

**2021 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT**

**COAL COMBUSTION RESIDUE (CCR) LANDFILL
PERMIT NO. #70-SDP-06-82P**

**MUSCATINE POWER & WATER
MUSCATINE, IOWA**

January 2022

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CERTIFICATION

**2021 ANNUAL GROUNDWATER MONITORING
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**CCR LANDFILL
Permit No. #70-SDP-06-82P**

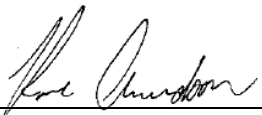
**MUSCATINE POWER & WATER
MUSCATINE, IOWA**

January 2022

	<p>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.</p>
	<p> Date: <u>1/28/2022</u></p> <p>STACY EILEEN WOODSON, P.E. License No. 17389 My renewal date is December 31, 2022</p> <p>Pages or sheets covered by this seal: <u>Entire Document</u></p>

Prepared By:

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Date: 1/28/2022

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I. GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

Under Federal CCR Rule 40 CFR Part 257.90 – *Groundwater Monitoring and Corrective Action*, Muscatine Power and Water (MP&W) as the owner of an existing coal combustion residue (CCR) landfill must prepare annually a Groundwater Monitoring and Corrective Action Report. The report must, for the preceding calendar year, document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. The prepared annual report must be placed in the facility’s operating record as required under Part 257.105(h)(1).

The following sections cover the annual report’s content requirements under Part 257.90(e) for calendar year 2021.

A. LOCATION AND SITE MAPS – §257.90(e)(1)

MP&W maintains a private CCR landfill that provides for the controlled disposal of CCR originating at its power generating facility located at 1700 Dick Drake Way in Muscatine. The approximate 80-acre landfill site is located 7.5 miles west of the power plant in the SW¼ of Section 16, Township 76 North, Range 3 West in Muscatine County (Figure 1, Appendix A).

The landfill has been in continuous operation since 1985. The CCR includes a mixture of gypsum, fly ash, bottom ash, and slag materials. The overall planned landfill development area includes four phases encompassing approximately 34 acres (Figure 2, Appendix A). Phases I and II (22.7 acres) are currently permitted and under development. Phases III and IV are designated for future development. As of this reporting period, the operational status of Phases I and II are broken down as follows:

- Final Cover Constructed Pre-1991: 3.2 acres (Phase I)
- Final Cover Constructed 2019-2020: 7.7 acres (Phase I)
- Current Active Operations Area 2021: 5.2 acres (Phase I & II)
- Current Temporary Covered Area 2021: 6.6 acres (Phase I & II)

The site is regulated under Iowa Department of Natural Resources (DNR) Sanitary Disposal Project Permit No. 70-SDP-06-82P which was reissued on August 8, 2020. The permit expires August 8, 2030.

A comprehensive list of references for this facility is provided in Section II. Of primary interest herein is: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, revised May 2, 2017). That document addresses the groundwater monitoring and corrective action requirements of the Federal CCR Rule Part 257.90-98 and is posted as a reference on MP&W’s publicly accessible Internet site at <https://www.mpw.org/utilities/electric/ccr-rule>.

B. IDENTIFICATION OF WELLS – §257.90(e)(2)

Table 1 provides a summary of the groundwater monitoring wells for the federal groundwater monitoring program under 257.90 (Appendix B).

There were no changes in the monitoring system program during the 2021 reporting period.

Well MW-22 was installed in 2018 to provide an additional background quality monitoring point. MW-23 added as a background well in 2020. These wells are incorporated into the statistical analysis and interpretations herein.

It was determined that well MW-13 was no longer an effective monitoring point and was abandoned in April 2019 following 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 it was abandoned in August 2019. Prior to fall sampling MW-4A was damaged, abandoned, and replaced with MW-4B. No other monitoring wells under the federal monitoring program were decommissioned or abandoned since 2020.

Note that there are other facility 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 and include: MW-24 installed in 2018, and MW-26 and MW-27 installed in 2020.

C. SUMMARY OF SAMPLE COLLECTION AND ANALYSIS – §257.90(e)(3)

Sample Collection and Results

Under 40 CFR Part 257.93(a) the Groundwater Monitoring Program (GMP) includes the following groundwater monitoring points: Upgradient wells: MW-8, MW-10, MW-22, and MW-23 used to establish background quality; and Downgradient wells: MW-4A/MW-4B, MW-5B, MW-6A, MW-13, MW-14A, MW-15A, MW-18A, and MW-21 to monitor for downgradient impacts.

Table 1 provides a summary of the groundwater monitoring points (Appendix B), including:

- (1) Location coordinates (see also Figure 2),
- (2) Construction details,
- (3) Function as a monitoring well or water level measuring point,
- (4) Hydrogeologic unit monitored, and
- (5) Recent water level measurement used for the current evaluation of horizontal groundwater flow pattern and vertical gradients.

The monitoring wells are sampled for the constituents specified in Appendix III and

Appendix IV of Part 257, as follows:

- Appendix III: boron, calcium, chloride, fluoride, pH, sulfates, and total dissolved solids.
- Appendix IV: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, thallium, and radium 226 & 228 combined.

Table 2 (Appendix B) provides the implementation schedule for the GMP, consisting of:

- (1) Well function as either an upgradient or downgradient monitoring point
- (2) Number of samples collected in each monitoring program,
- (3) Dates of completed sampling events, constituents tested, and reason for sampling including:
 - a. Establish background quality,
 - b. Detection monitoring,
 - c. Resampling events to verify an initial SSI,
 - d. Assessment monitoring, and
 - e. Corrective action monitoring.

Samples are collected and handled as described in *Procedure for Groundwater and Surface Water Sampling* (HR Green, updated November 2018). Samples are then analyzed for the Appendix III and/or Appendix IV lists by certified testing laboratory TestAmerica Laboratories, Inc. in Cedar Falls, Iowa.

A summary tabulation of the groundwater sampling data obtained under §257.90 through §257.98 is provided in Appendix C. This tabulation covers the period of June 2016 through December 2021, including 17 events used to establish background quality, the first detection (compliance) event, a resampling event, and the assessment monitoring events in 2021.

The laboratory's analytical reports, the field low-flow sampling forms, and the DNR Sampling Forms are also provided for the sampling events in Appendix C.

Analysis

The analyzed data were used to calculate statistical limits for each well/constituent pair. Statistical calculations were performed by Groundwater Stats Consulting using industry standard SANITAS™ Statistical Software, an EPA-compliant package (EPA 2009, Unified Guidance). The full procedure is as detailed in the document entitled: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, revised May 2, 2017).

The statistical report dated December 2, 2021 incorporates data collected through 2021 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), etc., and is provided herein for reference (Appendix D) and discussed below.

D. DISCUSSION OF FINDINGS – §257.90(e)(4)

The review was being conducted in accordance with the statistical methodologies presented in *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017; see Tables III-4, III-6, III-8, and III-9 in Appendix D).

The implementation schedule (Table 2) and monitoring program summary (Table 3) track the major milestones of the MP&W groundwater monitoring system and sampling and analysis program.

Appendix III constituents include: boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids.

Appendix IV constituents include: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226+228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium.

Year 2017

Establishment of background water quality occurred by testing all wells for Appendix III & 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 SSI, or statistically significant increase 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 total dissolved solids at MW-13) and 19 confirmed SSI (Groundwater Stats Consulting, December 19, 2017).

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

Years 2018, 2019, and 2020

Assessment monitoring commenced in 2018 with the analysis of Appendix III & IV constituents. The events were conducted March 6, June 19, and August 28, 2018.

These events were intended to satisfy the requirements of both the initial scan and the semi-annual and assessment monitoring requirements. Specifically, assessment monitoring was initiated at the March 6, 2018 event, where the full Appendix III and Appendix IV constituent lists were tested.

Year 2021

Additional assessment monitoring and background collection was completed in 2021 for Appendix III & IV constituents. The events were conducted April 6 and September 1, 2021. These events are intended to satisfy the requirements of both the initial scan and the semi-annual and assessment monitoring requirements.¹

Assessment monitoring continued during the 2021 events, where the full Appendix III and Appendix IV constituent lists were tested. The Appendix IV constituents that were detected are shown below.

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

Table 3 (Appendix B) provides a 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 3 shows that the concentrations of several constituents remain at statistically significant levels above background (i.e., SSI), but that all confidence interval concentrations are below the GWPS, that is, there were no SSLs determined.

¹ Under §257.95(b), assessment monitoring requires an initial scan of Appendix IV constituents, followed under §257.95(d)(1) by semi-annual testing for Appendix III list plus detected Appendix IV constituents. To streamline the tracking of sampling requirements and results, and to align the federal and state sampling schedules, MP&W elects to test for full Appendix III and Appendix IV constituent lists during each sampling event, except for combined radium which has not been detected over a reporting limit.

Because there were no SSL's determined during 2021, the facility is required to continue in assessment monitoring in 2022, as shown in Table 3.

The GWPS values are shown in Table 4 and were established as the appropriate Maximum Contaminant Level (MCL) or Regional Screening Level (RSL)². Also shown in Table 4 is the background statistical limit.

1. SUMMARY

In summary, the current-year review indicates:

1. Monitoring wells remain viable sampling points as they are physically intact, 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. Horizontal and vertical groundwater flow gradients appear stable and consistent with historic observations. The primary groundwater flow path is lateral, with flow across the filled landfill area traveling from the southeast toward the northwest (Figure 2).
3. Analytical results indicate the landfill's primary impact on groundwater quality is from Appendix III constituents, including boron, calcium, 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-21).

Statistical analysis indicates that the concentrations of multiple constituents remain above background limits (see SSI on Table 3), however, during 2021 there were no Appendix IV constituents that exhibited a statistically significant level (SSL) above a groundwater protection standard (GWPS). As such, under Assessment Monitoring Program §257.95(f) this site must continue in assessment monitoring.

E. SUPPLEMENTAL INFORMATION – §257.90(e)(5)

The following information is provided to fill in context for the MP&W CCR facility.

Monitored Hydrogeologic Unit

For a full discussion of the GMP, reference the document *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, Revised May 2, 2017, original May 18, 2016).

Of particular relevance herein is that the GMP wells monitor (1) water levels to

² The RSL values under §257.95(h)(2) were set for cobalt, lithium and molybdenum in Federal Register Volume 83, No. 146 dated July 30, 2018. These four constituents do not have an established MCL.

determine horizontal and vertical groundwater flow paths, and (2) for downgradient groundwater quality impacts to the uppermost continuous aquifer beneath the site. The aquifer and gradients are discussed below.

Uppermost Continuous Aquifer:

As a whole, a deep un-weathered and un-oxidized clay-rich glacial till functions as a lower confining unit with field hydraulic conductivity values of less than $1 \times 10E-7$ cm/sec. Over most of the site, this underlying low permeability glacial till confining unit is overlain by a sequence of weathered oxidized till, sand, and clayey silt (loess) which collectively constitute the uppermost continuous aquifer beneath the site. This aquifer exhibits hydraulic conductivity values as great as $1.7 \times 10E-4$ cm/sec and which are two to three orders of magnitude greater than the underlying confining unit. Therefore, the assemblage of deposits generally at depths of less than 50 feet is interpreted to function as the uppermost continuous aquifer beneath the landfill. This is also the unit, within which the water table fluctuates, which means the uppermost continuous aquifer is one in the same hydrogeologic unit as the shallow water table aquifer. This uppermost continuous aquifer is the unit monitored by the GMP groundwater monitoring wells.

Groundwater Flow:

The pre-landfill groundwater flow direction in the uppermost aquifer was dominantly horizontal from the southeast toward the northwest with natural convergence along an ephemeral stream that formerly drained the undeveloped site.

Under current conditions the dominant flow direction remains the same except that convergence is now to the runoff control pond located west of the landfill in the area of the original ephemeral stream. The current year water table contours and primary flow path directions are depicted on Figure 2.

The observed vertical flow components are recharge (downward) in the upland area of the southeast corner of the site (MW-8/9) and slightly so in the upper aquifer (silt and till) in lowland area (MW-10/11) and discharge (upward) from the confining layer to the upper aquifer in lowland area along the drainage way in the northeast corner of the site (MW-11/12 and MW-10/12) (see Table 1).

State Monitoring Requirements

Monitoring at this facility is also conducted under the State of Iowa Department of Natural Resources in accordance with Sanitary Disposal Permit #70-SDP-06-82P and per the approved Hydrologic Monitoring System Plan (HMSP).

The state's monitoring and analysis requirements are not addressed further herein but can be found in the Annual Water Quality Report to Iowa DNR (submitted to DNR annually by February 15).

Regulatory Status

The facility is regulated by the Iowa Department of Natural Resources (IDNR) under [567] Iowa Administrative Code (IAC) Chapter 103 and by state Sanitary Disposal Project Permit, issued August 8, 2020 with an expiration date of August 8, 2030.

The IDNR also regulates the site under the National Pollution Discharge Elimination System NPDES Permit #7000109. MP&W is authorized to discharge storm water runoff from the sediment runoff pond and two groundwater cut-off drains. Quarterly monitoring of the designated Farm Pond outfall and quarterly reporting are completed by MP&W in accordance with this permit.

II. REFERENCES CITED

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.

Groundwater Stats Consulting, December 2, 2021. Summary of statistical analysis used to establish baseline water quality, SSI and SSL. Includes the analysis of 17 sample events conducted from June 2016 through August 2021.

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, 2021. Annual Inspection Report, Muscatine Power & Water, CCR Landfill.

HR Green, December 19, 2021. Annual CCR Fugitive Dust Control Report, 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, June 2017. Procedure for Groundwater and Surface Water Sampling. (Updated November 2018.)

HR Green, October 17, 2016. Closure and Post-Closure Plan, 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, May 2, 2017. Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill (original May 18, 2016).

HR Green, January 17, 2012. CCR Landfill Cell Development – Phase II Expansion Plans, Muscatine Power and Water.

Iowa Administrative Code [567], Chapter 103 Sanitary Landfills: Coal Combustion Residue.

Iowa Department of Natural Resources (IDNR) Landfill Operating Permit No. 70-SDP-06-82P dated August 8, Muscatine Power and Water.

Iowa Geological Survey, 2010. The Iowa State-Wide Trace Element Soil Sampling Project: Design and Implementation: Iowa Department of Natural Resources, Iowa Geological and Water Survey, Open File Report 10-1, June 2010.

Muscatine Power and Water. Federal *CCR Rule Compliance Data and Information*, publicly accessible Internet site at <https://www.mpw.org/utilities/electric/ccr-rule>.

Muscatine Power and Water, October 2, 2008, December 17, 2009, and March 30, 2010. Supplemental Information relating to landfill development.

U.S. Environmental Protection Agency (EPA), 2015. Published in Federal Register Volume 80, No. 74 published on April 17, 2015, *Final Rule 40 CFR Part 257 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities*; and *Technical Amendments* published in Federal Register Volume 80, No. 127 on July 2, 2015 (correcting the effective date); and Volume 83, No. 146 on July 30, 2018 (revising groundwater protection standards for four constituents which do not have an established MCL).

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.

APPENDIX A

FIGURES

Figure 1: Location Map

Figure 2: Site Map

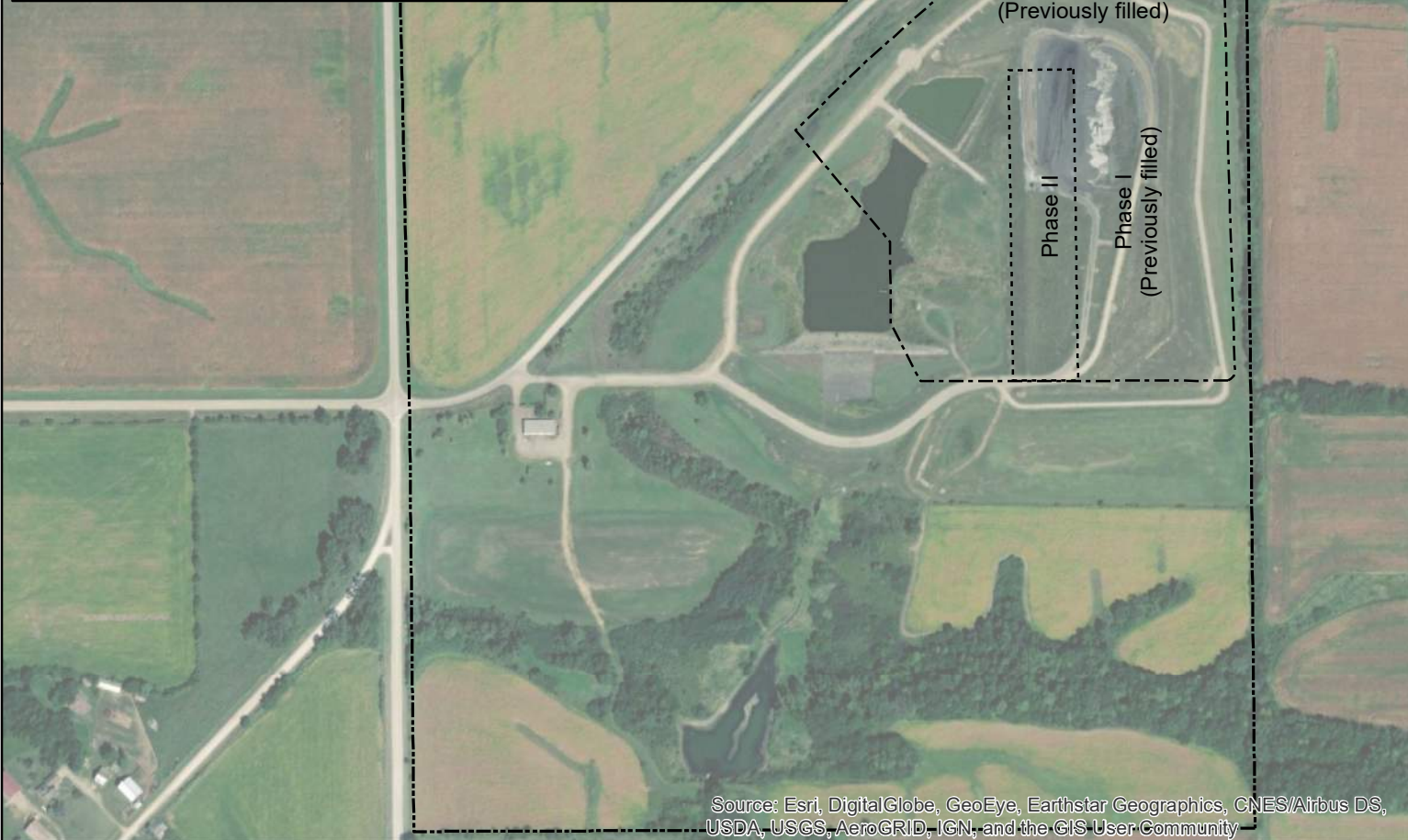
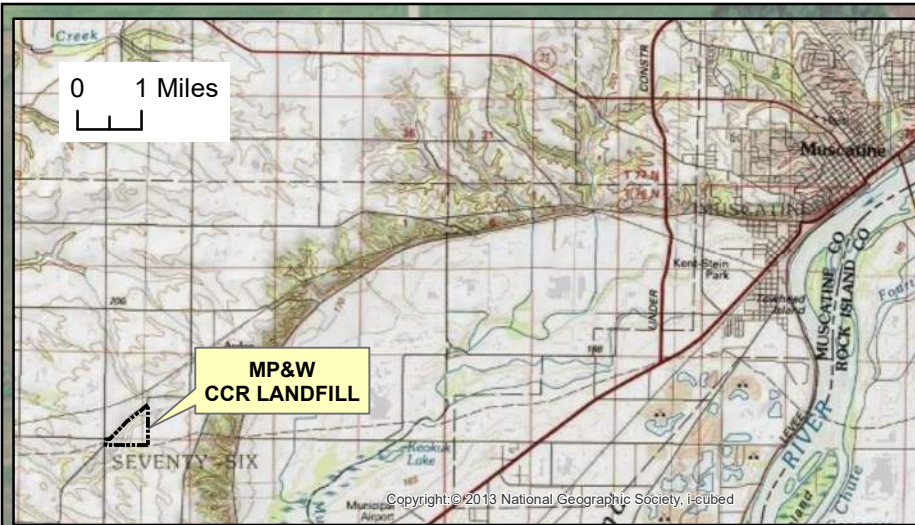
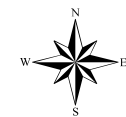


Figure 1
LOCATION MAP

CCR Landfill
Muscatine Power and Water

Legend

- Property Line (Approx.)
- Permitted Fill Area
- Phase II (2012)



Projected Coordinate System:
NAD 1983 StatePlane Iowa_South



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

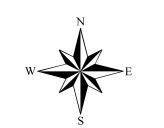
Figure 2
SITE MAP

CCR Landfill
Muscatine Power and Water

Legend

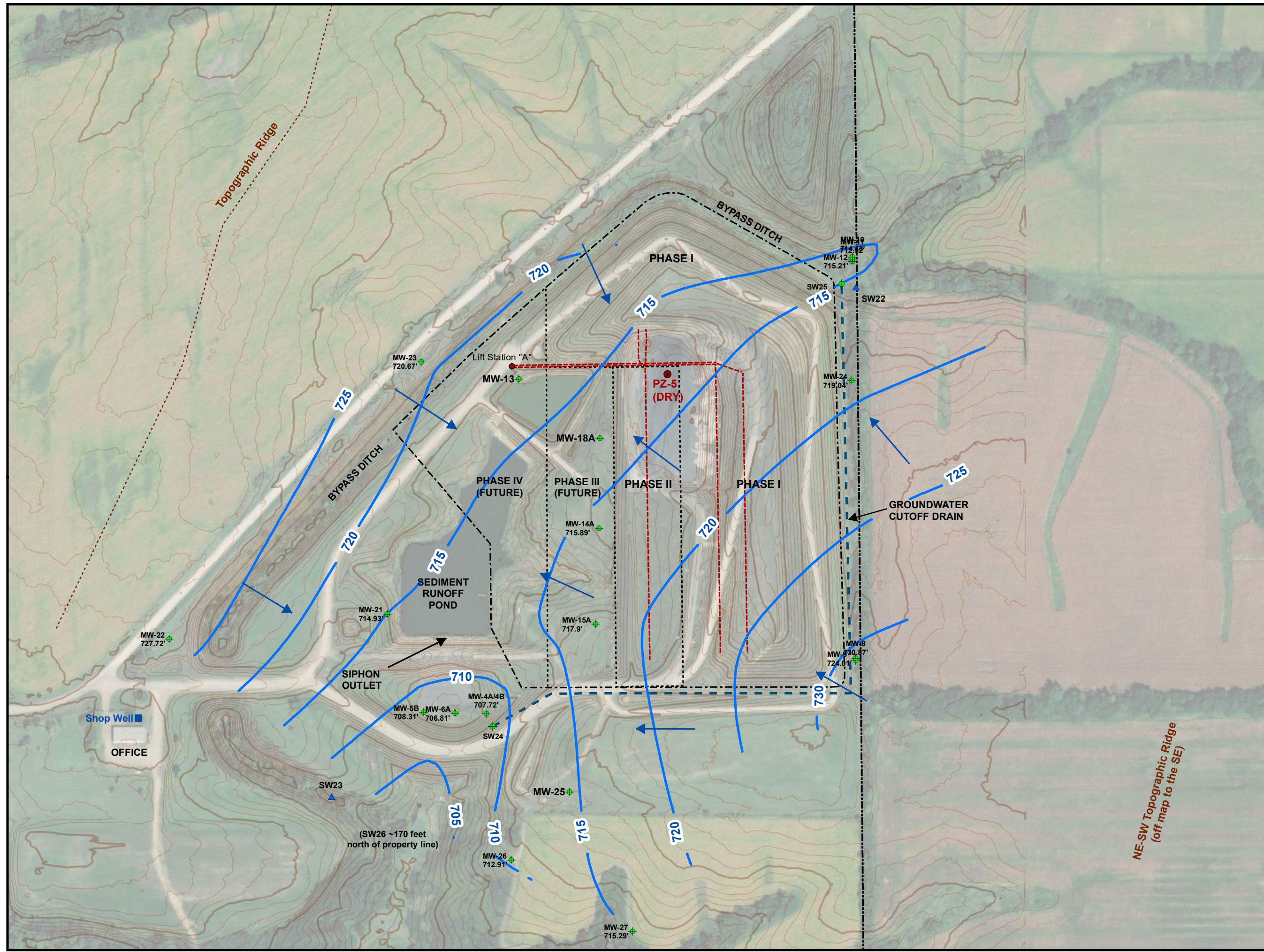
- ▲ Surface Water Points
- ◆ Groundwater Points
- Piezometers (Head, in feet)
- Shop Well
- Water Table (September 2021)
- - - Leachate Collection System
- - - Groundwater Cut-Off Drain
- Permitted Fill Area
- Phase Boundaries
- Property Line (Approx.)
- ← Groundwater Flow Direction

MW-13, MW-18A, PZ-1, PZ-2, PZ-3, PZ-4 were abandoned in 2019 and MW-25 was abandoned in 2020



0 275 Feet

Projected Coordinate System:
NAD 1983 StatePlane Iowa_South



APPENDIX B

TABLES

Table 1	Summary of Monitoring Wells and Piezometers
Table 2	Implementation Schedule
Table 3	Groundwater Monitoring Program Summary
Table 4	Groundwater Protection Standards (GWPS)

Table 1

**Summary of Monitoring Wells and Piezometers
2021 Groundwater Monitoring and Corrective Action Report
Muscatine Power & Water CCR Landfill
Permit No. #70-SDP-06-82P**

Well ID	State Plane ⁽¹⁾		WELL CONSTRUCTION ⁽²⁾					Function	Hydrogeologic Unit	WATER LEVELS (Feet, amsl) ⁽³⁾				
			Elevation		Well Depth	Screen Length	Screened Lithology			Low	High	Vertical Gradient 9/2021 ⁽⁴⁾	4/6/2021	9/2/2021
	Northing	Easting	Top of Well Casing	Ground										
PZ-5	511,495	2,269,505	729.63	727	10.00	1	CCR	Piezometer	CCR	DRY	DRY	N/A	DRY	DRY
MW-4B ⁽⁵⁾	510,484	2,268,975	715.87	712.04	24.70	10	Clay, Silt	Monitoring	Uppermost Aquifer	705.73	710.01	N/A	709.14	707.72
MW-5B	510,485	2,268,777	709.10	706.73	25.30	10	Silt, Clay	Monitoring	Uppermost Aquifer	704.07	708.31	N/A	708.09	708.31
MW-6A	510,482	2,268,871	708.92	706.49	25.35	10	Silt, Sand	Monitoring	Uppermost Aquifer	704.47	706.82	N/A	706.19	706.81
MW-8	510,639	2,270,068	747.36	744.37	42.95	10	Till	Monitoring	Uppermost Aquifer	728.06	737.74	0.434	734.98	730.87
MW-9	510,646	2,270,068	747.12	744.40	58.74	10	Till	Piezometer	Uppermost Aquifer	721.96	729.75	N/A	-	724.01
MW-10	511,846	2,270,058	718.51	716.32	20.32	10	Silt, Till	Monitoring	Uppermost Aquifer	710.89	715.10	0.035	714.98	714.18
MW-11	511,840	2,270,058	718.34	716.00	55.97	10	Till, Sand	Piezometer	Uppermost Aquifer	712.92	718.34	-0.069	-	712.92
MW-12	511,833	2,270,057	717.75	715.40	86.42	5	Till	Piezometer	Lower Confining Unit	713.13	717.75	N/A	-	715.21
MW-14A	511,035	2,269,301	729.00	726.19	20.50	10	Silt, Till, Clay	Monitoring	Uppermost Aquifer	712.59	719.55	N/A	719.55	715.89
MW-15A	510,748	2,269,291	729.99	727.12	20.50	10	Silt, Clay	Monitoring	Uppermost Aquifer	713.83	721.92	N/A	721.92	717.90
MW-21	510,779	2,268,668	725.75	722.81	22.20	10	Silt, Clay	Monitoring	Uppermost Aquifer	713.16	721.01	N/A	716.07	714.93
MW-22	510,704	2,268,017	744.27	741.13	41	10	Clay Till	Monitoring	Uppermost Aquifer	727.43	731.18	N/A	729.67	727.72
MW-23	511,532	2,268,770	726.90	723.73	25	10	Clay Till	Assessment	Uppermost Aquifer	719.37	723.02	N/A	721.99	720.67
MW-24	511,476	2,270,056	735.32	732.10	20	10	Clay Till	Assessment	Uppermost Aquifer	718.47	725.83	N/A	722.96	719.04
MW-26	510,044	2,269,037	731.08	727.35	38.27	10	Clay Till	Assessment	Uppermost Aquifer	712.65	712.91	N/A	712.75	712.91
MW-27	509,830	2,269,401	730.26	726.26	19.44	10	Sand Clay	Assessment	Uppermost Aquifer	716.08	718.43	N/A	718.43	715.29

(1) State Plane coordinates from MP&W in email dated 1/20/16 and 6/28/18. MP&W 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: 2002-2021 (for wells installed during a portion or the entire duration)

(4) Negative value is a discharge gradient; positive value is a recharge gradient. 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 available; N/A not applicable.

Table 2

Implementation Schedule
2021 Groundwater Monitoring and Corrective Action Report
Muscatine Power & Water CCR Landfill
Permit No. #70-SDP-06-82P

Monitoring Well	Well Function	Number Of Samples Collected In Each Monitoring Program June 2016 through 2019				Dates Of Completed Sampling Events And Constituents Tested						
						Establish Background Levels (Initial 8 Events)		Detection Monitoring	Resampling Events To Verify Initial SSI Over Background	Assessment Monitoring ⁽¹⁾	Corrective Action	
		Background	Detection	Assessment	Corrective Action	2016: Jun 6, Aug 15, Oct 10, Dec 12	2017: Feb 17, Apr 17, Jun 19, Aug 7	10/16/2017	11/28/2017	3/6, 6/19 & 8/29/2018 / 3/18 & 8/6/2019 / 4/7&9/24/2020 / 4/6&9/1/2021	None in 2021	
MW-4A/MW-4B	Downgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III		Appendix III & IV	N/A	
MW-5B	Downgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Chloride	Appendix III & IV	N/A	
MW-6A	Downgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III		Appendix III & IV	N/A	
MW-8	Upgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III		Appendix III & IV	N/A	
MW-10	Upgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III		Appendix III & IV	N/A	
MW-13 ⁽³⁾	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, sulfate, TDS	Appendix III & IV	N/A	
MW-14A	Downgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, chloride, sulfate, TDS	Appendix III & IV	N/A	
MW-15A	Downgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, chloride, sulfate, TDS	Appendix III & IV	N/A	
MW-18A ⁽³⁾	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, chloride, sulfate, TDS	Appendix III & IV	N/A	
MW-21	Downgradient	17	1	9	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, pH	Appendix III & IV	N/A	
						2018: Mar 6, June 19, Aug 29 2019: Mar18, Aug 6	2020: Apr 7, Sept 18 2021: Apr 6	9/1/2021				
MW-22 ⁽²⁾	Upgradient	8	1	8	N/A	Appendix III & IV	Appendix III & IV	Appendix III	N/A	N/A	N/A	
						2018: Jun 30, Aug 30 2019: Mar 18, Aug 6	2020: Apr 7, Sept 18 2021: Apr 6, Sept 1					
MW-23 ⁽²⁾	Upgradient	8	1	8	N/A	Appendix III & IV	Appendix III & IV	N/A	N/A	N/A	N/A	

(1) Assessment monitoring: the full Appendix III & IV constituent lists are tested.
(2) MW-22 installed in February 2018 as an additional background well.
(3) MW-13 and MW-18A were closed in 2019 due to damage and site construction following IDNR approval.

Table 3

Groundwater Monitoring Program Summary
2021 Groundwater Monitoring and Corrective Action Report
Muscatine Power & 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 Signifiant Increase (SSI) Over Background	Statistically Significant Trends	Statistically Significant Level (SSL) Over GWPS	Upcoming Sampling Dates And Constituents			
						Resample	Semi-Annual Assessment Monitoring: March 2022	Semi-Annual Assessment Monitoring: September 2022	Others TBD, if needed
MW-4A / MW-4B	Assessment	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV	
MW-5B	Assessment	None	Chloride	None	None	N/A	Appendix III & IV	Appendix III & IV	
MW-6A	Assessment	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV	
MW-8	Background	None	None	Downward: Sulfate, TDS	None	N/A	Appendix III & IV	Appendix III & IV	
MW-10	Background	None	None	Downward: TDS	None	N/A	Appendix III & IV	Appendix III & IV	
MW-13	Abandoned ⁽¹⁾	None	N/A	N/A	N/A	N/A	N/A	N/A	
MW-14A	Assessment	None	Boron, calcium, sulfate, TDS	Downward: Calcium, TDS	None	N/A	Appendix III & IV	Appendix III & IV	
MW-15A	Assessment	None	Boron, TDS	Downward: Boron, TDS	None	N/A	Appendix III & IV	Appendix III & IV	
MW-18A	Abandoned ⁽¹⁾	None	N/A	N/A	N/A	N/A	N/A	N/A	
MW-21	Assessment	None	Boron	Downward: TDS	None	N/A	Appendix III & IV	Appendix III & IV	
MW-22	Background	None	None	Upward: Sulfate	None	N/A	Appendix III & IV	Appendix III & IV	
MW-23	Background	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV	

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

To simplify the sampling program, MP&W elects to sample for Appendix III & IV constituents, except radium, during all events (as opposed to Appendix III + detected Appendix IV constituents).

SSI = Statistically Significant Increase above background

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

N/A = Not Applicable

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

Table 4

**Groundwater Protection Standards
 2021 Groundwater Monitoring and Corrective Action Report
 Muscatine Power & Water CCR Landfill
 Permit No. #70-SDP-06-82P**

Constituent	Unit	MCL	RSL	Statistical Background Limit	GWPS
Antimony	(mg/L)	0.006		0.002	0.006
Arsenic	(mg/L)	0.01		0.0078	0.01
Barium	(mg/L)	2		0.25	2
Beryllium	(mg/L)	0.004		0.001	0.004
Cadmium	(mg/L)	0.005		0.0001	0.005
Chromium	(mg/L)	0.1		0.005	0.1
Cobalt	(mg/L)	N/A	0.006	0.0056	0.006
Combined Radium	(pCi/L)	5		1.066	5
Fluoride	(mg/L)	4		0.86	4
Lead	(mg/L)	0.015		0.002	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	0.0082	0.1
Selenium	(mg/L)	0.05		0.005	0.05
Thallium	(mg/L)	0.002		0.001	0.002

All metals as Total recoverable.

MCL: Maximum Contaminant Level

RSL: Regional Screening Level

Statistical Background Limit: Groundwater Stats Consulting, 12/2/2021

GWPS: Ground Water Protection Standard

APPENDIX C

SAMPLING DATA

- April 6 and September 1, 2021 Sampling Events
 - Laboratory analytical Reports
 - Ground water sampling forms
 - Low Flow Sampling Forms
- Summary Tabulations of Analytical Results

ANALYTICAL REPORT

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

Laboratory Job ID: 310-203890-1
Client Project/Site: Muscatine Power & Water CCR

For:
Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
4/23/2021 1:03:12 PM

Shawn Hayes, Senior Project Manager
(319)229-8211
Shawn.Hayes@Eurofinset.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

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

Job ID: 310-203890-1

Job ID: 310-203890-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative 310-203890-1

Comments

No additional comments.

Receipt

The samples were received on 4/8/2021 10:10 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.9° C and 2.1° C.

HPLC/IC

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

Metals

Method 6020A: The continuing calibration verification (CCV) associated with batch 310-313142 recovered above the upper control limit for Boron. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: MW-4B (310-203890-1), MW-5B (310-203890-2), MW-6A (310-203890-3), MW-8 (310-203890-4) and MW-10 (310-203890-5).

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

General Chemistry

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



Sample Summary

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

Job ID: 310-203890-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-203890-1	MW-4B	Ground Water	04/06/21 19:15	04/08/21 10:10	
310-203890-2	MW-5B	Ground Water	04/07/21 07:35	04/08/21 10:10	
310-203890-3	MW-6A	Ground Water	04/07/21 09:25	04/08/21 10:10	
310-203890-4	MW-8	Ground Water	04/06/21 14:15	04/08/21 10:10	
310-203890-5	MW-10	Ground Water	04/06/21 08:40	04/08/21 10:10	
310-203890-6	MW-14A	Ground Water	04/06/21 17:20	04/08/21 10:10	
310-203890-7	MW-15A	Ground Water	04/06/21 18:20	04/08/21 10:10	
310-203890-8	MW-21	Ground Water	04/06/21 15:35	04/08/21 10:10	
310-203890-9	MW-22	Ground Water	04/06/21 14:50	04/08/21 10:10	
310-203890-10	MW-23	Ground Water	04/05/21 15:05	04/08/21 10:10	
310-203890-14	DUP-1	Ground Water	04/06/21 12:00	04/08/21 10:10	
310-203890-15	DUP-2	Ground Water	04/06/21 12:00	04/08/21 10:10	

Detection Summary

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

Job ID: 310-203890-1

Client Sample ID: MW-4B

Lab Sample ID: 310-203890-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	22.9		5.00		mg/L	5		9056A	Total/NA
Sulfate	60.1		5.00		mg/L	5		9056A	Total/NA
Barium	0.169		0.00200		mg/L	1		6020A	Total/NA
Calcium	94.1		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.00132		0.000500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	380		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-203890-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	42.7		5.00		mg/L	5		9056A	Total/NA
Sulfate	57.4		5.00		mg/L	5		9056A	Total/NA
Barium	0.252		0.00200		mg/L	1		6020A	Total/NA
Calcium	104		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	434		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-6A

Lab Sample ID: 310-203890-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	19.3		5.00		mg/L	5		9056A	Total/NA
Sulfate	27.3		5.00		mg/L	5		9056A	Total/NA
Barium	0.245		0.00200		mg/L	1		6020A	Total/NA
Calcium	87.6		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	330		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-8

Lab Sample ID: 310-203890-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	22.3		5.00		mg/L	5		9056A	Total/NA
Sulfate	99.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.0596		0.00200		mg/L	1		6020A	Total/NA
Calcium	81.2		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.000839		0.000500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	382		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-10

Lab Sample ID: 310-203890-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	27.6		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00393		0.00200		mg/L	1		6020A	Total/NA
Barium	0.196		0.00200		mg/L	1		6020A	Total/NA
Calcium	78.8		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.000752		0.000500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	322		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Detection Summary

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

Job ID: 310-203890-1

Client Sample ID: MW-14A

Lab Sample ID: 310-203890-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	952		20.0		mg/L	20		9056A	Total/NA
Barium	0.0355		0.00200		mg/L	1		6020A	Total/NA
Boron	17.2		1.00		mg/L	10		6020A	Total/NA
Calcium	259		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1290		150		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-15A

Lab Sample ID: 310-203890-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15.0		5.00		mg/L	5		9056A	Total/NA
Fluoride	0.516		0.500		mg/L	5		9056A	Total/NA
Sulfate	338		5.00		mg/L	5		9056A	Total/NA
Barium	0.0365		0.00200		mg/L	1		6020A	Total/NA
Boron	10.3		1.00		mg/L	10		6020A	Total/NA
Calcium	128		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	738		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-21

Lab Sample ID: 310-203890-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.14		5.00		mg/L	5		9056A	Total/NA
Sulfate	237		5.00		mg/L	5		9056A	Total/NA
Barium	0.0309		0.00200		mg/L	1		6020A	Total/NA
Boron	5.24		0.400		mg/L	4		6020A	Total/NA
Calcium	79.5		0.500		mg/L	1		6020A	Total/NA
Chromium	0.00708		0.00500		mg/L	1		6020A	Total/NA
Lithium	0.0198		0.0100		mg/L	1		6020A	Total/NA
Total Dissolved Solids	540		30.0		mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-22

Lab Sample ID: 310-203890-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	28.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	154		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00289		0.00200		mg/L	1		6020A	Total/NA
Barium	0.242		0.00200		mg/L	1		6020A	Total/NA
Calcium	78.4		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	412		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-23

Lab Sample ID: 310-203890-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	21.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	35.5		5.00		mg/L	5		9056A	Total/NA
Barium	0.0608		0.00200		mg/L	1		6020A	Total/NA
Calcium	56.3		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.000517		0.000500		mg/L	1		6020A	Total/NA
Lead	0.000624		0.000500		mg/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Detection Summary

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

Job ID: 310-203890-1

Client Sample ID: MW-23 (Continued)

Lab Sample ID: 310-203890-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	274		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUP-1

Lab Sample ID: 310-203890-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	31.6		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00394		0.00200		mg/L	1		6020A	Total/NA
Barium	0.191		0.00200		mg/L	1		6020A	Total/NA
Calcium	77.5		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.000752		0.000500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	314		30.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUP-2

Lab Sample ID: 310-203890-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	6.06		5.00		mg/L	5		9056A	Total/NA
Sulfate	239		5.00		mg/L	5		9056A	Total/NA
Barium	0.0298		0.00200		mg/L	1		6020A	Total/NA
Boron	4.84		0.400		mg/L	4		6020A	Total/NA
Calcium	75.3		0.500		mg/L	1		6020A	Total/NA
Chromium	0.00680		0.00500		mg/L	1		6020A	Total/NA
Lithium	0.0193		0.0100		mg/L	1		6020A	Total/NA
Total Dissolved Solids	510		30.0		mg/L	1		SM 2540C	Total/NA
pH	6.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-4B

Lab Sample ID: 310-203890-1

Date Collected: 04/06/21 19:15

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22.9		5.00		mg/L			04/13/21 13:33	5
Fluoride	<0.500		0.500		mg/L			04/13/21 13:33	5
Sulfate	60.1		5.00		mg/L			04/13/21 13:33	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:47	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:47	1
Barium	0.169		0.00200		mg/L		04/12/21 09:00	04/16/21 13:47	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:47	1
Boron	<0.100	^+	0.100		mg/L		04/12/21 09:00	04/16/21 13:47	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 13:47	1
Calcium	94.1		0.500		mg/L		04/12/21 09:00	04/16/21 13:47	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:47	1
Cobalt	0.00132		0.000500		mg/L		04/12/21 09:00	04/16/21 13:47	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:47	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 13:47	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:47	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:47	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:47	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	380		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-5B

Lab Sample ID: 310-203890-2

Date Collected: 04/07/21 07:35

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	42.7		5.00		mg/L			04/13/21 13:48	5
Fluoride	<0.500		0.500		mg/L			04/13/21 13:48	5
Sulfate	57.4		5.00		mg/L			04/13/21 13:48	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:49	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:49	1
Barium	0.252		0.00200		mg/L		04/12/21 09:00	04/16/21 13:49	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:49	1
Boron	<0.100	^+	0.100		mg/L		04/12/21 09:00	04/16/21 13:49	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 13:49	1
Calcium	104		0.500		mg/L		04/12/21 09:00	04/16/21 13:49	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:49	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:49	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:49	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 13:49	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:49	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:49	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:49	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	434		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-6A

Lab Sample ID: 310-203890-3

Date Collected: 04/07/21 09:25

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	19.3		5.00		mg/L			04/13/21 14:35	5
Fluoride	<0.500		0.500		mg/L			04/13/21 14:35	5
Sulfate	27.3		5.00		mg/L			04/13/21 14:35	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:52	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:52	1
Barium	0.245		0.00200		mg/L		04/12/21 09:00	04/16/21 13:52	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:52	1
Boron	<0.100	^+	0.100		mg/L		04/12/21 09:00	04/16/21 13:52	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 13:52	1
Calcium	87.6		0.500		mg/L		04/12/21 09:00	04/16/21 13:52	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:52	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:52	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:52	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 13:52	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:52	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:52	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:52	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	330		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-8

Lab Sample ID: 310-203890-4

Date Collected: 04/06/21 14:15

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22.3		5.00		mg/L			04/13/21 14:51	5
Fluoride	<0.500		0.500		mg/L			04/13/21 14:51	5
Sulfate	99.7		5.00		mg/L			04/13/21 14:51	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:55	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:55	1
Barium	0.0596		0.00200		mg/L		04/12/21 09:00	04/16/21 13:55	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:55	1
Boron	<0.100	^+	0.100		mg/L		04/12/21 09:00	04/16/21 13:55	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 13:55	1
Calcium	81.2		0.500		mg/L		04/12/21 09:00	04/16/21 13:55	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:55	1
Cobalt	0.000839		0.000500		mg/L		04/12/21 09:00	04/16/21 13:55	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:55	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 13:55	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:55	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:55	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:55	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	382		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-10

Lab Sample ID: 310-203890-5

Date Collected: 04/06/21 08:40

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			04/22/21 13:35	5
Fluoride	<0.500		0.500		mg/L			04/22/21 13:35	5
Sulfate	27.6		5.00		mg/L			04/22/21 13:35	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:57	1
Arsenic	0.00393		0.00200		mg/L		04/12/21 09:00	04/16/21 13:57	1
Barium	0.196		0.00200		mg/L		04/12/21 09:00	04/16/21 13:57	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:57	1
Boron	<0.100	^+	0.100		mg/L		04/12/21 09:00	04/16/21 13:57	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 13:57	1
Calcium	78.8		0.500		mg/L		04/12/21 09:00	04/16/21 13:57	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:57	1
Cobalt	0.000752		0.000500		mg/L		04/12/21 09:00	04/16/21 13:57	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:57	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 13:57	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:57	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:57	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:57	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	322		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-14A

Lab Sample ID: 310-203890-6

Date Collected: 04/06/21 17:20

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.1		5.00		mg/L			04/13/21 15:22	5
Fluoride	<0.500		0.500		mg/L			04/13/21 15:22	5
Sulfate	952		20.0		mg/L			04/13/21 15:37	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:00	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:00	1
Barium	0.0355		0.00200		mg/L		04/12/21 09:00	04/16/21 14:00	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:00	1
Boron	17.2		1.00		mg/L		04/12/21 09:00	04/19/21 16:00	10
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 14:00	1
Calcium	259		0.500		mg/L		04/12/21 09:00	04/16/21 14:00	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:00	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:00	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:00	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 14:00	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:00	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:00	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:00	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1290		150		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-15A

Lab Sample ID: 310-203890-7

Date Collected: 04/06/21 18:20

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.0		5.00		mg/L			04/13/21 15:53	5
Fluoride	0.516		0.500		mg/L			04/13/21 15:53	5
Sulfate	338		5.00		mg/L			04/13/21 15:53	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:03	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:03	1
Barium	0.0365		0.00200		mg/L		04/12/21 09:00	04/16/21 14:03	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:03	1
Boron	10.3		1.00		mg/L		04/12/21 09:00	04/19/21 16:03	10
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 14:03	1
Calcium	128		0.500		mg/L		04/12/21 09:00	04/16/21 14:03	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:03	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:03	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:03	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 14:03	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:03	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:03	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	738		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-21

Lab Sample ID: 310-203890-8

Date Collected: 04/06/21 15:35

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.14		5.00		mg/L			04/22/21 14:06	5
Fluoride	<0.500		0.500		mg/L			04/22/21 14:06	5
Sulfate	237		5.00		mg/L			04/22/21 14:06	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:19	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:19	1
Barium	0.0309		0.00200		mg/L		04/12/21 09:00	04/16/21 14:19	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:19	1
Boron	5.24		0.400		mg/L		04/12/21 09:00	04/19/21 16:06	4
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 14:19	1
Calcium	79.5		0.500		mg/L		04/12/21 09:00	04/16/21 14:19	1
Chromium	0.00708		0.00500		mg/L		04/12/21 09:00	04/16/21 14:19	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:19	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:19	1
Lithium	0.0198		0.0100		mg/L		04/12/21 09:00	04/16/21 14:19	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:19	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:19	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:19	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	540		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-22

Lab Sample ID: 310-203890-9

Date Collected: 04/06/21 14:50

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28.1		5.00		mg/L			04/13/21 16:24	5
Fluoride	<0.500		0.500		mg/L			04/13/21 16:24	5
Sulfate	154		5.00		mg/L			04/13/21 16:24	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:24	1
Arsenic	0.00289		0.00200		mg/L		04/12/21 09:00	04/16/21 14:24	1
Barium	0.242		0.00200		mg/L		04/12/21 09:00	04/16/21 14:24	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:24	1
Boron	<0.100		0.100		mg/L		04/12/21 09:00	04/19/21 16:11	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 14:24	1
Calcium	78.4		0.500		mg/L		04/12/21 09:00	04/16/21 14:24	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:24	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:24	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:24	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 14:24	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:24	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:24	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	412		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: MW-23
 Date Collected: 04/05/21 15:05
 Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-10
 Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21.4		5.00		mg/L			04/13/21 16:40	5
Fluoride	<0.500		0.500		mg/L			04/13/21 16:40	5
Sulfate	35.5		5.00		mg/L			04/13/21 16:40	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:27	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:27	1
Barium	0.0608		0.00200		mg/L		04/12/21 09:00	04/16/21 14:27	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:27	1
Boron	<0.100		0.100		mg/L		04/12/21 09:00	04/19/21 16:14	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 14:27	1
Calcium	56.3		0.500		mg/L		04/12/21 09:00	04/16/21 14:27	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:27	1
Cobalt	0.000517		0.000500		mg/L		04/12/21 09:00	04/16/21 14:27	1
Lead	0.000624		0.000500		mg/L		04/12/21 09:00	04/16/21 14:27	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 14:27	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:27	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:27	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:27	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	274		30.0		mg/L			04/09/21 11:45	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: DUP-1
Date Collected: 04/06/21 12:00
Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-14
Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			04/13/21 18:13	5
Fluoride	<0.500		0.500		mg/L			04/13/21 18:13	5
Sulfate	31.6		5.00		mg/L			04/13/21 18:13	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:38	1
Arsenic	0.00394		0.00200		mg/L		04/12/21 09:00	04/16/21 14:38	1
Barium	0.191		0.00200		mg/L		04/12/21 09:00	04/16/21 14:38	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:38	1
Boron	<0.100		0.100		mg/L		04/12/21 09:00	04/19/21 16:25	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 14:38	1
Calcium	77.5		0.500		mg/L		04/12/21 09:00	04/16/21 14:38	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:38	1
Cobalt	0.000752		0.000500		mg/L		04/12/21 09:00	04/16/21 14:38	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:38	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 14:38	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:38	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:38	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:38	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	314		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			04/09/21 16:44	1

Client Sample Results

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

Job ID: 310-203890-1

Client Sample ID: DUP-2

Lab Sample ID: 310-203890-15

Date Collected: 04/06/21 12:00

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.06		5.00		mg/L			04/13/21 18:29	5
Fluoride	<0.500		0.500		mg/L			04/13/21 18:29	5
Sulfate	239		5.00		mg/L			04/13/21 18:29	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:40	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:40	1
Barium	0.0298		0.00200		mg/L		04/12/21 09:00	04/16/21 14:40	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:40	1
Boron	4.84		0.400		mg/L		04/12/21 09:00	04/19/21 16:41	4
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 14:40	1
Calcium	75.3		0.500		mg/L		04/12/21 09:00	04/16/21 14:40	1
Chromium	0.00680		0.00500		mg/L		04/12/21 09:00	04/16/21 14:40	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:40	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 14:40	1
Lithium	0.0193		0.0100		mg/L		04/12/21 09:00	04/16/21 14:40	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 14:40	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 14:40	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 14:40	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	510		30.0		mg/L			04/13/21 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.6	HF	0.1		SU			04/09/21 16:44	1

Definitions/Glossary

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

Job ID: 310-203890-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.

General Chemistry

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

Glossary

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

QC Sample Results

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

Job ID: 310-203890-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-313016/3
Matrix: Water
Analysis Batch: 313016

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			04/13/21 12:15	1
Fluoride	<0.100		0.100		mg/L			04/13/21 12:15	1
Sulfate	<1.00		1.00		mg/L			04/13/21 12:15	1

Lab Sample ID: LCS 310-313016/4
Matrix: Water
Analysis Batch: 313016

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	9.246		mg/L		92	90 - 110
Fluoride	2.00	2.003		mg/L		100	90 - 110
Sulfate	10.0	9.909		mg/L		99	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-312237/1-A
Matrix: Water
Analysis Batch: 313142

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 312237

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:12	1
Arsenic	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:12	1
Barium	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:12	1
Beryllium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:12	1
Boron	<0.100		0.100		mg/L		04/12/21 09:00	04/16/21 13:12	1
Cadmium	<0.000100		0.000100		mg/L		04/12/21 09:00	04/16/21 13:12	1
Calcium	<0.500		0.500		mg/L		04/12/21 09:00	04/16/21 13:12	1
Chromium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:12	1
Cobalt	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:12	1
Lead	<0.000500		0.000500		mg/L		04/12/21 09:00	04/16/21 13:12	1
Lithium	<0.0100		0.0100		mg/L		04/12/21 09:00	04/16/21 13:12	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/21 09:00	04/16/21 13:12	1
Selenium	<0.00500		0.00500		mg/L		04/12/21 09:00	04/16/21 13:12	1
Thallium	<0.00100		0.00100		mg/L		04/12/21 09:00	04/16/21 13:12	1

Lab Sample ID: LCS 310-312237/2-A
Matrix: Water
Analysis Batch: 313142

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 312237

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.200	0.1994		mg/L		100	80 - 120
Arsenic	0.200	0.2110		mg/L		105	80 - 120
Barium	0.100	0.1055		mg/L		106	80 - 120
Beryllium	0.100	0.1012		mg/L		101	80 - 120
Boron	0.200	0.1914		mg/L		96	80 - 120
Cadmium	0.100	0.1010		mg/L		101	80 - 120
Calcium	2.00	1.753		mg/L		88	80 - 120
Chromium	0.100	0.1019		mg/L		102	80 - 120
Cobalt	0.100	0.1018		mg/L		102	80 - 120

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QC Sample Results

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

Job ID: 310-203890-1

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

Lab Sample ID: LCS 310-312237/2-A
Matrix: Water
Analysis Batch: 313142

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 312237

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	0.200	0.2019		mg/L		101	80 - 120
Lithium	0.200	0.2023		mg/L		101	80 - 120
Molybdenum	0.200	0.1973		mg/L		99	80 - 120
Selenium	0.400	0.4040		mg/L		101	80 - 120
Thallium	0.200	0.2116		mg/L		106	80 - 120

Lab Sample ID: 310-203890-8 DU
Matrix: Ground Water
Analysis Batch: 313142

Client Sample ID: MW-21
Prep Type: Total/NA
Prep Batch: 312237

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	<0.00200		<0.00200		mg/L		NC	20
Arsenic	<0.00200		<0.00200		mg/L		NC	20
Barium	0.0309		0.03077		mg/L		0.6	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Cadmium	<0.000100		<0.000100		mg/L		NC	20
Calcium	79.5		78.67		mg/L		1	20
Chromium	0.00708		0.007097		mg/L		0.3	20
Cobalt	<0.000500		<0.000500		mg/L		NC	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Lithium	0.0198		0.01937		mg/L		2	20
Molybdenum	<0.00200		<0.00200		mg/L		NC	20
Selenium	<0.00500		<0.00500		mg/L		NC	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Lab Sample ID: 310-203890-8 DU
Matrix: Ground Water
Analysis Batch: 313305

Client Sample ID: MW-21
Prep Type: Total/NA
Prep Batch: 312237

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Boron	5.24		5.294		mg/L		0.9	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-313041/1-A
Matrix: Water
Analysis Batch: 313250

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 313041

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/16/21 14:16	04/19/21 15:03	1

Lab Sample ID: LCS 310-313041/2-A
Matrix: Water
Analysis Batch: 313250

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313041

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001581		mg/L		95	80 - 120

QC Sample Results

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

Job ID: 310-203890-1

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

Lab Sample ID: 310-203890-1 MS
Matrix: Ground Water
Analysis Batch: 313250

Client Sample ID: MW-4B
Prep Type: Total/NA
Prep Batch: 313041
 %Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	<0.000200		0.00167	0.001493		mg/L		90	80 - 120

Lab Sample ID: 310-203890-1 MSD
Matrix: Ground Water
Analysis Batch: 313250

Client Sample ID: MW-4B
Prep Type: Total/NA
Prep Batch: 313041
 %Rec. RPD

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	<0.000200		0.00167	0.001476		mg/L		89	80 - 120	1	20

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

Lab Sample ID: MB 310-312192/1
Matrix: Water
Analysis Batch: 312192

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	<30.0		30.0		mg/L			04/09/21 11:45	1

Lab Sample ID: LCS 310-312192/2
Matrix: Water
Analysis Batch: 312192

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	962.0		mg/L		96	90 - 110

Lab Sample ID: MB 310-312533/1
Matrix: Water
Analysis Batch: 312533

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	<30.0		30.0		mg/L			04/13/21 11:54	1

Lab Sample ID: LCS 310-312533/2
Matrix: Water
Analysis Batch: 312533

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	966.0		mg/L		97	90 - 110

Lab Sample ID: 310-203890-9 DU
Matrix: Ground Water
Analysis Batch: 312533

Client Sample ID: MW-22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	412		416.0		mg/L		1	20

QC Association Summary

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

Job ID: 310-203890-1

HPLC/IC

Analysis Batch: 313016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	9056A	
310-203890-2	MW-5B	Total/NA	Ground Water	9056A	
310-203890-3	MW-6A	Total/NA	Ground Water	9056A	
310-203890-4	MW-8	Total/NA	Ground Water	9056A	
310-203890-5	MW-10	Total/NA	Ground Water	9056A	
310-203890-6	MW-14A	Total/NA	Ground Water	9056A	
310-203890-6	MW-14A	Total/NA	Ground Water	9056A	
310-203890-7	MW-15A	Total/NA	Ground Water	9056A	
310-203890-8	MW-21	Total/NA	Ground Water	9056A	
310-203890-9	MW-22	Total/NA	Ground Water	9056A	
310-203890-10	MW-23	Total/NA	Ground Water	9056A	
310-203890-14	DUP-1	Total/NA	Ground Water	9056A	
310-203890-15	DUP-2	Total/NA	Ground Water	9056A	
MB 310-313016/3	Method Blank	Total/NA	Water	9056A	
LCS 310-313016/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 312237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	3010A	
310-203890-2	MW-5B	Total/NA	Ground Water	3010A	
310-203890-3	MW-6A	Total/NA	Ground Water	3010A	
310-203890-4	MW-8	Total/NA	Ground Water	3010A	
310-203890-5	MW-10	Total/NA	Ground Water	3010A	
310-203890-6	MW-14A	Total/NA	Ground Water	3010A	
310-203890-7	MW-15A	Total/NA	Ground Water	3010A	
310-203890-8	MW-21	Total/NA	Ground Water	3010A	
310-203890-9	MW-22	Total/NA	Ground Water	3010A	
310-203890-10	MW-23	Total/NA	Ground Water	3010A	
310-203890-14	DUP-1	Total/NA	Ground Water	3010A	
310-203890-15	DUP-2	Total/NA	Ground Water	3010A	
MB 310-312237/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-312237/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-203890-8 DU	MW-21	Total/NA	Ground Water	3010A	

Prep Batch: 313041

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	7470A	
310-203890-2	MW-5B	Total/NA	Ground Water	7470A	
310-203890-3	MW-6A	Total/NA	Ground Water	7470A	
310-203890-4	MW-8	Total/NA	Ground Water	7470A	
310-203890-5	MW-10	Total/NA	Ground Water	7470A	
310-203890-6	MW-14A	Total/NA	Ground Water	7470A	
310-203890-7	MW-15A	Total/NA	Ground Water	7470A	
310-203890-8	MW-21	Total/NA	Ground Water	7470A	
310-203890-9	MW-22	Total/NA	Ground Water	7470A	
310-203890-10	MW-23	Total/NA	Ground Water	7470A	
310-203890-14	DUP-1	Total/NA	Ground Water	7470A	
310-203890-15	DUP-2	Total/NA	Ground Water	7470A	
MB 310-313041/1-A	Method Blank	Total/NA	Water	7470A	

QC Association Summary

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

Job ID: 310-203890-1

Metals (Continued)

Prep Batch: 313041 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-313041/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-203890-1 MS	MW-4B	Total/NA	Ground Water	7470A	
310-203890-1 MSD	MW-4B	Total/NA	Ground Water	7470A	

Analysis Batch: 313142

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	6020A	312237
310-203890-2	MW-5B	Total/NA	Ground Water	6020A	312237
310-203890-3	MW-6A	Total/NA	Ground Water	6020A	312237
310-203890-4	MW-8	Total/NA	Ground Water	6020A	312237
310-203890-5	MW-10	Total/NA	Ground Water	6020A	312237
310-203890-6	MW-14A	Total/NA	Ground Water	6020A	312237
310-203890-7	MW-15A	Total/NA	Ground Water	6020A	312237
310-203890-8	MW-21	Total/NA	Ground Water	6020A	312237
310-203890-9	MW-22	Total/NA	Ground Water	6020A	312237
310-203890-10	MW-23	Total/NA	Ground Water	6020A	312237
310-203890-14	DUP-1	Total/NA	Ground Water	6020A	312237
310-203890-15	DUP-2	Total/NA	Ground Water	6020A	312237
MB 310-312237/1-A	Method Blank	Total/NA	Water	6020A	312237
LCS 310-312237/2-A	Lab Control Sample	Total/NA	Water	6020A	312237
310-203890-8 DU	MW-21	Total/NA	Ground Water	6020A	312237

Analysis Batch: 313250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	7470A	313041
310-203890-2	MW-5B	Total/NA	Ground Water	7470A	313041
310-203890-3	MW-6A	Total/NA	Ground Water	7470A	313041
310-203890-4	MW-8	Total/NA	Ground Water	7470A	313041
310-203890-5	MW-10	Total/NA	Ground Water	7470A	313041
310-203890-6	MW-14A	Total/NA	Ground Water	7470A	313041
310-203890-7	MW-15A	Total/NA	Ground Water	7470A	313041
310-203890-8	MW-21	Total/NA	Ground Water	7470A	313041
310-203890-9	MW-22	Total/NA	Ground Water	7470A	313041
310-203890-10	MW-23	Total/NA	Ground Water	7470A	313041
310-203890-14	DUP-1	Total/NA	Ground Water	7470A	313041
310-203890-15	DUP-2	Total/NA	Ground Water	7470A	313041
MB 310-313041/1-A	Method Blank	Total/NA	Water	7470A	313041
LCS 310-313041/2-A	Lab Control Sample	Total/NA	Water	7470A	313041
310-203890-1 MS	MW-4B	Total/NA	Ground Water	7470A	313041
310-203890-1 MSD	MW-4B	Total/NA	Ground Water	7470A	313041

Analysis Batch: 313305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-6	MW-14A	Total/NA	Ground Water	6020A	312237
310-203890-7	MW-15A	Total/NA	Ground Water	6020A	312237
310-203890-8	MW-21	Total/NA	Ground Water	6020A	312237
310-203890-9	MW-22	Total/NA	Ground Water	6020A	312237
310-203890-10	MW-23	Total/NA	Ground Water	6020A	312237
310-203890-14	DUP-1	Total/NA	Ground Water	6020A	312237
310-203890-15	DUP-2	Total/NA	Ground Water	6020A	312237
310-203890-8 DU	MW-21	Total/NA	Ground Water	6020A	312237

QC Association Summary

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

Job ID: 310-203890-1

General Chemistry

Analysis Batch: 312192

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-10	MW-23	Total/NA	Ground Water	SM 2540C	
MB 310-312192/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-312192/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 312256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-2	MW-5B	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-3	MW-6A	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-4	MW-8	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-5	MW-10	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-6	MW-14A	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-7	MW-15A	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-8	MW-21	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-9	MW-22	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-10	MW-23	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-14	DUP-1	Total/NA	Ground Water	SM 4500 H+ B	
310-203890-15	DUP-2	Total/NA	Ground Water	SM 4500 H+ B	
LCS 310-312256/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCS 310-312256/26	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 312533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	SM 2540C	
310-203890-2	MW-5B	Total/NA	Ground Water	SM 2540C	
310-203890-3	MW-6A	Total/NA	Ground Water	SM 2540C	
310-203890-4	MW-8	Total/NA	Ground Water	SM 2540C	
310-203890-5	MW-10	Total/NA	Ground Water	SM 2540C	
310-203890-6	MW-14A	Total/NA	Ground Water	SM 2540C	
310-203890-7	MW-15A	Total/NA	Ground Water	SM 2540C	
310-203890-8	MW-21	Total/NA	Ground Water	SM 2540C	
310-203890-9	MW-22	Total/NA	Ground Water	SM 2540C	
310-203890-14	DUP-1	Total/NA	Ground Water	SM 2540C	
310-203890-15	DUP-2	Total/NA	Ground Water	SM 2540C	
MB 310-312533/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-312533/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-203890-9 DU	MW-22	Total/NA	Ground Water	SM 2540C	

Lab Chronicle

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

Job ID: 310-203890-1

Client Sample ID: MW-4B
Date Collected: 04/06/21 19:15
Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-1
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 13:33	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 13:47	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:08	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-5B
Date Collected: 04/07/21 07:35
Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-2
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 13:48	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 13:49	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:14	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-6A
Date Collected: 04/07/21 09:25
Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-3
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 14:35	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 13:52	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:16	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-8
Date Collected: 04/06/21 14:15
Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-4
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 14:51	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 13:55	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:23	HED	TAL CF

Eurofins TestAmerica, Cedar Falls

Lab Chronicle

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

Job ID: 310-203890-1

Client Sample ID: MW-8

Date Collected: 04/06/21 14:15

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-10

Date Collected: 04/06/21 08:40

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/22/21 13:35	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 13:57	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:25	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-14A

Date Collected: 04/06/21 17:20

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 15:22	CJT	TAL CF
Total/NA	Analysis	9056A		20	313016	04/13/21 15:37	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 14:00	SAD	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		10	313305	04/19/21 16:00	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:27	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-15A

Date Collected: 04/06/21 18:20

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 15:53	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 14:03	SAD	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		10	313305	04/19/21 16:03	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:29	HED	TAL CF

Eurofins TestAmerica, Cedar Falls

Lab Chronicle

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

Job ID: 310-203890-1

Client Sample ID: MW-15A

Date Collected: 04/06/21 18:20

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-21

Date Collected: 04/06/21 15:35

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-8

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/22/21 14:06	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 14:19	SAD	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		4	313305	04/19/21 16:06	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:31	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-22

Date Collected: 04/06/21 14:50

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-9

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 16:24	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 14:24	SAD	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313305	04/19/21 16:11	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:33	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: MW-23

Date Collected: 04/05/21 15:05

Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-10

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 16:40	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 14:27	SAD	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313305	04/19/21 16:14	SAD	TAL CF

Lab Chronicle

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

Job ID: 310-203890-1

Client Sample ID: MW-23

Lab Sample ID: 310-203890-10

Date Collected: 04/05/21 15:05

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:36	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312192	04/09/21 11:45	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: DUP-1

Lab Sample ID: 310-203890-14

Date Collected: 04/06/21 12:00

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 18:13	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 14:38	SAD	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313305	04/19/21 16:25	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:38	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Client Sample ID: DUP-2

Lab Sample ID: 310-203890-15

Date Collected: 04/06/21 12:00

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	313016	04/13/21 18:29	CJT	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	313142	04/16/21 14:40	SAD	TAL CF
Total/NA	Prep	3010A			312237	04/12/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		4	313305	04/19/21 16:41	SAD	TAL CF
Total/NA	Prep	7470A			313041	04/16/21 14:16	HED	TAL CF
Total/NA	Analysis	7470A		1	313250	04/19/21 15:40	HED	TAL CF
Total/NA	Analysis	SM 2540C		1	312533	04/13/21 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	312256	04/09/21 16:44	AJW	TAL CF

Laboratory References:

TAL CF = Eurofins TestAmerica, 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

Job ID: 310-203890-1

Laboratory: Eurofins TestAmerica, Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-21
Georgia	State	IA100001 (OR)	09-29-21
Illinois	NELAP	200024	11-29-21
Iowa	State	007	12-01-21
Kansas	NELAP	E-10341	01-31-22
Minnesota	NELAP	019-999-319	12-31-21
Minnesota (Petrofund)	State	3349	08-22-21
North Dakota	State	R-186	09-29-21
Oregon	NELAP	IA100001	09-29-21
USDA	US Federal Programs	P330-19-00003	01-02-22

Method Summary

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

Job ID: 310-203890-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

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

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

Laboratory References:

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



Environment Testing
TestAmerica



310-203890 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscadine Power & Water</u>		
City/State: <u>Muscadine</u> <small>CITY</small> <u>GA</u> <small>STATE</small>	Project:	
Receipt Information		
Date/Time Received: <u>4/8/21</u> <small>DATE</small> <u>1010</u> <small>TIME</small>	Received By: <u>[Signature]</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
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 # <u>1</u> of <u>2</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
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>Q</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>2.1</u>	Corrected Temp (°C): <u>2.1</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
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		
Additional Comments		

Document: CF-LG-WI-002
Revision: 25
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

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



Environment Testing
TestAmerica

Place COC scanning label
here

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscotina Power & Water</u>		
City/State: <small>CITY</small> <u>Muscotina</u> <small>STATE</small> <u>IA</u>	Project:	
Receipt Information		
Date/Time Received: <small>DATE</small> <u>4/8/21</u> <small>TIME</small> <u>1010</u>	Received By: <u>sel</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
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 # <u>2</u> of <u>2</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
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>2</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>0.9</u>	Corrected Temp (°C): <u>0.9</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
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		
Additional Comments		

Document: CF-LG-WI-002
Revision: 25
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

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

TestAmerica Cedar Falls

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

Chain of Custody Record



THE LEADER IN ENVIRONMENTAL TESTING

Client Information Client Contact: Sam Bennett Phone: 563/262-3583 Company: Muscatine Power & Water		Lab PM: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com		Carrier Tracking No(s): COC No:								
Address: 1700 Dick Drake Way City: Muscatine State: IA, 52761 Phone: 211753 Email: sbennett@mpw.org and ramundson@hrgreen.com		Due Date Requested: Normal TAT Requested (days): PO #: 211753 W/O #:		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - log J - DI Water K - EDTA L - EDA Other:								
Project Name: Muscatine Power & Water CCR Landfill Site: Iowa		TestAmerica Project #: 31007856 Event:		Analysis Requested Total Number of Containers:								
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=salt, O=ore/slim, G=grab)	Field Filtered Sample (Yes or No)	Perform Mercury (Yes or No)	6020A CCR List, 7470A Mercury	2540C TDS, SM4500_H+PH	9050A Chloride, Fluoride, Sulfate	Radium-226	Radium-228	Special Instructions/Note:
MW-4B	4/6/21	1915	G	GW	X	X	X	X	X	X	X	
MW-5B	4/7/21	0735	G	GW	X	X	X	X	X	X	X	
MW-6A	4/7/21	0925	G	GW	X	X	X	X	X	X	X	
MW-8	4/6/21	1415	G	GW	X	X	X	X	X	X	X	
MW-10	4/6/21	0840	G	GW	X	X	X	X	X	X	X	
MW-14A	4/6/21	1720	G	GW	X	X	X	X	X	X	X	
MW-15A	4/6/21	1820	G	GW	X	X	X	X	X	X	X	
MW-21	4/6/21	1535	G	GW	X	X	X	X	X	X	X	
MW-22	4/5/21	1450	G	GW	X	X	X	X	X	X	X	
MW-23	4/5/21	1550	G	GW	X	X	X	X	X	X	X	
Duplicate-1	4/6/21	1200	G	GW	X	X	X	X	X	X	X	
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: <u>Sam Bennett</u> Date: <u>4/6/21 1130</u>												
Relinquished by: <u>Sam Bennett</u> Date: <u>4/6/21 1130</u> Company: <u>Company</u>												
Relinquished by: _____ Date: _____ Company: <u>Company</u>												
Relinquished by: _____ Date: _____ Company: <u>Company</u>												
Custody Seals Intact: <u>Yes</u> <input type="checkbox"/> <u>No</u> <input type="checkbox"/> Custody Seal No.: <u>41821 100</u>												
Cooler Temperature(s) °C and Other Remarks:												



Chain of Custody Record

Client Information		Sampler: Sam Bennett	Lab PM: Hayes, Shawn M	Carrier Tracking No(s):											
Client Contact: Sam Bennett MP&W and Rose Amundson (HR Green)		Phone: 563/262-3583	E-Mail: shawn.hayes@testamericainc.com												
Company: Muscatine Power & Water		Analysis Requested													
Address: 1700 Dick Drake Way		Due Date Requested: Normal													
City: Muscatine		TAT Requested (days):													
State, Zip: IA, 52761		PO #: 211753													
Phone:		WO #:													
Email: sbennett@mpw.org and ramundson@hrgreen.com		TestAmerica Project #: 31007856													
Project Name: Muscatine Power & Water COR Landfill		Event: Federal List													
Site: Iowa															
Sample Identification	Duplicate-2	Sample Date: 4/6/21	Sample Time: 1200	Sample Type (C=Comp, G=grab): G	Matrix (W=water, S=solid, O=organic, ST=THAA, A=AL):	Preservation Code:	Field Filtered Sample (Yes or No):	Field Filtered Sample (Yes or No):	6020A CCR List, 7470A Mercury	2540C TDS, SM4500_H+PH	9056A Chloride, Fluoride, Sulfate	Radium-226	Radium-228	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: _____ Date: _____ Relinquished by: Sam Bennett Date: 4/7/21 1130 Company Relinquished by: _____ Date/Time: _____ Company Relinquished by: _____ Date/Time: _____ Company Custody Seals Intact: _____ Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks:															



Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-203890-1

Login Number: 203890

List Source: Eurofins TestAmerica, 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	



ANALYTICAL REPORT

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

Laboratory Job ID: 310-203890-2
Client Project/Site: Muscatine Power & Water CCR

For:
Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
5/6/2021 11:59:09 AM

Shawn Hayes, Senior Project Manager
(319)229-8211
Shawn.Hayes@Eurofinset.com

LINKS

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results through
TotalAccess

Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

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

Job ID: 310-203890-2

Job ID: 310-203890-2

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

**Job Narrative
310-203890-2**

Comments

No additional comments.

Receipt

The samples were received on 4/8/2021 10:10 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.9° C and 2.1° C.

RAD

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

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Sample Summary

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

Job ID: 310-203890-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-203890-1	MW-4B	Ground Water	04/06/21 19:15	04/08/21 10:10	
310-203890-2	MW-5B	Ground Water	04/07/21 07:35	04/08/21 10:10	
310-203890-3	MW-6A	Ground Water	04/07/21 09:25	04/08/21 10:10	
310-203890-4	MW-8	Ground Water	04/06/21 14:15	04/08/21 10:10	
310-203890-5	MW-10	Ground Water	04/06/21 08:40	04/08/21 10:10	
310-203890-6	MW-14A	Ground Water	04/06/21 17:20	04/08/21 10:10	
310-203890-7	MW-15A	Ground Water	04/06/21 18:20	04/08/21 10:10	
310-203890-8	MW-21	Ground Water	04/06/21 15:35	04/08/21 10:10	
310-203890-9	MW-22	Ground Water	04/06/21 14:50	04/08/21 10:10	
310-203890-10	MW-23	Ground Water	04/05/21 15:05	04/08/21 10:10	
310-203890-14	DUP-1	Ground Water	04/06/21 12:00	04/08/21 10:10	
310-203890-15	DUP-2	Ground Water	04/06/21 12:00	04/08/21 10:10	

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-4B

Lab Sample ID: 310-203890-1

Date Collected: 04/06/21 19:15

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.101	U	0.0879	0.0884	1.00	0.135	pCi/L	04/13/21 16:10	05/05/21 09:47	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.4		40 - 110					04/13/21 16:10	05/05/21 09:47	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0490	U	0.218	0.218	1.00	0.400	pCi/L	04/13/21 16:42	04/28/21 12:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.4		40 - 110					04/13/21 16:42	04/28/21 12:40	1
Y Carrier	89.3		40 - 110					04/13/21 16:42	04/28/21 12:40	1

Method: 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	0.0519	U	0.235	0.235	5.00	0.400	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-5B

Lab Sample ID: 310-203890-2

Date Collected: 04/07/21 07:35

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.231		0.103	0.105	1.00	0.118	pCi/L	04/13/21 16:10	05/05/21 09:47	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.4		40 - 110					04/13/21 16:10	05/05/21 09:47	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.751		0.295	0.303	1.00	0.412	pCi/L	04/13/21 16:42	04/28/21 12:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.4		40 - 110					04/13/21 16:42	04/28/21 12:40	1
Y Carrier	90.1		40 - 110					04/13/21 16:42	04/28/21 12:40	1

Method: 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	0.982		0.312	0.321	5.00	0.412	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-6A

Lab Sample ID: 310-203890-3

Date Collected: 04/07/21 09:25

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.179		0.0882	0.0897	1.00	0.100	pCi/L	04/13/21 16:10	05/05/21 09:47	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.9		40 - 110					04/13/21 16:10	05/05/21 09:47	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.488		0.259	0.263	1.00	0.384	pCi/L	04/13/21 16:42	04/28/21 12:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.9		40 - 110					04/13/21 16:42	04/28/21 12:40	1
Y Carrier	89.3		40 - 110					04/13/21 16:42	04/28/21 12:40	1

Method: 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	0.667		0.274	0.278	5.00	0.384	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-8

Lab Sample ID: 310-203890-4

Date Collected: 04/06/21 14:15

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.111	U	0.0885	0.0890	1.00	0.132	pCi/L	04/13/21 16:10	05/05/21 09:47	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					04/13/21 16:10	05/05/21 09:47	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0974	U	0.227	0.227	1.00	0.391	pCi/L	04/13/21 16:42	04/28/21 12:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					04/13/21 16:42	04/28/21 12:40	1
Y Carrier	89.0		40 - 110					04/13/21 16:42	04/28/21 12:40	1

Method: 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	0.208	U	0.244	0.244	5.00	0.391	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-10

Lab Sample ID: 310-203890-5

Date Collected: 04/06/21 08:40

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.207		0.0956	0.0974	1.00	0.106	pCi/L	04/13/21 16:10	05/05/21 09:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.8		40 - 110					04/13/21 16:10	05/05/21 09:48	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.281	U	0.264	0.265	1.00	0.425	pCi/L	04/13/21 16:42	04/28/21 12:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.8		40 - 110					04/13/21 16:42	04/28/21 12:40	1
Y Carrier	87.1		40 - 110					04/13/21 16:42	04/28/21 12:40	1

Method: 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	0.488		0.281	0.282	5.00	0.425	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-14A

Lab Sample ID: 310-203890-6

Date Collected: 04/06/21 17:20

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0454	U	0.0566	0.0567	1.00	0.0928	pCi/L	04/13/21 16:10	05/05/21 09:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.1		40 - 110					04/13/21 16:10	05/05/21 09:48	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.568		0.297	0.302	1.00	0.440	pCi/L	04/13/21 16:42	04/28/21 12:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.1		40 - 110					04/13/21 16:42	04/28/21 12:41	1
Y Carrier	82.2		40 - 110					04/13/21 16:42	04/28/21 12:41	1

Method: 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	0.614		0.302	0.307	5.00	0.440	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-15A

Lab Sample ID: 310-203890-7

Date Collected: 04/06/21 18:20

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0226	U	0.0511	0.0511	1.00	0.0952	pCi/L	04/13/21 16:10	05/05/21 09:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					04/13/21 16:10	05/05/21 09:48	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.197	U	0.221	0.221	1.00	0.362	pCi/L	04/13/21 16:42	04/28/21 12:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					04/13/21 16:42	04/28/21 12:41	1
Y Carrier	92.0		40 - 110					04/13/21 16:42	04/28/21 12:41	1

Method: 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	0.219	U	0.227	0.227	5.00	0.362	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-21

Lab Sample ID: 310-203890-8

Date Collected: 04/06/21 15:35

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0282	U	0.0537	0.0538	1.00	0.0971	pCi/L	04/13/21 16:10	05/05/21 09:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					04/13/21 16:10	05/05/21 09:48	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.154	U	0.217	0.217	1.00	0.363	pCi/L	04/13/21 16:42	04/28/21 12:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					04/13/21 16:42	04/28/21 12:41	1
Y Carrier	85.2		40 - 110					04/13/21 16:42	04/28/21 12:41	1

Method: 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	0.182	U	0.224	0.224	5.00	0.363	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-22

Lab Sample ID: 310-203890-9

Date Collected: 04/06/21 14:50

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.168		0.0905	0.0918	1.00	0.106	pCi/L	04/13/21 16:10	05/05/21 09:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.9		40 - 110					04/13/21 16:10	05/05/21 09:49	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.379	U	0.250	0.253	1.00	0.381	pCi/L	04/13/21 16:42	04/28/21 12:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.9		40 - 110					04/13/21 16:42	04/28/21 12:41	1
Y Carrier	86.7		40 - 110					04/13/21 16:42	04/28/21 12:41	1

Method: 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	0.547		0.266	0.269	5.00	0.381	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: MW-23

Lab Sample ID: 310-203890-10

Date Collected: 04/05/21 15:05

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0292	U	0.0590	0.0590	1.00	0.107	pCi/L	04/13/21 16:10	05/05/21 09:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					04/13/21 16:10	05/05/21 09:49	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.266	U	0.249	0.251	1.00	0.402	pCi/L	04/13/21 16:42	04/28/21 12:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					04/13/21 16:42	04/28/21 12:41	1
Y Carrier	86.0		40 - 110					04/13/21 16:42	04/28/21 12:41	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.296	U	0.256	0.258	5.00	0.402	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: DUP-1

Lab Sample ID: 310-203890-14

Date Collected: 04/06/21 12:00

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.238		0.105	0.107	1.00	0.115	pCi/L	04/13/21 16:10	05/05/21 09:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.2		40 - 110					04/13/21 16:10	05/05/21 09:49	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.617		0.292	0.297	1.00	0.424	pCi/L	04/13/21 16:42	04/28/21 12:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.2		40 - 110					04/13/21 16:42	04/28/21 12:41	1
Y Carrier	88.6		40 - 110					04/13/21 16:42	04/28/21 12:41	1

Method: 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	0.854		0.310	0.316	5.00	0.424	pCi/L		05/06/21 11:40	1

Client Sample Results

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

Job ID: 310-203890-2

Client Sample ID: DUP-2

Lab Sample ID: 310-203890-15

Date Collected: 04/06/21 12:00

Matrix: Ground Water

Date Received: 04/08/21 10:10

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0959	U	0.0742	0.0747	1.00	0.105	pCi/L	04/13/21 16:10	05/05/21 09:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		40 - 110					04/13/21 16:10	05/05/21 09:49	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.167	U	0.221	0.222	1.00	0.368	pCi/L	04/13/21 16:42	04/28/21 12:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		40 - 110					04/13/21 16:42	04/28/21 12:42	1
Y Carrier	86.4		40 - 110					04/13/21 16:42	04/28/21 12:42	1

Method: 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	0.263	U	0.233	0.234	5.00	0.368	pCi/L		05/06/21 11:40	1

Definitions/Glossary

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

Job ID: 310-203890-2

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

Job ID: 310-203890-2

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-505469/23-A
Matrix: Water
Analysis Batch: 508499

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 505469

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.2010		0.0901	0.0919	1.00	0.0947	pCi/L	04/13/21 16:10	05/05/21 12:35	1
Carrier	MB %Yield	MB Qualifier	Limits				Prepared		Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110				04/13/21 16:10		05/05/21 12:35	1

Lab Sample ID: LCS 160-505469/1-A
Matrix: Water
Analysis Batch: 508499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 505469

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	10.73		1.13	1.00	0.0923	pCi/L	95	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	89.1		40 - 110						

Lab Sample ID: LCSD 160-505469/2-A
Matrix: Water
Analysis Batch: 508499

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 505469

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER
				Uncert. (2σ+/-)							Limit
Radium-226	11.3	11.18		1.18	1.00	0.105	pCi/L	99	75 - 125	0.20	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	80.6		40 - 110								

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-505471/23-A
Matrix: Water
Analysis Batch: 507513

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 505471

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.002131	U	0.218	0.218	1.00	0.390	pCi/L	04/13/21 16:42	04/28/21 12:44	1
Carrier	MB %Yield	MB Qualifier	Limits				Prepared		Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110				04/13/21 16:42		04/28/21 12:44	1
Y Carrier	95.0		40 - 110				04/13/21 16:42		04/28/21 12:44	1

QC Sample Results

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

Job ID: 310-203890-2

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

Lab Sample ID: LCS 160-505471/1-A
Matrix: Water
Analysis Batch: 507515

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 505471

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
										RER	Limit
Radium-228	7.25	7.360		0.913	1.00	0.383	pCi/L	102	75 - 125		
LCS LCS											
Carrier	%Yield	Qualifier	Limits								
Ba Carrier	89.1		40 - 110								
Y Carrier	88.6		40 - 110								

Lab Sample ID: LCSD 160-505471/2-A
Matrix: Water
Analysis Batch: 507515

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 505471

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER	Limit
Radium-228	7.25	8.588		1.06	1.00	0.413	pCi/L	118	75 - 125	0.62	1	
LCSD LCSD												
Carrier	%Yield	Qualifier	Limits									
Ba Carrier	80.6		40 - 110									
Y Carrier	87.9		40 - 110									

QC Association Summary

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

Job ID: 310-203890-2

Rad

Prep Batch: 505469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	PrecSep-21	
310-203890-2	MW-5B	Total/NA	Ground Water	PrecSep-21	
310-203890-3	MW-6A	Total/NA	Ground Water	PrecSep-21	
310-203890-4	MW-8	Total/NA	Ground Water	PrecSep-21	
310-203890-5	MW-10	Total/NA	Ground Water	PrecSep-21	
310-203890-6	MW-14A	Total/NA	Ground Water	PrecSep-21	
310-203890-7	MW-15A	Total/NA	Ground Water	PrecSep-21	
310-203890-8	MW-21	Total/NA	Ground Water	PrecSep-21	
310-203890-9	MW-22	Total/NA	Ground Water	PrecSep-21	
310-203890-10	MW-23	Total/NA	Ground Water	PrecSep-21	
310-203890-14	DUP-1	Total/NA	Ground Water	PrecSep-21	
310-203890-15	DUP-2	Total/NA	Ground Water	PrecSep-21	
MB 160-505469/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-505469/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-505469/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 505471

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-203890-1	MW-4B	Total/NA	Ground Water	PrecSep_0	
310-203890-2	MW-5B	Total/NA	Ground Water	PrecSep_0	
310-203890-3	MW-6A	Total/NA	Ground Water	PrecSep_0	
310-203890-4	MW-8	Total/NA	Ground Water	PrecSep_0	
310-203890-5	MW-10	Total/NA	Ground Water	PrecSep_0	
310-203890-6	MW-14A	Total/NA	Ground Water	PrecSep_0	
310-203890-7	MW-15A	Total/NA	Ground Water	PrecSep_0	
310-203890-8	MW-21	Total/NA	Ground Water	PrecSep_0	
310-203890-9	MW-22	Total/NA	Ground Water	PrecSep_0	
310-203890-10	MW-23	Total/NA	Ground Water	PrecSep_0	
310-203890-14	DUP-1	Total/NA	Ground Water	PrecSep_0	
310-203890-15	DUP-2	Total/NA	Ground Water	PrecSep_0	
MB 160-505471/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-505471/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-505471/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

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

Job ID: 310-203890-2

Client Sample ID: MW-4B
 Date Collected: 04/06/21 19:15
 Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-1
 Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:47	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:40	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: MW-5B
 Date Collected: 04/07/21 07:35
 Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-2
 Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:47	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:40	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: MW-6A
 Date Collected: 04/07/21 09:25
 Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-3
 Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:47	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:40	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: MW-8
 Date Collected: 04/06/21 14:15
 Date Received: 04/08/21 10:10

Lab Sample ID: 310-203890-4
 Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:47	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:40	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Lab Chronicle

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

Job ID: 310-203890-2

Client Sample ID: MW-10

Lab Sample ID: 310-203890-5

Date Collected: 04/06/21 08:40

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:48	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:40	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: MW-14A

Lab Sample ID: 310-203890-6

Date Collected: 04/06/21 17:20

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:48	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:41	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: MW-15A

Lab Sample ID: 310-203890-7

Date Collected: 04/06/21 18:20

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:48	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:41	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: MW-21

Lab Sample ID: 310-203890-8

Date Collected: 04/06/21 15:35

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:48	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:41	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Lab Chronicle

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

Job ID: 310-203890-2

Client Sample ID: MW-22

Lab Sample ID: 310-203890-9

Date Collected: 04/06/21 14:50

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:49	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:41	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: MW-23

Lab Sample ID: 310-203890-10

Date Collected: 04/05/21 15:05

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:49	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:41	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: DUP-1

Lab Sample ID: 310-203890-14

Date Collected: 04/06/21 12:00

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:49	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:41	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Client Sample ID: DUP-2

Lab Sample ID: 310-203890-15

Date Collected: 04/06/21 12:00

Matrix: Ground Water

Date Received: 04/08/21 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			505469	04/13/21 16:10	JEC	TAL SL
Total/NA	Analysis	9315		1	508499	05/05/21 09:49	SCB	TAL SL
Total/NA	Prep	PrecSep_0			505471	04/13/21 16:42	JEC	TAL SL
Total/NA	Analysis	9320		1	507515	04/28/21 12:42	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	508610	05/06/21 11:40	FLC	TAL SL

Laboratory References:

TAL SL = Eurofins TestAmerica, 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

Job ID: 310-203890-2

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-21
California	Los Angeles County Sanitation Districts	10259	06-30-21
California	State	2886	06-30-21
Connecticut	State	PH-0241	03-31-21 *
Florida	NELAP	E87689	06-30-21
HI - RadChem Recognition	State	n/a	06-30-21
Illinois	NELAP	004553	11-30-21
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-21
Kentucky (DW)	State	KY90125	01-01-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-21
Louisiana	NELAP	04080	06-30-21
Louisiana (DW)	State	LA011	12-31-21
Maryland	State	310	09-30-21
MI - RadChem Recognition	State	9005	06-30-21
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-21
New Jersey	NELAP	MO002	06-30-21
New York	NELAP	11616	04-01-22
North Dakota	State	R-207	06-30-21
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-21
Oregon	NELAP	4157	09-01-21
Pennsylvania	NELAP	68-00540	03-01-22
South Carolina	State	85002001	06-30-21
Texas	NELAP	T104704193	07-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-21
Virginia	NELAP	10310	06-14-21
Washington	State	C592	08-30-21
West Virginia DEP	State	381	10-31-21

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

Method Summary

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

Job ID: 310-203890-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

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:

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





Environment Testing
TestAmerica



310-203890 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscadine Power & Water</u>		
City/State: <u>Muscadine</u> <small>CITY</small> <u>GA</u> <small>STATE</small>	Project:	
Receipt Information		
Date/Time Received: <u>4/8/21</u> <small>DATE</small> <u>1010</u> <small>TIME</small>	Received By: <u>[Signature]</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
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 # <u>1</u> of <u>2</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
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>Q</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>2.1</u>	Corrected Temp (°C): <u>2.1</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
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		
Additional Comments		



Environment Testing
TestAmerica

Place COC scanning label
here

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscotina Power & Water</u>		
City/State: <small>CITY</small> <u>Muscotina</u> <small>STATE</small> <u>IA</u>	Project:	
Receipt Information		
Date/Time Received: <small>DATE</small> <u>9/8/21</u> <small>TIME</small> <u>1010</u>	Received By: <u>sel</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
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 # <u>2</u> of <u>2</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
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>2</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>0.9</u>	Corrected Temp (°C): <u>0.9</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
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		
Additional Comments		

TestAmerica Cedar Falls

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

Chain of Custody Record



Client Information Client Contact: Sam Bennett Phone: 563/262-3583 Company: Muscatine Power & Water		Lab PM: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com		Carrier Tracking No(s): COC No: Page: Job #:									
Address: 1700 Dick Drake Way City: Muscatine State: IA, 52761 Phone: 211753 Email: sbennett@mpw.org and ramundson@hrgreen.com Project Name: Muscatine Power & Water CCR Landfill Site: Iowa		Due Date Requested: Normal TAT Requested (days): PO #: 211753 W/O #: TestAmerica Project #: 31007856 Event:		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - DI Water J - DI Water K - EDTA L - EDA Other: 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)									
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=salt, O=ore/sink, BT=Trace, A=As)	Field Filtered Sample (Yes or No)	Perform Mercury (Yes or No)	6020A CCR List, 7470A Mercury	2540C TDS, SM4500_H+PH	9050A Chloride, Fluoride, Sulfate	Radium-226	Radium-228	Total Number of Containers	Special Instructions/Note:
MW-4B	4/6/21	1915	G	GW	X	X	X	X	X	X	X	X	
MW-5B	4/7/21	0735	G	GW	X	X	X	X	X	X	X	X	
MW-6A	4/7/21	0925	G	GW	X	X	X	X	X	X	X	X	
MW-8	4/6/21	1415	G	GW	X	X	X	X	X	X	X	X	
MW-10	4/6/21	0840	G	GW	X	X	X	X	X	X	X	X	
MW-14A	4/6/21	1720	G	GW	X	X	X	X	X	X	X	X	
MW-15A	4/6/21	1820	G	GW	X	X	X	X	X	X	X	X	
MW-21	4/6/21	1535	G	GW	X	X	X	X	X	X	X	X	
MW-22	4/5/21	1450	G	GW	X	X	X	X	X	X	X	X	
MW-23	4/5/21	1550	G	GW	X	X	X	X	X	X	X	X	
Duplicate-1	4/6/21	1200	G	GW	X	X	X	X	X	X	X	X	
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: <u>Sam Bennett</u> Date: <u>4/9/21 1130</u>													
Relinquished by: <u>Sam Bennett</u> Date: <u>4/9/21 1130</u> Company: <u>Company</u>													
Relinquished by: _____ Date: _____ Company: _____													
Relinquished by: _____ Date: _____ Company: _____													
Custody Seals Intact: <u>Yes</u> <input type="checkbox"/> No <input type="checkbox"/> Custody Seal No.: <u>41821 100</u>													
Cooler Temperature(s) °C and Other Remarks: <u>M</u>													



Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-203890-2

Login Number: 203890

List Source: Eurofins TestAmerica, 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: 310-203890-2

Login Number: 203890

List Number: 2

Creator: O'Gara, Mallory L

List Source: Eurofins TestAmerica, St. Louis

List Creation: 04/10/21 10:42 AM

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



Tracer/Carrier Summary

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

Job ID: 310-203890-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
310-203890-1	MW-4B	89.4	
310-203890-2	MW-5B	86.4	
310-203890-3	MW-6A	90.9	
310-203890-4	MW-8	88.5	
310-203890-5	MW-10	85.8	
310-203890-6	MW-14A	86.1	
310-203890-7	MW-15A	88.5	
310-203890-8	MW-21	90.0	
310-203890-9	MW-22	80.9	
310-203890-10	MW-23	90.0	
310-203890-14	DUP-1	85.2	
310-203890-15	DUP-2	89.1	

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 (40-110)	
LCS 160-505469/1-A	Lab Control Sample	89.1	
LCS D 160-505469/2-A	Lab Control Sample Dup	80.6	
MB 160-505469/23-A	Method Blank	88.5	

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 (40-110)	Y (40-110)
310-203890-1	MW-4B	89.4	89.3
310-203890-2	MW-5B	86.4	90.1
310-203890-3	MW-6A	90.9	89.3
310-203890-4	MW-8	88.5	89.0
310-203890-5	MW-10	85.8	87.1
310-203890-6	MW-14A	86.1	82.2
310-203890-7	MW-15A	88.5	92.0
310-203890-8	MW-21	90.0	85.2
310-203890-9	MW-22	80.9	86.7
310-203890-10	MW-23	90.0	86.0
310-203890-14	DUP-1	85.2	88.6
310-203890-15	DUP-2	89.1	86.4

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

Tracer/Carrier Summary

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

Job ID: 310-203890-2

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

<u>Lab Sample ID</u>	<u>Client Sample ID</u>	<u>Ba</u> <u>(40-110)</u>	<u>Y</u> <u>(40-110)</u>
LCS 160-505471/1-A	Lab Control Sample	89.1	88.6
LCSD 160-505471/2-A	Lab Control Sample Dup	80.6	87.9
MB 160-505471/23-A	Method Blank	88.5	95.0

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-4B
Upgradient **Downgradient** _____
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 715.87 **Ground Elevation** 712.04

Depth of Well 28.03 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 18:55	6.73	706.72
*After Purging	4/6/2021 19:15	8.65	704.8
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.53

No. of Well Volumes (based on current water level) 0.18

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Partly cloudy, 65DF, S Wind 5 mph

Field Measurements (after stabilization):

Temperature 12.18 **Units** C

Equipment Used Horiba U-50

pH 7.94

Equipment Used Horiba U-50

Specific Conductance .740 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 4/06/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-5B
Upgradient _____ **Downgradient** X
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) **YES** **NO**

If no, explain _____

Standing Water or Litter? (please check) **YES** **NO**

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 709.10 **Ground Elevation** 706.73

Depth of Well 25.30 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/7/2021 6:55	1.01	708.09
*After Purging	4/13/2021 7:35	2.13	706.97
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.06

No. of Well Volumes (based on current water level) 0.27

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Cloudy, 62DF, Calm

Field Measurements (after stabilization):

Temperature 13.49 Units C

Equipment Used Horiba U-50

pH 7.31

Equipment Used Horiba U-50

Specific Conductance 0.821 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/07/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-5DP-6_82P
Monitoring Well/Piezometer No. MW-6A
Upgradient _____ **Downgradient** X
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 708.92 **Ground Elevation** 706.49

Depth of Well 25.35 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/7/2021 08:00	2.73	706.19
*After Purging	4/7/2021 09:25	2.6	706.32
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.19

No. of Well Volumes (based on current water level) 0.32

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Cloudy, 65DF, Calm

Field Measurements (after stabilization):

Temperature 14.51 Units C

Equipment Used Horiba U-50

pH 7.59

Equipment Used Horiba U-50

Specific Conductance 0.675 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/7/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water Permit No. 70-SDP-6_82P
 Monitoring Well/Piezometer No. MW-08
 Upgradient Downgradient _____
 Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 747.36 Ground Elevation 744.37

Depth of Well 42.95 Inside Casing Diameter (in inches) 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 13:30	12.38	734.98
*After Purging	4/6/2021 14:15	18.84	728.52
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.19

No. of Well Volumes (based on current water level) 0.24

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Dedicated Pump? Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 77DF, SW wind at 10-20 mph

Field Measurements (after stabilization):

Temperature 18.44 Units C

Equipment Used Horiba U-50

pH 7.63

Equipment Used Horiba U-50

Specific Conductance 0.629 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/6/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-10
Upgradient **Downgradient**
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 718.51 Ground Elevation 716.32

Depth of Well 20.32 Inside Casing Diameter (in inches) 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 7:55	3.53	714.98
*After Purging	4/6/2021 8:40	3.63	714.88
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.19

No. of Well Volumes (based on current water level) 0.43

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Dedicated Pump? Yes

If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions Cloudy, 65DF, SW wind at 5 mph

Field Measurements (after stabilization):

Temperature 10.28 Units C

Equipment Used Horiba U-50

pH 7.57

Equipment Used Horiba U-50

Specific Conductance 0.645 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/6/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-14A
Upgradient _____ **Downgradient** X
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 729.00 **Ground Elevation** 726.19

Depth of Well 20.50 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 16:55	9.45	719.55
*After Purging	4/6/2021 17:20	12.92	716.08
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) .66

No. of Well Volumes (based on current water level) 0.37

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions Cloudy, 65DF, S wind at 10-15 mph

Field Measurements (after stabilization):

Temperature 13.40 **Units** C

Equipment Used Horiba U-50

pH 7.64

Equipment Used Horiba U-50

Specific Conductance 1.95 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 4/6/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

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GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-15A
Upgradient _____ **Downgradient** X
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 729.99 **Ground Elevation** 727.12

Depth of Well 20.50 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 18:00	8.07	721.92
*After Purging	4/6/2021 18:20	11.73	718.26
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.53

No. of Well Volumes (based on current water level) 0.26

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-21
Upgradient _____ **Downgradient** X
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 725.75 **Ground Elevation** 722.81

Depth of Well 22.20 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/06/2021 15:05	9.68	716.07
*After Purging	4/06/2021 16:00	10.05	715.7
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.79

No. of Well Volumes (based on current water level) 0.39

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Sunny, 75DF, Calm

Field Measurements (after stabilization):

Temperature 15.03 Units C

Equipment Used Horiba U-50

pH 7.56

Equipment Used Horiba U-50

Specific Conductance 0.382 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/6/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-22
Upgradient _____ **Downgradient** X
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) **YES** **NO**

If no, explain _____

Standing Water or Litter? (please check) **YES** **NO**

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 744.27 **Ground Elevation** 741.00

Depth of Well 44.27 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/5/2021 14:00	14.6	729.67
*After Purging	4/5/2021 14:50	23.88	720.39
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.32

No. of Well Volumes (based on current water level) .27

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 76DF, S wind at 25 mph

Field Measurements (after stabilization):

Temperature 18.34 **Units** C

Equipment Used Horiba U-50

pH 7.70

Equipment Used Horiba U-50

Specific Conductance .690 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 4/5/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-23
Upgradient **Downgradient** _____
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 726.90 **Ground Elevation** 723.73

Depth of Well 27.17 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/5/2021 15:30	4.91	721.99
*After Purging	4/5/2021 15:50	11.49	715.41
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.53

No. of Well Volumes (based on current water level) 0.15

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 76DF, S wind 20-30 mph

Field Measurements (after stabilization):

Temperature 16.59 Units C

Equipment Used Horiba U-50

pH 7.61

Equipment Used Horiba U-50

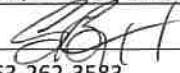
Specific Conductance .487 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/5/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-24
Upgradient **Downgradient**
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 735.32 **Ground Elevation** 732.10

Depth of Well 22.22 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 12:15	12.36	722.96
*After Purging	4/6/2021 13:05	12.92	722.4
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.32

No. of Well Volumes (based on current water level) .82

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 75F SW wind 10-15 mph

Field Measurements (after stabilization):

Temperature 15.76 **Units** C

Equipment Used Horiba U-50

pH 7.64

Equipment Used Horiba U-50

Specific Conductance 0.662 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 4/6/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-26
Upgradient **Downgradient**
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 731.08 **Ground Elevation** 727.35

Depth of Well 38.27 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 9:50	18.33	720.79
*After Purging	4/6/2021 10:20	20.98	718.14
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.79

No. of Well Volumes (based on current water level) 0.26

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Sunny, 72DF, SW wind 5-10 mph

Field Measurements (after stabilization):

Temperature 17.28 Units C

Equipment Used Horiba U-50

pH 8.12

Equipment Used Horiba U-50

Specific Conductance 1.030 Units m5/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/6/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-27
Upgradient **Downgradient**
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 730.26 **Ground Elevation** 726.26

Depth of Well 19.44 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	4/6/2021 10:55	11.83	727.29
*After Purging	4/6/2021 11:35	12.03	727.09
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92

No. of Well Volumes (based on current water level) 0.23

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Sunny, 75DF, Calm

Field Measurements (after stabilization):

Temperature 15.03 Units C

Equipment Used Horiba U-50

pH 7.56

Equipment Used Horiba U-50

Specific Conductance 0.382 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 4/6/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, S02 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., S1S-72S-8309, nina.booker@dnr.iowa.gov

ANALYTICAL REPORT

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

Laboratory Job ID: 310-214546-2
Client Project/Site: Muscatine Power & Water CCR

For:
Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
10/19/2021 11:38:40 AM

Shawn Hayes, Senior Project Manager
(319)229-8211
Shawn.Hayes@Eurofinset.com

LINKS

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results through
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Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

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

Job ID: 310-214546-2

Job ID: 310-214546-2

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative
310-214546-2

Comments

No additional comments.

Receipt

The samples were received on 9/8/2021 9:40 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 was 0.4° C.

RAD

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

- 1
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Sample Summary

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

Job ID: 310-214546-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-214546-1	MW-4A	Water	09/02/21 15:00	09/08/21 09:40
310-214546-2	MW-5B	Water	09/03/21 10:45	09/08/21 09:40
310-214546-3	MW-6A	Water	09/02/21 15:55	09/08/21 09:40
310-214546-4	MW-14A	Water	09/02/21 11:55	09/08/21 09:40

- 1
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- 14

Client Sample Results

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

Job ID: 310-214546-2

Client Sample ID: MW-4A

Lab Sample ID: 310-214546-1

Date Collected: 09/02/21 15:00

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.190	U	0.190	0.191	1.00	0.301	pCi/L	09/13/21 14:09	10/13/21 12:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.2		40 - 110					09/13/21 14:09	10/13/21 12:59	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.895		0.313	0.324	1.00	0.424	pCi/L	09/13/21 14:46	10/12/21 12:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.2		40 - 110					09/13/21 14:46	10/12/21 12:22	1
Y Carrier	86.0		40 - 110					09/13/21 14:46	10/12/21 12:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.08		0.366	0.376	5.00	0.424	pCi/L		10/18/21 21:29	1

Client Sample Results

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

Job ID: 310-214546-2

Client Sample ID: MW-5B

Lab Sample ID: 310-214546-2

Date Collected: 09/03/21 10:45

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.257	U	0.239	0.241	1.00	0.375	pCi/L	09/13/21 14:09	10/13/21 12:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.5		40 - 110					09/13/21 14:09	10/13/21 12:59	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.03		0.393	0.404	1.00	0.557	pCi/L	09/13/21 14:46	10/12/21 12:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.5		40 - 110					09/13/21 14:46	10/12/21 12:23	1
Y Carrier	84.1		40 - 110					09/13/21 14:46	10/12/21 12:23	1

Method: 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	1.29		0.460	0.470	5.00	0.557	pCi/L		10/18/21 21:29	1

Client Sample Results

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

Job ID: 310-214546-2

Client Sample ID: MW-6A

Lab Sample ID: 310-214546-3

Date Collected: 09/02/21 15:55

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.336		0.238	0.239	1.00	0.334	pCi/L	09/13/21 14:09	10/13/21 12:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	63.9		40 - 110					09/13/21 14:09	10/13/21 12:59	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.784		0.374	0.381	1.00	0.542	pCi/L	09/13/21 14:46	10/12/21 12:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	63.9		40 - 110					09/13/21 14:46	10/12/21 12:23	1
Y Carrier	87.5		40 - 110					09/13/21 14:46	10/12/21 12:23	1

Method: 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		0.443	0.450	5.00	0.542	pCi/L		10/18/21 21:29	1

Client Sample Results

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

Job ID: 310-214546-2

Client Sample ID: MW-14A

Lab Sample ID: 310-214546-4

Date Collected: 09/02/21 11:55

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.160	U	0.192	0.192	1.00	0.316	pCi/L	09/13/21 14:09	10/13/21 13:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.7		40 - 110					09/13/21 14:09	10/13/21 13:00	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.524		0.289	0.293	1.00	0.434	pCi/L	09/13/21 14:46	10/12/21 12:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.7		40 - 110					09/13/21 14:46	10/12/21 12:23	1
Y Carrier	84.1		40 - 110					09/13/21 14:46	10/12/21 12:23	1

Method: 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	0.684		0.347	0.350	5.00	0.434	pCi/L		10/18/21 21:29	1

Definitions/Glossary

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

Job ID: 310-214546-2

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

Job ID: 310-214546-2

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-526810/23-A
Matrix: Water
Analysis Batch: 531341

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 526810

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.07573	U	0.218	0.218	1.00	0.394	pCi/L	09/13/21 14:09	10/13/21 13:00	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	82.1		40 - 110		09/13/21 14:09	10/13/21 13:00	1			

Lab Sample ID: LCS 160-526810/1-A
Matrix: Water
Analysis Batch: 531341

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 526810

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	11.13		1.34	1.00	0.306	pCi/L	98	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	88.2		40 - 110						

Lab Sample ID: LCSD 160-526810/2-A
Matrix: Water
Analysis Batch: 531341

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 526810

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	11.3	10.95		1.39	1.00	0.389	pCi/L	97	75 - 125	0.06	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	76.5		40 - 110								

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-526812/23-A
Matrix: Water
Analysis Batch: 531122

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 526812

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.5191		0.258	0.263	1.00	0.370	pCi/L	09/13/21 14:46	10/12/21 12:24	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	82.1		40 - 110		09/13/21 14:46	10/12/21 12:24	1			
Y Carrier	87.5		40 - 110		09/13/21 14:46	10/12/21 12:24	1			

QC Sample Results

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

Job ID: 310-214546-2

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

Lab Sample ID: LCS 160-526812/1-A
Matrix: Water
Analysis Batch: 531336

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 526812

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
										Radium-228
LCS LCS										
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	88.2		40 - 110							
Y Carrier	81.1		40 - 110							

Lab Sample ID: LCSD 160-526812/2-A
Matrix: Water
Analysis Batch: 531336

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 526812

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
LCSD LCSD											
Carrier	%Yield	Qualifier	Limits								
Ba Carrier	76.5		40 - 110								
Y Carrier	80.7		40 - 110								

QC Association Summary

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

Job ID: 310-214546-2

Rad

Prep Batch: 526810

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	PrecSep-21	
310-214546-2	MW-5B	Total/NA	Water	PrecSep-21	
310-214546-3	MW-6A	Total/NA	Water	PrecSep-21	
310-214546-4	MW-14A	Total/NA	Water	PrecSep-21	
MB 160-526810/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-526810/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-526810/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 526812

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	PrecSep_0	
310-214546-2	MW-5B	Total/NA	Water	PrecSep_0	
310-214546-3	MW-6A	Total/NA	Water	PrecSep_0	
310-214546-4	MW-14A	Total/NA	Water	PrecSep_0	
MB 160-526812/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-526812/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-526812/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

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

Job ID: 310-214546-2

Client Sample ID: MW-4A
 Date Collected: 09/02/21 15:00
 Date Received: 09/08/21 09:40

Lab Sample ID: 310-214546-1
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526810	09/13/21 14:09	MJ	TAL SL
Total/NA	Analysis	9315		1	531341	10/13/21 12:59	FLC	TAL SL
Total/NA	Prep	PrecSep_0			526812	09/13/21 14:46	MJ	TAL SL
Total/NA	Analysis	9320		1	531122	10/12/21 12:22	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532588	10/18/21 21:29	MLK	TAL SL

Client Sample ID: MW-5B
 Date Collected: 09/03/21 10:45
 Date Received: 09/08/21 09:40

Lab Sample ID: 310-214546-2
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526810	09/13/21 14:09	MJ	TAL SL
Total/NA	Analysis	9315		1	531341	10/13/21 12:59	FLC	TAL SL
Total/NA	Prep	PrecSep_0			526812	09/13/21 14:46	MJ	TAL SL
Total/NA	Analysis	9320		1	531122	10/12/21 12:23	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532588	10/18/21 21:29	MLK	TAL SL

Client Sample ID: MW-6A
 Date Collected: 09/02/21 15:55
 Date Received: 09/08/21 09:40

Lab Sample ID: 310-214546-3
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526810	09/13/21 14:09	MJ	TAL SL
Total/NA	Analysis	9315		1	531341	10/13/21 12:59	FLC	TAL SL
Total/NA	Prep	PrecSep_0			526812	09/13/21 14:46	MJ	TAL SL
Total/NA	Analysis	9320		1	531122	10/12/21 12:23	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532588	10/18/21 21:29	MLK	TAL SL

Client Sample ID: MW-14A
 Date Collected: 09/02/21 11:55
 Date Received: 09/08/21 09:40

Lab Sample ID: 310-214546-4
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526810	09/13/21 14:09	MJ	TAL SL
Total/NA	Analysis	9315		1	531341	10/13/21 13:00	FLC	TAL SL
Total/NA	Prep	PrecSep_0			526812	09/13/21 14:46	MJ	TAL SL
Total/NA	Analysis	9320		1	531122	10/12/21 12:23	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532588	10/18/21 21:29	MLK	TAL SL

Laboratory References:

TAL SL = Eurofins TestAmerica, 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

Job ID: 310-214546-2

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-21
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	06-30-21 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	004553	11-30-21
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-21
Kentucky (DW)	State	KY90125	01-01-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-21
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-21
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-22
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	03-01-22
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

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

Method Summary

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

Job ID: 310-214546-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

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:

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





Environment Testing
TestAmerica



310-214546 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscatine Power + Water</u>		
City/State: <u>Muscatine IA</u>	Project:	
Receipt Information		
Date/Time Received: <u>9/18/21 0940</u>	Received By: <u>UB</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: _____		
Condition of Cooler/Containers		
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? ↓
Temperature Record		
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>R</u>	Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>0.4</u>	Corrected Temp (°C): <u>0.4</u>	
• Sample Container Temperature		
Container(s) used:	CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <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		
Additional Comments		
<u>Received 4A not 4B</u>		

Document: CF-LG-WI-002

Revision: 25

Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

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

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-214546-2

Login Number: 214546

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Hayes, Shawn M

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	MW-4A received vs MW-4B on COC
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: 310-214546-2

Login Number: 214546

List Source: Eurofins TestAmerica, St. Louis

List Number: 2

List Creation: 09/09/21 05:48 PM

Creator: Mazariegos, Leonel A

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



Tracer/Carrier Summary

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

Job ID: 310-214546-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
310-214546-1	MW-4A	87.2
310-214546-2	MW-5B	77.5
310-214546-3	MW-6A	63.9
310-214546-4	MW-14A	87.7
LCS 160-526810/1-A	Lab Control Sample	88.2
LCSD 160-526810/2-A	Lab Control Sample Dup	76.5
MB 160-526810/23-A	Method Blank	82.1

Tracer/Carrier Legend

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 (40-110)	Y (40-110)
310-214546-1	MW-4A	87.2	86.0
310-214546-2	MW-5B	77.5	84.1
310-214546-3	MW-6A	63.9	87.5
310-214546-4	MW-14A	87.7	84.1
LCS 160-526812/1-A	Lab Control Sample	88.2	81.1
LCSD 160-526812/2-A	Lab Control Sample Dup	76.5	80.7
MB 160-526812/23-A	Method Blank	82.1	87.5

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

ANALYTICAL REPORT

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

Laboratory Job ID: 310-214293-1
Client Project/Site: Muscatine Power & Water CCR

For:
Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
9/17/2021 1:19:26 PM

Shawn Hayes, Senior Project Manager
(319)229-8211
Shawn.Hayes@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

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

Job ID: 310-214293-1

Job ID: 310-214293-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

**Job Narrative
310-214293-1**

Comments

No additional comments.

Receipt

The samples were received on 9/3/2021 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.7° C and 3.1° C.

HPLC/IC

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

Metals

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

General Chemistry

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

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Sample Summary

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

Job ID: 310-214293-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-214293-1	MW-8	Ground Water	08/31/21 14:05	09/03/21 09:15
310-214293-2	MW-10	Ground Water	09/01/21 10:15	09/03/21 09:15
310-214293-3	MW-15A	Ground Water	09/02/21 09:05	09/03/21 09:15
310-214293-4	MW-21	Ground Water	09/01/21 14:25	09/03/21 09:15
310-214293-5	MW-22	Ground Water	09/01/21 12:50	09/03/21 09:15
310-214293-6	MW-23	Ground Water	09/01/21 11:50	09/03/21 09:15
310-214293-7	MW-24	Ground Water	08/31/21 13:10	09/03/21 09:15
310-214293-9	Duplicate-1	Ground Water	09/01/21 12:00	09/03/21 09:15
310-214293-10	Duplicate-2	Ground Water	09/01/21 12:00	09/03/21 09:15

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Detection Summary

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

Job ID: 310-214293-1

Client Sample ID: MW-8

Lab Sample ID: 310-214293-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.3		5.00		mg/L	5		9056A	Total/NA
Sulfate	82.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.0623		0.00200		mg/L	1		6020A	Total/NA
Calcium	78.3		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.00127		0.000500		mg/L	1		6020A	Total/NA
Molybdenum	0.00218		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	342		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-10

Lab Sample ID: 310-214293-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	32.3		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00781		0.00200		mg/L	1		6020A	Total/NA
Barium	0.233		0.00200		mg/L	1		6020A	Total/NA
Calcium	80.0		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.000576		0.000500		mg/L	1		6020A	Total/NA
Molybdenum	0.00217		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	314		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-15A

Lab Sample ID: 310-214293-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	8.86		5.00		mg/L	5		9056A	Total/NA
Sulfate	333		5.00		mg/L	5		9056A	Total/NA
Barium	0.0355		0.00200		mg/L	1		6020A	Total/NA
Boron	11.1		0.400		mg/L	4		6020A	Total/NA
Calcium	125		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	736		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-21

Lab Sample ID: 310-214293-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	6.58		5.00		mg/L	5		9056A	Total/NA
Sulfate	303		5.00		mg/L	5		9056A	Total/NA
Barium	0.0434		0.00200		mg/L	1		6020A	Total/NA
Boron	5.88		0.400		mg/L	4		6020A	Total/NA
Calcium	93.5		0.500		mg/L	1		6020A	Total/NA
Chromium	0.00659		0.00500		mg/L	1		6020A	Total/NA
Lithium	0.0233		0.0100		mg/L	1		6020A	Total/NA
Selenium	0.00617		0.00500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	636		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-22

Lab Sample ID: 310-214293-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	20.0		5.00		mg/L	5		9056A	Total/NA
Sulfate	154		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00267		0.00200		mg/L	1		6020A	Total/NA
Barium	0.247		0.00200		mg/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Detection Summary

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

Job ID: 310-214293-1

Client Sample ID: MW-22 (Continued)

Lab Sample ID: 310-214293-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	79.4		0.500		mg/L	1		6020A	Total/NA
Molybdenum	0.00558		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	420		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-23

Lab Sample ID: 310-214293-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	25.8		5.00		mg/L	5		9056A	Total/NA
Barium	0.0497		0.00200		mg/L	1		6020A	Total/NA
Calcium	56.1		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	256		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-24

Lab Sample ID: 310-214293-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	21.9		5.00		mg/L	5		9056A	Total/NA
Sulfate	59.3		5.00		mg/L	5		9056A	Total/NA
Barium	0.0922		0.00200		mg/L	1		6020A	Total/NA
Calcium	69.0		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	322		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Duplicate-1

Lab Sample ID: 310-214293-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	6.55		5.00		mg/L	5		9056A	Total/NA
Sulfate	299		5.00		mg/L	5		9056A	Total/NA
Barium	0.0439		0.00200		mg/L	1		6020A	Total/NA
Boron	5.62		0.400		mg/L	4		6020A	Total/NA
Calcium	92.6		0.500		mg/L	1		6020A	Total/NA
Chromium	0.00632		0.00500		mg/L	1		6020A	Total/NA
Lithium	0.0226		0.0100		mg/L	1		6020A	Total/NA
Selenium	0.00588		0.00500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	628		50.0		mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Duplicate-2

Lab Sample ID: 310-214293-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	35.4		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00675		0.00200		mg/L	1		6020A	Total/NA
Barium	0.227		0.00200		mg/L	1		6020A	Total/NA
Boron	0.110		0.100		mg/L	1		6020A	Total/NA
Calcium	80.8		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.000578		0.000500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	322		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: MW-8

Lab Sample ID: 310-214293-1

Date Collected: 08/31/21 14:05

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16.3		5.00		mg/L			09/08/21 08:43	5
Fluoride	<0.500		0.500		mg/L			09/08/21 08:43	5
Sulfate	82.7		5.00		mg/L			09/08/21 08:43	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:02	1
Arsenic	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:02	1
Barium	0.0623		0.00200		mg/L		09/07/21 09:00	09/09/21 22:02	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:02	1
Boron	<0.100		0.100		mg/L		09/07/21 09:00	09/09/21 22:02	1
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:02	1
Calcium	78.3		0.500		mg/L		09/07/21 09:00	09/09/21 22:02	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:02	1
Cobalt	0.00127		0.000500		mg/L		09/07/21 09:00	09/09/21 22:02	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:02	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 22:02	1
Molybdenum	0.00218		0.00200		mg/L		09/07/21 09:00	09/09/21 22:02	1
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:02	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:02	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	342		50.0		mg/L			09/03/21 12:48	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			09/03/21 15:01	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: MW-10

Lab Sample ID: 310-214293-2

Date Collected: 09/01/21 10:15

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			09/08/21 09:29	5
Fluoride	<0.500		0.500		mg/L			09/08/21 09:29	5
Sulfate	32.3		5.00		mg/L			09/08/21 09:29	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:23	1
Arsenic	0.00781		0.00200		mg/L		09/07/21 09:00	09/09/21 22:23	1
Barium	0.233		0.00200		mg/L		09/07/21 09:00	09/09/21 22:23	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:23	1
Boron	<0.100		0.100		mg/L		09/07/21 09:00	09/09/21 22:23	1
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:23	1
Calcium	80.0		0.500		mg/L		09/07/21 09:00	09/09/21 22:23	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:23	1
Cobalt	0.000576		0.000500		mg/L		09/07/21 09:00	09/09/21 22:23	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:23	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 22:23	1
Molybdenum	0.00217		0.00200		mg/L		09/07/21 09:00	09/09/21 22:23	1
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:23	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:23	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	314		50.0		mg/L			09/03/21 12:48	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			09/03/21 15:12	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: MW-15A

Lab Sample ID: 310-214293-3

Date Collected: 09/02/21 09:05

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.86		5.00		mg/L			09/08/21 09:45	5
Fluoride	<0.500		0.500		mg/L			09/08/21 09:45	5
Sulfate	333		5.00		mg/L			09/08/21 09:45	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:26	1
Arsenic	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:26	1
Barium	0.0355		0.00200		mg/L		09/07/21 09:00	09/09/21 22:26	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:26	1
Boron	11.1		0.400		mg/L		09/07/21 09:00	09/10/21 17:36	4
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:26	1
Calcium	125		0.500		mg/L		09/07/21 09:00	09/09/21 22:26	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:26	1
Cobalt	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:26	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:26	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 22:26	1
Molybdenum	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:26	1
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:26	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:26	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	736		50.0		mg/L			09/03/21 12:48	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			09/03/21 15:11	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: MW-21

Lab Sample ID: 310-214293-4

Date Collected: 09/01/21 14:25

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.58		5.00		mg/L			09/08/21 10:00	5
Fluoride	<0.500		0.500		mg/L			09/08/21 10:00	5
Sulfate	303		5.00		mg/L			09/08/21 10:00	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:28	1
Arsenic	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:28	1
Barium	0.0434		0.00200		mg/L		09/07/21 09:00	09/09/21 22:28	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:28	1
Boron	5.88		0.400		mg/L		09/07/21 09:00	09/10/21 17:38	4
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:28	1
Calcium	93.5		0.500		mg/L		09/07/21 09:00	09/09/21 22:28	1
Chromium	0.00659		0.00500		mg/L		09/07/21 09:00	09/09/21 22:28	1
Cobalt	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:28	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:28	1
Lithium	0.0233		0.0100		mg/L		09/07/21 09:00	09/09/21 22:28	1
Molybdenum	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:28	1
Selenium	0.00617		0.00500		mg/L		09/07/21 09:00	09/09/21 22:28	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:28	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	636		50.0		mg/L			09/03/21 12:48	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1		SU			09/03/21 15:03	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: MW-22

Lab Sample ID: 310-214293-5

Date Collected: 09/01/21 12:50

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	20.0		5.00		mg/L			09/08/21 10:16	5
Fluoride	<0.500		0.500		mg/L			09/08/21 10:16	5
Sulfate	154		5.00		mg/L			09/08/21 10:16	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:31	1
Arsenic	0.00267		0.00200		mg/L		09/07/21 09:00	09/09/21 22:31	1
Barium	0.247		0.00200		mg/L		09/07/21 09:00	09/09/21 22:31	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:31	1
Boron	<0.100		0.100		mg/L		09/07/21 09:00	09/09/21 22:31	1
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:31	1
Calcium	79.4		0.500		mg/L		09/07/21 09:00	09/09/21 22:31	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:31	1
Cobalt	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:31	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:31	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 22:31	1
Molybdenum	0.00558		0.00200		mg/L		09/07/21 09:00	09/09/21 22:31	1
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:31	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:31	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	420		50.0		mg/L			09/03/21 12:48	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1		SU			09/03/21 15:04	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: MW-23

Lab Sample ID: 310-214293-6

Date Collected: 09/01/21 11:50

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.2		5.00		mg/L			09/08/21 10:32	5
Fluoride	<0.500		0.500		mg/L			09/08/21 10:32	5
Sulfate	25.8		5.00		mg/L			09/08/21 10:32	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:34	1
Arsenic	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:34	1
Barium	0.0497		0.00200		mg/L		09/07/21 09:00	09/09/21 22:34	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:34	1
Boron	<0.100		0.100		mg/L		09/07/21 09:00	09/09/21 22:34	1
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:34	1
Calcium	56.1		0.500		mg/L		09/07/21 09:00	09/09/21 22:34	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:34	1
Cobalt	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:34	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:34	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 22:34	1
Molybdenum	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:34	1
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:34	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:34	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	256		50.0		mg/L			09/03/21 12:48	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			09/03/21 15:07	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: MW-24

Lab Sample ID: 310-214293-7

Date Collected: 08/31/21 13:10

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21.9		5.00		mg/L			09/08/21 11:18	5
Fluoride	<0.500		0.500		mg/L			09/08/21 11:18	5
Sulfate	59.3		5.00		mg/L			09/08/21 11:18	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:36	1
Arsenic	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:36	1
Barium	0.0922		0.00200		mg/L		09/07/21 09:00	09/09/21 22:36	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:36	1
Boron	<0.100		0.100		mg/L		09/07/21 09:00	09/09/21 22:36	1
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:36	1
Calcium	69.0		0.500		mg/L		09/07/21 09:00	09/09/21 22:36	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:36	1
Cobalt	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:36	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:36	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 22:36	1
Molybdenum	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:36	1
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:36	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:36	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	322		50.0		mg/L			09/03/21 12:48	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1		SU			09/03/21 15:10	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: Duplicate-1

Lab Sample ID: 310-214293-9

Date Collected: 09/01/21 12:00

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.55		5.00		mg/L			09/08/21 11:50	5
Fluoride	<0.500		0.500		mg/L			09/08/21 11:50	5
Sulfate	299		5.00		mg/L			09/08/21 11:50	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:50	1
Arsenic	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:50	1
Barium	0.0439		0.00200		mg/L		09/07/21 09:00	09/09/21 22:50	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:50	1
Boron	5.62		0.400		mg/L		09/07/21 09:00	09/10/21 17:41	4
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:50	1
Calcium	92.6		0.500		mg/L		09/07/21 09:00	09/09/21 22:50	1
Chromium	0.00632		0.00500		mg/L		09/07/21 09:00	09/09/21 22:50	1
Cobalt	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:50	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:50	1
Lithium	0.0226		0.0100		mg/L		09/07/21 09:00	09/09/21 22:50	1
Molybdenum	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:50	1
Selenium	0.00588		0.00500		mg/L		09/07/21 09:00	09/09/21 22:50	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:50	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	628		50.0		mg/L			09/07/21 13:18	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1		SU			09/03/21 14:50	1

Client Sample Results

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

Job ID: 310-214293-1

Client Sample ID: Duplicate-2

Lab Sample ID: 310-214293-10

Date Collected: 09/01/21 12:00

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			09/08/21 12:05	5
Fluoride	<0.500		0.500		mg/L			09/08/21 12:05	5
Sulfate	35.4		5.00		mg/L			09/08/21 12:05	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:52	1
Arsenic	0.00675		0.00200		mg/L		09/07/21 09:00	09/09/21 22:52	1
Barium	0.227		0.00200		mg/L		09/07/21 09:00	09/09/21 22:52	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:52	1
Boron	0.110		0.100		mg/L		09/07/21 09:00	09/09/21 22:52	1
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 22:52	1
Calcium	80.8		0.500		mg/L		09/07/21 09:00	09/09/21 22:52	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:52	1
Cobalt	0.000578		0.000500		mg/L		09/07/21 09:00	09/09/21 22:52	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 22:52	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 22:52	1
Molybdenum	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 22:52	1
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 22:52	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 22:52	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	322		50.0		mg/L			09/07/21 13:18	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			09/03/21 14:54	1

Definitions/Glossary

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

Job ID: 310-214293-1

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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

Job ID: 310-214293-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-327921/3
Matrix: Water
Analysis Batch: 327921

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			09/08/21 08:11	1
Fluoride	<0.100		0.100		mg/L			09/08/21 08:11	1
Sulfate	<1.00		1.00		mg/L			09/08/21 08:11	1

Lab Sample ID: LCS 310-327921/4
Matrix: Water
Analysis Batch: 327921

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	9.810		mg/L		98	90 - 110
Fluoride	2.00	1.902		mg/L		95	90 - 110
Sulfate	10.0	10.23		mg/L		102	90 - 110

Lab Sample ID: 310-214293-1 MS
Matrix: Ground Water
Analysis Batch: 327921

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	16.3		25.0	38.34		mg/L		88	80 - 120
Fluoride	<0.500		5.00	4.705		mg/L		94	80 - 120
Sulfate	82.7		25.0	104.1		mg/L		85	80 - 120

Lab Sample ID: 310-214293-1 MSD
Matrix: Ground Water
Analysis Batch: 327921

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	16.3		25.0	38.33		mg/L		88	80 - 120	0	15
Fluoride	<0.500		5.00	4.544		mg/L		91	80 - 120	3	15
Sulfate	82.7		25.0	104.3		mg/L		86	80 - 120	0	15

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-327545/1-A
Matrix: Water
Analysis Batch: 328019

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 327545

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 21:57	1
Arsenic	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 21:57	1
Barium	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 21:57	1
Beryllium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 21:57	1
Boron	<0.100		0.100		mg/L		09/07/21 09:00	09/09/21 21:57	1
Cadmium	<0.000100		0.000100		mg/L		09/07/21 09:00	09/09/21 21:57	1
Calcium	<0.500		0.500		mg/L		09/07/21 09:00	09/09/21 21:57	1
Chromium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 21:57	1
Cobalt	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 21:57	1
Lead	<0.000500		0.000500		mg/L		09/07/21 09:00	09/09/21 21:57	1
Lithium	<0.0100		0.0100		mg/L		09/07/21 09:00	09/09/21 21:57	1
Molybdenum	<0.00200		0.00200		mg/L		09/07/21 09:00	09/09/21 21:57	1

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QC Sample Results

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

Job ID: 310-214293-1

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

Lab Sample ID: MB 310-327545/1-A
Matrix: Water
Analysis Batch: 328019

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 327545

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	<0.00500		0.00500		mg/L		09/07/21 09:00	09/09/21 21:57	1
Thallium	<0.00100		0.00100		mg/L		09/07/21 09:00	09/09/21 21:57	1

Lab Sample ID: LCS 310-327545/2-A
Matrix: Water
Analysis Batch: 328019

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 327545

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.200	0.2020		mg/L		101	80 - 120
Arsenic	0.200	0.2066		mg/L		103	80 - 120
Barium	0.100	0.1098		mg/L		110	80 - 120
Beryllium	0.100	0.1034		mg/L		103	80 - 120
Boron	0.200	0.2146		mg/L		107	80 - 120
Cadmium	0.100	0.1021		mg/L		102	80 - 120
Calcium	2.00	1.944		mg/L		97	80 - 120
Chromium	0.100	0.09986		mg/L		100	80 - 120
Cobalt	0.100	0.1014		mg/L		101	80 - 120
Lead	0.200	0.2246		mg/L		112	80 - 120
Lithium	0.200	0.2116		mg/L		106	80 - 120
Molybdenum	0.200	0.2009		mg/L		100	80 - 120
Selenium	0.400	0.3954		mg/L		99	80 - 120
Thallium	0.200	0.2213		mg/L		111	80 - 120

Lab Sample ID: 310-214293-1 MS
Matrix: Ground Water
Analysis Batch: 328019

Client Sample ID: MW-8
Prep Type: Total/NA
Prep Batch: 327545

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	<0.00200		0.200	0.2002		mg/L		100	75 - 125
Arsenic	<0.00200		0.200	0.2093		mg/L		104	75 - 125
Barium	0.0623		0.100	0.1705		mg/L		108	75 - 125
Beryllium	<0.00100		0.100	0.1042		mg/L		104	75 - 125
Boron	<0.100		0.200	0.2589		mg/L		97	75 - 125
Cadmium	<0.000100		0.100	0.1019		mg/L		102	75 - 125
Calcium	78.3		2.00	82.91	4	mg/L		228	75 - 125
Chromium	<0.00500		0.100	0.09832		mg/L		98	75 - 125
Cobalt	0.00127		0.100	0.09842		mg/L		97	75 - 125
Lead	<0.000500		0.200	0.2153		mg/L		108	75 - 125
Lithium	<0.0100		0.200	0.2146		mg/L		107	75 - 125
Molybdenum	0.00218		0.200	0.2111		mg/L		104	75 - 125
Selenium	<0.00500		0.400	0.3767		mg/L		94	75 - 125
Thallium	<0.00100		0.200	0.2153		mg/L		107	75 - 125

Lab Sample ID: 310-214293-1 MSD
Matrix: Ground Water
Analysis Batch: 328019

Client Sample ID: MW-8
Prep Type: Total/NA
Prep Batch: 327545

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	<0.00200		0.200	0.1988		mg/L		99	75 - 125	1	20

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QC Sample Results

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

Job ID: 310-214293-1

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

Lab Sample ID: 310-214293-1 MSD
Matrix: Ground Water
Analysis Batch: 328019

Client Sample ID: MW-8
Prep Type: Total/NA
Prep Batch: 327545

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec.		RPD
				Result	Qualifier				Limits	RPD	
Arsenic	<0.00200		0.200	0.2087		mg/L		104	75 - 125	0	20
Barium	0.0623		0.100	0.1689		mg/L		107	75 - 125	1	20
Beryllium	<0.00100		0.100	0.1032		mg/L		103	75 - 125	1	20
Boron	<0.100		0.200	0.2585		mg/L		96	75 - 125	0	20
Cadmium	<0.000100		0.100	0.1006		mg/L		100	75 - 125	1	20
Calcium	78.3		2.00	81.84	4	mg/L		175	75 - 125	1	20
Chromium	<0.00500		0.100	0.09743		mg/L		97	75 - 125	1	20
Cobalt	0.00127		0.100	0.09775		mg/L		96	75 - 125	1	20
Lead	<0.000500		0.200	0.2136		mg/L		107	75 - 125	1	20
Lithium	<0.0100		0.200	0.2127		mg/L		106	75 - 125	1	20
Molybdenum	0.00218		0.200	0.2097		mg/L		104	75 - 125	1	20
Selenium	<0.00500		0.400	0.3781		mg/L		95	75 - 125	0	20
Thallium	<0.00100		0.200	0.2148		mg/L		107	75 - 125	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-328265/1-A
Matrix: Water
Analysis Batch: 328439

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 328265

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:13	1

Lab Sample ID: LCS 310-328265/2-A
Matrix: Water
Analysis Batch: 328439

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 328265

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec.	
		Result	Qualifier				Limits	RPD
Mercury	0.00167	0.001648		mg/L		99	80 - 120	

Lab Sample ID: 310-214293-2 MS
Matrix: Ground Water
Analysis Batch: 328439

Client Sample ID: MW-10
Prep Type: Total/NA
Prep Batch: 328265

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec.	
				Result	Qualifier				Limits	RPD
Mercury	<0.000200		0.00167	0.001574		mg/L		94	80 - 120	

Lab Sample ID: 310-214293-2 MSD
Matrix: Ground Water
Analysis Batch: 328439

Client Sample ID: MW-10
Prep Type: Total/NA
Prep Batch: 328265

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	%Rec.		RPD
				Result	Qualifier				Limits	RPD	
Mercury	<0.000200		0.00167	0.001637		mg/L		98	80 - 120	4	20

QC Sample Results

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

Job ID: 310-214293-1

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

Lab Sample ID: MB 310-327495/1
Matrix: Water
Analysis Batch: 327495

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			09/03/21 12:48	1

Lab Sample ID: LCS 310-327495/2
Matrix: Water
Analysis Batch: 327495

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	940.0		mg/L		94	90 - 110

Lab Sample ID: MB 310-327634/1
Matrix: Water
Analysis Batch: 327634

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			09/07/21 13:18	1

Lab Sample ID: LCS 310-327634/2
Matrix: Water
Analysis Batch: 327634

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	924.0		mg/L		92	90 - 110

Lab Sample ID: 310-214293-9 DU
Matrix: Ground Water
Analysis Batch: 327634

Client Sample ID: Duplicate-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	628		630.0		mg/L		0.3	20

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-327503/1
Matrix: Water
Analysis Batch: 327503

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		101	98 - 102

Lab Sample ID: LCS 310-327503/28
Matrix: Water
Analysis Batch: 327503

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

QC Sample Results

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

Job ID: 310-214293-1

Method: SM 4500 H+ B - pH (Continued)

Lab Sample ID: 310-214293-6 DU
Matrix: Ground Water
Analysis Batch: 327503

Client Sample ID: MW-23
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		0.3	20

Lab Sample ID: 310-214293-9 DU
Matrix: Ground Water
Analysis Batch: 327503

Client Sample ID: Duplicate-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.7	HF	6.7		SU		0.4	20

QC Association Summary

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

Job ID: 310-214293-1

HPLC/IC

Analysis Batch: 327921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	9056A	
310-214293-2	MW-10	Total/NA	Ground Water	9056A	
310-214293-3	MW-15A	Total/NA	Ground Water	9056A	
310-214293-4	MW-21	Total/NA	Ground Water	9056A	
310-214293-5	MW-22	Total/NA	Ground Water	9056A	
310-214293-6	MW-23	Total/NA	Ground Water	9056A	
310-214293-7	MW-24	Total/NA	Ground Water	9056A	
310-214293-9	Duplicate-1	Total/NA	Ground Water	9056A	
310-214293-10	Duplicate-2	Total/NA	Ground Water	9056A	
MB 310-327921/3	Method Blank	Total/NA	Water	9056A	
LCS 310-327921/4	Lab Control Sample	Total/NA	Water	9056A	
310-214293-1 MS	MW-8	Total/NA	Ground Water	9056A	
310-214293-1 MSD	MW-8	Total/NA	Ground Water	9056A	

Metals

Prep Batch: 327545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	3010A	
310-214293-2	MW-10	Total/NA	Ground Water	3010A	
310-214293-3	MW-15A	Total/NA	Ground Water	3010A	
310-214293-4	MW-21	Total/NA	Ground Water	3010A	
310-214293-5	MW-22	Total/NA	Ground Water	3010A	
310-214293-6	MW-23	Total/NA	Ground Water	3010A	
310-214293-7	MW-24	Total/NA	Ground Water	3010A	
310-214293-9	Duplicate-1	Total/NA	Ground Water	3010A	
310-214293-10	Duplicate-2	Total/NA	Ground Water	3010A	
MB 310-327545/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-327545/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-214293-1 MS	MW-8	Total/NA	Ground Water	3010A	
310-214293-1 MSD	MW-8	Total/NA	Ground Water	3010A	

Analysis Batch: 328019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	6020A	327545
310-214293-2	MW-10	Total/NA	Ground Water	6020A	327545
310-214293-3	MW-15A	Total/NA	Ground Water	6020A	327545
310-214293-4	MW-21	Total/NA	Ground Water	6020A	327545
310-214293-5	MW-22	Total/NA	Ground Water	6020A	327545
310-214293-6	MW-23	Total/NA	Ground Water	6020A	327545
310-214293-7	MW-24	Total/NA	Ground Water	6020A	327545
310-214293-9	Duplicate-1	Total/NA	Ground Water	6020A	327545
310-214293-10	Duplicate-2	Total/NA	Ground Water	6020A	327545
MB 310-327545/1-A	Method Blank	Total/NA	Water	6020A	327545
LCS 310-327545/2-A	Lab Control Sample	Total/NA	Water	6020A	327545
310-214293-1 MS	MW-8	Total/NA	Ground Water	6020A	327545
310-214293-1 MSD	MW-8	Total/NA	Ground Water	6020A	327545

Analysis Batch: 328133

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-3	MW-15A	Total/NA	Ground Water	6020A	327545

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QC Association Summary

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

Job ID: 310-214293-1

Metals (Continued)

Analysis Batch: 328133 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-4	MW-21	Total/NA	Ground Water	6020A	327545
310-214293-9	Duplicate-1	Total/NA	Ground Water	6020A	327545

Prep Batch: 328265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	7470A	
310-214293-2	MW-10	Total/NA	Ground Water	7470A	
310-214293-3	MW-15A	Total/NA	Ground Water	7470A	
310-214293-4	MW-21	Total/NA	Ground Water	7470A	
310-214293-5	MW-22	Total/NA	Ground Water	7470A	
310-214293-6	MW-23	Total/NA	Ground Water	7470A	
310-214293-7	MW-24	Total/NA	Ground Water	7470A	
310-214293-9	Duplicate-1	Total/NA	Ground Water	7470A	
310-214293-10	Duplicate-2	Total/NA	Ground Water	7470A	
MB 310-328265/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-328265/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-214293-2 MS	MW-10	Total/NA	Ground Water	7470A	
310-214293-2 MSD	MW-10	Total/NA	Ground Water	7470A	

Analysis Batch: 328439

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	7470A	328265
310-214293-2	MW-10	Total/NA	Ground Water	7470A	328265
310-214293-3	MW-15A	Total/NA	Ground Water	7470A	328265
310-214293-4	MW-21	Total/NA	Ground Water	7470A	328265
310-214293-5	MW-22	Total/NA	Ground Water	7470A	328265
310-214293-6	MW-23	Total/NA	Ground Water	7470A	328265
310-214293-7	MW-24	Total/NA	Ground Water	7470A	328265
310-214293-9	Duplicate-1	Total/NA	Ground Water	7470A	328265
310-214293-10	Duplicate-2	Total/NA	Ground Water	7470A	328265
MB 310-328265/1-A	Method Blank	Total/NA	Water	7470A	328265
LCS 310-328265/2-A	Lab Control Sample	Total/NA	Water	7470A	328265
310-214293-2 MS	MW-10	Total/NA	Ground Water	7470A	328265
310-214293-2 MSD	MW-10	Total/NA	Ground Water	7470A	328265

General Chemistry

Analysis Batch: 327495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	SM 2540C	
310-214293-2	MW-10	Total/NA	Ground Water	SM 2540C	
310-214293-3	MW-15A	Total/NA	Ground Water	SM 2540C	
310-214293-4	MW-21	Total/NA	Ground Water	SM 2540C	
310-214293-5	MW-22	Total/NA	Ground Water	SM 2540C	
310-214293-6	MW-23	Total/NA	Ground Water	SM 2540C	
310-214293-7	MW-24	Total/NA	Ground Water	SM 2540C	
MB 310-327495/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-327495/2	Lab Control Sample	Total/NA	Water	SM 2540C	

QC Association Summary

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

Job ID: 310-214293-1

General Chemistry

Analysis Batch: 327503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-2	MW-10	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-3	MW-15A	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-4	MW-21	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-5	MW-22	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-6	MW-23	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-7	MW-24	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-9	Duplicate-1	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-10	Duplicate-2	Total/NA	Ground Water	SM 4500 H+ B	
LCS 310-327503/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
LCS 310-327503/28	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-214293-6 DU	MW-23	Total/NA	Ground Water	SM 4500 H+ B	
310-214293-9 DU	Duplicate-1	Total/NA	Ground Water	SM 4500 H+ B	

Analysis Batch: 327634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-9	Duplicate-1	Total/NA	Ground Water	SM 2540C	
310-214293-10	Duplicate-2	Total/NA	Ground Water	SM 2540C	
MB 310-327634/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-327634/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-214293-9 DU	Duplicate-1	Total/NA	Ground Water	SM 2540C	

Lab Chronicle

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

Job ID: 310-214293-1

Client Sample ID: MW-8

Date Collected: 08/31/21 14:05

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 08:43	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:02	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:17	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327495	09/03/21 12:48	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 15:01	WJF	TAL CF

Client Sample ID: MW-10

Date Collected: 09/01/21 10:15

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 09:29	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:23	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:19	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327495	09/03/21 12:48	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 15:12	WJF	TAL CF

Client Sample ID: MW-15A

Date Collected: 09/02/21 09:05

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 09:45	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:26	SAP	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		4	328133	09/10/21 17:36	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:25	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327495	09/03/21 12:48	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 15:11	WJF	TAL CF

Client Sample ID: MW-21

Date Collected: 09/01/21 14:25

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 10:00	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:28	SAP	TAL CF

Lab Chronicle

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

Job ID: 310-214293-1

Client Sample ID: MW-21

Lab Sample ID: 310-214293-4

Date Collected: 09/01/21 14:25

Matrix: Ground Water

Date Received: 09/03/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		4	328133	09/10/21 17:38	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:27	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327495	09/03/21 12:48	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 15:03	WJF	TAL CF

Client Sample ID: MW-22

Lab Sample ID: 310-214293-5

Date Collected: 09/01/21 12:50

Matrix: Ground Water

Date Received: 09/03/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 10:16	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:31	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:30	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327495	09/03/21 12:48	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 15:04	WJF	TAL CF

Client Sample ID: MW-23

Lab Sample ID: 310-214293-6

Date Collected: 09/01/21 11:50

Matrix: Ground Water

Date Received: 09/03/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 10:32	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:34	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:32	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327495	09/03/21 12:48	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 15:07	WJF	TAL CF

Client Sample ID: MW-24

Lab Sample ID: 310-214293-7

Date Collected: 08/31/21 13:10

Matrix: Ground Water

Date Received: 09/03/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 11:18	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:36	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:38	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327495	09/03/21 12:48	SAS	TAL CF

Lab Chronicle

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

Job ID: 310-214293-1

Client Sample ID: MW-24
Date Collected: 08/31/21 13:10
Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-7
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 15:10	WJF	TAL CF

Client Sample ID: Duplicate-1
Date Collected: 09/01/21 12:00
Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-9
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 11:50	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:50	SAP	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		4	328133	09/10/21 17:41	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:42	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327634	09/07/21 13:18	ARG	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 14:50	WJF	TAL CF

Client Sample ID: Duplicate-2
Date Collected: 09/01/21 12:00
Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-10
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	327921	09/08/21 12:05	CTB	TAL CF
Total/NA	Prep	3010A			327545	09/07/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	328019	09/09/21 22:52	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 12:45	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327634	09/07/21 13:18	ARG	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327503	09/03/21 14:54	WJF	TAL CF

Laboratory References:

TAL CF = Eurofins TestAmerica, 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

Job ID: 310-214293-1

Laboratory: Eurofins TestAmerica, Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-21
Georgia	State	IA100001 (OR)	09-29-21
Illinois	NELAP	200024	11-29-21
Iowa	State	007	12-01-21
Kansas	NELAP	E-10341	01-31-22
Minnesota	NELAP	019-999-319	12-31-21
Minnesota (Petrofund)	State	3349	04-06-23
North Dakota	State	R-186	09-29-21
Oregon	NELAP	IA100001	09-29-21
USDA	US Federal Programs	P330-19-00003	01-02-22

Method Summary

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

Job ID: 310-214293-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

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

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

Laboratory References:

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



Environment Testing
TestAmerica



310-214293 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscataine P+U</u>		
City/State: <u>Muscataine IA</u>	CITY STATE	Project:
Receipt Information		
Date/Time Received: <u>9/3/21 0915</u>	DATE TIME	Received By: <u>UB</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: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No ^{9/3/21}	If yes: Cooler # <u>1</u> of <u>2</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? ↓
Temperature Record		
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>N</u>	Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>1.7</u>	Corrected Temp (°C): <u>1.7</u>	
• Sample Container Temperature		
Container(s) used:	CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <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		
Additional Comments		



Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscatine P+U</u>		
City/State: <small>CITY</small> <u>Muscatine</u> <small>STATE</small> <u>IA</u>	Project:	
Receipt Information		
Date/Time Received: <small>DATE</small> <u>9/13/24</u> <small>TIME</small> <u>0915</u>	Received By: <u>UB</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: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2 of 2</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? ↓
Temperature Record		
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>N</u>	Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>3.1</u>	Corrected Temp (°C): <u>3.1</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
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		
Additional Comments		

Chain of Custody Record

Client Information		Lab PM: Hayes, Shawn M		Carrier Tracking No(s):	
Client Contact: Sam Bennett MP&W and Rose Amundson (HR Green)		E-Mail: shawn.hayes@testamericainc.com		COC No:	
Company: Muscatine Power & Water		Address: 1700 Dick Drake Way		Job #:	
City: Muscatine		State, Zip: IA, 52761		Preservation Codes:	
Phone: 214440		PO #: 214440		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 ramundson@hrgreen.com		WO #: 31007856		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)	
Project Name: Muscatine Power & Water CCR Landfill		TestAmerica Project #: 31007856		Special Instructions/Note:	
Site: Iowa		Event:		in second shipment	
Sample Identification		Due Date Requested:		Analysis Requested	
Sample Date		TAT Requested (days):		Total Number of Containers	
Sample Time		Field Filtered Sample (Yes or No)		X	
Sample Type (C=Comp, G=grab)		Matrix (Water, Soil, Other)		X	
Preservation Code:		9029A CCR List 7470A Mercury		X	
MW-4A		2450C TDS, SM4500, H+ pH		X	
MW-5B		9056A Chloride, Fluoride, Sulfate		X	
MW-6A		6029A CCR List 7470A Mercury		X	
MW-8		8/31/21 1405		X	
MW-10		9/1/21 1015		X	
MW-14A		9/2/21 0905		X	
MW-15A		9/1/21 1425		X	
MW-21		9/1/21 1250		X	
MW-22		9/1/21 1150		X	
MW-23		8/31/21 1310		X	
MW-24					
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		Special Instructions/OC Requirements:	
<input checked="" 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		Special Instructions/OC Requirements:	
Deliverable Requested: I, II, III, IV, Other (specify)		Empty Kit Relinquished by:		Method of Shipment:	
Date/Time: 9/12/21 1230		Date/Time: 9/13/21 0915		Date/Time: 9/13/21 0915	
Relinquished by: Sam Bennett		Company: mpw		Company: Company	
Relinquished by:		Company: Company		Company: Company	
Relinquished by:		Company: Company		Company: Company	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	



Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-214293-1

Login Number: 214293

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Hayes, Shawn M

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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	



ANALYTICAL REPORT

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

Laboratory Job ID: 310-214293-2
Client Project/Site: Muscatine Power & Water CCR

For:
Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
10/19/2021 11:32:19 AM

Shawn Hayes, Senior Project Manager
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

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

Job ID: 310-214293-2

Job ID: 310-214293-2

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative 310-214293-2

Comments

No additional comments.

Receipt

The samples were received on 9/3/2021 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.7° C and 3.1° C.

RAD

Methods 904.0, 9320: Radium-228 Batch 526666

The Radium-228 laboratory control sample duplicate (LCSD) associated with the following samples recovered at 132%: MW-10 (310-214293-2), MW-15A (310-214293-3), MW-21 (310-214293-4), MW-22 (310-214293-5), MW-23 (310-214293-6), MW-24 (310-214293-7), Duplicate-1 (310-214293-9), Duplicate-2 (310-214293-10), (LCS 160-526666/2-A), (LCSD 160-526666/3-A) and (MB 160-526666/1-A). The limits in our LIMS system at (75-125%) reflect the requirements of a regulatory agency that represents a large amount of our work. However the samples associated with this LCS are not from this agency and are therefore held to our in-house statistical limits of (61-138%) per method requirements. The LCS is within criteria and no further action is required.

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



Sample Summary

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

Job ID: 310-214293-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-214293-1	MW-8	Ground Water	08/31/21 14:05	09/03/21 09:15
310-214293-2	MW-10	Ground Water	09/01/21 10:15	09/03/21 09:15
310-214293-3	MW-15A	Ground Water	09/02/21 09:05	09/03/21 09:15
310-214293-4	MW-21	Ground Water	09/01/21 14:25	09/03/21 09:15
310-214293-5	MW-22	Ground Water	09/01/21 12:50	09/03/21 09:15
310-214293-6	MW-23	Ground Water	09/01/21 11:50	09/03/21 09:15
310-214293-7	MW-24	Ground Water	08/31/21 13:10	09/03/21 09:15
310-214293-9	Duplicate-1	Ground Water	09/01/21 12:00	09/03/21 09:15
310-214293-10	Duplicate-2	Ground Water	09/01/21 12:00	09/03/21 09:15

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

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: MW-8

Lab Sample ID: 310-214293-1

Date Collected: 08/31/21 14:05

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0456	U	0.163	0.163	1.00	0.313	pCi/L	09/10/21 17:56	10/08/21 17:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.9		40 - 110					09/10/21 17:56	10/08/21 17:56	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.250	U	0.224	0.226	1.00	0.360	pCi/L	09/13/21 16:09	10/08/21 12:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.9		40 - 110					09/13/21 16:09	10/08/21 12:05	1
Y Carrier	85.2		40 - 110					09/13/21 16:09	10/08/21 12:05	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.296	U	0.277	0.279	5.00	0.360	pCi/L		10/12/21 18:29	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: MW-10

Lab Sample ID: 310-214293-2

Date Collected: 09/01/21 10:15

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.410		0.163	0.167	1.00	0.175	pCi/L	09/10/21 20:10	10/15/21 07:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.5		40 - 110					09/10/21 20:10	10/15/21 07:25	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.912		0.342	0.352	1.00	0.470	pCi/L	09/13/21 09:59	10/12/21 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.5		40 - 110					09/13/21 09:59	10/12/21 12:28	1
Y Carrier	75.5		40 - 110					09/13/21 09:59	10/12/21 12:28	1

Method: 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	1.32		0.379	0.390	5.00	0.470	pCi/L		10/18/21 18:28	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: MW-15A

Lab Sample ID: 310-214293-3

Date Collected: 09/02/21 09:05

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.126	U	0.134	0.135	1.00	0.212	pCi/L	09/10/21 20:10	10/13/21 13:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.8		40 - 110					09/10/21 20:10	10/13/21 13:12	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.236	U	0.299	0.299	1.00	0.495	pCi/L	09/13/21 09:59	10/12/21 12:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.8		40 - 110					09/13/21 09:59	10/12/21 12:33	1
Y Carrier	77.8		40 - 110					09/13/21 09:59	10/12/21 12:33	1

Method: 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	0.362	U	0.328	0.328	5.00	0.495	pCi/L		10/18/21 18:28	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: MW-21

Lab Sample ID: 310-214293-4

Date Collected: 09/01/21 14:25

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0566	U	0.130	0.130	1.00	0.238	pCi/L	09/10/21 20:10	10/13/21 13:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		40 - 110					09/10/21 20:10	10/13/21 13:12	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.443		0.281	0.284	1.00	0.430	pCi/L	09/13/21 09:59	10/12/21 12:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		40 - 110					09/13/21 09:59	10/12/21 12:33	1
Y Carrier	79.3		40 - 110					09/13/21 09:59	10/12/21 12:33	1

Method: 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	0.499		0.310	0.312	5.00	0.430	pCi/L		10/18/21 18:28	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: MW-22

Lab Sample ID: 310-214293-5

Date Collected: 09/01/21 12:50

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.235		0.159	0.161	1.00	0.212	pCi/L	09/10/21 20:10	10/13/21 13:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.6		40 - 110					09/10/21 20:10	10/13/21 13:12	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.287	U	0.299	0.300	1.00	0.487	pCi/L	09/13/21 09:59	10/12/21 12:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.6		40 - 110					09/13/21 09:59	10/12/21 12:33	1
Y Carrier	75.9		40 - 110					09/13/21 09:59	10/12/21 12:33	1

Method: 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		0.339	0.340	5.00	0.487	pCi/L		10/18/21 18:28	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: MW-23

Lab Sample ID: 310-214293-6

Date Collected: 09/01/21 11:50

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0236	U	0.136	0.136	1.00	0.268	pCi/L	09/10/21 20:10	10/13/21 13:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.4		40 - 110					09/10/21 20:10	10/13/21 13:13	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.771		0.402	0.408	1.00	0.607	pCi/L	09/13/21 09:59	10/12/21 12:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.4		40 - 110					09/13/21 09:59	10/12/21 12:34	1
Y Carrier	76.3		40 - 110					09/13/21 09:59	10/12/21 12:34	1

Method: 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	0.794		0.424	0.430	5.00	0.607	pCi/L		10/18/21 18:28	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: MW-24
Date Collected: 08/31/21 13:10
Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-7
Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00873	U	0.137	0.137	1.00	0.274	pCi/L	09/10/21 20:10	10/13/21 13:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.7		40 - 110					09/10/21 20:10	10/13/21 13:13	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.266	U	0.296	0.297	1.00	0.485	pCi/L	09/13/21 09:59	10/12/21 12:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.7		40 - 110					09/13/21 09:59	10/12/21 12:34	1
Y Carrier	77.8		40 - 110					09/13/21 09:59	10/12/21 12:34	1

Method: 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	0.275	U	0.326	0.327	5.00	0.485	pCi/L		10/18/21 18:28	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: Duplicate-1

Lab Sample ID: 310-214293-9

Date Collected: 09/01/21 12:00

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.192	U	0.165	0.165	1.00	0.246	pCi/L	09/10/21 20:10	10/13/21 13:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110					09/10/21 20:10	10/13/21 13:13	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.592		0.340	0.344	1.00	0.519	pCi/L	09/13/21 09:59	10/12/21 12:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110					09/13/21 09:59	10/12/21 12:38	1
Y Carrier	78.5		40 - 110					09/13/21 09:59	10/12/21 12:38	1

Method: 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	0.783		0.378	0.382	5.00	0.519	pCi/L		10/18/21 18:28	1

Client Sample Results

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

Job ID: 310-214293-2

Client Sample ID: Duplicate-2

Lab Sample ID: 310-214293-10

Date Collected: 09/01/21 12:00

Matrix: Ground Water

Date Received: 09/03/21 09:15

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.391		0.206	0.209	1.00	0.254	pCi/L	09/10/21 20:10	10/13/21 13:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110					09/10/21 20:10	10/13/21 13:14	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.796		0.355	0.362	1.00	0.515	pCi/L	09/13/21 09:59	10/12/21 12:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110					09/13/21 09:59	10/12/21 12:39	1
Y Carrier	77.0		40 - 110					09/13/21 09:59	10/12/21 12:39	1

Method: 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	1.19		0.410	0.418	5.00	0.515	pCi/L		10/18/21 18:28	1

Definitions/Glossary

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

Job ID: 310-214293-2

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

Job ID: 310-214293-2

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-526405/1-A
Matrix: Water
Analysis Batch: 530557

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 526405

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.07808	U	0.238	0.239	1.00	0.438	pCi/L	09/10/21 17:56	10/08/21 17:44	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	82.1		40 - 110		09/10/21 17:56	10/08/21 17:44	1			

Lab Sample ID: LCS 160-526405/2-A
Matrix: Water
Analysis Batch: 530557

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 526405

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	9.757		1.32	1.00	0.430	pCi/L	86	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	89.0		40 - 110						

Lab Sample ID: MB 160-526414/1-A
Matrix: Water
Analysis Batch: 531338

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 526414

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.08219	U	0.159	0.159	1.00	0.282	pCi/L	09/10/21 20:10	10/13/21 13:08	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	87.7		40 - 110		09/10/21 20:10	10/13/21 13:08	1			

Lab Sample ID: LCS 160-526414/2-A
Matrix: Water
Analysis Batch: 531338

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 526414

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	11.02		1.33	1.00	0.330	pCi/L	97	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	88.7		40 - 110						

Lab Sample ID: LCSD 160-526414/3-A
Matrix: Water
Analysis Batch: 531971

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 526414

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
				Uncert. (2σ+/-)							
Radium-226	11.3	9.695		1.15	1.00	0.257	pCi/L	85	75 - 125	0.54	1

Eurofins TestAmerica, Cedar Falls

QC Sample Results

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

Job ID: 310-214293-2

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

Lab Sample ID: LCSD 160-526414/3-A
Matrix: Water
Analysis Batch: 531971

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 526414

Carrier	LCS D %Yield	LCS D Qualifier	Limits
Ba Carrier	74.9	U	40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-526666/1-A
Matrix: Water
Analysis Batch: 531122

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 526666

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.4706	U	0.319	0.322	1.00	0.495	pCi/L	09/13/21 09:59	10/12/21 12:27	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	87.7		40 - 110		09/13/21 09:59	10/12/21 12:27	1			
Y Carrier	73.3		40 - 110		09/13/21 09:59	10/12/21 12:27	1			

Lab Sample ID: LCS 160-526666/2-A
Matrix: Water
Analysis Batch: 531122

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 526666

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
									Limit	Upper
Radium-228	9.25	10.61		1.27	1.00	0.460	pCi/L	115	75 - 125	
Carrier	LCS %Yield	LCS Qualifier	Limits							
Ba Carrier	88.7		40 - 110							
Y Carrier	71.8		40 - 110							

Lab Sample ID: LCSD 160-526666/3-A
Matrix: Water
Analysis Batch: 531122

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 526666

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	RER Limit
									Limit	Upper	Limit	Upper
Radium-228	9.25	12.25		1.48	1.00	0.562	pCi/L	132	75 - 125	0.60	1	
Carrier	LCSD %Yield	LCSD Qualifier	Limits									
Ba Carrier	74.9		40 - 110									
Y Carrier	69.9		40 - 110									

Lab Sample ID: MB 160-526822/1-A
Matrix: Water
Analysis Batch: 530557

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 526822

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.5057		0.317	0.320	1.00	0.489	pCi/L	09/13/21 16:09	10/08/21 11:53	1

Eurofins TestAmerica, Cedar Falls

QC Sample Results

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

Job ID: 310-214293-2

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

Lab Sample ID: MB 160-526822/1-A
Matrix: Water
Analysis Batch: 530557

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 526822

Carrier	MB MB		Limits
	%Yield	Qualifier	
Ba Carrier	82.1		40 - 110
Y Carrier	81.9		40 - 110

Prepared	Analyzed	Dil Fac
09/13/21 16:09	10/08/21 11:53	1
09/13/21 16:09	10/08/21 11:53	1

Lab Sample ID: LCS 160-526822/2-A
Matrix: Water
Analysis Batch: 530557

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 526822

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
									75 - 125
Radium-228	9.26	10.41		1.20	1.00	0.425	pCi/L	112	75 - 125

Carrier	LCS LCS		Limits
	%Yield	Qualifier	
Ba Carrier	89.0		40 - 110
Y Carrier	81.9		40 - 110

QC Association Summary

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

Job ID: 310-214293-2

Rad

Prep Batch: 526405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	PrecSep-21	
MB 160-526405/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-526405/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 526414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-2	MW-10	Total/NA	Ground Water	PrecSep-21	
310-214293-3	MW-15A	Total/NA	Ground Water	PrecSep-21	
310-214293-4	MW-21	Total/NA	Ground Water	PrecSep-21	
310-214293-5	MW-22	Total/NA	Ground Water	PrecSep-21	
310-214293-6	MW-23	Total/NA	Ground Water	PrecSep-21	
310-214293-7	MW-24	Total/NA	Ground Water	PrecSep-21	
310-214293-9	Duplicate-1	Total/NA	Ground Water	PrecSep-21	
310-214293-10	Duplicate-2	Total/NA	Ground Water	PrecSep-21	
MB 160-526414/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-526414/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-526414/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 526666

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-2	MW-10	Total/NA	Ground Water	PrecSep_0	
310-214293-3	MW-15A	Total/NA	Ground Water	PrecSep_0	
310-214293-4	MW-21	Total/NA	Ground Water	PrecSep_0	
310-214293-5	MW-22	Total/NA	Ground Water	PrecSep_0	
310-214293-6	MW-23	Total/NA	Ground Water	PrecSep_0	
310-214293-7	MW-24	Total/NA	Ground Water	PrecSep_0	
310-214293-9	Duplicate-1	Total/NA	Ground Water	PrecSep_0	
310-214293-10	Duplicate-2	Total/NA	Ground Water	PrecSep_0	
MB 160-526666/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-526666/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-526666/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 526822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214293-1	MW-8	Total/NA	Ground Water	PrecSep_0	
MB 160-526822/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-526822/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

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

Job ID: 310-214293-2

Client Sample ID: MW-8

Date Collected: 08/31/21 14:05

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526405	09/10/21 17:56	MLK	TAL SL
Total/NA	Analysis	9315		1	530570	10/08/21 17:56	ANW	TAL SL
Total/NA	Prep	PrecSep_0			526822	09/13/21 16:09	IG	TAL SL
Total/NA	Analysis	9320		1	530588	10/08/21 12:05	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	531330	10/12/21 18:29	EMH	TAL SL

Client Sample ID: MW-10

Date Collected: 09/01/21 10:15

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531971	10/15/21 07:25	ANW	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531122	10/12/21 12:28	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Client Sample ID: MW-15A

Date Collected: 09/02/21 09:05

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531338	10/13/21 13:12	EMH	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531159	10/12/21 12:33	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Client Sample ID: MW-21

Date Collected: 09/01/21 14:25

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531338	10/13/21 13:12	EMH	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531159	10/12/21 12:33	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Lab Chronicle

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

Job ID: 310-214293-2

Client Sample ID: MW-22

Date Collected: 09/01/21 12:50

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531338	10/13/21 13:12	EMH	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531159	10/12/21 12:33	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Client Sample ID: MW-23

Date Collected: 09/01/21 11:50

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531338	10/13/21 13:13	EMH	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531159	10/12/21 12:34	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Client Sample ID: MW-24

Date Collected: 08/31/21 13:10

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531338	10/13/21 13:13	EMH	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531159	10/12/21 12:34	ANW	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Client Sample ID: Duplicate-1

Date Collected: 09/01/21 12:00

Date Received: 09/03/21 09:15

Lab Sample ID: 310-214293-9

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531338	10/13/21 13:13	EMH	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531123	10/12/21 12:38	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Lab Chronicle

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

Job ID: 310-214293-2

Client Sample ID: Duplicate-2

Lab Sample ID: 310-214293-10

Date Collected: 09/01/21 12:00

Matrix: Ground Water

Date Received: 09/03/21 09:15

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Prep	PrecSep-21			526414	09/10/21 20:10	LAM	TAL SL
Total/NA	Analysis	9315		1	531338	10/13/21 13:14	EMH	TAL SL
Total/NA	Prep	PrecSep_0			526666	09/13/21 09:59	MJ	TAL SL
Total/NA	Analysis	9320		1	531123	10/12/21 12:39	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	532586	10/18/21 18:28	CAH	TAL SL

Laboratory References:

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

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Accreditation/Certification Summary

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

Job ID: 310-214293-2

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-21
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	06-30-21 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	004553	11-30-21
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-21
Kentucky (DW)	State	KY90125	01-01-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-21
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-21
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-22
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	03-01-22
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

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

Method Summary

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

Job ID: 310-214293-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

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:

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



Environment Testing
TestAmerica



310-214293 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscataine P+U</u>		
City/State: <u>Muscataine IA</u>	CITY STATE	Project:
Receipt Information		
Date/Time Received: <u>9/3/21 0915</u>	DATE TIME	Received By: <u>UB</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: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No ^{9/3/21}	If yes: Cooler # <u>1</u> of <u>2</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? ↓
Temperature Record		
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>N</u>	Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>1.7</u>	Corrected Temp (°C): <u>1.7</u>	
Sample Container Temperature		
Container(s) used:	CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <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		
Additional Comments		



Environment Testing
TestAmerica

Place GOC scanning label
here

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscatine P+U</u>		
City/State: <small>CITY</small> <u>Muscatine</u> <small>STATE</small> <u>IA</u>	Project:	
Receipt Information		
Date/Time Received: <small>DATE</small> <u>9/13/24</u> <small>TIME</small> <u>0915</u>	Received By: <u>UB</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: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2 of 2</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? ↓
Temperature Record		
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>N</u>	Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>3.1</u>	Corrected Temp (°C): <u>3.1</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
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		
Additional Comments		

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-214293-2

Login Number: 214293

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Hayes, Shawn M

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



Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-214293-2

Login Number: 214293

List Number: 2

Creator: Mazariegos, Leonel A

List Source: Eurofins TestAmerica, St. Louis

List Creation: 09/04/21 11:11 AM

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



Tracer/Carrier Summary

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

Job ID: 310-214293-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
310-214293-1	MW-8	94.9	
310-214293-2	MW-10	89.5	
310-214293-3	MW-15A	91.8	
310-214293-4	MW-21	92.3	
310-214293-5	MW-22	92.6	
310-214293-6	MW-23	83.4	
310-214293-7	MW-24	86.7	
310-214293-9	Duplicate-1	88.0	
310-214293-10	Duplicate-2	85.9	

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 (40-110)	
LCS 160-526405/2-A	Lab Control Sample	89.0	
LCS 160-526414/2-A	Lab Control Sample	88.7	
LCSD 160-526414/3-A	Lab Control Sample Dup	74.9	
MB 160-526405/1-A	Method Blank	82.1	
MB 160-526414/1-A	Method Blank	87.7	

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 (40-110)	Y (40-110)
310-214293-1	MW-8	94.9	85.2
310-214293-2	MW-10	89.5	75.5
310-214293-3	MW-15A	91.8	77.8
310-214293-4	MW-21	92.3	79.3
310-214293-5	MW-22	92.6	75.9
310-214293-6	MW-23	83.4	76.3
310-214293-7	MW-24	86.7	77.8
310-214293-9	Duplicate-1	88.0	78.5
310-214293-10	Duplicate-2	85.9	77.0

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

Tracer/Carrier Summary

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

Job ID: 310-214293-2

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
LCS 160-526666/2-A	Lab Control Sample	88.7	71.8
LCS 160-526822/2-A	Lab Control Sample	89.0	81.9
LCSD 160-526666/3-A	Lab Control Sample Dup	74.9	69.9
MB 160-526666/1-A	Method Blank	87.7	73.3
MB 160-526822/1-A	Method Blank	82.1	81.9

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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- 12
- 13
- 14

ANALYTICAL REPORT

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

Laboratory Job ID: 310-214546-1

Client Project/Site: Muscatine Power & Water CCR

For:

Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



*Authorized for release by:
9/17/2021 2:06:48 PM*

Shawn Hayes, Senior Project Manager
(319)229-8211
Shawn.Hayes@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

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

Job ID: 310-214546-1

Job ID: 310-214546-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

**Job Narrative
310-214546-1**

Comments

No additional comments.

Receipt

The samples were received on 9/8/2021 9:40 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 was 0.4° C.

HPLC/IC

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

Metals

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

General Chemistry

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

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Sample Summary

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

Job ID: 310-214546-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-214546-1	MW-4A	Water	09/02/21 15:00	09/08/21 09:40
310-214546-2	MW-5B	Water	09/03/21 10:45	09/08/21 09:40
310-214546-3	MW-6A	Water	09/02/21 15:55	09/08/21 09:40
310-214546-4	MW-14A	Water	09/02/21 11:55	09/08/21 09:40

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- 13
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Detection Summary

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

Job ID: 310-214546-1

Client Sample ID: MW-4A

Lab Sample ID: 310-214546-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.7		5.00		mg/L	5		9056A	Total/NA
Sulfate	50.2		5.00		mg/L	5		9056A	Total/NA
Barium	0.186		0.00200		mg/L	1		6020A	Total/NA
Calcium	95.1		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.00335		0.000500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	370		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-214546-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	37.6		5.00		mg/L	5		9056A	Total/NA
Sulfate	53.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.241		0.00200		mg/L	1		6020A	Total/NA
Calcium	108		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	448		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-6A

Lab Sample ID: 310-214546-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	17.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	22.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.248		0.00200		mg/L	1		6020A	Total/NA
Calcium	90.6		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	350		50.0		mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-14A

Lab Sample ID: 310-214546-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	23.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	1010		20.0		mg/L	20		9056A	Total/NA
Barium	0.0345		0.00200		mg/L	1		6020A	Total/NA
Boron	17.1		0.700		mg/L	7		6020A	Total/NA
Calcium	270		0.500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1560		250		mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Client Sample Results

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

Job ID: 310-214546-1

Client Sample ID: MW-4A

Lab Sample ID: 310-214546-1

Date Collected: 09/02/21 15:00

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16.7		5.00		mg/L			09/10/21 12:28	5
Fluoride	<0.500		0.500		mg/L			09/10/21 12:28	5
Sulfate	50.2		5.00		mg/L			09/10/21 12:28	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:09	1
Arsenic	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:09	1
Barium	0.186		0.00200		mg/L		09/09/21 09:00	09/11/21 19:09	1
Beryllium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:09	1
Boron	<0.100		0.100		mg/L		09/09/21 09:00	09/13/21 15:40	1
Cadmium	<0.000100		0.000100		mg/L		09/09/21 09:00	09/11/21 19:09	1
Calcium	95.1		0.500		mg/L		09/09/21 09:00	09/11/21 19:09	1
Chromium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:09	1
Cobalt	0.00335		0.000500		mg/L		09/09/21 09:00	09/11/21 19:09	1
Lead	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 19:09	1
Lithium	<0.0100		0.0100		mg/L		09/09/21 09:00	09/11/21 19:09	1
Molybdenum	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:09	1
Selenium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:09	1
Thallium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:09	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 13:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	370		50.0		mg/L			09/08/21 16:16	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			09/08/21 14:47	1

Client Sample Results

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

Job ID: 310-214546-1

Client Sample ID: MW-5B

Lab Sample ID: 310-214546-2

Date Collected: 09/03/21 10:45

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	37.6		5.00		mg/L			09/10/21 12:43	5
Fluoride	<0.500		0.500		mg/L			09/10/21 12:43	5
Sulfate	53.7		5.00		mg/L			09/10/21 12:43	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:12	1
Arsenic	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:12	1
Barium	0.241		0.00200		mg/L		09/09/21 09:00	09/11/21 19:12	1
Beryllium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:12	1
Boron	<0.100		0.100		mg/L		09/09/21 09:00	09/13/21 15:43	1
Cadmium	<0.000100		0.000100		mg/L		09/09/21 09:00	09/11/21 19:12	1
Calcium	108		0.500		mg/L		09/09/21 09:00	09/11/21 19:12	1
Chromium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:12	1
Cobalt	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 19:12	1
Lead	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 19:12	1
Lithium	<0.0100		0.0100		mg/L		09/09/21 09:00	09/11/21 19:12	1
Molybdenum	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:12	1
Selenium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:12	1
Thallium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:12	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 13:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	448		50.0		mg/L			09/08/21 16:16	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			09/08/21 14:49	1

Client Sample Results

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

Job ID: 310-214546-1

Client Sample ID: MW-6A

Lab Sample ID: 310-214546-3

Date Collected: 09/02/21 15:55

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17.4		5.00		mg/L			09/10/21 12:59	5
Fluoride	<0.500		0.500		mg/L			09/10/21 12:59	5
Sulfate	22.7		5.00		mg/L			09/10/21 12:59	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:14	1
Arsenic	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:14	1
Barium	0.248		0.00200		mg/L		09/09/21 09:00	09/11/21 19:14	1
Beryllium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:14	1
Boron	<0.100		0.100		mg/L		09/09/21 09:00	09/13/21 15:45	1
Cadmium	<0.000100		0.000100		mg/L		09/09/21 09:00	09/11/21 19:14	1
Calcium	90.6		0.500		mg/L		09/09/21 09:00	09/11/21 19:14	1
Chromium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:14	1
Cobalt	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 19:14	1
Lead	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 19:14	1
Lithium	<0.0100		0.0100		mg/L		09/09/21 09:00	09/11/21 19:14	1
Molybdenum	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:14	1
Selenium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:14	1
Thallium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:14	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/15/21 11:53	09/16/21 10:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	350		50.0		mg/L			09/08/21 16:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			09/08/21 14:50	1

Client Sample Results

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

Job ID: 310-214546-1

Client Sample ID: MW-14A

Lab Sample ID: 310-214546-4

Date Collected: 09/02/21 11:55

Matrix: Water

Date Received: 09/08/21 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23.2		5.00		mg/L			09/10/21 13:15	5
Fluoride	<0.500		0.500		mg/L			09/10/21 13:15	5
Sulfate	1010		20.0		mg/L			09/10/21 13:30	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:17	1
Arsenic	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:17	1
Barium	0.0345		0.00200		mg/L		09/09/21 09:00	09/11/21 19:17	1
Beryllium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:17	1
Boron	17.1		0.700		mg/L		09/09/21 09:00	09/13/21 15:48	7
Cadmium	<0.000100		0.000100		mg/L		09/09/21 09:00	09/11/21 19:17	1
Calcium	270		0.500		mg/L		09/09/21 09:00	09/11/21 19:17	1
Chromium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:17	1
Cobalt	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 19:17	1
Lead	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 19:17	1
Lithium	<0.0100		0.0100		mg/L		09/09/21 09:00	09/11/21 19:17	1
Molybdenum	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 19:17	1
Selenium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 19:17	1
Thallium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 19:17	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/15/21 11:53	09/16/21 10:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1560		250		mg/L			09/08/21 16:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1		SU			09/08/21 14:50	1

Definitions/Glossary

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

Job ID: 310-214546-1

Qualifiers

General Chemistry

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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

Job ID: 310-214546-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-328215/3
Matrix: Water
Analysis Batch: 328215

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			09/10/21 07:51	1
Fluoride	<0.100		0.100		mg/L			09/10/21 07:51	1
Sulfate	<1.00		1.00		mg/L			09/10/21 07:51	1

Lab Sample ID: LCS 310-328215/4
Matrix: Water
Analysis Batch: 328215

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	9.778		mg/L		98	90 - 110
Fluoride	2.00	1.941		mg/L		97	90 - 110
Sulfate	10.0	10.27		mg/L		103	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-327872/1-A
Matrix: Water
Analysis Batch: 328224

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 327872

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 18:03	1
Arsenic	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 18:03	1
Barium	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 18:03	1
Beryllium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 18:03	1
Cadmium	<0.000100		0.000100		mg/L		09/09/21 09:00	09/11/21 18:03	1
Calcium	<0.500		0.500		mg/L		09/09/21 09:00	09/11/21 18:03	1
Chromium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 18:03	1
Cobalt	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 18:03	1
Lead	<0.000500		0.000500		mg/L		09/09/21 09:00	09/11/21 18:03	1
Lithium	<0.0100		0.0100		mg/L		09/09/21 09:00	09/11/21 18:03	1
Molybdenum	<0.00200		0.00200		mg/L		09/09/21 09:00	09/11/21 18:03	1
Selenium	<0.00500		0.00500		mg/L		09/09/21 09:00	09/11/21 18:03	1
Thallium	<0.00100		0.00100		mg/L		09/09/21 09:00	09/11/21 18:03	1

Lab Sample ID: MB 310-327872/1-A
Matrix: Water
Analysis Batch: 328351

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 327872

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.100		0.100		mg/L		09/09/21 09:00	09/13/21 15:27	1

Lab Sample ID: LCS 310-327872/2-A
Matrix: Water
Analysis Batch: 328224

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 327872

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.200	0.1865		mg/L		93	80 - 120
Arsenic	0.200	0.1960		mg/L		98	80 - 120
Barium	0.100	0.1044		mg/L		104	80 - 120
Beryllium	0.100	0.1017		mg/L		102	80 - 120

Eurofins TestAmerica, Cedar Falls

QC Sample Results

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

Job ID: 310-214546-1

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

Lab Sample ID: LCS 310-327872/2-A
Matrix: Water
Analysis Batch: 328224

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 327872

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	0.100	0.09777		mg/L		98	80 - 120
Calcium	2.00	1.841		mg/L		92	80 - 120
Chromium	0.100	0.09818		mg/L		98	80 - 120
Cobalt	0.100	0.1007		mg/L		101	80 - 120
Lead	0.200	0.2101		mg/L		105	80 - 120
Lithium	0.200	0.1943		mg/L		97	80 - 120
Molybdenum	0.200	0.1902		mg/L		95	80 - 120
Selenium	0.400	0.3807		mg/L		95	80 - 120
Thallium	0.200	0.2060		mg/L		103	80 - 120

Lab Sample ID: LCS 310-327872/2-A
Matrix: Water
Analysis Batch: 328351

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 327872

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.200	0.1806		mg/L		90	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-328265/1-A
Matrix: Water
Analysis Batch: 328439

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 328265

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/13/21 11:09	09/14/21 12:13	1

Lab Sample ID: LCS 310-328265/2-A
Matrix: Water
Analysis Batch: 328439

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 328265

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001648		mg/L		99	80 - 120

Lab Sample ID: MB 310-328555/1-A
Matrix: Water
Analysis Batch: 328704

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 328555

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/15/21 11:53	09/16/21 10:39	1

Lab Sample ID: LCS 310-328555/2-A
Matrix: Water
Analysis Batch: 328704

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 328555

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001702		mg/L		102	80 - 120

QC Sample Results

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

Job ID: 310-214546-1

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

Lab Sample ID: MB 310-327807/1
 Matrix: Water
 Analysis Batch: 327807

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			09/08/21 16:16	1

Lab Sample ID: LCS 310-327807/2
 Matrix: Water
 Analysis Batch: 327807

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	960.0		mg/L		96	90 - 110

Lab Sample ID: 310-214546-1 DU
 Matrix: Water
 Analysis Batch: 327807

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	370		368.0		mg/L		0.5	20

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-327785/1
 Matrix: Water
 Analysis Batch: 327785

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

QC Association Summary

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

Job ID: 310-214546-1

HPLC/IC

Analysis Batch: 328215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	9056A	
310-214546-2	MW-5B	Total/NA	Water	9056A	
310-214546-3	MW-6A	Total/NA	Water	9056A	
310-214546-4	MW-14A	Total/NA	Water	9056A	
310-214546-4	MW-14A	Total/NA	Water	9056A	
MB 310-328215/3	Method Blank	Total/NA	Water	9056A	
LCS 310-328215/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 327872

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	3010A	
310-214546-2	MW-5B	Total/NA	Water	3010A	
310-214546-3	MW-6A	Total/NA	Water	3010A	
310-214546-4	MW-14A	Total/NA	Water	3010A	
MB 310-327872/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-327872/2-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 328224

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	6020A	327872
310-214546-2	MW-5B	Total/NA	Water	6020A	327872
310-214546-3	MW-6A	Total/NA	Water	6020A	327872
310-214546-4	MW-14A	Total/NA	Water	6020A	327872
MB 310-327872/1-A	Method Blank	Total/NA	Water	6020A	327872
LCS 310-327872/2-A	Lab Control Sample	Total/NA	Water	6020A	327872

Analysis Batch: 328225

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	6020A	327872

Prep Batch: 328265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	7470A	
310-214546-2	MW-5B	Total/NA	Water	7470A	
MB 310-328265/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-328265/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 328351

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	6020A	327872
310-214546-2	MW-5B	Total/NA	Water	6020A	327872
310-214546-3	MW-6A	Total/NA	Water	6020A	327872
310-214546-4	MW-14A	Total/NA	Water	6020A	327872
MB 310-327872/1-A	Method Blank	Total/NA	Water	6020A	327872
LCS 310-327872/2-A	Lab Control Sample	Total/NA	Water	6020A	327872

Analysis Batch: 328439

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	7470A	328265

Eurofins TestAmerica, Cedar Falls

QC Association Summary

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

Job ID: 310-214546-1

Metals (Continued)

Analysis Batch: 328439 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-2	MW-5B	Total/NA	Water	7470A	328265
MB 310-328265/1-A	Method Blank	Total/NA	Water	7470A	328265
LCS 310-328265/2-A	Lab Control Sample	Total/NA	Water	7470A	328265

Prep Batch: 328555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-3	MW-6A	Total/NA	Water	7470A	
310-214546-4	MW-14A	Total/NA	Water	7470A	
MB 310-328555/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-328555/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 328704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-3	MW-6A	Total/NA	Water	7470A	328555
310-214546-4	MW-14A	Total/NA	Water	7470A	328555
MB 310-328555/1-A	Method Blank	Total/NA	Water	7470A	328555
LCS 310-328555/2-A	Lab Control Sample	Total/NA	Water	7470A	328555

General Chemistry

Analysis Batch: 327785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	SM 4500 H+ B	
310-214546-2	MW-5B	Total/NA	Water	SM 4500 H+ B	
310-214546-3	MW-6A	Total/NA	Water	SM 4500 H+ B	
310-214546-4	MW-14A	Total/NA	Water	SM 4500 H+ B	
LCS 310-327785/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 327807

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-214546-1	MW-4A	Total/NA	Water	SM 2540C	
310-214546-2	MW-5B	Total/NA	Water	SM 2540C	
310-214546-3	MW-6A	Total/NA	Water	SM 2540C	
310-214546-4	MW-14A	Total/NA	Water	SM 2540C	
MB 310-327807/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-327807/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-214546-1 DU	MW-4A	Total/NA	Water	SM 2540C	

Lab Chronicle

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

Job ID: 310-214546-1

Client Sample ID: MW-4A

Lab Sample ID: 310-214546-1

Date Collected: 09/02/21 15:00

Matrix: Water

Date Received: 09/08/21 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	328215	09/10/21 12:28	JNR	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328224	09/11/21 19:09	SAP	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328225	09/11/21 19:09	SAP	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328351	09/13/21 15:40	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 13:08	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327807	09/08/21 16:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327785	09/08/21 14:47	BER	TAL CF

Client Sample ID: MW-5B

Lab Sample ID: 310-214546-2

Date Collected: 09/03/21 10:45

Matrix: Water

Date Received: 09/08/21 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	328215	09/10/21 12:43	JNR	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328224	09/11/21 19:12	SAP	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328351	09/13/21 15:43	SAP	TAL CF
Total/NA	Prep	7470A			328265	09/13/21 11:09	EAM	TAL CF
Total/NA	Analysis	7470A		1	328439	09/14/21 13:10	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327807	09/08/21 16:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327785	09/08/21 14:49	BER	TAL CF

Client Sample ID: MW-6A

Lab Sample ID: 310-214546-3

Date Collected: 09/02/21 15:55

Matrix: Water

Date Received: 09/08/21 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	328215	09/10/21 12:59	JNR	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328224	09/11/21 19:14	SAP	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328351	09/13/21 15:45	SAP	TAL CF
Total/NA	Prep	7470A			328555	09/15/21 11:53	EAM	TAL CF
Total/NA	Analysis	7470A		1	328704	09/16/21 10:50	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327807	09/08/21 16:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327785	09/08/21 14:50	BER	TAL CF

Lab Chronicle

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

Job ID: 310-214546-1

Client Sample ID: MW-14A

Lab Sample ID: 310-214546-4

Date Collected: 09/02/21 11:55

Matrix: Water

Date Received: 09/08/21 09:40

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Analysis	9056A		5	328215	09/10/21 13:15	JNR	TAL CF
Total/NA	Analysis	9056A		20	328215	09/10/21 13:30	JNR	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	328224	09/11/21 19:17	SAP	TAL CF
Total/NA	Prep	3010A			327872	09/09/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		7	328351	09/13/21 15:48	SAP	TAL CF
Total/NA	Prep	7470A			328555	09/15/21 11:53	EAM	TAL CF
Total/NA	Analysis	7470A		1	328704	09/16/21 10:52	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	327807	09/08/21 16:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	327785	09/08/21 14:50	BER	TAL CF

Laboratory References:

TAL CF = Eurofins TestAmerica, 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

Job ID: 310-214546-1

Laboratory: Eurofins TestAmerica, Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-21
Georgia	State	IA100001 (OR)	09-29-21
Illinois	NELAP	200024	11-29-21
Iowa	State	007	12-01-21
Kansas	NELAP	E-10341	01-31-22
Minnesota	NELAP	019-999-319	12-31-21
Minnesota (Petrofund)	State	3349	04-06-23
North Dakota	State	R-186	09-29-21
Oregon	NELAP	IA100001	09-29-21
USDA	US Federal Programs	P330-19-00003	01-02-22

Method Summary

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

Job ID: 310-214546-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

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

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

Laboratory References:

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





Environment Testing
TestAmerica



310-214546 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: <u>Muscatine Power + Water</u>		
City/State: <u>Muscatine IA</u>	Project:	
Receipt Information		
Date/Time Received: <u>9/18/21 0940</u>	Received By: <u>UB</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: _____		
Condition of Cooler/Containers		
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? ↓
Temperature Record		
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>R</u>	Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>0.4</u>	Corrected Temp (°C): <u>0.4</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
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		
Additional Comments		
<u>Received 4A not 4B</u>		

Document: CF-LG-WI-002

Revision: 25

Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

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

TestAmerica Cedar Falls

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

Chain of Custody Record



THE LEADING NATIONAL TESTING

Client Information Client Contact: Sam Bennett MP&W and Rose Arundson (HR Green) Company: Muscatine Power & Water Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: [blank] Email: sbennett@mpw.org and ramundson@hrgreen.com Project Name: Muscatine Power & Water CCR Landfill Site: Iowa		Sampler: Lab PM: Hayes, Shawn M Phone: E-Mail: shawn.hayes@testamericainc.com		Carrier Tracking No(s): COC No: Page: Job #:			
Due Date Requested: TAT Requested (days): PO #: 214440 WO #: [blank] TestAmerica Project #: 31007856 Event: [blank]		Analysis Requested					
Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/>		6020A CCR List, 7470A Mercury 2540C TDS, SM4500-H+PH 9056A Chloride, Fluoride, Sulfate Radium-226 Radium-228		Total Number of containers: <input checked="" type="checkbox"/>			
Sample Identification MW-4B MW-5B MW-6A MW-14A		Sample Date 9/2/21 9/3/21 9/2/21 9/2/21	Sample Time 1500 1045 1555 1155	Sample Type (C=Comp, G=grab) G G G G	Matrix (Water, Solid, Overstool, AT-Tissue, AAU) GW GW GW GW	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2OXS Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecalhydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	Special Instructions/Note: [blank]
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: [blank] Date: [blank] Relinquished by: Neil Hoskins Date/Time: 9/21 0600 Relinquished by: [blank] Date/Time: [blank] Relinquished by: [blank] Date/Time: [blank]							
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Cooler Temperature(s) °C and Other Remarks: [blank]							



Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-214546-1

Login Number: 214546

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Hayes, Shawn M

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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	MW-4A received vs MW-4B on COC
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	

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-4B
Upgradient _____ **Downgradient** X
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:

Top of inner well casing 715.87 **Ground Elevation** 712.04

Depth of Well 28.03 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/2/2021 14:30	8.15	705.3
*After Purging	9/2/2020 15:00	9.37	704.08
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.79

No. of Well Volumes (based on current water level) 0.30

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Partly cloudy 75dF S Wind 5 mph

Field Measurements (after stabilization):

Temperature 18.38 **Units** C

Equipment Used Horiba U-50

pH 7.75

Equipment Used Horiba U-50

Specific Conductance 0.709 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-5B
Upgradient _____ **Downgradient** X
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:

Top of inner well casing 709.10 **Ground Elevation** 706.73

Depth of Well 25.30 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/3/2021 10:20	0.74	708.36
*After Purging	9/3/2021 10:45	7.94	707.16
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.79

No. of Well Volumes (based on current water level) 0.20

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 72dF Calm

Field Measurements (after stabilization):

Temperature 15.94 **Units** C

Equipment Used Horiba U-50

pH 7.22

Equipment Used Horiba U-50

Specific Conductance 0.856 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-6A
Upgradient _____ **Downgradient** X
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:

Top of inner well casing 708.92 **Ground Elevation** 706.49

Depth of Well 25.35 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/2/2021 15:40	2.11	706.81
*After Purging	9/2/2021 15:55	2.79	706.13
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.4

No. of Well Volumes (based on current water level) 0.1

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 75dF Calm

Field Measurements (after stabilization):

Temperature 18.3 Units C

Equipment Used Horiba U-50

pH 7.61

Equipment Used Horiba U-50

Specific Conductance 0.685 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 9/28/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-08
Upgradient **Downgradient** _____
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO
 If no, explain _____
Standing Water or Litter? (please check) YES NO
 If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:
Top of inner well casing 747.36 **Ground Elevation** 744.37
Depth of Well 42.95 **Inside Casing Diameter (in inches)** 2"
Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/31/2021 13:40	16.49	730.87
*After Purging	8/31/2021 14:05	19.91	727.45
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.66
No. of Well Volumes (based on current water level) 0.15
Was well pumped/bailed dry? No
Equipment used:
Bailer type _____ **Dedicated Bailer?** _____
Pump type Peristaltic **Dedicated Pump?** Yes
If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 72dF Calm

Field Measurements (after stabilization):

Temperature 18.55 Units C

Equipment Used Horiba U-50

pH 7.45

Equipment Used Horiba U-50

Specific Conductance 0.652 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 9/28/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-10
Upgradient **Downgradient** _____
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO
 If no, explain _____
Standing Water or Litter? (please check) YES NO
 If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:
Top of inner well casing 718.51 **Ground Elevation** 716.32
Depth of Well 20.32 **Inside Casing Diameter (in inches)** 2"
Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/1/2021 9:35	4.33	714.18
*After Purging	9/1/2021 10:15	4.46	714.05
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.06
No. of Well Volumes (based on current water level) 0.41
Was well pumped/bailed dry? No
Equipment used:
Bailer type _____ **Dedicated Bailer?** _____
Pump type Peristaltic **Dedicated Pump?** Yes
If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 68dF Calm

Field Measurements (after stabilization):

Temperature 16.73 **Units** C

Equipment Used Horiba U-50

pH 7.59

Equipment Used Horiba U-50

Specific Conductance 0.650 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-14A
Upgradient _____ **Downgradient** X
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:

Top of inner well casing 729.00 **Ground Elevation** 726.19

Depth of Well 20.50 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/2/2021 1130	13.11	715.89
*After Purging	9/2/2021 1155	13.95	715.05
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.66

No. of Well Volumes (based on current water level) 0.55

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 75dF Calm

Field Measurements (after stabilization):

Temperature 22.04 **Units** C

Equipment Used Horiba U-50

pH 7.48

Equipment Used Horiba U-50

Specific Conductance 1.73 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-15A
Upgradient _____ **Downgradient** X
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) **YES** **NO**
 If no, explain _____
Standing Water or Litter? (please check) **YES** **NO**
 If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:
Top of inner well casing 729.99 **Ground Elevation** 727.12
Depth of Well 20.50 **Inside Casing Diameter (in inches)** 2"
Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/2/2021 8:30	12.09	717.9
*After Purging	9/2/2021 9:05	13.60	716.39
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92
No. of Well Volumes (based on current water level) 0.67
Was well pumped/bailed dry? No
Equipment used:
Bailer type _____ **Dedicated Bailer?** _____
Pump type Peristaltic **Dedicated Pump?** Yes
If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions 65dF Calm

Field Measurements (after stabilization):

Temperature 17.60 Units C

Equipment Used Horiba U-50

pH 7.46

Equipment Used Horiba U-50

Specific Conductance 1.03 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 9/28/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-21
Upgradient _____ **Downgradient** X
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) **YES** **NO**
 If no, explain _____
Standing Water or Litter? (please check) **YES** **NO**
 If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:
Top of inner well casing 725.75 **Ground Elevation** 722.81
Depth of Well 22.20 **Inside Casing Diameter (in inches)** 2"
Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/1/2021 13:50	10.82	714.93
*After Purging	9/1/2021 14:25	11.22	714.53
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92
No. of Well Volumes (based on current water level) 0.50
Was well pumped/bailed dry? No
Equipment used:
Bailer type _____ **Dedicated Bailer?** _____
Pump type Peristaltic **Dedicated Pump?** Yes
If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Partly Cloudy 75dF variable wind at 1-5 mph

Field Measurements (after stabilization):

Temperature 24.22 **Units** C

Equipment Used Horiba U-50

pH 7.06

Equipment Used Horiba U-50

Specific Conductance 0.87 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water Permit No. 70-SDP-6_82P
 Monitoring Well/Piezometer No. MW-22
 Upgradient _____ Downgradient X
 Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO
 If no, explain _____
 Standing Water or Litter? (please check) YES NO
 If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:
 Top of inner well casing 744.27 Ground Elevation 741.00
 Depth of Well 44.27 Inside Casing Diameter (in inches) 2"
 Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/1/2021 12:25	16.58	727.69
*After Purging	9/1/2021 12:50	21.88	722.39
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.66
 No. of Well Volumes (based on current water level) 0.15
 Was well pumped/bailed dry? No
 Equipment used:
 Bailer type _____ Dedicated Bailer? _____
 Pump type Peristaltic Dedicated Pump? Yes
 If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 76df variable winds

Field Measurements (after stabilization):

Temperature 23.04 **Units** C

Equipment Used Horiba U-50

pH 7.97

Equipment Used Horiba U-50

Specific Conductance 0.640 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-23
Upgradient **Downgradient** _____
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:

Top of inner well casing 726.90 **Ground Elevation** 723.73

Depth of Well 27.17 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/1/2021 11:15	6.23	720.67
*After Purging	9/1/2021 11:50	11.92	714.98
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92

No. of Well Volumes (based on current water level) 0.27

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 76dF Variable winds

Field Measurements (after stabilization):

Temperature 23.07 **Units** C

Equipment Used Horiba U-50

pH 7.89

Equipment Used Horiba U-50

Specific Conductance 0.486 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-24
Upgradient **Downgradient** _____
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:

Top of inner well casing 735.32 **Ground Elevation** 732.10

Depth of Well 22.22 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/31/2021 12:50	16.28	719.04
*After Purging	8/31/2021 13:10	17.33	717.99
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.53

No. of Well Volumes (based on current water level) 0.55

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Clear 72dF Calm

Field Measurements (after stabilization):

Temperature 18.05 Units C

Equipment Used Horiba U-50

pH 7.44

Equipment Used Horiba U-50

Specific Conductance 0.653 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 9/28/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-26
Upgradient **Downgradient** _____
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO

If no, explain _____

Standing Water or Litter? (please check) YES NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:

Top of inner well casing 731.08 **Ground Elevation** 727.35

Depth of Well 38.27 **Inside Casing Diameter (in inches)** 2"

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/1/2021 1515	18.17	720.95
*After Purging	9/1/2021 1540	21.55	717.57
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.66

No. of Well Volumes (based on current water level) 0.22

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ **Dedicated Bailer?** _____

Pump type Peristaltic **Dedicated Pump?** Yes

If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Partly Cloudy 75dF SW wind 5 mph

Field Measurements (after stabilization):

Temperature 20.78 **Units** C

Equipment Used Horiba U-50

pH 7.98

Equipment Used Horiba U-50

Specific Conductance 0.991 **Units** mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  **Date** 9/28/2021

Telephone 563-262-3583 **Fax** _____ **Email** sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water **Permit No.** 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-27
Upgradient **Downgradient** _____
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) YES NO
 If no, explain _____
Standing Water or Litter? (please check) YES NO
 If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (+ 0.01 foot, MSL)

Elevation:
Top of inner well casing 730.26 **Ground Elevation** 726.26
Depth of Well 19.44 **Inside Casing Diameter (in inches)** 2"
Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (+ 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/2/2021 1300	14.97	724.15
*After Purging	9/2/2021 1335	16.27	722.85
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92
No. of Well Volumes (based on current water level) 0.26
Was well pumped/bailed dry? No
Equipment used:
Bailer type _____ **Dedicated Bailer?** _____
Pump type Peristaltic **Dedicated Pump?** Yes
If not dedicated, method of cleaning _____

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

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

***D. FIELD MEASUREMENT**

Weather Conditions Sunny 75dF Calm

Field Measurements (after stabilization):

Temperature 18.35 Units C

Equipment Used Horiba U-50

pH 7.03

Equipment Used Horiba U-50

Specific Conductance 0.617 Units mS/m

Equipment Used Horiba U-50

Comments

CERTIFICATION

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

Signature  Date 9/28/2021

Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

LOW FLOW SAMPLING FORM

DATE 9/1/2021 WELL ID MW-21 SAMPLE DATE / TIME 9/1/2021 14:25:00 PM
 SITE Muscatine Power & Water DTW 10.82 NOTE Duplicate 1 - marked 9/1/21 1200
 PROJECT # Fall 2021 sampling WELL DEPTH 22.20
 WEATHER Partly Cloudy 75dF variable wind at 1-5 mph PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 17'

TIME	PURGE RATE(ml)	VOL REMOVED(m)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES	
13:50			10.82								
13:55	100	500	11.08	27.21	7.45	92	0.811	0.0	0.00		
14:00	100	1000	11.12	24.63	7.27	97	0.857	0.1	0.00		
14:05	100	1500	11.14	24.11	7.20	100	0.872	0.0	0.00		
14:10	100	2000	11.18	23.81	7.15	102	0.879	5.0	0.00		
14:15	100	2500	11.20	24.12	7.11	106	0.874	1.4	0.00		
14:20	100	3000	11.21	24.32	7.08	110	0.871	0.0	0.00		
14:25	100	3500	11.22	24.22	7.06	112	0.87	0.0	0.00	Sample Start	
14:45			11.26							Sample End/Duplicate Start	
15:05			11.30							Duplicate End	
										Preservative	# of Containers
										HCl	
										HNO ₃	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 9/2/2021 WELL ID MW-27 SAMPLE DATE / TIME 9/2/21 1335
 SITE Muscatine Power & Water DTW 14.97 NOTE _____
 PROJECT # Fall 2021 sampling WELL DEPTH 19.44 _____
 WEATHER Sunny 75dF Calm PUMP TYPE GeoTech Peristaltic DEPTH TO INTAKE 18'

TIME	PURGE RATE(ml)	VOL REMOVED(m)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES	
1300			14.97								
1305	100	500	15.31	18.76	7.57	127	0.624	42.9	0.00		
1310	100	1000	15.12	17.87	7.72	132	0.630	65.6	0.00		
1315	100	1500	15.81	17.89	7.14	137	0.624	50.3	0.00		
1320	100	2000	15.97	17.89	7.12	139	0.623	55.8	0.00		
1325	100	2500	16.08	17.82	7.04	138	0.623	18.9	0.00		
1330	100	3000	16.23	18.45	6.98	141	0.616	16.2	0.00		
1335	100	3500	16.27	18.35	7.03	143	0.617	13.5	0.00		
1345			16.49							Sample Start	
										Sample End	
										Preservative	# of Containers
										HCl	
										HNO ₃	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

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	April-20	September-20	April-21	September-21
MW-08 Upgradient																				

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2		< .2	< .2	< .2	< .2	0.205	< .2	< .1	< .1	< .1
Calcium	mg/L	152	117	118	109	89.9	96.5	113	91.3	77		74.7	115	83.6	97.6	132	92.4	77.7	81.2	78.3
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	17.2	14.7	22.3	16.3
Fluoride	mg/L	<.5	< .5	< .5	0.72	< .5	1.69	< .5	< .5	< .5		< .5	0.826	< .5	< .5	0.643	0.864	< .5	<0.5	< .5
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	7.21	7.4	7.63	7.45
Sulfate	mg/L	366	187	187	149	145	145	190	119	106		87.3	136	94.7	223	276	123	100	99.7	82.7
Total Dissolved Solids	mg/L	836	664	708	634	578	624	656	488	470		376	502	414	612	702	418	350	382	342

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	0.001	< .001	< .001	< .001	< .001	< .002	< .002
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	0.002	< .002	< .002	< .002	< .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	0.0613	0.0549	0.0596	0.0623
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	0.001	< .001	< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0001	< .0001	< .0001
Chromium	mg/L	< .005	< .005	< .005	< .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	0.000517	0.000738	0.000839	0.00127
Fluoride	mg/L	< .5	< .5	< .5	0.72	< .5	1.69	< .5	< .5			< .5	0.826	< .5	< .5	0.643	0.864	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .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			< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .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			0.0022	< .002	0.00224	< .002	< .002	< .002	< .002	< .002	0.00218
Selenium	mg/L	< .005	< .005	< .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	< .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		0.0645		0.111 U	0.0456 U
Radium-228	mg/L	0.224	0.0663	0.336	0.102	0.161	0.104	0.144	0.249			0.646			<0.194		0.398		0.0974 U	0.25 U
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		0.462		0.208 U	0.296 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	March-19	August-19	April-20	September-20	April-21	September-21
MW-10 Upgradient																				
Appendix III Parameters:																				
Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2		< .2	< .2	< .2	< .2	< .2	< .2	< .1	< .1	< .1
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	75.4	74.2	78.8	80
Chloride	mg/L	6.22	< 5	< 5	< 5	< 5	< 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	< .5	< .5	< .5	< .5
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	7.26	7.33	7.57	7.59
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	18.6	36.5	27.6	32.3
Total Dissolved Solids	mg/L	468	412	444	428	498	538	524	458	414		314	396	392	326	320	316	344	322	314
Appendix IV Parameters:																				
Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002
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	0.00697	0.00748	0.00393	0.00781
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	0.199	0.227	0.196	0.233
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .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	< .0005	< .0001	< .0001	< .0001
Chromium	mg/L	< .005	< .005	< .005	< .005	< .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	0.000581	0.000751	0.000752	0.000576
Fluoride	mg/L	0.731	< .5	< .5	< .5	< .5	0.774	< .5	< .5			< .5	< .5	< .5	< .5	0.596	< .5	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .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			< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .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	0.0022	0.00341	0.00219	0.00215	< .002	< .002	0.00217
Selenium	mg/L	< .005	< .005	< .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	< .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		0.284		0.207	0.41
Radium-228	mg/L	0.0326	0.255	0.575	0.377	0.314	0.332	-0.00196	0.558			0.0884			< .178		0.723		0.281 U	0.912
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		1.01		0.488	1.32

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

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	0.299	<.2	<.2	0.263	< .1	< .1
Calcium	mg/L	69.8	91.5	80.7	91.6	83.8	80.9	75.5	78.4	79.4
Chloride	mg/L	30	27.2	29.8	27.6	26.9	24.8	23.2	28.1	20
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.507	< .5	< .5	< .5	< .5
pH	SU	7.36	7.9	7.42	7.21	7.12	7.32	7.53	7.7	7.97
Sulfate	mg/L	123	134	125	134	139	143	151	154	154
Total Dissolved Solids	mg/L	424	434	420	456	428	422	398	412	420

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002
Arsenic	mg/L	< .002	0.00245	0.00261	< .002	< .002	< .002	< .002	0.00289	0.00267
Barium	mg/L	0.15	0.184	0.181	0.209	0.215	0.222	0.222	0.242	0.247
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0001	< .0001	< .0001	< .0001
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Cobalt	mg/L	0.00142	0.00129	0.00149	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.507	< .5	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	0.00568	0.00423	0.00424	0.00263	0.00574	0.00297	0.00529	< .002	0.00558
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.122	0.284		0.116		0.137		0.168	0.235
Radium-228	mg/L	0.135	0.128		<.226		0.303		0.379 U	0.287 U
Combined Radium 226 + 228	mg/L	0.257	0.412		<.343		0.44		0.547	0.522

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-23 Downgradient	June-18	August-18	March-19	August-19	April-20	September-20	April-21	September-21

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	0.15	< .1	< .1
Calcium	mg/L	70.5	63.9	59.7	59.5	61	52.1	56.3	56.1
Chloride	mg/L	15.9	14.2	10.5	13.8	15.7	14.4	21.4	15.2
Fluoride	mg/L	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5
pH	SU	7.69	7.55	7.24	6.75	7.33	7.53	7.61	7.89
Sulfate	mg/L	38.4	31.7	26.2	29.7	25.5	25.8	35.5	25.8
Total Dissolved Solids	mg/L	384	340	296	336	298	250	274	256

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002
Barium	mg/L	0.106	0.0779	0.0922	0.0635	0.0654	0.0491	0.0608	0.0497
Beryllium	mg/L	< .001	< .001	<0.001	<0.001	<0.001	<0.001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0001	< .0001	< .0001	< .0001
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Cobalt	mg/L	0.00161	0.00066	0.00176	< .0005	0.000817	< .0005	0.000517	< .0005
Fluoride	mg/L	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5
Lead	mg/L	0.00151	0.000626	0.00204	0.000663	0.00116	< .0005	0.000624	< .0005
Lithium	mg/L	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	0.00822	0.00617	< .002	< .002	< .002	< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.161		0.215		0.0587		0.0292 U	0.0236 U
Radium-228	mg/L	-0.419		0.785		0.517		0.266 U	0.771
Combined Radium 226 + 228	mg/L	0.0129		1.00		0.576		0.296 U	0.794

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	April-20	September-20	April-21	September-21
	MW-4A/MW-4B Downgradient																		

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2		0.66	< .2	< .2	< .2	< .2	< .2	< .1	< .1	< .1
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	99.7	93.8	89.6	89	94.1	95.1
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	16	15.6	14.8	15.1	22.9	16.7
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.664	0.801	< .5	< .5	< .5		< .5	< .5	< .5	0.771	0.525	< .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	7.26	7.22	7.46	7.93	7.49	7.75
Sulfate	mg/L	32.2	28.4	27.2	32.7	36	39.5	33	35.3	45.4		162	51.3	52.2	48	47	41.5	46.9	60.1	50.2
Total Dissolved Solids	mg/L	507	426	450	450	460	442	452	420	466		586	440	420	398	422	366	360	380	370

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .0002	< .002	< .002	< .002	< .002	< .002	< .002	< .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	0.161	0.147	0.156	0.147	0.169	0.186
Beryllium	mg/L	< .001	< .001	< .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	< .0001	< .0001	< .0001
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .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	< .0005	< .0005	0.00147	0.00132	0.00335
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.664	0.801	< .5	< .5			< .5	< .5	< .5	0.771	0.525	< .5	< .5	< .5	< .5
Lead	mg/L	< .00147	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	0.000532	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .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	< .002	< .002	0.00296	< .002	< .002
Selenium	mg/L	< .005	< .005	< .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	< .001	< .001
Radium-226	mg/L	0.54	0.326	0.285	0.585	0.215	0.0818	0.177	0.255			0.111			0.218		0.13		0.101 U	0.19 U
Radium-228	mg/L	0.171	0.612	0.388	0.0872	0.313	0.227	0.192	0.188			0.339			< .218		0.224		-0.049 U	0.895
Combined Radium 226 + 228	mg/L	0.711	0.938	0.674	0.672	0.528	0.309	0.368	0.443			0.45			0.436		0.354		0.0519 U	1.08

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	April-20	September-20	April-21	September-21
MW-5B Downgradient																				

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2		< .2	< .2	< .2	< .2	< .2	< .2	< .1	< .1	< .1
Calcium	mg/L	147	< .0005	140	147	126	130	140	139	136		134	147	146	134	139	117	108	104	108
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	44	41	42.7	37.6
Fluoride	mg/L	< .5	< .5	< .5	1.88	2.14	0.627	< .5	< .5	< .5		< .5	< .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	7.24	7.33	7.31	7.22
Sulfate	mg/L	109	109	105	109	111	108	108	114	135		122	119	120	85	112	58.9	61.9	57.4	53.7
Total Dissolved Solids	mg/L	920	672	646	636	684	680	656	734	688		620	828	622	562	596	494	436	434	448

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .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	0.25	0.239	0.252	0.241	
Beryllium	mg/L	< .001	< .001	< .001	< .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	< .0001	< .0001	< .0001	< .0001
Chromium	mg/L	< .005	< .005	< .005	< .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	< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	1.88	2.14	0.627	< .5	< .5		< .5	< .5	< .5	< .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	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05		< .01	< .01	< .0005	< .0005	< .0005	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .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	0.00212	< .002	< .002	< .002	< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .005	< .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	< .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		0.293		0.231	0.257 U	
Radium-228	mg/L	0.3	0.405	-0.169	0.541	0.386	0.664	0.54	0.294		0.61			0.372		0.908		0.751	1.03	
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		1.2		0.982	1.29	

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	April-20	September-20	April-21	September-21
MW-6A Downgradient																				

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2		< .2	< .2	< .2	< .2	< .2	< .2	< .1	< .1	< .1
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	85.1	87.9	87.6	90.6
Chloride	mg/L	5.97	< 5	< 5	9.08	9.93	< 5	< 5	< 5	< 5		5.33	< 5	< 5	< 5	< 5	12.2	15.6	19.3	17.4
Fluoride	mg/L	< .5	< .5	< .5	2.02	1.89	0.814	< .5	< .5	< .5		< .5	< .5	< .5	< .5	0.535	0.652	< .5	< .5	< .5
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	7.3	7.24	7.59	7.61
Sulfate	mg/L	< 5	< 5	< 5	< 5	5.94	< 5	< 5	< 5	< 5		< 5	< 5	< 5	< 5	< 5	13.6	19.1	27.3	22.7
Total Dissolved Solids	mg/L	440	340	370	368	336	402	486	364	424		292	368	298	320	308	336	374	330	350

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002
Arsenic	mg/L	< .002	< .002	< .002	< .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	0.216	0.231	0.245	0.248
Beryllium	mg/L	< .001	< .001	< .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	< .0001	< .0001	< .0001
Chromium	mg/L	< .005	< .005	< .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	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	2.02	1.89	0.814	< .5	< .5			< .5	< .5	< .5	< .5	0.535	0.652	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .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			< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .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	< .002	< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .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	< .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		0.154		0.179	0.336
Radium-228	mg/L	0.178	0.599	0.311	0.432	0.148	0.182	0.23	0.197			0.439			< .26		0.633		0.488	0.784
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		0.787		0.667	1.12

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095																				
MW-13 Downgradient		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	April-20	September-20	April-21	September-21

Appendix III Parameters:

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						

Appendix IV Parameters:

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								

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	April-20	September-20	April-21	September-21
	MW-14A Downgradient																		

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	17.4	19.5	17.2	17.1
Calcium	mg/L	281	311	308	333	268	310	307	296	310	301	278	297	309	290	255	245	244	259	270
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	22.5	22.8	27.1	23.2
Fluoride	mg/L	< .5	< .5	0.867	< .5	< .5	1.93	< .5	< .5	< .5	< .5	< .5	0.684	< .5	< .5	< .5	< .5	< .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	7.32	7.21	7.64	7.48
Sulfate	mg/L	1050	1040	1010	1140	1190	1200	1020	1110	1210	1140	1110	1090	1070	1050	837	888	924	952	1010
Total Dissolved Solids	mg/L	2000	1980	2500	2080	1010	2260	2250	2170	2080	2650	1820	1800	1900	1690	1510	1510	1620	1290	1560

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001				< .001	< .001	< .001	< .001	< .004	< .001	< .001	< .002	< .002	
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002				< .002	< .002	< .002	< .002	< .002	< .008	< .002	< .002	< .002	< .002
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	0.0266	0.0328	0.0355	0.0345	
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001				< .001	< .001	< .001	< .001	< .004	< .001	< .001	< .001	< .001	
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005				< .0005	< .0005	< .0005	< .0005	< .002	< .0001	< .0001	< .0001	< .0001	
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005				< .005	< .005	< .005	< .005	< .02	< .005	< .005	< .005	< .005	
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005				< .0005	< .0005	< .0005	< .0005	< .002	< .0005	< .0005	< .0005	< .0005	
Fluoride	mg/L	< .5	< .5	0.867	< .5	< .5	1.93	< .5	< .5				< .5	0.684	< .5	< .5	< .5	< .5	< .5	< .5	< .5	
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .05	< .0005	< .0005	< .0005				< .0005	< .0005	< .0005	< .0005	< .002	< .0005	< .0005	< .0005	< .0005	
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05				< .01	< .01	< .01	< .01	< .04	< .01	< .01	< .01	< .01	
Mercury	mg/L	< .0002	< .0002	< .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	< .008	< .002	< .002	< .002	< .002	
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	< .005	< .005	< .005	< .005	
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001				< .001	< .001	< .001	< .001	< .004	< .001	< .001	< .001	< .001	
Radium-226	mg/L	0.0496	0.095	0.0604	0.137	0.0624	0.0561	0.0545	0.0506				0.0335			< .0588		0.0647		0.0454 U	0.16 U	
Radium-228	mg/L	0.0956	0.107	0.462	0.122	0.23	0.424	-0.0414	0.406				0.224			< .0365		0.332		0.568	0.524	
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		0.397		0.614	0.684	

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095																				
MW-15A Downgradient		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	April-20	September-20	April-21	September-21

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	10.6	14.5	10.3	11.1
Calcium	mg/L	206	199	203	244	233	226	186	206	218	217	278	102	155	118	111	163	134	128	125
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	13	8.63	15	8.86
Fluoride	mg/L	< .5	0.549	< .5	< .5	< .5	6.7	< .5	< .5	< .5	< .5	< .5	< .5	< .5	0.523	0.625	< .5	< .5	0.516	< .5
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	7.54	7.28	7.92	7.46
Sulfate	mg/L	827	605	607	732	849	853	537	664	835	779	1110	210	400	351	327	496	403	338	333
Total Dissolved Solids	mg/L	1620	1270	1500	1600	1470	1780	1280	1390	1520	1670	1820	676	948	724	786	942	920	738	736

Appendix IV Parameters:

Antimony	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001				< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002	
Arsenic	mg/L	< .1	< .002	< .002	< .002	< .002	< .002	< .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	0.0389	0.0416	0.0365	0.0355	
Beryllium	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .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	< .0005	< .0001	< .0001	< .0001	< .0001
Chromium	mg/L	< .250	< .005	< .005	< .005	< .005	< .005	< .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	< .0005	< .0005	< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	0.549	< .5	< .5	< .5	6.7	< .5	< .5				< .5	< .5	< .5	< .5	0.625	< .5	< .5	0.516	< .5	
Lead	mg/L	< .025	< .0005	< .0005	< .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				< .0005	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .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	< .002	< .002	< .002	< .002	< .002
Selenium	mg/L	< .25	< .005	< .005	< .005	< .005	< .005	< .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	< .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				0.0226 U	0.126 U	
Radium-228	mg/L	0.216	0.18	0.123	0.145	0.0218	0.0842	0.121	0.197				0.0715			<.33				0.197 U	0.236 U	
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				0.219 U	0.362 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	March-19	August-19	April-20	September-20	April-21	September-21
	MW-18A Downgradient																		

Appendix III Parameters:

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	< .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						

Appendix IV Parameters:

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								

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	April-20	September-20	April-21	September-21
MW-21 Downgradient																				

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	6.76	6.82	5.24	5.88
Calcium	mg/L	37.2	146	185	178	118	110	149	163	62.3		191	159	78.7	142	145	104	101	79.5	93.5
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	8.05	7.21	5.14	6.58
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.993	0.768	< .5	< .5	< .5		< .5	< .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	6.55	6.8	6.92	7.06
Sulfate	mg/L	713	520	603	645	415	461	541	590	206		624	489	96.6	442	529	373	356	237	303
Total Dissolved Solids	mg/L	1440	1110	1420	1240	1010	1060	1140	1220	514		1150	952	416	872	960	698	738	540	636

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			0.00195	< .001	< .001	< .001	< .001	< .001	< .001	< .002	< .002
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			0.00265	< .002	< .002	< .002	< .002	< .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	0.0352	0.0407	0.0309	0.0434
Beryllium	mg/L	< .001	< .001	< .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	< .0001	< .0001	< .0001
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	0.00644	0.00589	0.00708	0.00659
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .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	< .5	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	0.000633	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .01	0.0189	< .01	0.0277	0.0279	0.0213	0.0225	0.0198	0.0233
Mercury	mg/L	< .0002	< .0002	< .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	0.00383	< .002	< .002	< .002	< .002	< .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	0.00632	0.00762	< .005	0.00617
Thallium	mg/L	< .001	< .001	< .001	< .001	< .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		0.0383		0.0282 U	0.0566 U
Radium-228	mg/L	-0.0462	0.0116	0.391	0.178	-0.0507	0.1	0.507	0.605			0.344			< .17		0.267		0.154 U	0.443
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		0.305		0.182 U	0.499

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
	MW-24 Downgradient							

Appendix III Parameters:

Boron	mg/L	< .2	< .2		< .2	< .2	0.109	< .1	<.1
Calcium	mg/L	88	72.8		103	94.3	69.9	74.6	69
Chloride	mg/L	19.9	18.1		22.4	24.8	19.5	28.9	21.9
Fluoride	mg/L	0.653	< .5		< .5	< .5	< .5	< .5	< .5
pH	SU	7.47	7.39		6.87	7.29	7.47	7.64	7.44
Sulfate	mg/L	101	70		169	164	81	91.2	59.3
Total Dissolved Solids	mg/L	474	368		542				

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001		< .001				
Arsenic	mg/L	< .002	< .002		< .002	< .002	< .002	< .002	< .002
Barium	mg/L	0.0695	0.0776		0.128	0.084	0.0969	0.0936	0.0922
Beryllium	mg/L	< .001	< .001		< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005		< .0005				
Chromium	mg/L	< .005	< .005		< .005				
Cobalt	mg/L	< .0005	< .0005		< .0005	< .0005	< .0005	< .0005	<.0005
Fluoride	mg/L	0.653	< .5		< .5	< .5	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005		< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .01	< .01		< .01				
Mercury	mg/L	< .0002	< .0002		< .0002				
Molybdenum	mg/L	0.00447	< .002		< .002	< .002	< .002	< .002	< .002
Selenium	mg/L	< .005	< .005		< .005	< .005	< .005	< .005	< .005
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

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
MW-25 Downgradient									
Appendix III Parameters:									
Boron	mg/L	14	14.4	14.5	11.5				
Calcium	mg/L	171	141	157	160				
Chloride	mg/L	11.4	11.4	11.4	11.6				
Fluoride	mg/L	0.551	< .5	< .5	< .5				
pH	SU	7.96	7.31	7.15	6.91				
Sulfate	mg/L	382	343	360	325				
Total Dissolved Solids	mg/L	962	NC	NC	768				
Appendix IV Parameters:									
Antimony	mg/L	< .001	< .001		< .004				
Arsenic	mg/L	< .002	< .002	< .002	< .008				
Barium	mg/L	0.0828	0.0487	0.0342	0.0448				
Beryllium	mg/L	< .001	< .001	< .004	< .004				
Cadmium	mg/L	< .0005	< .0005		< .002				
Chromium	mg/L	< .005	< .005		< .02				
Cobalt	mg/L	< .0005	< .0005	< .0002	< .002				
Fluoride	mg/L	0.551	< .5	< .5	< .5				
Lead	mg/L	< .0005	< .0005	< .0005	< .002				
Lithium	mg/L	< .01	< .01		< .04				
Mercury	mg/L	< .0002	< .0002		< .0002				
Molybdenum	mg/L	0.00279	< .002	< .002	< .008				
Selenium	mg/L	< .005	< .005	< .005	< .02				
Thallium	mg/L	< .001	< .001		< .004				
Radium-226	mg/L	0.0532							
Radium-228	mg/L	0.635							
Combined Radium 226 + 228	mg/L	0.688							

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-26 Downgradient	April-20	September-20	April-21	September-21

Appendix III Parameters:

Boron	mg/L		2.5	2.33	2.49
Calcium	mg/L		134	130	134
Chloride	mg/L		19.7	21.1	19.3
Fluoride	mg/L		< .5	< .5	< .5
pH	SU		7.88	8.12	7.98
Sulfate	mg/L		376	341	358
Total Dissolved Solids	mg/L				

Appendix IV Parameters:

Antimony	mg/L				
Arsenic	mg/L		< .002	< .002	< .002
Barium	mg/L		0.114	0.0989	0.0889
Beryllium	mg/L		< .001	< .001	< .001
Cadmium	mg/L				
Chromium	mg/L				
Cobalt	mg/L		< .005	< .005	<.0005
Fluoride	mg/L		< .5	< .5	< .5
Lead	mg/L		< .0005	< .0005	< .0005
Lithium	mg/L				
Mercury	mg/L				
Molybdenum	mg/L		< .002	0.00239	< .002
Selenium	mg/L		< .005	< .005	< .005
Thallium	mg/L				
Radium-226	mg/L				
Radium-228	mg/L				
Combined Radium 226 + 228	mg/L				

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-27 Downgradient	April-20	September-20	April-21	September-21

Appendix III Parameters:

Boron	mg/L		3.25	0.17	3.82
Calcium	mg/L		61	57.6	68.4
Chloride	mg/L		13.6	10.4	15
Fluoride	mg/L		< .5	< .5	< .5
pH	SU		6.69	7.56	7.03
Sulfate	mg/L		119	7.63	111
Total Dissolved Solids	mg/L				

Appendix IV Parameters:

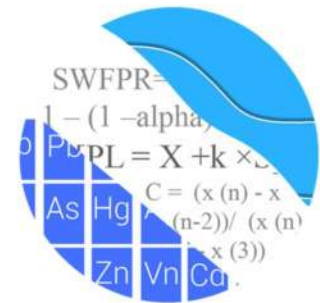
Antimony	mg/L				
Arsenic	mg/L		< .002	< .002	< .002
Barium	mg/L		0.0738	0.0534	0.0862
Beryllium	mg/L		< .001	< .001	< .001
Cadmium	mg/L				
Chromium	mg/L				
Cobalt	mg/L		< .005	< .0005	< .0005
Fluoride	mg/L		< .5	< .5	< .5
Lead	mg/L		< .0005	< .0005	< .0005
Lithium	mg/L				
Mercury	mg/L				
Molybdenum	mg/L		< .002	< .002	< .002
Selenium	mg/L		< .005	< .005	< .005
Thallium	mg/L				
Radium-226	mg/L				
Radium-228	mg/L				
Combined Radium 226 + 228	mg/L				

APPENDIX D

STATISTICAL RESULTS AND METHODOLOGIES

- Annual Statistical Results Report, December 2, 2021
- Flow Charts showing statistical procedure methodologies

GROUNDWATER STATS CONSULTING



December 2, 2021

HR Green, Inc.
Attn: Ms. Rose Amundson
8710 Earhart Ln, SW
Cedar Rapids, Iowa 52404

Re: Muscatine Power & Water – Federal September 2021 Detection & Assessment
Monitoring Report

Dear Ms. Amundson,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data for the September 2021 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 (CCR) 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-08, 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 Kristina Rayner, Groundwater Statistician and Founder of Groundwater Stats Consulting. Note that Combined Radium 226 + 228 is sampled annually; therefore, it is not analyzed in this report.

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.

Prior to constructing statistical limits in this analysis, background data were screened for new outliers and extreme trending patterns, particularly in upgradient wells, that would lead to artificially elevated statistical limits. No new outliers were flagged during this analysis and a list of previously flagged outliers follows this letter (Figure C).

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. 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 careful screening for any new outliers. In some cases, the earlier portion of data are 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 October 2017 screening is discussed below.

Outlier Screening and Trend Tests

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.

No seasonal patterns were visually apparent in the 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.

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.

Prediction Limits – Appendix III Parameters September 2021

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 September 2021 (Figure D). Interwell prediction limits pool upgradient well data to establish a background limit for an individual constituent. The September 2021 sample from each downgradient well is compared to the background limit to determine whether there are statistically significant increases (SSIs).

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.

Prediction Limits

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:

- Boron: MW-14A, MW-15A, and MW-21
- Calcium: MW-14A
- Chloride: MW-5B
- Sulfate: MW-14A
- TDS: MW-14A and MW-15A

Trend Tests

When prediction limit exceedances are identified in downgradient wells, data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether concentrations are statistically increasing, decreasing, or stable (Figure E). 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 natural variability in groundwater unrelated to practices at the site. A summary of the trend test results follows this letter. The following statistically significant decreasing trends were noted:

Increasing:

- Sulfate: MW-22

Decreasing:

- Boron: MW-15A
- Calcium: MW-14A
- Sulfate: MW-08 (upgradient)
- TDS: MW-08 (upgradient), MW-10 (upgradient), MW-14A, and MW-15A

Appendix IV Analysis - September 2021

Data from all upgradient wells for Appendix IV parameters were reassessed for outliers during previous analyses. No changes to previously flagged outliers were made. A summary of previously flagged outliers follows this report (Figure C).

Interwell Upper Tolerance Limits

Background limits were determined using upper tolerance limits (UTLs) constructed from pooled upgradient well data (Figure F). The tolerance limits contain a known fraction (coverage) of the background population with a known level of confidence. When data followed a normal or transformed-normal distribution, parametric tolerance limits were used to calculate background limits for Appendix IV parameters using pooled upgradient well data through September 2021 with a target of 95% confidence and 95% coverage. Nonparametric tolerance limits, which use the highest value in background as the statistical limit, were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

Groundwater Protection Standards

Background limits were then 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 G).

Confidence Intervals

Confidence intervals were then constructed on downgradient wells with data through September 2021 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 H). These intervals were either parametric or nonparametric confidence intervals depending on the data distribution and percentage of non-detects. As mentioned above, well/constituent pairs with 100% non-detects do not require statistics and were, therefore, deselected prior to construction of confidence intervals. As mentioned above, a list of deselected well/constituent pairs follows this report. The decision logic, with respect to the use of a parametric or nonparametric confidence interval, is similar to that used to construct tolerance limits as discussed above. Each confidence interval was compared with the corresponding GWPS.

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



Kristina L. Rayner
Groundwater Statistician

100% Non-Detects

Analysis Run 12/1/2021 4:48 PM View: Confidence Intervals - Federal
Muscatine Power & Water Client: HR Green, Inc. 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-4B, MW-5B, 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-5B, 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-5B, 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-4B, MW-5B, MW-6A

Interwell Prediction Limits - Significant Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:28 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	0.299	n/a	9/1/2021	17.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.299	n/a	9/1/2021	11.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.299	n/a	9/1/2021	5.88	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	9/1/2021	270	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	9/1/2021	37.6	Yes	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	9/1/2021	1010	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	689.2	n/a	9/1/2021	1560	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-15A	689.2	n/a	9/1/2021	736	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2

Interwell Prediction Limits - All Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:28 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	0.299	n/a	9/1/2021	17.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.299	n/a	9/1/2021	11.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.299	n/a	9/1/2021	5.88	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-5B	0.299	n/a	9/1/2021	0.1ND	No	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-6A	0.299	n/a	9/1/2021	0.1ND	No	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-4B	0.299	n/a	9/1/2021	0.1ND	No	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	9/1/2021	270	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-15A	152	n/a	9/1/2021	125	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-21	152	n/a	9/1/2021	93.5	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-5B	152	n/a	9/1/2021	108	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-6A	152	n/a	9/1/2021	90.6	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-4B	152	n/a	9/1/2021	95.1	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	9/1/2021	23.2	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-15A	30	n/a	9/1/2021	8.86	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-21	30	n/a	9/1/2021	6.58	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	9/1/2021	37.6	Yes	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-6A	30	n/a	9/1/2021	17.4	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-4B	30	n/a	9/1/2021	16.7	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-14A	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-15A	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-21	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-5B	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-6A	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-4B	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
pH (SU)	MW-14A	7.859	6.847	9/1/2021	7.48	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-15A	7.859	6.847	9/1/2021	7.46	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-21	7.859	6.847	9/1/2021	7.06	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-5B	7.859	6.847	9/1/2021	7.22	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-6A	7.859	6.847	9/1/2021	7.61	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-4B	7.859	6.847	9/1/2021	7.75	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	9/1/2021	1010	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-15A	366	n/a	9/1/2021	333	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-21	366	n/a	9/1/2021	303	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-5B	366	n/a	9/1/2021	53.7	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-6A	366	n/a	9/1/2021	22.7	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-4B	366	n/a	9/1/2021	50.2	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	689.2	n/a	9/1/2021	1560	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-15A	689.2	n/a	9/1/2021	736	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-21	689.2	n/a	9/1/2021	636	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-5B	689.2	n/a	9/1/2021	448	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-6A	689.2	n/a	9/1/2021	350	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-4B	689.2	n/a	9/1/2021	370	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2

Trend Test - Significant Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:30 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	-1.881	-98	-74	Yes	19	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-10.03	-82	-74	Yes	19	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-08 (bg)	-19.45	-71	-68	Yes	18	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-22 (bg)	9.286	32	25	Yes	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-08 (bg)	-72.16	-93	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-10 (bg)	-31.47	-88	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-14A	-157.8	-81	-74	Yes	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-15A	-177.2	-92	-74	Yes	19	0	n/a	n/a	0.01	NP

Trend Test - All Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:30 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-08 (bg)	0	9	68	No	18	94.44	n/a	n/a	0.01	NP
Boron (mg/L)	MW-10 (bg)	0	0	68	No	18	100	n/a	n/a	0.01	NP
Boron (mg/L)	MW-14A	0.4174	27	74	No	19	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-15A	-1.881	-98	-74	Yes	19	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-21	-0.1001	-17	-74	No	19	5.263	n/a	n/a	0.01	NP
Boron (mg/L)	MW-22 (bg)	0	1	25	No	9	77.78	n/a	n/a	0.01	NP
Boron (mg/L)	MW-23 (bg)	0	3	21	No	8	87.5	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-08 (bg)	-7.501	-61	-68	No	18	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-10 (bg)	-1.547	-62	-68	No	18	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-10.03	-82	-74	Yes	19	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-22 (bg)	-1.595	-6	-25	No	9	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-23 (bg)	-3.995	-20	-21	No	8	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-08 (bg)	0	-1	-68	No	18	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-10 (bg)	0	-17	-68	No	18	94.44	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-22 (bg)	-2.571	-22	-25	No	9	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-23 (bg)	0.6052	6	21	No	8	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5B	-4.887	-66	-74	No	19	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-08 (bg)	-19.45	-71	-68	Yes	18	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-10 (bg)	-1.679	-45	-68	No	18	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-14A	-37.82	-57	-74	No	19	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-22 (bg)	9.286	32	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-23 (bg)	-1.918	-11	-21	No	8	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-08 (bg)	-72.16	-93	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-10 (bg)	-31.47	-88	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-14A	-157.8	-81	-74	Yes	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-15A	-177.2	-92	-74	Yes	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-22 (bg)	-4.835	-15	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-23 (bg)	-37.9	-20	-21	No	8	0	n/a	n/a	0.01	NP

Upper Tolerance Limits

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:24 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Bg N</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony (mg/L)	0.002	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Arsenic (mg/L)	0.00784	51	n/a	62.75	n/a	0.0731	NP Inter(normality)
Barium (mg/L)	0.247	51	n/a	0	n/a	0.0731	NP Inter(normality)
Beryllium (mg/L)	0.001	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Cadmium (mg/L)	0.0001	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Chromium (mg/L)	0.005	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Cobalt (mg/L)	0.00558	52	n/a	36.54	n/a	0.06944	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	1.066	37	0.2827	0	No	0.05	Inter
Fluoride (mg/L)	0.864	52	n/a	84.62	n/a	0.06944	NP Inter(NDs)
Lead (mg/L)	0.00204	51	n/a	88.24	n/a	0.0731	NP Inter(NDs)
Lithium (mg/L)	0.01	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Mercury (mg/L)	0.0002	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Molybdenum (mg/L)	0.00822	53	n/a	64.15	n/a	0.06597	NP Inter(normality)
Selenium (mg/L)	0.005	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Thallium (mg/L)	0.001	51	n/a	100	n/a	0.0731	NP Inter(NDs)

MUSCATINE POWER & WATER GWPS				
Constituent Name	MCL	CCR Rule-Specified	Background Limit	GWPS
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		0.25	2
Beryllium, Total (mg/L)	0.004		0.001	0.004
Cadmium, Total (mg/L)	0.005		0.0001	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		1.066	5
Fluoride, Total (mg/L)	4		0.86	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

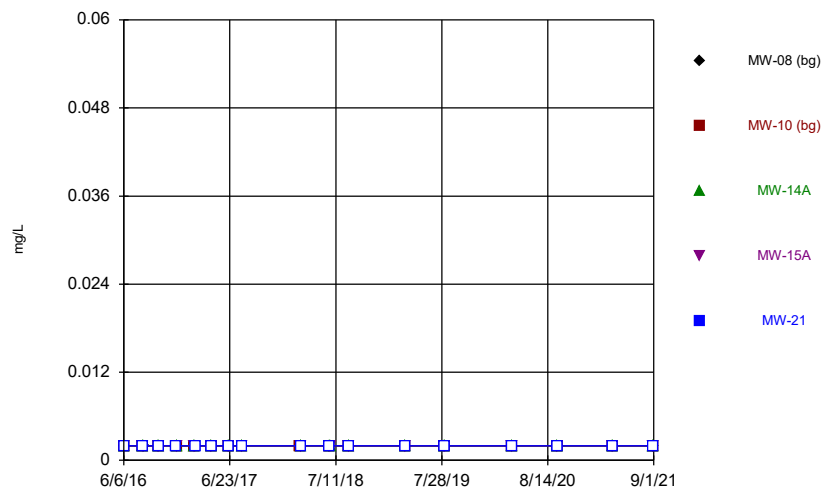
Confidence Interval Summary Table - All Results (No Significant)

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:26 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	MW-14A	0.03744	0.0317	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-15A	0.04083	0.03534	2	No	16	0	No	0.01	Param.
Barium (mg/L)	MW-21	0.05704	0.03936	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-5B	0.323	0.2782	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-6A	0.2222	0.1944	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-4B	0.1553	0.1322	2	No	17	0	No	0.01	Param.
Chromium (mg/L)	MW-21	0.006435	0.005254	0.1	No	17	23.53	No	0.01	Param.
Cobalt (mg/L)	MW-4B	0.000681	0.0005	0.006	No	17	76.47	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-14A	0.684	0.5	4	No	17	88.24	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-15A	0.516	0.5	4	No	17	76.47	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-21	0.768	0.5	4	No	18	88.89	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-5B	0.627	0.5	4	No	18	83.33	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-6A	0.652	0.5	4	No	18	72.22	No	0.01	NP (normality)
Fluoride (mg/L)	MW-4B	0.525	0.5	4	No	18	77.78	No	0.01	NP (NDs)
Lead (mg/L)	MW-21	0.000633	0.0005	0.015	No	17	94.12	No	0.01	NP (NDs)
Lead (mg/L)	MW-4B	0.000532	0.0005	0.015	No	16	93.75	No	0.01	NP (NDs)
Lithium (mg/L)	MW-21	0.0225	0.01	0.04	No	17	58.82	No	0.01	NP (normality)
Molybdenum (mg/L)	MW-21	0.00383	0.002	0.1	No	17	94.12	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-5B	0.00212	0.002	0.1	No	17	94.12	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-4B	0.00296	0.002	0.1	No	17	94.12	No	0.01	NP (NDs)
Selenium (mg/L)	MW-14A	0.00823	0.005	0.05	No	17	35.29	No	0.01	NP (normality)
Selenium (mg/L)	MW-15A	0.00502	0.005	0.05	No	17	94.12	No	0.01	NP (NDs)
Selenium (mg/L)	MW-21	0.01107	0.006264	0.05	No	17	17.65	No	0.01	Param.

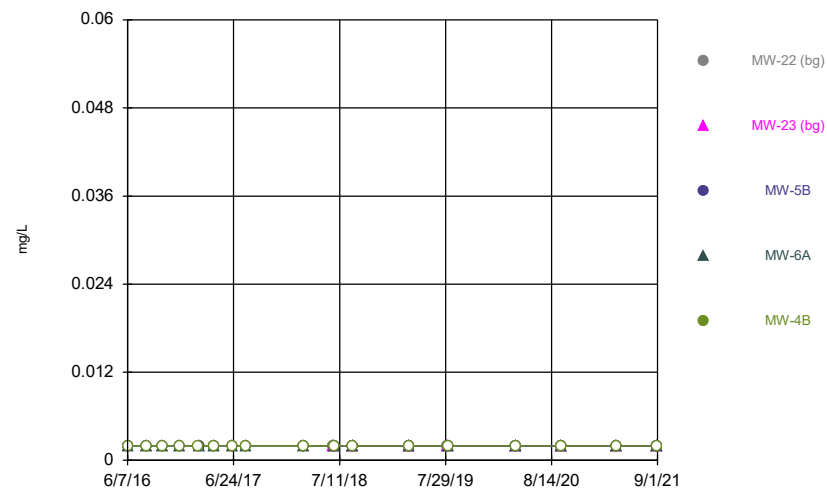
FIGURE A.

Time Series



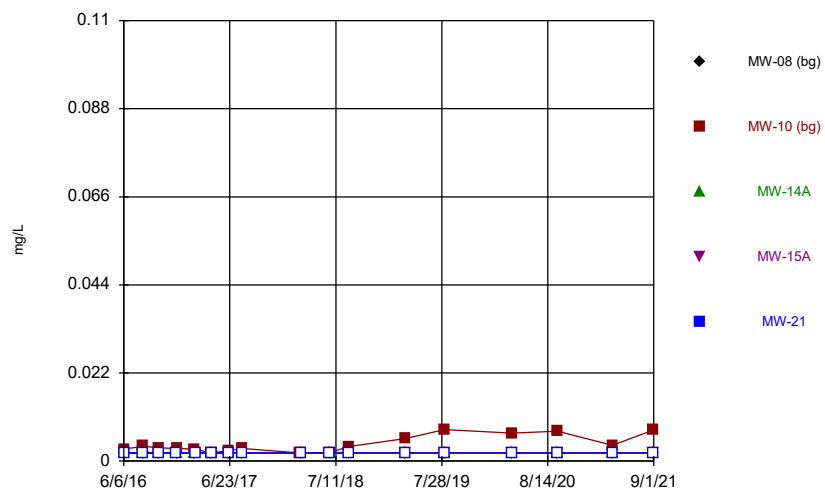
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



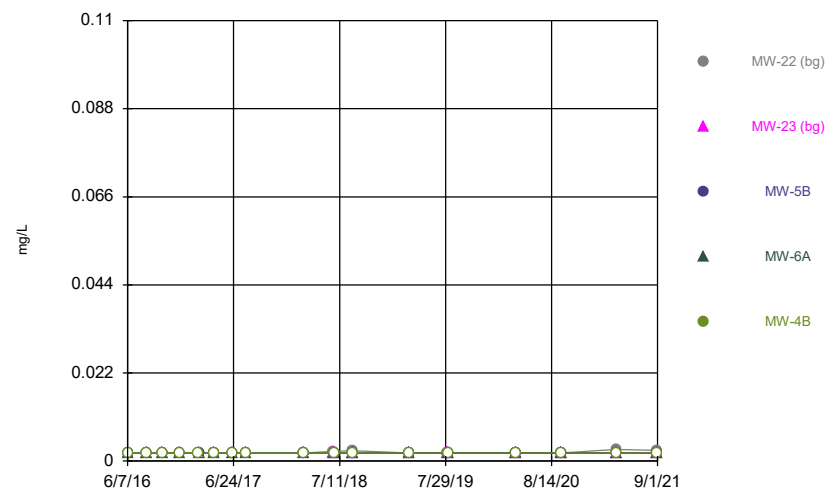
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Time Series



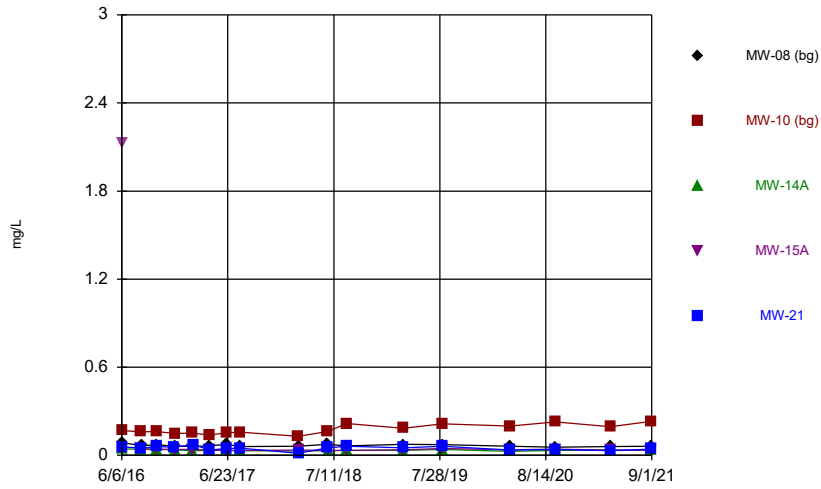
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Time Series



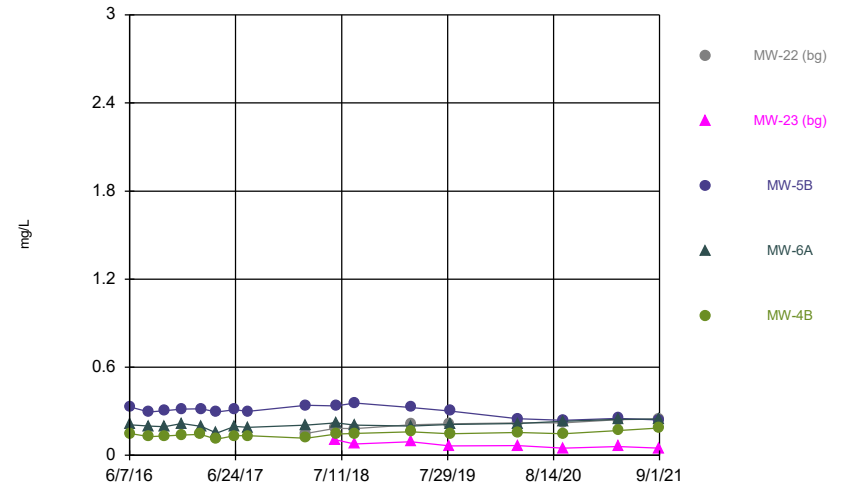
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



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 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

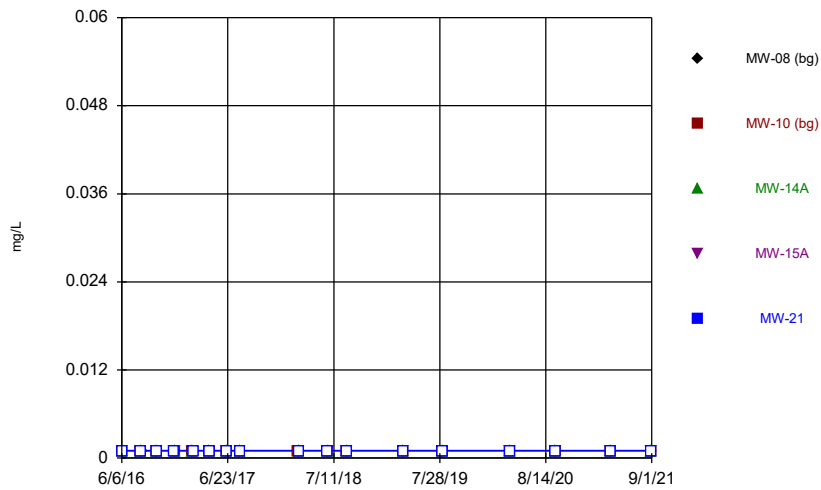
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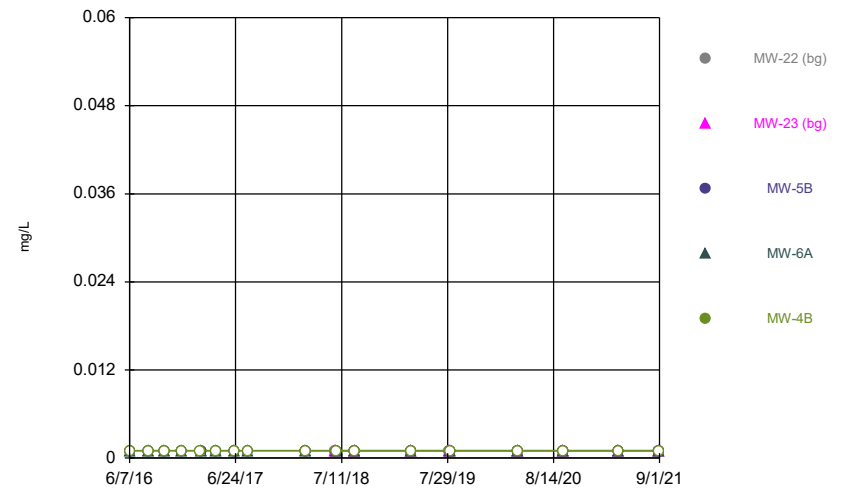
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Constituent: Beryllium Analysis Run 11/30/2021 10:15 PM View: Federal Descriptive
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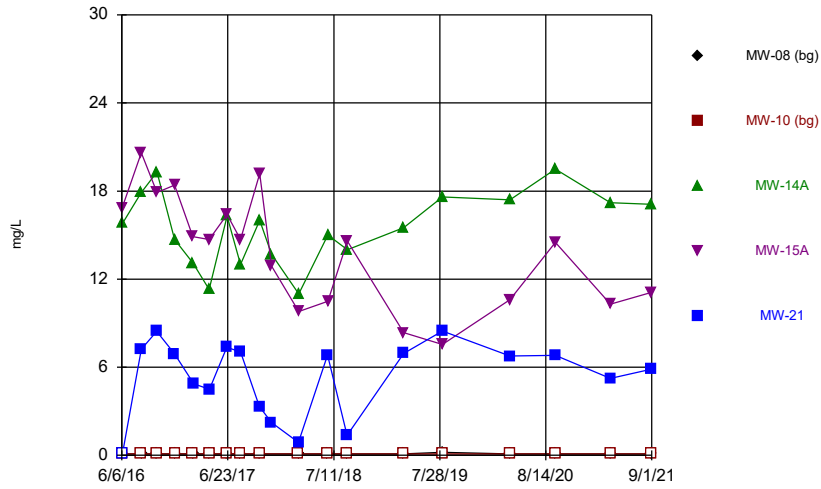
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Time Series



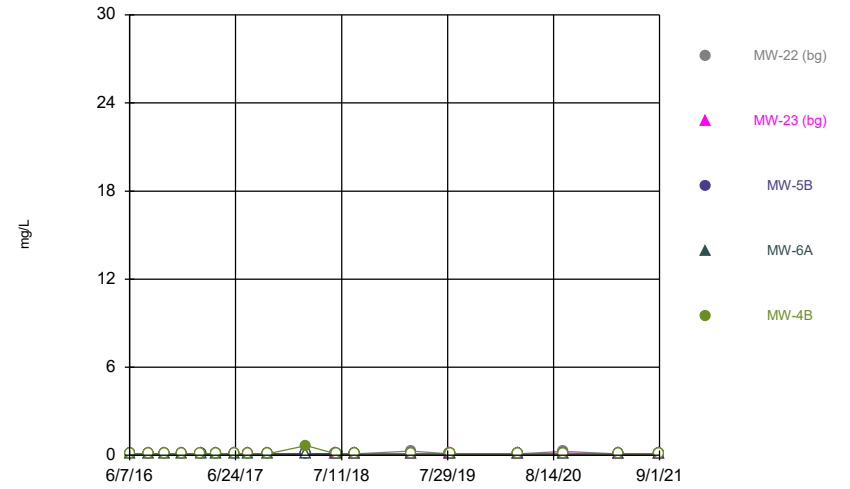
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 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



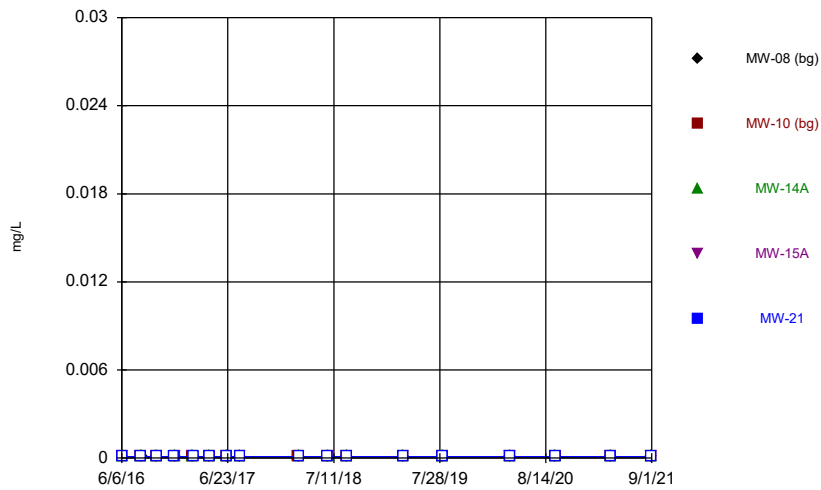
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



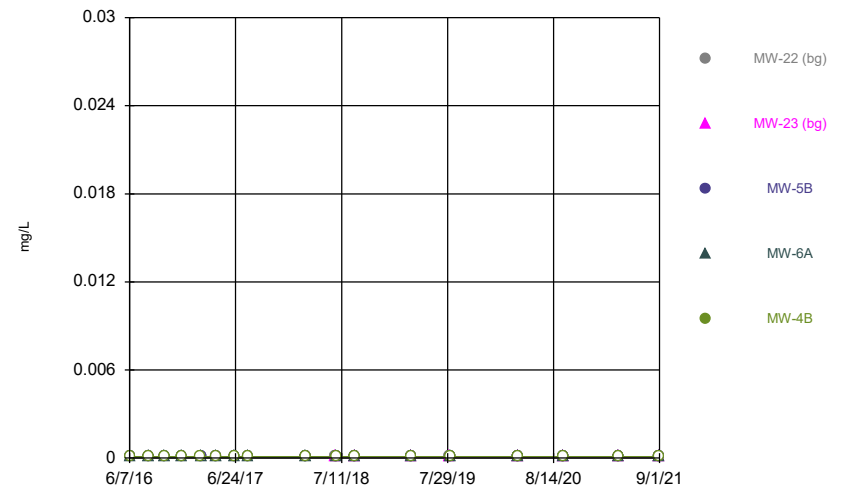
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



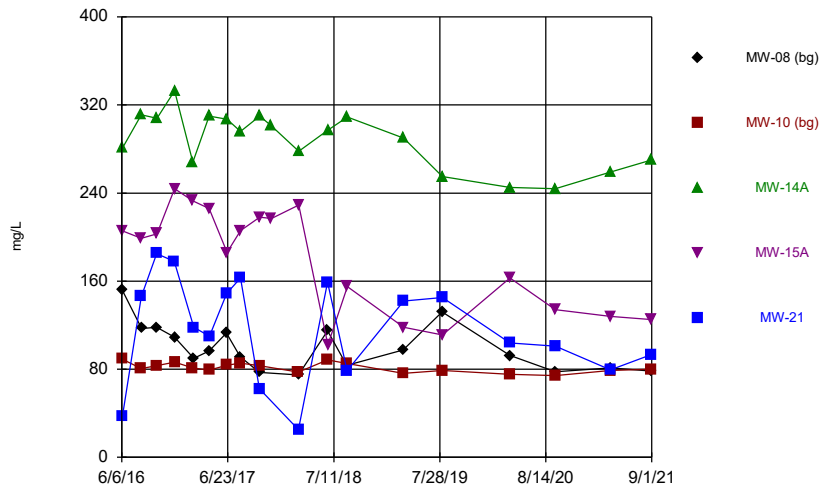
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



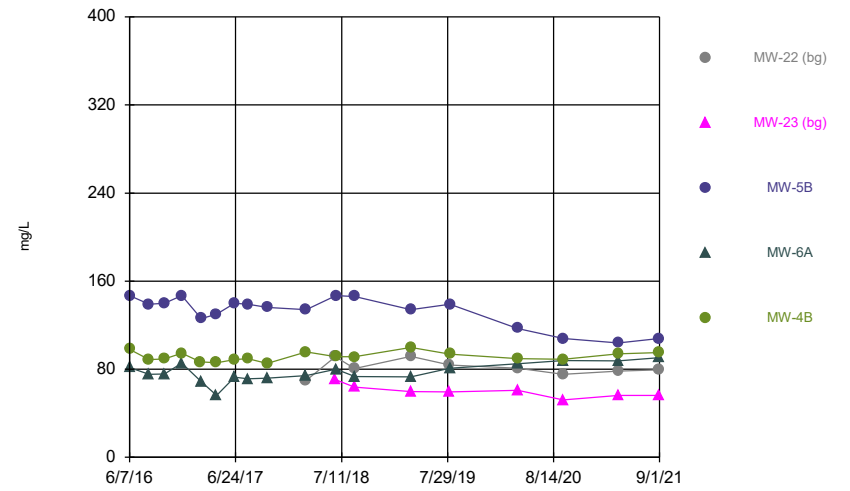
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



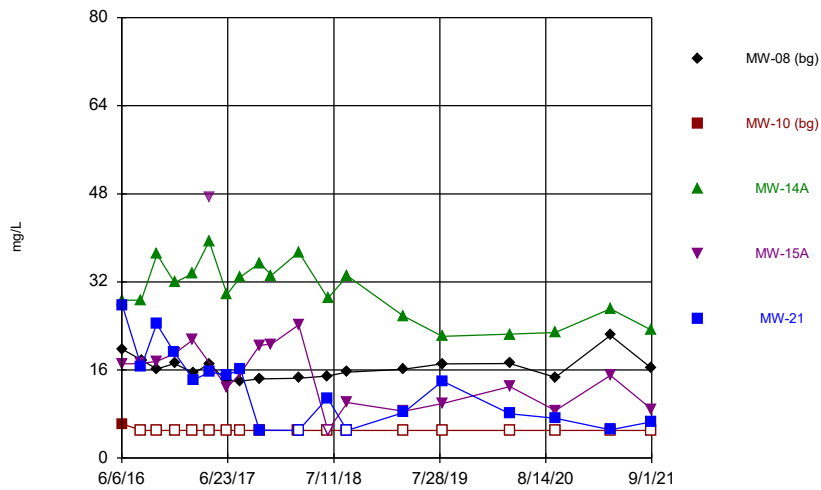
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Time Series



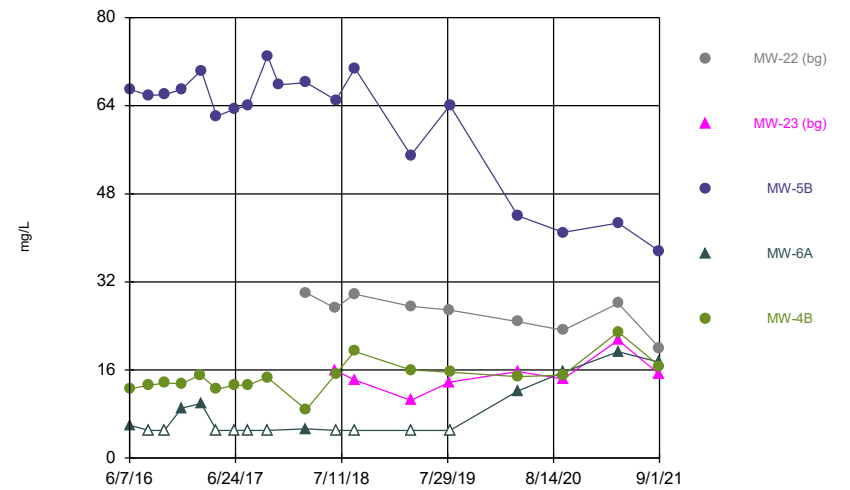
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Time Series



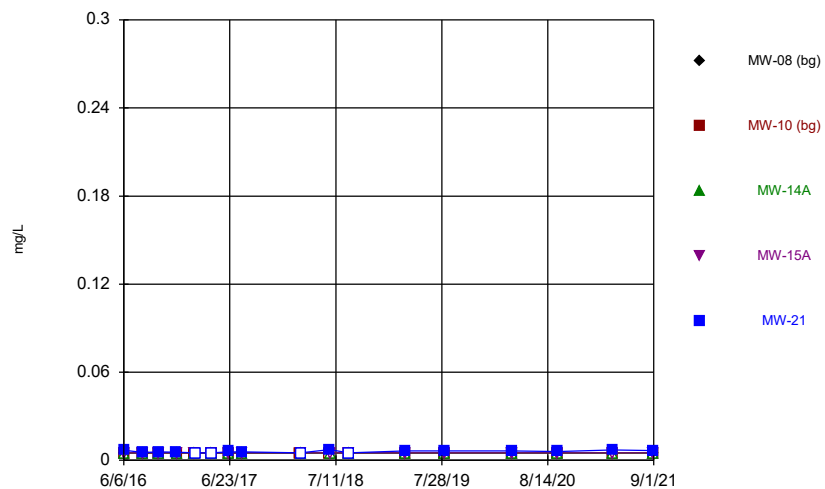
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Time Series



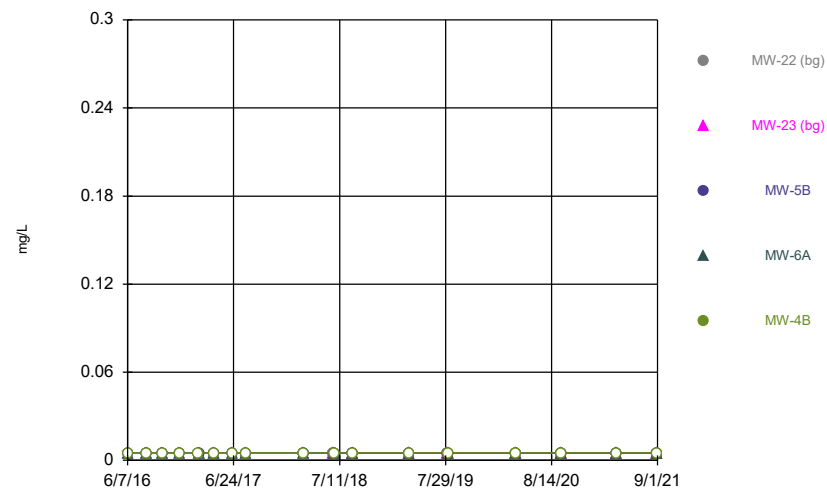
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Time Series



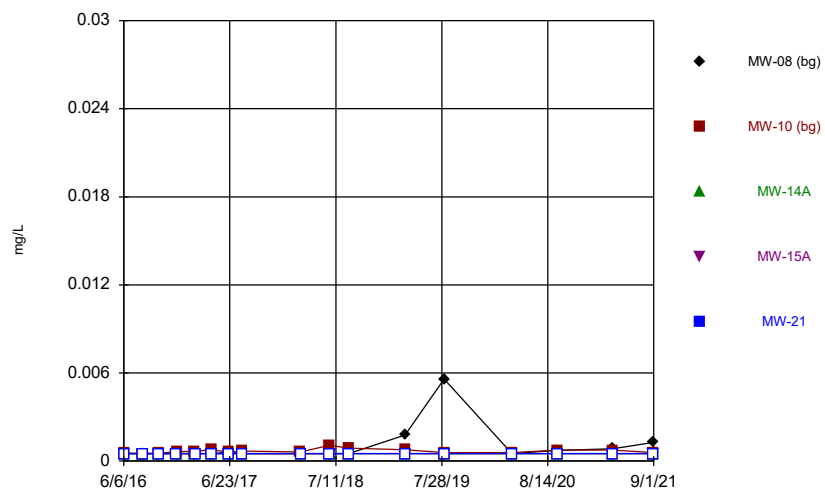
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



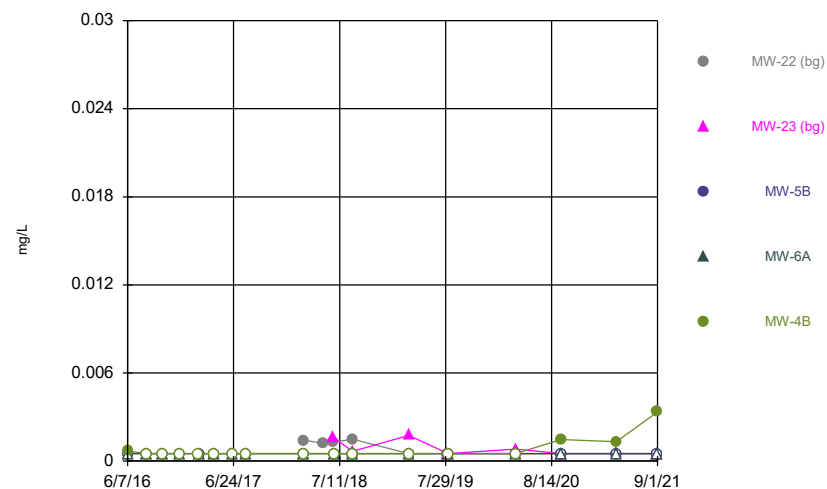
Constituent: Chromium Analysis Run 11/30/2021 10:15 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



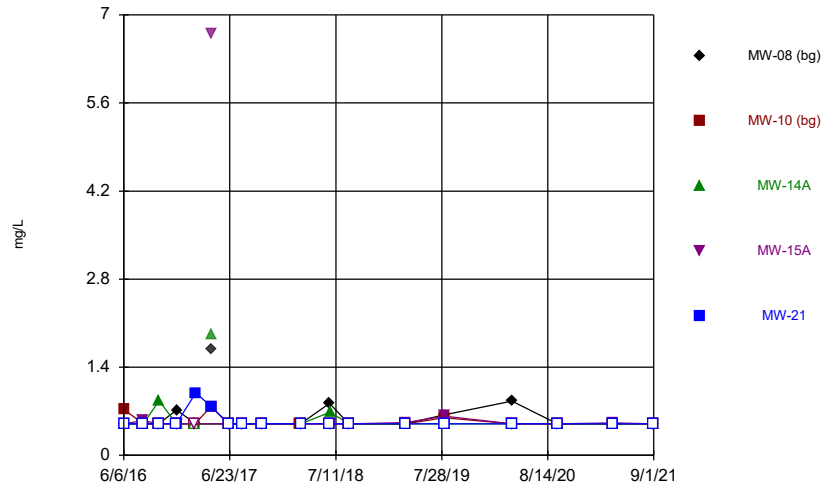
Constituent: Cobalt Analysis Run 11/30/2021 10:15 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



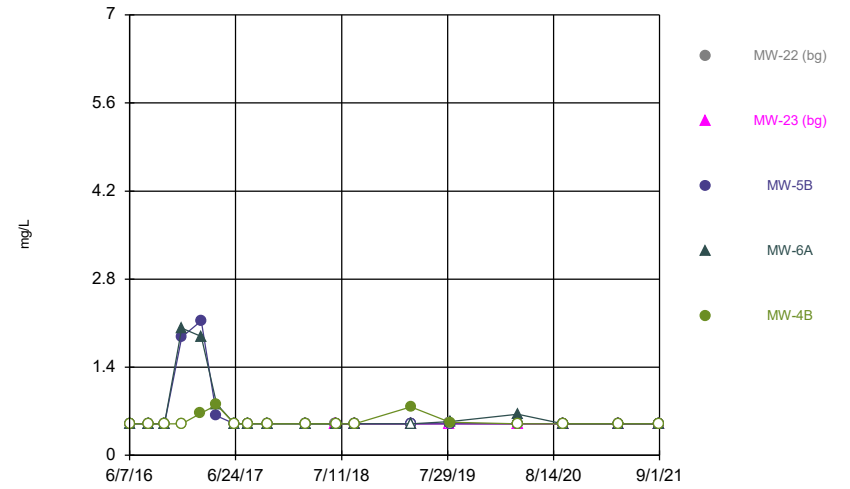
Constituent: Cobalt Analysis Run 11/30/2021 10:15 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



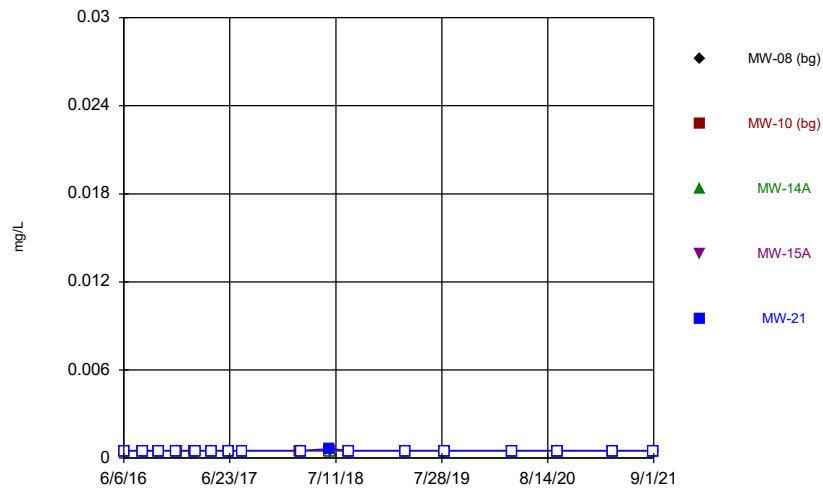
Constituent: Fluoride Analysis Run 11/30/2021 10:15 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



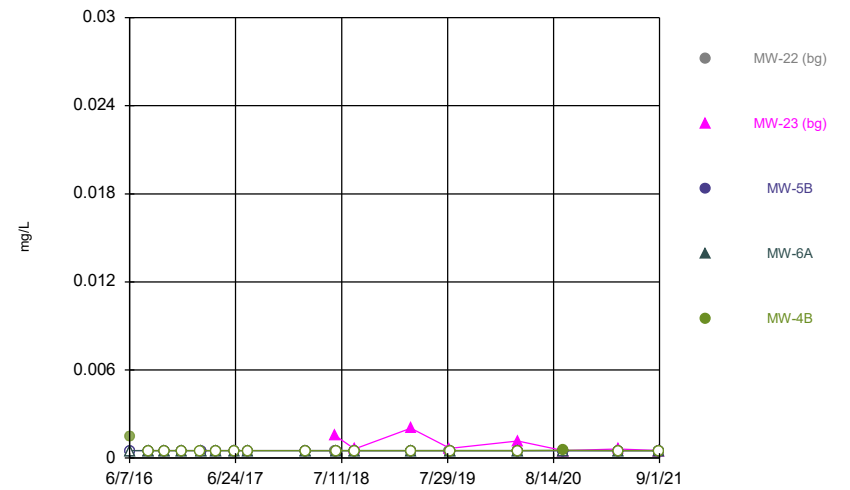
Constituent: Fluoride Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



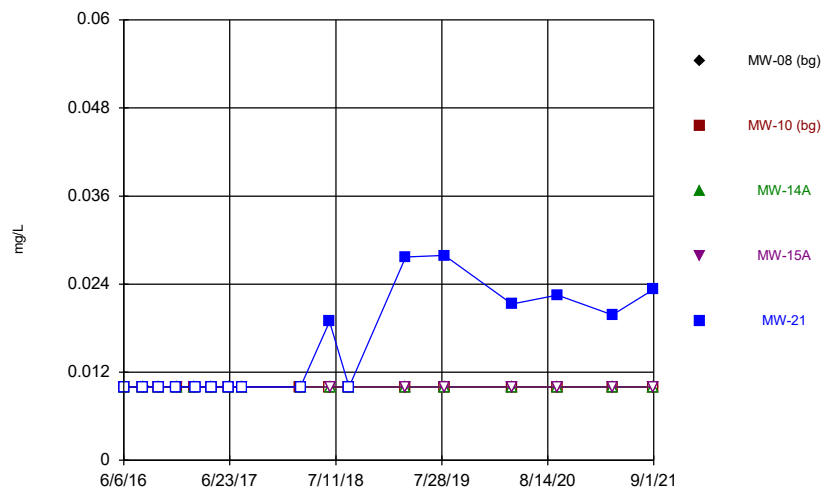
Constituent: Lead Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



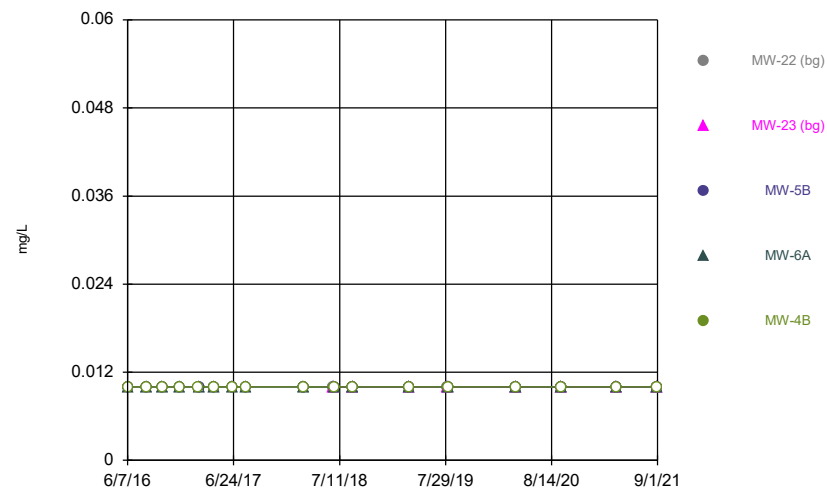
Constituent: Lead Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



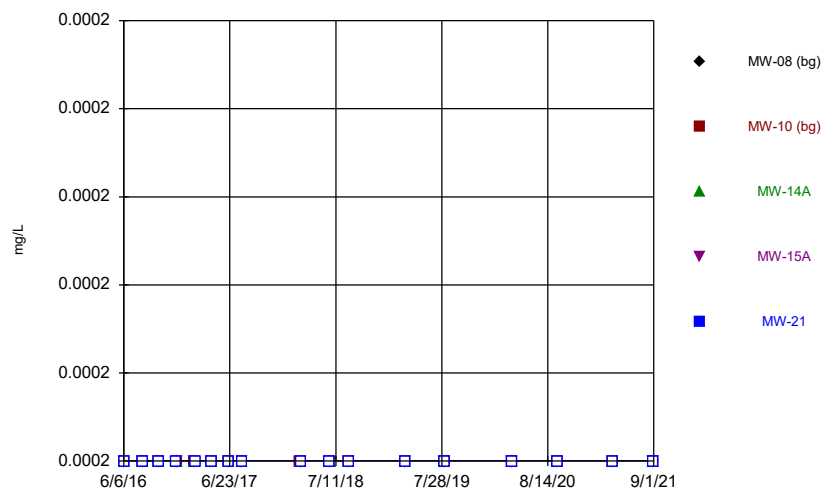
Constituent: Lithium Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



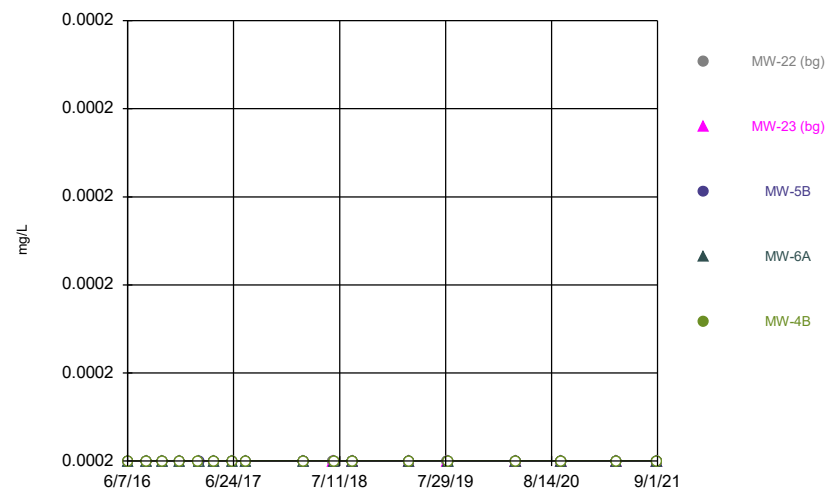
Constituent: Lithium Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



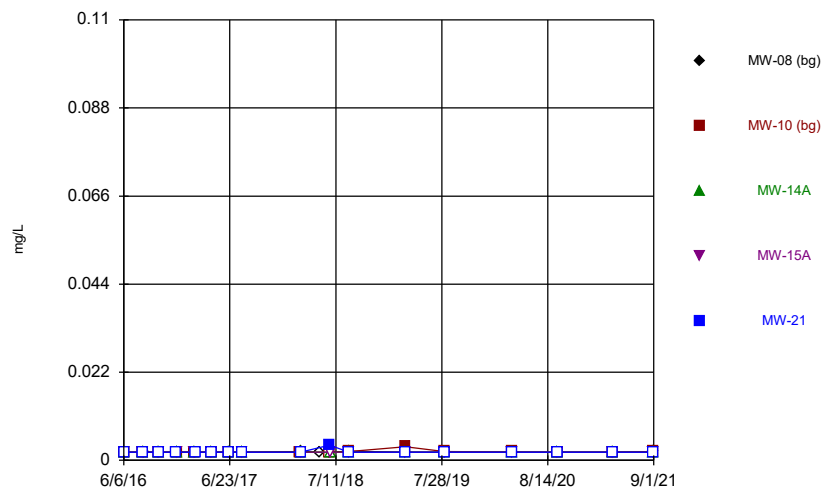
Constituent: Mercury Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



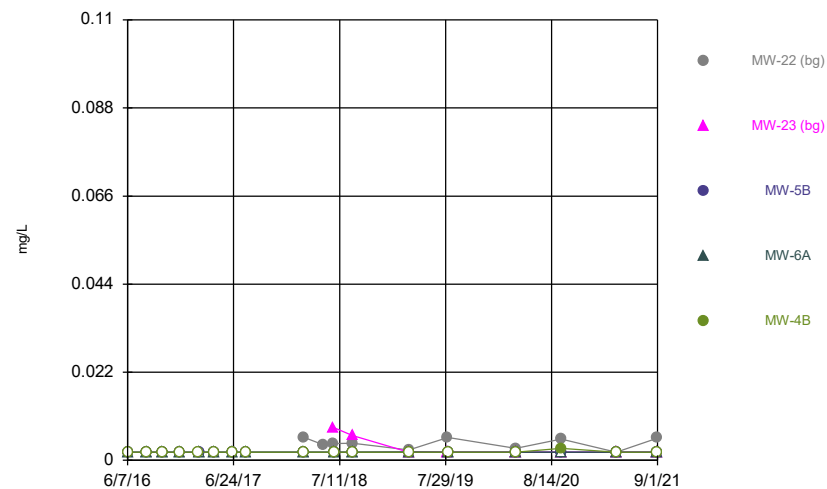
Constituent: Mercury Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



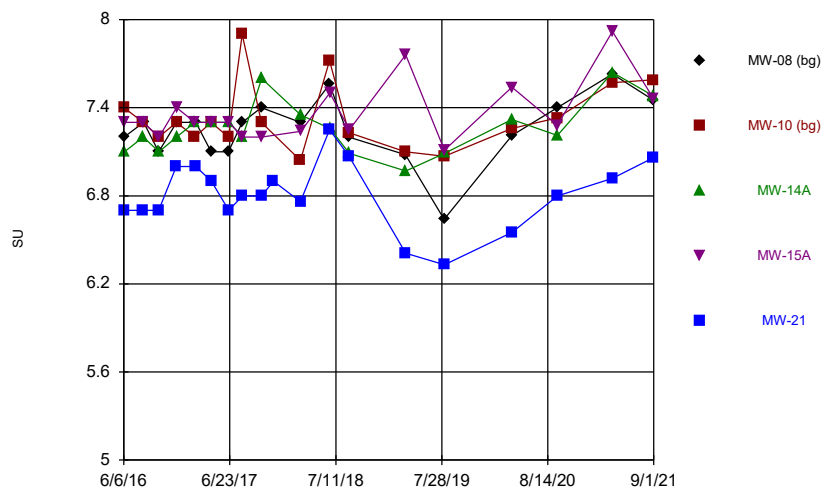
Constituent: Molybdenum Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



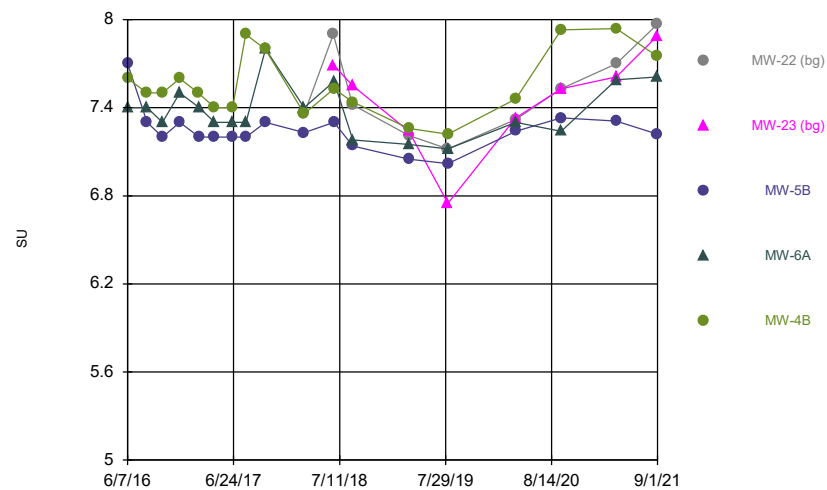
Constituent: Molybdenum Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



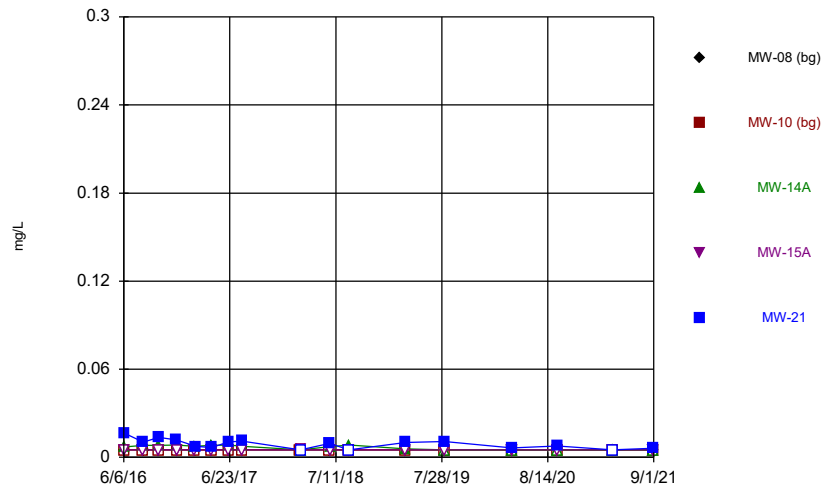
Constituent: pH Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series

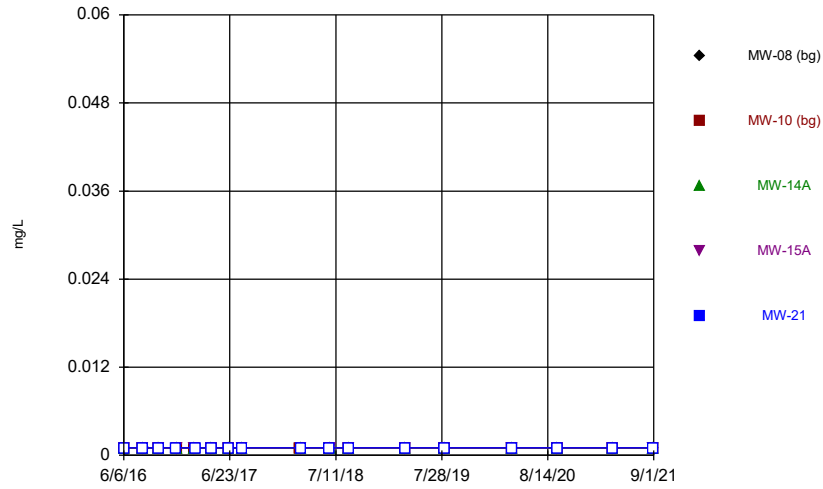


Constituent: pH Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series

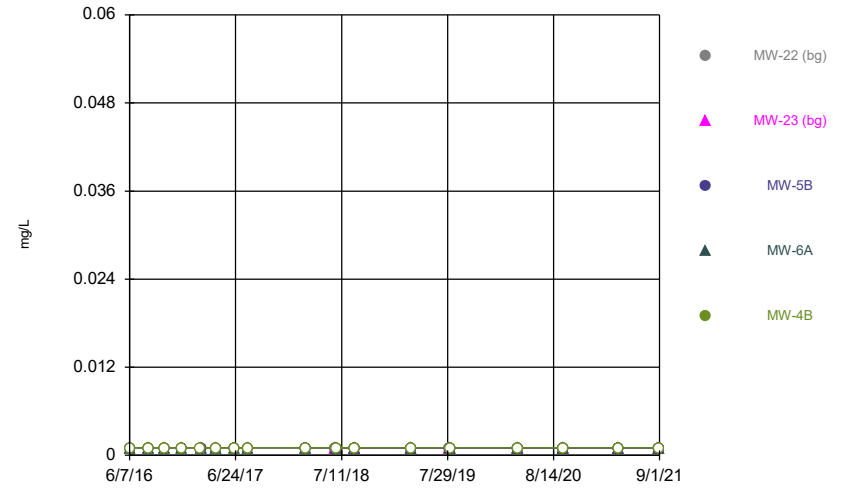


Time Series



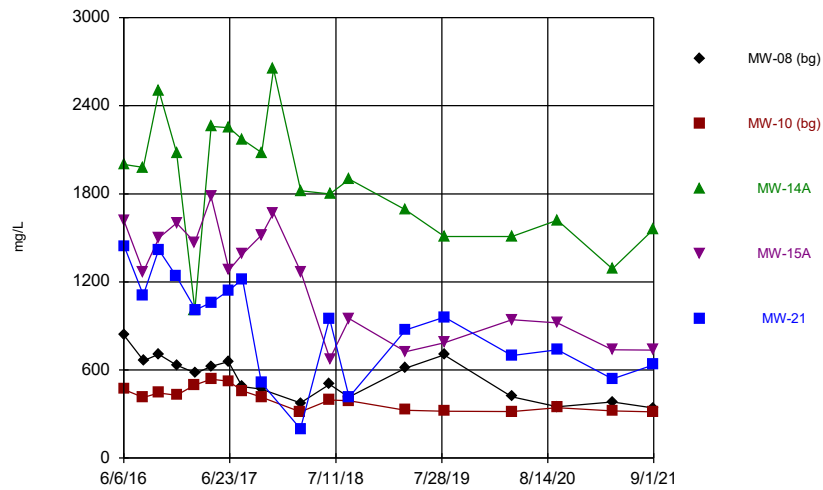
Constituent: Thallium Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



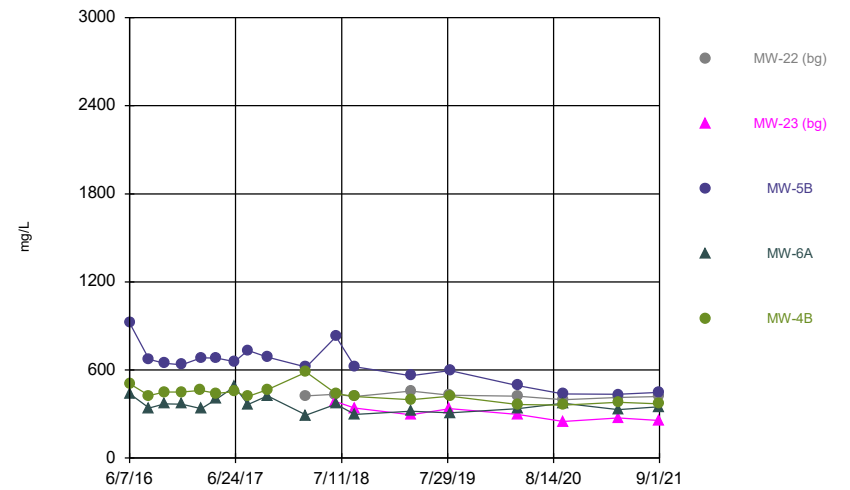
Constituent: Thallium Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:16 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series

Constituent: Antimony (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.002		<0.002	
6/7/2016	<0.002				
6/8/2016			<0.002		<0.002
8/15/2016		<0.002	<0.002	<0.002	<0.002
8/16/2016	<0.002				
10/10/2016	<0.002	<0.002			<0.002
10/11/2016			<0.002	<0.002	
12/12/2016					<0.002
12/14/2016	<0.002	<0.002	<0.002	<0.002	
2/17/2017		<0.002	<0.002	<0.002	
2/21/2017	<0.002				<0.002
4/17/2017	<0.002	<0.002	<0.002	<0.002	
4/18/2017					<0.002
6/19/2017	<0.002	<0.002			
6/20/2017					<0.002
6/21/2017			<0.002	<0.002	
8/7/2017	<0.002	<0.002			
8/8/2017			<0.002	<0.002	<0.002
3/5/2018		<0.002			
3/6/2018	<0.002				<0.002
3/7/2018			<0.002	<0.002	
6/19/2018	<0.002	<0.002			<0.002
6/20/2018			<0.002	<0.002	
8/27/2018	<0.002	<0.002			
8/28/2018					<0.002
8/29/2018			<0.002	<0.002	
3/18/2019	<0.002				
3/19/2019		<0.002			
3/20/2019			<0.002	<0.002	<0.002
8/6/2019	<0.002				
8/7/2019		<0.002	<0.002	<0.002	<0.002
4/7/2020	<0.002	<0.002	<0.002	<0.002	<0.002
9/18/2020	<0.002	<0.002	<0.002	<0.002	<0.002
4/5/2021	<0.002	<0.002	<0.002	<0.002	<0.002
9/1/2021	<0.002	<0.002	<0.002	<0.002	<0.002

Time Series

Constituent: Antimony (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.002	<0.002	<0.002
8/16/2016			<0.002	<0.002	<0.002
10/11/2016			<0.002	<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	<0.002
6/20/2017			<0.002		<0.002
6/21/2017				<0.002	
8/7/2017					<0.002
8/8/2017			<0.002	<0.002	
3/6/2018	<0.002		<0.002	<0.002	<0.002
6/19/2018	<0.002				
6/20/2018		<0.002			
6/21/2018			<0.002	<0.002	<0.002
8/27/2018	<0.002	<0.002			
8/28/2018					<0.002
8/29/2018			<0.002	<0.002	
3/19/2019	<0.002	<0.002	<0.002	<0.002	<0.002
8/6/2019	<0.002	<0.002			
8/7/2019			<0.002	<0.002	<0.002
4/7/2020	<0.002	<0.002	<0.002	<0.002	<0.002
9/18/2020	<0.002	<0.002	<0.002	<0.002	<0.002
4/5/2021	<0.002	<0.002	<0.002	<0.002	<0.002
9/1/2021	<0.002	<0.002	<0.002	<0.002	<0.002

Time Series

Constituent: Arsenic (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		0.00298		<0.002	
6/7/2016	<0.002				
6/8/2016			<0.002		<0.002
8/15/2016		0.00369	<0.002	<0.002	<0.002
8/16/2016	<0.002				
10/10/2016	<0.002	0.00328			<0.002
10/11/2016			<0.002	<0.002	
12/12/2016					<0.002
12/14/2016	<0.002	0.00312	<0.002	<0.002	
2/17/2017		0.00298	<0.002	<0.002	
2/21/2017	<0.002				<0.002
4/17/2017	<0.002	<0.002	<0.002	<0.002	
4/18/2017					<0.002
6/19/2017	<0.002	0.00262			
6/20/2017					<0.002
6/21/2017			<0.002	<0.002	
8/7/2017	<0.002	0.00317			
8/8/2017			<0.002	<0.002	<0.002
3/5/2018		<0.002			
3/6/2018	<0.002				<0.002
3/7/2018			<0.002	<0.002	
6/19/2018	<0.002	0.00211			<0.002
6/20/2018			<0.002	<0.002	
8/27/2018	<0.002	0.0036			
8/28/2018					<0.002
8/29/2018			<0.002	<0.002	
3/18/2019	<0.002				
3/19/2019		0.0056			
3/20/2019			<0.002	<0.002	<0.002
8/6/2019	<0.002				
8/7/2019		0.00784	<0.002	<0.002	<0.002
4/7/2020	<0.002	0.00697	<0.002	<0.002	<0.002
9/18/2020	<0.002	0.00748	<0.002	<0.002	<0.002
4/5/2021	<0.002	0.00393	<0.002	<0.002	<0.002
9/1/2021	<0.002 (D)	0.00781	<0.002	<0.002	<0.002

Time Series

Constituent: Arsenic (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.002	<0.002	<0.002
8/16/2016			<0.002	<0.002	<0.002
10/11/2016			<0.002	<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	<0.002
6/20/2017			<0.002		<0.002
6/21/2017				<0.002	
8/7/2017					<0.002
8/8/2017			<0.002	<0.002	
3/6/2018	<0.002		<0.002	<0.002	<0.002
6/19/2018	0.00245				
6/20/2018		<0.002			
6/21/2018			<0.002	<0.002	<0.002
8/27/2018	0.00261	<0.002			
8/28/2018					<0.002
8/29/2018			<0.002	<0.002	
3/19/2019	<0.002	<0.002	<0.002	<0.002	<0.002
8/6/2019	<0.002	<0.002			
8/7/2019			<0.002	<0.002	<0.002
4/7/2020	<0.002	<0.002	<0.002	<0.002	<0.002
9/18/2020	<0.002	<0.002	<0.002	<0.002	<0.002
4/5/2021	0.00289	<0.002	<0.002	<0.002	<0.002
9/1/2021	0.00267	<0.002	<0.002	<0.002	<0.002 (D)

Time Series

Constituent: Barium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		0.168		2.13 (o)	
6/7/2016	0.0861				
6/8/2016			0.0443		0.0573
8/15/2016		0.161	0.0402	0.044	0.0482
8/16/2016	0.0671				
10/10/2016	0.0706	0.163			0.0606
10/11/2016			0.0391	0.0426	
12/12/2016					0.056
12/14/2016	0.0645	0.15	0.0383	0.0406	
2/17/2017		0.151	0.0306	0.0402	
2/21/2017	0.0594 (F1)				0.0735
4/17/2017	0.0636	0.138	0.0341	0.0364	
4/18/2017					0.0356
6/19/2017	0.076	0.154			
6/20/2017					0.0461
6/21/2017			0.0338	0.0327	
8/7/2017	0.0596	0.157			
8/8/2017			0.031	0.0338	0.0499
3/5/2018		0.129			
3/6/2018	0.0617				0.0148
3/7/2018			0.0285	0.0352	
6/19/2018	0.0761	0.162			0.0515
6/20/2018			0.0314	0.0338	
8/27/2018	0.0649	0.216			
8/28/2018					0.0622
8/29/2018			0.0344	0.0335	
3/18/2019	0.0751				
3/19/2019		0.185			
3/20/2019			0.0328	0.037	0.0511
8/6/2019	0.0733				
8/7/2019		0.215	0.0398	0.047	0.0624
4/7/2020	0.0613	0.199	0.0266	0.0389	0.0352
9/18/2020	0.0549	0.227	0.0328	0.0416	0.0407
4/5/2021	0.0596	0.196	0.0355	0.0365	0.0309
9/1/2021	0.0623 (D)	0.233	0.0345	0.0355	0.0434

Time Series

Constituent: Barium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			0.331	0.209	0.15
8/16/2016			0.295	0.199	0.128
10/11/2016			0.304	0.196	0.131
12/12/2016			0.315	0.216	0.139
2/17/2017					0.143
2/21/2017			0.316	0.197	
4/17/2017			0.296	0.152	0.111
6/20/2017			0.31		0.133
6/21/2017				0.197	
8/7/2017					0.133
8/8/2017			0.3	0.19	
3/6/2018	0.15		0.341	0.206	0.117
6/19/2018	0.184				
6/20/2018		0.106			
6/21/2018			0.336	0.222	0.144
8/27/2018	0.181	0.0779			
8/28/2018					0.149
8/29/2018			0.357	0.206	
3/19/2019	0.209	0.0922	0.326	0.2	0.161
8/6/2019	0.215	0.0635			
8/7/2019			0.301	0.211	0.147
4/7/2020	0.222	0.0654	0.25	0.216	0.156
9/18/2020	0.222	0.0491	0.239	0.231	0.147
4/5/2021	0.242	0.0608	0.252	0.245	0.169
9/1/2021	0.247	0.0497	0.241	0.248	0.186 (D)

Time Series

Constituent: Beryllium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.001		<0.001	
6/7/2016	<0.001				
6/8/2016			<0.001		<0.001
8/15/2016		<0.001	<0.001	<0.001	<0.001
8/16/2016	<0.001				
10/10/2016	<0.001	<0.001			<0.001
10/11/2016			<0.001	<0.001	
12/12/2016					<0.001
12/14/2016	<0.001	<0.001	<0.001	<0.001	
2/17/2017		<0.001	<0.001	<0.001	
2/21/2017	<0.001				<0.001
4/17/2017	<0.001	<0.001	<0.001	<0.001	
4/18/2017					<0.001
6/19/2017	<0.001	<0.001			
6/20/2017					<0.001
6/21/2017			<0.001	<0.001	
8/7/2017	<0.001	<0.001			
8/8/2017			<0.001	<0.001	<0.001
3/5/2018		<0.001			
3/6/2018	<0.001				<0.001
3/7/2018			<0.001	<0.001	
6/19/2018	<0.001	<0.001			<0.001
6/20/2018			<0.001	<0.001	
8/27/2018	<0.001	<0.001			
8/28/2018					<0.001
8/29/2018			<0.001	<0.001	
3/18/2019	<0.001				
3/19/2019		<0.001			
3/20/2019			<0.001	<0.001	<0.001
8/6/2019	<0.001				
8/7/2019		<0.001	<0.001	<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001	<0.001	<0.001
9/1/2021	<0.001 (D)	<0.001	<0.001	<0.001	<0.001

Time Series

Constituent: Beryllium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.001	<0.001	<0.001
8/16/2016			<0.001	<0.001	<0.001
10/11/2016			<0.001	<0.001	<0.001
12/12/2016			<0.001	<0.001	<0.001
2/17/2017					<0.001
2/21/2017			<0.001	<0.001	
4/17/2017			<0.001	<0.001	<0.001
6/20/2017			<0.001		<0.001
6/21/2017				<0.001	
8/7/2017					<0.001
8/8/2017			<0.001	<0.001	
3/6/2018	<0.001		<0.001	<0.001	<0.001
6/19/2018	<0.001				
6/20/2018		<0.001			
6/21/2018			<0.001	<0.001	<0.001
8/27/2018	<0.001	<0.001			
8/28/2018					<0.001
8/29/2018			<0.001	<0.001	
3/19/2019	<0.001	<0.001	<0.001	<0.001	<0.001
8/6/2019	<0.001	<0.001			
8/7/2019			<0.001	<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001	<0.001	<0.001 (D)

Time Series

Constituent: Boron (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.1		16.8	
6/7/2016	<0.1				
6/8/2016			15.8		<0.1
8/15/2016		<0.1	17.9	20.6	7.23
8/16/2016	<0.1				
10/10/2016	<0.1	<0.1			8.45
10/11/2016			19.3	17.9	
12/12/2016					6.93
12/14/2016	<0.1	<0.1	14.7	18.4	
2/17/2017		<0.1	13.1	14.9	
2/21/2017	<0.1				4.87
4/17/2017	<0.1	<0.1	11.3	14.7	
4/18/2017					4.49
6/19/2017	<0.1	<0.1			
6/20/2017					7.36
6/21/2017			16.3	16.4	
8/7/2017	<0.1	<0.1			
8/8/2017			13	14.7	7.05
10/16/2017	<0.1	<0.1			3.33
10/17/2017			16	19.2	
11/28/2017			13.7 (R)	12.9 (R)	2.24 (R)
3/5/2018		<0.1			
3/6/2018	<0.1				0.885
3/7/2018			11	9.8	
6/19/2018	<0.1	<0.1			6.84
6/20/2018			15	10.5	
8/27/2018	<0.1	<0.1			
8/28/2018					1.36
8/29/2018			14	14.6	
3/18/2019	<0.1				
3/19/2019		<0.1			
3/20/2019			15.5	8.35	6.95
8/6/2019	0.205				
8/7/2019		<0.1	17.6	7.56	8.46
4/7/2020	<0.1	<0.1	17.4	10.6	6.76
9/18/2020	<0.1	<0.1	19.5	14.5	6.82
4/5/2021	<0.1	<0.1	17.2	10.3	5.24
9/1/2021	<0.1 (D)	<0.1	17.1	11.1	5.88

Time Series

Constituent: Boron (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.1	<0.1	<0.1
8/16/2016			<0.1	<0.1	<0.1
10/11/2016			<0.1	<0.1	<0.1
12/12/2016			<0.1	<0.1	<0.1
2/17/2017					<0.1
2/21/2017			<0.1	<0.1	
4/17/2017			<0.1	<0.1	<0.1
6/20/2017			<0.1		<0.1
6/21/2017				<0.1	
8/7/2017					<0.1
8/8/2017			<0.1	<0.1	
10/16/2017					<0.1
10/17/2017			<0.1	<0.1	
3/6/2018	<0.1		<0.1	<0.1	0.66
6/19/2018	<0.1				
6/20/2018		<0.1			
6/21/2018			<0.1	<0.1	<0.1
8/27/2018	<0.1	<0.1			
8/28/2018					<0.1
8/29/2018			<0.1	<0.1	
3/19/2019	0.299	<0.1	<0.1	<0.1	<0.1
8/6/2019	<0.1	<0.1			
8/7/2019			<0.1	<0.1	<0.1
4/7/2020	<0.1	<0.1	<0.1	<0.1	<0.1
9/18/2020	0.263	0.15	<0.1	<0.1	<0.1
4/5/2021	<0.1	<0.1	<0.1	<0.1	<0.1
9/1/2021	<0.1	<0.1	<0.1	<0.1	<0.1 (D)

Time Series

Constituent: Cadmium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.0001		<0.0001	
6/7/2016	<0.0001				
6/8/2016			<0.0001		<0.0001
8/15/2016		<0.0001	<0.0001	<0.0001	<0.0001
8/16/2016	<0.0001				
10/10/2016	<0.0001	<0.0001			<0.0001
10/11/2016			<0.0001	<0.0001	
12/12/2016					<0.0001
12/14/2016	<0.0001	<0.0001	<0.0001	<0.0001	
2/17/2017		<0.0001	<0.0001	<0.0001	
2/21/2017	<0.0001				<0.0001
4/17/2017	<0.0001	<0.0001	<0.0001	<0.0001	
4/18/2017					<0.0001
6/19/2017	<0.0001	<0.0001			
6/20/2017					<0.0001
6/21/2017			<0.0001	<0.0001	
8/7/2017	<0.0001	<0.0001			
8/8/2017			<0.0001	<0.0001	<0.0001
3/5/2018		<0.0001			
3/6/2018	<0.0001				<0.0001
3/7/2018			<0.0001	<0.0001	
6/19/2018	<0.0001	<0.0001			<0.0001
6/20/2018			<0.0001	<0.0001	
8/27/2018	<0.0001	<0.0001			
8/28/2018					<0.0001
8/29/2018			<0.0001	<0.0001	
3/18/2019	<0.0001				
3/19/2019		<0.0001			
3/20/2019			<0.0001	<0.0001	<0.0001
8/6/2019	<0.0001				
8/7/2019		<0.0001	<0.0001	<0.0001	<0.0001
4/7/2020	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
9/18/2020	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4/5/2021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
9/1/2021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Time Series

Constituent: Cadmium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.0001	<0.0001	<0.0001
8/16/2016			<0.0001	<0.0001	<0.0001
10/11/2016			<0.0001	<0.0001	<0.0001
12/12/2016			<0.0001	<0.0001	<0.0001
2/17/2017					<0.0001
2/21/2017			<0.0001	<0.0001	
4/17/2017			<0.0001	<0.0001	<0.0001
6/20/2017			<0.0001		<0.0001
6/21/2017				<0.0001	
8/7/2017					<0.0001
8/8/2017			<0.0001	<0.0001	
3/6/2018	<0.0001		<0.0001	<0.0001	<0.0001
6/19/2018	<0.0001				
6/20/2018		<0.0001			
6/21/2018			<0.0001	<0.0001	<0.0001
8/27/2018	<0.0001	<0.0001			
8/28/2018					<0.0001
8/29/2018			<0.0001	<0.0001	
3/19/2019	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
8/6/2019	<0.0001	<0.0001			
8/7/2019			<0.0001	<0.0001	<0.0001
4/7/2020	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
9/18/2020	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4/5/2021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
9/1/2021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Time Series

Constituent: Calcium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		89.3		206	
6/7/2016	152				
6/8/2016			281		37.2
8/15/2016		80.7	311	199	146
8/16/2016	117				
10/10/2016	118	83.3			185
10/11/2016			308	203	
12/12/2016					178
12/14/2016	109	86.5	333	244	
2/17/2017		81.2	268	233	
2/21/2017	89.9				118
4/17/2017	96.5	79.2	310	226	
4/18/2017					110
6/19/2017	113	83.6			
6/20/2017					149
6/21/2017			307	186	
8/7/2017	91.3	85.5			
8/8/2017			296	206	163
10/16/2017	77	83.3			62.3
10/17/2017			310	218	
11/28/2017			301 (R)	217 (R)	
3/5/2018		77.3			
3/6/2018	74.7				25.1
3/7/2018			278	229	
6/19/2018	115	88.5			159
6/20/2018			297	102	
8/27/2018	83.6	85.4			
8/28/2018					78.7
8/29/2018			309	155	
3/18/2019	97.6				
3/19/2019		76.3			
3/20/2019			290	118	142
8/6/2019	132				
8/7/2019		78.9	255	111	145
4/7/2020	92.4	75.4	245	163	104
9/18/2020	77.7	74.2	244	134	101
4/5/2021	81.2	78.8	259	128	79.5
9/1/2021	78.3 (D)	80	270	125	93.5

Time Series

Constituent: Calcium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			147	81.4	98.2
8/16/2016			139	75.4	88.8
10/11/2016			140	75.7	89.3
12/12/2016			147	85.6	94.5
2/17/2017					86.8
2/21/2017			126	68.8	
4/17/2017			130	56.3	85.9
6/20/2017			140		88.7
6/21/2017				72.9	
8/7/2017					89.7
8/8/2017			139	71.2	
10/16/2017					85.3
10/17/2017			136	71.9	
3/6/2018	69.8		134	74.1	95.8
6/19/2018	91.5				
6/20/2018		70.5			
6/21/2018			147	80.1	91.4
8/27/2018	80.7	63.9			
8/28/2018					91.3
8/29/2018			146	73.3	
3/19/2019	91.6	59.7	134	73.2	99.7
8/6/2019	83.8	59.5			
8/7/2019			139	80.9	93.8
4/7/2020	80.9	61	117	85.1	89.6
9/18/2020	75.5	52.1	108	87.9	89
4/5/2021	78.4	56.3	104	87.6	94.1
9/1/2021	79.4	56.1	108	90.6	95.1 (D)

Time Series

Constituent: Chloride (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		6.22		17.1	
6/7/2016	19.8				
6/8/2016			28.7		27.7
8/15/2016		<5	28.7	17.2	16.6
8/16/2016	17.8				
10/10/2016	16.2	<5			24.4
10/11/2016			37	17.6	
12/12/2016					19.2
12/14/2016	17.2	<5	31.9	19	
2/17/2017		<5	33.5	21.5	
2/21/2017	15.4				14.2
4/17/2017	17.1	<5	39.4	47.4 (o)	
4/18/2017					15.6
6/19/2017	14.1	<5			
6/20/2017					15.1
6/21/2017			29.7	12.8	
8/7/2017	14	<5			
8/8/2017			32.9	15.4	16.1
10/16/2017	14.4	<5			5.09
10/17/2017			35.4	20.5	
11/28/2017			33.2 (R)	20.7 (R)	
3/5/2018		<5			
3/6/2018	14.5				<5
3/7/2018			37.4	24.2	
6/19/2018	14.9	<5			10.9
6/20/2018			29	<5	
8/27/2018	15.6	<5			
8/28/2018					<5
8/29/2018			33.1	10.1	
3/18/2019	16.1				
3/19/2019		<5			
3/20/2019			25.8	8.54	8.3
8/6/2019	17.1				
8/7/2019		<5	22.1	9.91	14
4/7/2020	17.2	<5	22.5	13	8.05
9/18/2020	14.7	<5	22.8	8.63	7.21
4/5/2021	22.3	<5	27.1	15	5.14
9/1/2021	16.3 (D)	<5	23.2	8.86	6.58

Time Series

Constituent: Chloride (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			67	5.97	12.6
8/16/2016			65.9	<5	13.2
10/11/2016			66	<5	13.6
12/12/2016			67	9.08	13.5
2/17/2017					15.1
2/21/2017			70.4	9.93	
4/17/2017			62.1	<5	12.5
6/20/2017			63.4		13.2
6/21/2017				<5	
8/7/2017					13.2
8/8/2017			64	<5	
10/16/2017					14.7
10/17/2017			73	<5	
11/28/2017			67.8 (R)		
3/6/2018	30		68.2	5.33	8.81
6/19/2018	27.2				
6/20/2018		15.9			
6/21/2018			65	<5	15.3
8/27/2018	29.8	14.2			
8/28/2018					19.4
8/29/2018			70.8	<5	
3/19/2019	27.6	10.5	55	<5	16
8/6/2019	26.9	13.8			
8/7/2019			64.1	<5	15.6
4/7/2020	24.8	15.7	44	12.2	14.8
9/18/2020	23.2	14.4	41	15.6	15.1
4/5/2021	28.1	21.4	42.7	19.3	22.9
9/1/2021	20	15.2	37.6	17.4	16.7 (D)

Time Series

Constituent: Chromium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.005		<0.005	
6/7/2016	<0.005				
6/8/2016			<0.005		0.00694
8/15/2016		<0.005	<0.005	<0.005	0.00538
8/16/2016	<0.005				
10/10/2016	<0.005	<0.005			0.00582
10/11/2016			<0.005	<0.005	
12/12/2016					0.00561
12/14/2016	<0.005	<0.005	<0.005	<0.005	
2/17/2017		<0.005	<0.005 (F2)	<0.005	
2/21/2017	<0.005				<0.005
4/17/2017	<0.005	<0.005	<0.005	<0.005	
4/18/2017					<0.005
6/19/2017	<0.005	<0.005			
6/20/2017					0.00586
6/21/2017			<0.005	<0.005	
8/7/2017	<0.005	<0.005			
8/8/2017			<0.005	<0.005	0.00572
3/5/2018		<0.005			
3/6/2018	<0.005				<0.005
3/7/2018			<0.005	<0.005	
6/19/2018	<0.005	<0.005			0.00726
6/20/2018			<0.005	<0.005	
8/27/2018	<0.005	<0.005			
8/28/2018					<0.005
8/29/2018			<0.005	<0.005	
3/18/2019	<0.005				
3/19/2019		<0.005			
3/20/2019			<0.005	<0.005	0.00647
8/6/2019	<0.005				
8/7/2019		<0.005	<0.005	<0.005	0.00637
4/7/2020	<0.005	<0.005	<0.005	<0.005	0.00644
9/18/2020	<0.005	<0.005	<0.005	<0.005	0.00589
4/5/2021	<0.005	<0.005	<0.005	<0.005	0.00708
9/1/2021	<0.005	<0.005	<0.005	<0.005	0.00659

Time Series

Constituent: Chromium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.005	<0.005	<0.005
8/16/2016			<0.005	<0.005	<0.005
10/11/2016			<0.005	<0.005	<0.005
12/12/2016			<0.005	<0.005	<0.005
2/17/2017					<0.005
2/21/2017			<0.005	<0.005	
4/17/2017			<0.005	<0.005	<0.005
6/20/2017			<0.005		<0.005
6/21/2017				<0.005	
8/7/2017					<0.005
8/8/2017			<0.005	<0.005	
3/6/2018	<0.005		<0.005	<0.005	<0.005
6/19/2018	<0.005				
6/20/2018		<0.005			
6/21/2018			<0.005	<0.005	<0.005
8/27/2018	<0.005	<0.005			
8/28/2018					<0.005
8/29/2018			<0.005	<0.005	
3/19/2019	<0.005	<0.005	<0.005	<0.005	<0.005
8/6/2019	<0.005	<0.005			
8/7/2019			<0.005	<0.005	<0.005
4/7/2020	<0.005	<0.005	<0.005	<0.005	<0.005
9/18/2020	<0.005	<0.005	<0.005	<0.005	<0.005
4/5/2021	<0.005	<0.005	<0.005	<0.005	<0.005
9/1/2021	<0.005	<0.005	<0.005	<0.005	<0.005

Time Series

Constituent: Cobalt (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		0.000555		<0.0005	
6/7/2016	<0.0005				
6/8/2016			<0.0005		<0.0005
8/15/2016		<0.0005	<0.0005	<0.0005	<0.0005
8/16/2016	<0.0005				
10/10/2016	<0.0005	0.000523			<0.0005
10/11/2016			<0.0005	<0.0005	
12/12/2016					<0.0005
12/14/2016	<0.0005	0.000638	<0.0005	<0.0005	
2/17/2017		0.000663	<0.0005	<0.0005	
2/21/2017	<0.0005				<0.0005
4/17/2017	<0.0005	0.000779	<0.0005	<0.0005	
4/18/2017					<0.0005
6/19/2017	0.000601	0.000621			
6/20/2017					<0.0005
6/21/2017			<0.0005	<0.0005	
8/7/2017	0.00051	0.000695			
8/8/2017			<0.0005	<0.0005	<0.0005
3/5/2018		0.000627			
3/6/2018	<0.0005				<0.0005
3/7/2018			<0.0005	<0.0005	
6/19/2018	<0.0005	0.00107			<0.0005
6/20/2018			<0.0005	<0.0005	
8/27/2018	<0.0005	0.00088			
8/28/2018					<0.0005
8/29/2018			<0.0005	<0.0005	
3/18/2019	0.00177				
3/19/2019		0.000783			
3/20/2019			<0.0005	<0.0005	<0.0005
8/6/2019	0.00558				
8/7/2019		0.000572	<0.0005	<0.0005	<0.0005
4/7/2020	0.000517	0.000581	<0.0005	<0.0005	<0.0005
9/18/2020	0.000738	0.000751	<0.0005	<0.0005	<0.0005
4/5/2021	0.000839	0.000752	<0.0005	<0.0005	<0.0005
9/1/2021	0.00127 (D)	0.000576	<0.0005	<0.0005	<0.0005

Time Series

Constituent: Cobalt (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.0005	<0.0005	0.000681
8/16/2016			<0.0005	<0.0005	<0.0005
10/11/2016			<0.0005	<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	<0.0005
6/20/2017			<0.0005		<0.0005
6/21/2017				<0.0005	
8/7/2017					<0.0005
8/8/2017			<0.0005	<0.0005	
3/6/2018	0.00142		<0.0005	<0.0005	<0.0005
5/14/2018	0.0012				
6/19/2018	0.00129				
6/20/2018		0.00161			
6/21/2018			<0.0005	<0.0005	<0.0005
8/27/2018	0.00149	0.00066			
8/28/2018					<0.0005
8/29/2018			<0.0005	<0.0005	
3/19/2019	<0.0005	0.00176	<0.0005	<0.0005	<0.0005
8/6/2019	<0.0005	<0.0005			
8/7/2019			<0.0005	<0.0005	<0.0005
4/7/2020	<0.0005	0.000817	<0.0005	<0.0005	<0.0005
9/18/2020	<0.0005	<0.0005	<0.0005	<0.0005	0.00147
4/5/2021	<0.0005	0.000517	<0.0005	<0.0005	0.00132
9/1/2021	<0.0005	<0.0005	<0.0005	<0.0005	0.00335 (D)

Time Series

Constituent: Fluoride (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		0.731		<0.5	
6/7/2016	<0.5				
6/8/2016			<0.5		<0.5
8/15/2016		<0.5	<0.5	0.549	<0.5
8/16/2016	<0.5				
10/10/2016	<0.5	<0.5			<0.5
10/11/2016			0.867	<0.5	
12/12/2016					<0.5
12/14/2016	0.72	<0.5	<0.5	<0.5	
2/17/2017		<0.5	<0.5	<0.5	
2/21/2017	<0.5				0.993
4/17/2017	1.69 (o)	0.774	1.93 (o)	6.7 (o)	
4/18/2017					0.768
6/19/2017	<0.5	<0.5			
6/20/2017					<0.5
6/21/2017			<0.5	<0.5	
8/7/2017	<0.5	<0.5			
8/8/2017			<0.5	<0.5	<0.5
10/16/2017	<0.5	<0.5			<0.5
10/17/2017			<0.5	<0.5	
3/5/2018		<0.5			
3/6/2018	<0.5				<0.5
3/7/2018			<0.5	<0.5	
6/19/2018	0.826	<0.5			<0.5
6/20/2018			0.684	<0.5	
8/27/2018	<0.5	<0.5			
8/28/2018					<0.5
8/29/2018			<0.5	<0.5	
3/18/2019	<0.5				
3/19/2019		<0.5			
3/20/2019			<0.5	0.523	<0.5
8/6/2019	0.643				
8/7/2019		0.596	<0.5	0.625	<0.5
4/7/2020	0.864	<0.5	<0.5	<0.5	<0.5
9/18/2020	<0.5	<0.5	<0.5	<0.5	<0.5
4/5/2021	<0.5	<0.5	<0.5	0.516	<0.5
9/1/2021	<0.5 (D)	<0.5	<0.5	<0.5	<0.5

Time Series

Constituent: Fluoride (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.5	<0.5	<0.5
8/16/2016			<0.5	<0.5	<0.5
10/11/2016			<0.5	<0.5	<0.5
12/12/2016			1.88	2.02	<0.5
2/17/2017					0.664
2/21/2017			2.14	1.89	
4/17/2017			0.627	0.814	0.801
6/20/2017			<0.5		<0.5
6/21/2017				<0.5	
8/7/2017					<0.5
8/8/2017			<0.5	<0.5	
10/16/2017					<0.5
10/17/2017			<0.5	<0.5	
3/6/2018	<0.5		<0.5	<0.5	<0.5
6/19/2018	<0.5				
6/20/2018		<0.5			
6/21/2018			<0.5	<0.5	<0.5
8/27/2018	<0.5	<0.5			
8/28/2018					<0.5
8/29/2018			<0.5	<0.5	
3/19/2019	<0.5	<0.5	<0.5	<0.5	0.771
8/6/2019	0.507	<0.5			
8/7/2019			<0.5	0.535	0.525
4/7/2020	<0.5	<0.5	<0.5	0.652	<0.5
9/18/2020	<0.5	<0.5	<0.5	<0.5	<0.5
4/5/2021	<0.5	<0.5	<0.5	<0.5	<0.5
9/1/2021	<0.5	<0.5	<0.5	<0.5	<0.5 (D)

Time Series

Constituent: Lead (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.0005		<0.0005	
6/7/2016	<0.0005				
6/8/2016			<0.0005		<0.0005
8/15/2016		<0.0005	<0.0005	<0.0005	<0.0005
8/16/2016	<0.0005				
10/10/2016	<0.0005	<0.0005			<0.0005
10/11/2016			<0.0005	<0.0005	
12/12/2016					<0.0005
12/14/2016	<0.0005	<0.0005	<0.0005	<0.0005	
2/17/2017		<0.0005	<0.0005	<0.0005	
2/21/2017	<0.0005				<0.0005
4/17/2017	<0.0005	<0.0005	<0.0005	<0.0005	
4/18/2017					<0.0005
6/19/2017	<0.0005	<0.0005			
6/20/2017					<0.0005
6/21/2017			<0.0005	<0.0005	
8/7/2017	<0.0005	<0.0005			
8/8/2017			<0.0005	<0.0005	<0.0005
3/5/2018		<0.0005			
3/6/2018	<0.0005				<0.0005
3/7/2018			<0.0005	<0.0005	
6/19/2018	<0.0005	<0.0005			0.000633
6/20/2018			<0.0005	<0.0005	
8/27/2018	<0.0005	<0.0005			
8/28/2018					<0.0005
8/29/2018			<0.0005	<0.0005	
3/18/2019	<0.0005				
3/19/2019		<0.0005			
3/20/2019			<0.0005	<0.0005	<0.0005
8/6/2019	<0.0005				
8/7/2019		<0.0005	<0.0005	<0.0005	<0.0005
4/7/2020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
9/18/2020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
4/5/2021	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
9/1/2021	<0.0005 (D)	<0.0005	<0.0005	<0.0005	<0.0005

Time Series

Constituent: Lead (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.0005	<0.0005	0.00147 (o)
8/16/2016			<0.0005	<0.0005	<0.0005
10/11/2016			<0.0005	<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	<0.0005
6/20/2017			<0.0005		<0.0005
6/21/2017				<0.0005	
8/7/2017					<0.0005
8/8/2017			<0.0005	<0.0005	
3/6/2018	<0.0005		<0.0005	<0.0005	<0.0005
6/19/2018	<0.0005				
6/20/2018		0.00151			
6/21/2018			<0.0005	<0.0005	<0.0005
8/27/2018	<0.0005	0.000626			
8/28/2018					<0.0005
8/29/2018			<0.0005	<0.0005	
3/19/2019	<0.0005	0.00204	<0.0005	<0.0005	<0.0005
8/6/2019	<0.0005	0.000663			
8/7/2019			<0.0005	<0.0005	<0.0005
4/7/2020	<0.0005	0.00116	<0.0005	<0.0005	<0.0005
9/18/2020	<0.0005	<0.0005	<0.0005	<0.0005	0.000532
4/5/2021	<0.0005	0.000624	<0.0005	<0.0005	<0.0005
9/1/2021	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 (D)

Time Series

Constituent: Lithium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.01		<0.01	
6/7/2016	<0.01				
6/8/2016			<0.01		<0.01
8/15/2016		<0.01	<0.01	<0.01	<0.01
8/16/2016	<0.01				
10/10/2016	<0.01	<0.01			<0.01
10/11/2016			<0.01	<0.01	
12/12/2016					<0.01
12/14/2016	<0.01	<0.01	<0.01	<0.01	
2/17/2017		<0.01	<0.01	<0.01	
2/21/2017	<0.01				<0.01
4/17/2017	<0.01	<0.01	<0.01	<0.01	
4/18/2017					<0.01
6/19/2017	<0.01	<0.01			
6/20/2017					<0.01
6/21/2017			<0.01	<0.01	
8/7/2017	<0.01	<0.01			
8/8/2017			<0.01	<0.01	<0.01
3/5/2018		<0.01			
3/6/2018	<0.01				<0.01
3/7/2018			<0.01	<0.01	
6/19/2018	<0.01	<0.01			0.0189
6/20/2018			<0.01	<0.01	
8/27/2018	<0.01	<0.01			
8/28/2018					<0.01
8/29/2018			<0.01	<0.01	
3/18/2019	<0.01				
3/19/2019		<0.01			
3/20/2019			<0.01	<0.01	0.0277
8/6/2019	<0.01				
8/7/2019		<0.01	<0.01	<0.01	0.0279
4/7/2020	<0.01	<0.01	<0.01	<0.01	0.0213
9/18/2020	<0.01	<0.01	<0.01	<0.01	0.0225
4/5/2021	<0.01	<0.01	<0.01	<0.01	0.0198
9/1/2021	<0.01	<0.01	<0.01	<0.01	0.0233

Time Series

Constituent: Lithium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.01	<0.01	<0.01
8/16/2016			<0.01	<0.01	<0.01
10/11/2016			<0.01	<0.01	<0.01
12/12/2016			<0.01	<0.01	<0.01
2/17/2017					<0.01
2/21/2017			<0.01	<0.01	
4/17/2017			<0.01	<0.01	<0.01
6/20/2017			<0.01		<0.01
6/21/2017				<0.01	
8/7/2017					<0.01
8/8/2017			<0.01	<0.01	
3/6/2018	<0.01		<0.01	<0.01	<0.01
6/19/2018	<0.01				
6/20/2018		<0.01			
6/21/2018			<0.01	<0.01	<0.01
8/27/2018	<0.01	<0.01			
8/28/2018					<0.01
8/29/2018			<0.01	<0.01	
3/19/2019	<0.01	<0.01	<0.01	<0.01	<0.01
8/6/2019	<0.01	<0.01			
8/7/2019			<0.01	<0.01	<0.01
4/7/2020	<0.01	<0.01	<0.01	<0.01	<0.01
9/18/2020	<0.01	<0.01	<0.01	<0.01	<0.01
4/5/2021	<0.01	<0.01	<0.01	<0.01	<0.01
9/1/2021	<0.01	<0.01	<0.01	<0.01	<0.01

Time Series

Constituent: Mercury (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.0002		<0.0002	
6/7/2016	<0.0002				
6/8/2016			<0.0002		<0.0002
8/15/2016		<0.0002	<0.0002	<0.0002	<0.0002
8/16/2016	<0.0002				
10/10/2016	<0.0002	<0.0002			<0.0002
10/11/2016			<0.0002	<0.0002	
12/12/2016					<0.0002
12/14/2016	<0.0002	<0.0002	<0.0002	<0.0002	
2/17/2017		<0.0002	<0.0002	<0.0002	
2/21/2017	<0.0002				<0.0002
4/17/2017	<0.0002	<0.0002 (F1)	<0.0002	<0.0002	
4/18/2017					<0.0002
6/19/2017	<0.0002	<0.0002			
6/20/2017					<0.0002
6/21/2017			<0.0002	<0.0002	
8/7/2017	<0.0002	<0.0002			
8/8/2017			<0.0002	<0.0002	<0.0002
3/5/2018		<0.0002			
3/6/2018	<0.0002				<0.0002
3/7/2018			<0.0002	<0.0002	
6/19/2018	<0.0002	<0.0002			<0.0002
6/20/2018			<0.0002	<0.0002	
8/27/2018	<0.0002	<0.0002			
8/28/2018					<0.0002
8/29/2018			<0.0002	<0.0002	
3/18/2019	<0.0002				
3/19/2019		<0.0002			
3/20/2019			<0.0002	<0.0002	<0.0002
8/6/2019	<0.0002				
8/7/2019		<0.0002	<0.0002	<0.0002	<0.0002
4/7/2020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Time Series

Constituent: Mercury (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.0002	<0.0002	<0.0002
8/16/2016			<0.0002	<0.0002	<0.0002
10/11/2016			<0.0002	<0.0002	<0.0002
12/12/2016			<0.0002	<0.0002	<0.0002
2/17/2017					<0.0002
2/21/2017			<0.0002	<0.0002	
4/17/2017			<0.0002	<0.0002	<0.0002
6/20/2017			<0.0002		<0.0002
6/21/2017				<0.0002	
8/7/2017					<0.0002
8/8/2017			<0.0002	<0.0002	
3/6/2018	<0.0002		<0.0002	<0.0002	<0.0002
6/19/2018	<0.0002				
6/20/2018		<0.0002			
6/21/2018			<0.0002	<0.0002	<0.0002
8/27/2018	<0.0002	<0.0002			
8/28/2018					<0.0002
8/29/2018			<0.0002	<0.0002	
3/19/2019	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
8/6/2019	<0.0002	<0.0002			
8/7/2019			<0.0002	<0.0002	<0.0002
4/7/2020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
9/18/2020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
4/5/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
9/1/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Time Series

Constituent: Molybdenum (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.002		<0.002	
6/7/2016	<0.002				
6/8/2016			<0.002		<0.002
8/15/2016		<0.002	<0.002	<0.002	<0.002
8/16/2016	<0.002				
10/10/2016	<0.002	<0.002			<0.002
10/11/2016			<0.002	<0.002	
12/12/2016					<0.002
12/14/2016	<0.002	<0.002	<0.002	<0.002	
2/17/2017		<0.002	<0.002	<0.002	
2/21/2017	<0.002				<0.002
4/17/2017	<0.002	<0.002	<0.002	<0.002	
4/18/2017					<0.002
6/19/2017	<0.002	<0.002			
6/20/2017					<0.002
6/21/2017			<0.002	<0.002	
8/7/2017	<0.002	<0.002			
8/8/2017			<0.002	<0.002	<0.002
3/5/2018		<0.002			
3/6/2018	0.0022				<0.002
3/7/2018			<0.002	<0.002	
5/14/2018	<0.002				
6/19/2018	<0.002	<0.002			0.00383
6/20/2018			<0.002	<0.002	
8/27/2018	0.00224	0.0022			
8/28/2018					<0.002
8/29/2018			<0.002	<0.002	
3/18/2019	<0.002				
3/19/2019		0.00341			
3/20/2019			<0.002	<0.002	<0.002
8/6/2019	<0.002				
8/7/2019		0.00219	<0.002	<0.002	<0.002
4/7/2020	<0.002	0.00215	<0.002	<0.002	<0.002
9/18/2020	<0.002	<0.002	<0.002	<0.002	<0.002
4/5/2021	<0.002	<0.002	<0.002	<0.002	<0.002
9/1/2021	0.00218 (D)	0.00217	<0.002	<0.002	<0.002

Time Series

Constituent: Molybdenum (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.002	<0.002	<0.002
8/16/2016			<0.002	<0.002	<0.002
10/11/2016			<0.002	<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	<0.002
6/20/2017			<0.002		<0.002
6/21/2017				<0.002	
8/7/2017					<0.002
8/8/2017			<0.002	<0.002	
3/6/2018	0.00568		<0.002	<0.002	<0.002
5/14/2018	0.00385				
6/19/2018	0.00423				
6/20/2018		0.00822			
6/21/2018			<0.002	<0.002	<0.002
8/27/2018	0.00424	0.00617			
8/28/2018					<0.002
8/29/2018			<0.002	<0.002	
3/19/2019	0.00263	<0.002	0.00212	<0.002	<0.002
8/6/2019	0.00574	<0.002			
8/7/2019			<0.002	<0.002	<0.002
4/7/2020	0.00297	<0.002	<0.002	<0.002	<0.002
9/18/2020	0.00529	<0.002	<0.002	<0.002	0.00296
4/5/2021	<0.002	<0.002	<0.002	<0.002	<0.002
9/1/2021	0.00558	<0.002	<0.002	<0.002	<0.002 (D)

Time Series

Constituent: pH (SU) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		7.4		7.3	
6/7/2016	7.2				
6/8/2016			7.1		6.7
8/15/2016		7.3	7.2	7.3	6.7
8/16/2016	7.3				
10/10/2016	7.1	7.2			6.7
10/11/2016			7.1	7.2	
12/12/2016					7
12/14/2016	7.3	7.3	7.2	7.4	
2/17/2017		7.2	7.3	7.3	
2/21/2017	7.3				7
4/17/2017	7.1	7.3	7.3	7.3	
4/18/2017					6.9
6/19/2017	7.1	7.2			
6/20/2017					6.7
6/21/2017			7.3	7.3	
8/7/2017	7.3	7.9			
8/8/2017			7.2	7.2	6.8
10/16/2017	7.4	7.3			6.8
10/17/2017			7.6	7.2	
11/28/2017					6.9 (R)
3/5/2018		7.04			
3/6/2018	7.3				6.76
3/7/2018			7.35	7.24	
6/19/2018	7.56	7.72			7.25
6/20/2018			7.26	7.5	
8/27/2018	7.2	7.23			
8/28/2018					7.07
8/29/2018			7.09	7.25	
3/19/2019	7.08	7.1			
3/20/2019			6.97	7.76	6.41
8/6/2019	6.64				
8/7/2019		7.07	7.09	7.11	6.33
4/7/2020	7.21	7.26	7.32	7.54	6.55
9/18/2020	7.4	7.33	7.21	7.28	6.8
4/5/2021	7.63	7.57	7.64	7.92	6.92
9/1/2021	7.45	7.59	7.48	7.46	7.06

Time Series

Constituent: pH (SU) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			7.7	7.4	7.6
8/16/2016			7.3	7.4	7.5
10/11/2016			7.2	7.3	7.5
12/12/2016			7.3	7.5	7.6
2/17/2017					7.5
2/21/2017			7.2	7.4	
4/17/2017			7.2	7.3	7.4
6/20/2017			7.2		7.4
6/21/2017				7.3	
8/7/2017					7.9
8/8/2017			7.2	7.3	
10/16/2017					7.8
10/17/2017			7.3	7.8	
3/6/2018	7.36		7.23	7.4	7.36
6/19/2018	7.9				
6/20/2018		7.69			
6/21/2018			7.3	7.58	7.53
8/27/2018	7.42	7.55			
8/28/2018					7.44
8/29/2018			7.14	7.18	
3/19/2019	7.21	7.24	7.05	7.15	7.26
8/6/2019	7.12	6.75			
8/7/2019			7.02	7.12	7.22
4/7/2020	7.32	7.33	7.24	7.3	7.46
9/18/2020	7.53	7.53	7.33	7.24	7.93
4/5/2021	7.7	7.61	7.31	7.59	7.94
9/1/2021	7.97	7.89	7.22	7.61	7.75

Time Series

Constituent: Selenium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.005		<0.005	
6/7/2016	<0.005				
6/8/2016			0.0071		0.0165
8/15/2016		<0.005	0.00811	<0.005	0.0103
8/16/2016	<0.005				
10/10/2016	<0.005	<0.005			0.0137
10/11/2016			0.00821	<0.005	
12/12/2016					0.0119
12/14/2016	<0.005	<0.005	0.00834	<0.005	
2/17/2017		<0.005	0.00752	<0.005	
2/21/2017	<0.005				0.0074
4/17/2017	<0.005	<0.005	0.00823	<0.005	
4/18/2017					0.00674
6/19/2017	<0.005	<0.005			
6/20/2017					0.0106
6/21/2017			0.00829	<0.005	
8/7/2017	<0.005	<0.005			
8/8/2017			0.00759	<0.005	0.0109
3/5/2018		<0.005			
3/6/2018	<0.005				<0.005
3/7/2018			<0.005	0.00502	
6/19/2018	<0.005	<0.005			0.00939
6/20/2018			0.00739	<0.005	
8/27/2018	<0.005	<0.005			
8/28/2018					<0.005
8/29/2018			0.00827	<0.005	
3/18/2019	<0.005				
3/19/2019		<0.005			
3/20/2019			0.00569	<0.005	0.0102
8/6/2019	<0.005				
8/7/2019		<0.005	<0.005	<0.005	0.0108
4/7/2020	<0.005	<0.005	<0.005	<0.005	0.00632
9/18/2020	<0.005	<0.005	<0.005	<0.005	0.00762
4/5/2021	<0.005	<0.005	<0.005	<0.005	<0.005
9/1/2021	<0.005 (D)	<0.005	<0.005	<0.005	0.00617

Time Series

Constituent: Selenium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.005	<0.005	<0.005
8/16/2016			<0.005	<0.005	<0.005
10/11/2016			<0.005	<0.005	<0.005
12/12/2016			<0.005	<0.005	<0.005
2/17/2017					<0.005
2/21/2017			<0.005	<0.005	
4/17/2017			<0.005	<0.005	<0.005
6/20/2017			<0.005		<0.005
6/21/2017				<0.005	
8/7/2017					<0.005
8/8/2017			<0.005	<0.005	
3/6/2018	<0.005		<0.005	<0.005	<0.005
6/19/2018	<0.005				
6/20/2018		<0.005			
6/21/2018			<0.005	<0.005	<0.005
8/27/2018	<0.005	<0.005			
8/28/2018					<0.005
8/29/2018			<0.005	<0.005	
3/19/2019	<0.005	<0.005	<0.005	<0.005	<0.005
8/6/2019	<0.005	<0.005			
8/7/2019			<0.005	<0.005	<0.005
4/7/2020	<0.005	<0.005	<0.005	<0.005	<0.005
9/18/2020	<0.005	<0.005	<0.005	<0.005	<0.005
4/5/2021	<0.005	<0.005	<0.005	<0.005	<0.005
9/1/2021	<0.005	<0.005	<0.005	<0.005	<0.005 (D)

Time Series

Constituent: Sulfate (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		42.1		827	
6/7/2016	366				
6/8/2016			1050		713
8/15/2016		33.8	1040	605	520
8/16/2016	187				
10/10/2016	187	36.4			603
10/11/2016			1010	607	
12/12/2016					645
12/14/2016	149	38.4	1140	732	
2/17/2017		47.3	1190	849	
2/21/2017	145				415
4/17/2017	145	38.3	1200	853	
4/18/2017					461
6/19/2017	190	35.4			
6/20/2017					541
6/21/2017			1020	537	
8/7/2017	119	39			
8/8/2017			1110	664	590
10/16/2017	106	46.9			206
10/17/2017			1210	835	
11/28/2017			1140 (R)	779 (R)	
3/5/2018		51.4			
3/6/2018	87.3				53.7
3/7/2018			1110	824	
6/19/2018	136	37.3			489
6/20/2018			1090	210	
8/27/2018	94.7	34.3			
8/28/2018					96.6
8/29/2018			1070	400	
3/18/2019	223				
3/19/2019		42.8			
3/20/2019			1050	351	442
8/6/2019	276				
8/7/2019		28.8	837	327	529
4/7/2020	123	18.6	888	496	373
9/18/2020	100	36.5	924	403	356
4/5/2021	99.7	27.6	952	338	237
9/1/2021	82.7 (D)	32.3	1010	333	303

Time Series

Constituent: Sulfate (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			109	<5	32.2
8/16/2016			109	<5	28.4
10/11/2016			105	<5	27.2
12/12/2016			109	<5	32.7
2/17/2017					36
2/21/2017			111	5.94	
4/17/2017			108	<5	39.5
6/20/2017			108		33
6/21/2017				<5	
8/7/2017					35.3
8/8/2017			114	<5	
10/16/2017					45.4
10/17/2017			135	<5	
3/6/2018	123		122	<5	162
6/19/2018	134				
6/20/2018		38.4			
6/21/2018			119	<5	51.3
8/27/2018	125	31.7			
8/28/2018					52.2
8/29/2018			120	<5	
3/19/2019	134	26.2	85	<5	48
8/6/2019	139	29.7			
8/7/2019			112	<5	47
4/7/2020	143	25.5	58.9	13.6	41.5
9/18/2020	151	25.8	61.9	19.1	46.9
4/5/2021	154	35.5	57.4	27.3	60.1
9/1/2021	154	25.8	53.7	22.7	50.2 (D)

Time Series

Constituent: Thallium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		<0.001		<0.001	
6/7/2016	<0.001				
6/8/2016			<0.001		<0.001
8/15/2016		<0.001	<0.001	<0.001	<0.001
8/16/2016	<0.001				
10/10/2016	<0.001	<0.001			<0.001
10/11/2016			<0.001	<0.001	
12/12/2016					<0.001
12/14/2016	<0.001	<0.001	<0.001	<0.001	
2/17/2017		<0.001	<0.001	<0.001	
2/21/2017	<0.001				<0.001
4/17/2017	<0.001	<0.001	<0.001	<0.001	
4/18/2017					<0.001
6/19/2017	<0.001	<0.001			
6/20/2017					<0.001
6/21/2017			<0.001	<0.001	
8/7/2017	<0.001	<0.001			
8/8/2017			<0.001	<0.001	<0.001
3/5/2018		<0.001			
3/6/2018	<0.001				<0.001
3/7/2018			<0.001	<0.001	
6/19/2018	<0.001	<0.001			<0.001
6/20/2018			<0.001	<0.001	
8/27/2018	<0.001	<0.001			
8/28/2018					<0.001
8/29/2018			<0.001	<0.001	
3/18/2019	<0.001				
3/19/2019		<0.001			
3/20/2019			<0.001	<0.001	<0.001
8/6/2019	<0.001				
8/7/2019		<0.001	<0.001	<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001	<0.001	<0.001

Time Series

Constituent: Thallium (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			<0.001	<0.001	<0.001
8/16/2016			<0.001	<0.001	<0.001
10/11/2016			<0.001	<0.001	<0.001
12/12/2016			<0.001	<0.001	<0.001
2/17/2017					<0.001
2/21/2017			<0.001	<0.001	
4/17/2017			<0.001	<0.001	<0.001
6/20/2017			<0.001		<0.001
6/21/2017				<0.001	
8/7/2017					<0.001
8/8/2017			<0.001	<0.001	
3/6/2018	<0.001		<0.001	<0.001	<0.001
6/19/2018	<0.001				
6/20/2018		<0.001			
6/21/2018			<0.001	<0.001	<0.001
8/27/2018	<0.001	<0.001			
8/28/2018					<0.001
8/29/2018			<0.001	<0.001	
3/19/2019	<0.001	<0.001	<0.001	<0.001	<0.001
8/6/2019	<0.001	<0.001			
8/7/2019			<0.001	<0.001	<0.001
4/7/2020	<0.001	<0.001	<0.001	<0.001	<0.001
9/18/2020	<0.001	<0.001	<0.001	<0.001	<0.001
4/5/2021	<0.001	<0.001	<0.001	<0.001	<0.001
9/1/2021	<0.001	<0.001	<0.001	<0.001	<0.001

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-14A	MW-15A	MW-21
6/6/2016		468		1620	
6/7/2016	836				
6/8/2016			2000		1440
8/15/2016		412	1980	1270	1110
8/16/2016	664				
10/10/2016	708	444			1420
10/11/2016			2500	1500	
12/12/2016					1240
12/14/2016	634	428	2080	1600	
2/17/2017		498	1010	1470	
2/21/2017	578				1010
4/17/2017	624	538	2260	1780	
4/18/2017					1060
6/19/2017	656	524			
6/20/2017					1140
6/21/2017			2250	1280	
8/7/2017	488	458			
8/8/2017			2170	1390	1220
10/16/2017	470	414			514
10/17/2017			2080	1520	
11/28/2017			2650 (R)	1670 (R)	
3/5/2018		314			
3/6/2018	376				200
3/7/2018			1820	1270	
6/19/2018	502	396			952
6/20/2018			1800	676	
8/27/2018	414	392			
8/28/2018					416
8/29/2018			1900	948	
3/18/2019	612				
3/19/2019		326			
3/20/2019			1690	724	872
8/6/2019	702				
8/7/2019		320	1510	786	960
4/7/2020	418	316	1510	942	698
9/18/2020	350	344	1620	920	738
4/5/2021	382	322	1290	738	540
9/1/2021	342	314	1560	736	636

Time Series

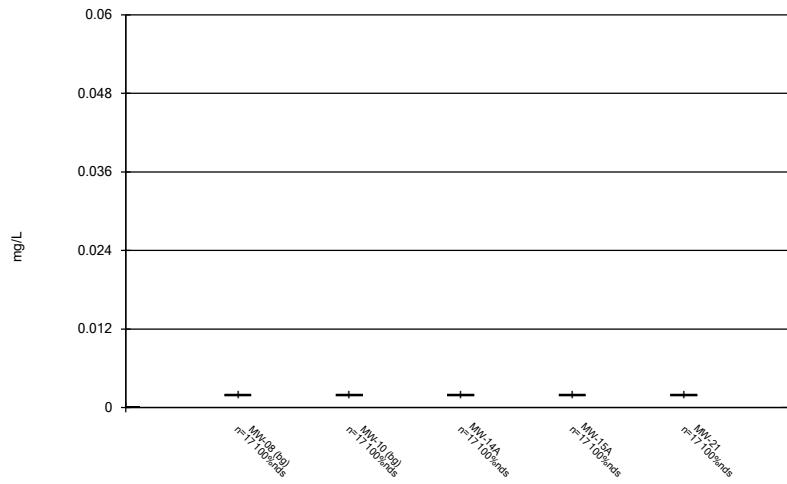
Constituent: Total Dissolved Solids (mg/L) Analysis Run 11/30/2021 10:19 PM View: Federal Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-22 (bg)	MW-23 (bg)	MW-5B	MW-6A	MW-4B
6/7/2016			920	440	507
8/16/2016			672	340	426
10/11/2016			646	370	450
12/12/2016			636	368	450
2/17/2017					460
2/21/2017			684	336	
4/17/2017			680	402	442
6/20/2017			656		452
6/21/2017				486	
8/7/2017					420
8/8/2017			734	364	
10/16/2017					466
10/17/2017			688	424	
3/6/2018	424		620	292	586
6/19/2018	434				
6/20/2018		384			
6/21/2018			828	368	440
8/27/2018	420	340			
8/28/2018					420
8/29/2018			622	298	
3/19/2019	456	296	562	320	398
8/6/2019	428	336			
8/7/2019			596	308	422
4/7/2020	422	298	494	336	366
9/18/2020	398	250	436	374	360
4/5/2021	412	274	434	330	380
9/1/2021	420	256	448	350	370

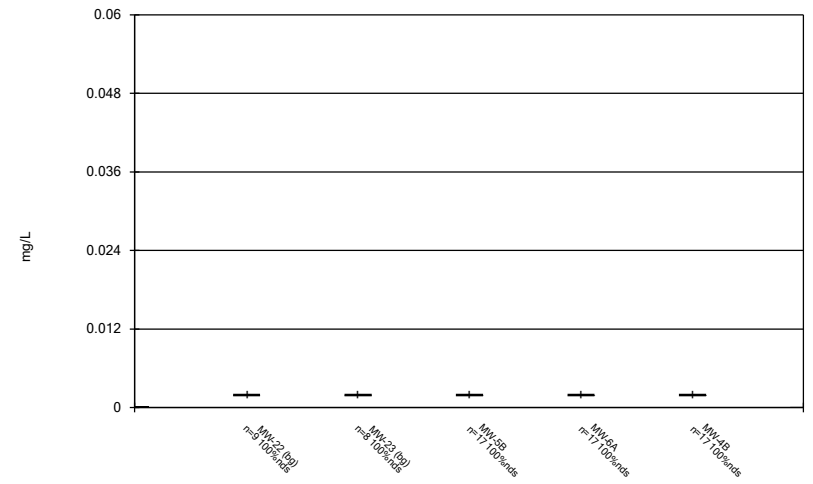
FIGURE B.

Box & Whiskers Plot



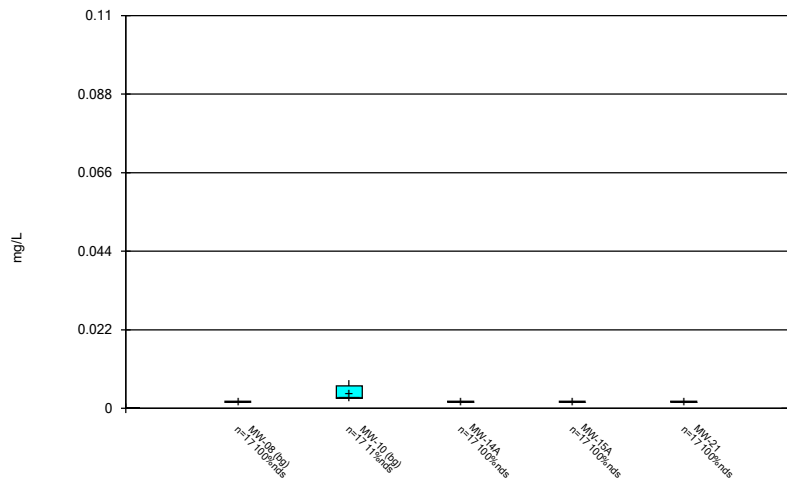
Constituent: Antimony Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



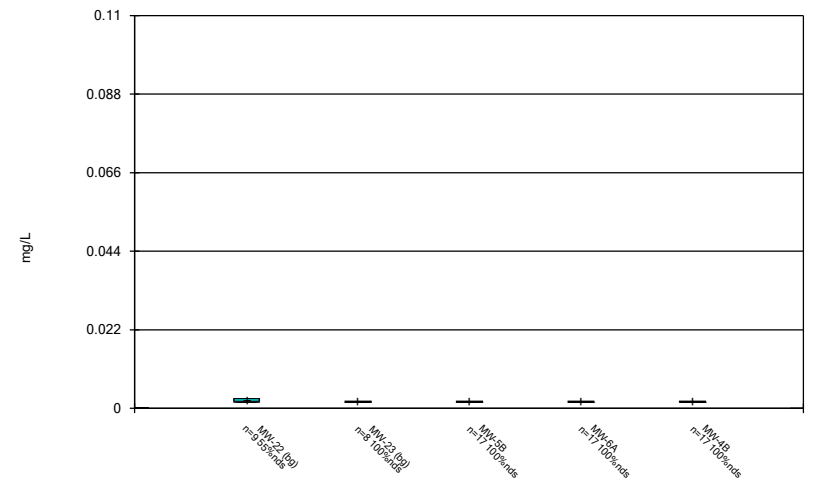
Constituent: Antimony Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



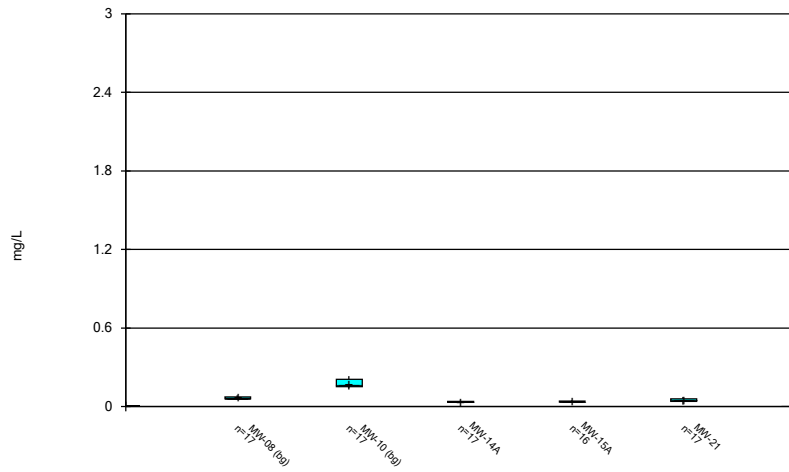
Constituent: Arsenic Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



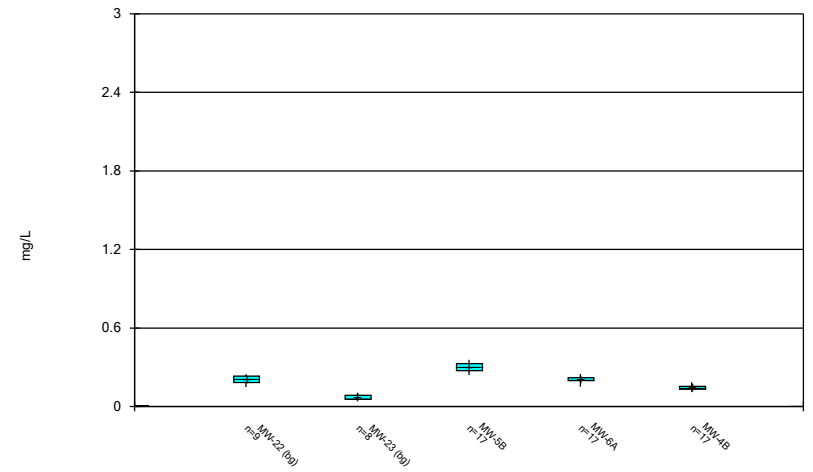
Constituent: Arsenic Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



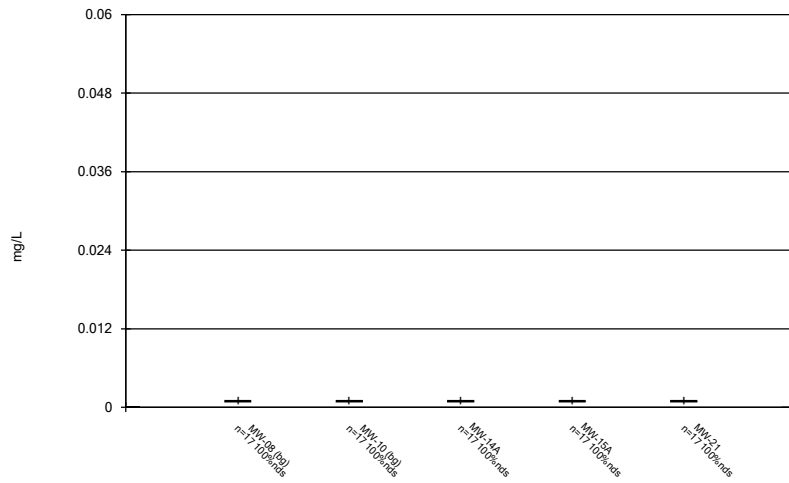
Constituent: Barium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



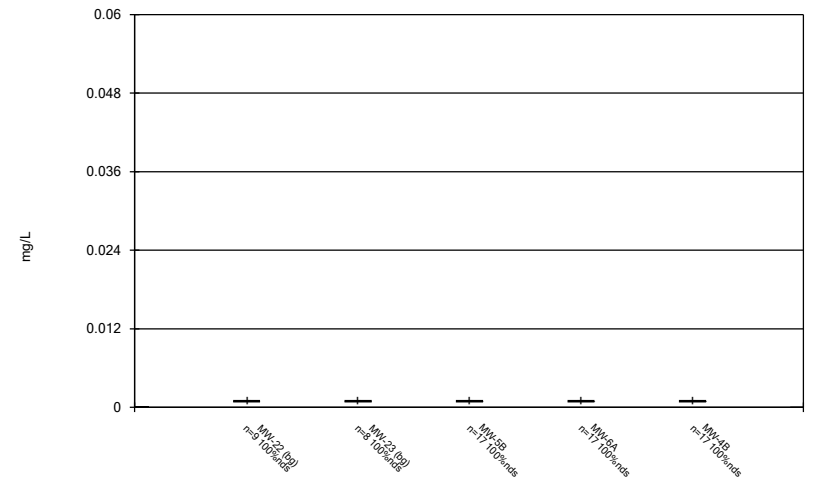
Constituent: Barium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



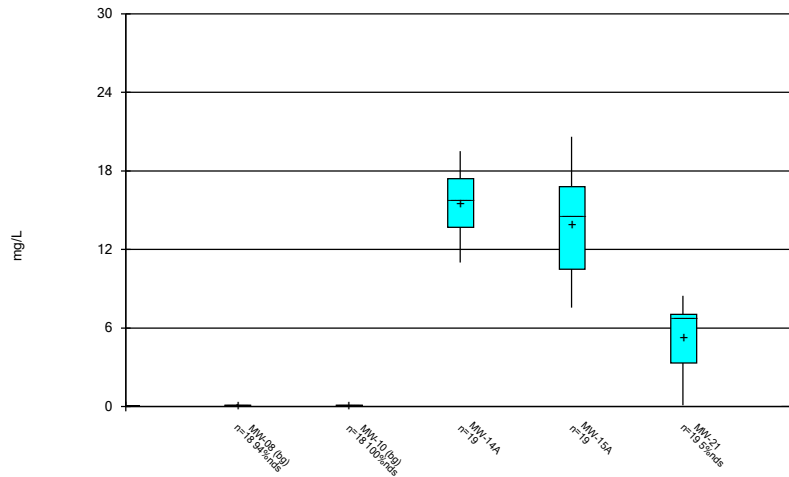
Constituent: Beryllium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



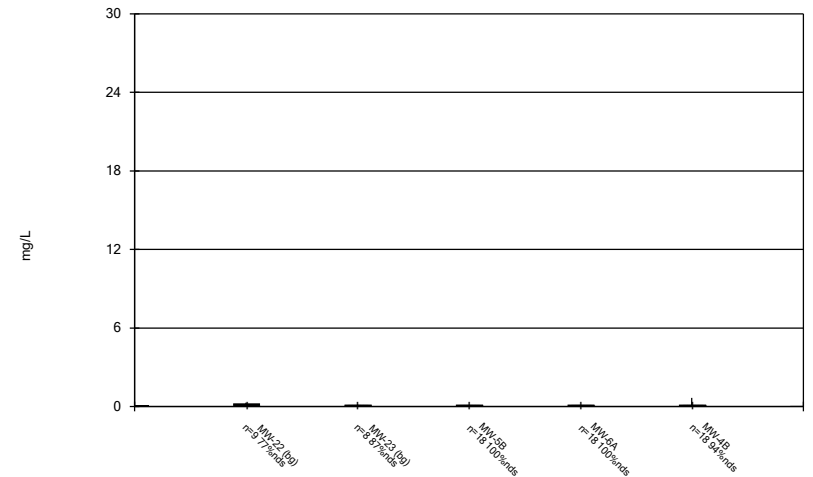
Constituent: Beryllium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



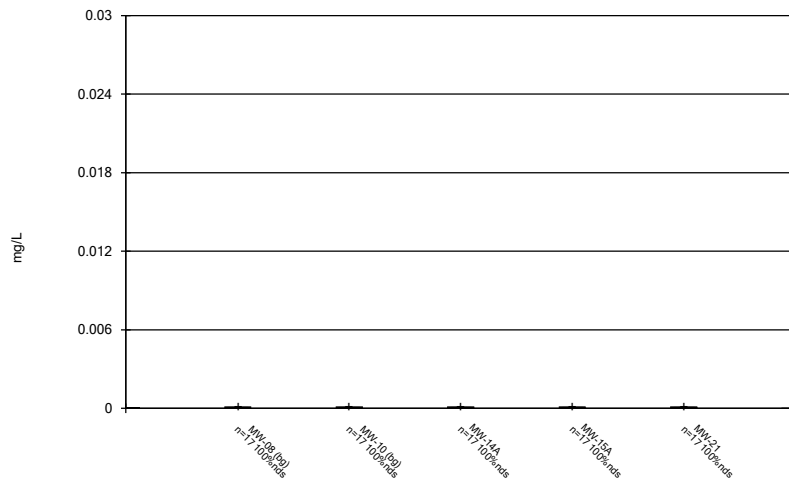
Constituent: Boron Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



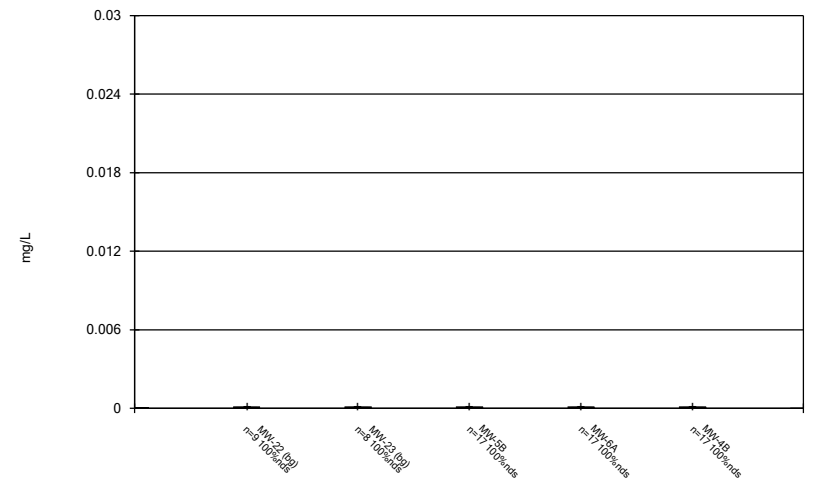
Constituent: Boron Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



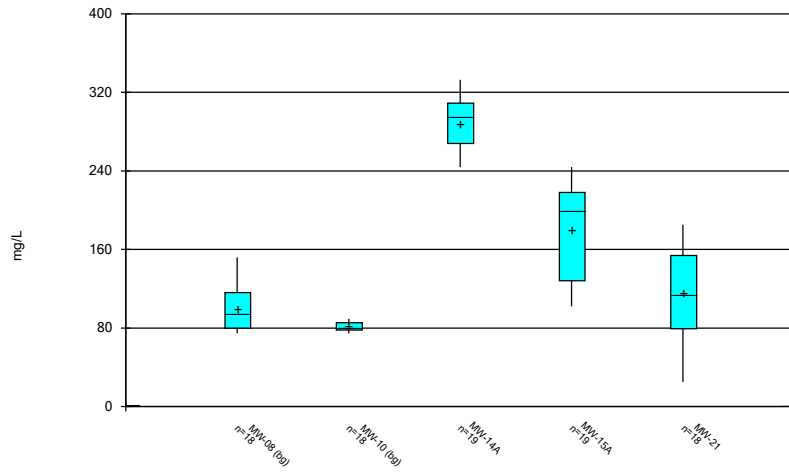
Constituent: Cadmium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



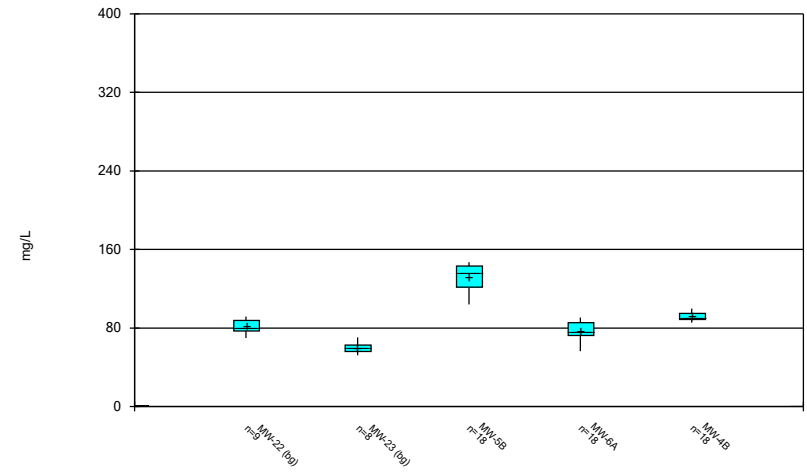
Constituent: Cadmium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



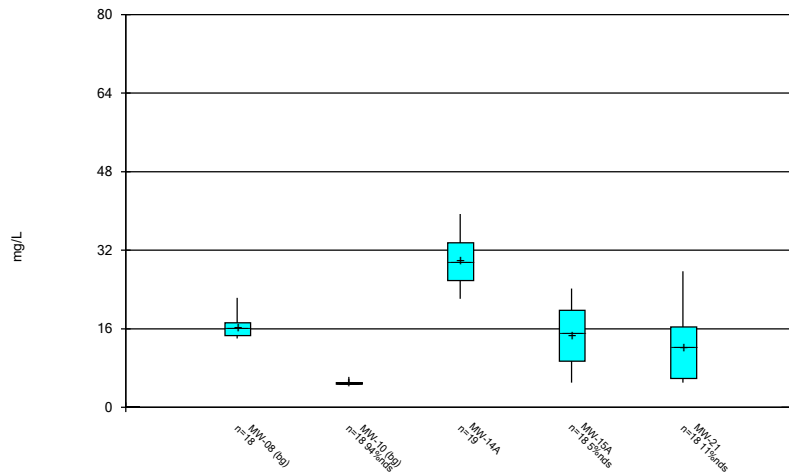
Constituent: Calcium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



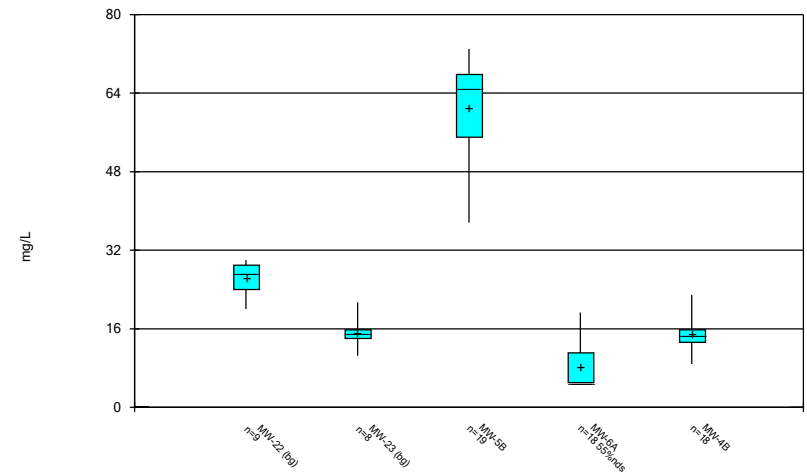
Constituent: Calcium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



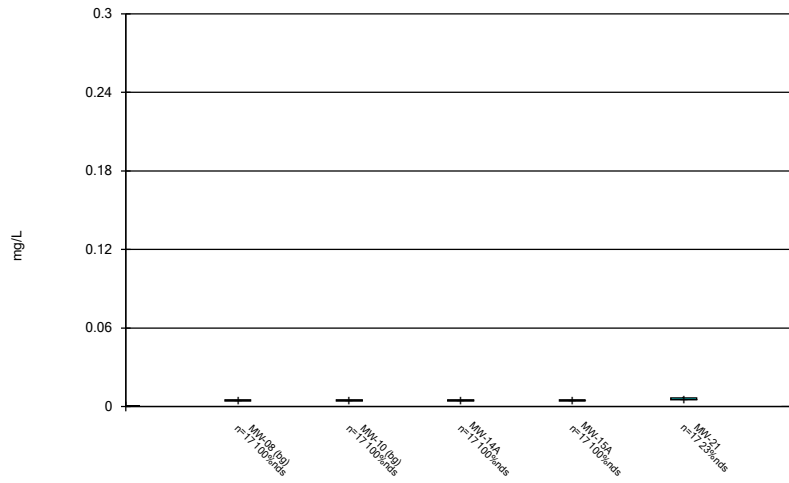
Constituent: Chloride Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



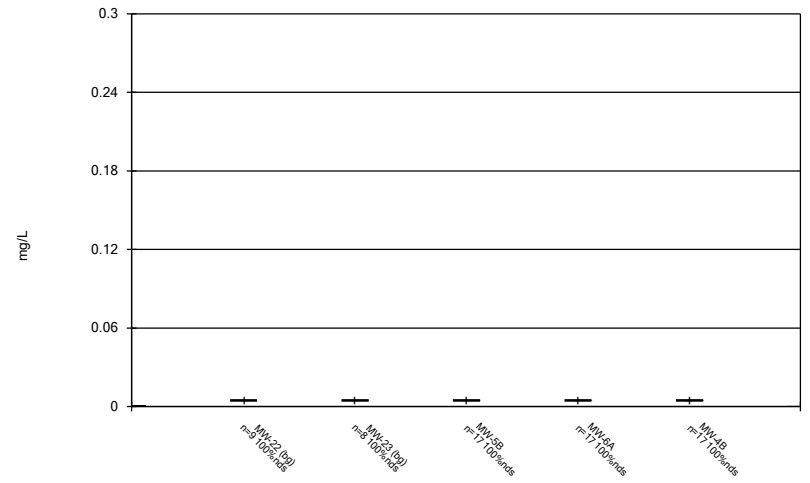
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



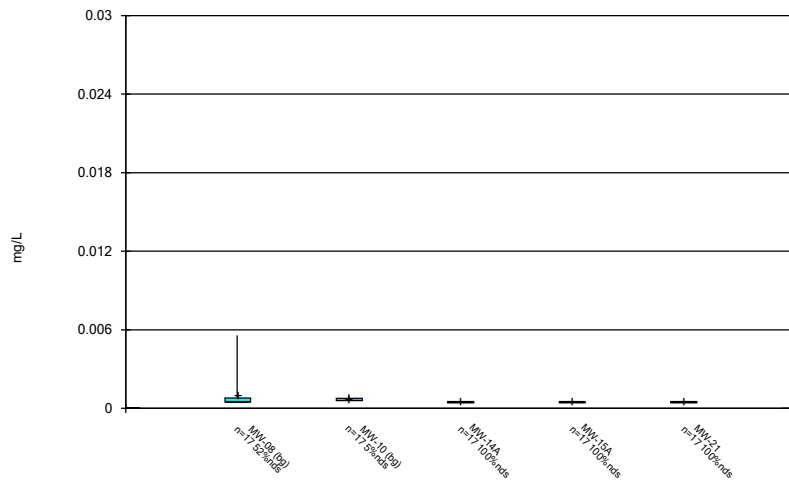
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



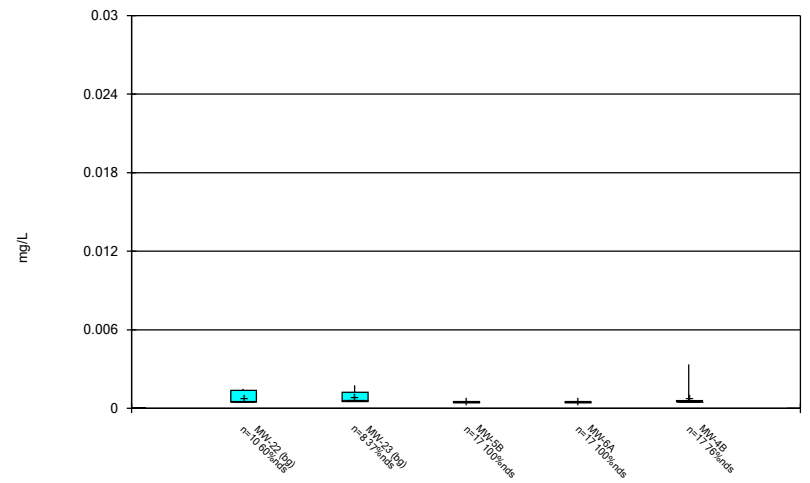
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



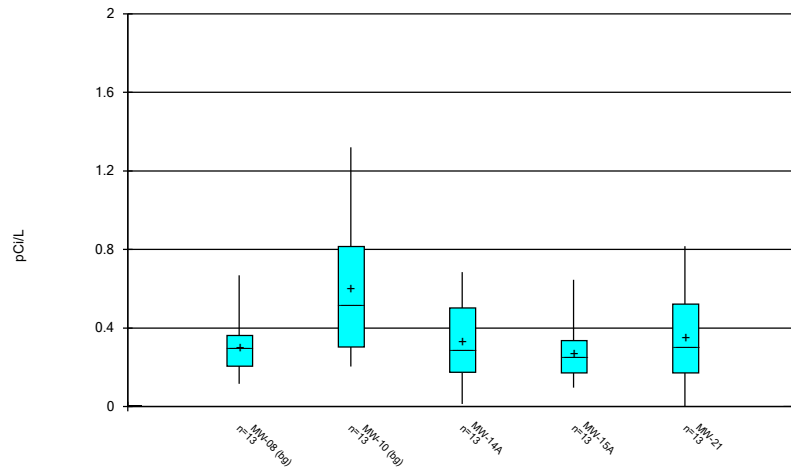
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



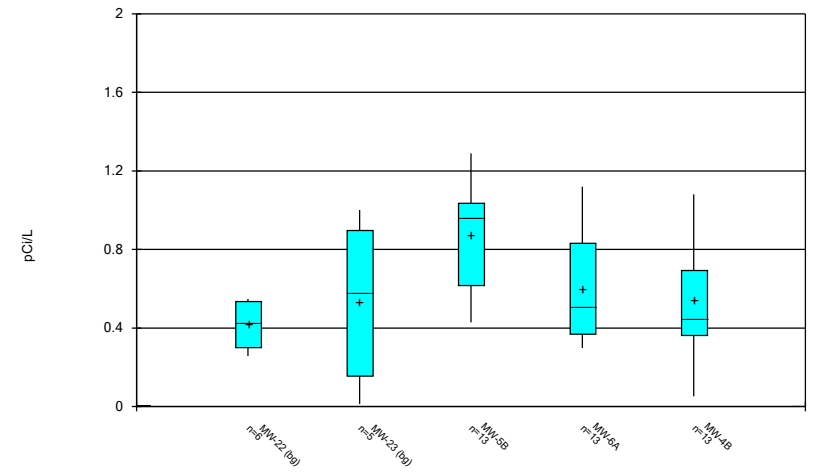
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



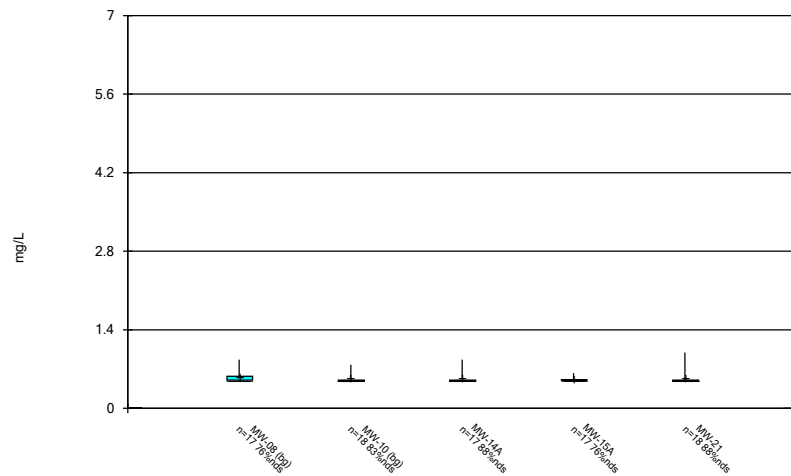
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



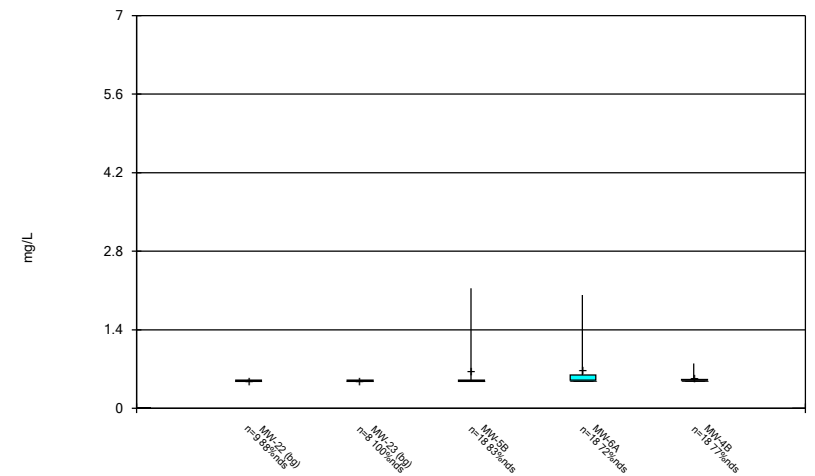
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



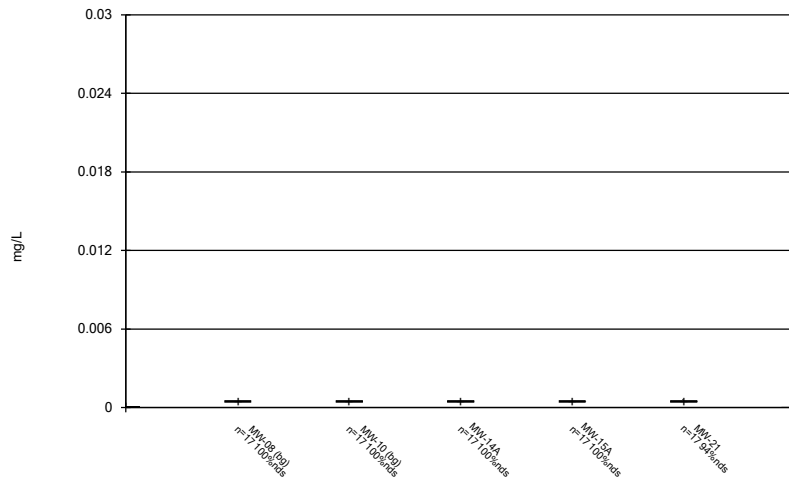
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



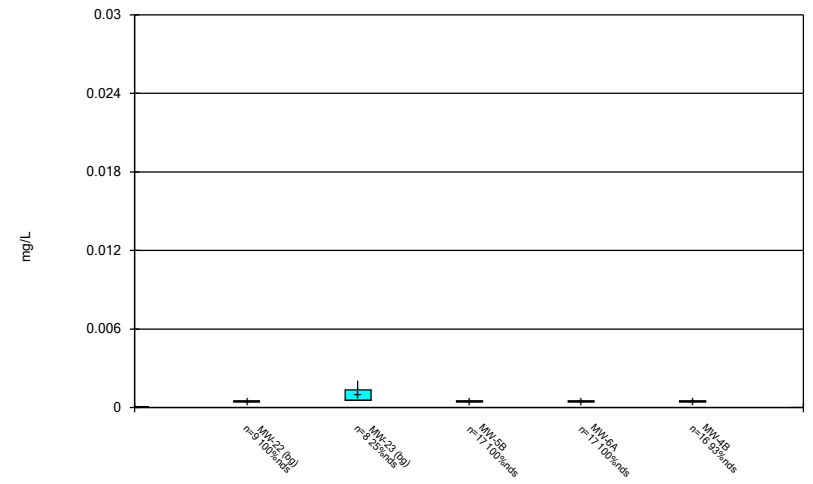
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



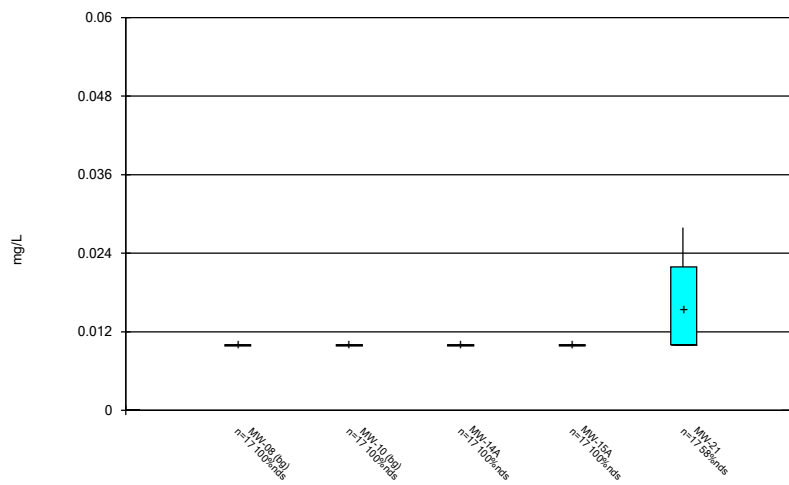
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



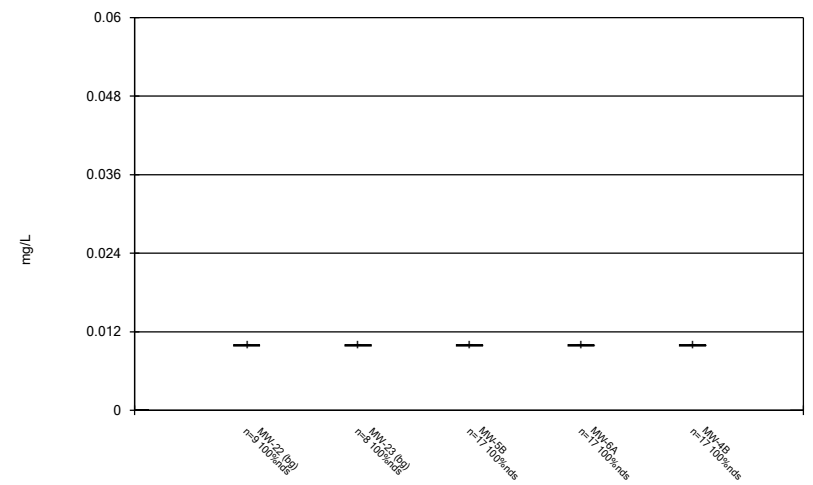
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



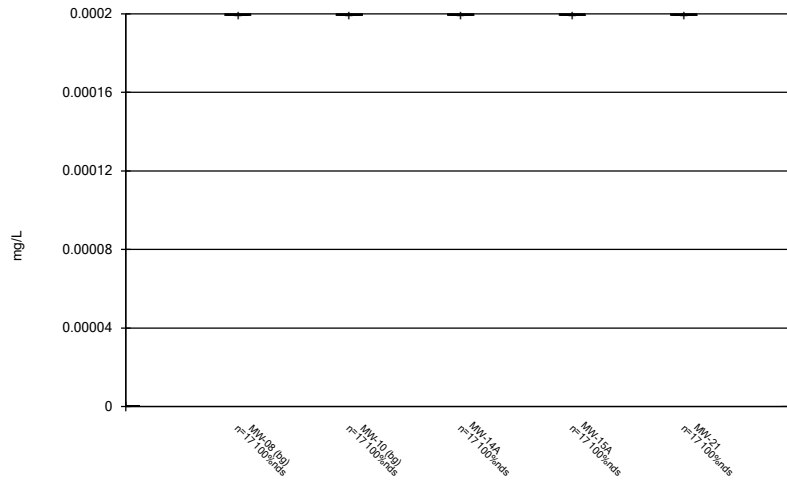
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



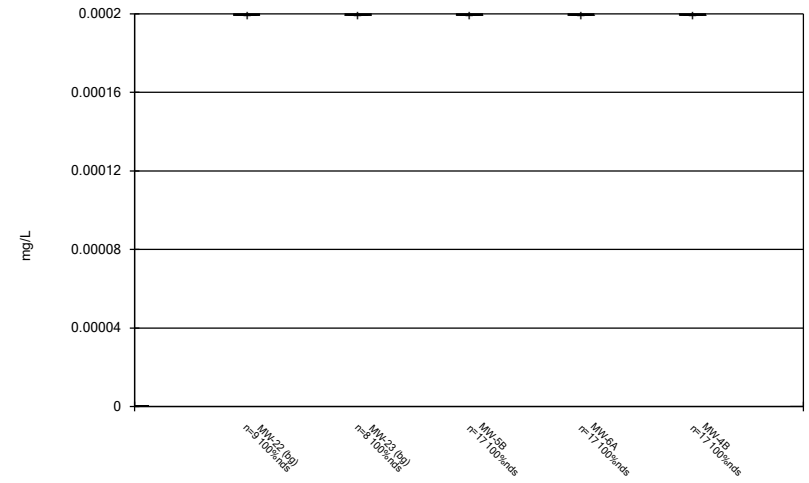
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



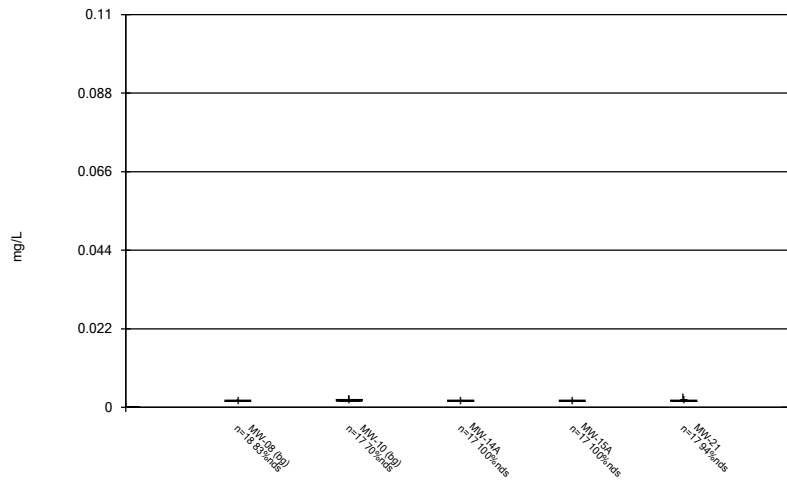
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



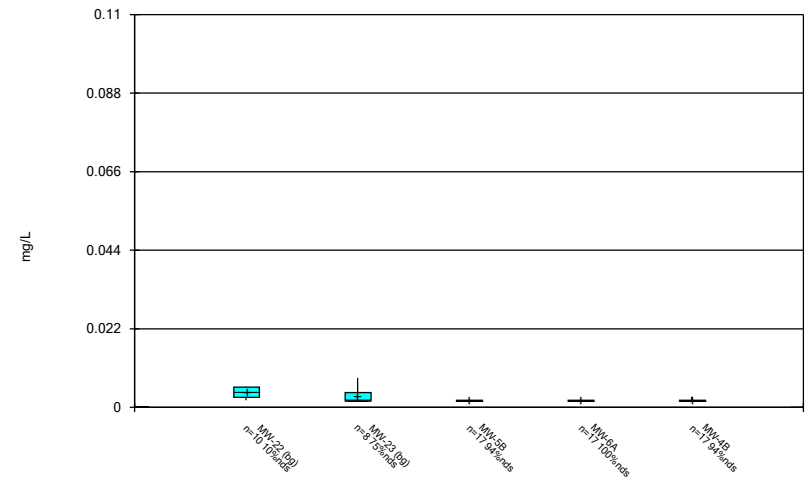
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



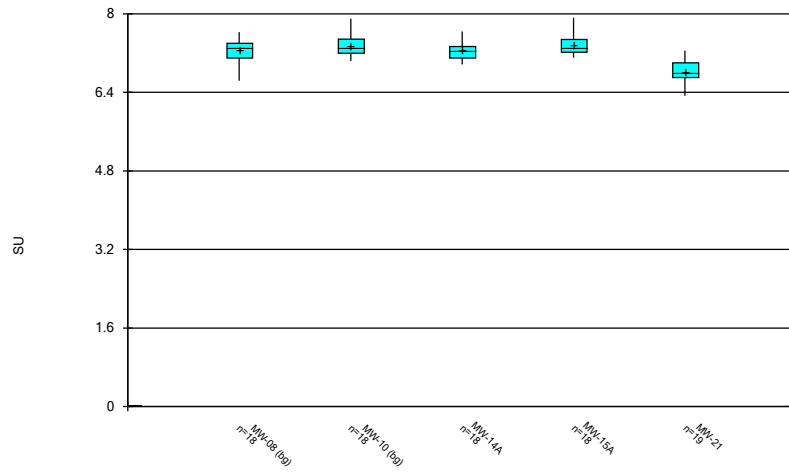
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



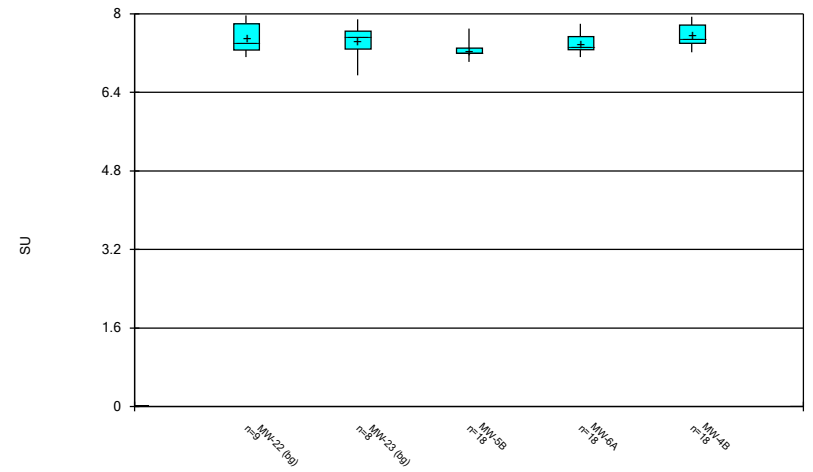
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



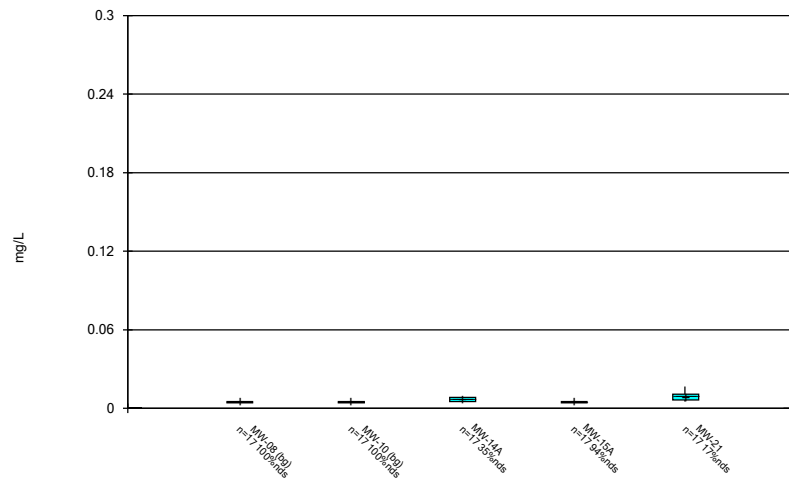
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



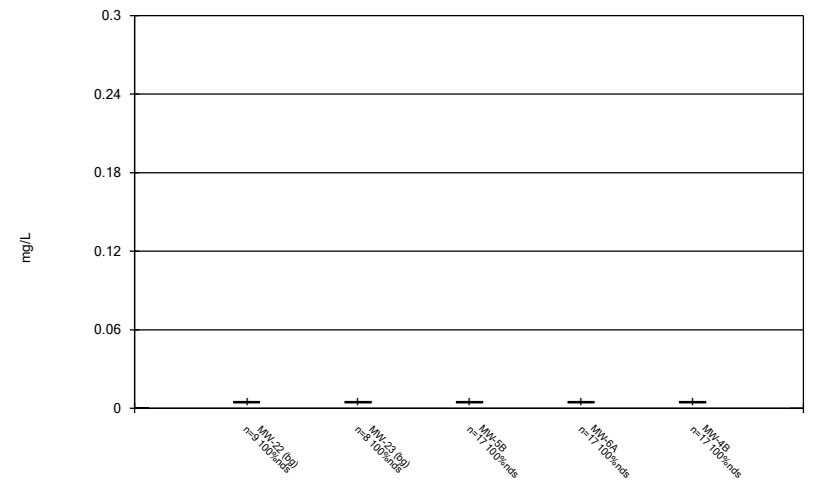
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



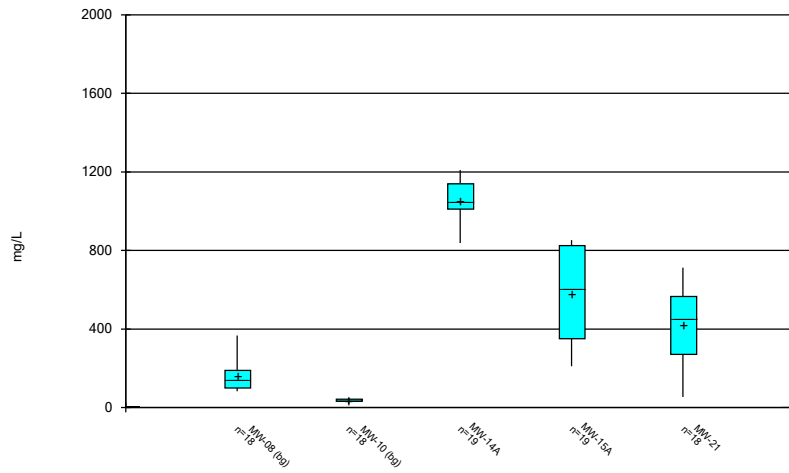
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



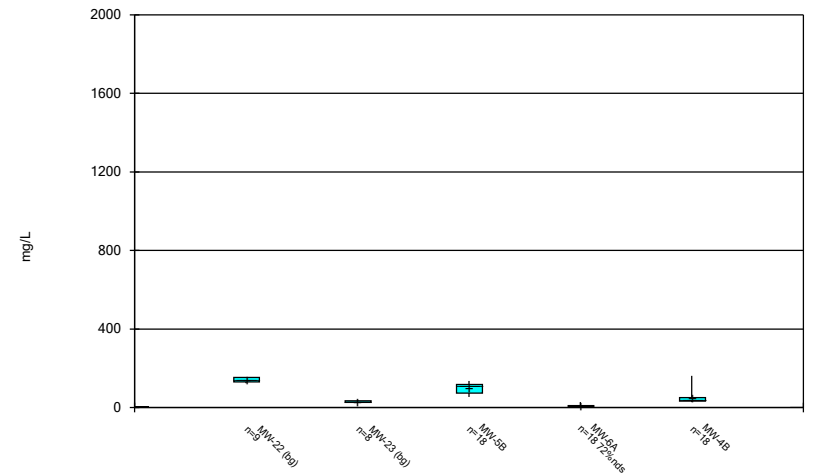
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



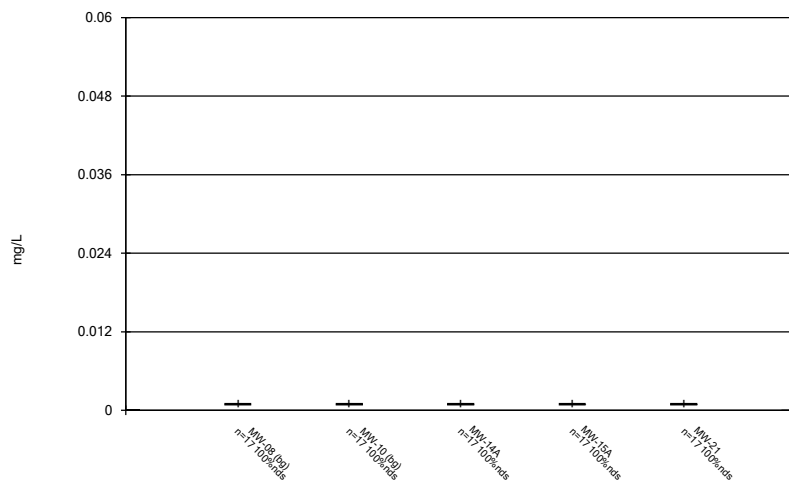
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Box & Whiskers Plot



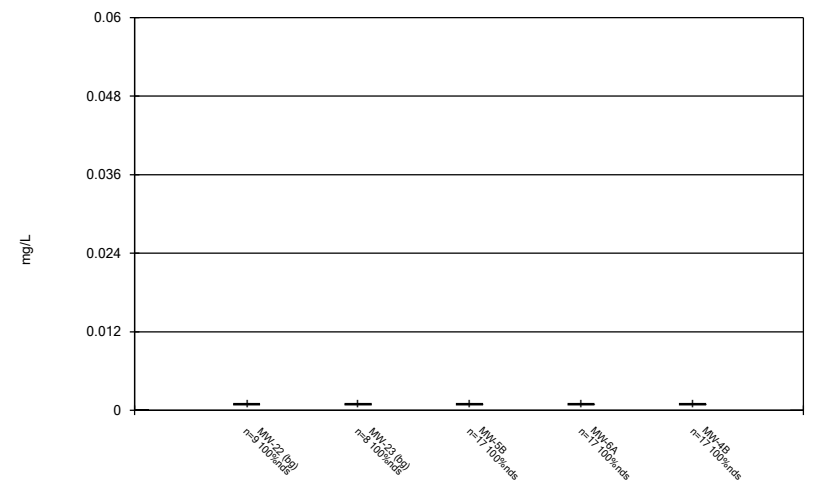
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Box & Whiskers Plot



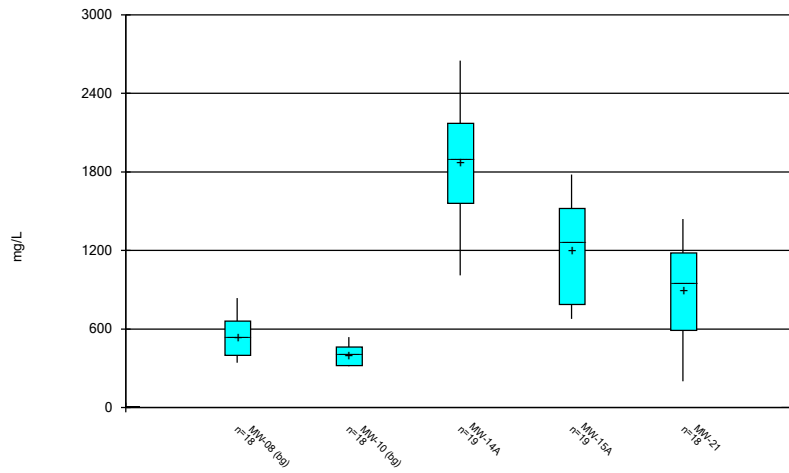
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Box & Whiskers Plot



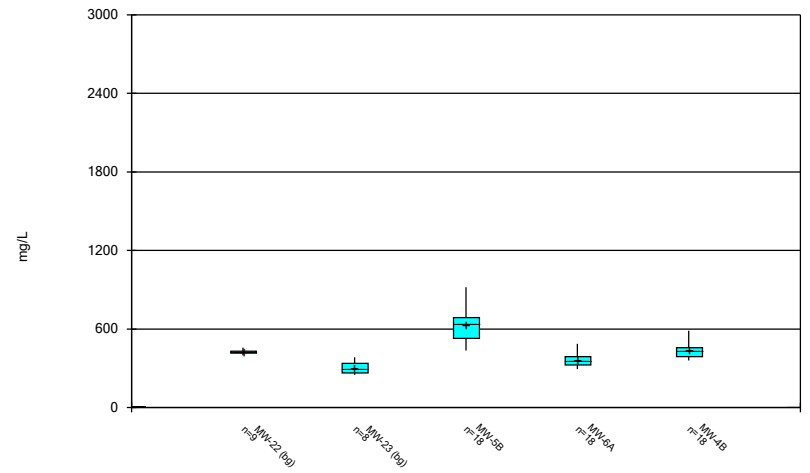
Constituent: Thallium Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:32 PM View: Federal Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

FIGURE C.

Outlier Summary

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:37 PM

	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)
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)		

FIGURE D.

Interwell Prediction Limits - Significant Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:28 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	0.299	n/a	9/1/2021	17.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.299	n/a	9/1/2021	11.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.299	n/a	9/1/2021	5.88	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	9/1/2021	270	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	9/1/2021	37.6	Yes	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	9/1/2021	1010	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	689.2	n/a	9/1/2021	1560	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-15A	689.2	n/a	9/1/2021	736	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2

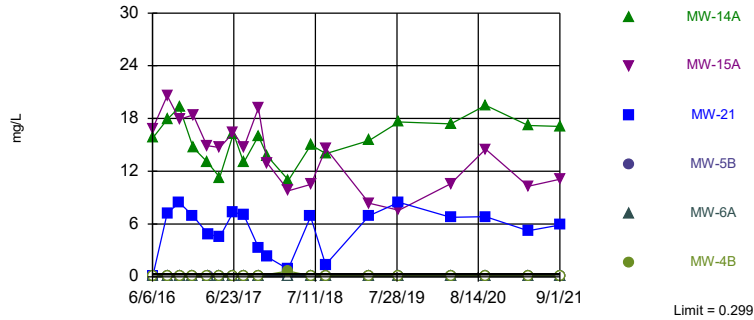
Interwell Prediction Limits - All Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:28 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	0.299	n/a	9/1/2021	17.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.299	n/a	9/1/2021	11.1	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.299	n/a	9/1/2021	5.88	Yes	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-5B	0.299	n/a	9/1/2021	0.1ND	No	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-6A	0.299	n/a	9/1/2021	0.1ND	No	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-4B	0.299	n/a	9/1/2021	0.1ND	No	53	n/a	n/a	92.45	n/a	n/a	0.0006747	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	9/1/2021	270	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-15A	152	n/a	9/1/2021	125	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-21	152	n/a	9/1/2021	93.5	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-5B	152	n/a	9/1/2021	108	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-6A	152	n/a	9/1/2021	90.6	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-4B	152	n/a	9/1/2021	95.1	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	9/1/2021	23.2	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-15A	30	n/a	9/1/2021	8.86	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-21	30	n/a	9/1/2021	6.58	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	9/1/2021	37.6	Yes	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-6A	30	n/a	9/1/2021	17.4	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-4B	30	n/a	9/1/2021	16.7	No	53	n/a	n/a	32.08	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-14A	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-15A	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-21	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-5B	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-6A	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-4B	0.864	n/a	9/1/2021	0.5ND	No	52	n/a	n/a	84.62	n/a	n/a	0.0006966	NP Inter (NDs) 1 of 2
pH (SU)	MW-14A	7.859	6.847	9/1/2021	7.48	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-15A	7.859	6.847	9/1/2021	7.46	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-21	7.859	6.847	9/1/2021	7.06	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-5B	7.859	6.847	9/1/2021	7.22	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-6A	7.859	6.847	9/1/2021	7.61	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
pH (SU)	MW-4B	7.859	6.847	9/1/2021	7.75	No	53	7.353	0.2669	0	None	No	0.0006268	Param Inter 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	9/1/2021	1010	Yes	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-15A	366	n/a	9/1/2021	333	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-21	366	n/a	9/1/2021	303	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-5B	366	n/a	9/1/2021	53.7	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-6A	366	n/a	9/1/2021	22.7	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-4B	366	n/a	9/1/2021	50.2	No	53	n/a	n/a	0	n/a	n/a	0.0006747	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	689.2	n/a	9/1/2021	1560	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-15A	689.2	n/a	9/1/2021	736	Yes	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-21	689.2	n/a	9/1/2021	636	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-5B	689.2	n/a	9/1/2021	448	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-6A	689.2	n/a	9/1/2021	350	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-4B	689.2	n/a	9/1/2021	370	No	53	20.74	2.91	0	None	sqrt(x)	0.001254	Param Inter 1 of 2

Exceeds Limit: MW-14A, MW-15A, MW-21

Prediction Limit
Interwell Non-parametric

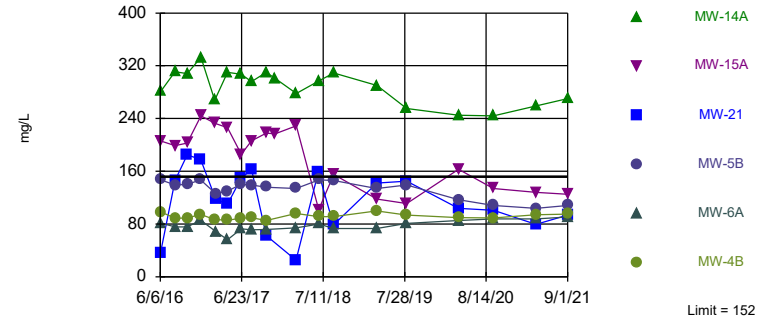


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 53 background values. 92.45% NDs. Annual per-constituent alpha = 0.008067. Individual comparison alpha = 0.0006747 (1 of 2). Comparing 6 points to limit.

Constituent: Boron Analysis Run 11/30/2021 10:27 PM View: Federal All
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Exceeds Limit: MW-14A

Prediction Limit
Interwell Non-parametric

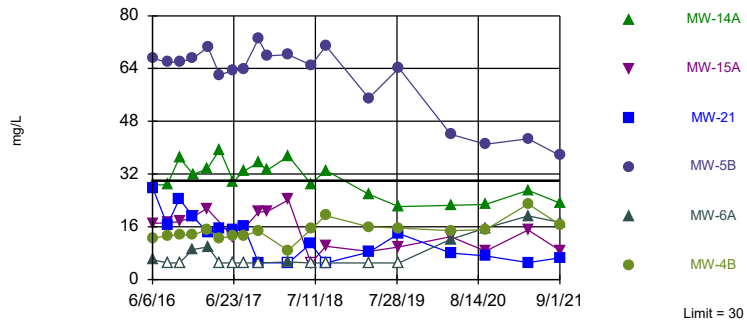


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 53 background values. Annual per-constituent alpha = 0.008067. Individual comparison alpha = 0.0006747 (1 of 2). Comparing 6 points to limit.

Constituent: Calcium Analysis Run 11/30/2021 10:27 PM View: Federal All
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Exceeds Limit: MW-5B

Prediction Limit
Interwell Non-parametric

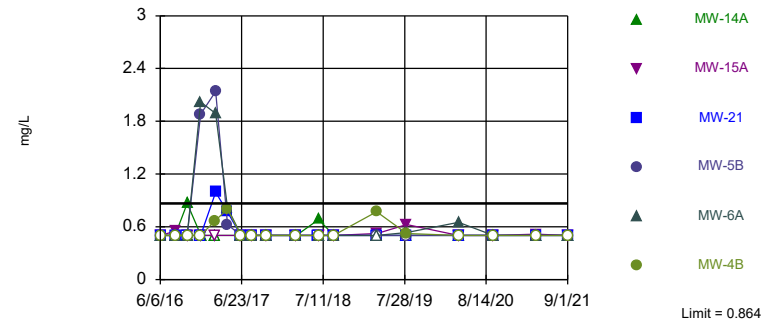


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 53 background values. 32.08% NDs. Annual per-constituent alpha = 0.008067. Individual comparison alpha = 0.0006747 (1 of 2). Comparing 6 points to limit.

Constituent: Chloride Analysis Run 11/30/2021 10:27 PM View: Federal All
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Within Limit

Prediction Limit
Interwell Non-parametric

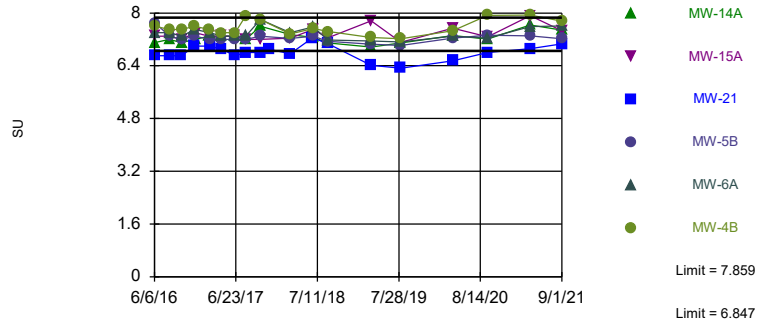


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 52 background values. 84.62% NDs. Annual per-constituent alpha = 0.008327. Individual comparison alpha = 0.0006966 (1 of 2). Comparing 6 points to limit.

Constituent: Fluoride Analysis Run 11/30/2021 10:27 PM View: Federal All
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Within Limits

Prediction Limit
Interwell Parametric

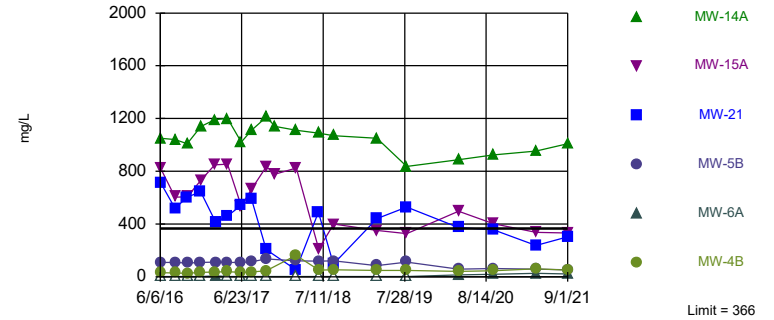


Background Data Summary: Mean=7.353, Std. Dev.=0.2669, n=53. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9498, critical = 0.938. Kappa = 1.896 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0006268. Comparing 6 points to limit.

Constituent: pH Analysis Run 11/30/2021 10:27 PM View: Federal AIII
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Hollow symbols indicate censored values.
Exceeds Limit: MW-14A

Prediction Limit
Interwell Non-parametric

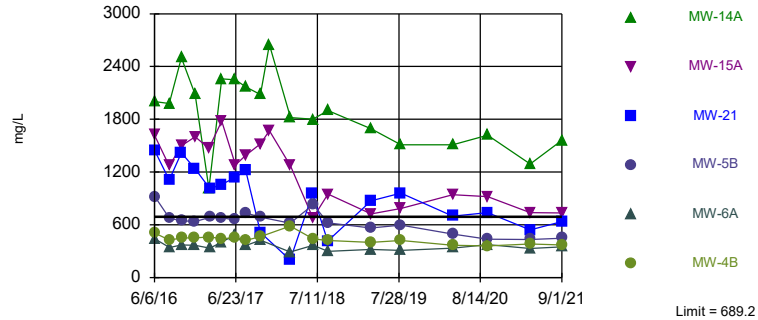


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 53 background values. Annual per-constituent alpha = 0.008067. Individual comparison alpha = 0.0006747 (1 of 2). Comparing 6 points to limit.

Constituent: Sulfate Analysis Run 11/30/2021 10:28 PM View: Federal AIII
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Exceeds Limit: MW-14A, MW-15A

Prediction Limit
Interwell Parametric



Background Data Summary (based on square root transformation): Mean=20.74, Std. Dev.=2.91, n=53. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9529, critical = 0.938. Kappa = 1.896 (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 11/30/2021 10:28 PM View: Federal AIII
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

FIGURE E.

Trend Test - Significant Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:30 PM

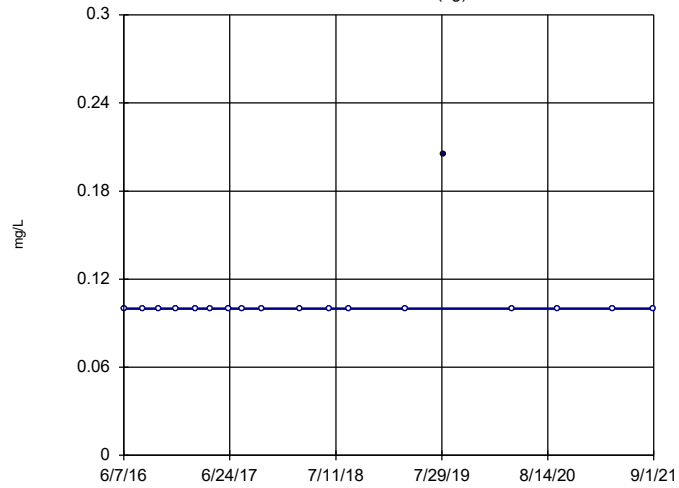
<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-15A	-1.881	-98	-74	Yes	19	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-10.03	-82	-74	Yes	19	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-08 (bg)	-19.45	-71	-68	Yes	18	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-22 (bg)	9.286	32	25	Yes	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-08 (bg)	-72.16	-93	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-10 (bg)	-31.47	-88	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-14A	-157.8	-81	-74	Yes	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-15A	-177.2	-92	-74	Yes	19	0	n/a	n/a	0.01	NP

Trend Test - All Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:30 PM

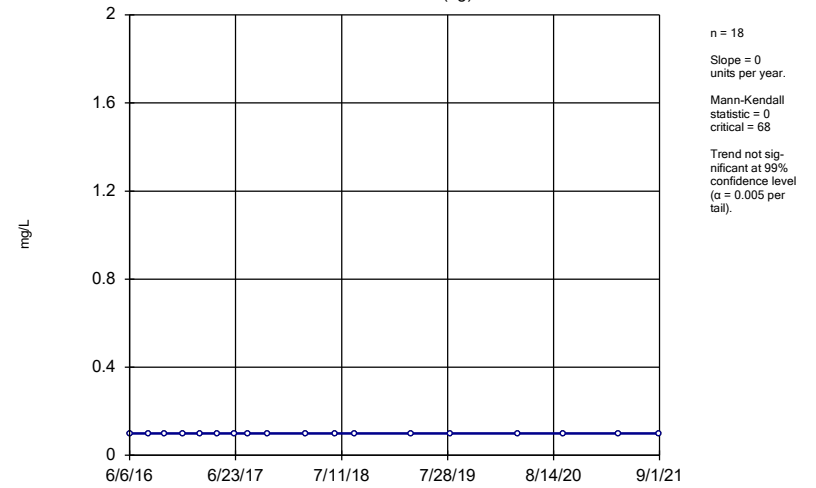
Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-08 (bg)	0	9	68	No	18	94.44	n/a	n/a	0.01	NP
Boron (mg/L)	MW-10 (bg)	0	0	68	No	18	100	n/a	n/a	0.01	NP
Boron (mg/L)	MW-14A	0.4174	27	74	No	19	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-15A	-1.881	-98	-74	Yes	19	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-21	-0.1001	-17	-74	No	19	5.263	n/a	n/a	0.01	NP
Boron (mg/L)	MW-22 (bg)	0	1	25	No	9	77.78	n/a	n/a	0.01	NP
Boron (mg/L)	MW-23 (bg)	0	3	21	No	8	87.5	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-08 (bg)	-7.501	-61	-68	No	18	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-10 (bg)	-1.547	-62	-68	No	18	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-10.03	-82	-74	Yes	19	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-22 (bg)	-1.595	-6	-25	No	9	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-23 (bg)	-3.995	-20	-21	No	8	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-08 (bg)	0	-1	-68	No	18	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-10 (bg)	0	-17	-68	No	18	94.44	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-22 (bg)	-2.571	-22	-25	No	9	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-23 (bg)	0.6052	6	21	No	8	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5B	-4.887	-66	-74	No	19	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-08 (bg)	-19.45	-71	-68	Yes	18	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-10 (bg)	-1.679	-45	-68	No	18	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-14A	-37.82	-57	-74	No	19	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-22 (bg)	9.286	32	25	Yes	9	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-23 (bg)	-1.918	-11	-21	No	8	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-08 (bg)	-72.16	-93	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-10 (bg)	-31.47	-88	-68	Yes	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-14A	-157.8	-81	-74	Yes	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-15A	-177.2	-92	-74	Yes	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-22 (bg)	-4.835	-15	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-23 (bg)	-37.9	-20	-21	No	8	0	n/a	n/a	0.01	NP

Sen's Slope Estimator
MW-08 (bg)



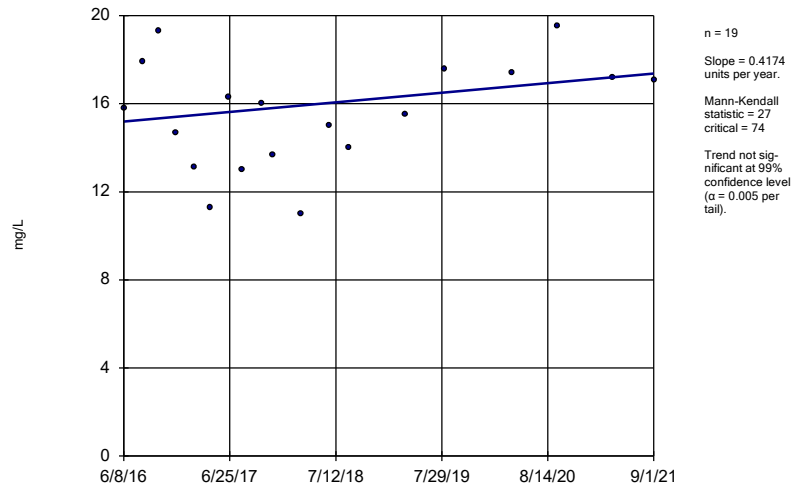
Constituent: Boron Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-10 (bg)



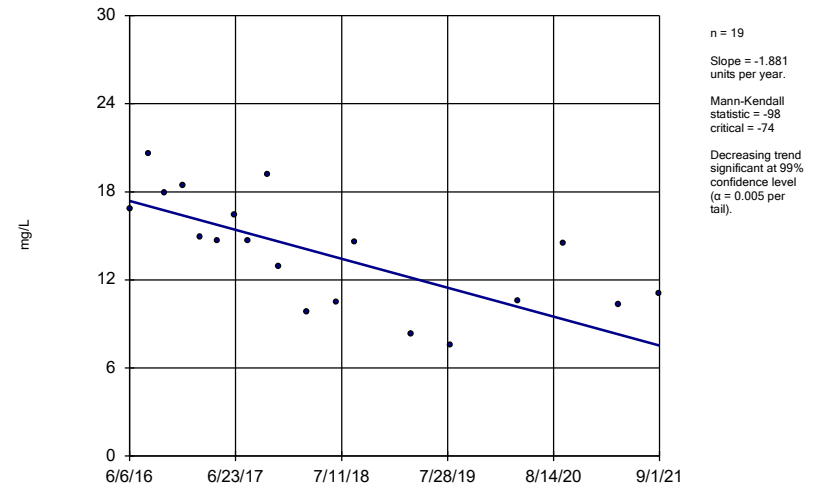
Constituent: Boron Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-14A



Constituent: Boron Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

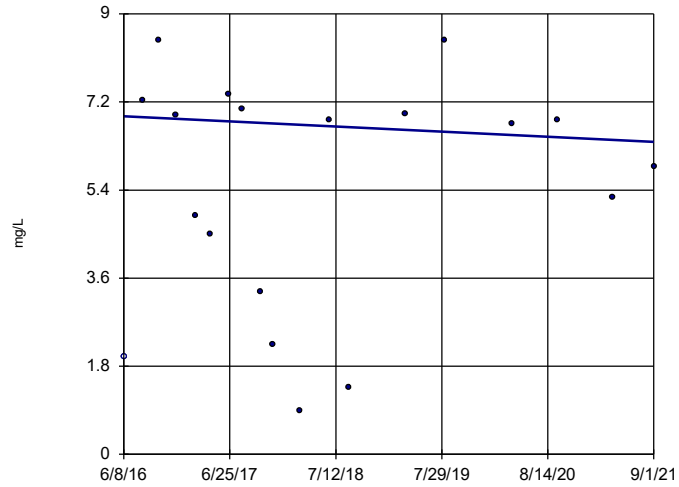
Sen's Slope Estimator
MW-15A



Constituent: Boron Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

MW-21

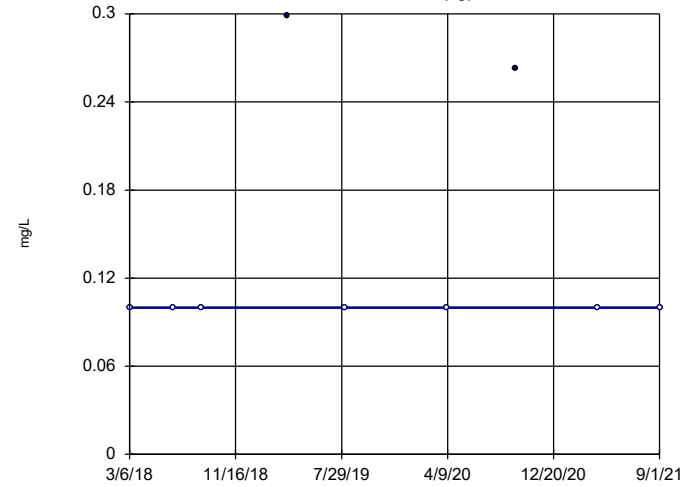


n = 19
Slope = -0.1001
units per year.
Mann-Kendall
statistic = -17
critical = -74
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Boron Analysis Run 11/30/2021 10:29 PM View: Federal AIII Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

MW-22 (bg)

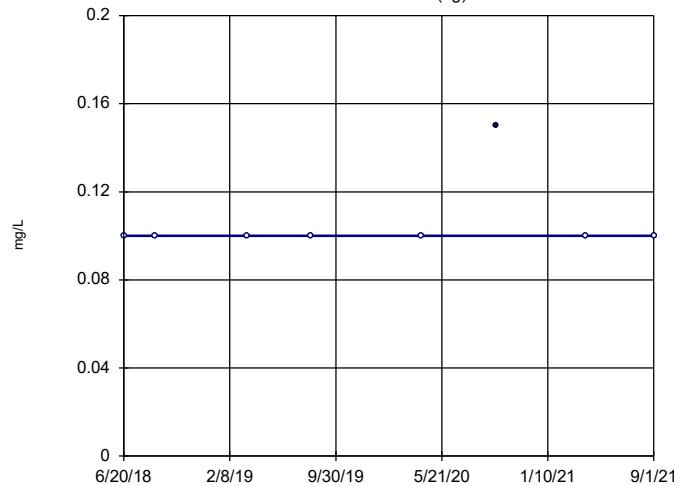


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = 1
critical = 25
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Boron Analysis Run 11/30/2021 10:29 PM View: Federal AIII Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

MW-23 (bg)

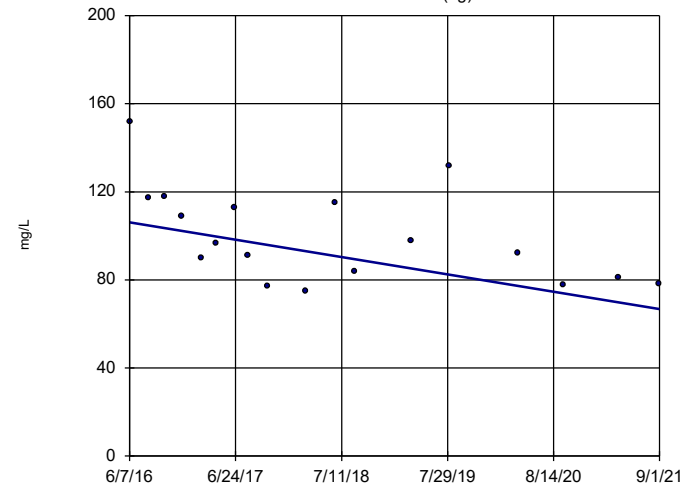


n = 8
Slope = 0
units per year.
Mann-Kendall
statistic = 3
critical = 21
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Boron Analysis Run 11/30/2021 10:29 PM View: Federal AIII Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

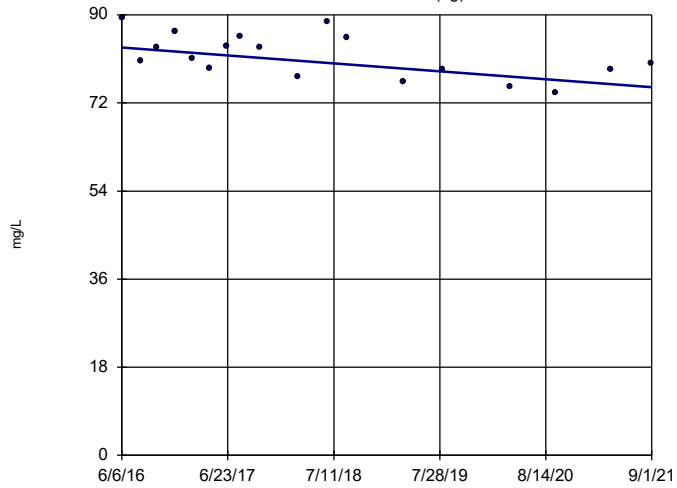
Sen's Slope Estimator

MW-08 (bg)

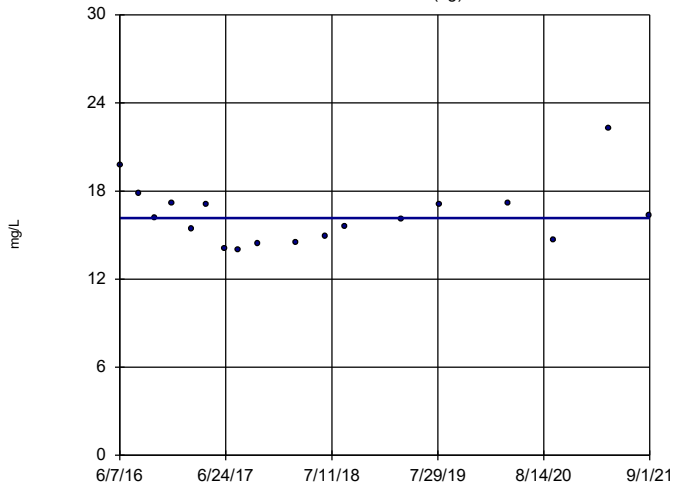


Sen's Slope Estimator

MW-10 (bg)

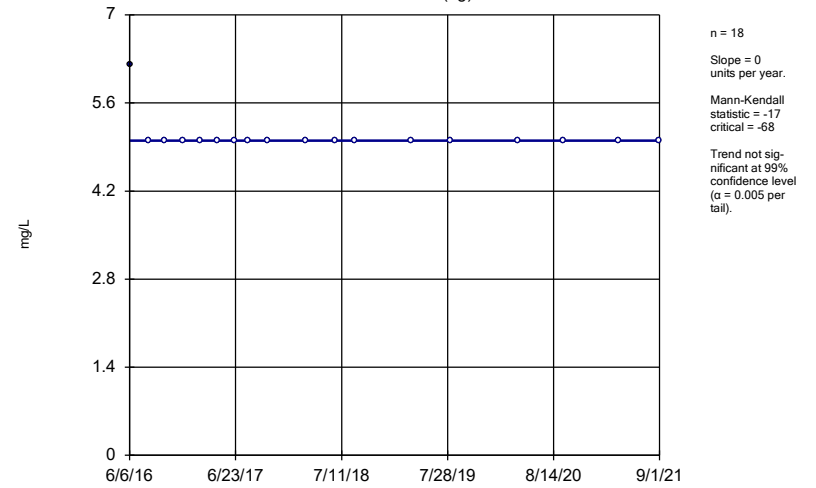


Sen's Slope Estimator
MW-08 (bg)



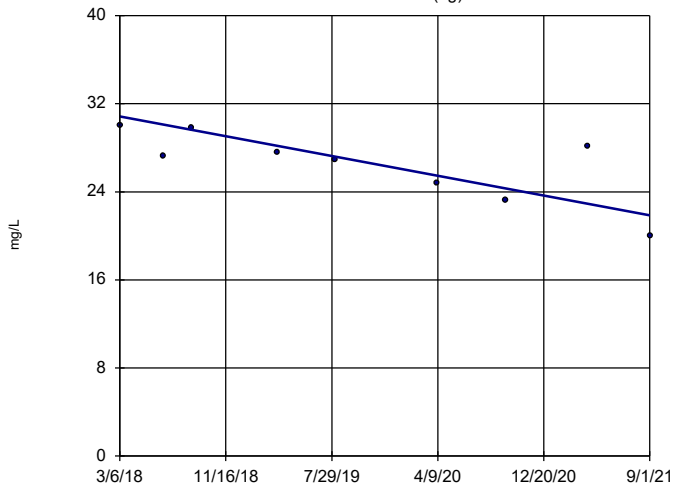
Constituent: Chloride Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-10 (bg)



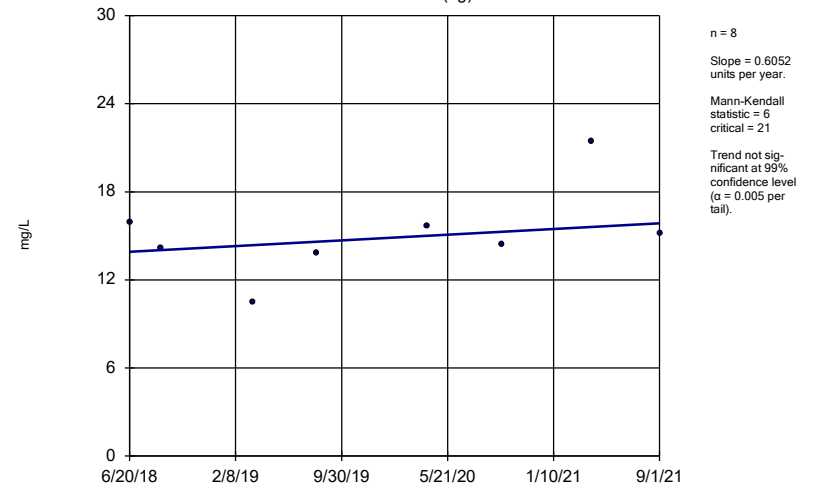
Constituent: Chloride Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-22 (bg)



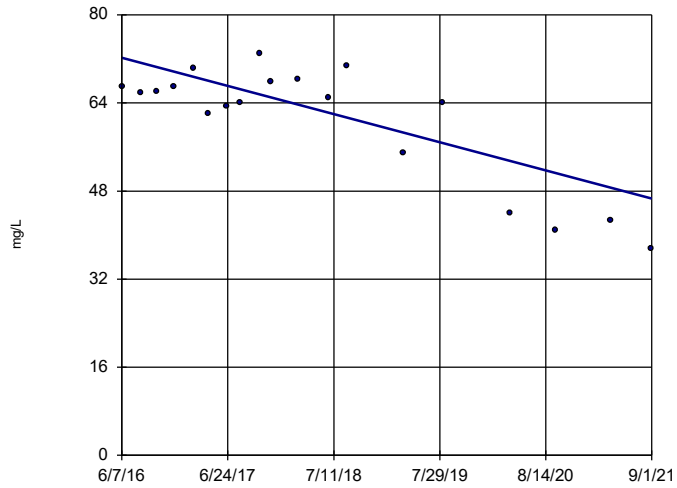
Constituent: Chloride Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-23 (bg)



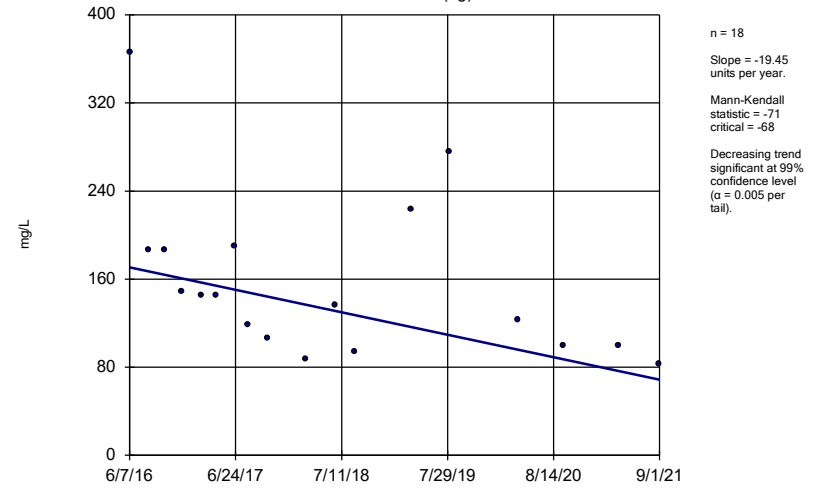
Constituent: Chloride Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-5B



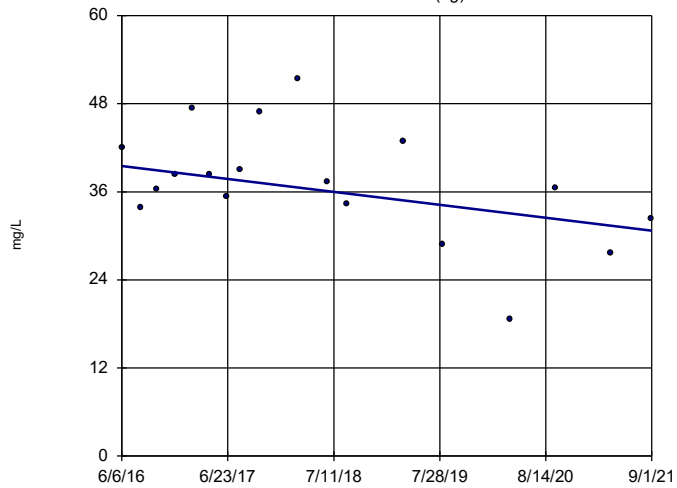
Constituent: Chloride Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-08 (bg)



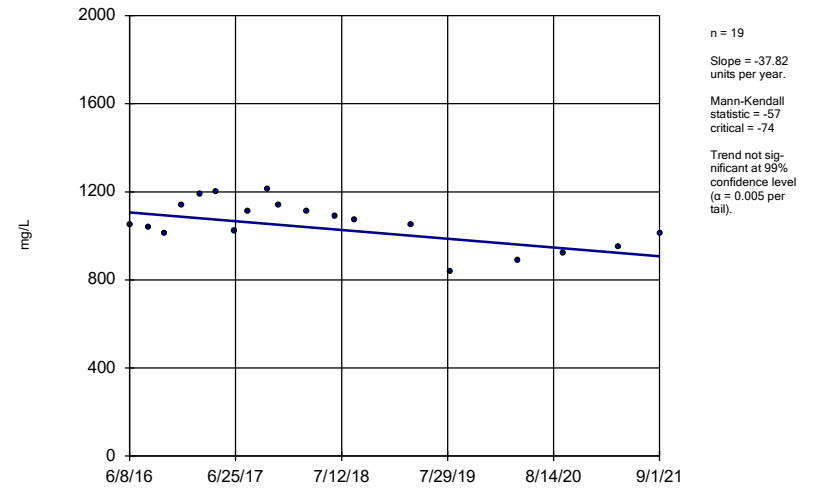
Constituent: Sulfate Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-10 (bg)



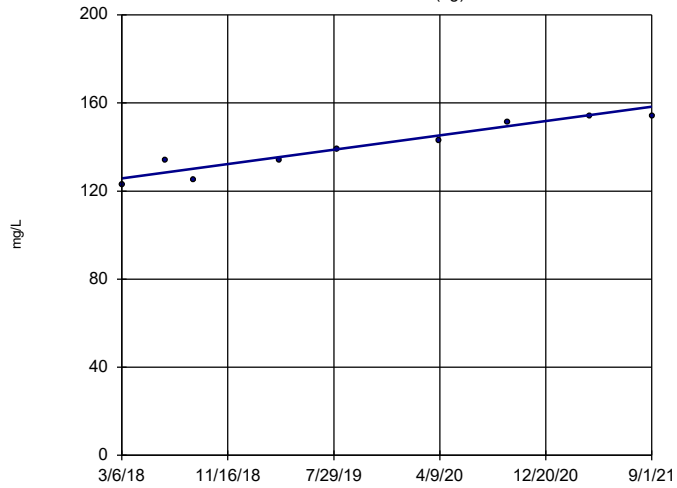
Constituent: Sulfate Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-14A



Constituent: Sulfate Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

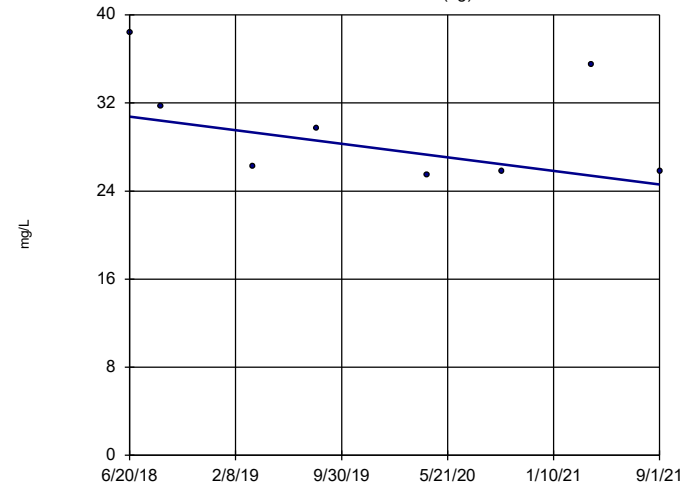
Sen's Slope Estimator
MW-22 (bg)



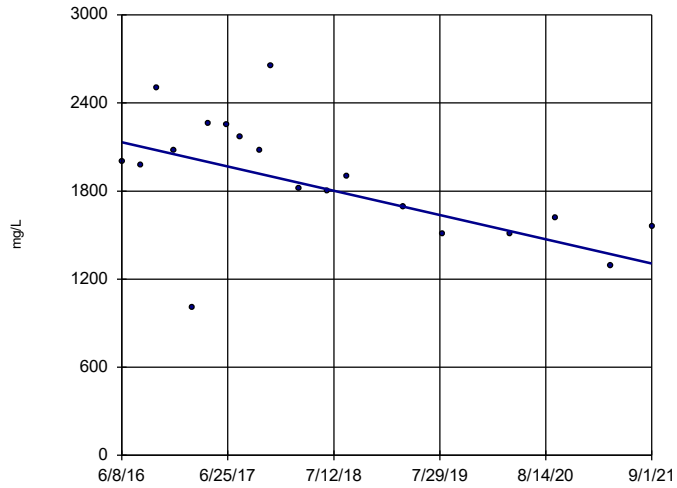
n = 9
 Slope = 9.286
 units per year.
 Mann-Kendall
 statistic = 32
 critical = 25
 Increasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Sulfate Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-23 (bg)

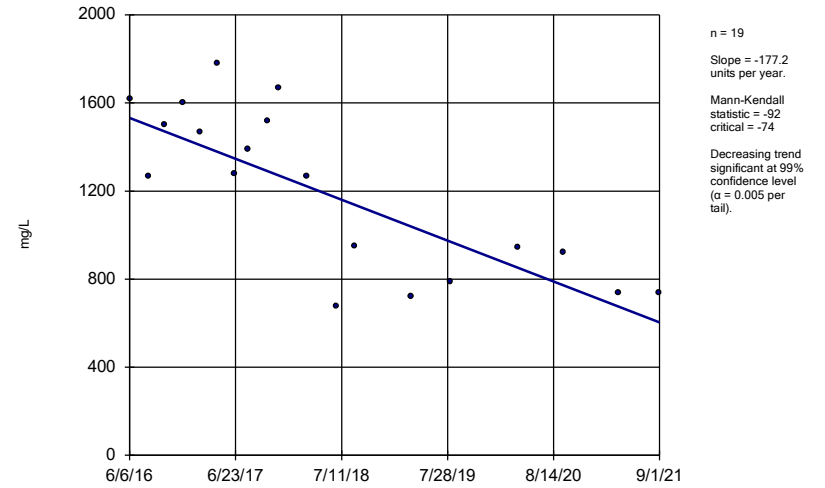


Sen's Slope Estimator
MW-14A



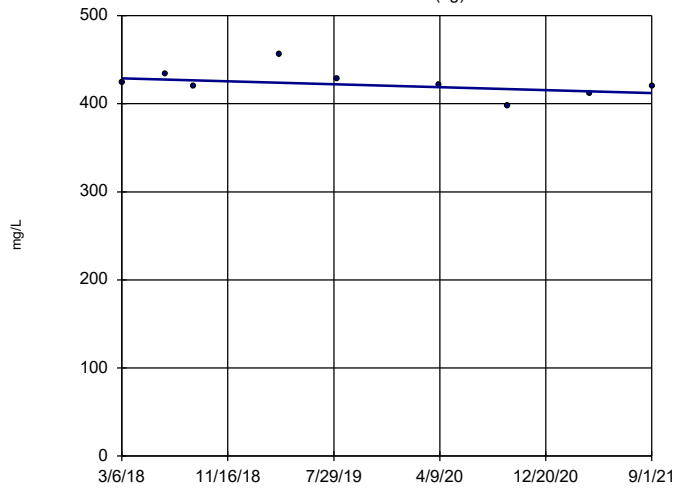
Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:29 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-15A



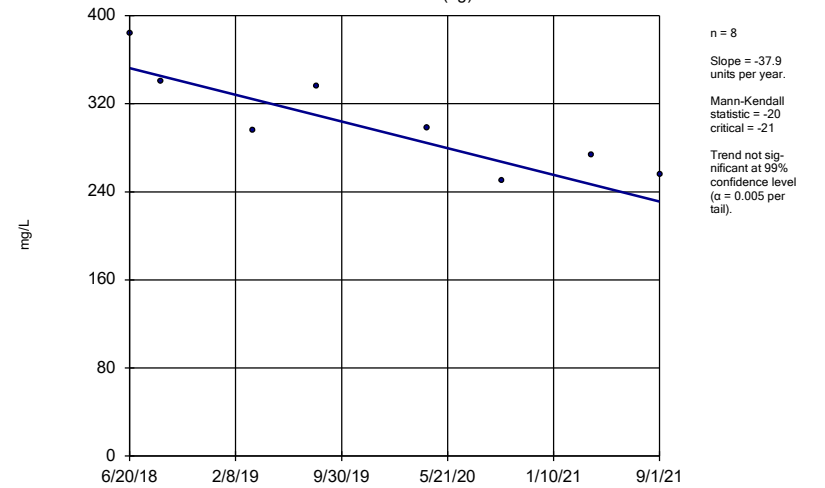
Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:30 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-22 (bg)



Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:30 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator
MW-23 (bg)



Constituent: Total Dissolved Solids Analysis Run 11/30/2021 10:30 PM View: Federal All Trend
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

FIGURE F.

Upper Tolerance Limits

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:24 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Bg N</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony (mg/L)	0.002	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Arsenic (mg/L)	0.00784	51	n/a	62.75	n/a	0.0731	NP Inter(normality)
Barium (mg/L)	0.247	51	n/a	0	n/a	0.0731	NP Inter(normality)
Beryllium (mg/L)	0.001	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Cadmium (mg/L)	0.0001	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Chromium (mg/L)	0.005	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Cobalt (mg/L)	0.00558	52	n/a	36.54	n/a	0.06944	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	1.066	37	0.2827	0	No	0.05	Inter
Fluoride (mg/L)	0.864	52	n/a	84.62	n/a	0.06944	NP Inter(NDs)
Lead (mg/L)	0.00204	51	n/a	88.24	n/a	0.0731	NP Inter(NDs)
Lithium (mg/L)	0.01	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Mercury (mg/L)	0.0002	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Molybdenum (mg/L)	0.00822	53	n/a	64.15	n/a	0.06597	NP Inter(normality)
Selenium (mg/L)	0.005	51	n/a	100	n/a	0.0731	NP Inter(NDs)
Thallium (mg/L)	0.001	51	n/a	100	n/a	0.0731	NP Inter(NDs)

FIGURE G.

MUSCATINE POWER & WATER GWPS				
Constituent Name	MCL	CCR Rule-Specified	Background Limit	GWPS
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		0.25	2
Beryllium, Total (mg/L)	0.004		0.001	0.004
Cadmium, Total (mg/L)	0.005		0.0001	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		1.066	5
Fluoride, Total (mg/L)	4		0.86	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 H.

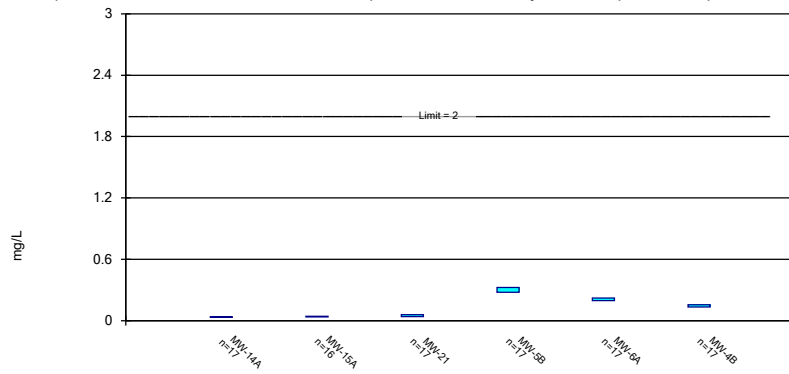
Confidence Interval Summary Table - All Results (No Significant)

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 11/30/2021, 10:26 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	MW-14A	0.03744	0.0317	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-15A	0.04083	0.03534	2	No	16	0	No	0.01	Param.
Barium (mg/L)	MW-21	0.05704	0.03936	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-5B	0.323	0.2782	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-6A	0.2222	0.1944	2	No	17	0	No	0.01	Param.
Barium (mg/L)	MW-4B	0.1553	0.1322	2	No	17	0	No	0.01	Param.
Chromium (mg/L)	MW-21	0.006435	0.005254	0.1	No	17	23.53	No	0.01	Param.
Cobalt (mg/L)	MW-4B	0.000681	0.0005	0.006	No	17	76.47	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-14A	0.684	0.5	4	No	17	88.24	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-15A	0.516	0.5	4	No	17	76.47	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-21	0.768	0.5	4	No	18	88.89	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-5B	0.627	0.5	4	No	18	83.33	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-6A	0.652	0.5	4	No	18	72.22	No	0.01	NP (normality)
Fluoride (mg/L)	MW-4B	0.525	0.5	4	No	18	77.78	No	0.01	NP (NDs)
Lead (mg/L)	MW-21	0.000633	0.0005	0.015	No	17	94.12	No	0.01	NP (NDs)
Lead (mg/L)	MW-4B	0.000532	0.0005	0.015	No	16	93.75	No	0.01	NP (NDs)
Lithium (mg/L)	MW-21	0.0225	0.01	0.04	No	17	58.82	No	0.01	NP (normality)
Molybdenum (mg/L)	MW-21	0.00383	0.002	0.1	No	17	94.12	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-5B	0.00212	0.002	0.1	No	17	94.12	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-4B	0.00296	0.002	0.1	No	17	94.12	No	0.01	NP (NDs)
Selenium (mg/L)	MW-14A	0.00823	0.005	0.05	No	17	35.29	No	0.01	NP (normality)
Selenium (mg/L)	MW-15A	0.00502	0.005	0.05	No	17	94.12	No	0.01	NP (NDs)
Selenium (mg/L)	MW-21	0.01107	0.006264	0.05	No	17	17.65	No	0.01	Param.

Parametric Confidence Interval

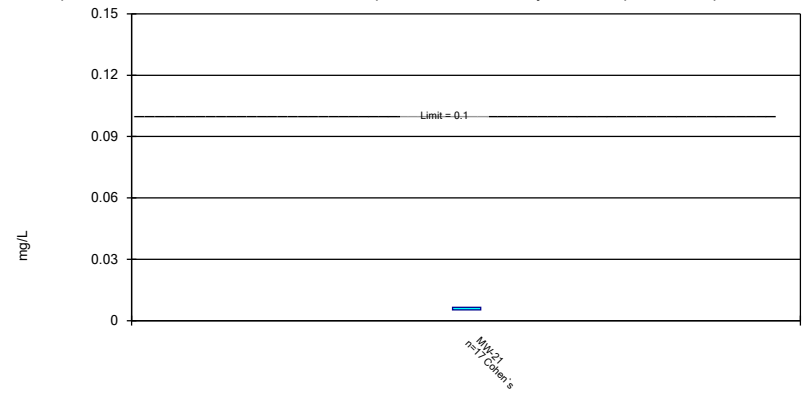
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium Analysis Run 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Parametric Confidence Interval

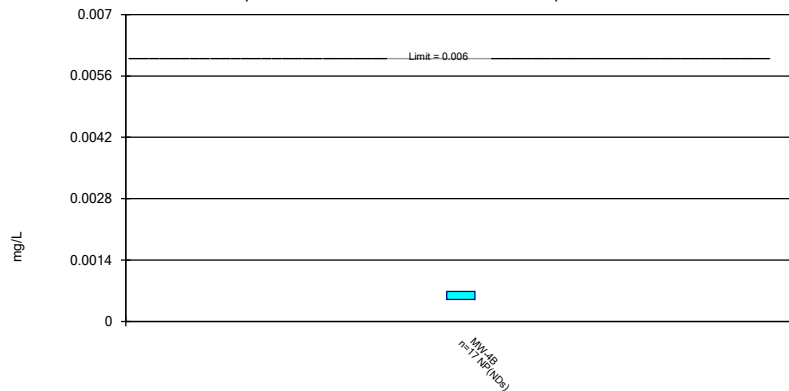
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium Analysis Run 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

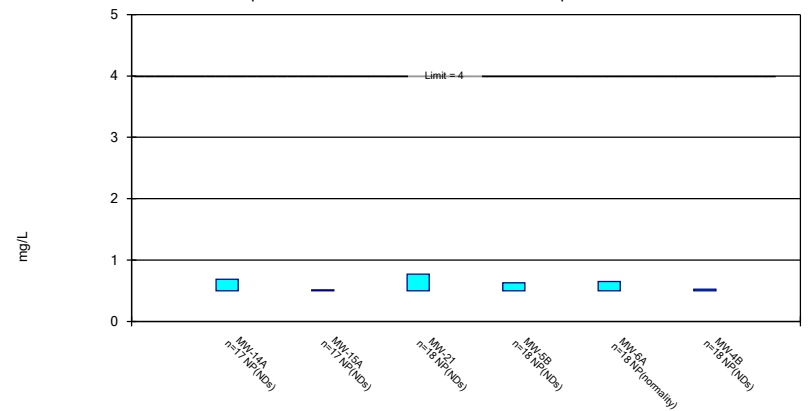
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cobalt Analysis Run 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

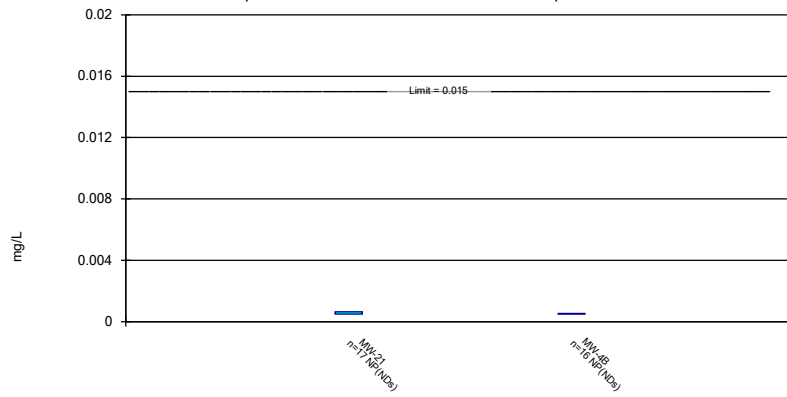
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride Analysis Run 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

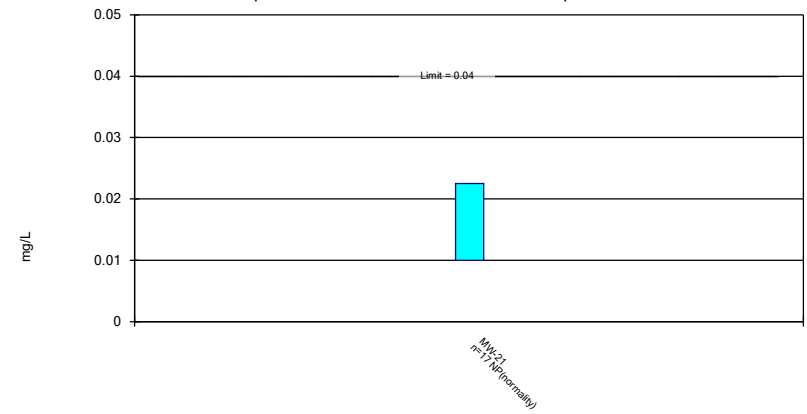
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead Analysis Run 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

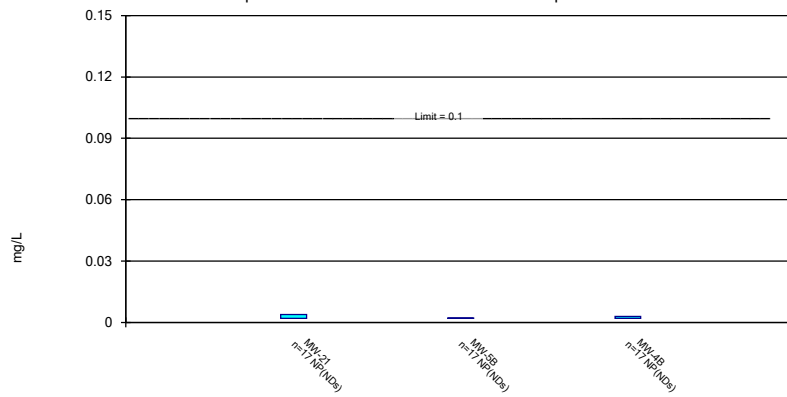
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lithium Analysis Run 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

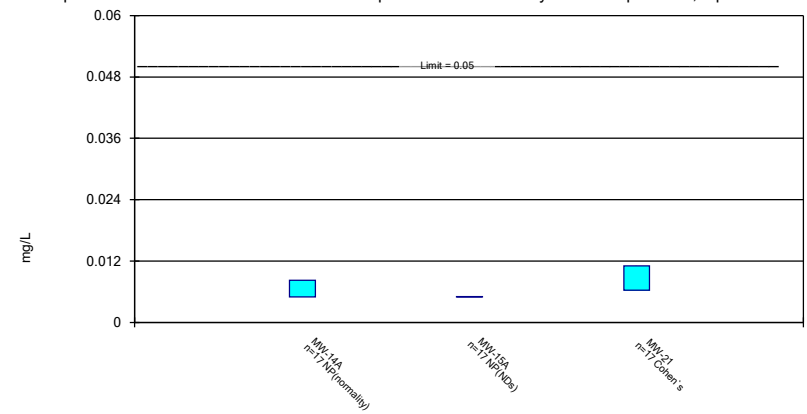
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum Analysis Run 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. 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 11/30/2021 10:25 PM View: Federal AIV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

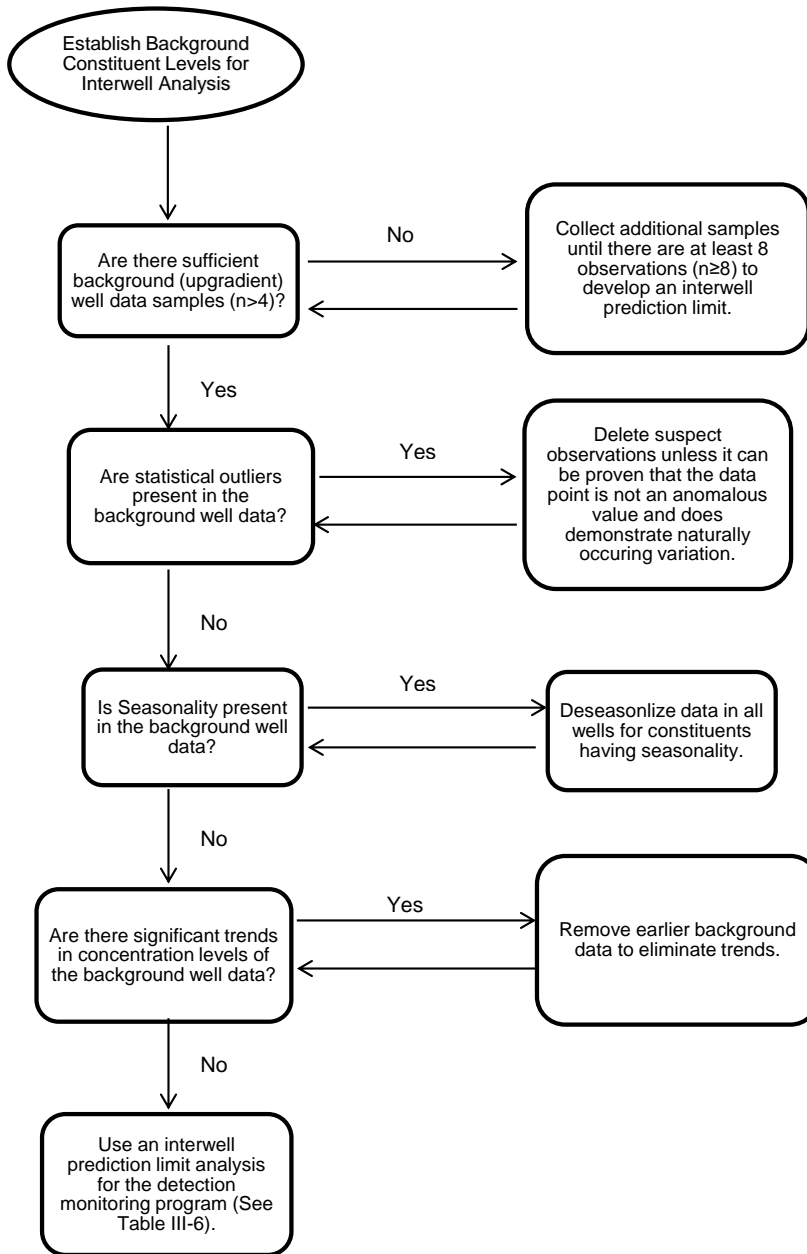


Table III-4: Methodology to Screen Background Data for Interwell Limits and Establish Background Constituent Levels

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).

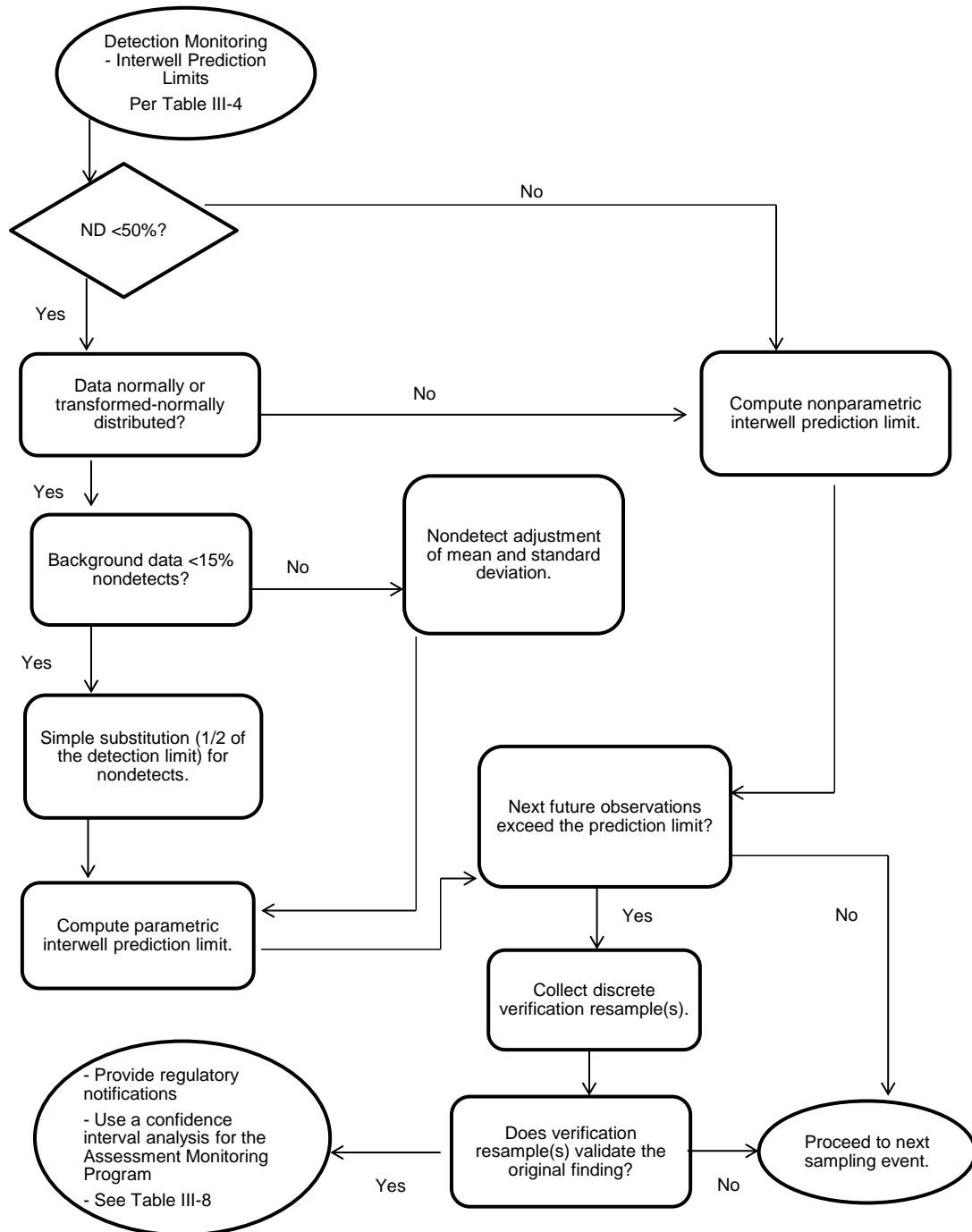


Table III-6: Methodology for Detection Monitoring - Computing Interwell Prediction Limits

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).

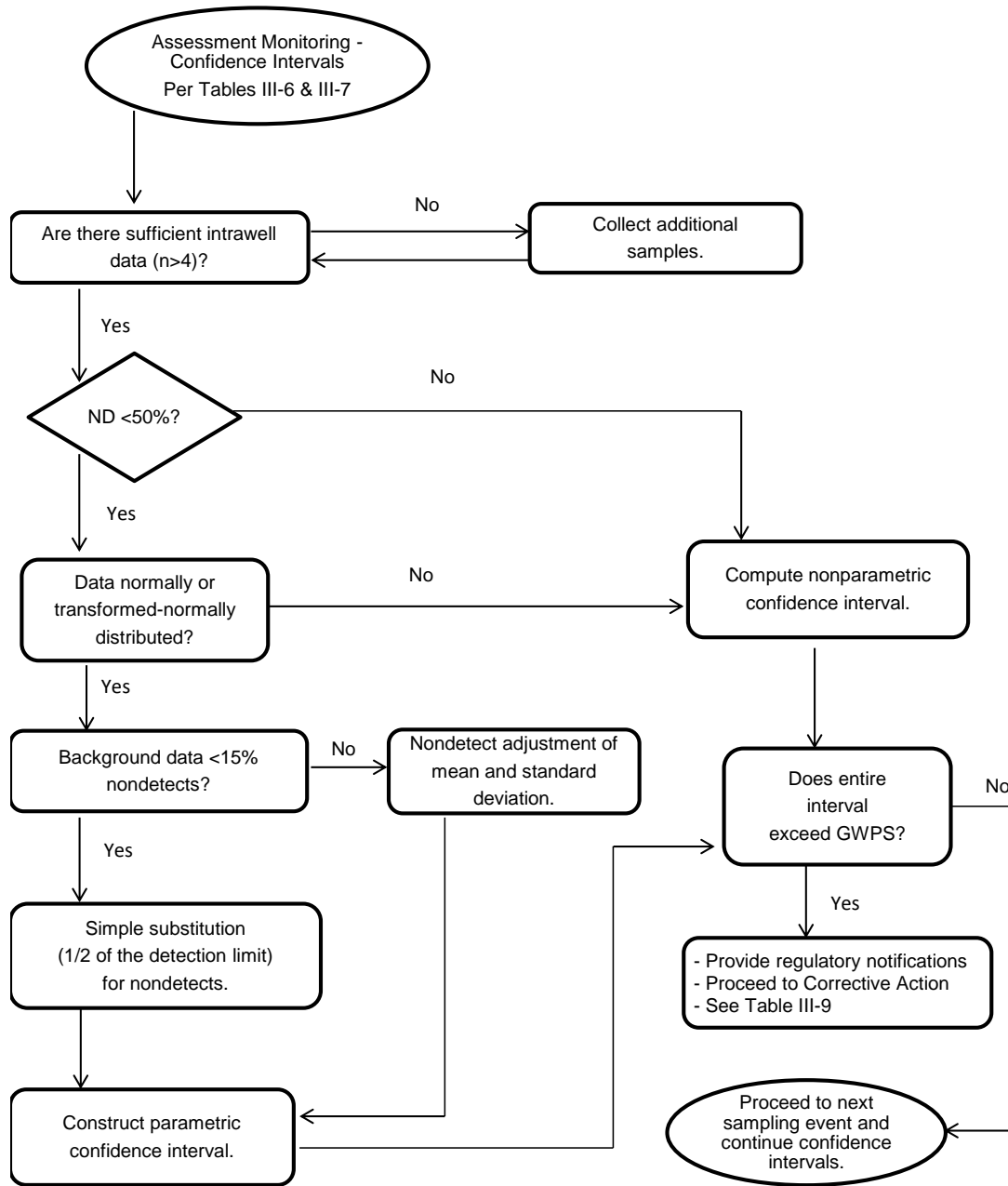


Table III-8: Methodology for Assessment Monitoring – Constructing Confidence Intervals

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).

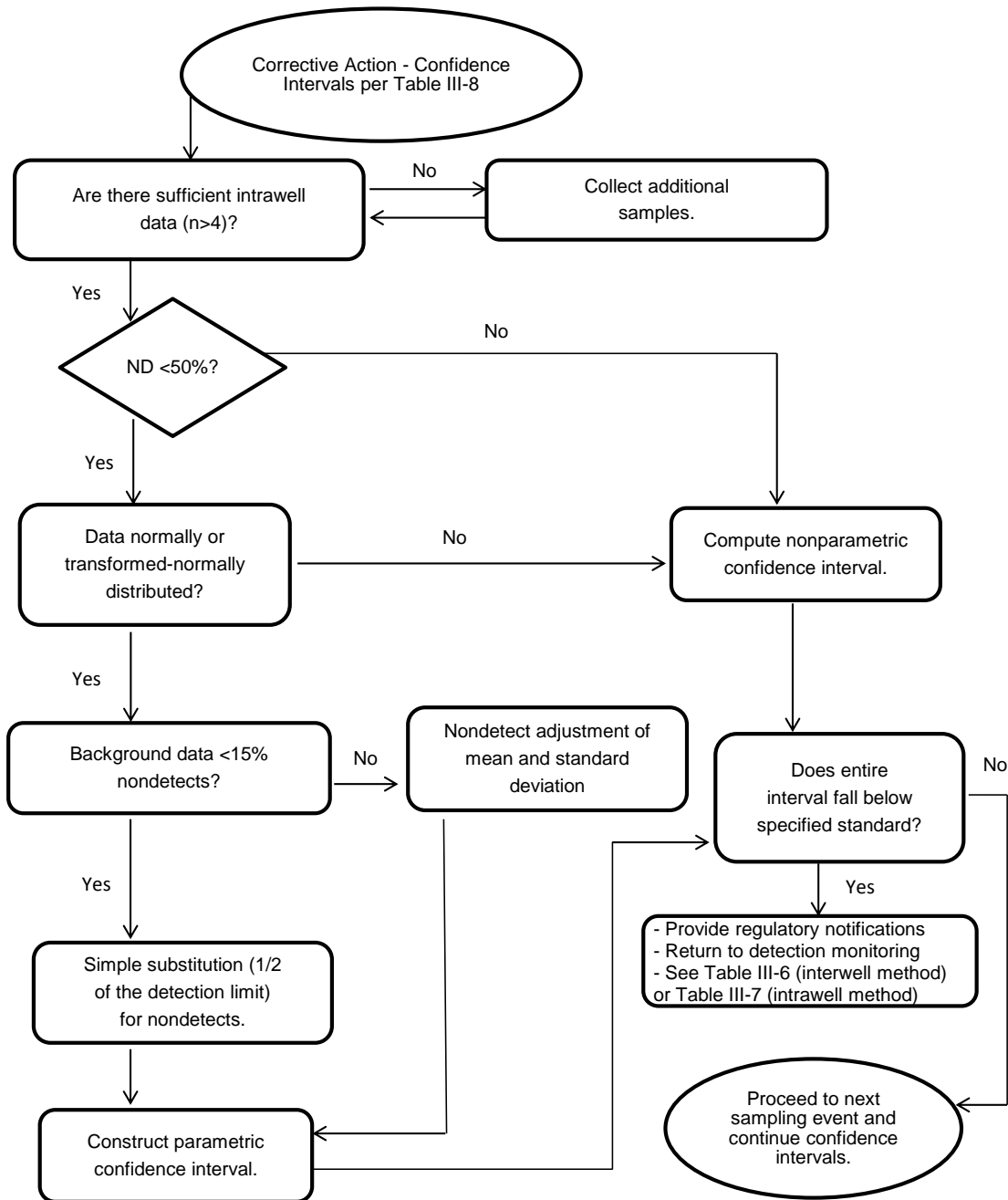


Table III-9: Methodology for Corrective Action

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).