B	MW-5B	MW-6A
6/6/2016		2.13 (o)				
6/7/2016				0.15	0.331	0.209
6/8/2016	0.0443		0.0573			
8/15/2016	0.0402	0.044	0.0482			
8/16/2016				0.128	0.295	0.199
10/10/2016			0.0606			
10/11/2016	0.0391	0.0426		0.131	0.304	0.196
12/12/2016			0.056	0.139	0.315	0.216
12/14/2016	0.0383	0.0406				
2/17/2017	0.0306	0.0402		0.143		
2/21/2017			0.0735		0.316	0.197
4/17/2017	0.0341	0.0364		0.111	0.296	0.152
4/18/2017			0.0356			
6/20/2017			0.0461	0.133	0.31	
6/21/2017	0.0338	0.0327				0.197
8/7/2017				0.133		
8/8/2017	0.031	0.0338	0.0499		0.3	0.19
3/6/2018			0.0148	0.117	0.341	0.206
3/7/2018	0.0285	0.0352				
6/19/2018			0.0515			
6/20/2018	0.0314	0.0338				
6/21/2018				0.144	0.336	0.222
8/28/2018			0.0622	0.149		
8/29/2018	0.0344	0.0335			0.357	0.206
3/19/2019				0.161	0.326	0.2
3/20/2019	0.0328	0.037	0.0511			
8/7/2019	0.0398	0.047	0.0624	0.147	0.301	0.211
4/7/2020	0.0266	0.0389	0.0352	0.156	0.25	0.216
9/18/2020	0.0328	0.0416	0.0407	0.147	0.239	0.231
4/5/2021	0.0355	0.0365	0.0309	0.169	0.252	0.245
9/1/2021	0.0345	0.0355	0.0434	0.186	0.241	0.248
4/20/2022	0.0327	0.0443	0.036	0.191	0.258	0.249
9/14/2022	0.034	0.0327	0.0447	0.188	0.253	0.229
4/11/2023	0.032	0.0299	0.031			
4/12/2023				0.173	0.237	0.246
9/19/2023	0.0348	0.0338	0.0559			
9/20/2023				0.181	0.274	0.222
4/12/2024			0.031			
4/15/2024	0.0323	0.0353		0.168	0.243	0.235
9/10/2024			0.0555			
9/11/2024	0.0338	0.0335				
9/12/2024				0.184	0.258	0.249
Mean	0.03423	0.03722	0.04667	0.1534	0.2884	0.2161
Std. Dev.	0.003981	0.004536	0.01348	0.02325	0.03756	0.02382
Upper Lim.	0.03631	0.03965	0.05372	0.1656	0.308	0.2286
Lower Lim.	0.03215	0.03478	0.03963	0.1413	0.2687	0.2037

# Confidence Interval

Constituent: Cadmium (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-4B	MW-5B
6/7/2016	<0.0002	<0.0002
8/16/2016	<0.0002	<0.0002
10/11/2016	<0.0002	<0.0002
12/12/2016	<0.0002	<0.0002
2/17/2017	<0.0002	
2/21/2017		<0.0002
4/17/2017	<0.0002	<0.0002
6/20/2017	<0.0002	<0.0002
8/7/2017	<0.0002	
8/8/2017		<0.0002
3/6/2018	<0.0002	<0.0002
6/21/2018	<0.0002	<0.0002
8/28/2018	<0.0002	
8/29/2018		<0.0002
3/19/2019	<0.0002	<0.0002
8/7/2019	<0.0002	<0.0002
4/7/2020	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002
4/20/2022	<0.0002	<0.0002
9/14/2022	<0.0002	<0.0002
4/12/2023	<0.0002	<0.0002
9/20/2023	0.000285	0.000255
4/15/2024	<0.0002	<0.0002
9/12/2024	<0.0002	<0.0002
Mean	0.0002037	0.0002024
Std. Dev.	1.772E-05	1.147E-05
Upper Lim.	0.000285	0.000255
Lower Lim.	0.0002	0.0002

# Confidence Interval

Constituent: Chromium (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-21
6/8/2016	0.00694
8/15/2016	0.00538
10/10/2016	0.00582
12/12/2016	0.00561
2/21/2017	<0.005
4/18/2017	<0.005
6/20/2017	0.00586
8/8/2017	0.00572
3/6/2018	<0.005
6/19/2018	0.00726
8/28/2018	<0.005
3/20/2019	0.00647
8/7/2019	0.00637
4/7/2020	0.00644
9/18/2020	0.00589
4/5/2021	0.00708
9/1/2021	0.00659
4/20/2022	0.00636
9/14/2022	0.00505
4/11/2023	0.00577
9/19/2023	0.00752
4/12/2024	<0.005
9/10/2024	0.00657
Mean	0.005987
Std. Dev.	0.0007958
Upper Lim.	0.006394
Lower Lim.	0.00558



# Confidence Interval

Constituent: Cobalt (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-4B
6/7/2016	0.000681
8/16/2016	<0.0005
10/11/2016	<0.0005
12/12/2016	<0.0005
2/17/2017	<0.0005
4/17/2017	<0.0005
6/20/2017	<0.0005
8/7/2017	<0.0005
3/6/2018	<0.0005
6/21/2018	<0.0005
8/28/2018	<0.0005
3/19/2019	<0.0005
8/7/2019	<0.0005
4/7/2020	<0.0005
9/18/2020	0.00147
4/5/2021	0.00132
9/1/2021	0.00335
4/20/2022	0.00135
9/14/2022	0.00459
4/12/2023	0.00271
9/20/2023	0.00374
4/15/2024	0.00172
9/12/2024	0.0028
Mean	0.001314
Std. Dev.	0.001245
Upper Lim.	0.00172
Lower Lim.	0.0005

# Confidence Interval

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-21	MW-4B	MW-5B	MW-6A
6/6/2016		0.31 (U)				
6/7/2016				0.711 (U)	0.665	0.405
6/8/2016	0.145 (U)		0.253 (U)			
8/15/2016	0.202 (U)	0.251 (U)	0.159 (U)			
8/16/2016				0.938 (U)	0.854	0.876
10/10/2016			0.817			
10/11/2016	0.523	0.286 (U)		0.674	0.428 (U)	0.512
12/12/2016			0.306 (U)	0.672	1.05	0.894
12/14/2016	0.26 (U)	0.251 (U)				
2/17/2017	0.293 (U)	0.103 (U)		0.528		
2/21/2017			-0.000573 (U)		0.85	0.314 (U)
4/17/2017	0.48	0.0966 (U)		0.309 (U)	1.02	0.298 (U)
4/18/2017			0.0953 (U)			
6/20/2017			0.545	0.368	0.973	
6/21/2017	0.0131 (U)	0.221 (U)				0.44
8/7/2017				0.443		
8/8/2017	0.456	0.244 (U)	0.814		0.507	0.333 (U)
3/6/2018			0.358	0.45	0.959	0.618
3/7/2018	0.258 (U)	0.123 (U)				
3/19/2019				0.436	0.568	0.481
3/20/2019	0.0223 (U)	0.391 (U)	0.287 (U)			
4/7/2020	0.397 (U)	0.645	0.305 (U)	0.354 (U)	1.2	0.787
4/5/2021	0.614	0.219 (U)	0.182 (U)	0.0519 (U)	0.982	0.667
9/1/2021	0.684	0.362 (U)	0.499	1.08	1.29	1.12
4/20/2022	0.0486 (U)	0.0289 (U)	0.171 (U)	0.55 (U)	0.913	0.901
9/14/2022	0.0843 (U)	-0.159 (U)	-0.0783 (U)	0.836	0.363 (U)	0.599
4/11/2023	0.0651 (U)	0.727	0.678			
4/12/2023				0.687	0.556	0.695
9/19/2023	0.57	0.118 (U)	0.497 (U)			
9/20/2023				0.575 (U)	1.15	0.916
4/12/2024			0.0684 (U)			
4/15/2024	1.02	0.157 (U)		0.663	1.23	0.522
9/10/2024			0.275 (U)			
9/11/2024	0.343 (U)	0.34 (U)				
9/12/2024				1.3	1.57	0.876
Mean	0.341	0.2481	0.3279	0.6119	0.9015	0.6449
Std. Dev.	0.2671	0.202	0.2565	0.2891	0.3222	0.2411
Upper Lim.	0.4974	0.3664	0.4781	0.7811	1.09	0.7861
Lower Lim.	0.1845	0.1299	0.1778	0.4426	0.7128	0.5038

# Confidence Interval

Constituent: Fluoride (mg/L)    Analysis Run 12/11/2024 1:09 PM    View: Federal Confidence Intervals  
 Muscatine Power & Water    Client: GHD    Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-21	MW-4B	MW-5B	MW-6A
6/6/2016		<1				
6/7/2016				<1	<1	<1
6/8/2016	<1		<1			
8/15/2016	<1	0.549	<1			
8/16/2016				<1	<1	<1
10/10/2016			<1			
10/11/2016	0.867	<1		<1	<1	<1
12/12/2016			<1	<1	1.88	2.02
12/14/2016	<1	<1				
2/17/2017	<1	<1		0.664		
2/21/2017			0.993		2.14	1.89
4/17/2017	1.93 (o)	6.7 (o)		0.801	0.627	0.814
4/18/2017			0.768			
6/20/2017			<1	<1	<1	
6/21/2017	<1	<1				<1
8/7/2017				<1		
8/8/2017	<1	<1	<1		<1	<1
10/16/2017			<1	<1		
10/17/2017	<1	<1			<1	<1
3/6/2018			<1	<1	<1	<1
3/7/2018	<1	<1				
6/19/2018			<1			
6/20/2018	0.684	<1				
6/21/2018				<1	<1	<1
8/28/2018			<1	<1		
8/29/2018	<1	<1			<1	<1
3/19/2019				0.771	<1	<1
3/20/2019	<1	0.523	<1			
8/7/2019	<1	0.625	<1	0.525	<1	0.535
4/7/2020	<1	<1	<1	<1	<1	0.652
9/18/2020	<1	<1	<1	<1	<1	<1
4/5/2021	<1	0.516	<1	<1	<1	<1
9/1/2021	<1	<1	<1	<1	<1	<1
4/20/2022	<1	<1	<1	<1	<1	<1
9/14/2022	<1	<1	<1	<1	<1	<1
4/11/2023	<1	<1	<1			
4/12/2023				<1	<1	<1
9/19/2023	<1	<1	<1			
9/20/2023				<1	<1	<1
4/12/2024			<1			
4/15/2024	<1	<1		<1	<1	<1
9/10/2024			<1			
9/11/2024	<1	<1				
9/12/2024				<1	<1	<1
Mean	0.9805	0.9223	0.99	0.9484	1.069	1.038
Std. Dev.	0.07032	0.1741	0.04732	0.1263	0.3022	0.3071
Upper Lim.	1	1	1	1	1.88	1.89
Lower Lim.	0.867	0.625	0.993	0.801	0.627	0.814

# Confidence Interval

Constituent: Lead (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-21	MW-4B	MW-5B
6/7/2016		0.00147 (o)	<0.0005
6/8/2016	<0.0005		
8/15/2016	<0.0005		
8/16/2016		<0.0005	<0.0005
10/10/2016	<0.0005		
10/11/2016		<0.0005	<0.0005
12/12/2016	<0.0005	<0.0005	<0.0005
2/17/2017		<0.0005	
2/21/2017	<0.0005		<0.0005
4/17/2017		<0.0005	<0.0005
4/18/2017	<0.0005		
6/20/2017	<0.0005	<0.0005	<0.0005
8/7/2017		<0.0005	
8/8/2017	<0.0005		<0.0005
3/6/2018	<0.0005	<0.0005	<0.0005
6/19/2018	0.000633		
6/21/2018		<0.0005	<0.0005
8/28/2018	<0.0005	<0.0005	
8/29/2018			<0.0005
3/19/2019		<0.0005	<0.0005
3/20/2019	<0.0005		
8/7/2019	<0.0005	<0.0005	<0.0005
4/7/2020	<0.0005	<0.0005	<0.0005
9/18/2020	<0.0005	0.000532	<0.0005
4/5/2021	<0.0005	<0.0005	<0.0005
9/1/2021	<0.0005	<0.0005	<0.0005
4/20/2022	<0.0005	<0.0005	<0.0005
9/14/2022	<0.0005	<0.0005	<0.0005
4/11/2023	<0.0005		
4/12/2023		<0.0005	<0.0005
9/19/2023	<0.0005		
9/20/2023		0.000576	0.000627
4/12/2024	<0.0005		
4/15/2024		<0.0005	<0.0005
9/10/2024	<0.0005		
9/12/2024		<0.0005	<0.0005
Mean	0.0005058	0.0005049	0.0005055
Std. Dev.	2.773E-05	1.728E-05	2.648E-05
Upper Lim.	0.000633	0.000532	0.000627
Lower Lim.	0.0005	0.0005	0.0005

# Confidence Interval

Constituent: Lithium (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-21
6/8/2016	<0.01
8/15/2016	<0.01
10/10/2016	<0.01
12/12/2016	<0.01
2/21/2017	<0.01
4/18/2017	<0.01
6/20/2017	<0.01
8/8/2017	<0.01
3/6/2018	<0.01
6/19/2018	0.0189
8/28/2018	<0.01
3/20/2019	0.0277
8/7/2019	0.0279
4/7/2020	0.0213
9/18/2020	0.0225
4/5/2021	0.0198
9/1/2021	0.0233
4/20/2022	0.0162
9/14/2022	0.018
4/11/2023	0.0143
9/19/2023	0.0205
4/12/2024	0.0124
9/10/2024	0.0194
Mean	0.01575
Std. Dev.	0.006162
Upper Lim.	0.0205
Lower Lim.	0.01

# Confidence Interval

Constituent: Mercury (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals  
Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

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	MW-5B
6/7/2016	<0.0002
8/16/2016	<0.0002
10/11/2016	<0.0002
12/12/2016	<0.0002
2/21/2017	<0.0002
4/17/2017	<0.0002
6/20/2017	<0.0002
8/8/2017	<0.0002
3/6/2018	<0.0002
6/21/2018	<0.0002
8/29/2018	<0.0002
3/19/2019	<0.0002
8/7/2019	<0.0002
4/7/2020	<0.0002
9/18/2020	<0.0002
4/5/2021	<0.0002
9/1/2021	<0.0002
4/20/2022	<0.0002
9/14/2022	0.000813
4/12/2023	<0.0002
9/20/2023	<0.0002
4/15/2024	<0.0002
9/12/2024	<0.0002
Mean	0.0002267
Std. Dev.	0.0001278
Upper Lim.	0.000813
Lower Lim.	0.0002

# Confidence Interval

Constituent: Molybdenum (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-21	MW-4B	MW-5B
6/7/2016		<0.002	<0.002
6/8/2016	<0.002		
8/15/2016	<0.002		
8/16/2016		<0.002	<0.002
10/10/2016	<0.002		
10/11/2016		<0.002	<0.002
12/12/2016	<0.002	<0.002	<0.002
2/17/2017		<0.002	
2/21/2017	<0.002		<0.002
4/17/2017		<0.002	<0.002
4/18/2017	<0.002		
6/20/2017	<0.002	<0.002	<0.002
8/7/2017		<0.002	
8/8/2017	<0.002		<0.002
3/6/2018	<0.002	<0.002	<0.002
6/19/2018	0.00383		
6/21/2018		<0.002	<0.002
8/28/2018	<0.002	<0.002	
8/29/2018			<0.002
3/19/2019		<0.002	0.00212
3/20/2019	<0.002		
8/7/2019	<0.002	<0.002	<0.002
4/7/2020	<0.002	<0.002	<0.002
9/18/2020	<0.002	0.00296	<0.002
4/5/2021	<0.002	<0.002	<0.002
9/1/2021	<0.002	<0.002	<0.002
4/20/2022	<0.002	<0.002	<0.002
9/14/2022	<0.002	<0.002	<0.002
4/11/2023	<0.002		
4/12/2023		<0.002	<0.002
9/19/2023	<0.002		
9/20/2023		<0.002	<0.002
4/12/2024	<0.002		
4/15/2024		<0.002	<0.002
9/10/2024	<0.002		
9/12/2024		<0.002	<0.002
Mean	0.00208	0.002042	0.002005
Std. Dev.	0.0003816	0.0002002	2.502E-05
Upper Lim.	0.00383	0.00296	0.00212
Lower Lim.	0.002	0.002	0.002

# Confidence Interval

Constituent: Selenium (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-21
6/6/2016		<0.005	
6/8/2016	0.0071		0.0165
8/15/2016	0.00811	<0.005	0.0103
10/10/2016			0.0137
10/11/2016	0.00821	<0.005	
12/12/2016			0.0119
12/14/2016	0.00834	<0.005	
2/17/2017	0.00752	<0.005	
2/21/2017			0.0074
4/17/2017	0.00823	<0.005	
4/18/2017			0.00674
6/20/2017			0.0106
6/21/2017	0.00829	<0.005	
8/8/2017	0.00759	<0.005	0.0109
3/6/2018			<0.005
3/7/2018	<0.005	0.00502	
6/19/2018			0.00939
6/20/2018	0.00739	<0.005	
8/28/2018			<0.005
8/29/2018	0.00827	<0.005	
3/20/2019	0.00569	<0.005	0.0102
8/7/2019	<0.005	<0.005	0.0108
4/7/2020	<0.005	<0.005	0.00632
9/18/2020	<0.005	<0.005	0.00762
4/5/2021	<0.005	<0.005	<0.005
9/1/2021	<0.005	<0.005	0.00617
4/20/2022	<0.005	<0.005	0.00634
9/14/2022	<0.005	<0.005	<0.005
4/11/2023	<0.005	<0.005	<0.005
9/19/2023	<0.005	<0.005	0.0053
4/12/2024			<0.005
4/15/2024	<0.005	<0.005	
9/10/2024			0.00666
9/11/2024	<0.005	<0.005	
Mean	0.006293	0.005001	0.008123
Std. Dev.	0.001481	4.17E-06	0.003225
Upper Lim.	0.00811	0.00502	0.009469
Lower Lim.	0.005	0.005	0.006371



# Confidence Interval

Constituent: Thallium (mg/L) Analysis Run 12/11/2024 1:09 PM View: Federal Confidence Intervals

Muscatine Power & Water Client: GHD Data: Muscatine Power & Water

	MW-4B	MW-5B
6/7/2016	<0.001	<0.001
8/16/2016	<0.001	<0.001
10/11/2016	<0.001	<0.001
12/12/2016	<0.001	<0.001
2/17/2017	<0.001	
2/21/2017		<0.001
4/17/2017	<0.001	<0.001
6/20/2017	<0.001	<0.001
8/7/2017	<0.001	
8/8/2017		<0.001
3/6/2018	<0.001	<0.001
6/21/2018	<0.001	<0.001
8/28/2018	<0.001	
8/29/2018		<0.001
3/19/2019	<0.001	<0.001
8/7/2019	<0.001	<0.001
4/7/2020	<0.001	<0.001
9/18/2020	<0.001	<0.001
4/5/2021	<0.001	<0.001
9/1/2021	<0.001	<0.001
4/20/2022	<0.001	<0.001
9/14/2022	<0.001	<0.001
4/12/2023	0.00288	0.00393
9/20/2023	0.003	0.00442
4/15/2024	<0.001	<0.001
9/12/2024	<0.001	<0.001
Mean	0.001169	0.001276
Std. Dev.	0.0005592	0.0009177
Upper Lim.	0.00288	0.00393
Lower Lim.	0.001	0.001

# **Appendix D**

**Current and Historical Analytical Results**

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18
MW-4A/MW-4B Downgradient														
<b>Appendix III Parameters:</b>														
Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2		0.66	< .2	< .2
Calcium	mg/L	98.1	88.8	89.3	94.5	86.8	85.9	88.7	89.7	85.3		95.8	91.4	91.3
Chloride	mg/L	12.6	13.2	13.6	13.5	15.1	12.5	13.2	13.2	14.7		8.81	15.3	19.4
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.664	0.801	< .5	< .5	< .5		< .5	< .5	< .5
pH	SU	8.9	7.3	7.38		7.42	7.33	8.16	6.53	7.49		7.36	7.53	7.44
Sulfate	mg/L	32.2	28.4	27.2	32.7	36	39.5	33	35.3	45.4		162	51.3	52.2
Total Dissolved Solids	mg/L	507	426	450	450	460	442	452	420	466		586	440	420
<b>Appendix IV Parameters:</b>														
Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .0002	< .002
Barium	mg/L	0.15	0.128	0.131	0.139	0.143	0.111	0.133	0.133			0.117	0.144	0.149
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Cobalt	mg/L	< .000681	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.664	0.801	< .5	< .5			< .5	< .5	< .5
Lead	mg/L	< .00147	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05		< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002		< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	M .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Radium-226	mg/L	0.54	0.326	0.285	0.585	0.215	0.0818	0.177	0.255			0.111		
Radium-228	mg/L	0.171	0.612	0.388	0.0872	0.313	0.227	0.192	0.188			0.339		
Combined Radium 226 + 228	mg/L	0.711	0.938	0.674	0.672	0.528	0.309	0.368	0.443			0.45		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		March-19	August-19	April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23	April-24	September-24
MW-4A/MW-4B Downgradient													
<b>Appendix III Parameters:</b>													
Boron	mg/L	< .2	< .2	< .2	< .1	< .1	< .1	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Calcium	mg/L	99.7	93.8	89.6	89	94.1	95.1	106	92.3	91.3	90.4	97.7	102
Chloride	mg/L	16	15.6	14.8	15.1	22.9	16.7	20.8	16.8	18	17.4	18.1	14.6
Fluoride	mg/L	0.771	0.525	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
pH	SU	7.26	7.22	7.46	7.93	7.49	7.75	7.04	7.52	7.23	7.03	7.6	7.5
Sulfate	mg/L	48	47	41.5	46.9	60.1	50.2	58.4	49.5	54	53.1	56.1	65.8
Total Dissolved Solids	mg/L	398	422	366	360	380	370	370	358	396	364	392	410
<b>Appendix IV Parameters:</b>													
Antimony	mg/L	< .001	< .001	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Barium	mg/L	0.161	0.147	0.156	0.147	0.169	0.186	0.191	0.188	0.173	0.181	0.168	0.184
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0005	< .0005	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	0.000285	<0.000200	<0.000200
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	< .0005	< .0005	< .0005	0.00147	0.00132	0.00335	0.00135	0.00459	0.00271	0.00374	0.00172	0.0028
Fluoride	mg/L	0.771	0.525	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	0.000532	< .0005	< .0005	<0.000500	<0.000500	<0.000500	0.000576	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	< .002	< .002	< .002	0.00296	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	<0.00100	<0.00100	0.00288	0.003	<0.00100	<0.00100
Radium-226	mg/L	0.218		0.13		0.101 U	0.19 U	0.0562 U	0.0958 U	0.154 U	0.109 U	0.242	0.166
Radium-228	mg/L	<.218		0.224		-0.049 U	0.895	0.494 U	0.740 U	0.534 U	0.466 U	0.421 U	1.13
Combined Radium 226 + 228	mg/L	0.436		0.354		0.0519 U	1.08	0.550 U	0.836	0.687	0.575 U	0.663	1.3

<b>Muscatine Power &amp; Water CCR Landfill</b> <b>Federal Parameters</b> <b>Job # 10100095</b>  <b>MW-5B</b> <b>Downgradient</b>	June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	March-19	August-19
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**Appendix III Parameters:**

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	
Calcium	mg/L	147	< .0005	140	147	126	130	140	139	136	134	147	146	134	139	
Chloride	mg/L	67	65.9	66	67	70.4	62.1	63.4	64	73	67.8	68.2	65	70.8	55	64.1
Fluoride	mg/L	< .5	< .5	< .5	1.88	2.14	0.627	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5	
pH	SU	8.49	7.08	7.1		6.05	7	7.89	6.95	7.08	7	7.23	7.3	7.14	7.05	7.02
Sulfate	mg/L	109	109	105	109	111	108	108	114	135		122	119	120	85	112
Total Dissolved Solids	mg/L	920	672	646	636	684	680	656	734	688		620	828	622	562	596

**Appendix IV Parameters:**

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	
Barium	mg/L	0.331	0.295	0.304	0.315	0.316	0.296	0.31	0.300			0.341	0.336	0.357	0.326	0.301
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	1.88	2.14	0.627	< .5	< .5			< .5	< .5	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .01	< .01	< .0005	< .0005	< .0005
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	0.00212	< .002
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.365	0.449	0.598	0.509	0.464	0.357	0.433	0.213			0.349			0.196	
Radium-228	mg/L	0.3	0.405	-0.169	0.541	0.386	0.664	0.54	0.294			0.61			0.372	
Combined Radium 226 + 228	mg/L	0.665	0.854	0.428	1.05	0.85	1.02	0.973	0.507			0.959			0.568	

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23	April-24	September-24
MW-5B Downgradient											
<b>Appendix III Parameters:</b>											
Boron	mg/L	< .2	< .1	< .1	< .1	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Calcium	mg/L	117	108	104	108	117	117	107	115	112	123
Chloride	mg/L	44	41	42.7	37.6	38.1	39	38.7	41.8	39.3	40.5
Fluoride	mg/L	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
pH	SU	7.24	7.33	7.31	7.22	7.37	7.37	6.96	6.42	7.4	7.3
Sulfate	mg/L	58.9	61.9	57.4	53.7	44.7	49.9	45.8	53.4	46.3	50.4
Total Dissolved Solids	mg/L	494	436	434	448	428	484	478	476	450	520
<b>Appendix IV Parameters:</b>											
Antimony	mg/L	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Barium	mg/L	0.25	0.239	0.252	0.241	0.258	0.253	0.237	0.274	0.243	0.258
Beryllium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	0.000255	<0.000200	<0.000200
Chromium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Fluoride	mg/L	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	0.000627	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	<0.000200	0.000813	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	0.00393	0.00442	<0.00100	<0.00100
Radium-226	mg/L	0.293		0.231	0.257 U	0.195	0.274	0.229	0.374	0.300 U	0.264
Radium-228	mg/L	0.908		0.751	1.03	0.718	0.0895 U	0.327 U	0.775	0.925	1.31
Combined Radium 226 + 228	mg/L	1.2		0.982	1.29	0.913	0.363 U	0.556	1.15	1.23	1.57

<b>Muscatine Power &amp; Water CCR Landfill</b> <b>Federal Parameters</b> <b>Job # 10100095</b>  <b>MW-6A</b> <b>Downgradient</b>	June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	March-19	August-19
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**Appendix III Parameters:**

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium	mg/L	81.4	75.4	75.7	85.6	68.8	56.3	72.9	71.2	71.9	74.1	80.1	73.3	73.2	80.9
Chloride	mg/L	5.97	< 5	< 5	9.08	9.93	< 5	< 5	< 5	< 5	5.33	< 5	< 5	< 5	< 5
Fluoride	mg/L	< .5	< .5	< .5	2.02	1.89	0.814	< .5	< .5	< .5	< .5	< .5	< .5	< .5	0.535
pH	SU	8.71	6.79	7.21		7.2	7.14	7.7	6.73	7.58	7.4	7.58	7.18	7.15	7.12
Sulfate	mg/L	< 5	< 5	< 5	< 5	5.94	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Total Dissolved Solids	mg/L	440	340	370	368	336	402	486	364	424	292	368	298	320	308

**Appendix IV Parameters:**

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002
Barium	mg/L	0.209	0.199	0.196	0.216	0.197	0.152	0.197	0.19		0.206	0.222	0.206	0.2	0.211
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	2.02	1.89	0.814	< .5	< .5		< .5	< .5	< .5	< .5	0.535
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.226	0.278	0.202	0.462	0.166	0.116	0.21	0.136		0.179			0.22	
Radium-228	mg/L	0.178	0.599	0.311	0.432	0.148	0.182	0.23	0.197		0.439			<.26	
Combined Radium 226 + 228	mg/L	0.405	0.876	0.512	0.894	0.314	0.298	0.44	0.333		0.618			0.481	

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23	April-24	September-24
<b>MW-6A Downgradient</b>											
<b>Appendix III Parameters:</b>											
Boron	mg/L	< .2	< .1	< .1	< .1	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Calcium	mg/L	85.1	87.9	87.6	90.6	96.5	89	95.4	82.1	92.4	99.4
Chloride	mg/L	12.2	15.6	19.3	17.4	14.2	13.3	15.4	12.2	15.5	14.4
Fluoride	mg/L	0.652	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
pH	SU	7.3	7.24	7.59	7.61	7.35	7.38	7.08	6.88	7.3	7.5
Sulfate	mg/L	13.6	19.1	27.3	22.7	18.9	16.4	20.5	10.1	18.1	16.3
Total Dissolved Solids	mg/L	336	374	330	350	336	334	428	332	376	382
<b>Appendix IV Parameters:</b>											
Antimony	mg/L	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Barium	mg/L	0.216	0.231	0.245	0.248	0.249	0.229	0.246	0.222	0.235	0.249
Beryllium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	<0.000200	<0.000200	<0.000200
Chromium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Fluoride	mg/L	0.652	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L	0.154		0.179	0.336	0.521	0.244	0.318	0.237	0.230 U	0.18
Radium-228	mg/L	0.633		0.488	0.784	0.380 U	0.355 U	0.377 U	0.679	0.291 U	0.696
Combined Radium 226 + 228	mg/L	0.787		0.667	1.12	0.901	0.599	0.695	0.916	0.522	0.876



<b>Muscatine Power &amp; Water CCR Landfill</b> <b>Federal Parameters</b> <b>Job # 10100095</b>  <b>MW-08</b> <b>Upgradient</b>	June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	March-19	August-19

**Appendix III Parameters:**

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	0.205
Calcium	mg/L	152	117	118	109	89.9	96.5	113	91.3	77	74.7	115	83.6	97.6	132	
Chloride	mg/L	19.8	17.8	16.2	17.2	15.4	17.1	14.1	14	14.4	14.5	14.9	15.6	16.1	17.1	
Fluoride	mg/L	<.5	< .5	< .5	0.72	< .5	1.69	< .5	< .5	< .5	< .5	0.826	< .5	< .5	0.643	
pH	SU	8.26	6.82	7.03		7.03	7.05	7.59	6.77	7.24	7.3	7.56	7.2	7.08	6.64	
Sulfate	mg/L	366	187	187	149	145	145	190	119	106	87.3	136	94.7	223	276	
Total Dissolved Solids	mg/L	836	664	708	634	578	624	656	488	470	376	502	414	612	702	

**Appendix IV Parameters:**

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	0.001	< .001	< .001	
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	0.002	< .002	< .002	
Barium	mg/L	0.0861	0.0671	0.0706	0.0645	0.0594	0.0636	0.076	0.0596		0.0617	0.0761	0.0649	0.0751	0.0733	
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	0.001	< .001	< .001	
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	0.000601	0.00051		< .0005	< .0005	< .0005	0.00177	0.00558	
Fluoride	mg/L	< .5	< .5	< .5	0.72	< .5	1.69	< .5	< .5		< .5	0.826	< .5	< .5	0.643	
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	0.0022	< .002	0.00224	< .002	< .002	
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	
Radium-226	mg/L	0.152	0.4086	0.0139	0.234	0.0604	0.0229	0.0596	0.087		0.022			<0.0229		
Radium-228	mg/L	0.224	0.0663	0.336	0.102	0.161	0.104	0.144	0.249		0.646			<0.194		
Combined Radium 226 + 228	mg/L	0.375	0.115	0.35	0.336	0.221	0.126	0.204	0.336		0.668			<0.217		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23
MW-08 Upgradient									
<b>Appendix III Parameters:</b>									
Boron	mg/L	< .2	< .1	< .1	< .1	<0.100	<0.100	<0.100	<0.100
Calcium	mg/L	92.4	77.7	81.2	78.3	69.6	76.8	78.2	79.4
Chloride	mg/L	17.2	14.7	22.3	16.3	15.8	16.7	17.9	19.9
Fluoride	mg/L	0.864	< .5	<0.5	< .5	<0.500	<0.500	<1.00	<1.00
pH	SU	7.21	7.4	7.63	7.45	7.35	7.43	7.24	6.81
Sulfate	mg/L	123	100	99.7	82.7	72.8	67.1	72.2	94.2
Total Dissolved Solids	mg/L	418	350	382	342	322	350	2390	260
<b>Appendix IV Parameters:</b>									
Antimony	mg/L	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	0.00247	<0.00200
Barium	mg/L	0.0613	0.0549	0.0596	0.0623	0.0631	0.0703	0.07	0.0782
Beryllium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	<0.000200
Chromium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	0.000517	0.000738	0.000839	0.00127	0.00143	0.00164	0.0014	0.00126
Fluoride	mg/L	0.864	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	< .002	< .002	< .002	0.00218	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L	0.0645		0.111 U	0.0456 U	0.194	0.0635 U	0.169 U	0.0608 U
Radium-228	mg/L	0.398		0.0974 U	0.25 U	0.123 U	-0.0943 U	0.301 U	0.973
Combined Radium 226 + 228	mg/L	0.462		0.208 U	0.296 U	0.316 U	-0.0309 U	0.469 U	1.03

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	March-19	August-19
<b>MW-10 Upgradient</b>																
<b>Appendix III Parameters:</b>																
Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2		< .2	< .2	< .2	< .2	< .2
Calcium	mg/L	89.3	80.7	83.3	86.5	81.2	79.2	83.6	85.5	83.3		77.3	88.5	85.4	76.3	78.9
Chloride	mg/L	6.22	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5		< 5	< 5	< 5	< 5	< 5
Fluoride	mg/L	0.731	< .5	< .5	< .5	< .5	0.774	< .5	< .5	< .5		< .5	< .5	< .5	< .5	0.596
pH	SU	8.68	7.12	7.27		7.51	7.18	7.45	6.34	7.18		7.04	7.72	7.23	7.1	7.07
Sulfate	mg/L	42.1	7.3	36.4	38.4	47.3	38.3	35.4	39	46.9		51.4	37.3	34.3	42.8	28.8
Total Dissolved Solids	mg/L	468	412	444	428	498	538	524	458	414		314	396	392	326	320
<b>Appendix IV Parameters:</b>																
Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Arsenic	mg/L	0.00298	0.00369	0.00328	0.00312	0.00298	< .002	0.00262	0.00317			< .002	0.00211	0.0036	0.0056	0.00784
Barium	mg/L	0.168	0.161	0.163	0.15	0.151	0.138	0.154	0.157			0.129	0.162	0.216	0.185	0.215
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	89.3	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005			< .005	< .005	< .005	< .005	< .005
Cobalt	mg/L	0.000555	< .0005	0.000523	0.000638	0.000663	0.000779	0.000621	0.000695			0.000627	0.00107	0.00088	0.000783	0.000572
Fluoride	mg/L	0.731	< .5	< .5	< .5	< .5	0.774	< .5	< .5			< .5	< .5	< .5	< .5	0.596
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	0.0022	0.00341	0.00219
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005			< .005	< .005	< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.19	0.413	0.119	0.422	0.199	0.139	0.206	0.273			0.188			0.153	
Radium-228	mg/L	0.0326	0.255	0.575	0.377	0.314	0.332	-0.00196	0.558			0.0884			<.178	
Combined Radium 226 + 228	mg/L	0.223	0.668	0.694	0.799	0.513	0.47	0.204	0.831			0.276			<.331	

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23
MW-10 Upgradient									
<b>Appendix III Parameters:</b>									
Boron	mg/L	<.2	<.1	<.1	<.1	<0.100	<0.100	<0.100	<0.100
Calcium	mg/L	75.4	74.2	78.8	80	90.4	82	83.7	84.7
Chloride	mg/L	<5	<5	<5	<5	<5.00	<5.00	5.86	<5.00
Fluoride	mg/L	<.5	<.5	<.5	<.5	<0.500	<0.500	<1.00	<1.00
pH	SU	7.26	7.33	7.57	7.59	7.35	7.48	6.96	6.86
Sulfate	mg/L	18.6	36.5	27.6	32.3	48.3	31.2	39.8	57.4
Total Dissolved Solids	mg/L	316	344	322	314	344	340	410	318
<b>Appendix IV Parameters:</b>									
Antimony	mg/L	<.001	<.001	<.002	<.002	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	0.00697	0.00748	0.00393	0.00781	0.00371	0.00497	0.00224	0.00501
Barium	mg/L	0.199	0.227	0.196	0.233	0.208	0.223	0.19	0.233
Beryllium	mg/L	<.001	<.001	<.001	<.001	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	<.0001	<.0001	<.0001	<.0001	<0.000100	<0.000100	<0.000200	<0.000200
Chromium	mg/L	<.005	<.005	<.005	<.005	<0.00500	<0.00500	<0.000500	<0.000500
Cobalt	mg/L	0.000581	0.000751	0.000752	0.000576	0.00104	0.00109	0.00142	0.000995
Fluoride	mg/L	<.5	<.5	<.5	<.5	<0.500	<0.500	<1.00	<1.00
Lead	mg/L	<.0005	<.0005	<.0005	<.0005	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	<.01	<.01	<.01	<.01	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	<.0002	<.0002	<.0002	<.0002	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	0.00215	<.002	<.002	0.00217	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	<.005	<.005	<.005	<.005	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	<.001	<.001	<.001	<.001	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L	0.284		0.207	0.41	0.25	0.362	0.127 U	0.466
Radium-228	mg/L	0.723		0.281 U	0.912	0.443 U	0.759	0.648	1.01
Combined Radium 226 + 228	mg/L	1.01		0.488	1.32	0.693	1.12	0.775	1.48

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18
MW-13 Downgradient														
<b>Appendix III Parameters:</b>														
Boron	mg/L	47.2	13.3	74.8	7.03	4.35	5.93	2.77	2.72	50	2.92	21.7	1.34	1.45
Calcium	mg/L	218	112	276	105	87.6	97.5	92.8	95.4	208	93.2	149	89.5	93.1
Chloride	mg/L	22.9	17.1	29.8	12.7	14.8	12.8	9.17	9.62	15.2		19.9	5.84	7.24
Fluoride	mg/L	< .5	1.21	3.25	< .5	< .5	0.997	< .5	< .5	< .5		2.08	0.528	< .5
pH	SU	7.82	7.3	7.1		7.72	7.31	7.76	7.08	7.14	7.04	7.72	8.03	7.37
Sulfate	mg/L	975	197	1170	117	110	174	86.7	99.4	931	102	506	62.1	72.7
Total Dissolved Solids	mg/L	1970	694	2740	616	554	574	502	536	2150	562	1120	472	384
<b>Appendix IV Parameters:</b>														
Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	< .002
Barium	mg/L	0.0302	0.0616	477	0.0945	0.0872	0.0559	0.0783	0.0857			0.132	0.118	0.122
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Chromium	mg/L	0.0191	< .005	< .005	< .005	< .005	< .005	< .005	0.00658			< .005	< .005	< .005
Cobalt	mg/L	0.00172	0.000637	0.00179	0.000717	0.000727	0.000695	0.000682	0.000686			0.000964	< .0005	< .0005
Fluoride	mg/L	< .5	1.21	3.25	< .5	< .5	0.997	< .5	< .5			2.08	0.528	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Lithium	mg/L	< .100	< .05	< .150	< .05	< .05	< .05	< .05	< .05			0.0122	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002
Molybdenum	mg/L	0.0227	0.00867	0.0176	0.00676	0.00416	0.00443	0.00346	0.00329			0.00732	0.00296	0.00278
Selenium	mg/L	< .005	< .005	0.0364	< .005	< .005	< .005	< .005	< .005			0.0195	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Radium-226	mg/L	0.0909	0.142	0.312	0.0896	0.11	0.103	0.179	0.164			0.12		
Radium-228	mg/L	0.114	0.0795	0.832	0.173	0.241	0.262	0.0132	0.359			0.665		
Combined Radium 226 + 228	mg/L	0.205	0.222	1.14	0.262	0.35	0.365	0.192	0.523			0.785		

<b>Muscatine Power &amp; Water CCR Landfill</b> <b>Federal Parameters</b> <b>Job # 10100095</b>  <b>MW-14A</b> <b>Downgradient</b>	June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	March-19	August-19

**Appendix III Parameters:**

Boron	mg/L	15.8	17.9	19.3	14.7	13.1	11.3	16.3	13	16	13.7	11	15	14	15.5	17.6
Calcium	mg/L	281	311	308	333	268	310	307	296	310	301	278	297	309	290	255
Chloride	mg/L	28.7	28.7	37	31.9	33.5	39.4	29.7	32.9	35.4	33.2	37.4	29	33.1	25.8	22.1
Fluoride	mg/L	< .5	< .5	0.867	< .5	< .5	1.93	< .5	< .5	< .5		< .5	0.684	< .5	< .5	< .5
pH	SU	7.88	7.1	7.15		7.52	7.25	7.57	6.85	6.68	7	7.35	7.26	7.09	6.97	7.09
Sulfate	mg/L	1050	1040	1010	1140	1190	1200	1020	1110	1210	1140	1110	1090	1070	1050	837
Total Dissolved Solids	mg/L	2000	1980	2500	2080	1010	2260	2250	2170	2080	2650	1820	1800	1900	1690	1510

**Appendix IV Parameters:**

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .004
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	< .002	< .002	< .008
Barium	mg/L	0.0443	0.0402	0.0391	0.0383	0.0306	0.0341	0.0338	0.031			0.0285	0.0314	0.0344	0.0328	0.0398
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .004
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .002
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005			< .005	< .005	< .005	< .005	< .02
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .002
Fluoride	mg/L	< .5	< .5	0.867	< .5	< .5	1.93	< .5	< .5			< .5	0.684	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .05	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .002
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .01	< .01	< .01	< .01	< .04
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	< .002	< .002	< .008
Selenium	mg/L	0.0071	0.00811	0.00821	0.00834	0.00752	0.00823	0.00829	0.00759			< .005	0.00739	0.00827	0.00569	< .02
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .004
Radium-226	mg/L	0.0496	0.095	0.0604	0.137	0.0624	0.0561	0.0545	0.0506			0.0335			<.0588	
Radium-228	mg/L	0.0956	0.107	0.462	0.122	0.23	0.424	-0.0414	0.406			0.224			<-.0365	
Combined Radium 226 + 228	mg/L	0.145	0.202	0.523	0.26	0.293	0.48	0.0131	0.456			0.258			<.0223	

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23
MW-14A Downgradient									
<b>Appendix III Parameters:</b>									
Boron	mg/L	17.4	19.5	17.2	17.1	15.2	15.1	14.8	18.1
Calcium	mg/L	245	244	259	270	289	301	318	291
Chloride	mg/L	22.5	22.8	27.1	23.2	25.5	22.4	20.3	20.9
Fluoride	mg/L	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00
pH	SU	7.32	7.21	7.64	7.48	7.13	7.21	6.97	6.78
Sulfate	mg/L	888	924	952	1010	1030	978	1150	1440
Total Dissolved Solids	mg/L	1510	1620	1290	1560	1530	1710	2140	1800
<b>Appendix IV Parameters:</b>									
Antimony	mg/L	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200
Barium	mg/L	0.0266	0.0328	0.0355	0.0345	0.0327	0.034	0.032	0.0348
Beryllium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	<0.000200
Chromium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500
Fluoride	mg/L	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L	0.0647		0.0454 U	0.16 U	0.101 U	0.0533 U	0.114 U	0.132 U
Radium-228	mg/L	0.332		0.568	0.524	-0.0522 U	0.0310 U	-0.0486 U	0.438 U
Combined Radium 226 + 228	mg/L	0.397		0.614	0.684	0.0486 U	0.0843 U	0.0651 U	0.57

<b>Muscatine Power &amp; Water CCR Landfill</b> <b>Federal Parameters</b> <b>Job # 10100095</b>  <b>MW-15A</b> <b>Downgradient</b>	June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	March-19	March-19
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**Appendix III Parameters:**

Boron	mg/L	16.8	20.6	17.9	18.4	14.9	14.7	16.4	14.7	19.2	12.9	11	10.5	14.6	8.35	7.56
Calcium	mg/L	206	199	203	244	233	226	186	206	218	217	278	102	155	118	111
Chloride	mg/L	17.1	17.2	17.6	19	21.5	47.4	12.8	15.4	20.5	20.7	37.4	< 5	10.1	8.54	9.91
Fluoride	mg/L	< .5	0.549	< .5	< .5	< .5	6.7	< .5	< .5	< .5		< .5	< .5	< .5	0.523	0.625
pH	SU	7.97	7.16	7.27		7.2	7.31	7.84	6.96	6.94	7	7.35	7.5	7.25	7.76	7.11
Sulfate	mg/L	827	605	607	732	849	853	537	664	835	779	1110	210	400	351	327
Total Dissolved Solids	mg/L	1620	1270	1500	1600	1470	1780	1280	1390	1520	1670	1820	676	948	724	786

**Appendix IV Parameters:**

Antimony	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Arsenic	mg/L	< .1	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	< .002	< .002	< .002
Barium	mg/L	2.13	0.044	0.0426	0.0406	0.0402	0.0364	0.0327	0.0338			0.0285	>0338	0.0335	0.037	0.047
Beryllium	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005
Chromium	mg/L	< .250	< .005	< .005	< .005	< .005	< .005	< .005	< .005			< .005	< .005	< .005	< .005	< .005
Cobalt	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	0.549	< .5	< .5	< .5	6.7	< .5	< .5			< .5	< .5	< .5	< .5	0.625
Lead	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .0005	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	< .1	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	< .002	< .002	< .002
Selenium	mg/L	< .25	< .005	< .005	< .005	< .005	< .005	< .005	< .005			< .005	< .005	< .005	< .005	< .005
Thallium	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.0942	0.0703	0.164	0.106	0.0814	0.0124	0.100	0.047			0.0518			<.0609	
Radium-228	mg/L	0.216	0.18	0.123	0.145	0.0218	0.0842	0.121	0.197			0.0715			<.33	
Combined Radium 226 + 228	mg/L	0.31	0.251	0.286	0.251	0.103	0.0966	0.221	0.244			0.123			<.391	



Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23	April-24	September-24
MW-15A Downgradient											
<b>Appendix III Parameters:</b>											
Boron	mg/L	10.6	14.5	10.3	11.1	6.98	10.4	5.8	9.28	5.8	8.5
Calcium	mg/L	163	134	128	125	127	132	110	126	118	129
Chloride	mg/L	13	8.63	15	8.86	7.71	8.29	7.3	8.41	7.01	7.41
Fluoride	mg/L	< .5	< .5	0.516	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
pH	SU	7.54	7.28	7.92	7.46	6.83	7.4	7.24	6.97	7.6	7.2
Sulfate	mg/L	496	403	338	333	297	319	254	365	256	273
Total Dissolved Solids	mg/L	942	920	738	736	682	796	646	720	636	602
<b>Appendix IV Parameters:</b>											
Antimony	mg/L	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Barium	mg/L	0.0389	0.0416	0.0365	0.0355	0.0443	0.0327	0.0299	0.0338	0.0353	0.0335
Beryllium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	<0.000200	<0.000200	<0.000200
Chromium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Fluoride	mg/L	< .5	< .5	0.516	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L			0.0226 U	0.126 U	0.0866 U	-0.0189 U	0.0906 U	0.536 U	0.0414 U	<0.146 U
Radium-228	mg/L			0.197 U	0.236 U	-0.0577 U	-0.140 U	0.637	0.0640 U	0.116 U	<0.549 U
Combined Radium 226 + 228	mg/L			0.219 U	0.362 U	0.0289 U	-0.159 U	0.727	0.118 U	0.157 U	<0.549 U

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18
MW-18A Downgradient														
<b>Appendix III Parameters:</b>														
Boron	mg/L	13.7	15.1	14.2	11.8	12.7	10.5	11.5	10.8	13.1	10.7	8.81	13.3	10.5
Calcium	mg/L	294	294	280	291	266	237	255	258	239	232	191	264	223
Chloride	mg/L	30.4	27.6	35.3	29.2	28.1	44.2	27.2	27	29.3	27.4	27.1	25.6	26.9
Fluoride	mg/L	< .5	< .5	0.791	< .5	< .5	3.16	< .5	< .5	< .5		< .5	< .5	< .5
pH	SU	7.88	7.1	7.2		7.18	7.05	7.38	6.96	6.34	7	7.28	7.19	7.12
Sulfate	mg/L	1100	874	855	886	917	863	796	801	808	737	624	709	675
Total Dissolved Solids	mg/L	1750	1720	1850	2320	1800	4160	1970	1530	1420	1430	1150	1890	1330
<b>Appendix IV Parameters:</b>														
Antimony	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001			0.00195	< .001	< .001
Arsenic	mg/L	< .1	< .002	< .002	< .002	< .002	< .002	< .002	< .002			0.00265	< .002	< .002
Barium	mg/L	< .1	0.0391	0.0381	0.0394	0.0403	0.0297	0.0313	0.0329			0.0281	0.0352	0.036
Beryllium	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Cadmium	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Chromium	mg/L	< .250	< .005	< .005	< .005	< .005	< .005	< .005	< .005			< .005	< .005	< .005
Cobalt	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	0.791	< .5	< .5	3.16	< .5	< .5			< .5	< .5	< .5
Lead	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .0005	< .01	< .01
Mercury	mg/L	0.000245	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002
Molybdenum	mg/L	< .1	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	< .002
Selenium	mg/L	< .25	< .005	< .005	< .005	< .005	< .005	< .005	< .005			< .005	< .005	< .005
Thallium	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Radium-226	mg/L	0.0607	-0.00906	0.106	0.226	0.0909	0.0175	-0.000744	0.0546			0.0456		
Radium-228	mg/L	0.344	0.228	0.605	0.407	0.195	0.387	0.185	0.23			0.339		
Combined Radium 226 + 228	mg/L	0.405	0.218	0.711	0.633	0.286	0.405	0.184	0.284			0.384		

<b>Muscatine Power &amp; Water CCR Landfill Federal Parameters Job # 10100095</b>																
<b>MW-21 Downgradient</b>		June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	March-19	August-19

**Appendix III Parameters:**

Boron	mg/L	< 2	7.23	8.45	6.93	4.87	4.49	7.36	7.05	3.33	2.24	8.81	6.84	1.36	6.95	8.46
Calcium	mg/L	37.2	146	185	178	118	110	149	163	62.3		191	159	78.7	142	145
Chloride	mg/L	27.7	16.6	24.4	19.2	14.2	15.6	15.1	16.1	5.09		27.1	10.9	< 5	8.3	14
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.993	0.768	< .5	< .5	< .5		< .5	< .5	< .5	< .5	< .5
pH	SU	7.56	6.56	6.66		5.9	6.6	7.34	6.77	6.76	6.87	7.28	7.25	7.07	6.41	6.33
Sulfate	mg/L	713	520	603	645	415	461	541	590	206		624	489	96.6	442	529
Total Dissolved Solids	mg/L	1440	1110	1420	1240	1010	1060	1140	1220	514		1150	952	416	872	960

**Appendix IV Parameters:**

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			0.00195	< .001	< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			0.00265	< .002	< .002	< .002	< .002
Barium	mg/L	0.0573	0.0482	0.0606	0.056	0.0735	0.0356	0.0461	0.0499			0.0281	0.0515	0.0622	0.0511	0.0624
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005
Chromium	mg/L	0.00694	0.00538	0.00582	0.00561	< .005	< .005	0.00586	0.00572			< .005	0.00726	< .005	0.00647	0.00637
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.993	0.768	< .5	< .5			< .5	< .5	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	0.000633	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .01	0.0189	< .01	0.0277	0.0279
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	0.00383	< .002	< .002	< .002
Selenium	mg/L	0.0165	0.0103	0.0137	0.0119	0.0074	0.00674	0.0106	0.0109			< .005	0.00939	< .005	0.102	0.0108
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.299	0.148	0.427	0.128	0.0502	-0.00511	0.0379	0.209			0.0141			0.117	
Radium-228	mg/L	-0.0462	0.0116	0.391	0.178	-0.0507	0.1	0.507	0.605			0.344			<.17	
Combined Radium 226 + 228	mg/L	0.253	0.159	0.817	0.306	-0.000573	0.0953	0.545	0.814			0.358			<.287	

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23	April-24	September-24
MW-21 Downgradient											
<b>Appendix III Parameters:</b>											
Boron	mg/L	6.76	6.82	5.24	5.88	3.57	3.69	3.35	4.42	2.31	3.68
Calcium	mg/L	104	101	79.5	93.5	97.5	88.2	76.000	96.0	59.9	96.6
Chloride	mg/L	8.05	7.21	5.14	6.58	7.19	18	5.93	8.23	< 5	13.5
Fluoride	mg/L	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
pH	SU	6.55	6.8	6.92	7.06	6.69	7.09	7.24	6.55	7	6.9
Sulfate	mg/L	373	356	237	303	293	151	215	303	138	248
Total Dissolved Solids	mg/L	698	738	540	636	558	524	646	626	366	584
<b>Appendix IV Parameters:</b>											
Antimony	mg/L	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Barium	mg/L	0.0352	0.0407	0.0309	0.0434	0.036	0.0447	0.0310	0.0559	0.031	0.0555
Beryllium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	<0.000200	<0.000200	<0.000200
Chromium	mg/L	0.00644	0.00589	0.00708	0.00659	0.00636	0.00505	0.00577	0.00752	< .005	0.00657
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Fluoride	mg/L	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	0.0213	0.0225	0.0198	0.0233	0.0162	0.018	0.0143	0.0205	0.0124	0.0194
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	0.00632	0.00762	< .005	0.00617	0.00634	<0.00500	<0.00500	0.00530	<0.00500	0.00666
Thallium	mg/L	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L	0.0383		0.0282 U	0.0566 U	0.0448 U	0.117	0.0716	0.0898 U	0.150 U	<0.124 U
Radium-228	mg/L	0.267		0.154 U	0.443	0.126 U	-0.195 U	0.606	0.407 U	-0.0821 U	<0.586 U
Combined Radium 226 + 228	mg/L	0.305		0.182 U	0.499	0.171 U	-0.0783 U	0.678	0.497 U	0.0684 U	<0.586 U

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		March-18	June-18	August-18	March-19	August-19	April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23	April-24	September-24
MW-22 Downgradient																
<b>Appendix III Parameters:</b>																
Boron	mg/L	< .2	< .2	< .2	0.299	<.2	<.2	0.263	< .1	< .1	<0.100	0.322	0.247	0.207	<0.100	0.243
Calcium	mg/L	69.8	91.5	80.7	91.6	83.8	80.9	75.5	78.4	79.4	80.2	79.6	80.4	79	83.1	84.3
Chloride	mg/L	30	27.2	29.8	27.6	26.9	24.8	23.2	28.1	20	20.2	7.04	18.2	18.4	15.8	16.6
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.507	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
pH	SU	7.36	7.9	7.42	7.21	7.12	7.32	7.53	7.7	7.97	7.23	7.58	7.14	7.14	7.5	7.5
Sulfate	mg/L	123	134	125	134	139	143	151	154	154	158	220	147	208	160	161
Total Dissolved Solids	mg/L	424	434	420	456	428	422	398	412	420	388	390	450	404	422	396
<b>Appendix IV Parameters:</b>																
Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	0.00245	0.00261	< .002	< .002	< .002	< .002	0.00289	0.00267	0.0034	0.00285	0.00421	0.00421	0.00634	0.00749
Barium	mg/L	0.15	0.184	0.181	0.209	0.215	0.222	0.222	0.242	0.247	0.239	0.243	0.227	0.256	0.271	0.268
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.000200	<0.000200	<0.000200	<0.000200
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	0.00142	0.00129	0.00149	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<0.000500	<0.000500	<0.00500	<0.00500	<0.00500	<0.00500
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.507	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	0.00568	0.00423	0.00424	0.00263	0.00574	0.00297	0.00529	< .002	0.00558	0.0042	0.00446	0.00364	0.00661	0.00217	0.00578
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L	0.122	0.284		0.116		0.137		0.168	0.235	0.222	0.17	0.117	0.146 U	0.421	0.185
Radium-228	mg/L	0.135	0.128		<.226		0.303		0.379 U	0.287 U	0.272 U	0.112 U	0.324 U	0.966	2.06	<0.576 U
Combined Radium 226 + 228	mg/L	0.257	0.412		<.343		0.44		0.547	0.522	0.494	0.283 U	0.442 U	1.11	2.48	0.674

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		June-18	August-18	March-19	August-19	April-20	September-20	April-21	September-21	April-22	September-22	April-23	September-23	April-24	September-24
MW-23 Downgradient															
<b>Appendix III Parameters:</b>															
Boron	mg/L	< .2	< .2	< .2	< .2	< .2	0.15	< .1	< .1	<0.100	0.204	0.145	0.128	<0.100	0.126
Calcium	mg/L	70.5	63.9	59.7	59.5	61	52.1	56.3	56.1	54	54.5	55.3	56	59.7	58
Chloride	mg/L	15.9	14.2	10.5	13.8	15.7	14.4	21.4	15.2	16.9	16.2	17.7	19.2	19.2	21.7
Fluoride	mg/L	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
pH	SU	7.69	7.55	7.24	6.75	7.33	7.53	7.61	7.89	7.39	7.3	7.24	7.05	7.4	7.4
Sulfate	mg/L	38.4	31.7	26.2	29.7	25.5	25.8	35.5	25.8	25.4	23	25	28.6	21.8	23.8
Total Dissolved Solids	mg/L	384	340	296	336	298	250	274	256	218	278	286	282	274	260
<b>Appendix IV Parameters:</b>															
Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Barium	mg/L	0.106	0.0779	0.0922	0.0635	0.0654	0.0491	0.0608	0.0497	0.0572	0.0507	0.0518	0.0533	0.0547	0.0521
Beryllium	mg/L	< .001	< .001	<0.001	<0.001	<0.001	<0.001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0001	< .0001	< .0001	< .0001	<0.000100	<0.000100	<0.00200	<0.00200	<0.00200	<0.00200
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	0.00161	0.00066	0.00176	< .0005	0.000817	< .0005	0.000517	<.0005	0.000561	<0.000500	<0.00500	<0.00500	<0.00500	<0.00500
Fluoride	mg/L	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00
Lead	mg/L	0.00151	0.000626	0.00204	0.000663	0.00116	< .0005	0.000624	< .0005	0.000596	<0.000500	<0.00500	<0.00500	<0.00500	<0.00500
Lithium	mg/L	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	0.00822	0.00617	< .002	< .002	< .002	< .002	< .002	< .002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Radium-226	mg/L	0.161		0.215		0.0587		0.0292 U	0.0236 U	0.0699 U	0.0309 U	0.195 U	0.0679 U	0.202 U	<0.116 U
Radium-228	mg/L	-0.419		0.785		0.517		0.266 U	0.771	1.20 U	-0.225 U	1.13 U G	0.538 U	0.200 U	<0.563 U
Combined Radium 226 + 228	mg/L	0.0129		1.00		0.576		0.296 U	0.794	1.27	-0.195 U	1.32	0.606 U	0.402 U	<0.563 U

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		June-18	August-18	March-19	August-19	April-20	September-20	April-21	September-21	April-22	September-22
MW-24 Downgradient											
<b>Appendix III Parameters:</b>											
Boron	mg/L	< .2	< .2		< .2	< .2	0.109	< .1	<.1	<0.100	0.134
Calcium	mg/L	88	72.8		103	94.3	69.9	74.6	69	62.8	66.8
Chloride	mg/L	19.9	18.1		22.4	24.8	19.5	28.9	21.9	19.9	19.9
Fluoride	mg/L	0.653	< .5		< .5	< .5	< .5	< .5	< .5		<0.500
pH	SU	7.47	7.39		6.87	7.29	7.47	7.64	7.44	7.49	7.53
Sulfate	mg/L	101	70		169	164	81	91.2	59.3	48.5	44.5
Total Dissolved Solids	mg/L	474	368		542						
<b>Appendix IV Parameters:</b>											
Antimony	mg/L	< .001	< .001		< .001						
Arsenic	mg/L	< .002	< .002		< .002	< .002	< .002	< .002	< .002	<0.00200	<0.00200
Barium	mg/L	0.0695	0.0776		0.128	0.084	0.0969	0.0936	0.0922	0.0826	0.0887
Beryllium	mg/L	< .001	< .001		< .001	< .001	< .001	< .001	< .001	<0.00100	<0.00100
Cadmium	mg/L	< .0005	< .0005		< .0005						
Chromium	mg/L	< .005	< .005		< .005						
Cobalt	mg/L	< .0005	< .0005		< .0005	< .0005	< .0005	< .0005	<.0005	<0.000500	<0.000500
Fluoride	mg/L	0.653	< .5		< .5	< .5	< .5	< .5	< .5	<0.500	<0.500
Lead	mg/L	< .0005	< .0005		< .0005	< .0005	< .0005	< .0005	< .0005	<0.000500	<0.000500
Lithium	mg/L	< .01	< .01		< .01						
Mercury	mg/L	< .0002	< .0002		< .0002						
Molybdenum	mg/L	0.00447	< .002		< .002	< .002	< .002	< .002	< .002	<0.00200	<0.00200
Selenium	mg/L	< .005	< .005		< .005	< .005	< .005	< .005	< .005	<0.00500	<0.00500
Thallium	mg/L	< .001	< .001		< .001						
Radium-226	mg/L	-0.0261							0.00873 U		
Radium-228	mg/L	0.19							0.266 U		
Combined Radium 226 + 228	mg/L	0.164							0.275 U		

