



2021 Annual Groundwater Monitoring and Corrective Action Report

WEC Temporary Ash Disposal Area

Whelan Energy Center
Public Power Generation Agency/
City of Hastings Utilities



Hastings, Nebraska
January 25, 2022



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Professional Engineer Certification

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am duly licensed Professional Engineer under the laws of the State of Nebraska.

Print Name: Megan B. Seymour

Signature: _____

Date: _____

License #: E-15931

My license renewal date is December 31, 2022.



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Executive Summary

Hastings Utilities, City of Hastings (Hastings) operates an existing fossil fuel combustion ash disposal area that is used exclusively by the Whelan Energy Center (WEC), designated as the WEC Temporary Ash Disposal Area. The WEC is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. The WEC site is a parcel of the historical Hastings Naval Ammunition Depot and is included in the Superfund activities for this subsite. WEC is also downgradient of additional Superfund subsites located in the City of Hastings.

On April 17, 2015, the United States Environmental Protection Agency (U.S. EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The CCR rule is formally promulgated in the Title 40 United States Code of Federal Regulations (CFR) Part 257. This regulation applies to the existing WEC Temporary Ash Disposal Area operated by Hastings. This annual report covers the WEC Temporary Ash Disposal Area and provides a summary of CCR groundwater monitoring system activities for calendar year 2021 for the assessment monitoring program under 40 CFR §257.95.

The WEC Temporary Ash Disposal Area transitioned from detection to assessment monitoring following the fall 2017 sampling event due to the following statistically significant increases (SSIs) in downgradient monitoring wells: calcium, chloride, sulfate, and total dissolved solids. An alternate source demonstration (ASD), dated May 1, 2018, was prepared to evaluate the published SSIs. The ASD established that the potential for an offsite source of contamination or natural variation in regional groundwater chemistry was supported for several of the SSIs, including calcium, chloride and total dissolved solids; however, this was not supported for sulfate based on the groundwater data available at the time. As a result, Hastings initiated an assessment monitoring program in 2018, as required in the CCR rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in 40 CFR §257.95. To continue collecting information on groundwater characteristics near the site, site investigations occurred, and a conceptual site model was prepared in 2019. Assessment monitoring continued for sampling events in spring and fall 2021. No transition of monitoring programs occurred in 2021.

For the April 2021 sampling event, results of the analysis indicated two (2) SSIs above background for Appendix III constituents and three (3) SSIs above background for Appendix IV constituents.

- Calcium at MW-3R
- Sulfate at MW-3R
- Barium at MW-2B
- Cobalt at MW-3R
- Lithium at MW-3R

For the December 2021 sampling event, results of the analysis indicated seven (7) SSIs above background for Appendix III constituents and five (5) SSIs above background for Appendix IV



constituents. Fluoride is included on both the Appendix III and Appendix IV constituent lists and is therefore counted as an SSI twice on this list.

- Sulfate at MW-3R
- Sulfate at MW-4B
- Calcium at MW-7
- Chloride at MW-7
- Sulfate at MW-7
- TDS at MW-7
- Fluoride at MW-8
- Barium at MW-2B
- Cobalt at MW-3R
- Lithium at MW-3R
- Lithium at MW-4B
- Fluoride at MW-8

At the time this report was issued, the contracted laboratory had not yet returned results for radium. Once the radium data is received, the analytical results and updated statistical analysis for radium will be placed in the operating record and uploaded to the facility's CCR website. If there are any SSIs for radium, that will also be noted at that time.

There were no statistically significant levels (SSLs) of any constituents above the groundwater protection standards (GWPS) for either the April 2021 or December 2021 sampling events. Assessment monitoring will continue in spring and fall 2022.

1 Introduction

On April 17, 2015, the United States Environmental Protection Agency (U.S. EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The CCR rule is formally promulgated in the Title 40 United States Code of Federal Regulations (CFR) Parts 257 and 261. This regulation applies to the existing Whelan Energy Center (WEC) Temporary Ash Disposal Area operated by Hastings Utilities, City of Hastings, Nebraska (Hastings).

1.1 Purpose

The CCR rule established requirements for annual reporting of groundwater monitoring and corrective action in 40 CFR §257.90. The information included in this report complies with the requirements established in 40 CFR §257.90(e). This report provides a summary of CCR-related groundwater activities for calendar year 2021.

1.2 Facility Information

Hastings operates an existing fossil fuel combustion ash disposal area that is used exclusively by the WEC (designated as the WEC Temporary Ash Disposal Area). The WEC is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. The WEC site is a parcel located within the historical Hastings Naval Ammunition Depot (NAD) and as such is included in the Superfund activities for this subsite of the Hastings Groundwater Contamination Superfund Site. The Superfund actions include groundwater and soil restoration. Buried byproducts of NAD have historically been found on the site. NAD extends south, east and west of the site. The WEC is also downgradient of the various Superfund sites and subsites of the Hastings Groundwater Contamination Superfund Site located in the City of Hastings. These sites include, but are not limited to, the Colorado Avenue Subsite, Second Street Subsite, North Landfill Subsite, and the Far-Mar-Co Subsite.

WEC consists of two fossil fuel combustion units. WEC Unit No. 1 (WEC1) is owned and operated by Hastings. WEC Unit No. 2 (WEC2) is owned by Public Power Generation Agency (PPGA), of which Hastings is a member and acts as operating agent for PPGA. WEC Temporary Ash Disposal Area is an existing unlined CCR surface impoundment of approximately 23.2 acres and serves the two fossil fuel combustion units.

CCR disposal at this site began in 1981, the same year that commercial operation of WEC1 began. Fossil fuel bottom ash and fly ash mixture (pond ash) from WEC1 is currently sluiced to the WEC Temporary Ash Disposal Area. Commercial operation of WEC2 began on May 1, 2011. Fly ash from the WEC2 silo is direct loaded into trucks for off-site beneficial use. WEC2 bottom ash is hauled in dump trucks and stockpiled within the limits of the disposal area. Scrubber ash from WEC2 is moisture conditioned and hauled to the disposal area. The sluiced pond ash and scrubber ash are kept apart in the WEC Temporary Ash Disposal Area by a separation berm. Hastings has marketed and utilized the CCR for beneficial reuse. The intent is to manage the CCR within the WEC Temporary Ash Disposal Area permitted limits and balance production with excavation for beneficial reuse.

1.3 Transition of Monitoring Programs

The following statistically significant increases (SSIs) were detected and reported in the 2017 WEC CCR Annual Groundwater Report in downgradient monitoring wells at the WEC Temporary Ash Disposal Area: calcium, chloride, sulfate, and total dissolved solids. An alternate source demonstration (ASD) was conducted for the published SSIs (dated May 1, 2018). The ASD established that the potential for an offsite source of contamination or natural variation in regional groundwater chemistry was supported for several of the SSIs, including calcium, chloride and total dissolved solids; however, this was not supported for sulfate based on the groundwater data available at the time. As a result, Hastings initiated an assessment monitoring program in 2018, as required in the CCR rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in 40 CFR §257.95. To continue collecting information on groundwater characteristics near the site, several investigative monitoring wells were installed, sampling was conducted, and a conceptual site model was completed in 2019. Assessment monitoring continued for sampling events in spring and fall 2021. No transition of monitoring programs occurred in 2021.

2 Monitoring Program Summary

The groundwater monitoring system currently consists of nine monitoring wells. Monitoring well details for the monitoring network, including the date of installation, are provided in **Table 1**. The locations of the monitoring wells in the groundwater monitoring program with respect to the WEC Temporary Ash Disposal Area are shown in **Figure 1**. Based on historical data collected at the site during Nebraska Department of Environment and Energy (NDEE) Title 132 semiannual monitoring, monitoring wells upgradient of the CCR unit (current background wells) include MW-5B, MW-6, and MW-9, and downgradient monitoring wells include MW-1, MW-2B, MW-3R, MW-4B, MW-7, and MW-8.

2.1 Groundwater Monitoring Network Condition Assessment

Hastings Utilities personnel evaluated the condition of each monitoring well in the groundwater monitoring system during the semiannual sampling events in April 2021 and December 2021. During the April 2021 sampling event, the dedicated pumps for MW-2B and MW-7 were not working, so the monitoring wells were sampled with a portable Geotech SS Geosub instead. The portable pump was decontaminated between samples, and an equipment blank was collected. The pumps were repaired prior to the December 2021 sampling event. The wells were noted in good working condition, concrete pads were intact, and no damage was observed to the protective well casings. No wells were added or abandoned from the certified monitoring well network in 2021.

2.2 Groundwater Purging and Sampling

Groundwater sampling events were conducted by Hastings Utilities personnel in April 2021 and December 2021 at the semiannual assessment monitoring events. Samples were collected in compliance with 40 CFR §257.90(c), which requires groundwater monitoring be conducted throughout the active life and post-closure care period of the CCR unit for wells in the

monitoring network. The number of samples collected for each background and downgradient well during each groundwater sample event, whether the sample was required by detection or assessment monitoring programs, and the date of each event is summarized in **Table 2**.

Groundwater sampling was conducted by Hastings Utilities personnel in accordance with the WEC Temporary Ash Disposal Area's Groundwater Sampling and Analysis Plan (SAP) dated October 2016, revised on February 21, 2020, and further revised with the NDEE Title 132 permit renewal on August 6, 2021. The monitoring wells were purged and sampled with dedicated Geotech SS Geosub pumps and controllers in the monitoring wells under low-flow sampling conditions (with the exception of MW-2B and MW-7 during the April 2021 sampling event; see **Section 2.1**). A calibrated water quality meter was used to monitor field parameters, including pH, temperature, turbidity, dissolved oxygen (DO), oxidation-reduction potential (ORP) and conductivity. Field sampling forms for the April 2021 and December 2021 sampling events are provided in **Appendix A**. After the water quality parameters stabilized, groundwater samples were collected and placed into iced coolers under chain-of-custody control pending delivery to the laboratories. Groundwater samples were analyzed by Eurofins TestAmerica. The laboratory analytical reports are provided in **Appendix B**.

2.3 Groundwater Elevations & Flow Direction

Static groundwater level measurements were recorded at the monitoring wells listed in **Table 1** prior to purging and sampling activities conducted during the groundwater sampling events. Groundwater measurements were used to determine groundwater elevations for monitoring wells (**Table 3**). Groundwater flow observed during the two assessment monitoring sampling events was to the northeast with an average flow velocity of 1.850 ft/day to 2.824 ft/day during the spring sampling event and 2.195 ft/day to 3.351 ft/day, which is consistent with historical data observed from 2007 to 2020 (see **Figures 2 and 3**).

2.4 Detection Monitoring Program Results

The results of background sampling events in November 2016 through June 2017 and the detection and assessment monitoring activities in October 2017 through December 2021 for Appendix III and Appendix IV constituents are presented in **Table 4** and **Table 5**.

2.5 Assessment Monitoring Program Results

The WEC Temporary Ash Disposal Area transitioned from the detection monitoring program to the assessment monitoring program following the ASD dated May 1, 2018. Groundwater sampling was completed as part of an assessment monitoring program for the WEC CCR unit in July 2018, as specified in 40 CFR §257.95(b), and October 2018, as specified in 40 CFR §257.95(d). The July and October 2018 sampling events were analyzed for the full Appendix III and Appendix IV constituent lists in accordance with 40 CFR §257.95(b) and 40 CFR §257.95(d). Semiannual sampling for the assessment monitoring program has continued through 2021. Samples were collected in accordance with 40 CFR §257.90(e). The samples were analyzed for all constituents from the Appendix III and IV lists. The results of the assessment monitoring events in April 2021 and December 2021 are presented in **Table 4** and

Table 5. At the time this report was issued, the contracted laboratory had not yet returned results for radium. Once the radium data is received, the analytical results and updated statistical analysis for radium will be placed in the operating record and uploaded to the facility's CCR website. If there are any SSIs for radium, they will also be noted at that time.

2.6 Statistical Analysis Results

Statistically derived background threshold values (BTVs) for Appendix III and Appendix IV constituents for assessment monitoring are provided in **Table 6**. Sampling results used to calculate BTVs were obtained during monitoring events conducted between November 2016 and November 2020. Background data sets will be updated every two years or during monitoring program transition, as recommended by the U.S. EPA's Unified Guidance, "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (2009) and in accordance with the facility's SAP. As a result of entering the assessment monitoring program, groundwater protection standards (GWPS) were established for all detected Appendix IV constituents. The GWPS were established in accordance with 40 CFR §257.95(h) and are presented in **Table 7**.

Spring and fall 2021 statistical analysis memos are included in **Appendix C**. The memos include a summary of the BTVs for the Appendix III and IV constituents in assessment monitoring. The memos also contain the results of statistical evaluation for SSIs above background and statistically significant levels (SSLs) above the GWPS at downgradient monitoring wells.

2.7 Other Information Required under 40 CFR §257.90-98

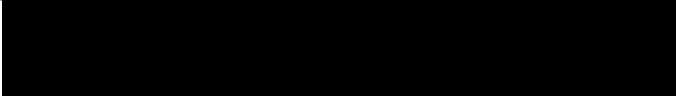
No other information is required under 40 CFR §257.90 through 40 CFR §257.98 at this time.

4 Key Activities for Upcoming Year

In 2022, all wells in the CCR groundwater monitoring network will be sampled at least semiannually, in accordance with the assessment monitoring program requirements (40 CFR §257.95). Analytical results will be evaluated for SSIs above background and for SSLs above the GWPS in spring and fall 2022. Results of the statistical analysis will be included in the 2022 Annual Groundwater Monitoring and Corrective Action Report.



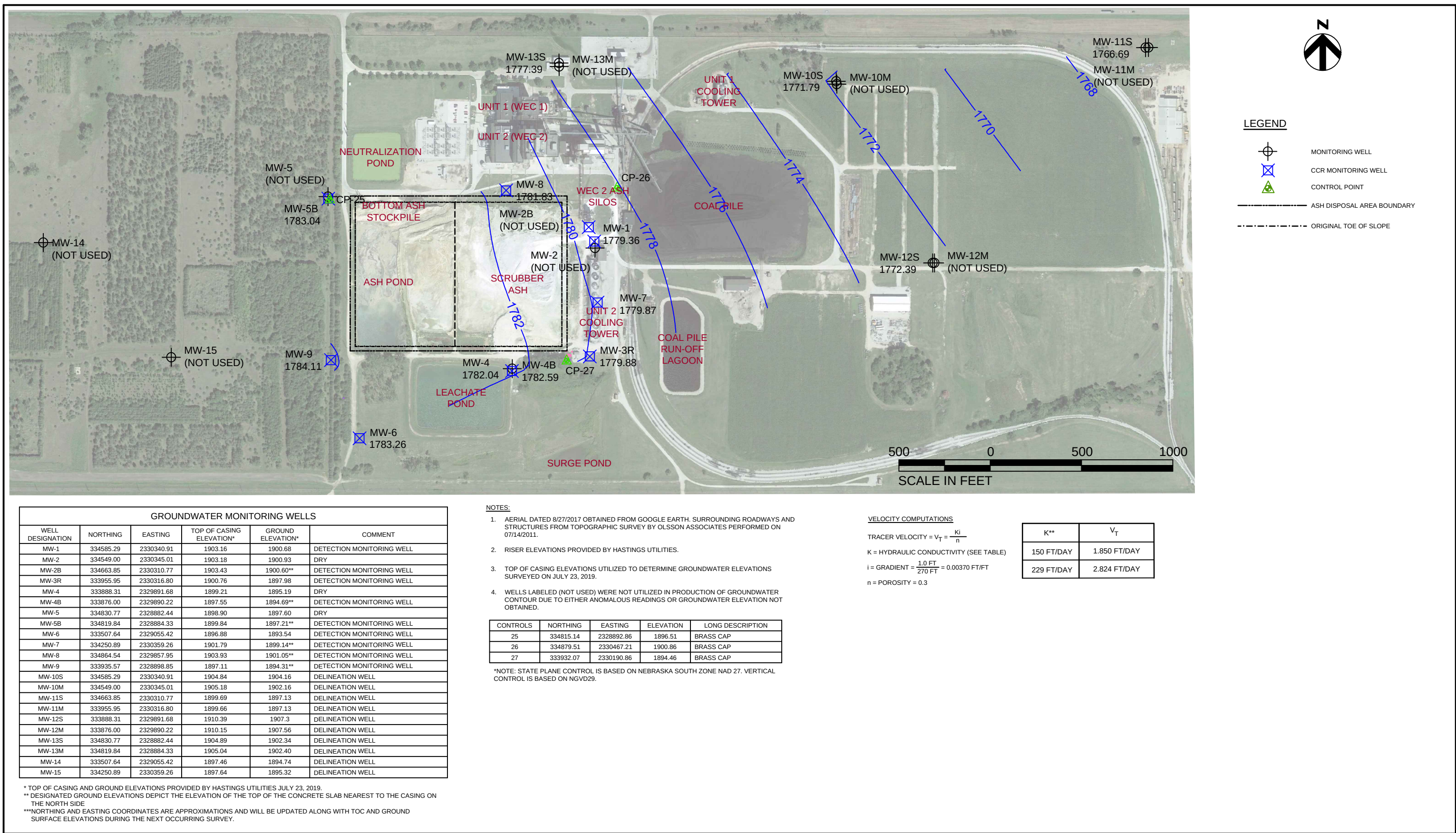
Figures



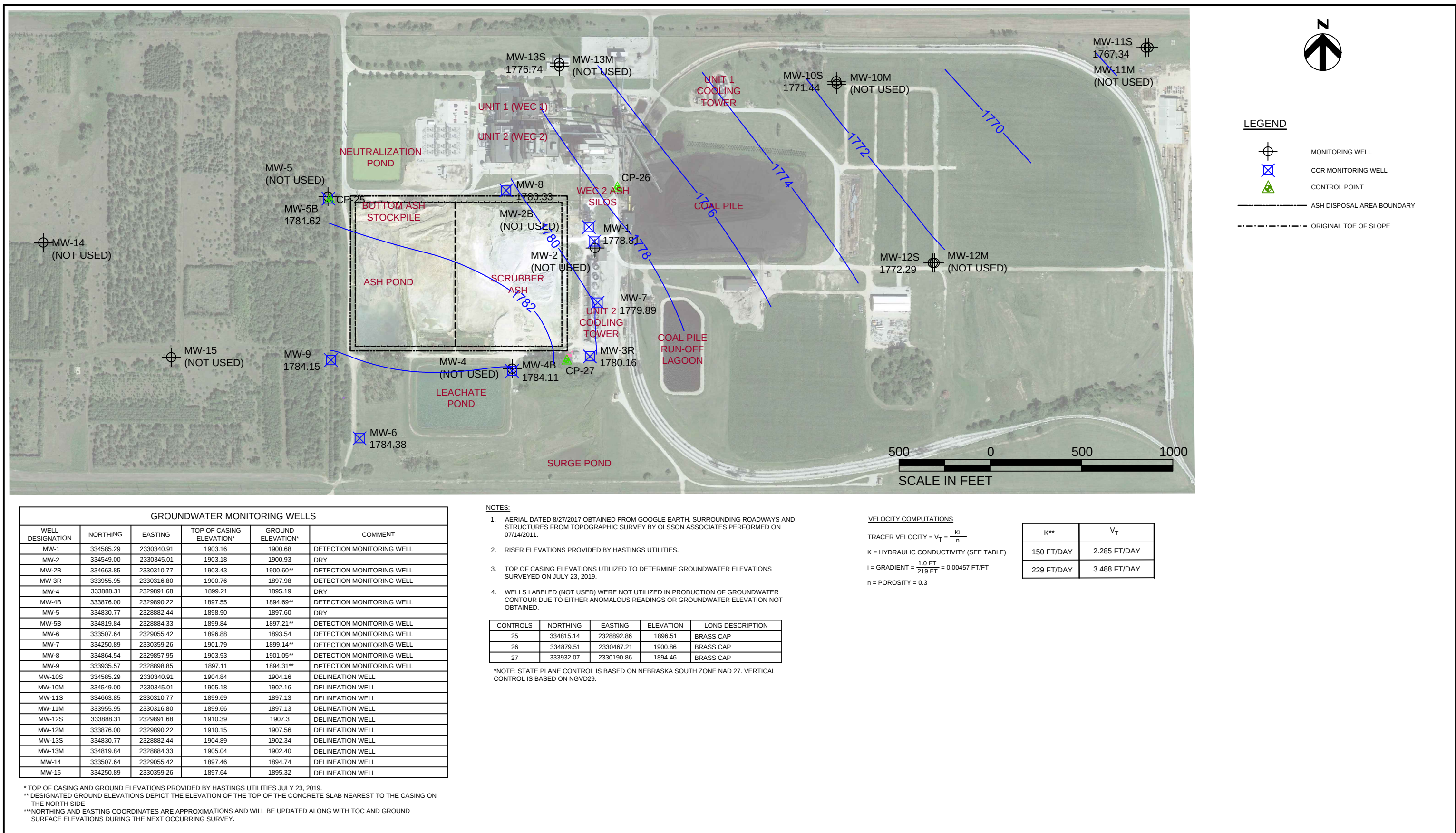
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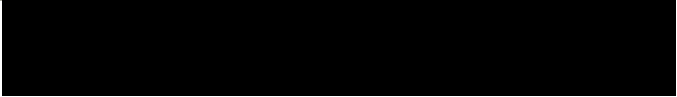
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Tables



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Table 1 - Groundwater Monitoring System

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

Monitoring Well ID	Date Installed	Boring Depth ^[1] (feet bgs)	Well Depth (feet bgs)	Screened Interval (feet bgs)	Location w/ respect to Temporary Ash Disposal Area	Top of Well Casing Elevation ^[4] (ft AMSL)
CCR Monitoring System Network						
MW-5B ^[2]	10/11/2016	122	121	111.0 – 121.0	Upgradient	1899.84
MW-6	10/5/2004	110.5	110	100.0 – 110.0	Upgradient	1896.88
MW-9	10/10/2016	118.5	117	107.0 – 117.0	Upgradient	1897.11
MW-1	7/28/1999	135	134	104.0 – 134.0	Downgradient	1903.16
MW-2B	10/18/2016	162	160	150.0 – 160.0	Downgradient	1903.43
MW-3R	1/29/2011	126.7	111.9	101.9 – 111.9	Downgradient	1900.76
MW-4B ^[3]	10/26/2016	121	119	109.0 – 119.0	Downgradient/Cross-gradient	1897.55
MW-7	10/7/2016	127.2	127	117.0 – 127.0	Downgradient	1901.79
MW-8	10/20/2016	131	127	117.0 – 127.0	Downgradient/Cross-gradient	1903.93
Investigative - Water Level Only Wells						
MW-10S	12/14/2018	144	140	130 - 140	Downgradient/Cross-gradient	1904.84
MW-10M	12/15/2018	190	187	177 - 187	Downgradient/Cross-gradient	1905.18
MW-11S	12/18/2018	154	150	140 - 150	Downgradient	1899.69
MW-11M	12/19/2018	184	184	174-184	Downgradient	1899.66
MW-12S	12/17/2018	144	144	130 - 140	Downgradient/Cross-gradient	1910.39
MW-12M	12/16/2018	177	170	160 - 170	Downgradient/Cross-gradient	1910.15
MW-13S	12/12/2018	154	140	130 - 140	Downgradient/Cross-gradient	1904.89
MW-13M	12/13/2018	191	187	177 - 187	Downgradient/Cross-gradient	1905.04
MW-14	12/11/2018	140	140	130 - 140	Upgradient	1897.46
MW-15	12/10/2018	140	140	130 - 140	Upgradient	1897.64

Notes:^[1] - Gravel pack (16-30 Silica Sand) was utilized to fill annulus between the bottom of the bore hole to approximately 2 feet above the top of screen.^[2] - MW-5B is a replacement well for MW-5 which has not had sufficient water to sample since 2014. MW-5 has not been abandoned; however it is not included in the monitoring well system.^[3] - MW-4B is a replacement well for MW-4 which has not had sufficient water to sample since 2014. MW-4 has not been abandoned; however it is not included in the monitoring well system.^[4] - Top of Well Casing Elevations (TOCs) were updated based on survey as of July 23, 2019.

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Table 2 - Groundwater Sampling Event Summary

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

Monitoring Well ID	# of Initial Background Samples	Initial Background Sample Dates	# of Detection Monitoring Samples	Detection Monitoring Sample Dates ^[1]	# of Assessment Monitoring Samples	Assessment Monitoring Sample Dates
Current background Monitoring Wells^[2]						
MW-5B	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21
MW-6	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21
MW-9	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/18/19, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21
Downgradient Monitoring Wells						
MW-1	8	11/17/2016, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 7/6/2017, 8/8/2017, 9/12/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/19/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21
MW-2B	9	12/21/2016, 1/23/2017, 2/21/2017, 3/23/2017, 4/26/2017, 5/26/2017, 6/27/2017, 8/8/2017, 9/12/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/19/2019, 2/17/2020, 5/6/2020, 11/18/2020, 4/20/21, 12/7/21
MW-3R	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21
MW-4B	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	11/01/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/15/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21
MW-7	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/20/21, 12/7/21
MW-8	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	9	7/25/2018, 10/16/2018, 5/13/2019, 11/18/19, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21

Notes:^[1] The March 5th - 7th, 2018 sampling event was conducted as part of the Alternate Source Demonstration.^[2] Background monitoring wells are generally upgradient of CCR Unit; however, groundwater direction may fluctuate due to seasonal variation in irrigation and/or production wells use.

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Table 3 - Groundwater Elevations

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

CCR Monitoring System Network																		
Historical TOC July 2019 TOC	MW-1		MW-2B		MW-3R		MW-4B		MW-5B		MW-6		MW-7		MW-8		MW-9	
	TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation	
	1902.93		1902.96		1900.45		1897.02		1899.16		1896.72		1901.23		1903.37		1896.54	
	1903.16		1903.43		1900.76		1897.55		1899.84		1896.88		1901.79		1903.93		1897.11	
Date	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)
11/16/2016	123.65	1779.28	135.65	1767.31	120.10	1780.35	113.28	1783.74	117.31	1781.85	112.40	1784.32	121.50	1779.73	122.08	1781.29	112.33	1784.21
12/20/2016	123.90	1779.03	137.60	1765.36	120.33	1780.12	113.50	1783.52	117.40	1781.76	N.M.	N.M.	121.50	1779.73	122.80	1780.57	112.48	1784.06
1/23/2017	123.70	1779.23	137.80	1765.16	120.06	1780.39	113.41	1783.61	117.52	1781.64	N.M.	N.M.	121.40	1779.83	122.85	1780.52	112.98	1783.56
2/21/2017	123.78	1779.15	138.00	1764.96	120.10	1780.35	113.59	1783.43	117.68	1781.48	112.75	1783.97	121.42	1779.81	122.90	1780.47	112.96	1783.58
3/23/2017	123.85	1779.08	137.25	1765.71	120.13	1780.32	113.70	1783.32	117.79	1781.37	112.95	1783.77	121.60	1779.63	122.96	1780.41	113.12	1783.42
4/26/2017	124.08	1778.85	135.78	1767.18	120.30	1780.15	114.15	1782.87	118.10	1781.06	113.30	1783.42	121.72	1779.51	123.30	1780.07	113.52	1783.02
5/26/2017	124.53	1778.40	135.50	1767.46	121.08	1779.37	114.69	1782.33	118.41	1780.75	113.59	1783.13	122.27	1778.96	123.65	1779.72	113.80	1782.74
6/27/2017	N.M.	N.M.	139.13	1763.83	120.82	1779.63	114.32	1782.70	117.97	1781.19	113.20	1783.52	122.05	1779.18	123.45	1779.92	112.53	1784.01
8/8/2017	124.48	1778.45	141.19	1761.77	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.
9/12/2017	124.53	1778.40	140.92	1762.04	121.18	1779.27	114.89	1782.13	117.10	1782.06	112.43	1784.29	122.32	1778.91	123.24	1780.13	110.75	1785.79
10/11/2017	124.68	1778.25	137.92	1765.04	121.34	1779.11	115.50	1781.52	117.72	1781.44	113.46	1783.26	122.53	1778.70	123.60	1779.77	112.83	1783.71
2/20/2018	125.50	1777.43	139.77	1763.19	121.85	1778.60	115.52	1781.50	117.80	1781.36	113.00	1783.72	123.25	1777.98	124.22	1779.15	111.40	1785.14
7/25/2018	126.29	1776.64	141.02	1761.94	122.95	1777.50	116.75	1780.27	119.42	1779.74	114.40	1782.32	124.14	1777.09	125.30	1778.07	113.52	1783.02
10/16/2018	125.78	1777.15	139.30	1763.66	121.71	1778.74	115.37	1781.65	118.70	1780.46	114.23	1782.49	123.32	1777.91	124.64	1778.73	113.77	1782.77
3/5/2019	122.40	1780.53	138.50	1764.46	120.85	1779.60	113.85	1783.17	117.28	1781.88	112.90	1783.82	122.00	1779.23	122.72	1780.65	112.33	1784.21
3/28/2019	124.16	1778.77	138.34	1764.62	120.46	1779.99	N.M.	N.M.	117.32	1781.84	112.35	1784.37	121.86	1779.37	122.80	1780.57	112.05	1784.49
4/30/2019	124.20	1778.73	137.13	1765.83	120.47	1779.98	N.M.	N.M.	117.85	1781.31	113.38	1783.34	121.90	1779.33	123.30	1780.07	113.33	1783.21
5/13/2019	124.56	1778.37	136.92	1766.04	120.98	1779.47	115.17	1781.85	118.37	1780.79	114.10	1782.62	122.35	1778.88	123.67	1779.70	114.03	1782.51
5/31/2019	125.10	1777.83	134.61	1768.35	121.77	1778.68	116.27	1780.75	118.88	1780.28	114.90	1781.82	122.98	1778.25	124.28	1779.09	114.84	1781.70
6/25/2019	125.59	1777.34	137.55	1765.41	121.55	1778.90	116.40	1780.62	119.00	1780.16	115.25	1781.47	121.20	1780.03	124.93	1778.44	115.25	1781.29
8/26/2019	125.47	1777.69	138.26	1765.17	121.39	1779.37	114.76	1782.79	119.36	1780.48	114.00	1782.88	123.00	1778.79	124.80	1779.13	114.10	1783.01
10/28/2019	124.62	1778.54	135.51	1767.92	120.95	1779.81	114.27	1783.28	117.70	1782.14	112.80	1784.08	122.22	1779.57	123.66	1780.27	111.20	1785.91
11/19/2019	124.32	1778.84	136.65	1766.78	121.08	1779.68	114.30	1783.25	116.87	1782.97	112.28	1784.60	122.10	1779.69	123.16	1780.77	110.10	1787.01
5/7/2020	124.23	1778.93	133.40	1770.03	121.44	1779.32	115.92	1781.63	117.00	1782.84	113.45	1783.43	122.37	1779.42	123.05	1780.88	112.85	1784.26
8/31/2020	124.50	1778.66	144.43	1759.00	121.17	1779.59	115.10	1782.45	116.63	1783.21	112.58	1784.30	122.40	1779.39	123.10	1780.83	109.80	1787.31
11/16/2020	125.24	1777.92	136.10	1767.33	122.20	1778.56	116.23	1781.32	117.60	1782.24	112.90	1783.98	123.20	1778.59	123.95	1779.98	110.95	1786.16
3/30/2021	124.08	1779.08	134.87	1768.56	121.25	1779.51	115.06	1782.49	116.70	1783.14	113.83	1783.05	122.20	1779.59	122.00	1781.93	112.82	1784.29
4/19/2021	123.80	1779.36	133.78	1769.65	120.88	1779.88	114.96	1782.59	116.80	1783.04	113.62	1783.26	121.92	1779.87	122.10	1781.83	113.00	1784.11
12/7/2021	124.35	1778.81	138.35	1765.08	120.60	1780.16	113.44	1784.11	118.22	1781.62	112.50	1784.38	121.90	1779.89	123.60	1780.33	112.96	1784.15

Notes:

TOC: Top of PVC well casing

N.M. = not measured

AMSL = above mean sea level

Table 3 - Groundwater Elevations

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

Investigative - Water Level Only Wells																				
Historical TOC July 2019 TOC	MW-10S		MW- 10M		MW-11S		MW-11M		MW-12S		MW-12M		MW-13S		MW-13M		MW-14		MW-15	
	TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation	
	1904.83		1905.08		1899.63		1899.63		1910.30		1910.06		1905.01		1905.07		1897.41		1897.65	
	1904.84		1905.18		1899.69		1899.66		1910.39		1910.15		1904.89		1905.04		1897.46		1897.64	
Date	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measure d Depth to Water (ft)	GW Elevation	Measure d Depth to Water (ft)	GW Elevation	Measure d Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation
1/3/2019	134.05	1770.78	142.90	1762.18	135.60	1764.03	133.70	1765.93	138.80	1771.50	145.85	1764.21	128.30	1776.71	140.85	1764.22	125.20	1772.21	126.40	1771.25
1/23/2019	133.90	1770.93	144.23	1760.85	135.50	1764.13	134.22	1765.41	138.74	1771.56	145.95	1764.11	128.14	1776.87	140.50	1764.57	125.34	1772.07	126.65	1771.00
3/6/2019	133.70	1771.13	144.43	1760.65	135.25	1764.38	137.58	1762.05	N.M	N.M	145.82	1764.24	128.15	1776.86	140.87	1764.20	125.07	1772.34	127.03	1770.62
3/28/2019	133.83	1771.00	143.00	1762.08	135.26	1764.37	136.98	1762.65	138.65	1771.65	145.68	1764.38	128.25	1776.76	144.70	1760.37	125.30	1772.11	127.40	1770.25
4/30/2019	133.50	1771.33	140.68	1764.40	134.50	1765.13	136.20	1763.43	138.38	1771.92	144.97	1765.09	128.09	1776.92	139.68	1765.39	124.45	1772.96	126.48	1771.17
5/13/2019	133.60	1771.23	140.38	1764.70	134.55	1765.08	136.30	1763.33	138.40	1771.90	144.88	1765.18	128.40	1776.61	139.25	1765.82	124.45	1772.96	126.30	1771.35
5/31/2019	133.49	1771.34	137.87	1767.21	133.92	1765.71	134.15	1765.48	138.40	1771.90	143.07	1766.99	128.44	1776.57	136.35	1768.72	N.M.	N.M.	N.M.	N.M.
6/25/2019	133.46	1771.37	141.48	1763.60	134.15	1765.48	136.22	1763.41	138.37	1771.93	145.00	1765.06	128.72	1776.29	139.80	1765.27	125.54	1771.87	127.75	1769.90
8/26/2019	142.64	1762.20	142.64	1762.54	135.95	1763.74	137.28	1762.38	138.63	1771.76	145.97	1764.18	129.25	1775.64	140.68	1764.36	125.57	1771.89	127.95	1769.69
10/28/2019	133.60	1771.24	140.15	1765.03	134.34	1765.35	135.15	1764.51	138.37	1772.02	143.78	1766.37	128.69	1776.20	138.08	1766.96	123.65	1773.81	125.62	1772.02
11/19/2019	133.50	1771.34	141.45	1763.73	134.24	1765.45	135.75	1763.91	138.25	1772.14	144.42	1765.73	128.45	1776.44	139.05	1765.99	124.16	1773.30	126.57	1771.07
2/18/2020	133.15	1771.69	140.70	1764.48	133.86	1765.83	135.22	1764.44	138.10	1772.29	144.15	1766.00	127.72	1777.17	138.68	1766.36	123.17	1774.29	125.55	1772.09
5/7/2020	132.46	1772.38	140.10	1765.08	132.35	1767.34	133.72	1765.94	137.75	1772.64	141.95	1768.20	127.28	1777.61	135.30	1769.74	121.62	1775.84	123.82	1773.82
9/1/2020	133.68	1771.16	152.02	1753.16	140.45	1767.34	144.55	1755.11	138.27	1772.12	152.35	1757.80	127.98	1776.91	147.60	1757.44	128.80	1768.66	132.02	1765.62
11/17/2020	133.55	1771.29	143.10	1762.08	135.16	1767.34	136.62	1763.04	138.33	1772.06	145.20	1764.95	128.30	1776.59	139.40	1765.64	124.10	1773.36	126.95	1770.69
3/30/2021	133.30	1771.54	138.60	1766.58	133.70	1767.34	134.60	1765.06	138.20	1772.19	143.20	1766.95	127.75	1777.14	136.70	1768.34	122.60	1774.86	125.20	1772.44
4/19/2021	133.05	1771.79	137.42	1767.76	133.00	1767.34	133.49	1766.17	138.00	1772.39	142.60	1767.55	127.50	1777.39	135.75	1769.29	121.70	1775.76	124.35	1773.29
12/7/2021	133.40	1771.44	143.80	1761.38	135.30	1767.34	137.55	1762.11	138.10	1772.29	145.95	1764.20	128.15	1776.74	143.80	1761.24	124.20	1773.26	127.90	1769.74

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-1	11/17/2016	1.0	41	31	0.28	6.15	165	510
	2/21/2017	1.2	39	31	0.28	6.68	166	506
	3/22/2017	1.2	38	31	0.29	6.8	175	436
	4/26/2017	1.4	42	31	0.29	6.69	175	412
	5/26/2017	1.3	38	32	0.28	6.7	184	412
	7/6/2017	1.4	37	32	0.29	6.49	170	510
	8/8/2017	1.3	36	34	0.29	6.51	191	504
	9/12/2017	1.5	40	34	0.30	6.76	179	480
	10/12/2017	1.4	38	32	0.28	6.50	158	492
	3/7/2018	1.18	33.8	32.1	<.500	6.79	165	322
	7/25/2018	1.14	38.1	28.9	<.500	6.14	182	432
	10/16/2018	1.39	37.1	27.9	<.500	6.51	155	400
	3/5/2019	1.16	43	27.8	0.382	6.75	160	404
	5/13/2019	1.06	44.6	33.6	0.549	6.31	203	476
	8/26/2019	1.35	38.7	29.5	<.500	6.11	182	634
	11/19/2019	1.14	32.2	26.7	0.445	6.94	152	354
	2/17/2020	1.13	30.4	24.8	0.259	5.74	143	364
	5/6/2020	1.35	36.2	26.7	0.587	5.34	158	390
	8/31/2020	1.32	30.0	27.6	0.724	6.86	140	342
	11/16/2020	0.969	28.2	24.8	0.374J	6.83	139	294
	4/19/2021	1.06	27.3	24.2	0.316J	6.94	149	344
	12/7/2021	1.19	35.7	29.2	0.663	6.72	169	342
MW-2B ^[2]	12/21/2016	0.43	80	31	0.31	7.24	174	566
	1/23/2017	0.52	84	30	0.26	7.08	192	518
	2/21/2017	0.50	82	30	0.29	6.84	169	572
	3/23/2017	0.47	77	30	0.30	6.84	176	502
	4/26/2017	0.52	86	30	0.30	6.85	168	536
	5/26/2017	0.46	83	30	0.29	6.81	184	494
	6/27/2017	0.55	90	30	0.31	6.94	169	584
	8/8/2017	0.48	69	30	0.31	6.68	176	730
	9/12/2017	0.57	83	30	0.31	6.66	177	548
	10/11/2017	0.51	82	30	0.28	6.73	159	644
	3/7/2018	0.547	83.4	28.7	<.500	6.79	167	458
	7/25/2018	0.632	77.1	27.9	<.500	6.28	164	460
	10/16/2018	0.538	86.4	26.6	<.500	6.53	149	456
	3/5/2019	0.606	96.3	27.8	0.401	6.63	158	488
	5/13/2019	0.489	79.1	30.8	0.552	6.32	168	480
	8/26/2019	0.548	82.0	28.2	<.500	6.06	163	486
	11/19/2019	0.572	78.3	26.6	0.274	6.69	151	444
	2/17/2020	0.548	79.5	27.5	<.500	5.47	157	458
	5/6/2020	0.600	86.8	27.1	0.534	5.15	149	472
	11/18/2020	0.562	79.2	26.1	<0.500	6.95	153	474
	4/20/2021	0.542	69.2	25.2	<0.500	6.93	144	410
	12/7/2021	0.537	71.7	28.4	0.667	6.83	150	394
MW-3R	11/16/2016	0.77	65	33	0.29	6.38	207	574
	12/20/2016	0.61	65	35	0.29	6.76	221	548
	1/23/2017	0.47	73	39	0.25	6.79	283	642
	2/21/2017	0.49	77	39	0.29	6.65	238	626
	3/22/2017	0.46	73	37	0.30	6.70	233	590
	4/26/2017	0.50	69	36	0.30	6.68	227	588
	5/26/2017	0.41	59	36	0.28	6.58	264	652
	6/27/2017	0.45	67	36	0.29	6.68	214	634
	10/11/2017	0.42	64	34	0.28	6.55	198	724
	3/7/2018	0.471	67.1	36.2	<.500	6.62	218	484
	7/25/2018	0.594	48.5	29	<.500	6.51	174	430
	10/16/2018	0.601	60	30.9	<.500	6.53	186	454
	3/7/2019	0.702	74.1	32.6	0.299	6.55	233	532

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

		Appendix III Constituents						
	Constituent	Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
	Reporting Unit	mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-3R	5/13/2019	0.616	71.1	37.0	0.519	6.46	232	540
	8/26/2019	0.667	75.4	35.1	<.500	5.88	213	550
	11/18/2019	0.704	63.3	31.7	0.481	6.58	191	484
	2/17/2020	0.811	81.2	33.4	<.500	5.69	240	566
	5/6/2020	0.971	90.8	34.8	0.401	5.53	278	622
	8/31/2020	0.951	79.3	22.8	0.374J	6.68	265	568
	11/16/2020	0.925	64.4	33.1	<0.500	6.58	237	522
	4/19/2021	0.847	60.3	34.2	<0.500	6.95	240	514
	12/7/2021	0.616	67.2	31.9	0.498J	6.62	201	418
MW-4B	11/16/2016	0.48	47	31	0.28	6.58	162	424
	12/20/2016	0.51	43	31	0.25	6.52	170	432
	1/23/2017	0.62	46	31	0.20	6.58	180	620
	2/21/2017	0.59	41	31	0.24	6.38	166	480
	3/22/2017	0.72	40	30	0.24	6.49	162	470
	4/26/2017	0.69	35	30	0.26	6.40	155	456
	5/26/2017	0.66	40	30	0.25	6.44	167	456
	6/27/2017	0.64	41	29	0.26	6.49	147	492
	11/1/2017	0.52	51	29	0.22	6.37	170	490
	3/7/2018	0.518	41.5	29.4	<.500	6.4	169	286
	7/25/2018	0.58	41.4	28.1	<.500	6.52	176	386
	10/16/2018	0.532	48.8	28.36	<.500	6.55	192	424
	3/7/2019	0.929	51.4	27.6	0.367	6.65	167	406
	5/15/2019	0.809	40.9	30.1	0.579	6.54	166	376
	8/27/2019	0.66	42.7	28.2	<.500	6.15	186	444
	11/18/2019	0.693	52.1	25.8	<.500	6.59	160	424
	2/17/2020	0.947	49.9	27.6	<.500	5.77	179	430
	5/6/2020	0.990	45.3	26.7	0.665	5.24	156	396
	8/31/2020	0.709	39.9	25.8	0.677	6.78	143	386
	11/16/2020	1.05	37.6	24.7	0.609	6.79	155	368
	4/19/2021	0.706	27.1	24.1	0.892	6.78	138	312
	12/7/2021	0.687	54.7	26.2	0.732	6.54	227	384
MW-5B	11/16/2016	1.2	39	30	1.1	6.35	157	428
	12/20/2016	1.2	37	30	1.2	7.11	33.5	492
	1/23/2017	1.3	33	30	1.2	7.26	174	412
	2/21/2017	1.3	36	30	1.3	6.91	159	480
	3/22/2017	1.2	35	30	1.3	7.03	167	482
	4/26/2017	1.3	35	30	1.3	7.07	164	438
	5/26/2017	1.1	35	30	1.3	6.44	173	460
	6/27/2017	1.1	43	29	1.2	6.95	164	492
	10/11/2017	1.1	72	30	0.86	6.58	132	662
	3/7/2018	1.15	63.1	29.5	1.34	6.65	182	512
	7/25/2018	1.89	55.3	26.7	0.896	6.55	172	436
	10/16/2018	1.23	78.3	26.1	0.714	6.56	178	542
	3/5/2019	0.333	24.4	29.3	0.672	6.84	164	382
	5/13/2019	0.759	39.3	29.1	1.50	6.49	167	412
	8/28/2019	0.674	38.2	26.8	1.4	6.94	151	448
	11/18/2019	0.783	49	25.5	0.984	6.18	174	458
	2/17/2020	1.91	52.7	24.7	0.597	5.30	209	456
	5/6/2020	1.54	48.2	20.0	1.41	5.86	172	440
	8/31/2020	1.17	39.6	22.0	1.26	7.25	136	340
	11/16/2020	1.33	34.6	23.4	1.10	7.30	135	372
	4/19/2021	1.03	32.7	21.1	1.11	7.17	139	346
	12/7/2021	1.07	47.5	25.2	1.52	7.16	184	326
MW-6	11/16/2016	0.55	60	31	0.36	6.24	157	470
	12/20/2016	0.6	59	32	0.35	6.88	172	452
	1/23/2017	0.75	64	33	0.3	7.04	175	472
	2/21/2017	0.72	58	32	0.34	6.86	158	478

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-6	3/22/2017	0.61	57	32	0.34	6.91	169	566
	4/26/2017	0.6	65	32	0.35	6.84	163	618
	5/26/2017	0.5	58	31	0.35	6.87	180	444
	6/27/2017	0.47	67	31	0.36	6.91	148	500
	10/11/2017	0.55	79	32	0.30	6.71	169	602
	3/7/2018	1.12	61.3	32.8	<.500	7.02	167	442
	7/25/2018	0.738	61.7	31.1	<.500	6.74	180	474
	10/16/2018	0.501	68.8	30.9	<.500	6.81	152	466
	3/5/2019	0.333	24.4	29.3	0.672	6.84	164	452
	5/13/2019	0.459	73.1	36.1	0.622	6.54	182	496
	8/26/2019	0.562	73.9	30.5	0.33	6.22	166	500
	11/18/2019	0.629	68.9	29.5	0.547	6.39	157	420
	2/17/2020	0.901	53.0	25.8	<.500	6.14	149	388
	5/6/2020	1.10	55.7	27.5	0.635	6.14	146	404
	8/31/2020	0.618	45.7	25.6	0.639	6.94	174	376
	11/16/2020	0.761	51.2	26.5	0.416J	6.82	148	416
MW-7	4/19/2021	0.855	46.3	27.4	0.433J	6.86	145	370
	12/7/2021	1.05	52.9	28.0	0.779	6.74	164	312
	11/16/2016	1.0	43	30	0.38	6.51	182	494
	12/20/2016	1.1	56	32	0.36	6.90	239	536
	1/23/2017	1.3	82	33	0.27	6.77	349	688
	2/21/2017	1.2	71	33	0.33	6.62	277	636
	3/22/2017	1.1	62	32	0.36	6.64	273	656
	4/26/2017	1.1	58	32	0.38	6.59	232	552
	5/26/2017	0.95	59	33	0.37	6.56	267	526
	6/27/2017	0.99	79	35	0.34	6.60	299	696
	10/11/2017	0.97	60	34	0.34	6.42	215	664
	3/7/2018	1.13	43	67.4	0.604	6.61	369	384
	7/25/2018	1.4	39.3	30.6	<.500	6.44	181	438
	10/16/2018	0.957	39	28.3	<.500	6.51	161	426
	3/5/2019	0.914	41	29.8	<.500	6.8	179	420
	5/13/2019	1.56	41.6	33.3	0.852	6.34	195	454
MW-8	8/26/2019	1.09	42.1	29.8	0.254	5.85	185	440
	11/18/2019	1.16	52.9	38.7	<.500	6.62	216	496
	2/17/2020	1.35	54.9	32.7	0.289	5.59	256	528
	5/6/2020	1.47	39.5	27.2	0.517	5.17	145	450
	8/31/2020	1.02	31.0	26.9	0.758	6.84	141	344
	11/16/2020	0.825	31.0	26.4	0.658	6.75	149	362
	4/20/2021	1.08	28.1	24.5	0.448J	6.83	145	320
	12/7/2021	1.31	79.7	47.5	0.67	6.52	348	608
	11/16/2016	1.1	40	31	0.63	6.5	157	496
	12/20/2016	1.1	40	32	0.63	7.70	185	416
	1/23/2017	1.3	41	32	0.58	7.50	175	402
	2/21/2017	1.3	45	33	0.64	7.26	180	434
	3/22/2017	1.2	41	33	0.69	7.19	181	472
	4/26/2017	1.3	45	33	0.76	7.23	189	442
	5/26/2017	1.2	60	35	0.75	7.14	272	566
	6/27/2017	1.3	68	35	0.77	7.21	247	594
	10/11/2017	1	65	33	0.81	7.05	216	600
	3/7/2018	1.69	52.8	30.1	1.12	6.96	168	416
	7/26/2018	1.89	38.6	26.47	0.969	6.53	158	398
	10/16/2018	1.5	41.3	27.1	0.724	6.53	160	400
	3/5/2019	1.49	46.6	27.1	1.11	6.77	188	450
	5/13/2019	1.13	35.7	31.0	1.36	6.53	174	418
	8/26/2019	0.975	32	27.3	0.888	6.37	156	418
	11/18/2019	1.04	58.5	32.2	1.08	6.87	265	506

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-8	2/17/2020	1.05	32.4	26.0	0.782	5.80	156	374
	5/7/2020	1.22	32.3	26.3	1.36	6.57	140	348
	8/31/2020	0.785	29.3	23.3	1.22	7.32	120	342
	11/16/2020	0.879	32.1	25.1	0.886	7.25	154	380
	4/19/2021	1.21	32.6	24.5	1.01	7.33	172	368
	12/7/2021	1.24	32.8	34.8	3.17	7.26	156	316
MW-9	11/16/2016	0.83	39	28	1.0	6.67	154	376
	12/20/2016	0.74	42	29	0.97	6.89	177	414
	1/23/2017	0.87	48	29	0.87	7.19	166	412
	2/21/2017	0.73	43	30	0.91	7.02	154	444
	3/22/2017	0.83	45	30	0.91	7.08	171	480
	4/26/2017	1.0	43	30	0.9	7.04	163	400
	5/26/2017	0.98	44	30	0.87	6.93	175	396
	6/27/2017	0.89	46	30	0.85	7.03	155	496
	10/11/2017	1.7	45	29	0.59	6.85	139	496
	3/7/2018	0.365	42.6	36.4	0.639	6.95	215	418
	7/25/2018	0.816	35.4	26.5	0.472	6.47	152	344
	10/16/2018	1.19	33.1	26.9	0.618	6.59	126	330
	3/5/2019	1.07	37.7	26.7	1.33	6.94	138	352
	5/13/2019	0.862	32.9	29.4	1.56	6.58	144	378
	8/26/2019	0.957	30.4	25.5	0.956	6.21	133	364
	11/18/2019	1.55	33.4	23.6	1.08	6.16	119	276
	2/17/2020	0.968	33.9	25.9	0.798	6.01	132	338
	5/6/2020	0.750	33.4	25.4	0.992	5.35	126	328
	8/31/2020	1.54	36.0	24.7	0.813	7.13	125	312
	11/16/2020	1.37	27.2	23.5	1.14	7.14	121	332
	4/19/2021	0.748	28.0	23.7	0.717	7.19	124	280
	12/7/2021	1.36	40.5	26.0	1.02	7.09	138	294

Notes:

^[1] During the spring 2020 semiannual sampling event, the pH meter did not calibrate within range, and therefore the pH values reported for the February 17th, 2020 and May 6th - 7th, 2020 sampling events were likely inaccurate. The values were marked as outliers for the fall 2020 sampling event and will not be used in future analysis. The meter was repaired after the spring 2020 sampling event.

^[2] During the August/September 2020 sampling event, the pump stopped working and therefore a sample was not collected.

* Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

< For the period of November 2016 through October 2019, the symbol indicates analyte not detected above the reporting limit, which is the value shown following the "<" symbol. Starting in January 2020, the symbol indicates analyte not detected above the method detection limit, which is the value shown following the "<" symbol.

"J" data qualifier indicates the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2022

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-1	11/17/2016 ^[1]	< 0.001	0.00341	0.0868	< 0.001	< 0.0005	0.0344	< 0.0005	0.28	< 0.0005	< 0.05	< 0.0002	0.0395	1.19	0.0367	< 0.001
	2/21/2017	< 0.001	0.00349	0.0826	< 0.001	< 0.0005	0.0344	< 0.0005	0.28	< 0.0005	< 0.05	< 0.0002	0.0387	1.22	0.0445	< 0.001
	3/22/2017	< 0.001	0.00314	0.0789	< 0.001	< 0.0005	0.0315	< 0.0005	0.29	< 0.0005	0.0146	< 0.0002	0.038	2.49	0.0411	< 0.001
	4/26/2017	< 0.001	0.00361	0.0812	< 0.001	< 0.0005	0.0336	< 0.0005	0.29	< 0.0005	0.0122	< 0.0002	0.0362	2.15	0.038	< 0.001
	5/26/2017	< 0.001	0.00338	0.0739	< 0.001	< 0.0005	0.0329	< 0.0005	0.28	< 0.0005	0.0154	< 0.0002	0.034	0.604	0.0377	< 0.001
	7/6/2017	< 0.001	0.00311	0.0788	< 0.001	< 0.0005	0.029	< 0.0005	0.29	< 0.0005	0.0126	< 0.0002	0.0337	1.16	0.042	< 0.001
	8/8/2017	< 0.001	0.00289	0.0806	< 0.001	< 0.0005	0.0259	< 0.0005	0.29	< 0.0005	0.0117	< 0.0002	0.031	1.02	0.0395	< 0.001
	9/12/2017	< 0.001	0.00288	0.0713	< 0.001	< 0.0005	0.0248	< 0.0005	0.30	0.0077	0.0117	< 0.0002	0.0353	1.41	0.0437	< 0.001
	10/12/2017	< 0.001	0.00362	0.0754	< 0.001	< 0.0005	0.025	< 0.0005	0.28	< 0.0005	0.0119	< 0.0002	0.0369	2.12	0.0369	< 0.001
	3/7/2018	0.000207J	0.00398	0.0699	<0.00100	< 0.000500	0.0306	0.000101J	<0.500	< 0.000500	0.0111	< 0.000200	0.035	0.842	0.0439	< 0.00100
	7/25/2018	< 0.00100	0.00399	0.0821	<0.00100	< 0.000500	0.033	0.00018J	<0.500	< 0.000500	0.0109	< 0.000200	0.0284	0.842	0.13	< 0.00100
	10/16/2018	< 0.00100	0.00444	0.0754	<0.00100	< 0.000500	0.033	0.000129J	<0.500	< 0.000500	0.0116	< 0.000200	0.0299	0.477	0.0894	< 0.00100
	3/5/2019	< 0.00100	0.00522	0.0973	<0.00100	< 0.000500	0.0413	0.000149J	0.382J	< 0.000500	0.0142	< 0.000200	0.0402	0.949	0.102	< 0.00100
	5/13/2019	<0.00300	0.00413	0.102	<0.00100	< 0.000500	0.0365	<0.00100	0.549	< 0.000500	0.0123	< 0.000200	0.0337	0.838	0.0943	<0.00200
	8/26/2019	< 0.00100	0.00409	0.0843	<0.00100	<0.000100	0.0311	0.000105J	<0.500	< 0.000500	0.0125	< 0.000200	0.0422	Not Sampled	0.0587	< 0.00100
	11/19/2019	< 0.00100	0.00447	0.0673	<0.00100	<0.000100	0.0315	0.000102J	0.445J	< 0.000500	0.00881J	< 0.000200	0.0386	1.53	0.0394	< 0.00100
	2/17/2020	<0.00100	0.00473	0.0640	<0.00100	<0.000100	0.0303	0.000129J	0.259J	<0.000500	0.0111	< 0.000200	0.0420	1.32	0.0448	<0.00100
	5/6/2020	<0.00100	0.00459	0.0770	<0.00100	<0.000100	0.0327	0.000119J	0.587	<0.000500	0.0107	<0.000200	0.0441	Not Sampled ^[3]	0.0668	<0.00100
	8/31/2020	<0.00100	0.00414	0.0655	<0.00100	<0.000100	0.0296	0.0000990J	0.724	<0.000500	0.0104	<0.000200	0.0436	Not Sampled	0.0404	<0.00100
	11/16/2020	<0.00100	0.00409	0.0627	<0.00100	<0.000100	0.0329	<0.000500	0.374J	<0.000500	0.0101	<0.000200	0.0395	0.269U	0.0297	<0.00100
	4/19/2021	<0.00200	0.00367	0.0726	<0.00100	<0.000100	0.0323	0.0000930J	0.316J	<0.000500	0.00997J	<0.000200	0.0281	0.647	0.0385	<0.00100
	12/7/2021	<0.00200	0.00298	0.0797	<0.00100	<0.000100	0.0324	<0.000500	0.663	<0.000500	0.00981J	<0.000200	0.0432	Results Pending ^[4]	0.072	<0.00100
MW-2B ^[2,4]	12/21/2016	< 0.001	0.00213	0.162	< 0.001	< 0.0005	0.0178	< 0.0005	0.31	< 0.0005	< 0.05	< 0.0002	0.0043	3.74 U	0.0325	< 0.001
	1/23/2017	< 0.001	0.00204	0.159	< 0.001	< 0.0005	0.0144	< 0.0005	0.26	< 0.0005	< 0.05	< 0.0002	0.00329	1.56	0.0316	< 0.001
	2/21/2017	< 0.001	0.00224	0.172	< 0.001	< 0.0005	0.0154	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.00302	1.25	0.036	< 0.001
	3/23/2017	< 0.001	< 0.002	0.161	< 0.001	< 0.0005	0.0154	< 0.0005	0.30	< 0.0005	0.0142	< 0.0002	0.00325	2.26 U	0.0335	< 0.001
	4/26/2017	< 0.001	0.00235	0.183	< 0.001	< 0.0005	0.018	< 0.0005	0.30	< 0.0005	0.014	< 0.0002	0.00312	0.848	0.0351	< 0.001
	5/26/2017	< 0.001	< 0.002	0.165	< 0.001	< 0.0005	0.015	< 0.0005	0.29	< 0.0005	0.0151	< 0.0002	0.00249	1.12	0.0308	< 0.001
	6/27/2017	< 0.001	< 0.002	0.167	< 0.001	< 0.0005	0.0173	< 0.0005	0.31	< 0.0005	0.0143	< 0.0002	0.00277	1.71	0.0347	< 0.001
	8/8/2017	< 0.001	< 0.002	0.159	< 0.001	< 0.0005	0.0175	< 0.0005	0.31	< 0.0005	0.0143	< 0.0002	0.00254	1.32	0.0358	< 0.001
	9/12/2017	< 0.001	< 0.002	0.142	< 0.001	< 0.0005	0.153	< 0.0005	0.31	< 0.0005	< 0.01	< 0.0002	0.00258	1.67	0.0373	< 0.001
	10/11/2017	< 0.001	0.00211	0.174	< 0.001	< 0.0005	0.0154	< 0.0005	0.28	< 0.0005	0.0142	< 0.0002	0.00248	2.06	0.0324	< 0.001
	3/7/2018	0.000202J	0.00224	0.176	<0.00100	< 0.000500	0.0175	0.000075J	<0.500	< 0.000500	0.0141	< 0.000200	0.0026	1.38	0.0358	< 0.00100
	7/25/2019	< 0.00100	0.00216	0.169	<0.00100	< 0.000500	0.018	0.000067J	<0.500	< 0.000500	0.0127	< 0.000200	0.00287	1.26	0.0366	< 0.00100
	10/16/2018	< 0.00100	0.00245	0.19	<0.00100	< 0.000500	0.0174	0.000374J	<0.500	0.000934	0.0156	< 0.000200	0.00245	1.24	0.0324	< 0.00100
	3/5/2019	< 0.00100	0.00265	0.22	<0.00100	< 0.000500	0.0205	< 0.000500	0.401J	< 0.000500	0.0173	< 0.000200	0.00313	1.59	0.0419	< 0.00100
	5/13/2019	<0.00300	0.00235	0.181	<0.00100	< 0.000500	0.0163	<0.00100	0.552	< 0.000500	0.013	< 0.000200	0.00264J	0.994	0.0382	<0.00200
	8/26/2019	< 0.00100	0.0023	0.174	<0.00100	< 0.000100	0.0165	< 0.000500	<0.500	< 0.000500	0.0146	< 0.000200	0.00251	Not Sampled	0.0362	< 0.00100
	11/19/2019	< 0.00100	0.00211	0.167	<0.00100	< 0.000100	0.0157	< 0.000500	0.274J	< 0.000500	0.0128	< 0.000200	0.00248	1.23	0.0339	< 0.00100
	2/17/2020	<0.00100	0.00217	0.184	<0.00100	<0.000100	0.0170	0.000100J	<0.500	<0.000500	0.0161	<0.000200	0.00249	2.12	0.0369	<0.00100
	5/6/2020	<0.00100	0.00237	0.193	<0.00100	<0.000100	0.0183	0.000347J	0.534	<0.000500	0.0145	<0.000200	0.00356	Not Sampled ^[3]	0.0363	<0.00100
	11/18/2020	<0.00100	0.00203	0.178	<0.00100	<0.0001000	0.0172	<0.000500	<0.500	<0.000500	0.0144	<0.000200	0.00267	0.982	0.0372	<0.00100
	4/20/2021	<0.00200	0.00204	0.193	<0.00100	<0.000100	0.0171	<0.000500	<0.500	<0.000500	0.0138	<0.000200	0.00265	0.768	0.0339	<0.00100
	12/7/2021	<0.00200	0.00174J	0.162	<0.00100	<0.000100	0.0178	<0.000500	0.667	<0.000500	0.0132	<0.000200	0.003	Results Pending ^[4]	0.0359	<0.00100
MW-3R	11/16/2016 ^[1]	< 0.001	0.00246	0.0857	< 0.001	< 0.0005	0.00941	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.00414	0.791	0.0421	< 0.001
	12/20/2016	< 0.001	0.00285	0.0927	< 0.001	< 0.0005	0.00785	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.00412	1.35	0.0367	< 0.001
	1/23/2017	< 0.001	0.0024	0.102	< 0.001	< 0.0005	0.00553	< 0.0005	0.25	< 0.0005	< 0.05	< 0.0002	0.00294	1.35	0.0348	< 0.001
	2/21/2017	< 0.001	0.00261	0.0993	< 0.001	< 0.0005	0.00526	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.0031	1.31 U	0.0339	< 0.001

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2022

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-3R	3/22/2017	< 0.001	0.00226	0.0906	< 0.001	< 0.0005	< 0.005	< 0.0005	0.30	< 0.0005	0.0274	< 0.0002	0.00335	1.42	0.0319	< 0.001
	4/26/2017	< 0.001	0.00276	0.087	< 0.001	< 0.0005	< 0.005	< 0.0005	0.30	< 0.0005	0.0258	< 0.0002	0.00365	0.44	0.032	< 0.001
	5/26/2017	< 0.001	0.00238	0.0757	< 0.001	< 0.0005	< 0.005	< 0.0005	0.28	< 0.0005	0.0292	< 0.0002	0.00302	1.21	0.0299	< 0.001
	6/27/2017	< 0.001	0.00224	0.0814	< 0.001	< 0.0005	0.00578	< 0.0005	0.29	< 0.0005	0.03	< 0.0002	0.00361	1.28	0.0339	< 0.001
	10/11/2017	< 0.001	0.0026	0.756	< 0.001	< 0.0005	0.00876	< 0.0005	0.28	< 0.0005	< 0.01	< 0.0002	0.00271	2.15	0.0333	< 0.001
	3/7/2018	0.000192J	0.00231	0.0672	< 0.00100	< 0.000500	0.00877	0.000064J	< 0.500	< 0.000500	0.0262	< 0.000200	0.00251	0.843	0.0384	< 0.00100
	7/25/2018	< 0.00100	0.00205	0.0611	< 0.00100	< 0.000500	0.00675	< 0.000500	< 0.500	< 0.000500	0.0258	< 0.000200	0.00322	0.637	0.0255	< 0.00100
	10/16/2018	< 0.00100	0.00225	0.0709	< 0.00100	< 0.000500	0.00463J	< 0.000500	< 0.500	< 0.000500	0.0299	< 0.000200	0.00327	0.519	0.0277	< 0.00100
	3/7/2019	< 0.00100	0.00204	0.0784	< 0.00100	< 0.000500	0.0126	0.000279	0.299J	< 0.000500	0.0302	< 0.000200	0.00476	1.55	0.0607	< 0.00100
	5/13/2019	< 0.00300	0.00231	0.0802	< 0.00100	< 0.000500	0.0125	< 0.00100	0.519	< 0.000500	0.0274	< 0.000200	0.00566	0.921	0.0590	< 0.00200
	8/26/2019	< 0.00100	0.00246	0.079	< 0.00100	< 0.000100	0.00392J	< 0.000500	< 0.500	< 0.000500	0.0302	< 0.000200	0.00613	Not Sampled	0.035	< 0.00100
	11/18/2019	< 0.00100	0.00259	0.0651	< 0.00100	< 0.000100	0.00385J	< 0.000500	0.481J	< 0.000500	0.0266	< 0.000200	0.00553	1.04	0.038	< 0.00100
	2/17/2020	< 0.00100	0.00220	0.0874	< 0.00100	< 0.000100	0.00355J	0.000108J	< 0.500	< 0.000500	0.0327	< 0.000200	0.00401	1.49	0.0595	< 0.00100
	5/6/2020	< 0.00100	0.00239	0.0905	< 0.00100	< 0.000100	0.01	0.000188J	0.401J	< 0.000500	0.0306	< 0.000200	0.00593	Not Sampled ^[3]	0.0606	< 0.00100
	8/31/2020	< 0.00100	0.00217	0.0755	< 0.00100	< 0.000100	0.0125	0.0003J	0.374J	< 0.0005000	0.0322	< 0.000200	0.00673	Not Sampled	0.0398	< 0.001000
	11/16/2020	< 0.00100	0.00198J	0.0611	< 0.00100	< 0.0001	0.0237	0.000668	< 0.500	< 0.000500	0.0314	< 0.000200	0.0107	0.427U	0.0351	< 0.00100
	4/19/2021	< 0.00200	0.00234	0.0585	< 0.00100	< 0.000100	0.0233	0.000806	< 0.500	< 0.000500	0.0271	< 0.000200	0.0122	0.184U	0.0382	< 0.00100
	12/7/2021	< 0.00200	0.00190J	0.0648	< 0.00100	< 0.000100	0.0353	0.000873	0.498J	< 0.000500	0.0248	< 0.000200	0.0114	Results Pending ^[4]	0.0495	< 0.00100
MW-4B	11/16/2016 ^[1]	< 0.001	0.00281	0.0364	< 0.001	< 0.0005	0.00648	< 0.0005	0.28	< 0.0005	< 0.05	< 0.0002	0.0123	0.424 U	0.0288	< 0.001
	12/20/2016	< 0.001	0.00297	0.0327	< 0.001	< 0.0005	< 0.005	< 0.0005	0.25	< 0.0005	< 0.05	< 0.0002	0.00402	1.08	0.0253	< 0.001
	1/23/2017	< 0.001	0.00286	0.033	< 0.001	< 0.0005	< 0.005	< 0.0005	0.20	< 0.0005	< 0.05	< 0.0002	0.00314	0.737	0.0281	< 0.001
	2/21/2017	< 0.001	0.00316	0.0337	< 0.001	< 0.0005	< 0.005	< 0.0005	0.24	< 0.0005	< 0.05	< 0.0002	0.00287	0.555 U	0.0263	< 0.001
	3/22/2017	< 0.001	0.00274	0.0296	< 0.001	< 0.0005	< 0.005	< 0.0005	0.24	< 0.0005	0.0321	< 0.0002	0.00266	0.775	0.0256	< 0.001
	4/26/2017	< 0.001	0.00376	0.0323	< 0.001	< 0.0005	0.00508	< 0.0005	0.26	< 0.0005	0.0313	< 0.0002	0.00324	0.917	0.0308	< 0.001
	5/26/2017	< 0.001	0.00315	0.0291	< 0.001	< 0.0005	0.00758	< 0.0005	0.25	< 0.0005	0.0373	< 0.0002	0.00327	0.625 U	0.029	< 0.001
	6/27/2017	< 0.001	0.0032	0.0319	< 0.001	< 0.0005	0.0105	< 0.0005	0.26	< 0.0005	0.0296	< 0.0002	0.00411	0.0747 U	0.0291	< 0.001
	11/1/2017	0.0011	< 0.002	0.0356	< 0.001	< 0.0005	0.0123	< 0.0005	0.22	< 0.0005	0.0325	< 0.0002	0.00515	2.33	0.0323	< 0.001
	3/7/2018	< 0.00100	0.00228	0.032	< 0.00100	< 0.000500	0.00444J	< 0.000500	< 0.500	< 0.000500	0.0271	< 0.000200	0.00557	0.468	0.0177	< 0.00100
	7/25/2018	< 0.00100	0.00202	0.0319	< 0.00100	< 0.000500	0.00328J	< 0.000500	< 0.500	< 0.000500	0.026	< 0.000200	0.00458	0.614	0.016	< 0.00100
	10/16/2018	< 0.00100	0.00245	0.0353	< 0.00100	< 0.000500	0.00185	< 0.000500	< 0.500	0.000606	0.031	< 0.000200	0.00604	0.26 U	0.0103	< 0.00100
	3/7/2019	< 0.00100	0.00319	0.0443	< 0.00100	< 0.000500	0.0131	< 0.000500	0.367J	< 0.000500	0.0311	< 0.000200	0.0139	0.899	0.0529	< 0.00100
	5/13/2019	< 0.00300	0.00278	0.0337	< 0.00100	< 0.000500	0.0639	0.00287	0.579	0.000195J	0.0245	< 0.000200	0.0259	1.19	0.0232	< 0.00200
	8/27/2019	< 0.00100	0.00261	0.0347	< 0.00100	< 0.000100	< 0.00500	< 0.000500	< 0.500	< 0.000500	0.0265	< 0.000200	0.00578	Not Sampled	0.0156	< 0.00100
	11/18/2019	< 0.00100	0.00447	0.0403	< 0.00100	< 0.000100	0.00933	< 0.000500	< 0.500	< 0.000500	0.0334	< 0.000200	0.00683	0.975	0.0656	< 0.00100
	2/17/2020	< 0.00100	0.00250	0.0392	< 0.00100	< 0.000100	0.0148	< 0.000500	< 0.500	< 0.000500	0.0314	< 0.000200	0.0145	1.85	0.0538	< 0.00100
	5/6/2020	< 0.00100	0.00286	0.0349	< 0.00100	< 0.000100	0.0216	< 0.000500	0.665	< 0.000500	0.0228	< 0.000200	0.0188	Not Sampled ^[3]	0.0416	< 0.00100
	8/31/2020	< 0.00100	0.00270	0.0327	< 0.00100	< 0.000100	0.024	< 0.000500	0.677	< 0.000500	0.0213	< 0.000200	0.0151	Not Sampled	0.036	< 0.00100
	11/16/2020	< 0.00100	0.00238	0.031	< 0.00100	< 0.000100	0.0246	< 0.000500	0.609	< 0.000500	0.0174	< 0.000200	0.0185	0.707	0.0372	< 0.00100
	4/19/2021	< 0.00200	0.00345	0.0276	< 0.00100	< 0.000100	0.0267	< 0.000500	0.892	< 0.000500	0.0150	< 0.000200	0.0172	0.375	0.0250	< 0.00100
	12/7/2021	< 0.00200	0.00227	0.0623	< 0.00100	0.0000520J	< 0.00500	< 0.000500	0.732	< 0.000500	0.0214	< 0.000200	0.0108	Results Pending ^[4]	0.0445	< 0.00100
MW-5B	11/16/2016 ^[1]	< 0.001	0.00562	0.0379	< 0.001	< 0.0005	0.0342	< 0.0005	1.1	< 0.0005	< 0.05	< 0.0002	0.029	1.42	0.0662	< 0.001
	12/20/2016	< 0.001	0.00601	0.035	< 0.001	< 0.0005	0.0312	< 0.0005	1.2	< 0.0005	< 0.05	< 0.0002	0.028	0.672 U	0.0683	< 0.001
	1/23/2017	< 0.001	0.00568	0.0347	< 0.001	< 0.0005	0.0314	< 0.0005	1.2	< 0.0005	< 0.05	< 0.0002	0.0283	0.344	0.0672	< 0.001
	2/21/2017	< 0.001	0.00609	0.0352	< 0.001	< 0.0005	0.0327	< 0.0005	1.3	< 0.0005	< 0.05	< 0.0002	0.0282	0.659	0.0655	< 0.001
	3/22/2017	< 0.001	0.00553	0.0354	< 0.001	< 0.0005	0.0308	< 0.0005	1.3	< 0.0005	0.0123	< 0.0002	0.0273	1.07	0.0594	< 0.001
	4/26/2017	< 0.001	0.00632	0.0344	< 0.001	< 0.0005	0.0329	< 0.0005	1.3	< 0.0005	0.0103	< 0.0002	0.0276	0.607	0.054	< 0.001
	5/26/2017	< 0.001	0.0055	0.0311	< 0.001	< 0.0005	0.0325	< 0.0005	1.3	< 0.0005	0.0125	< 0.0002	0.0229	0.228 U	0.0474	< 0.001

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2022

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-5B	6/27/2017	< 0.001	0.00529	0.0378	< 0.001	< 0.0005	0.0392	< 0.0005	1.2	< 0.0005	0.013	< 0.0002	0.0234	-0.00269 U	0.0634	< 0.001
	10/11/2017	< 0.001	0.0036	0.0632	< 0.001	< 0.0005	0.0404	< 0.0005	0.86	< 0.0005	0.0151	< 0.0002	0.0195	1.99	0.104	< 0.001
	3/7/2018	0.000202J	0.00393	0.0531	<0.00100	< 0.000500	0.0302	0.000405J	1.34	< 0.000500	0.0134	< 0.000200	0.026	0.694	0.17	< 0.00100
	7/25/2018	<0.00100	0.00399	0.0473	<0.00100	< 0.000500	0.0368	0.000188J	0.896	< 0.000500	0.0117	< 0.000200	0.0404	0.527	0.1	< 0.00100
	10/16/2018	<0.00100	0.00409	0.0623	<0.00100	< 0.000500	0.0306	0.00012J	0.714	< 0.000500	0.0144	< 0.000200	0.026	0.878	0.108	< 0.00100
	3/5/2019	<0.00100	0.00645	0.0469	<0.00100	< 0.000500	0.0484	0.000125J	1.28	0.000703	0.0176	< 0.000200	0.047	0.313 U	0.0588	< 0.00100
	5/15/2019	<0.00300	0.00485	0.0415	<0.00100	< 0.000500	0.0378	<0.00100	1.5	< 0.000500	0.0125	< 0.000200	0.0259	0.352 U	0.0771	<0.00200
	8/28/2019	<0.00100	0.00505	0.0387	<0.00100	< 0.000100	0.0369	0.000149J	1.4	0.000279J	0.0136	< 0.000200	0.0209	Not Sampled	0.0685	< 0.00100
	11/18/2019	0.000709J	0.00499	0.0492	<0.00100	< 0.000100^	0.0389	0.000141J	0.984	< 0.000500	0.0143	< 0.000200	0.0163	0.945	0.106	< 0.00100
	2/17/2020	<0.00100	0.00266	0.0574	<0.00100	<0.000100	0.0485	0.000298J	0.597	<0.000500	0.0172	<0.000200	0.0401	1.30	0.131	<0.00100
	5/6/2020	<0.00100	0.00381	0.0496	<0.00100	<0.000100	0.05	0.000420J	1.41	<0.000500	0.0115	<0.000200	0.0635	Not Sampled ^[3]	0.182	<0.00100
	8/31/2020	<0.00100	0.00507	0.0412	<0.00100	<0.000100	0.0439	0.000217J	1.26	0.000190J	0.0109	<0.000200	0.0462	Not Sampled	0.116	<0.00100
	11/16/2020	<0.00100	0.00498	0.0349	<0.00100	<0.000100	0.0383	0.000166J	1.1	<0.000500	0.0105	<0.000200	0.0396	0.203U	0.0938	<0.00100
	4/19/2021	<0.00200	0.00589	0.0423	<0.00100	<0.000100	0.0445	0.000140J	1.11	<0.000500	0.0108	<0.000200	0.0444	1.17	0.122	<0.00100
	12/7/2021	<0.00200	0.00400	0.0481	<0.00100	<0.000100	0.0435	<0.000500	1.52	<0.000500	0.0120	<0.000200	0.0242	Results Pending ^[4]	0.0843	<0.00100
MW-6	11/16/2016 ^[1]	< 0.001	0.0025	0.0496	< 0.001	< 0.0005	0.00601	< 0.0005	0.36	< 0.0005	< 0.05	< 0.0002	0.00761	2.03	0.0397	< 0.001
	12/20/2016	< 0.001	0.0022	0.0423	< 0.001	< 0.0005	< 0.005	< 0.0005	0.35	< 0.0005	< 0.05	< 0.0002	0.00685	0.453	0.0427	< 0.001
	1/23/2017	< 0.001	0.00234	0.0456	< 0.001	< 0.0005	< 0.005	< 0.0005	0.3	0.0207	< 0.05	< 0.0002	0.00746	1.38 U	0.059	< 0.001
	2/21/2017	< 0.001	0.00336	0.058	< 0.001	< 0.0005	0.00998	< 0.0005	0.34	< 0.0005	< 0.05	< 0.0002	0.0105	0.487	0.0913	< 0.001
	3/22/2017	< 0.001	0.00226	0.0454	< 0.001	< 0.0005	0.00896	< 0.0005	0.34	< 0.0005	0.015	< 0.0002	0.00795	0.988	0.0606	< 0.001
	4/26/2017	< 0.001	0.0027	0.051	< 0.001	< 0.0005	0.011	< 0.0005	0.35	< 0.0005	0.0146	< 0.0002	0.00795	1.52	0.0612	< 0.001
	5/26/2017	< 0.001	0.00237	0.0406	< 0.001	< 0.0005	0.0126	< 0.0005	0.35	< 0.0005	0.0164	< 0.0002	0.00771	0.528 U	0.042	< 0.001
	6/27/2017	< 0.001	0.00259	0.0454	< 0.001	< 0.0005	0.0133	< 0.0005	0.36	< 0.0005	0.0163	< 0.0002	0.00831	0.427	0.0415	< 0.001
	10/11/2017	< 0.001	0.00244	0.0535	< 0.001	< 0.0005	0.016	< 0.0005	0.30	< 0.0005	0.015	< 0.0002	0.00713	1.95	0.0528	< 0.001
	3/7/2018	0.000187J	0.00262	0.0443	<0.00100	< 0.000500	0.0241	0.000052J	<0.500	< 0.000500	0.0137	< 0.000200	0.0119	0.575	0.0407	< 0.00100
	7/25/2018	<0.00100	0.00262	0.0483	<0.00100	< 0.000500	0.0202	<0.000500	<0.500	< 0.000500	0.0134	< 0.000200	0.0121	0.376 U	0.0354	< 0.00100
	10/16/2018	<0.00100	0.00283	0.0547	<0.00100	< 0.000500	0.0167	<0.000500	<0.500	< 0.000500	0.014	< 0.000200	0.0115	0.716	0.0343	< 0.00100
	3/5/2019	<0.00100	0.00101	0.0202	<0.00100	< 0.000500	0.0108	<0.000500	0.672	< 0.000500	0.00714	< 0.000200	0.00471	0.705	0.0245	< 0.00100
	5/13/2019	<0.00300	0.00301	0.0858	<0.00100	< 0.000500	0.00961	<0.00100	0.622	0.000558	0.0134	< 0.000200	0.00776	1.03	0.0685	<0.00200
	8/26/2019	<0.00100	0.00243	0.0546	<0.00100	< 0.000100	0.00877	<0.000500	0.330J	< 0.000500	0.0153	< 0.000200	0.00934	Not Sampled	0.0803	< 0.00100
	11/18/2019	<0.00100	0.00317	0.0476	<0.00100	< 0.000100^	0.0141	<0.000500	0.547	< 0.000500	0.015	< 0.000200	0.00965	0.45	0.108	< 0.00100
	2/17/2020	<0.00100	0.00231	0.0421	<0.00100	<0.000100	0.0252	<0.000500	<0.500	<0.000500	0.0147	<0.000200	0.00998	1.70	0.178	<0.00100
	5/6/2020	<0.00100	0.00259	0.0512	<0.00100	<0.000100	0.0229	<0.000500	0.635	<0.000500	0.0114	<0.000200	0.00831	Not Sampled ^[3]	0.135	<0.00100
	8/31/2020	<0.00100	0.00226	0.0401	<0.00100	<0.000100	0.0261	<0.000500	0.639	<0.000500	0.0122	<0.000200	0.00998	Not Sampled	0.049	<0.00100
	11/16/2020	<0.00100	0.00203	0.0433	<0.00100	<0.000100	0.0244	<0.000500	0.416J	<0.000500	0.0134	<0.000200	0.00793	0.485	0.0601	<0.00100
	4/19/2021	<0.00200	0.00229	0.0481	<0.00100	<0.000100	0.0225	<0.000500	0.433J	<0.000500	0.0136	<0.000200	0.0100	1.22	0.0406	<0.00100
	12/7/2021	<0.00200	0.00233	0.0449	<0.00100	<0.000100	0.00631	<0.000500	0.779	<0.000500	0.0136	<0.000200	0.0138	Results Pending ^[4]	0.0337	<0.00100
MW-7 ^[4]	11/16/2016 ^[1]	< 0.001	0.00338	0.0518	< 0.001	< 0.0005	0.0241	< 0.0005	0.38	< 0.0005	< 0.05	< 0.0002	0.0262	1.27	0.045	< 0.001
	12/20/2016	< 0.001	0.00327	0.0688	< 0.001	< 0.0005	0.0129	< 0.0005	0.36	< 0.0005	< 0.05	< 0.0002	0.0229	0.622	0.0576	< 0.001
	1/23/2017	< 0.001	0.00293	0.09	< 0.001	< 0.0005	0.00689	< 0.0005	0.27	< 0.0005	< 0.05	< 0.0002	0.0193	2.42	0.0649	< 0.001
	2/21/2017	< 0.001	0.00351	0.088	< 0.001	< 0.0005	0.00959	< 0.0005	0.33	< 0.0005	< 0.05	< 0.0002	0.0219	1.01	0.0714	< 0.001
	3/22/2017	< 0.001	0.00321	0.073	< 0.001	< 0.0005	0.00827	< 0.0005	0.36	< 0.0005	0.0172	< 0.0002	0.0222	2.11	0.0568	< 0.001
	4/26/2017	< 0.001	0.0038	0.0649	< 0.001	< 0.0005	0.00562	< 0.0005	0.38	< 0.0005	0.014	< 0.0002	0.0201	1.06	0.0477	< 0.001
	5/26/2017	< 0.001	0.00333	0.0625	< 0.001	< 0.0005	< 0.005	< 0.0005	0.37	< 0.0005	0.017	< 0.0002	0.017	1.19 U	0.0469	< 0.001
	6/27/2017	< 0.001	0.00308	0.086	< 0.001	< 0.0005	0.00613	< 0.0005	0.34	< 0.0005	0.0184	< 0.0002	0.0145	0.948	0.0475	< 0.001
	10/11/2017	< 0.001	0.00368	0.0647	< 0.001	< 0.0005	0.00956	< 0.0005	0.34	< 0.0005	0.0157	< 0.0002	0.0147	1.57	0.0459	< 0.001
	3/7/2018	<0.00100	0.00411	0.051	<0.00100	< 0.000500	0.0264	0.000104J	0.604	< 0.000500	0.0146	< 0.000200	0.0194	0.439	0.0998	< 0.00100
	7/25/2018	<0.00100	0.00421	0.0518	<0.00100	< 0.000500	0.029	0.00008J	<0.500	< 0.000500	0.0128	< 0.000200	0.0203	0.73	0.0677	< 0.00100

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Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2022

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-7 ^[4]	10/16/2018	<0.00100	0.00378	0.0489	<0.00100	< 0.000500	0.0282	<0.000500	<0.500	< 0.000500	0.0151	< 0.000200	0.0248	0.721	0.0414	< 0.00100
	3/5/2019	<0.00100	0.0032	0.052	<0.00100	< 0.000500	0.0295	<0.000500	<0.500	< 0.000500	0.0143	< 0.000200	0.0227	0.925	0.0678	< 0.00100
	5/13/2019	<0.00300	0.00361	0.0534	<0.00100	< 0.000500	0.0318	0.00045J	0.852	< 0.000500	0.0126	< 0.000200	0.0258	0.917	0.0644	<0.00200
	8/26/2019	<0.00100	0.00386	0.0528	<0.00100	< 0.000100	0.0232	<0.000500	0.254J	< 0.000500	0.0146	< 0.000200	0.0284	Not Sampled	0.0516	< 0.00100
	11/18/2019	<0.00100	0.0042	0.0644	<0.00100	< 0.000100^	0.0167	<0.000500	<0.500	< 0.000500	0.0141	< 0.000200	0.0222	1.66	0.0719	< 0.00100
	2/17/2020	<0.00100	0.00347	0.0603	<0.00100	<0.000100	0.0287	0.000103J	0.289J	<0.000500	0.0159	<0.000200	0.0213	1.56	0.0457	<0.00100
	5/6/2020	<0.00100	0.00415	0.0407	<0.00100	<0.000100	0.0264	0.0000910J	0.517	<0.000500	0.00936J	<0.000200	0.0255	Not Sampled ^[3]	0.0421	<0.00100
	8/31/2020	<0.00100	0.00442	0.0402	<0.00100	<0.000100	0.0302	<0.000500	0.758	<0.000500	0.011	<0.000200	0.0286	Not Sampled	0.0255	<0.00100
	11/16/2020	0.00103	0.00417	0.0388	<0.00100	<0.000100	0.0267	<0.000500	0.658	<0.000500	0.0117	<0.000200	0.0245	0.423	0.0381	<0.00100
	4/20/2021	<0.00200	0.00360	0.0456	<0.00100	0.0000610J	0.0235	0.000164J	0.448J	0.000497J	0.0118	<0.000200	0.0231	0.893	0.0543	<0.00100
	12/7/2021	<0.00200	0.00279	0.0639	<0.00100	<0.000100	0.0148	<0.000500	0.67	<0.000500	0.0168	<0.000200	0.0221	Results Pending ^[4]	0.0545	<0.00100
MW-8	11/16/2016 ^[1]	< 0.001	0.00429	0.0498	< 0.001	< 0.0005	0.0332	< 0.0005	0.63	< 0.0005	< 0.05	< 0.0002	0.0499	0.56 U	0.035	< 0.001
	12/20/2016	< 0.001	0.00347	0.0456	< 0.001	< 0.0005	0.0347	< 0.0005	0.63	< 0.0005	< 0.05	< 0.0002	0.0479	0.397 U	0.0396	< 0.001
	1/23/2017	< 0.001	0.00333	0.0433	< 0.001	< 0.0005	0.0347	< 0.0005	0.58	0.0613	< 0.05	< 0.0002	0.0455	0.860 U	0.0374	< 0.001
	2/21/2017	< 0.001	0.00374	0.0516	< 0.001	< 0.0005	0.037	< 0.0005	0.64	< 0.0005	< 0.05	< 0.0002	0.0481	0.964	0.0415	< 0.001
	3/22/2017	< 0.001	0.00316	0.0448	< 0.001	< 0.0005	0.0326	< 0.0005	0.69	< 0.0005	0.0118	< 0.0002	0.0425	1.18	0.04	< 0.001
	4/26/2017	< 0.001	0.00414	0.0516	< 0.001	< 0.0005	0.0382	< 0.0005	0.76	< 0.0005	0.0122	< 0.0002	0.0458	0.678 U	0.0441	< 0.001
	5/26/2017	< 0.001	0.00345	0.0545	< 0.001	< 0.0005	0.0303	< 0.0005	0.75	< 0.0005	0.0141	< 0.0002	0.0384	0.103 U	0.0368	< 0.001
	6/27/2017	< 0.001	0.00338	0.0535	< 0.001	< 0.0005	0.031	< 0.0005	0.77	< 0.0005	0.013	< 0.0002	0.04	0.293 U	0.04	< 0.001
	10/11/2017	< 0.001	0.00384	0.0385	< 0.001	< 0.0005	0.0292	< 0.0005	0.81	< 0.0005	0.0111	< 0.0002	0.0385	0.894	0.0484	< 0.001
	3/7/2018	<0.00100	0.00394	0.0423	<0.00100	< 0.000500	0.0456	0.000103J	1.12	< 0.000500	0.0112	< 0.000200	0.0407	0.517	0.0741	< 0.00100
	7/26/2018	<0.00100	0.0045	0.0402	<0.00100	< 0.000500	0.0433	0.000129J	0.969	< 0.000500	0.0101	< 0.000200	0.0601	0.21 U	0.145	< 0.00100
	10/16/2018	<0.00100	0.00472	0.0403	<0.00100	< 0.000500	0.0393	0.000095J	0.724	< 0.000500	0.0111	< 0.000200	0.0552	0.466	0.0829	< 0.00100
	3/5/2019	<0.00100	0.00575	0.0545	<0.00100	< 0.000500	0.0494	0.000199J	1.11	< 0.000500	0.0139	< 0.000200	0.0661	0.516	0.0809	< 0.00100
	5/13/2019	<0.00300	0.0055	0.0449	<0.00100	< 0.000500	0.0335	<0.00100	1.36	< 0.000500	0.0111	< 0.000200	0.0705	0.506	0.0506	<0.00200
	8/26/2019	<0.00100	0.00509	0.0439	<0.00100	< 0.000100	0.034	0.000227J	0.888	0.000288J	0.0123	< 0.000200	0.0417	Not Sampled	0.0348	< 0.00100
	11/18/2019	<0.00100	0.00449	0.0646	<0.00100	< 0.000100^	0.0349	0.000131J	1.08	< 0.000500	0.0129	< 0.000200	0.0381	1.2	0.0697	< 0.00100
	2/17/2020	<0.00100	0.00414	0.0393	<0.00100	<0.000100	0.0380	<0.000500	0.782	<0.000500	0.0127	<0.000200	0.0387	0.708	0.0768	<0.00100
	5/7/2020	<0.00100	0.004	0.0358	<0.00100	0.0000880J	0.0380	0.000102J	1.36	0.000302J	0.00837J	<0.000200	0.0371	Not Sampled ^[3]	0.0293	<0.00100
	8/31/2020	<0.00100	0.0037	0.0346	<0.00100	<0.000100	0.0483	<0.000500	1.22	<0.000500	0.0101	<0.000200	0.0381	Not Sampled	0.0417	<0.00100
	11/16/2020	<0.00100	0.00329	0.0383	<0.00100	<0.000100	0.0445	<0.000500	0.886	<0.000500	0.0103	<0.000200	0.0318	0.313U	0.0408	<0.00100
	4/19/2021	<0.00200	0.00417	0.0415	<0.00100	<0.000100	0.0370	0.000122J	1.01	<0.000500	0.0102	<0.000200	0.0301	1.09	0.0596	<0.00100
	12/7/2021	<0.00200	0.00444	0.038	<0.00100	<0.000100	0.0486	<0.000500	3.17	<0.000500	0.0101	<0.000200	0.0435	Results Pending ^[4]	0.0428	<0.00100
MW-9	11/16/2016 ^[1]	< 0.001	0.00284	0.0456	< 0.001	< 0.0005	0.027	< 0.0005	1.0	< 0.0005	< 0.05	< 0.0002	0.0248	0.636 U	0.0586	< 0.001
	12/20/2016	< 0.001	0.00283	0.0462	< 0.001	< 0.0005	0.029	< 0.0005	0.97	< 0.0005	< 0.05	< 0.0002	0.0245	0.269 U	0.0638	< 0.001
	1/23/2017	< 0.001	0.0029	0.0467	< 0.001	< 0.0005	0.0278	< 0.0005	0.87	< 0.0005	< 0.05	< 0.0002	0.0235	0.953 U	0.0684	< 0.001
	2/21/2017	< 0.001	0.00317	0.0507	< 0.001	< 0.0005	0.0262	< 0.0005	0.91	< 0.0005	< 0.05	< 0.0002	0.0232	0.747	0.0686	< 0.001
	3/22/2017	< 0.001	0.00289	0.0531	< 0.001	< 0.0005	0.0166	< 0.0005	0.91	< 0.0005	0.0128	< 0.0002	0.0214	1.49	0.0591	< 0.001
	4/26/2017	< 0.001	0.00344	0.0477	< 0.001	< 0.0005	0.0095	< 0.0005	0.9	< 0.0005	0.0115	< 0.0002	0.0197	1.3	0.0458	< 0.001
	5/26/2017	< 0.001	0.00323	0.0437	< 0.001	< 0.0005	0.0109	< 0.0005	0.87	< 0.0005	0.0144	< 0.0002	0.0188	0.977	0.0461	< 0.001
	6/27/2017	< 0.001	0.00305	0.0529	< 0.001	< 0.0005	0.0157	< 0.0005	0.85	< 0.0005	0.0129	< 0.0002	0.0201	0.571	0.049	< 0.001
	10/11/2017	< 0.001	0.00252	0.0473	< 0.001	< 0.0005	0.0318	< 0.0005	0.59	< 0.0005	0.0102	< 0.0002	0.0222	1.49	0.0345	< 0.001
	3/7/2018	<0.00100	0.00199J	0.0551	<0.00100	< 0.000500	0.0274	0.000049J	0.639	< 0.000500	0.01	< 0.000200	0.015	0.71	0.0241	< 0.00100
	7/25/2018	<0.00100	0.00124J	0.0431	<0.00100	< 0.000500	0.0265	<0.000500	0.472J	< 0.000500	0.00699J	< 0.000200	0.0135	0.7	0.0373	< 0.00100
	10/16/2018	<0.00100	0.00193J	0.0425	<0.00100	< 0.000500	0.0294	<0.000500	0.618	< 0.000500	0.00889J	< 0.000200	0.0251	0.613	0.039	< 0.00100
	3/5/2019	<0.00100	0.00282	0.055	<0.00100	< 0.000500	0.0318	<0.000500	1.33	< 0.000500	0.0101	< 0.000200	0.0306	0.933	0.404	< 0.00100
	5/13/2019	<0.00300	0.00297	0.049	<0.00100	< 0.000500	0.0282	<0.00100	1.56	< 0.000500	0.00853	< 0.000200	0.029	0.658	0.0447	<0.00200
	8/26/2019	<0.00100	0.00339	0.0428	<0.00100	< 0.000100	0.0306	<0.000500	0.956	< 0.000500	0.0109	< 0.000200	0.029	Not Sampled	0.0598	< 0.00100

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2022

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-9	11/18/2019	<0.00100	0.0051	0.0426	<0.00100	< 0.000100^	0.0265	<0.000500	1.08	< 0.000500	0.0101	< 0.000200	0.0313	0.769	0.387	< 0.00100
	2/17/2020	<0.00100	0.00291	0.0516	<0.00100	<0.000100	0.0271	<0.000500	0.798	<0.000500	0.0119	<0.000200	0.0204	0.982	0.0501	<0.00100
	5/6/2020	<0.00100	0.00209	0.0473	<0.00100	<0.000100	0.0298	<0.000500	0.992	<0.000500	0.00670J	<0.000200	0.0182	Not Sampled ^[3]	0.0363	<0.00100
	8/31/2020	<0.00100	0.00229	0.0563	<0.00100	<0.000100	0.0469	<0.000500	0.813	<0.000500	0.00953J	<0.000200	0.0175	Not Sampled	0.0637	<0.00100
	11/16/2020	<0.00100	0.0028	0.0431	<0.00100	<0.000100	0.0469	<0.000500	1.14	<0.000500	0.00990J	<0.000200	0.0241	0.531	0.0751	<0.00100
	4/19/2021	<0.00200	0.00184J	0.0604	<0.00100	<0.000100	0.0343	<0.000500	0.717	<0.000500	0.00869J	<0.000200	0.0163	2.68	0.0578	<0.00100
	12/7/2021	<0.00200	0.00246	0.0680	<0.00100	<0.000100	0.00426J	<0.000500	1.02	<0.000500	0.00954J	<0.000200	0.0137	Results Pending ^[4]	0.0277	<0.00100

Notes:
^[1] - Radium was sampled at a later date in November (11/28/2016) than other constituents which were sampled on 11/16/2016 & 11/17/2016.
^[2] MW-2B not sampled in November 2016.
^[3] Radium was not sampled during the May 2020 event, so radium data from February 17, 2020 was used for the Spring 2020 Title 132 report and statistical analysis.
^[4] The contracted laboratory had not returned the radium results at the time that this report was issued. The radium results will be submitted as an addendum.
* Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).
< For the period of November 2016 through October 2019, the symbol indicates analyte not detected above the reporting limit, which is the value shown following the "<" symbol. Starting in January 2020, the symbol indicates analyte not detected above the method detection limit, which is the value shown following the "<" symbol.
"U" data qualifier (radium) indicates parameter was analyzed for but not detected above limiting criteria (minimum detectable concentration) as defined in the analytical laboratory data package.
"J" data qualifier indicates the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

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Table 6 - Background Threshold Values for Assessment Monitoring

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

Constituents	Units	Background Threshold Values (UPLs) - 2020 ^[1]
Appendix III		
Boron	mg/l	1.71
Calcium	mg/l	78.8
Chloride	mg/l	35.2
Fluoride*	mg/l	1.59
pH (LPL)**	SU	6.15
pH (UPL)***	SU	7.53
Sulfate	mg/l	199
TDS	mg/l	591
Appendix IV		
Antimony	mg/l	0.001
Arsenic	mg/l	0.00666
Barium	mg/l	0.0858
Beryllium	mg/l	0.001
Cadmium	mg/l	0.0001
Chromium	mg/l	0.0514
Cobalt	mg/l	0.0005
Fluoride*	mg/l	1.59
Lead	mg/l	0.0207
Lithium	mg/l	0.0175
Mercury	mg/l	0.0002
Molybdenum	mg/l	0.0489
Radium 226 + 228	pCi/l	2.03
Selenium	mg/l	0.158
Thallium	mg/l	0.001

Notes:

^[1] BTVs were updated in fall 2020. BTVs are updated approximately every two (2) years and therefore the next background update is scheduled for fall 2022.

* Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

** Indicates the lower bound of the range is the lower prediction limit (LPL).

*** Indicates the upper bound is the upper prediction limit (UPL).

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Table 7 - Established Groundwater Protection Standards

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2022

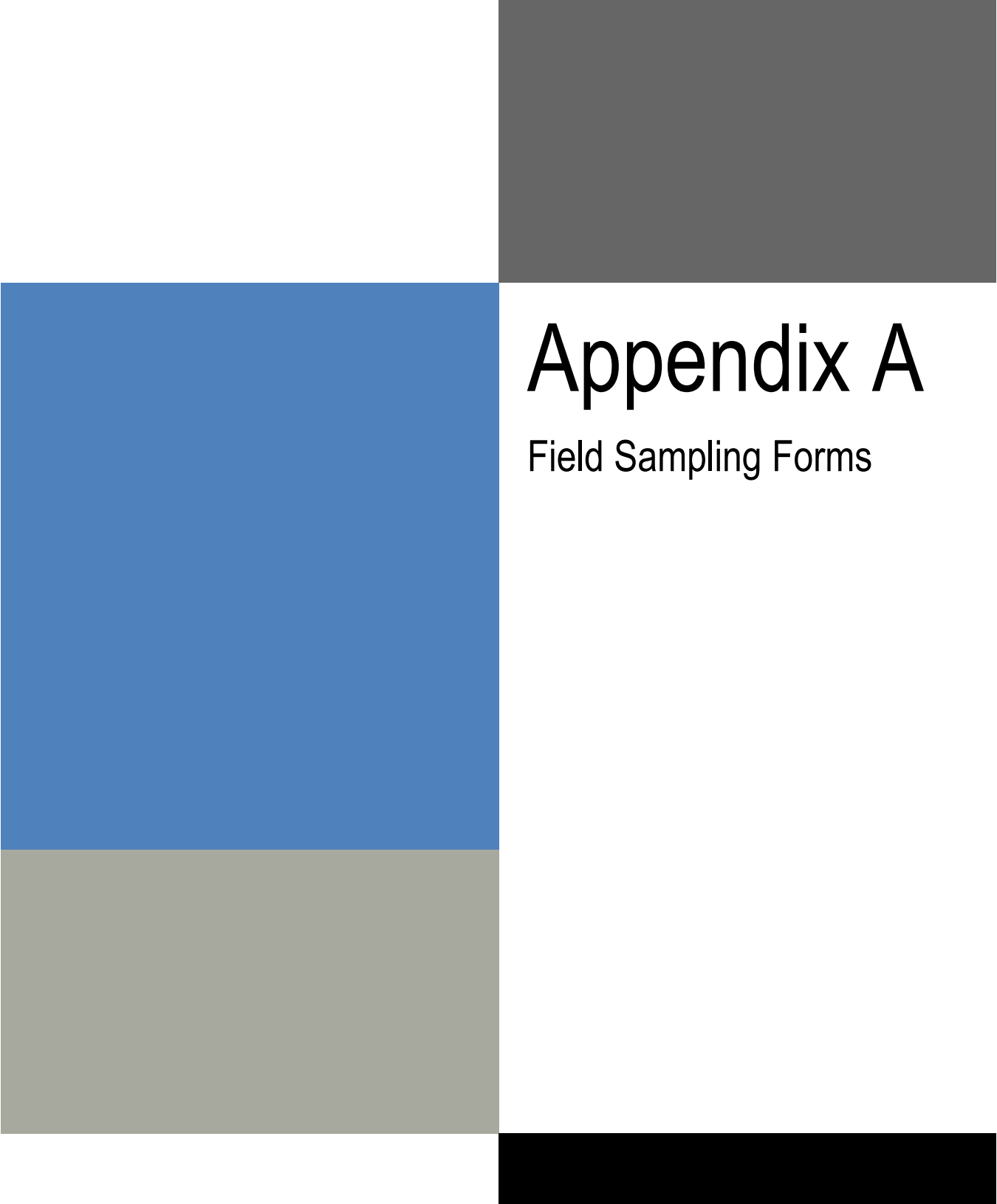
Constituents	Units	Established Groundwater Protection Standard (GWPS) ^[1]
Appendix IV		
Antimony	mg/l	0.006
Arsenic	mg/l	0.01
Barium	mg/l	2.00
Beryllium	mg/l	0.004
Cadmium	mg/l	0.005
Chromium	mg/l	0.10
Cobalt	mg/l	0.006
Fluoride	mg/l	4.00
Lead	mg/l	0.0207 ^[2]
Lithium	mg/l	0.04
Mercury	mg/l	0.002
Molybdenum	mg/l	0.1
Radium 226 + 228	pCi/l	5.00
Selenium	mg/l	0.158 ^[2]
Thallium	mg/l	0.002

Notes:

^[1] - GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2); unless otherwise specified.

^[2] - GWPS is established as the upper prediction limit (UPL) when the background level is higher than the U.S. EPA MCL or the GWPS specified in §257.95(h)(2).

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A decorative graphic consisting of several colored rectangles. A large blue rectangle is on the left. To its right is a dark gray rectangle. Below the blue rectangle is a light gray rectangle. To the right of the light gray rectangle is a black rectangle. The text 'Appendix A' and 'Field Sampling Forms' is positioned to the right of the blue and light gray rectangles.

Appendix A

Field Sampling Forms

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Groundwater Monitoring Sampling Collection Field Log

Field Blank collected

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly ☐ Quarterly ☒	Duplicate Collected: YES / ☒ NO If yes, Sample ID <u>MW-01F B</u> 15:08
Sample No: <u>MW-01</u>	Weather CLR P.CLDY ☒ FOG		Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp <u>32</u> °F Wind Calm ☒ High		Personnel:
Sample Date: <u>4/19/21</u>	Precip - Rain - Lite Mod High Snow - ☒ Lite Mod High		Sample Time: <u>15:05</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>14:35</u>	Time Completed: <u>15:10</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>123.80</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
<u>14:55</u>		<u>6.98</u>	<u>0.438</u>	<u>15.0</u>	<u>62.8</u>	<u>7.22</u>
<u>14:58</u>		<u>6.94</u>	<u>0.437</u>	<u>15.0</u>	<u>67.3</u>	<u>7.20</u>
<u>15:01</u>		<u>6.94</u>	<u>0.439</u>	<u>15.1</u>	<u>69.7</u>	<u>7.23</u>
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb.
2.37
2.65
2.64

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B, Ca, Cl, F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) ☒ Clear ☐ Sl. Cloudy ☐ Cloudy	Odor (circle one) ☒ None ☐ Strong ☐ Weak
--	---

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly <u>Quarterly</u>	Duplicate Collected: YES / <u>(NO)</u> If yes, Sample ID _____
Sample No: <u>MW-2B</u>	Weather CLR <u>P</u> CLDY CLDY FOG		Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp <u>41</u> °F Wind <u>Calm</u> Mod High		Personnel:
Sample Date: <u>4/20/21</u>	Precip Rain- Lite Mod High Snow- Lite Mod High		Sample Time: <u>12:35</u>

Purging Information

Date: ___/___/___	Time Started: <u>12:15</u>	Time Completed: <u>12:40</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>133.78</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
<u>12:30</u>		<u>6.85</u>	<u>0.53</u>	<u>13.9</u>	<u>133.1</u>	<u>7.43</u>
<u>12:32</u>		<u>6.95</u>	<u>0.55</u>	<u>13.9</u>	<u>133.3</u>	<u>7.34</u>
<u>12:34</u>		<u>6.93</u>	<u>0.55</u>	<u>13.9</u>	<u>133.8</u>	<u>7.33</u>
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb
2.05
2.24
2.54

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B, Ca, Cl, F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) Clear <u>Sl. Cloudy</u> Cloudy	Odor (circle one) None <u>Strong</u> Weak
--	---

Field Notes:

Used spare pump, set at 1160'. Ran a decon rinse before pumping. Well collected equipment blank. EB-01 4-20-21
@ 8:30am

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: <u>YES</u> / NO If yes, Sample ID <u>MW-008</u>
Sample No: <u>MW-3R</u>	Weather CLR P.CLDY <u>CLDY</u> FOG		Prepared By: <u>J. Sidlo</u> Personnel: Sample Time: <u>14:15</u>
Sample Media: Groundwater	Temp <u>32</u> °F Wind Calm <u>Mod</u> High		
Sample Date: <u>4/19/21</u>	Precip Rain Lite Mod High Snow Lite Mod High		

4-19-21
12:15

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>13:45</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>120.88</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
<u>14:05</u>		<u>6.84</u>	<u>0.66</u>	<u>15.1</u>	<u>32.2</u>	<u>7.27</u>
<u>14:08</u>		<u>6.97</u>	<u>0.68</u>	<u>15.6</u>	<u>29.7</u>	<u>7.20</u>
<u>14:11</u>		<u>6.95</u>	<u>0.68</u>	<u>15.7</u>	<u>34.7</u>	<u>7.31</u>
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb
2.64
3.55
3.45

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B,Ca,Cl,F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) <u>Clear</u> Sl.Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
---	---

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly ☐ Quarterly ☒	Duplicate Collected: YES / ☒ NO If yes, Sample ID _____
Sample No: <u>MW-4B</u>	Weather CLR P.CLDY ☒ FOG		Prepared By:
Sample Media: Groundwater	Temp ____ °F Wind Calm ☒ High		Personnel:
Sample Date: <u>4/19/21</u>	Precip Rain--Lite--Mod--High-- Snow--Lite--Mod--High--		Sample Time: <u>11:05</u>

Purging Information

Date: ____/____/____	Time Started: <u>10:35</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>114.96</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
<u>10:55</u>		<u>6.80</u>	<u>0.411</u>	<u>13.2</u>	<u>85.0</u>	<u>8.52</u>
<u>10:58</u>		<u>6.77</u>	<u>0.410</u>	<u>13.2</u>	<u>84.7</u>	<u>8.50</u>
<u>11:01</u>		<u>6.78</u>	<u>0.411</u>	<u>13.2</u>	<u>85.8</u>	<u>8.54</u>
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb
1.19
1.90
1.85

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B,Ca,Cl,F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) ☒ Clear ☐ Sl. Cloudy ☐ Cloudy	Odor (circle one) ☒ None ☐ Strong ☐ Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly <u>Quarterly</u>	Duplicate Collected: YES / <u>NO</u> If yes, Sample ID _____
Sample No: <u>MW-5B</u>	Weather CLR P.CLDY <u>CLDY</u> FOG		Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp <u>32</u> °F Wind Calm <u>Mod</u> High		Personnel:
Sample Date: <u>4/19/21</u>	Precip <u>Rain</u> Lite Med High Snow Lite Mod High		Sample Time: <u>9:05</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>8:35</u>	Time Completed: <u>9:10</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>116.80</u>	Purge Rate: _____	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
<u>8:55</u>		<u>7.16</u>	<u>0.413</u>	<u>2.23</u>	<u>8.15</u>	<u>12.5</u>	<u>228.2</u>
<u>8:50</u>		<u>7.18</u>	<u>0.416</u>	<u>1.84</u>	<u>7.96</u>	<u>12.5</u>	<u>225.9</u>
<u>9:01</u>		<u>7.17</u>	<u>0.415</u>	<u>1.76</u>	<u>7.94</u>	<u>12.6</u>	<u>225.1</u>
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Sl. Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: MW-6	Weather CLR P.CLDY CLDY FOG		Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 32 °F Wind Calm Mod High		Personnel:
Sample Date: 4/19/21	Precip Rain- Lite- Mod- High Snow- Lite Mod High		Sample Time: 10:25

Purging Information

Date: ___/___/___	Time Started: 9:55	Time Completed: 10:30
Method: Electric 12V DC Sampling Pump		
Water Level: 113.62	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
10:15		6.86	0.499	15.6	104.9	8.34
10:18		6.88	0.498	15.5	104.2	8.42
10:21		6.86	0.499	15.6	104.2	8.32
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb
1.35
1.67
1.66

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B, Ca, Cl, F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) Clear Sl. Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: <u>MW-7</u>	Weather CLR P.CLDY CLDY FOG Temp ____°F Wind Calm Mod High Precip Rain- Lite Mod High Snow- Lite Mod High		Prepared By:
Sample Media: Groundwater			Personnel:
Sample Date: <u>4/19/21</u>			Sample Time:

Purging Information

Date: ____/____/____	Time Started:	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>121.92</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B,Ca,Cl,F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) Clear SI.Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Pump not working. pulled

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly ☐ Quarterly ☒	Duplicate Collected: YES ☒ NO ☒ If yes, Sample ID <u>MW-107</u>
Sample No: <u>MW-7</u>	Weather CLR P.CLDY ☒ FOG		Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp <u>40</u> °F Wind <u>0</u> Calm Mod High		Personnel:
Sample Date: <u>4/20/21</u>	Precip Rain Light Mod High Snow Light Mod High		Sample Time: <u>15:45</u>

4-20-21
13:00

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>15:25</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>121.92</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
<u>15:40</u>		<u>6.84</u>	<u>0.430</u>	<u>13.7</u>	<u>141.3</u>	<u>6.92</u>
<u>15:42</u>		<u>6.84</u>	<u>0.429</u>	<u>13.7</u>	<u>141.6</u>	<u>6.86</u>
<u>15:44</u>		<u>6.83</u>	<u>0.433</u>	<u>13.7</u>	<u>142.0</u>	<u>6.89</u>
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb
12.38
10.31
9.19
7.65
8.62

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B, Ca, Cl, F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) Clear ☐ SL.Cloudy ☐ Cloudy ☐	Odor (circle one) None ☐ Strong ☐ Weak ☐
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Field Notes:

Used spare pump

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly ☐ Quarterly ☒	Duplicate Collected: YES / ☒ NO If yes, Sample ID _____
Sample No: MW-8	Weather CLR P.CLDY ☒ CLDY FOG		Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 32°F Wind Calm ☒ High		Personnel:
Sample Date: 4/19/21	Precip Rain ☐ Lite ☐ Mod ☐ High Snow Lite ☒ High		Sample Time: 15:45

Purging Information

Date: __/__/__	Time Started: 15:20	Time Completed: 15:50
Method: Electric 12V DC Sampling Pump		
Water Level: 122.10	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
15:40		7.29	0.474	13.2	116.3	7.17
15:42		7.30	0.470	13.2	115.8	7.15
15:44		7.33	0.472	13.2	117.4	7.16
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb
1.42
1.39
1.86

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B, Ca, Cl, F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) ☒ Clear ☐ Sl. Cloudy ☐ Cloudy	Odor (circle one) ☒ None ☐ Strong ☐ Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly <u>Quarterly</u>	Duplicate Collected: YES <u>NO</u> If yes, Sample ID _____
Sample No: <u>MW-9</u>	Weather CLR P.CLDY <u>CLDY</u> FOG		Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp. <u>32</u> °F Wind Calm <u>Mod</u> High		Personnel:
Sample Date: <u>4/19/21</u>	Precip Rain Lite Mod High Snow Lite Mod High		Sample Time: <u>9:45</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>9:15</u>	Time Completed: <u>9:50</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>113.00</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (mS/cm)	*Temp (°C)	ORP (mV)	DO (mg/L)
<u>9:35</u>		<u>7.20</u>	<u>0.384</u>	<u>13.3</u>	<u>91.6</u>	<u>8.80</u>
<u>9:38</u>		<u>7.18</u>	<u>0.385</u>	<u>13.3</u>	<u>91.8</u>	<u>8.72</u>
<u>9:41</u>		<u>7.19</u>	<u>0.387</u>	<u>13.4</u>	<u>92.5</u>	<u>8.75</u>
Expected Range		6 to 8.5	0 to 100	10 to 20	-350 to 350	4 to 10
Physical Range		0 to 14	0 to 10000	0 to 100	-750 to 750	0 to 20

Turb
2.13
1.83
1.91

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
2 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 250mL Poly	None	B,Ca,Cl,F		Test America
2 x 1000mL Poly	None	Radium		TA-St. Louis

Other Information

Appearance (circle one) <u>Clear</u> Sl.Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: <u>MW-01</u>	Weather CLR P.CLDY CLDY FOG		Prepared By: <u>Sidlo</u>
Sample Media: Groundwater	Temp <u>42</u> °F Wind Calm Mod High		Personnel:
Sample Date: <u>12/7/21</u>	Precip Rain Lite Mod High Snow Lite Mod High		Sample Time: <u>14:30</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>14:09</u>	Time Completed: <u>14:35</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>124.35</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
14:24		6.73	0.404		4.24	14.6	132.8
14:26		6.72	0.407		4.22	14.6	133.2
14:28		6.72	0.407		4.26	14.6	133.8
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl.Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Field Blank Duplicate Collected: <u>YES</u> / NO If yes, Sample ID <u>MW-102FB</u>
Sample No: <u>MW-2B</u>	Weather <u>CLR</u> P.CLDY CLDY FOG		Prepared By: <u>S,dllo</u>
Sample Media: Groundwater	Temp <u>40</u> °F Wind <u>Calm</u> Mod High		Personnel:
Sample Date: <u>12/7/21</u>	Precip <u>Rain-Lite</u> Mod High Snow- <u>Lite</u> Mod High		Sample Time: <u>15:05</u>

12-7-21
15:08

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>14:44</u>	Time Completed: <u>15:10</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>138.35</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
14:59		6.81	0.53		4.82	13.5	176.2
15:01		6.82	0.53		4.76	13.5	176.2
15:03		6.83	0.53		4.74	13.6	176.2
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Sl.CLOUDY Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

NO SL
MW-2 No water (Dry)

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly		Duplicate Collected: YES ☒ NO If yes, Sample ID _____	
Sample No: MW-3B		Weather ☒ CLR ☐ P.CLDY ☐ CLDY ☐ FOG		Prepared By: Sdio	
Sample Media: Groundwater		Temp 38°F Wind ☒ Calm ☐ Mod High		Personnel:	
Sample Date: 12/7/21		Precip ☐ Rain- ☐ Lite ☐ Mod High ☐ Snow- ☐ Lite ☐ Mod High		Sample Time: 13:15	

Purging Information

Date: __/__/__	Time Started: 13:00	Time Completed: 13:20
Method: Electric 12V DC Sampling Pump		
Water Level: 126.60	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
13:08 13:15		6.67	0.61		4.61	14.7	432
13:17		6.62	0.61		4.48	14.6	430
13:19		6.62	0.61		4.67	15.1	436
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) ☒ Clear ☒ Sl. Cloudy ☐ Cloudy	Odor (circle one) ☒ None ☐ Strong ☐ Weak
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Sample seems slightly off in color

Field Notes:

Initial water to flow was very rusty in color

pump was pumping funny, very low flow

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / <u>NO</u> If yes, Sample ID _____
Sample No: <u>MW-4B</u>	Weather <u>CLR</u> P. CLDY CLDY FOG		Prepared By: <u>JSD/10</u>
Sample Media: Groundwater	Temp <u>48</u> °F Wind <u>Calm</u> Mod High		Personnel:
Sample Date: <u>12/7/21</u>	Precip <u>Rain</u> Lite Mod High Snow <u>Lite</u> Mod High		Sample Time: <u>12:45</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>12:23</u>	Time Completed: <u>12:50</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>113.44</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
<u>12:38</u>		<u>6.55</u>	<u>0.53</u>		<u>2.81</u>	<u>14.0</u>	<u>116.0</u>
<u>12:40</u>		<u>6.53</u>	<u>0.52</u>		<u>2.84</u>	<u>13.9</u>	<u>117.7</u>
<u>12:42</u>		<u>6.51</u>	<u>0.53</u>		<u>2.84</u>	<u>13.9</u>	<u>117.5</u>
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> S/Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes: SL

MW-04 115.33

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES ☒ NO If yes, Sample ID _____
Sample No: MW-5B	Weather ☒ CLR ☐ P.CLDY ☐ CLDY ☐ FOG		Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 35°F Wind Calm Mod High		Personnel:
Sample Date: 12/7/21	Precip Rain ☐ Lite ☐ Mod ☐ High Snow ☐ Lite ☐ Mod ☐ High		Sample Time: 9:10

Purging Information

Date: __/__/__	Time Started: 8:43	Time Completed: 9:15
Method: Electric 12V DC Sampling Pump		
Water Level: 118.22	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
9:00		7.18	.477		5.85	13.1	162.2
9:03		7.17	.476		5.86	13.1	160.1
9:06		7.16	.479		5.85	13.1	158.0
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) ☒ Clear ☐ Sl. Cloudy ☐ Cloudy	Odor (circle one) ☒ None ☐ Strong ☐ Weak
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Field Notes:

MW-5 (original MW) NO water SL

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly		Duplicate Collected: YES ☒ NO If yes, Sample ID _____	
Sample No: <u>MW-06</u>		Weather ☒ CLR ☐ P.CLDY ☐ CLDY ☐ FOG		Prepared By: <u>Sidlo</u>	
Sample Media: Groundwater		Temp. <u>28</u> F Wind ☒ Calm ☐ Mod ☐ High		Personnel:	
Sample Date: <u>12/7/21</u>		Precip ☐ Rain ☐ Lite ☐ Mod ☐ High ☐ Snow ☐ Lite ☐ Mod ☐ High		Sample Time: <u>10:20</u>	

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>9:58</u>	Time Completed: <u>10:25</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>112.50</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
<u>10:12</u>		<u>6.76</u>	<u>0.485</u>		<u>4.66</u>	<u>15.3</u>	<u>78.1</u>
<u>10:14</u>		<u>6.76</u>	<u>0.485</u>		<u>4.64</u>	<u>15.3</u>	<u>81.0</u>
<u>10:16</u>		<u>6.74</u>	<u>0.486</u>		<u>4.61</u>	<u>15.3</u>	<u>87.5</u>
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) ☒ Clear ☐ Sl. Cloudy ☐ Cloudy	Odor (circle one) ☒ None ☐ Strong ☐ Weak
--	---

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: <u>YES</u> / NO If yes, Sample ID <u>MW-107</u>
Sample No: <u>MW-07</u>	Weather <u>CLR</u> P.CLDY CLDY FOG		Prepared By: <u>sidlo</u>
Sample Media: Groundwater	Temp <u>38</u> °F Wind <u>Calm</u> Mod High		Personnel:
Sample Date: <u>12/7/21</u>	Precip <u>Rain</u> - Lite Mod High <u>Snow</u> - Lite Mod High		Sample Time: <u>13:50</u>

12-7-21
8:30am

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>13:30</u>	Time Completed: <u>13:55</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>121.9</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
<u>13:44</u>		<u>6.53</u>	<u>0.77</u>		<u>4.27</u>	<u>13.3</u>	<u>179.5</u>
<u>13:46</u>		<u>6.53</u>	<u>0.77</u>		<u>4.26</u>	<u>13.3</u>	<u>179.9</u>
<u>13:48</u>		<u>6.52</u>	<u>0.77</u>		<u>4.24</u>	<u>13.3</u>	<u>179.8</u>
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Sl.Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / (NO) If yes, Sample ID _____
Sample No: MW-08	Weather (CLR) P.CLDY CLDY FOG		Prepared By: Sicillo
Sample Media: Groundwater	Temp 42 °F Wind (Calm) Mod High		Personnel:
Sample Date: 12/7/21	Precip Rain Lite Mod High Snow Lite Mod High		Sample Time: 15:35

Purging Information

Date: ____/____/____	Time Started: 15:16	Time Completed: 15:40
Method: Electric 12V DC Sampling Pump		
Water Level: 123.60	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
15:28		7.71	0.466		4.76	13.8	95.2
15:30		7.27	0.465		4.74	13.8	98.4
15:32		7.26	0.465		4.75	13.9	101.2
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) (Clear) Sl.Cloudy Cloudy	Odor (circle one) (None) Strong Weak
--	--

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: <u>MW-9</u>	Weather: CLR P.CLDY CLDY FOG		Prepared By: <u>S. dlo</u>
Sample Media: Groundwater	Temp: 5 F Wind: Calm Mod High		Personnel: _____
Sample Date: <u>12/7/21</u>	Precip: Rain- Lite- Mod- High- Snow- Lite- Mod- High-		Sample Time: <u>9:45</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>9:20</u>	Time Completed: <u>9:50</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>112.96</u>	Purge Rate: _____	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
9:38		7.10	.434		3.48	11.6	85.9
9:41		7.09	.432		3.58	11.6	86.4
9:43		7.09	.432		3.46	11.10	86.7
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

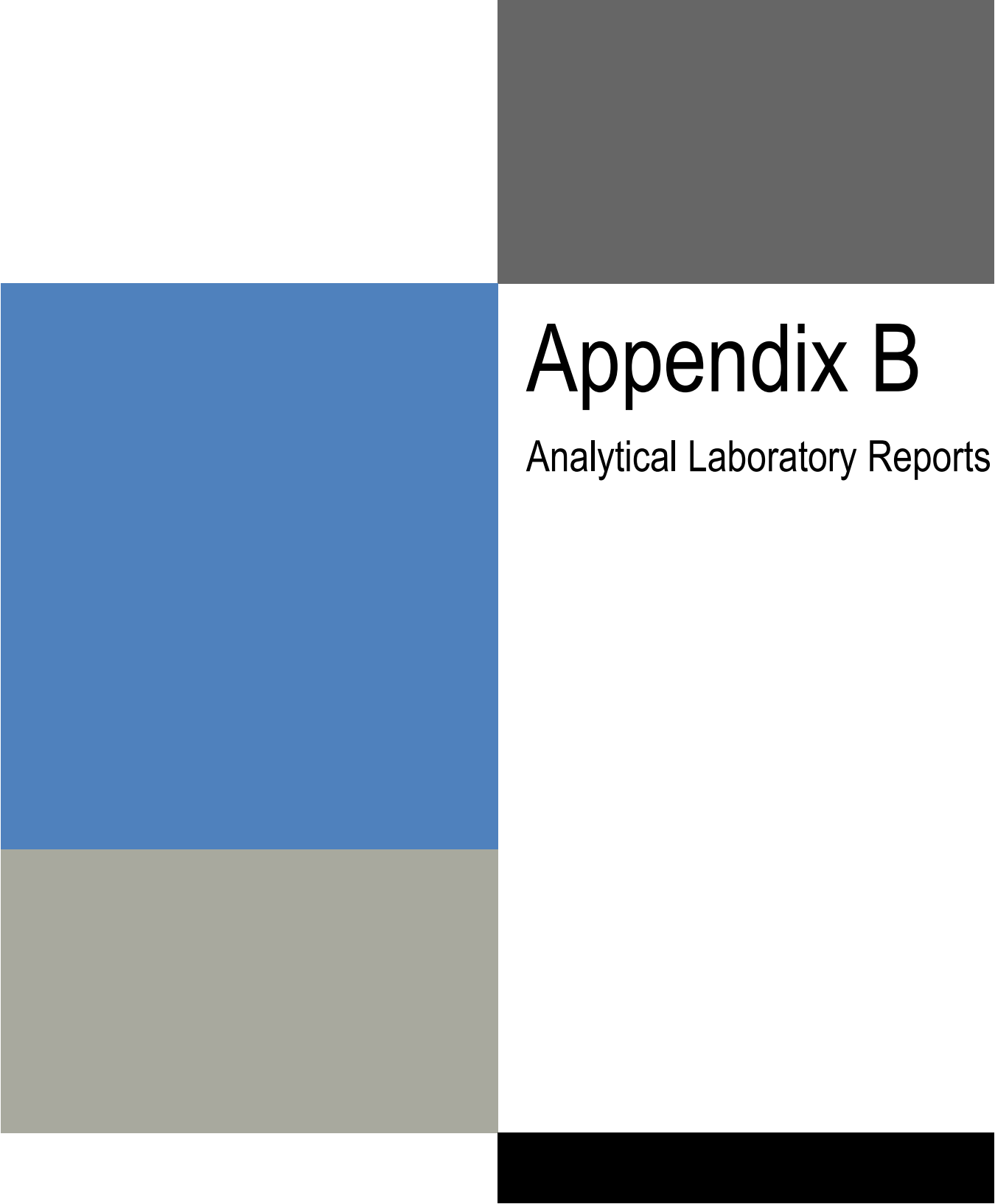
Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl. Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

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Appendix B

Analytical Laboratory Reports

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Environment Testing America

ANALYTICAL REPORT

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

Laboratory Job ID: 310-205130-2
Client Project/Site: WEC MW Sampling
Revision: 1

For:
Hastings Utilities
1228 N. Denver Ave
PO BOX 289
Hastings, Nebraska 68901

Attn: Jenny Sidlo

Authorized for release by:
5/17/2021 4:16:06 PM

Shirley Thompson, Senior Project Manager
(319)277-2401
Shirley.Thompson@Eurofinset.com

LINKS

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results through
Total Access

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Visit us at:
www.eurofinus.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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Client: Hastings Utilities
Project Site: WEC MW Sampling

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Job ID: 310-205130-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative
310-205130-1

Comments
Revised Report. Original report did not include the full list of metals requested.

Receipt
The samples were received on 4/27/2021 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9° C.

Receipt Exceptions
The following samples were received outside of holding time: MW-01 (310-205130-1), MW-2B (310-205130-2), MW-3R (310-205130-3), MW-4B (310-205130-4), MW-5B (310-205130-5), MW-6 (310-205130-6), MW-7 (310-205130-7), MW-8 (310-205130-8), MW-9 (310-205130-9), MW-107 (310-205130-10), MW-00R (310-205130-11) and MW-01FB (310-205130-12). Client was contacted and lab was instructed to qualify data and proceed with analysis.

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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Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-205130-1	MW-01	Water	04/19/21 15:05	04/27/21 09:30	
310-205130-2	MW-2B	Water	04/20/21 12:35	04/27/21 09:30	
310-205130-3	MW-3R	Water	04/19/21 14:15	04/27/21 09:30	
310-205130-4	MW-4B	Water	04/19/21 11:05	04/27/21 09:30	
310-205130-5	MW-5B	Water	04/19/21 09:05	04/27/21 09:30	
310-205130-6	MW-6	Water	04/19/21 10:25	04/27/21 09:30	
310-205130-7	MW-7	Water	04/20/21 15:45	04/27/21 09:30	
310-205130-8	MW-8	Water	04/19/21 15:45	04/27/21 09:30	
310-205130-9	MW-9	Water	04/19/21 09:45	04/27/21 09:30	
310-205130-10	MW-107	Water	04/20/21 13:00	04/27/21 09:30	
310-205130-11	MW-00R	Water	04/19/21 12:15	04/27/21 09:30	
310-205130-12	MW-01FB	Water	04/19/21 15:08	04/27/21 09:30	

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Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-205130-2

Client Sample ID: MW-01

Lab Sample ID: 310-205130-1

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	24.2		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	9.23	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.316	J	0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	149		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	1.06	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	27.3		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.140		0.100	0.0360 mg/L	1	6020A	Total/NA
Lithium	0.00997	J	0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0281		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0385		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0726		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00367		0.00200	0.000750 mg/L	1	6020A	Total/NA
Copper	0.00202	J	0.00500	0.00140 mg/L	1	6020A	Total/NA
Chromium	0.00233		0.00500	0.00110 mg/L	1	6020A	Total/NA
Cobalt	0.0000930	J	0.000500	0.0000910 mg/L	1	6020A	Total/NA
Total Dissolved Solids	344	H H3	30.0	26.0 mg/L	1	SM 2340C	Total/NA

Client Sample ID: MW-2B

Lab Sample ID: 310-205130-2

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	25.2		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	8.13	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Sulfate	144		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	0.542	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	69.2		0.500	0.190 mg/L	1	6020A	Total/NA
Lithium	0.0138		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.00265		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0339		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.193		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00204		0.00200	0.000750 mg/L	1	6020A	Total/NA
Chromium	0.0171		0.00500	0.00110 mg/L	1	6020A	Total/NA
Total Dissolved Solids	410	H	30.0	26.0 mg/L	1	SM 2340C	Total/NA

Client Sample ID: MW-3R

Lab Sample ID: 310-205130-3

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	34.2		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	8.06	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Sulfate	240		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	0.847	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	60.3		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.474		0.100	0.0360 mg/L	1	6020A	Total/NA
Lithium	0.0271		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0122		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0382		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0585		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00234		0.00200	0.000750 mg/L	1	6020A	Total/NA
Copper	0.00732		0.00500	0.00140 mg/L	1	6020A	Total/NA
Chromium	0.0233		0.00500	0.00110 mg/L	1	6020A	Total/NA
Cobalt	0.000806		0.000500	0.0000910 mg/L	1	6020A	Total/NA
Total Suspended Solids	4.00	J H H3	5.00	1.70 mg/L	1	I-3765-85	Total/NA
Total Dissolved Solids	514	H H3	30.0	26.0 mg/L	1	SM 2340C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-205130-2

Client Sample ID: MW-4B

Lab Sample ID: 310-205130-4

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	24.1		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	8.46	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.892		0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	138		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	0.706	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	27.1		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.0720	J	0.100	0.0360 mg/L	1	6020A	Total/NA
Lithium	0.0150		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0172		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0250		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0276		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00345		0.00200	0.000750 mg/L	1	6020A	Total/NA
Chromium	0.0267		0.00500	0.00110 mg/L	1	6020A	Total/NA
Total Dissolved Solids	312	H H3	30.0	26.0 mg/L	1	SM 2340C	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-205130-5

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	21.1		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	8.89	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	1.11		0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	139		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	1.03	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	32.7		0.500	0.190 mg/L	1	6020A	Total/NA
Lithium	0.0108		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.00200		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.122		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0423		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00589		0.00200	0.000750 mg/L	1	6020A	Total/NA
Chromium	0.00445		0.00500	0.00110 mg/L	1	6020A	Total/NA
Cobalt	0.000140	J	0.000500	0.0000910 mg/L	1	6020A	Total/NA
Total Dissolved Solids	346	H H3	30.0	26.0 mg/L	1	SM 2340C	Total/NA

Client Sample ID: MW-6

Lab Sample ID: 310-205130-6

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	27.4		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	7.53	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.433	J	0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	145		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	0.855	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	46.3		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.0499	J	0.100	0.0360 mg/L	1	6020A	Total/NA
Lithium	0.0136		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0100		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0406		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0481		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00229		0.00200	0.000750 mg/L	1	6020A	Total/NA
Chromium	0.0225		0.00500	0.00110 mg/L	1	6020A	Total/NA
Total Dissolved Solids	370	H H3	30.0	26.0 mg/L	1	SM 2340C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-205130-2

Client Sample ID: MW-7

Lab Sample ID: 310-205130-7

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	24.5		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	8.82	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.448	J	0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	145		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	1.08	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	28.1		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.285		0.100	0.0380 mg/L	1	6020A	Total/NA
Lithium	0.0118		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0231		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0543		0.00500	0.000960 mg/L	1	6020A	Total/NA
Cadmium	0.0000610	J	0.000100	0.0000510 mg/L	1	6020A	Total/NA
Barium	0.0456		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00360		0.00200	0.000750 mg/L	1	6020A	Total/NA
Lead	0.000497	J	0.000500	0.000210 mg/L	1	6020A	Total/NA
Chromium	0.0235		0.00500	0.00110 mg/L	1	6020A	Total/NA
Cobalt	0.000164	J	0.000500	0.0000910 mg/L	1	6020A	Total/NA
Total Suspended Solids	11.7		5.00	1.70 mg/L	1	I-3765-85	Total/NA
Total Dissolved Solids	320	H	30.0	26.0 mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW-8

Lab Sample ID: 310-205130-8

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	24.5		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	9.35	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	1.01		0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	172		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	1.21	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	32.6		0.500	0.190 mg/L	1	6020A	Total/NA
Lithium	0.0102		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0301		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0596		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0415		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00417		0.00200	0.000750 mg/L	1	6020A	Total/NA
Chromium	0.0370		0.00500	0.00110 mg/L	1	6020A	Total/NA
Cobalt	0.000122	J	0.000500	0.0000910 mg/L	1	6020A	Total/NA
Total Dissolved Solids	368	H H3	30.0	26.0 mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW-9

Lab Sample ID: 310-205130-9

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	23.7		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	9.08	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.717		0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	124		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	0.748	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	28.0		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.0393	J	0.100	0.0360 mg/L	1	6020A	Total/NA
Lithium	0.00669	J	0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0163		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0578		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0604		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00184	J	0.00200	0.000750 mg/L	1	6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-205130-2

Client Sample ID: MW-9 (Continued)

Lab Sample ID: 310-205130-9

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chromium	0.0343		0.00500	0.00110 mg/L	1	6020A	Total/NA
Total Dissolved Solids	280	H H3	30.0	26.0 mg/L	1	SM 2540C	Total/NA

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	24.4		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	8.80	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.450	J	0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	145		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	1.10	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	28.6		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.440		0.100	0.0380 mg/L	1	6020A	Total/NA
Lithium	0.0119		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0239		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0544		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0470		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00361		0.00200	0.000750 mg/L	1	6020A	Total/NA
Lead	0.000506		0.000500	0.000210 mg/L	1	6020A	Total/NA
Chromium	0.0250		0.00500	0.00110 mg/L	1	6020A	Total/NA
Cobalt	0.000164	J	0.000500	0.0000910 mg/L	1	6020A	Total/NA
Total Suspended Solids	11.3		5.00	1.70 mg/L	1	I-3765-85	Total/NA
Total Dissolved Solids	326	H	30.0	26.0 mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW-00R

Lab Sample ID: 310-205130-11

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	32.5		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	8.03	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Sulfate	227		5.00	2.45 mg/L	5	9056A	Total/NA
Boron	0.882	B	0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	62.5		0.500	0.190 mg/L	1	6020A	Total/NA
Iron	0.516		0.100	0.0360 mg/L	1	6020A	Total/NA
Lithium	0.0275		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0130		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0382		0.00500	0.000960 mg/L	1	6020A	Total/NA
Barium	0.0585		0.00200	0.000300 mg/L	1	6020A	Total/NA
Arsenic	0.00226		0.00200	0.000750 mg/L	1	6020A	Total/NA
Copper	0.00828		0.00500	0.00140 mg/L	1	6020A	Total/NA
Chromium	0.0222		0.00500	0.00110 mg/L	1	6020A	Total/NA
Cobalt	0.000897		0.000500	0.0000910 mg/L	1	6020A	Total/NA
Total Suspended Solids	2.33	J H H3	5.00	1.70 mg/L	1	I-3765-85	Total/NA
Total Dissolved Solids	496	H H3	30.0	26.0 mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW-01FB

Lab Sample ID: 310-205130-12

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Total Suspended Solids	22.7	H H3	5.00	1.70 mg/L	1	I-3765-85	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-01
Date Collected: 04/19/21 15:05
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-1
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.2		5.00	2.15 mg/L		05/07/21 17:56		5
Nitrate as N	0.500	9.23 H H3	0.500	0.200 mg/L		05/07/21 17:56		5
Fluoride	0.316 J		0.500	0.275 mg/L		05/07/21 17:56		5
Sulfate	149		5.00	2.45 mg/L		05/07/21 17:56		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.06 B		0.100	0.0560 mg/L		04/28/21 09:00	04/30/21 22:55	1
Calcium	27.3		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 22:55	1
Iron	0.140		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 22:55	1
Lithium	0.00997 J		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 22:55	1
Molybdenum	0.0281		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 22:55	1
Selenium	0.0385		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 22:55	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 22:55	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 22:55	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 22:55	1
Barium	0.0726		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 22:55	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 22:55	1
Arsenic	0.00367		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 22:55	1
Copper	0.00202 J		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 22:55	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 22:55	1
Chromium	0.0323		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 22:55	1
Cobalt	0.0000930 J		0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 22:55	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 16:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	344	H H3	30.0	26.0 mg/L		04/28/21 13:50		1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-2B
Date Collected: 04/20/21 12:35
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-2
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25.2		5.00	2.15 mg/L		05/07/21 18:43		5
Nitrate as N	8.13 H H3		0.500	0.200 mg/L		05/07/21 18:43		5
Fluoride	<0.500		0.500	0.275 mg/L		05/07/21 18:43		5
Sulfate	144		5.00	2.45 mg/L		05/07/21 18:43		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.542 B		0.100	0.0560 mg/L		04/28/21 09:00	04/30/21 22:58	1
Calcium	69.2		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 22:58	1
Iron	<0.100		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 22:58	1
Lithium	0.0136		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 22:58	1
Molybdenum	0.00265		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 22:58	1
Selenium	0.0339		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 22:58	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 22:58	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 22:58	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 22:58	1
Barium	0.193		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 22:58	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 22:58	1
Arsenic	0.00204		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 22:58	1
Copper	<0.00500		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 22:58	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 22:58	1
Chromium	0.0171		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 22:58	1
Cobalt	<0.000500		0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 22:58	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 16:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	410	H	30.0	26.0 mg/L		04/28/21 13:50		1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-3R
Date Collected: 04/19/21 14:15
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-3
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	34.2		5.00	2.15 mg/L		05/07/21 18:58		5
Nitrate as N	8.06	H H3	0.500	0.200 mg/L		05/07/21 18:58		5
Fluoride	<0.500		0.500	0.275 mg/L		05/07/21 18:58		5
Sulfate	240		5.00	2.45 mg/L		05/07/21 18:58		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.847	B	0.100	0.0580 mg/L		04/28/21 09:00	04/30/21 23:00	1
Calcium	60.3		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:00	1
Iron	0.474		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:00	1
Lithium	0.0271		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:00	1
Molybdenum	0.0122		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:00	1
Selenium	0.0382		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:00	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:00	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:00	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:00	1
Barium	0.0585		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:00	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:00	1
Arsenic	0.00234		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:00	1
Copper	0.00732		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:00	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:00	1
Chromium	0.0233		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:00	1
Cobalt	0.000806		0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:00	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 16:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	4.00	J H H3	5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	514	H H3	30.0	26.0 mg/L		04/28/21 13:50		1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-4B
Date Collected: 04/19/21 11:05
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-4
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.1		5.00	2.15 mg/L		05/07/21 19:14		5
Nitrate as N	8.48	H H3	0.500	0.200 mg/L		05/07/21 19:14		5
Fluoride	0.892		0.500	0.275 mg/L		05/07/21 19:14		5
Sulfate	138		5.00	2.45 mg/L		05/07/21 19:14		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.706	B	0.100	0.0580 mg/L		04/28/21 09:00	04/30/21 23:03	1
Calcium	27.1		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:03	1
Iron	0.0720	J	0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:03	1
Lithium	0.0150		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:03	1
Molybdenum	0.0172		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:03	1
Selenium	0.0250		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:03	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:03	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:03	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:03	1
Barium	0.0276		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:03	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:03	1
Arsenic	0.00345		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:03	1
Copper	<0.00500		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:03	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:03	1
Chromium	0.0267		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:03	1
Cobalt	<0.000500		0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 17:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	312	H H3	30.0	26.0 mg/L		04/28/21 13:50		1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-205130-2

Client Sample ID: MW-5B
Date Collected: 04/19/21 09:05
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-5
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21.1		5.00	2.15 mg/L		05/07/21 19:29		5
Nitrate as N	8.89	H H3	0.500	0.200 mg/L		05/07/21 19:29		5
Fluoride	1.11		0.500	0.275 mg/L		05/07/21 19:29		5
Sulfate	139		5.00	2.45 mg/L		05/07/21 19:29		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.03	B	0.100	0.0560 mg/L		04/28/21 09:00	04/30/21 23:06	1
Calcium	32.7		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:06	1
Iron	<0.100		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:06	1
Lithium	0.0108		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:06	1
Molybdenum	0.0444		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:06	1
Selenium	0.122		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:06	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:06	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:06	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:06	1
Barium	0.0423		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:06	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:06	1
Arsenic	0.00589		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:06	1
Copper	<0.00500		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:06	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:06	1
Chromium	0.0445		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:06	1
Cobalt	0.000140	J	0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:06	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 17:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	346	H H3	30.0	26.0 mg/L		04/28/21 13:50		1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-205130-2

Client Sample ID: MW-6
Date Collected: 04/19/21 10:25
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-6
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.4		5.00	2.15 mg/L		05/07/21 19:45		5
Nitrate as N	7.53	H H3	0.500	0.200 mg/L		05/07/21 19:45		5
Fluoride	0.433	J	0.500	0.275 mg/L		05/07/21 19:45		5
Sulfate	145		5.00	2.45 mg/L		05/07/21 19:45		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.855	B	0.100	0.0560 mg/L		04/28/21 09:00	04/30/21 23:11	1
Calcium	46.3		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:11	1
Iron	0.0499	J	0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:11	1
Lithium	0.0136		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:11	1
Molybdenum	0.0100		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:11	1
Selenium	0.0406		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:11	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:11	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:11	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:11	1
Barium	0.0481		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:11	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:11	1
Arsenic	0.00229		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:11	1
Copper	<0.00500		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:11	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:11	1
Chromium	0.0225		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:11	1
Cobalt	<0.000500		0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:11	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 17:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	370	H H3	30.0	26.0 mg/L		04/28/21 13:50		1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-7
Date Collected: 04/20/21 15:45
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-7
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.5		5.00	2.15 mg/L		05/07/21 20:32		5
Nitrate as N	8.82	H H3	0.500	0.200 mg/L		05/07/21 20:32		5
Fluoride	0.448	J	0.500	0.275 mg/L		05/07/21 20:32		5
Sulfate	145		5.00	2.45 mg/L		05/07/21 20:32		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.08	B	0.100	0.0580 mg/L		04/28/21 09:00	05/03/21 16:18	1
Calcium	28.1		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:24	1
Iron	0.285		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:24	1
Lithium	0.0118		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:24	1
Molybdenum	0.0231		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:24	1
Selenium	0.0543		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:24	1
Cadmium	0.000610	J	0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:24	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:24	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:24	1
Barium	0.0456		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:24	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:24	1
Arsenic	0.00360		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:24	1
Copper	<0.00500		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:24	1
Lead	0.000497	J	0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:24	1
Chromium	0.0235		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:24	1
Cobalt	0.000164	J	0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 17:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	11.7		5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	320	H	30.0	26.0 mg/L		04/28/21 13:50		1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-8
Date Collected: 04/19/21 15:45
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-8
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.5		5.00	2.15 mg/L		05/07/21 20:47		5
Nitrate as N	9.35	H H3	0.500	0.200 mg/L		05/07/21 20:47		5
Fluoride	1.01		0.500	0.275 mg/L		05/07/21 20:47		5
Sulfate	172		5.00	2.45 mg/L		05/07/21 20:47		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.21	B	0.100	0.0580 mg/L		04/28/21 09:00	05/03/21 16:21	1
Calcium	32.6		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:27	1
Iron	<0.100		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:27	1
Lithium	0.0102		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:27	1
Molybdenum	0.0301		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:27	1
Selenium	0.0596		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:27	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:27	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:27	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:27	1
Barium	0.0415		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:27	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:27	1
Arsenic	0.00417		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:27	1
Copper	<0.00500		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:27	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:27	1
Chromium	0.0370		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:27	1
Cobalt	0.000122	J	0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:27	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 17:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		04/27/21 12:52		1
Total Dissolved Solids	368	H H3	30.0	26.0 mg/L		04/29/21 14:12		1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-9
Date Collected: 04/19/21 09:45
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-9
Matrix: Water

Method: 9056A - Anions, Ion Chromatography					
Analyte	Result	Qualifier	RL	MDL Unit	D
Chloride	23.7		5.00	2.15 mg/L	05/07/21 21:03
Nitrate as N	9.08	H H3	0.500	0.200 mg/L	05/07/21 21:03
Fluoride	0.717		0.500	0.275 mg/L	05/07/21 21:03
Sulfate	124		5.00	2.45 mg/L	05/07/21 21:03

Method: 6020A - Metals (ICP/MS)					
Analyte	Result	Qualifier	RL	MDL Unit	D
Boron	0.748	B	0.100	0.0580 mg/L	04/28/21 09:00
Calcium	28.0		0.500	0.190 mg/L	04/28/21 09:00
Iron	0.0393	J	0.100	0.0360 mg/L	04/28/21 09:00
Lithium	0.00869	J	0.0100	0.00250 mg/L	04/30/21 23:30
Molybdenum	0.0163		0.00200	0.00130 mg/L	04/30/21 23:30
Selenium	0.0578		0.00500	0.000960 mg/L	04/30/21 23:30
Cadmium	<0.000100		0.000100	0.0000510 mg/L	04/30/21 23:30
Antimony	<0.00200		0.00200	0.00110 mg/L	04/30/21 23:30
Beryllium	<0.00100		0.00100	0.000270 mg/L	04/30/21 23:30
Barium	0.0604		0.00200	0.000300 mg/L	04/30/21 23:30
Thallium	<0.00100		0.00100	0.000260 mg/L	04/30/21 23:30
Arsenic	0.00184	J	0.00200	0.000750 mg/L	04/30/21 23:30
Copper	<0.00500		0.00500	0.00140 mg/L	04/30/21 23:30
Lead	<0.000500		0.000500	0.000210 mg/L	04/30/21 23:30
Chromium	0.0343		0.00500	0.00110 mg/L	04/30/21 23:30
Cobalt	<0.000500		0.000500	0.0000910 mg/L	04/30/21 23:30

Method: 7470A - Mercury (CVAA)					
Analyte	Result	Qualifier	RL	MDL Unit	D
Mercury	<0.000200		0.000200	0.000150 mg/L	05/13/21 14:35

General Chemistry					
Analyte	Result	Qualifier	RL	MDL Unit	D
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L	04/27/21 12:52
Total Dissolved Solids	280	H H3	30.0	26.0 mg/L	04/29/21 14:12

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-205130-2

Client Sample ID: MW-107
Date Collected: 04/20/21 13:00
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-10
Matrix: Water

Method: 9056A - Anions, Ion Chromatography					
Analyte	Result	Qualifier	RL	MDL Unit	D
Chloride	24.4		5.00	2.15 mg/L	05/07/21 21:18
Nitrate as N	8.80	H H3	0.500	0.200 mg/L	05/07/21 21:18
Fluoride	0.450	J	0.500	0.275 mg/L	05/07/21 21:18
Sulfate	145		5.00	2.45 mg/L	05/07/21 21:18

Method: 6020A - Metals (ICP/MS)					
Analyte	Result	Qualifier	RL	MDL Unit	D
Boron	1.10	B	0.100	0.0580 mg/L	04/28/21 09:00
Calcium	28.6		0.500	0.190 mg/L	04/30/21 23:32
Iron	0.440		0.100	0.0360 mg/L	04/30/21 23:32
Lithium	0.0119		0.0100	0.00250 mg/L	04/30/21 23:32
Molybdenum	0.0239		0.00200	0.00130 mg/L	04/30/21 23:32
Selenium	0.0544		0.00500	0.000960 mg/L	04/30/21 23:32
Cadmium	<0.000100		0.000100	0.0000510 mg/L	04/30/21 23:32
Antimony	<0.00200		0.00200	0.00110 mg/L	04/30/21 23:32
Beryllium	<0.00100		0.00100	0.000270 mg/L	04/30/21 23:32
Barium	0.0470		0.00200	0.000300 mg/L	04/30/21 23:32
Thallium	<0.00100		0.00100	0.000260 mg/L	04/30/21 23:32
Arsenic	0.00361		0.00200	0.000750 mg/L	04/30/21 23:32
Copper	<0.00500		0.00500	0.00140 mg/L	04/30/21 23:32
Lead	0.000506		0.000500	0.000210 mg/L	04/30/21 23:32
Chromium	0.0250		0.00500	0.00110 mg/L	04/30/21 23:32
Cobalt	0.000164	J	0.000500	0.0000910 mg/L	04/30/21 23:32

Method: 7470A - Mercury (CVAA)					
Analyte	Result	Qualifier	RL	MDL Unit	D
Mercury	<0.000200		0.000200	0.000150 mg/L	05/13/21 14:35

General Chemistry					
Analyte	Result	Qualifier	RL	MDL Unit	D
Total Suspended Solids	11.3		5.00	1.70 mg/L	04/27/21 12:52
Total Dissolved Solids	326	H	30.0	26.0 mg/L	04/30/21 14:08

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-205130-2

Client Sample ID: MW-00R
Date Collected: 04/19/21 12:15
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-11
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	32.5		5.00	2.15 mg/L		05/07/21 21:34	05/07/21 21:34	5
Nitrate as N	8.03	H H3	0.500	0.200 mg/L		05/07/21 21:34	05/07/21 21:34	5
Fluoride	<0.500		0.500	0.275 mg/L		05/07/21 21:34	05/07/21 21:34	5
Sulfate	227		5.00	2.45 mg/L		05/07/21 21:34	05/07/21 21:34	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.882	B	0.100	0.0580 mg/L		04/28/21 09:00	05/03/21 16:29	1
Calcium	62.5		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:35	1
Iron	0.516		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:35	1
Lithium	0.0275		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:35	1
Molybdenum	0.0130		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:35	1
Selenium	0.0382		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:35	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:35	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:35	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:35	1
Barium	0.0585		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:35	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:35	1
Arsenic	0.00226		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:35	1
Copper	0.00828		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:35	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:35	1
Chromium	0.0222		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:35	1
Cobalt	0.000897		0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:35	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 17:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	2.33	J H H3	5.00	1.70 mg/L		04/27/21 12:52	04/27/21 12:52	1
Total Dissolved Solids	496	H H3	30.0	26.0 mg/L		04/29/21 14:12	04/29/21 14:12	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-205130-2

Client Sample ID: MW-01FB
Date Collected: 04/19/21 15:08
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-12
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.430 mg/L		05/07/21 21:49	05/07/21 21:49	1
Nitrate as N	<0.100	H H3	0.100	0.0400 mg/L		05/07/21 21:49	05/07/21 21:49	1
Fluoride	<0.100		0.100	0.0550 mg/L		05/07/21 21:49	05/07/21 21:49	1
Sulfate	<1.00		1.00	0.490 mg/L		05/07/21 21:49	05/07/21 21:49	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.100		0.100	0.0580 mg/L		04/28/21 09:00	05/03/21 16:31	1
Calcium	<0.500		0.500	0.190 mg/L		04/28/21 09:00	04/30/21 23:37	1
Iron	<0.100		0.100	0.0360 mg/L		04/28/21 09:00	04/30/21 23:37	1
Lithium	<0.0100		0.0100	0.00250 mg/L		04/28/21 09:00	04/30/21 23:37	1
Molybdenum	<0.00200		0.00200	0.00130 mg/L		04/28/21 09:00	04/30/21 23:37	1
Selenium	<0.00500		0.00500	0.000960 mg/L		04/28/21 09:00	04/30/21 23:37	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		04/28/21 09:00	04/30/21 23:37	1
Antimony	<0.00200		0.00200	0.00110 mg/L		04/28/21 09:00	04/30/21 23:37	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		04/28/21 09:00	04/30/21 23:37	1
Barium	<0.00200		0.00200	0.000300 mg/L		04/28/21 09:00	04/30/21 23:37	1
Thallium	<0.00100		0.00100	0.000260 mg/L		04/28/21 09:00	04/30/21 23:37	1
Arsenic	<0.00200		0.00200	0.000750 mg/L		04/28/21 09:00	04/30/21 23:37	1
Copper	<0.00500		0.00500	0.00140 mg/L		04/28/21 09:00	04/30/21 23:37	1
Lead	<0.000500		0.000500	0.000210 mg/L		04/28/21 09:00	04/30/21 23:37	1
Chromium	<0.00500		0.00500	0.00110 mg/L		04/28/21 09:00	04/30/21 23:37	1
Cobalt	<0.000500		0.000500	0.0000910 mg/L		04/28/21 09:00	04/30/21 23:37	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		05/13/21 14:35	05/14/21 17:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	22.7	H H3	5.00	1.70 mg/L		04/27/21 15:02	04/27/21 15:02	1
Total Dissolved Solids	<30.0	H H3	30.0	26.0 mg/L		04/30/21 14:08	04/30/21 14:08	1

Definitions/Glossary

Job ID: 310-205130-2

Qualifiers

HPLC/IC

Qualifier Description

MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

H Sample was received and analyzed beyond the specified holding time

H3 Sample was received and analyzed past holding time.

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

Metals

Qualifier Description

Compound was found in the blank and sample.

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

General Chemistry

Qualifier Description

H Sample was prepped or analyzed beyond the specified holding time

H3 Sample was received and analyzed past holding time.

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

Glossary

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

† Listed under the "†" 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

MOL 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

POL 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

Job ID: 310-205130-2

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-315453/3

Matrix: Water

Analysis Batch: 315453

Analyte	Result	MB MB Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.430 mg/L			05/07/21 17:25	1
Nitrate as N	<0.100		0.100	0.0400 mg/L			05/07/21 17:25	1
Fluoride	<0.100		0.100	0.0550 mg/L			05/07/21 17:25	1
Sulfate	<1.00		1.00	0.490 mg/L			05/07/21 17:25	1

Lab Sample ID: LCS 310-315453/4

Matrix: Water

Analysis Batch: 315453

Analyte	Spike Added	LCS LCS Result Qualifier	%Rec.	D	Prepared	Analyzed	Dil Fac
Chloride	10.0	10.02		100			90 - 110
Nitrate as N	2.00	2.084		104			90 - 110
Fluoride	2.00	2.085		104			90 - 110
Sulfate	10.0	10.05		100			90 - 110

Lab Sample ID: 310-205130-1 MS

Matrix: Water

Analysis Batch: 315453

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS Result Qualifier	%Rec.	D	Prepared	Analyzed	Dil Fac
Chloride	24.2		25.0	50.50		105		80 - 120	
Nitrate as N	9.23		5.00	14.48		105		80 - 120	
Fluoride	0.316 J		5.00	5.270		99		80 - 120	
Sulfate	149		25.0	174.4 4		100		80 - 120	

Lab Sample ID: 310-205130-1 MSD

Matrix: Water

Analysis Batch: 315453

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD Result Qualifier	%Rec.	D	Prepared	Analyzed	Dil Fac
Chloride	24.2		25.0	50.37		105		80 - 120	
Nitrate as N	9.23		5.00	14.63		108		80 - 120	
Fluoride	0.316 J		5.00	5.172		97		80 - 120	
Sulfate	149		25.0	173.8 4		98		80 - 120	

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-314138/1-A

Matrix: Water

Analysis Batch: 314644

Analyte	Result	MB MB Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.08493 J		0.100	0.0580 mg/L			04/28/21 09:00 04/30/21 22:16	1
Calcium	<0.500		0.500	0.190 mg/L			04/28/21 09:00 04/30/21 22:16	1
Iron	<0.100		0.100	0.0360 mg/L			04/28/21 09:00 04/30/21 22:16	1
Lithium	<0.0100		0.0100	0.00250 mg/L			04/28/21 09:00 04/30/21 22:16	1
Molybdenum	<0.00200		0.00200	0.00130 mg/L			04/28/21 09:00 04/30/21 22:16	1
Selenium	<0.00500		0.00500	0.000960 mg/L			04/28/21 09:00 04/30/21 22:16	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L			04/28/21 09:00 04/30/21 22:16	1
Antimony	<0.00200		0.00200	0.000110 mg/L			04/28/21 09:00 04/30/21 22:16	1

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 314138

QC Sample Results

Job ID: 310-205130-2

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

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 314138									
Lab Sample ID: MB 310-314138/1-A Matrix: Water Analysis Batch: 314644									
Analyte	MB MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Beryllium	Result Qualifier	0.00100	0.000270	mg/L	04/28/21 09:00	04/30/21 22:16		1	6
Barium	<0.00200	0.00200	0.000300	mg/L	04/28/21 09:00	04/30/21 22:16		1	4
Thallium	<0.00100	0.00100	0.000260	mg/L	04/28/21 09:00	04/30/21 22:16		1	7
Arsenic	<0.00200	0.00200	0.000750	mg/L	04/28/21 09:00	04/30/21 22:16		1	5
Copper	<0.00500	0.00500	0.00140	mg/L	04/28/21 09:00	04/30/21 22:16		1	8
Lead	<0.000500	0.000500	0.000210	mg/L	04/28/21 09:00	04/30/21 22:16		1	9
Chromium	<0.00500	0.00500	0.00110	mg/L	04/28/21 09:00	04/30/21 22:16		1	
Cobalt	<0.000500	0.000500	0.0000910	mg/L	04/28/21 09:00	04/30/21 22:16		1	

Lab Sample ID: LCS 310-314138/2-A

Matrix: Water

Analysis Batch: 314644

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 314138

Analyte	Spike Added	LCS LCS	Unit	D	%Rec	Limits	%Rec.
Calcium	2.00	1.686	mg/L		84	80 - 120	
Lithium	0.200	0.2122	mg/L		106	80 - 120	
Molybdenum	0.200	0.1993	mg/L		100	80 - 120	
Cadmium	0.100	0.09923	mg/L		99	80 - 120	
Antimony	0.200	0.1970	mg/L		98	80 - 120	
Beryllium	0.100	0.1022	mg/L		102	80 - 120	
Barium	0.100	0.1066	mg/L		107	80 - 120	
Thallium	0.200	0.2005	mg/L		100	80 - 120	
Arsenic	0.200	0.2033	mg/L		102	80 - 120	
Copper	0.200	0.1862	mg/L		93	80 - 120	
Lead	0.200	0.2086	mg/L		104	80 - 120	
Chromium	0.100	0.1014	mg/L		101	80 - 120	
Cobalt	0.100	0.1033	mg/L		103	80 - 120	

Lab Sample ID: LCS 310-314138/2-A

Matrix: Water

Analysis Batch: 314805

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 314138

Analyte	Spike Added	LCS LCS	Unit	D	%Rec	Limits	%Rec.
Boron	0.200	0.1919	mg/L		96	80 - 120	

Lab Sample ID: 310-205130-5 DU

Matrix: Water

Analysis Batch: 314644

Client Sample ID: MW-5B
Prep Type: Total/NA
Prep Batch: 314138

Analyte	Sample Result	Sample Qualifier	DU DU	Unit	D	RPD	RPD Limit
Calcium	32.7		33.49	mg/L		2	20
Iron	<0.100		<0.100	mg/L		NC	20
Lithium	0.0108		0.01107	mg/L		2	20
Molybdenum	0.0444		0.04566	mg/L		3	20
Selenium	0.122		0.1253	mg/L		3	20
Cadmium	<0.000100		<0.000100	mg/L		NC	20
Antimony	<0.00200		<0.00200	mg/L		NC	20
Beryllium	<0.00100		<0.00100	mg/L		NC	20
Barium	0.0423		0.04334	mg/L		3	20

QC Sample Results

Job ID: 310-205130-2

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

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 314138									
Lab Sample ID: 310-205130-5 DU Matrix: Water Analysis Batch: 314644									
Analyte	Sample Result	Sample Qualifier	DU DU	Unit	D	Prepared	Analyzed	Dil Fac	
Thallium	<0.00100		<0.00100	mg/L				NC	20
Arsenic	0.00589		0.005951	mg/L				1	20
Copper	<0.00500		<0.00500	mg/L				NC	20
Lead	<0.000500		<0.000500	mg/L				NC	20
Chromium	0.0445		0.04562	mg/L				3	20
Cobalt	0.000140		0.0001450	J				4	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-315993/1-A

Matrix: Water

Analysis Batch: 316162

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 315993

Analyte	MB MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	Result Qualifier	0.000200	0.000150	mg/L	05/13/21 14:35	05/14/21 16:42		1

Lab Sample ID: LCS 310-315993/2-A

Matrix: Water

Analysis Batch: 316162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 315993

Analyte	Spike Added	LCS LCS	Unit	D	%Rec	Limits	%Rec.
Mercury	0.00167	0.001721	mg/L		103	80 - 120	

Lab Sample ID: 310-205130-1 MS

Matrix: Water

Analysis Batch: 316162

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 315993

Analyte	Sample Result	Sample Qualifier	MS MS	Unit	D	%Rec	Limits	%Rec.
Mercury	<0.000200		0.001655	mg/L		99	80 - 120	

Lab Sample ID: 310-205130-1 MSD

Matrix: Water

Analysis Batch: 316162

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 315993

Analyte	Sample Result	Sample Qualifier	MSD MSD	Unit	D	%Rec	Limits	RPD	RPD Limit
Mercury	<0.000200		0.001642	mg/L		99	80 - 120	1	20

Method: 1-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-314083/1

Matrix: Water

Analysis Batch: 314083

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

Analyte	MB MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	Result Qualifier	<5.00	5.00	1.70 mg/L			04/27/21 12:52	1

QC Sample Results

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Client Sample ID: Lab Control Sample Prep Type: Total/NA									
Lab Sample ID: LCS 310-314083/2 Matrix: Water Analysis Batch: 314083									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D %Rec. Limits				
Total Suspended Solids	100	108.0		mg/L	75 - 116				
Client Sample ID: Method Blank Prep Type: Total/NA									
Lab Sample ID: MB 310-314103/1 Matrix: Water Analysis Batch: 314103									
Analyte	MB Result	MB Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac	
Total Suspended Solids	<5.00		5.00	1.70 mg/L			04/27/21 15:02	1	
Client Sample ID: Lab Control Sample Prep Type: Total/NA									
Lab Sample ID: LCS 310-314103/2 Matrix: Water Analysis Batch: 314103									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D %Rec. Limits				
Total Suspended Solids	100	99.00		mg/L	75 - 116				
Method: SM 2540C - Solids, Total Dissolved (TDS)									

QC Association Summary

Job ID: 310-205130-2

HPLC/IC

Analysis Batch: 315453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-1	MW-01	Total/NA	Water	9056A	4
310-205130-2	MW-2B	Total/NA	Water	9056A	5
310-205130-3	MW-3R	Total/NA	Water	9056A	2
310-205130-4	MW-4B	Total/NA	Water	9056A	6
310-205130-5	MW-5B	Total/NA	Water	9056A	7
310-205130-6	MW-6	Total/NA	Water	9056A	8
310-205130-7	MW-7	Total/NA	Water	9056A	9
310-205130-8	MW-8	Total/NA	Water	9056A	10
310-205130-9	MW-9	Total/NA	Water	9056A	11
310-205130-10	MW-107	Total/NA	Water	9056A	12
310-205130-11	MW-00R	Total/NA	Water	9056A	13
310-205130-12	MW-01FB	Total/NA	Water	9056A	14
MB 310-315453/3	Method Blank	Total/NA	Water	9056A	
LCS 310-315453/4	Lab Control Sample	Total/NA	Water	9056A	
310-205130-1 MS	MW-01	Total/NA	Water	9056A	
310-205130-1 MSD	MW-01	Total/NA	Water	9056A	

Metals

Prep Batch: 314138

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-1	MW-01	Total/NA	Water	3010A	14
310-205130-2	MW-2B	Total/NA	Water	3010A	13
310-205130-3	MW-3R	Total/NA	Water	3010A	12
310-205130-4	MW-4B	Total/NA	Water	3010A	11
310-205130-5	MW-5B	Total/NA	Water	3010A	10
310-205130-6	MW-6	Total/NA	Water	3010A	9
310-205130-7	MW-7	Total/NA	Water	3010A	8
310-205130-8	MW-8	Total/NA	Water	3010A	7
310-205130-9	MW-9	Total/NA	Water	3010A	6
310-205130-10	MW-107	Total/NA	Water	3010A	5
310-205130-11	MW-00R	Total/NA	Water	3010A	4
310-205130-12	MW-01FB	Total/NA	Water	3010A	3
MB 310-314138/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-314138/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-205130-5 DU	MW-5B	Total/NA	Water	3010A	

Analysis Batch: 314644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-1	MW-01	Total/NA	Water	6020A	314138
310-205130-2	MW-2B	Total/NA	Water	6020A	314138
310-205130-3	MW-3R	Total/NA	Water	6020A	314138
310-205130-4	MW-4B	Total/NA	Water	6020A	314138
310-205130-5	MW-5B	Total/NA	Water	6020A	314138
310-205130-6	MW-6	Total/NA	Water	6020A	314138
310-205130-7	MW-7	Total/NA	Water	6020A	314138
310-205130-8	MW-8	Total/NA	Water	6020A	314138
310-205130-9	MW-9	Total/NA	Water	6020A	314138
310-205130-10	MW-107	Total/NA	Water	6020A	314138
310-205130-11	MW-00R	Total/NA	Water	6020A	314138
310-205130-12	MW-01FB	Total/NA	Water	6020A	314138

Eurofins TestAmerica, Cedar Falls

QC Association Summary

Job ID: 310-205130-2

Metals (Continued)

Analysis Batch: 314644 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-314138/1-A	Method Blank	Total/NA	Water	6020A	314138
LCS 310-314138/2-A	Lab Control Sample	Total/NA	Water	6020A	314138
310-205130-5 DU	MW-5B	Total/NA	Water	6020A	314138

Analysis Batch: 314805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-7	MW-7	Total/NA	Water	6020A	314138
310-205130-8	MW-8	Total/NA	Water	6020A	314138
310-205130-9	MW-9	Total/NA	Water	6020A	314138
310-205130-10	MW-107	Total/NA	Water	6020A	314138
310-205130-11	MW-00R	Total/NA	Water	6020A	314138
310-205130-12	MW-01FB	Total/NA	Water	6020A	314138
LCS 310-314138/2-A	Lab Control Sample	Total/NA	Water	6020A	314138

Prep Batch: 315993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-1	MW-01	Total/NA	Water	7470A	14
310-205130-2	MW-2B	Total/NA	Water	7470A	13
310-205130-3	MW-3R	Total/NA	Water	7470A	12
310-205130-4	MW-4B	Total/NA	Water	7470A	11
310-205130-5	MW-5B	Total/NA	Water	7470A	10
310-205130-6	MW-6	Total/NA	Water	7470A	9
310-205130-7	MW-7	Total/NA	Water	7470A	8
310-205130-8	MW-8	Total/NA	Water	7470A	7
310-205130-9	MW-9	Total/NA	Water	7470A	6
310-205130-10	MW-107	Total/NA	Water	7470A	5
310-205130-11	MW-00R	Total/NA	Water	7470A	4
310-205130-12	MW-01FB	Total/NA	Water	7470A	3
MB 310-315993/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-315993/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-205130-1 MS	MW-01	Total/NA	Water	7470A	
310-205130-1 MSD	MW-01	Total/NA	Water	7470A	

Analysis Batch: 316162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-1	MW-01	Total/NA	Water	7470A	315993
310-205130-2	MW-2B	Total/NA	Water	7470A	315993
310-205130-3	MW-3R	Total/NA	Water	7470A	315993
310-205130-4	MW-4B	Total/NA	Water	7470A	315993
310-205130-5	MW-5B	Total/NA	Water	7470A	315993
310-205130-6	MW-6	Total/NA	Water	7470A	315993
310-205130-7	MW-7	Total/NA	Water	7470A	315993
310-205130-8	MW-8	Total/NA	Water	7470A	315993
310-205130-9	MW-9	Total/NA	Water	7470A	315993
310-205130-10	MW-107	Total/NA	Water	7470A	315993
310-205130-11	MW-00R	Total/NA	Water	7470A	315993
310-205130-12	MW-01FB	Total/NA	Water	7470A	315993
MB 310-315993/1-A	Method Blank	Total/NA	Water	7470A	315993
LCS 310-315993/2-A	Lab Control Sample	Total/NA	Water	7470A	315993
310-205130-1 MS	MW-01	Total/NA	Water	7470A	315993
310-205130-1 MSD	MW-01	Total/NA	Water	7470A	315993

Eurofins TestAmerica, Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

QC Association Summary

Job ID: 310-205130-2

General Chemistry

Analysis Batch: 314083

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-1	MW-01	Total/NA	Water	1-3765-85	5
310-205130-2	MW-2B	Total/NA	Water	1-3765-85	
310-205130-3	MW-3R	Total/NA	Water	1-3765-85	
310-205130-4	MW-4B	Total/NA	Water	1-3765-85	6
310-205130-5	MW-5B	Total/NA	Water	1-3765-85	
310-205130-6	MW-6	Total/NA	Water	1-3765-85	
310-205130-7	MW-7	Total/NA	Water	1-3765-85	7
310-205130-8	MW-8	Total/NA	Water	1-3765-85	
310-205130-9	MW-9	Total/NA	Water	1-3765-85	
310-205130-10	MW-107	Total/NA	Water	1-3765-85	8
310-205130-11	MW-00R	Total/NA	Water	1-3765-85	
MB 310-314083/1	Method Blank	Total/NA	Water	1-3765-85	
LCS 310-314083/2	Lab Control Sample	Total/NA	Water	1-3765-85	9

Analysis Batch: 314103

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-12	MW-01FB	Total/NA	Water	1-3765-85	12
MB 310-314103/1	Method Blank	Total/NA	Water	1-3765-85	
LCS 310-314103/2	Lab Control Sample	Total/NA	Water	1-3765-85	

Analysis Batch: 314230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-1	MW-01	Total/NA	Water	SM 2540C	
310-205130-2	MW-2B	Total/NA	Water	SM 2540C	
310-205130-3	MW-3R	Total/NA	Water	SM 2540C	
310-205130-4	MW-4B	Total/NA	Water	SM 2540C	
310-205130-5	MW-5B	Total/NA	Water	SM 2540C	
310-205130-6	MW-6	Total/NA	Water	SM 2540C	
310-205130-7	MW-7	Total/NA	Water	SM 2540C	
MB 310-314230/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-314230/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 314381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-8	MW-8	Total/NA	Water	SM 2540C	
310-205130-9	MW-9	Total/NA	Water	SM 2540C	
310-205130-11	MW-00R	Total/NA	Water	SM 2540C	
MB 310-314381/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-314381/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-205130-9 DU	MW-9	Total/NA	Water	SM 2540C	

Analysis Batch: 314517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-205130-10	MW-107	Total/NA	Water	SM 2540C	
310-205130-12	MW-01FB	Total/NA	Water	SM 2540C	
MB 310-314517/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-314517/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Lab Chronicle

Job ID: 310-205130-2

Client Sample ID: MW-01

Date Collected: 04/19/21 15:05
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 17:56 CJT		TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00 JNR		TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 22:55 SAD		TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35 HED		TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 16:46 HED		TAL CF
Total/NA	Analysis	1-3765-85		1	314083	04/27/21 12:52 SAS		TAL CF
Total/NA	Analysis	SM 2540C		1	314230	04/28/21 13:50 ARG		TAL CF

Client Sample ID: MW-2B

Date Collected: 04/20/21 12:35
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 18:43 CJT		TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00 JNR		TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 22:58 SAD		TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35 HED		TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 16:57 HED		TAL CF
Total/NA	Analysis	1-3765-85		1	314083	04/27/21 12:52 SAS		TAL CF
Total/NA	Analysis	SM 2540C		1	314230	04/28/21 13:50 ARG		TAL CF

Client Sample ID: MW-3R

Date Collected: 04/19/21 14:15
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 18:58 CJT		TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00 JNR		TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:00 SAD		TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35 HED		TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 16:59 HED		TAL CF
Total/NA	Analysis	1-3765-85		1	314083	04/27/21 12:52 SAS		TAL CF
Total/NA	Analysis	SM 2540C		1	314230	04/28/21 13:50 ARG		TAL CF

Client Sample ID: MW-4B

Date Collected: 04/19/21 11:05
Date Received: 04/27/21 09:30

Lab Sample ID: 310-205130-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 19:14 CJT		TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00 JNR		TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:03 SAD		TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35 HED		TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:01 HED		TAL CF

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-205130-2

Client Sample ID: MW-4B
Date Collected: 04/19/21 11:05
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	I-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314230	04/28/21 13:50	ARG	TAL CF

Client Sample ID: MW-5B
Date Collected: 04/19/21 09:05
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 19:29	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:06	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:04	HED	TAL CF
Total/NA	Analysis	I-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314230	04/28/21 13:50	ARG	TAL CF

Client Sample ID: MW-6
Date Collected: 04/19/21 10:25
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 19:45	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:11	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:06	HED	TAL CF
Total/NA	Analysis	I-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314230	04/28/21 13:50	ARG	TAL CF

Client Sample ID: MW-7
Date Collected: 04/20/21 15:45
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 20:32	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:24	SAD	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314805	05/03/21 16:18	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:08	HED	TAL CF
Total/NA	Analysis	I-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314230	04/28/21 13:50	ARG	TAL CF

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-205130-2

Client Sample ID: MW-8
Date Collected: 04/19/21 15:45
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 20:47	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:27	SAD	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314805	05/03/21 16:21	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:10	HED	TAL CF
Total/NA	Analysis	I-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314381	04/29/21 14:12	SAS	TAL CF

Client Sample ID: MW-9
Date Collected: 04/19/21 09:45
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 21:03	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:30	SAD	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314805	05/03/21 16:23	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:12	HED	TAL CF
Total/NA	Analysis	I-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314381	04/29/21 14:12	SAS	TAL CF

Client Sample ID: MW-107
Date Collected: 04/20/21 13:00
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 21:18	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:32	SAD	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314805	05/03/21 16:26	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:14	HED	TAL CF
Total/NA	Analysis	I-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314517	04/30/21 14:08	ARG	TAL CF

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Lab Chronicle

Job ID: 310-205130-2

Client Sample ID: MW-00R
Date Collected: 04/19/21 12:15
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	315453	05/07/21 21:34	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:35	SAD	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314805	05/03/21 16:29	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:21	HED	TAL CF
Total/NA	Analysis	1-3765-85		1	314083	04/27/21 12:52	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314381	04/29/21 14:12	SAS	TAL CF

Client Sample ID: MW-01FB
Date Collected: 04/19/21 15:08
Date Received: 04/27/21 09:30
Lab Sample ID: 310-205130-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	315453	05/07/21 21:49	CJT	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314644	04/30/21 23:37	SAD	TAL CF
Total/NA	Prep	3010A			314138	04/28/21 09:00	JNR	TAL CF
Total/NA	Analysis	6020A		1	314805	05/03/21 16:31	SAD	TAL CF
Total/NA	Prep	7470A			315993	05/13/21 14:35	HED	TAL CF
Total/NA	Analysis	7470A		1	316162	05/14/21 17:23	HED	TAL CF
Total/NA	Analysis	1-3765-85		1	314103	04/27/21 15:02	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	314517	04/30/21 14:08	ARG	TAL CF

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

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Accreditation/Certification Summary

Job ID: 310-205130-2

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	IA100031 (OR)	09-29-21
Georgia	State	IA100031 (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 (Petroleum)	State	3349	08-22-21
North Dakota	State	R-186	09-29-21
Oregon	NELAP	IA100031	09-29-21
USDA	US Federal Programs	P330-19-00003	01-02-22

Method Summary

Job ID: 310-205130-2

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
1-3765-85	Residue, Non-filterable (TSS)	USGS	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	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.
USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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



Environment Testing
TestAmerica

Cooler/Sample Receipt and Temperature



Client Information	
Client: <u>TRCA</u>	STATE: <u>NE</u>
City/State: <u>Hastings</u>	Project: <u>Midwestern Network 1015</u>
Receipt Information DATE: <u>9/27/2021</u> TIME: <u>9:30</u>	Received By: <u>AM</u>
Date/Time Received: <u>9/27/2021</u> TIME: <u>9:30</u>	
Delivery Type: ☒ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Speed-Dee	
☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other: _____	
Condition of Cooler/Containers	
Sample(s) received in Cooler? ☒ Yes ☐ No If yes: Cooler ID: _____	
Multiple Coolers? ☐ Yes ☒ No If yes: Cooler # _____ of _____	
Cooler Custody Seals Present? ☐ Yes ☒ No If yes: Cooler custody seals intact? ☐ Yes ☐ No	
Sample Custody Seals Present? ☐ Yes ☒ No If yes: Sample custody seals intact? ☐ Yes ☐ No	
Trip Blank Present? ☐ Yes ☒ No If yes: Which VOA samples are in cooler? <u>1</u>	
Temperature Record	
Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: _____ ☐ NONE	
Thermometer ID: <u>7</u>	Correction Factor (°C): <u>+0.1</u>
• Temp Blank Temperature = If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature	
Uncorrected Temp (°C): <u>0.8</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? ☐ Yes ☐ No a) If yes: Is there evidence that the chilling process began? ☐ Yes ☐ No	
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid)? ☐ Yes ☐ No	
NOTE: If yes, contact PM before proceeding. If no, proceed with login	
Additional Comments	



Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact		Project Manager: Jenny Sidlo		Site Contact:		Date:		COC No:	
PPGA		Tel/Fax:		Lab Contact:		Carrier:		of COCs	
Hastings, NE 68901		Analysis Turnaround Time						Sampler:	
(xxx) xxx-xxxx Phone		☐ CALENDAR DAYS ☐ WORKING DAYS						For Lab Use Only:	
(xxx) xxx-xxxx FAX		IAI if different from below						Walk-in Client:	
Project Name: WEC MW Sampling		2 weeks						Lab Sampling:	
Monitoring Network Wells		1 week						Job / SDG No.:	
P O #6041		2 days							
1 day									
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:
MW-01	4-19-21	15:05	G		2	N	X	X	
MW-2B	4-20-21	12:35	G		2	N	X	X	
MW-3B	4-19-21	14:15	G		2	N	X	X	
MW-4B	4-19-21	11:05	G		2	N	X	X	
MW-5B	4-19-21	9:05	G		2	N	X	X	
MW-6	4-19-21	10:25	G		2	N	X	X	
MW-7	4-20-21	15:45	G		2	N	X	X	
MW-8	4-19-21	15:45	G		2	N	X	X	
MW-9	4-19-21	9:45	G		2	N	X	X	
MW-107	4-20-21	13:00	G		2	N	X	X	
MW-00B	4-19-21	12:15	G		2	N	X	X	
MW-01FB	4-19-21	15:08	G		2	N	X	X	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other									
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.									
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown									
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months									
Special Instructions/QC Requirements & Comments: Please report MDL and RL on lab results report.									
Report this COC as on separate project.									
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: _____		Corr'd: _____		Therm ID No.:	
Received by: _____		Company: Hastings Utilities		Received by: _____		Company: _____		Date/Time: _____	
Received by: _____		Company: _____		Received by: _____		Company: _____		Date/Time: _____	
Received by: _____		Company: _____		Received by: _____		Company: _____		Date/Time: _____	

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Login Sample Receipt Checklist

Client: Hastings Utilities

Job Number: 310-205130-1

Login Number: 205130
List Number: 1
Creator: Ramos, Eric F

List Source: Eurofins TestAmerica, Cedar Falls

Question

Answer

Comment

Radioactivity wasn't checked or is <= background as measured by a survey meter.

N/A

The cooler's custody seal, if present, is intact.

N/A

Sample custody seals, if present, are intact.

N/A

The cooler or samples do not appear to have been compromised or tampered with.

True

Samples were received on ice.

True

Cooler Temperature is acceptable.

True

Cooler Temperature is recorded.

True

COC is present.

True

COC is filled out in ink and legible.

True

COC is filled out with all pertinent information.

True

Is the Field Sampler's name present on COC?

True

There are no discrepancies between the containers received and the COC.

True

Samples are received within Holding Time (excluding tests with immediate HTS)

False

Sample containers have legible labels.

True

Containers are not broken or leaking.

True

Sample collection datelines 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 composting.

True

Residual Chlorine Checked.

N/A



Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-41929-1
Client Project/Site: Rad Groundwater

For:
Public Power Generation Agency
PO BOX 289
Hastings, Nebraska 68902-0289

Attn: Jenny Sidlo

(Rhonda Ridenhower)

Authorized for release by:
6/3/2021 12:36:41 PM
Rhonda Ridenhower, Client Service Manager
Rhonda.Ridenhower@Eurofinset.com
Designee for
Elizabeth Hoerchler, Project Manager I
(314)298-8566
Elizabeth.Hoerchler@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.

Client: Public Power Generation Agency
Project/Site: Rad Groundwater

Laboratory Job ID: 160-41929-1

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Job ID: 160-41929-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

CASE NARRATIVE

Client: Public Power Generation Agency

Project: Rad Groundwater

Report Number: 160-41929-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, St. Louis attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DL), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 05/03/2021; the samples arrived in good condition, properly preserved. The temperatures of the 2 coolers at receipt time were 23.0° C and 23.3° C

RADIUM-226 (GFPC)

Samples MW-01 (160-41929-1), MW-2B (160-41929-2), MW-3R (160-41929-3), MW-4B (160-41929-4), MW-5B (160-41929-5), MW-6 (160-41929-6), MW-7 (160-41929-7), MW-8 (160-41929-8) and MW-9 (160-41929-9) were analyzed for Radium-226 (GFPC) in accordance with EPA Method 903.0. The samples were prepared on 05/07/2021 and analyzed on 06/01/2021.

Job ID: 160-41929-1 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

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

RADIUM-228 (GFPC)

Samples MW-01 (160-41929-1), MW-2B (160-41929-2), MW-3R (160-41929-3), MW-4B (160-41929-4), MW-5B (160-41929-5), MW-6 (160-41929-6), MW-7 (160-41929-7), MW-8 (160-41929-8) and MW-9 (160-41929-9) were analyzed for Radium-228 (GFPC) in accordance with EPA 904. The samples were prepared on 05/07/2021 and analyzed on 05/27/2021 and 06/01/2021.

The Radium-228 laboratory control sample (LCS) associated with the following samples recovered at 74%, (LCS 160-508760/1-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.

The following samples did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interference. During preparation the analyst visually noted matrix effects. The data have been reported with this narrative, MW-01 (160-41929-1), MW-2B (160-41929-2), MW-3R (160-41929-3), MW-4B (160-41929-4), (LCS 160-508760/1-A), (MB 160-508760/23-A).

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

COMBINED RADIUM-226 AND RADIUM-228

Samples MW-01 (160-41929-1), MW-2B (160-41929-2), MW-3R (160-41929-3), MW-4B (160-41929-4), MW-5B (160-41929-5), MW-6 (160-41929-6), MW-7 (160-41929-7), MW-8 (160-41929-8) and MW-9 (160-41929-9) were analyzed for Combined Radium-226 and Radium-228 in accordance with EPA 903 Radium 226/EPA 904 Radium 228. The samples were analyzed on 06/02/2021.

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

Definitions/Glossary

Qualifiers	
Rad	Qualifier Description
U	Result is less than the sample detection limit.
Glossary	
These commonly used abbreviations may or may not be present in this report.	
±	Listed under the "P" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFU	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
MOL	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
POL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Method Summary

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	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

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Protocol References:
EPA = US Environmental Protection Agency
None = None
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

Sample Summary

Job ID: 160-41929-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
160-41929-1	MM-01	Water	04/19/21 15:05	05/03/21 11:15	
160-41929-2	MM-2B	Water	04/20/21 12:35	05/03/21 11:15	
160-41929-3	MM-3R	Water	04/19/21 14:15	05/03/21 11:15	
160-41929-4	MM-4B	Water	04/19/21 11:05	05/03/21 11:15	
160-41929-5	MM-5B	Water	04/19/21 09:05	05/03/21 11:15	
160-41929-6	MM-6	Water	04/19/21 10:25	05/03/21 11:15	
160-41929-7	MM-7	Water	04/20/21 15:45	05/03/21 11:15	
160-41929-8	MM-8	Water	04/19/21 15:45	05/03/21 11:15	
160-41929-9	MM-9	Water	04/19/21 09:45	05/03/21 11:15	

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Client Sample Results

Job ID: 160-41929-1

Client Sample ID: MM-01	Lab Sample ID: 160-41929-1
Date Collected: 04/19/21 15:05	Matrix: Water
Date Received: 05/03/21 11:15	

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count	Total	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.145		0.0975	0.0983		1.00	0.134	pCi/L	05/07/21 10:55	06/01/21 14:46	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	87.4		40 - 110						05/07/21 10:55	06/01/21 14:46	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count	Total	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.502		0.288	0.292		1.00	0.438	pCi/L	05/07/21 12:57	05/27/21 13:00	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	87.4		40 - 110						05/07/21 12:57	05/27/21 13:00	1
Y Carrier	87.1		40 - 110						05/07/21 12:57	05/27/21 13:00	1

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

Analyte	Result	Qualifier	Count	Total	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	0.647		0.304	0.308		5.00	0.438	pCi/L		06/02/21 22:30	1
226 + 228											

Client Sample ID: MM-2B	Lab Sample ID: 160-41929-2
Date Collected: 04/20/21 12:35	Matrix: Water
Date Received: 05/03/21 11:15	

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count	Total	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.340		0.128	0.131		1.00	0.132	pCi/L	05/07/21 10:55	06/01/21 14:47	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	90.4		40 - 110						05/07/21 10:55	06/01/21 14:47	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count	Total	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.428		0.263	0.266		1.00	0.402	pCi/L	05/07/21 12:57	05/27/21 13:00	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	90.4		40 - 110						05/07/21 12:57	05/27/21 13:00	1
Y Carrier	87.5		40 - 110						05/07/21 12:57	05/27/21 13:00	1

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Client Sample Results

Client: Public Power Generation Agency
Project/Site: Rad Groundwater

Job ID: 160-41929-1

Client Sample ID: MW-2B
Date Collected: 04/20/21 12:35
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-2
Matrix: Water

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

Analyte	Count		RL	MDC Unit	Prepared	Analyzed	Dil Fac
	Uncert.	Total					
Combined Radium	Result	Qualifier					
226 + 228	0.768	0.292	0.297	5.00	0.402	pCi/L	1

Client Sample ID: MW-3R
Date Collected: 04/19/21 14:15
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-3
Matrix: Water

Method: 903.0 - Radium-226 (GFPc)

		Count	Total					
		Uncert.	(2σ+)	RL	MDC Unit	Prepared	Analyzed	Dil Fac
Analyte	Result	Qualifier	(2σ+)	0.112	0.144 PC/L	05/07/21 10:55	06/01/21 14:47	1
Radium-226	0.200		0.111	1.00				
Carrier	%Yield	Qualifier	Limits					
Ba Carrier	93.4		40 - 110			05/07/21 10:55	06/01/21 14:47	1

Method: 904.0 - Radium-228 (GFPc)

		Count		Total			
		Uncert.	(2σ+/-)	RL	MDC Unit	Prepared	Analyzed
Analyte	Result	Qualifier	(2σ+/-)	RL	MDC Unit	Prepared	Analyzed
Radium-228	-0.0158	U	0.192	1.00	0.352 pCi/L	05/07/21 12:57	05/27/21 13:00
Carrier	%Yield	Qualifier	Limits				
Ba Carrier	93.4		40 - 110			05/07/21 12:57	05/27/21 13:00
Y Carrier	83.4		40 - 110			05/07/21 12:57	05/27/21 13:00

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

Analyte	Count		RL	MDC Unit	Prepared	Analyzed	Dil Fac
	Uncert.	Total					
Combined Radium 226 + 228	0.184	U	0.222	0.222	5.00	0.352 pCi/L	1

Client Sample ID: MW-4B
Date Collected: 04/19/21 11:05
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-4
Matrix: Water

Method: 903.0 - Radium-226 (GFPc)

		Count	Total					
Analyte	Result	Qualifier	Uncert. (2σ+)	RL	MDC Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.106	U	0.0875	0.0880	1.00	05/07/21 10:55	06/01/21 14:47	1
Carrier	%Yield	Qualifier	Limits					
Ba Carrier	89.8		40 - 110					
						Prepared	Analyzed	Dil Fac
						05/07/21 10:55	06/01/21 14:47	1

Client Sample Results

Client: Public Power Generation Agency
Project/Site: Rad Groundwater

Job ID: 160-41929-1

Client Sample ID: MW-4B
Date Collected: 04/19/21 11:05
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-4
Matrix: Water

Method: 904.0 - Radium-228 (GFPc)

		Count	Total		
		Uncert.	Uncert.	RL	MDC Unit
Analyte	Result	Qualifier	(2σ+)	(2σ+)	
Radium-228	0.269	U	0.211	0.212	1.00
					0.329 pCi/L
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed
Ba Carrier	89.8		40 - 110	05/07/21 12:57	05/27/21 13:01
Y Carrier	86.6		40 - 110	05/07/21 12:57	05/27/21 13:01
				Prepared	Analyzed
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Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count	Total	RL	MDC Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.					
Combined Radium 226 + 228	0.375		0.228		5.00	0.329		06/02/21 22:30	
				0.230		pC/L		1	

Client Sample ID: MW-5B
Date Collected: 04/19/21 09:05
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-5
Matrix: Water

Method: 903.0 - Radium-226 (GFPc)

		Count	Total				
Analyte	Result	Qualifier	RL	MDC Unit	Prepared	Analyzed	Dil Fac
Uncert.		(2σ+/-)					
Radium-226	0.266		0.199	0.201	1.00	0.267	PC/L
Carrier	%Yield	Qualifier	Limits				
Ba Carrier	84.2		40 - 110				
					Prepared	Analyzed	Dil Fac
					05/07/21 14:16	06/01/21 20:41	1

Method: 904.0 - Radium-228 (GFPc)

Count		Total		Prepared		Analyzed		Dil Fac
Analyte	Result	Qualifier	RL	MDC Unit	Prepared	Analyzed	Dil Fac	
Radium-228	0.885	0.331	0.341	1.00	05/07/21 14:42	06/01/21 09:37	1	
Carrier	%Yield	Qualifier	Limits		Prepared	Analyzed	Dil Fac	
Ba Carrier	84.2		40 - 110		05/07/21 14:42	06/01/21 09:37	1	
Y Carrier	84.1		40 - 110		05/07/21 14:42	06/01/21 09:37	1	

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

Analyte	Count Uncert.	Total Uncert.	RL	MDC Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.17	0.386	5.00	0.449	PC/L	06/02/21 22:30	1

Client: Public Power Generation Agency
Project/Site: Rad Groundwater

Client Sample Results

Job ID: 160-41929-1

Client Sample ID: MW-6
Date Collected: 04/19/21 10:25
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-6
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Radium-226	0.213	U	0.187	0.188	Radium-226	0.213	U
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	81.2		40 - 110		Ba Carrier	81.2	
Y Carrier	80.7		40 - 110		Y Carrier	80.7	

Method: 904.0 - Radium-228 (GFPC)

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Radium-228	1.01		0.358	0.370	Radium-228	1.01	
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	81.2		40 - 110		Ba Carrier	81.2	
Y Carrier	80.7		40 - 110		Y Carrier	80.7	

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

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Combined Radium	1.22		0.404	0.415	Combined Radium	1.22	
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	81.2		40 - 110		Ba Carrier	81.2	
Y Carrier	80.7		40 - 110		Y Carrier	80.7	

Client Sample ID: MW-7
Date Collected: 04/20/21 15:45
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-7
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Radium-226	0.171	U	0.187	0.188	Radium-226	0.171	U
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	77.9		40 - 110		Ba Carrier	77.9	
Y Carrier	81.9		40 - 110		Y Carrier	81.9	

Method: 904.0 - Radium-228 (GFPC)

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Radium-228	0.722		0.350	0.357	Radium-228	0.722	
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	77.9		40 - 110		Ba Carrier	77.9	
Y Carrier	81.9		40 - 110		Y Carrier	81.9	

Client: Public Power Generation Agency
Project/Site: Rad Groundwater

Client Sample Results

Job ID: 160-41929-1

Client Sample ID: MW-7
Date Collected: 04/20/21 15:45
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-7
Matrix: Water

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

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Combined Radium	0.883		0.397	0.403	Combined Radium	0.883	
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	92.1		40 - 110		Ba Carrier	92.1	
Y Carrier	81.9		40 - 110		Y Carrier	81.9	

Client Sample ID: MW-8
Date Collected: 04/19/21 15:45
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-8
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Radium-226	0.151	U	0.161	0.162	Radium-226	0.151	U
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	92.1		40 - 110		Ba Carrier	92.1	
Y Carrier	81.9		40 - 110		Y Carrier	81.9	

Method: 904.0 - Radium-228 (GFPC)

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Radium-228	0.937		0.337	0.348	Radium-228	0.937	
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	92.1		40 - 110		Ba Carrier	92.1	
Y Carrier	81.9		40 - 110		Y Carrier	81.9	

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

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Combined Radium	1.09		0.373	0.384	Combined Radium	1.09	
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	92.1		40 - 110		Ba Carrier	92.1	
Y Carrier	81.9		40 - 110		Y Carrier	81.9	

Client Sample ID: MW-9
Date Collected: 04/19/21 09:45
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-9
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Count		Total		Count		Total	
Analyte	Result	Qualifier	Uncert.	Uncert.	Analyte	Result	Qualifier
Radium-226	0.125	U	0.178	0.178	Radium-226	0.125	U
Carrier	%Yield	Qualifier	Limits		Carrier	%Yield	Qualifier
Ba Carrier	85.5		40 - 110		Ba Carrier	85.5	
Y Carrier	81.9		40 - 110		Y Carrier	81.9	

Client: Public Power Generation Agency
Project/Site: Rad Groundwater

Client Sample Results

Job ID: 160-41929-1

Client Sample ID: MW-9
Date Collected: 04/19/21 09:45
Date Received: 05/03/21 11:15

Lab Sample ID: 160-41929-9
Matrix: Water

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)					
Radium-228	2.56		0.442	0.500	1.00	0.434 pCi/L	05/07/21 14:42	06/01/21 09:38	1
Carrier	%Yield	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Ba Carrier	85.5		40 - 110				05/07/21 14:42	06/01/21 09:38	1
Y Carrier	80.7		40 - 110				05/07/21 14:42	06/01/21 09:38	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)					
Combined Radium	2.58		0.476	0.531	5.00	0.434 pCi/L		06/02/21 22:30	1

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Client: Public Power Generation Agency
Project/Site: Rad Groundwater

QC Sample Results

Job ID: 160-41929-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-508747/23-A
Matrix: Water
Analysis Batch: 512418

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 508747

Analyte	Result	Qualifier	Count	Total	RL	MDC Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)					
Radium-226	0.02869 U		0.0752	0.0752	1.00	0.134 pCi/L	05/07/21 10:55	06/01/21 20:23	1
Carrier	MB MB	%Yield	Qualifier	Limits			Prepared	Analyzed	Dil Fac
Ba Carrier	91.0		40 - 110				05/07/21 10:55	06/01/21 20:23	1

Lab Sample ID: LCS 160-508747/1-A

Matrix: Water
Analysis Batch: 512428

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 508747

Analyte	Result	Qualifier	Spike Added	LCS LCS	Uncert. (2σ+/-)	RL	MDC Unit	%Rec	Limits
				Qual					
Radium-226			15.1	15.50	1.65	1.00	0.178 pCi/L	103	75 - 125
Carrier	LCS LCS	%Yield	Qualifier	Limits					
Ba Carrier	82.0		40 - 110						

Lab Sample ID: MB 160-508769/23-A

Matrix: Water
Analysis Batch: 512429

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 508769

Analyte	Result	Qualifier	Count	Total	RL	MDC Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)					
Radium-226	-0.007853 U		0.123	0.123	1.00	0.253 pCi/L	05/07/21 14:16	06/02/21 15:14	1
Carrier	MB MB	%Yield	Qualifier	Limits			Prepared	Analyzed	Dil Fac
Ba Carrier	87.9		40 - 110				05/07/21 14:16	06/02/21 15:14	1

Lab Sample ID: LCS 160-508769/1-A

Matrix: Water
Analysis Batch: 512418

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 508769

Analyte	Result	Qualifier	Spike Added	LCS LCS	Uncert. (2σ+/-)	RL	MDC Unit	%Rec	Limits
				Qual					
Radium-226			11.3	10.43	1.34	1.00	0.306 pCi/L	92	75 - 125
Carrier	LCS LCS	%Yield	Qualifier	Limits					
Ba Carrier	83.9		40 - 110						

Lab Sample ID: LCSD 160-508769/2-A

Matrix: Water
Analysis Batch: 512418

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 508769

Analyte	Result	Qualifier	Spike Added	LCSD LCSD	Uncert. (2σ+/-)	RL	MDC Unit	%Rec	Limits
				Qual					
Radium-226			11.3	11.40	1.43	1.00	0.321 pCi/L	101	75 - 125 0.35
Carrier	LCS LCS	%Yield	Qualifier	Limits					
Ba Carrier	83.9		40 - 110						

QC Sample Results

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

Lab Sample ID: LCS 160-508769/2-A				Client Sample ID: Lab Control Sample Dup			
Matrix: Water				Prep Type: Total/NA			
Analysis Batch: 512418				Prep Batch: 508769			
Carrier		LCS D	Limits	Carrier		LCS D	Limits
Ba Carrier		%Yield	Qualifier	Ba Carrier		%Yield	Qualifier
		85.2	40 - 110			85.2	40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-508760/23-A				Client Sample ID: Method Blank			
Matrix: Water				Prep Type: Total/NA			
Analysis Batch: 511776				Prep Batch: 508760			
Analyte	MB	MB	Count	Total	RL	MDC	Unit
	Result	Qualifier	Uncert.				
Radium-228	0.1472	U	0.276	0.276	1.00	0.472	pCi/L
Carrier	MB	MB					
	%Yield	Qualifier	Limits				
Ba Carrier	91.0		40 - 110				
Y Carrier	87.1		40 - 110				
Prepared	Analyzed	Dil Fac	%	Prepared	Analyzed	Dil Fac	%
05/07/21 12:57	05/27/21 13:01			05/07/21 12:57	05/27/21 13:01		
05/07/21 12:57	05/27/21 13:01			05/07/21 12:57	05/27/21 13:01		

QC Association Summary

Job ID: 160-41929-1

Rad

Prep Batch: 508747

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-41929-1	MW-01	Total/NA	Water	PrecSep_21	5
160-41929-2	MW-2B	Total/NA	Water	PrecSep_21	
160-41929-3	MW-3R	Total/NA	Water	PrecSep_21	
160-41929-4	MW-4B	Total/NA	Water	PrecSep_21	6
MB 160-508747/23-A	Method Blank	Total/NA	Water	PrecSep_21	
LCS 160-508747/1-A	Lab Control Sample	Total/NA	Water	PrecSep_21	

Prep Batch: 508760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-41929-1	MW-01	Total/NA	Water	PrecSep_0	9
160-41929-2	MW-2B	Total/NA	Water	PrecSep_0	
160-41929-3	MW-3R	Total/NA	Water	PrecSep_0	
160-41929-4	MW-4B	Total/NA	Water	PrecSep_0	10
MB 160-508760/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-508760/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 508769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-41929-5	MW-5B	Total/NA	Water	PrecSep_21	12
160-41929-6	MW-6	Total/NA	Water	PrecSep_21	
160-41929-7	MW-7	Total/NA	Water	PrecSep_21	
160-41929-8	MW-8	Total/NA	Water	PrecSep_21	11
160-41929-9	MW-9	Total/NA	Water	PrecSep_21	
LCS 160-508769/1-A	Method Blank	Total/NA	Water	PrecSep_21	
MB 160-508769/23-A	Lab Control Sample	Total/NA	Water	PrecSep_21	10
LCS 160-508769/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_21	
LCS 160-508769/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_21	

Prep Batch: 508770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-41929-5	MW-5B	Total/NA	Water	PrecSep_0	5
160-41929-6	MW-6	Total/NA	Water	PrecSep_0	
160-41929-7	MW-7	Total/NA	Water	PrecSep_0	
160-41929-8	MW-8	Total/NA	Water	PrecSep_0	6
160-41929-9	MW-9	Total/NA	Water	PrecSep_0	
MB 160-508770/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-508770/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	7
LCS 160-508770/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
LCS 160-508770/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Tracer/Carrier Summary

Job ID: 160-41929-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)	Percent Yield (Acceptance Limits)
160-41929-1	MW-01	87.4	87.1	5
160-41929-2	MW-2B	90.4	87.5	
160-41929-3	MW-3R	93.4	83.4	
160-41929-4	MW-4B	89.8	85.6	6
160-41929-5	MW-5B	84.2	84.1	
160-41929-6	MW-6	81.2	80.7	
160-41929-7	MW-7	77.9	81.9	7
160-41929-8	MW-8	92.1	80.7	
160-41929-9	MW-9	85.5	82.0	
LCS 160-508747/1-A	Lab Control Sample	82.0	85.2	8
LCS 160-508769/1-A	Lab Control Sample	83.9	80.7	
LCS 160-508769/2-A	Lab Control Sample Dup	85.2	81.5	
MB 160-508747/23-A	Method Blank	91.0	87.1	9
MB 160-508760/23-A	Method Blank	87.9	84.1	
MB 160-508769/23-A	Method Blank	87.9	84.1	

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)	Percent Yield (Acceptance Limits)
160-41929-1	MW-01	87.4	87.1	5
160-41929-2	MW-2B	90.4	87.5	
160-41929-3	MW-3R	93.4	83.4	
160-41929-4	MW-4B	89.8	85.6	6
160-41929-5	MW-5B	84.2	84.1	
160-41929-6	MW-6	81.2	80.7	
160-41929-7	MW-7	77.9	81.9	7
160-41929-8	MW-8	92.1	81.9	
160-41929-9	MW-9	85.5	80.7	
LCS 160-508760/1-A	Lab Control Sample	82.0	85.2	8
LCS 160-508770/1-A	Lab Control Sample	83.9	80.7	
LCS 160-508770/2-A	Lab Control Sample Dup	85.2	81.5	
MB 160-508760/23-A	Method Blank	91.0	87.1	9
MB 160-508770/23-A	Method Blank	87.9	84.1	
MB 160-508770/23-A	Method Blank	87.9	84.1	

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier



Environment Testing America

ANALYTICAL REPORT

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

Laboratory Job ID: 310-221765-1
Client Project/Site: WEC MW Sampling

For:
Hastings Utilities
1228 North Denver Ave
PO BOX 289
Hastings, Nebraska 68901

Attn: Jenny Sidlo

Authorized for release by:
1/5/2022 4:45:32 PM
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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: Hastings Utilities
Project/Site: WEC MW Sampling

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Laboratory Job ID: 310-221765-1

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Job ID: 310-221765-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-221765-1

Comments
No additional comments.

Receipt
The samples were received on 12/15/2021 9:20 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 1.7° 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
Method SM 2540C: The following samples were received with insufficient time remaining to perform the analysis within holding time: MW-01 (310-221765-1), MW-2B (310-221765-2), MW-3R (310-221765-3), MW-4B (310-221765-4) and MW-5B (310-221765-5).

Method SM 2540C: The following samples were received outside of holding time: MW-06 (310-221765-6), MW-07 (310-221765-7), MW-08 (310-221765-8), MW-09 (310-221765-9), MW-102FB (310-221765-10) and MW-107 (310-221765-12).

Method I-3765-85: The following samples were received outside of holding time: MW-01 (310-221765-1), MW-2B (310-221765-2), MW-3R (310-221765-3), MW-4B (310-221765-4), MW-5B (310-221765-5), MW-06 (310-221765-6), MW-07 (310-221765-7), MW-08 (310-221765-8), MW-09 (310-221765-9), MW-102FB (310-221765-10), and MW-107 (310-221765-12).

Method I-3765-85: The following samples were received outside of holding time:

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

Job ID: 310-221765-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-221765-2

Comments

No additional comments.

Receipt

The samples were received on 12/15/2021 9:20 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 1.7° C.

HPLC/IC

Method 9056A: The following samples were received outside of holding time: MW-01 (310-221765-1), MW-2B (310-221765-2), MW-3R (310-221765-3), MW-4B (310-221765-4), MW-5B (310-221765-5), MW-06 (310-221765-6), MW-07 (310-221765-7), MW-08 (310-221765-8), MW-09 (310-221765-9), MW-102FB (310-221765-10), EOB-02 (310-221765-11) and MW-107 (310-221765-12).

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

Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-221765-1	MW-01	Water	12/07/21 14:30	12/15/21 09:20
310-221765-2	MW-2B	Water	12/07/21 15:05	12/15/21 09:20
310-221765-3	MW-3R	Water	12/07/21 13:15	12/15/21 09:20
310-221765-4	MW-4B	Water	12/07/21 12:45	12/15/21 09:20
310-221765-5	MW-5B	Water	12/07/21 09:10	12/15/21 09:20
310-221765-6	MW-06	Water	12/07/21 10:20	12/15/21 09:20
310-221765-7	MW-07	Water	12/07/21 13:50	12/15/21 09:20
310-221765-8	MW-08	Water	12/07/21 15:35	12/15/21 09:20
310-221765-9	MW-09	Water	12/07/21 09:45	12/15/21 09:20
310-221765-10	MW-102FB	Water	12/07/21 15:08	12/15/21 09:20
310-221765-11	EOB-02	Water	12/09/21 11:30	12/15/21 09:20
310-221765-12	MW-107	Water	12/07/21 08:30	12/15/21 09:20

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-221765-1

Client Sample ID: MW-01

Lab Sample ID: 310-221765-1

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D	Method	Prep Type
Chloride	29.2		5.00	2.15 mg/L		5	9056A	Total/NA
Nitrate as N	9.94	H H3	0.500	0.200 mg/L		5	9056A	Total/NA
Fluoride	0.663		0.500	0.275 mg/L		5	9056A	Total/NA
Sulfate	169		5.00	2.45 mg/L		5	9056A	Total/NA
Arsenic	0.00298		0.00200	0.000750 mg/L		1	6020A	Total/NA
Barium	0.0797		0.00200	0.000370 mg/L		1	6020A	Total/NA
Boron	1.19		0.100	0.0580 mg/L		1	6020A	Total/NA
Calcium	35.7		0.500	0.190 mg/L		1	6020A	Total/NA
Chromium	0.0324		0.00500	0.00110 mg/L		1	6020A	Total/NA
Lithium	0.00981	J	0.0100	0.00250 mg/L		1	6020A	Total/NA
Molybdenum	0.0432		0.00200	0.00130 mg/L		1	6020A	Total/NA
Selenium	0.0720		0.00500	0.000960 mg/L		1	6020A	Total/NA
Total Dissolved Solids	342	H H3	50.0	26.0 mg/L		1	SM 2540C	Total/NA

Client Sample ID: MW-2B

Lab Sample ID: 310-221765-2

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D	Method	Prep Type
Chloride	28.4		5.00	2.15 mg/L		5	9056A	Total/NA
Nitrate as N	9.12	H H3	0.500	0.200 mg/L		5	9056A	Total/NA
Fluoride	0.667		0.500	0.275 mg/L		5	9056A	Total/NA
Sulfate	150		5.00	2.45 mg/L		5	9056A	Total/NA
Arsenic	0.00174	J	0.00200	0.000750 mg/L		1	6020A	Total/NA
Barium	0.162		0.00200	0.000370 mg/L		1	6020A	Total/NA
Boron	0.537		0.100	0.0580 mg/L		1	6020A	Total/NA
Calcium	71.7		0.500	0.190 mg/L		1	6020A	Total/NA
Chromium	0.0178		0.00500	0.00110 mg/L		1	6020A	Total/NA
Lithium	0.0132		0.0100	0.00250 mg/L		1	6020A	Total/NA
Molybdenum	0.00300		0.00200	0.00130 mg/L		1	6020A	Total/NA
Selenium	0.0359		0.00500	0.000960 mg/L		1	6020A	Total/NA
Total Suspended Solids	2.33	J H H3	5.00	1.70 mg/L		1	I-3765-85	Total/NA
Total Dissolved Solids	394	H H3	50.0	26.0 mg/L		1	SM 2540C	Total/NA

Client Sample ID: MW-3R

Lab Sample ID: 310-221765-3

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D	Method	Prep Type
Chloride	31.9		5.00	2.15 mg/L		5	9056A	Total/NA
Nitrate as N	6.56	H H3	0.500	0.200 mg/L		5	9056A	Total/NA
Fluoride	0.496	J	0.500	0.275 mg/L		5	9056A	Total/NA
Sulfate	201		5.00	2.45 mg/L		5	9056A	Total/NA
Arsenic	0.00190	J	0.00200	0.000750 mg/L		1	6020A	Total/NA
Barium	0.0648		0.00200	0.000370 mg/L		1	6020A	Total/NA
Boron	0.616		0.100	0.0580 mg/L		1	6020A	Total/NA
Calcium	67.2		0.500	0.190 mg/L		1	6020A	Total/NA
Chromium	0.0353		0.00500	0.00110 mg/L		1	6020A	Total/NA
Cobalt	0.000873		0.000500	0.000190 mg/L		1	6020A	Total/NA
Iron	1.37		0.100	0.0360 mg/L		1	6020A	Total/NA
Lithium	0.0248		0.0100	0.00250 mg/L		1	6020A	Total/NA
Molybdenum	0.0114		0.00200	0.00130 mg/L		1	6020A	Total/NA
Selenium	0.0495		0.00500	0.000960 mg/L		1	6020A	Total/NA
Total Suspended Solids	14.7	H H3	5.00	1.70 mg/L		1	I-3765-85	Total/NA
Total Dissolved Solids	418	H H3	50.0	26.0 mg/L		1	SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-221765-1

Client Sample ID: MW-4B

Lab Sample ID: 310-221765-4

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D	Method	Prep Type
Chloride	26.2		5.00	2.15 mg/L		5	9056A	Total/NA
Nitrate as N	3.20	H H3	0.500	0.200 mg/L		5	9056A	Total/NA
Fluoride	0.732		0.500	0.275 mg/L		5	9056A	Total/NA
Sulfate	227		5.00	2.45 mg/L		5	9056A	Total/NA
Arsenic	0.00227		0.00200	0.000750 mg/L		1	6020A	Total/NA
Barium	0.0623		0.00200	0.000370 mg/L		1	6020A	Total/NA
Boron	0.687		0.100	0.0580 mg/L		1	6020A	Total/NA
Cadmium	0.000100	J	0.000100	0.0000510 mg/L		1	6020A	Total/NA
Calcium	54.7		0.500	0.190 mg/L		1	6020A	Total/NA
Lithium	0.0214		0.0100	0.00250 mg/L		1	6020A	Total/NA
Molybdenum	0.0108		0.00200	0.00130 mg/L		1	6020A	Total/NA
Selenium	0.0445		0.00500	0.000960 mg/L		1	6020A	Total/NA
Total Dissolved Solids	384	H H3	50.0	26.0 mg/L		1	SM 2540C	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-221765-5

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D	Method	Prep Type
Chloride	25.2		5.00	2.15 mg/L		5	9056A	Total/NA
Nitrate as N	9.82	H H3	0.500	0.200 mg/L		5	9056A	Total/NA
Fluoride	1.52		0.500	0.275 mg/L		5	9056A	Total/NA
Sulfate	184		5.00	2.45 mg/L		5	9056A	Total/NA
Arsenic	0.00400		0.00200	0.000750 mg/L		1	6020A	Total/NA
Barium	0.0481		0.00200	0.000370 mg/L		1	6020A	Total/NA
Boron	1.07		0.100	0.0580 mg/L		1	6020A	Total/NA
Calcium	47.5		0.500	0.190 mg/L		1	6020A	Total/NA
Chromium	0.0435		0.00500	0.00110 mg/L		1	6020A	Total/NA
Lithium	0.0120		0.0100	0.00250 mg/L		1	6020A	Total/NA
Molybdenum	0.0242		0.00200	0.00130 mg/L		1	6020A	Total/NA
Selenium	0.0843		0.00500	0.000960 mg/L		1	6020A	Total/NA
Total Dissolved Solids	326	H H3	50.0	26.0 mg/L		1	SM 2540C	Total/NA

Client Sample ID: MW-06

Lab Sample ID: 310-221765-6

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D	Method	Prep Type
Chloride	28.0		5.00	2.15 mg/L		5	9056A	Total/NA
Nitrate as N	5.86	H H3	0.500	0.200 mg/L		5	9056A	Total/NA
Fluoride	0.779		0.500	0.275 mg/L		5	9056A	Total/NA
Sulfate	164		5.00	2.45 mg/L		5	9056A	Total/NA
Arsenic	0.00233		0.00200	0.000750 mg/L		1	6020A	Total/NA
Barium	0.0449		0.00200	0.000370 mg/L		1	6020A	Total/NA
Boron	1.05		0.100	0.0580 mg/L		1	6020A	Total/NA
Calcium	52.9		0.500	0.190 mg/L		1	6020A	Total/NA
Chromium	0.00631		0.00500	0.00110 mg/L		1	6020A	Total/NA
Iron	0.0611	J	0.100	0.0360 mg/L		1	6020A	Total/NA
Lithium	0.0136		0.0100	0.00250 mg/L		1	6020A	Total/NA
Molybdenum	0.0138		0.00200	0.00130 mg/L		1	6020A	Total/NA
Selenium	0.0337		0.00500	0.000960 mg/L		1	6020A	Total/NA
Total Dissolved Solids	312	H H3	50.0	26.0 mg/L		1	SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-221765-1

Client Sample ID: MW-07

Lab Sample ID: 310-221765-7

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	47.5		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	9.80	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.670		0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	348		5.00	2.45 mg/L	5	9056A	Total/NA
Arsenic	0.00279		0.00200	0.000750 mg/L	1	6020A	Total/NA
Barium	0.0639		0.00200	0.000370 mg/L	1	6020A	Total/NA
Boron	1.31		0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	79.7		0.500	0.190 mg/L	1	6020A	Total/NA
Chromium	0.0148		0.00500	0.00110 mg/L	1	6020A	Total/NA
Lithium	0.0168		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0221		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0545		0.00500	0.000960 mg/L	1	6020A	Total/NA
Total Dissolved Solids	608	H H3	50.0	26.0 mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW-08

Lab Sample ID: 310-221765-8

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	34.8		20.0	8.60 mg/L	20	9056A	Total/NA
Nitrate as N	9.45	H H3	2.00	0.800 mg/L	20	9056A	Total/NA
Fluoride	3.17		2.00	1.10 mg/L	20	9056A	Total/NA
Sulfate	156		20.0	9.80 mg/L	20	9056A	Total/NA
Arsenic	0.00444		0.00200	0.000750 mg/L	1	6020A	Total/NA
Barium	0.0380		0.00200	0.000370 mg/L	1	6020A	Total/NA
Boron	1.24		0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	32.8		0.500	0.190 mg/L	1	6020A	Total/NA
Chromium	0.0486		0.00500	0.00110 mg/L	1	6020A	Total/NA
Lithium	0.0101		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0435		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0428		0.00500	0.000960 mg/L	1	6020A	Total/NA
Total Dissolved Solids	316	H H3	50.0	26.0 mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW-09

Lab Sample ID: 310-221765-9

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	26.0		10.0	4.30 mg/L	10	9056A	Total/NA
Nitrate as N	4.00	H H3	1.00	0.400 mg/L	10	9056A	Total/NA
Fluoride	1.02		1.00	0.550 mg/L	10	9056A	Total/NA
Sulfate	138		10.0	4.90 mg/L	10	9056A	Total/NA
Arsenic	0.00246		0.00200	0.000750 mg/L	1	6020A	Total/NA
Barium	0.0680		0.00200	0.000370 mg/L	1	6020A	Total/NA
Boron	1.36		0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	40.5		0.500	0.190 mg/L	1	6020A	Total/NA
Chromium	0.00426	J	0.00500	0.00110 mg/L	1	6020A	Total/NA
Lithium	0.00954	J	0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0137		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0277		0.00500	0.000960 mg/L	1	6020A	Total/NA
Total Dissolved Solids	294	H H3	50.0	26.0 mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW-102FB

Lab Sample ID: 310-221765-10

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Barium	0.000486	J	0.00200	0.000370 mg/L	1	6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-221765-1

Client Sample ID: EQB-02

Lab Sample ID: 310-221765-11

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	0.818	J	1.00	0.430 mg/L	1	9056A	Total/NA
Nitrate as N	0.558	H H3	0.100	0.0400 mg/L	1	9056A	Total/NA
Sulfate	0.543	J	1.00	0.490 mg/L	1	9056A	Total/NA
Barium	0.00115	J	0.00200	0.000370 mg/L	1	6020A	Total/NA
Calcium	0.450	J	0.500	0.190 mg/L	1	6020A	Total/NA

Client Sample ID: MW-107

Lab Sample ID: 310-221765-12

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	46.5		5.00	2.15 mg/L	5	9056A	Total/NA
Nitrate as N	9.71	H H3	0.500	0.200 mg/L	5	9056A	Total/NA
Fluoride	0.591		0.500	0.275 mg/L	5	9056A	Total/NA
Sulfate	342		5.00	2.45 mg/L	5	9056A	Total/NA
Arsenic	0.00273		0.00200	0.000750 mg/L	1	6020A	Total/NA
Barium	0.0601		0.00200	0.000370 mg/L	1	6020A	Total/NA
Boron	1.27		0.100	0.0580 mg/L	1	6020A	Total/NA
Calcium	78.8		0.500	0.190 mg/L	1	6020A	Total/NA
Chromium	0.0149		0.00500	0.00110 mg/L	1	6020A	Total/NA
Lithium	0.0170		0.0100	0.00250 mg/L	1	6020A	Total/NA
Molybdenum	0.0218		0.00200	0.00130 mg/L	1	6020A	Total/NA
Selenium	0.0544		0.00500	0.000960 mg/L	1	6020A	Total/NA
Total Dissolved Solids	604	H H3	50.0	26.0 mg/L	1	SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-221765-1

Client Sample ID: MW-01
Date Collected: 12/07/21 14:30
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-1
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.2		5.00	2.15 mg/L		12/16/21 09:00	12/16/21 10:45	5
Nitrate as N	9.94	H H3	0.500	0.200 mg/L		12/16/21 09:00	12/16/21 10:45	5
Fluoride	0.663		0.500	0.275 mg/L		12/16/21 09:00	12/16/21 10:45	5
Sulfate	169		5.00	2.45 mg/L		12/16/21 09:00	12/16/21 10:45	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 19:54	1
Arsenic	0.00298		0.00200	0.000750 mg/L		12/16/21 09:00	12/16/21 19:54	1
Barium	0.0797		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 19:54	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 14:59	1
Boron	1.19		0.100	0.0580 mg/L		12/16/21 09:00	12/16/21 19:54	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 19:54	1
Calcium	35.7		0.500	0.190 mg/L		12/16/21 09:00	12/16/21 19:54	1
Chromium	0.0324		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 14:59	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 19:54	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 19:54	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 19:54	1
Lithium	0.00981	J	0.0100	0.00250 mg/L		12/16/21 09:00	12/16/21 19:54	1
Molybdenum	0.0432		0.00200	0.00130 mg/L		12/16/21 09:00	12/16/21 19:54	1
Selenium	0.0720		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 19:54	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 19:54	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		12/16/21 09:30	12/16/21 09:30	1
Total Dissolved Solids	342	H H3	50.0	26.0 mg/L		12/15/21 15:37	12/15/21 15:37	1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-221765-1

Client Sample ID: MW-2B
Date Collected: 12/07/21 15:05
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-2
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28.4		5.00	2.15 mg/L		12/16/21 09:00	12/16/21 11:01	5
Nitrate as N	9.12	H H3	0.500	0.200 mg/L		12/16/21 09:00	12/16/21 11:01	5
Fluoride	0.667		0.500	0.275 mg/L		12/16/21 09:00	12/16/21 11:01	5
Sulfate	150		5.00	2.45 mg/L		12/16/21 09:00	12/16/21 11:01	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 19:57	1
Arsenic	0.00174	J	0.00200	0.000750 mg/L		12/16/21 09:00	12/16/21 19:57	1
Barium	0.162		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 19:57	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 15:01	1
Boron	0.537		0.100	0.0580 mg/L		12/16/21 09:00	12/16/21 19:57	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 19:57	1
Calcium	71.7		0.500	0.190 mg/L		12/16/21 09:00	12/16/21 19:57	1
Chromium	0.0178		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 15:01	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 19:57	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 19:57	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 19:57	1
Lithium	0.0132		0.0100	0.00250 mg/L		12/16/21 09:00	12/16/21 19:57	1
Molybdenum	0.00300		0.00200	0.00130 mg/L		12/16/21 09:00	12/16/21 19:57	1
Selenium	0.0359		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 19:57	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 19:57	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	2.33	J H H3	5.00	1.70 mg/L		12/16/21 09:30	12/16/21 09:30	1
Total Dissolved Solids	394	H H3	50.0	26.0 mg/L		12/15/21 15:37	12/15/21 15:37	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-3R
Date Collected: 12/07/21 13:15
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-3
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	31.9		5.00	2.15 mg/L			12/16/21 11:16	5
Nitrate as N	6.56	H H3	0.500	0.200 mg/L			12/16/21 11:16	5
Fluoride	0.498	J	0.500	0.275 mg/L			12/16/21 11:16	5
Sulfate	201		5.00	2.45 mg/L			12/16/21 11:16	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:00	1
Arsenic	0.00190	J	0.00200	0.000750 mg/L		12/16/21 09:00	12/16/21 20:00	1
Barium	0.0648		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:00	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 15:04	1
Boron	0.616		0.100	0.0580 mg/L		12/16/21 09:00	12/16/21 20:00	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:00	1
Calcium	67.2		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 15:04	1
Chromium	0.0353		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 15:04	1
Cobalt	0.000873		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 20:00	1
Iron	1.37		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 20:00	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:00	1
Lithium	0.0248		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 15:04	1
Molybdenum	0.0174		0.00200	0.00130 mg/L		12/16/21 09:00	12/16/21 20:00	1
Selenium	0.0495		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 20:00	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:00	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	14.7	H H3	5.00	1.70 mg/L			12/16/21 09:30	1
Total Dissolved Solids	418	H H3	50.0	26.0 mg/L			12/15/21 15:37	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-4B
Date Collected: 12/07/21 12:45
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-4
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	26.2		5.00	2.15 mg/L			12/16/21 11:32	5
Nitrate as N	3.20	H H3	0.500	0.200 mg/L			12/16/21 11:32	5
Fluoride	0.732		0.500	0.275 mg/L			12/16/21 11:32	5
Sulfate	227		5.00	2.45 mg/L			12/16/21 11:32	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:13	1
Arsenic	0.00227		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 15:07	1
Barium	0.0623		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:13	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 15:07	1
Boron	0.687		0.100	0.0580 mg/L		12/16/21 09:00	12/17/21 15:07	1
Cadmium	0.000520	J	0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:13	1
Calcium	54.7		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 15:07	1
Chromium	<0.00500		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 15:07	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 20:13	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 20:13	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:13	1
Lithium	0.0214		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 15:07	1
Molybdenum	0.0108		0.00200	0.00130 mg/L		12/16/21 09:00	12/17/21 15:07	1
Selenium	0.0445		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 20:13	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:13	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L			12/16/21 09:30	1
Total Dissolved Solids	384	H H3	50.0	26.0 mg/L			12/15/21 15:37	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-5B
Lab Sample ID: 310-221765-5
Date Collected: 12/07/21 09:10
Date Received: 12/15/21 09:20
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25.2		5.00	2.15 mg/L			12/16/21 11:47	5
Nitrate as N	9.82	H H3	0.500	0.200 mg/L			12/16/21 11:47	5
Fluoride	1.52		0.500	0.275 mg/L			12/16/21 11:47	5
Sulfate	184		5.00	2.45 mg/L			12/16/21 11:47	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:18	1
Arsenic	0.00400		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 15:50	1
Barium	0.0481		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:18	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 15:50	1
Boron	1.07		0.100	0.0580 mg/L		12/16/21 09:00	12/17/21 15:50	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:18	1
Calcium	47.5		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 15:50	1
Chromium	0.0435		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 15:50	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/17/21 15:50	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/17/21 15:50	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:18	1
Lithium	0.0120		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 15:50	1
Molybdenum	0.0242		0.00200	0.00130 mg/L		12/16/21 09:00	12/17/21 15:50	1
Selenium	0.0843		0.00500	0.000960 mg/L		12/16/21 09:00	12/17/21 15:50	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:18	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L			12/16/21 09:30	1
Total Dissolved Solids	326	H H3	50.0	26.0 mg/L			12/15/21 15:37	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-06
Lab Sample ID: 310-221765-6
Date Collected: 12/07/21 10:20
Date Received: 12/15/21 09:20
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28.0		5.00	2.15 mg/L			12/16/21 12:34	5
Nitrate as N	5.88	H H3	0.500	0.200 mg/L			12/16/21 12:34	5
Fluoride	0.779		0.500	0.275 mg/L			12/16/21 12:34	5
Sulfate	164		5.00	2.45 mg/L			12/16/21 12:34	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:21	1
Arsenic	0.00233		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 15:52	1
Barium	0.0449		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:21	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 15:52	1
Boron	1.05		0.100	0.0580 mg/L		12/16/21 09:00	12/17/21 15:52	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:21	1
Calcium	52.9		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 15:52	1
Chromium	0.00631		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 15:52	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 20:21	1
Iron	0.0611	J	0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 20:21	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:21	1
Lithium	0.0136		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 15:52	1
Molybdenum	0.0138		0.00200	0.00130 mg/L		12/16/21 09:00	12/17/21 15:52	1
Selenium	0.0337		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 20:21	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:21	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L			12/16/21 09:30	1
Total Dissolved Solids	312	H H3	50.0	26.0 mg/L			12/16/21 14:46	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-07
Lab Sample ID: 310-221765-7
Date Collected: 12/07/21 13:50
Date Received: 12/15/21 09:20
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	47.5		5.00	2.15 mg/L		12/16/21 09:00	12/16/21 12:50	5
Nitrate as N	9.80	H H3	0.500	0.200 mg/L		12/16/21 09:00	12/16/21 12:50	5
Fluoride	0.670		0.500	0.275 mg/L		12/16/21 09:00	12/16/21 12:50	5
Sulfate	348		5.00	2.45 mg/L		12/16/21 09:00	12/16/21 12:50	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:24	1
Arsenic	0.00279		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 15:55	1
Barium	0.0639		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:24	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 15:55	1
Boron	1.31		0.100	0.0580 mg/L		12/16/21 09:00	12/17/21 15:55	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:24	1
Calcium	79.7		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 15:55	1
Chromium	0.0148		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 15:55	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/17/21 15:55	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/17/21 15:55	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:24	1
Lithium	0.0168		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 15:55	1
Molybdenum	0.0221		0.00200	0.00130 mg/L		12/16/21 09:00	12/17/21 15:55	1
Selenium	0.0545		0.00500	0.000960 mg/L		12/16/21 09:00	12/17/21 15:55	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		12/16/21 09:30	12/16/21 14:46	1
Total Dissolved Solids	608	H H3	50.0	26.0 mg/L		12/16/21 14:46	12/16/21 14:46	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-08
Lab Sample ID: 310-221765-8
Date Collected: 12/07/21 15:35
Date Received: 12/15/21 09:20
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	34.8		20.0	8.60 mg/L		12/16/21 09:00	12/16/21 00:21	20
Nitrate as N	9.45	H H3	2.00	0.800 mg/L		12/16/21 09:00	12/16/21 00:21	20
Fluoride	3.17		2.00	1.10 mg/L		12/16/21 09:00	12/16/21 00:21	20
Sulfate	156		20.0	9.80 mg/L		12/16/21 09:00	12/16/21 00:21	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:26	1
Arsenic	0.00444		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 15:58	1
Barium	0.0380		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:26	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 15:58	1
Boron	1.24		0.100	0.0580 mg/L		12/16/21 09:00	12/16/21 20:26	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:26	1
Calcium	32.8		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 15:58	1
Chromium	0.0486		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 15:58	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 20:26	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 20:26	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:26	1
Lithium	0.0101		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 15:58	1
Molybdenum	0.0435		0.00200	0.00130 mg/L		12/16/21 09:00	12/16/21 20:26	1
Selenium	0.0428		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 20:26	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:26	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 12:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		12/16/21 09:30	12/16/21 14:46	1
Total Dissolved Solids	316	H H3	50.0	26.0 mg/L		12/16/21 14:46	12/16/21 14:46	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-09
Date Collected: 12/07/21 09:45
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-9
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	26.0		10.0	4.30 mg/L		12/16/21 00:37	12/16/21 00:37	10
Nitrate as N	4.00	H H3	1.00	0.400 mg/L		12/16/21 00:37	12/16/21 00:37	10
Fluoride	1.02		1.00	0.550 mg/L		12/16/21 00:37	12/16/21 00:37	10
Sulfate	138		10.0	4.90 mg/L		12/16/21 00:37	12/16/21 00:37	10

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:29	1
Arsenic	0.00246		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 16:00	1
Barium	0.0680		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:29	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 16:00	1
Boron	1.36		0.100	0.0580 mg/L		12/16/21 09:00	12/17/21 16:00	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:29	1
Calcium	40.5		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 16:00	1
Chromium	0.00426 J		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 16:00	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 20:29	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 20:29	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:29	1
Lithium	0.00954 J		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 16:00	1
Molybdenum	0.0137		0.00200	0.00130 mg/L		12/16/21 09:00	12/17/21 16:00	1
Selenium	0.0277		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 20:29	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:29	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 13:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		12/16/21 09:30	12/16/21 09:30	1
Total Dissolved Solids	294	H H3	50.0	26.0 mg/L		12/16/21 14:46	12/16/21 14:46	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-102FB
Date Collected: 12/07/21 15:08
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-10
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.430 mg/L		12/16/21 00:52	12/16/21 00:52	1
Nitrate as N	<0.100	H H3	0.100	0.0400 mg/L		12/16/21 00:52	12/16/21 00:52	1
Fluoride	<0.100		0.100	0.0550 mg/L		12/16/21 00:52	12/16/21 00:52	1
Sulfate	<1.00		1.00	0.490 mg/L		12/16/21 00:52	12/16/21 00:52	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:32	1
Arsenic	<0.00200		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 16:03	1
Barium	0.000486 J		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:32	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 16:03	1
Boron	<0.100		0.100	0.0580 mg/L		12/16/21 09:00	12/16/21 20:32	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:32	1
Calcium	<0.500		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 16:03	1
Chromium	<0.00500		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 16:03	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 20:32	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 20:32	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:32	1
Lithium	<0.0100		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 16:03	1
Molybdenum	<0.00200		0.00200	0.00130 mg/L		12/16/21 09:00	12/16/21 20:32	1
Selenium	<0.00500		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 20:32	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:32	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 13:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		12/16/21 09:30	12/16/21 09:30	1
Total Dissolved Solids	<50.0	H H3	50.0	26.0 mg/L		12/16/21 14:46	12/16/21 14:46	1

Client Sample Results

Client: Hastings Utilities		Job ID: 310-221765-1	
Project/Site: WEC MW Sampling			
Client Sample ID: EQB-02		Lab Sample ID: 310-221765-11	
Date Collected: 12/09/21 11:30		Matrix: Water	
Date Received: 12/15/21 09:20			

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.818	J	1.00	0.430 mg/L		12/16/21 01:08	12/16/21 01:08	1
Nitrate as N	0.558	H H3	0.100	0.0400 mg/L		12/16/21 01:08	12/16/21 01:08	1
Fluoride	<0.100		0.100	0.0550 mg/L		12/16/21 01:08		1
Sulfate	0.543	J	1.00	0.490 mg/L		12/16/21 01:08		1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:35	1
Arsenic	<0.00200		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 16:06	1
Barium	0.00115	J	0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:35	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 16:06	1
Boron	<0.100		0.100	0.0580 mg/L		12/16/21 09:00	12/16/21 20:35	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:35	1
Calcium	0.450	J	0.500	0.190 mg/L		12/16/21 09:00	12/17/21 16:06	1
Chromium	<0.00500		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 16:06	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 20:35	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 20:35	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:35	1
Lithium	<0.0100		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 16:06	1
Molybdenum	<0.00200		0.00200	0.00130 mg/L		12/16/21 09:00	12/16/21 20:35	1
Selenium	<0.00500		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 20:35	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:35	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:04	12/29/21 13:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70 mg/L		12/16/21 09:30		1
Total Dissolved Solids	<50.0		50.0	26.0 mg/L		12/15/21 15:37		1

Client Sample Results

Client: Hastings Utilities		Job ID: 310-221765-1	
Project/Site: WEC MW Sampling			
Client Sample ID: MW-107		Lab Sample ID: 310-221765-12	
Date Collected: 12/07/21 08:30		Matrix: Water	
Date Received: 12/15/21 09:20			

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	46.5		5.00	2.15 mg/L		12/16/21 13:05	12/16/21 13:05	5
Nitrate as N	9.71	H H3	0.500	0.200 mg/L		12/16/21 13:05	12/16/21 13:05	5
Fluoride	0.591		0.500	0.275 mg/L		12/16/21 13:05		5
Sulfate	342		5.00	2.45 mg/L		12/16/21 13:05		5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 20:37	1
Arsenic	0.00273		0.00200	0.000750 mg/L		12/16/21 09:00	12/17/21 16:09	1
Barium	0.0601		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 20:37	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/17/21 16:09	1
Boron	1.27		0.100	0.0580 mg/L		12/16/21 09:00	12/17/21 16:09	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 20:37	1
Calcium	78.8		0.500	0.190 mg/L		12/16/21 09:00	12/17/21 16:09	1
Chromium	0.0149		0.00500	0.00110 mg/L		12/16/21 09:00	12/17/21 16:09	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/17/21 16:09	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/17/21 16:09	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 20:37	1
Lithium	0.0170		0.0100	0.00250 mg/L		12/16/21 09:00	12/17/21 16:09	1
Molybdenum	0.0248		0.00200	0.00130 mg/L		12/16/21 09:00	12/17/21 16:09	1
Selenium	0.0544		0.00500	0.000960 mg/L		12/16/21 09:00	12/17/21 16:09	1
Thallium	<0.00100		0.00100	0.000260 mg/L		12/16/21 09:00	12/16/21 20:37	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000150 mg/L		12/28/21 14:08	12/29/21 13:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00	H H3	5.00	1.70 mg/L		12/16/21 09:30		1
Total Dissolved Solids	604	H H3	50.0	26.0 mg/L		12/16/21 14:46		1

Definitions/Glossary

Job ID: 310-221765-1

Qualifiers

HPLC/IC

Qualifier

Qualifier Description
Sample was prepped or analyzed beyond the specified holding time

H3 Sample was received and analyzed past holding time.

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

Metals

Qualifier

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

General Chemistry

Qualifier

Qualifier Description
Sample was prepped or analyzed beyond the specified holding time

H3 Sample was received and analyzed past holding time.

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

Glossary

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

DL, RA, RE, IN 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

MOL 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

POL 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)

TEO Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

QC Sample Results

Job ID: 310-221765-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-339170/3

Matrix: Water

Analysis Batch: 339170

Analyte	MB MB		RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Chloride	<1.00		1.00	0.430 mg/L			12/15/21 19:56	1
Nitrate as N	<0.100		0.100	0.0400 mg/L			12/15/21 19:56	1
Fluoride	<0.100		0.100	0.0550 mg/L			12/15/21 19:56	1
Sulfate	<1.00		1.00	0.490 mg/L			12/15/21 19:56	1

Lab Sample ID: LCS 310-339170/4

Matrix: Water

Analysis Batch: 339170

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Chloride	10.0	9.739		mg/L		97	90 - 110
Nitrate as N	2.00	2.098		mg/L		105	90 - 110
Fluoride	2.00	2.037		mg/L		102	90 - 110
Sulfate	10.0	10.18		mg/L		102	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-338857/1-A

Matrix: Water

Analysis Batch: 339014

Analyte	MB MB		RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Antimony	<0.00200		0.00200	0.00110 mg/L		12/16/21 09:00	12/16/21 15:10	1
Arsenic	<0.00200		0.00200	0.000750 mg/L		12/16/21 09:00	12/16/21 15:10	1
Barium	<0.00200		0.00200	0.000370 mg/L		12/16/21 09:00	12/16/21 15:10	1
Beryllium	<0.00100		0.00100	0.000270 mg/L		12/16/21 09:00	12/16/21 15:10	1
Boron	<0.100		0.100	0.0580 mg/L		12/16/21 09:00	12/16/21 15:10	1
Cadmium	<0.000100		0.000100	0.0000510 mg/L		12/16/21 09:00	12/16/21 15:10	1
Calcium	<0.500		0.500	0.190 mg/L		12/16/21 09:00	12/16/21 15:10	1
Chromium	<0.00500		0.00500	0.00110 mg/L		12/16/21 09:00	12/16/21 15:10	1
Cobalt	<0.000500		0.000500	0.000190 mg/L		12/16/21 09:00	12/16/21 15:10	1
Iron	<0.100		0.100	0.0360 mg/L		12/16/21 09:00	12/16/21 15:10	1
Lead	<0.000500		0.000500	0.000210 mg/L		12/16/21 09:00	12/16/21 15:10	1
Lithium	<0.0100		0.0100	0.00250 mg/L		12/16/21 09:00	12/16/21 15:10	1
Molybdenum	<0.00200		0.00200	0.00130 mg/L		12/16/21 09:00	12/16/21 15:10	1
Selenium	<0.00500		0.00500	0.000960 mg/L		12/16/21 09:00	12/16/21 15:10	1
Thallium	<0.00100		0.000260 mg/L			12/16/21 09:00	12/16/21 15:10	1

Lab Sample ID: LCS 310-338857/2-A

Matrix: Water

Analysis Batch: 339014

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Antimony	0.200	0.1982		mg/L		98	80 - 120
Arsenic	0.200	0.1830		mg/L		91	80 - 120
Barium	0.100	0.1018		mg/L		102	80 - 120
Beryllium	0.100	0.09879		mg/L		99	80 - 120
Boron	0.200	0.1930		mg/L		97	80 - 120
Cadmium	0.100	0.09732		mg/L		97	80 - 120

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 338857

QC Sample Results

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

Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 338857									
Analyte	Spike Added	LCS Result	LCS Qualifier	D	%Rec	Limits	%Rec.		
Calcium	2.00	1.742	mg/L	87	80 - 120			5	
Chromium	0.100	0.09194	mg/L	92	80 - 120			6	
Cobalt	0.100	0.09317	mg/L	93	80 - 120			7	
Iron	0.200	0.1916	mg/L	96	80 - 120			8	
Lead	0.200	0.2099	mg/L	105	80 - 120			9	
Lithium	0.200	0.1993	mg/L	100	80 - 120			10	
Molybdenum	0.200	0.2081	mg/L	104	80 - 120			11	
Selenium	0.400	0.3406	mg/L	85	80 - 120			12	
Thallium	0.200	0.2015	mg/L	101	80 - 120			13	

Lab Sample ID: 310-221765-4 DU

Matrix: Water

Analysis Batch: 339051

Client Sample ID: MW-4B									
Prep Type: Total/NA									
Prep Batch: 338857									
Analyte	Sample Result	Sample Qualifier	DU DU Result	DU DU Qualifier	D	RPD	Limit		
Antimony	<0.00200		<0.00200	mg/L	NC	0.6	20	13	
Barium	0.0623		0.06193	mg/L	NC	20	20	14	
Cadmium	0.0000520	J	<0.000100	mg/L	NC	20	20		
Cobalt	<0.000500		<0.000500	mg/L	NC	20	20		
Iron	<0.100		<0.100	mg/L	NC	20	20		
Lead	<0.000500		<0.000500	mg/L	NC	20	20		
Selenium	0.0445		0.04539	mg/L	2	20	20		
Thallium	<0.00100		<0.00100	mg/L	NC	20	20		

Lab Sample ID: 310-221765-4 DU

Matrix: Water

Analysis Batch: 339294

Client Sample ID: MW-4B									
Prep Type: Total/NA									
Prep Batch: 338857									
Analyte	Sample Result	Sample Qualifier	DU DU Result	DU DU Qualifier	D	RPD	Limit		
Arsenic	0.00227		0.002282	mg/L	0.5	20	20		
Beryllium	<0.00100		<0.00100	mg/L	NC	20	20		
Boron	0.687		0.6871	mg/L	0	20	20		
Calcium	54.7		55.26	mg/L	1	20	20		
Chromium	<0.00500		<0.00500	mg/L	NC	20	20		
Lithium	0.0214		0.02037	mg/L	5	20	20		
Molybdenum	0.0108		0.01084	mg/L	0.2	20	20		

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-340045/1-A

Matrix: Water

Analysis Batch: 340179

Client Sample ID: Method Blank									
Prep Type: Total/NA									
Prep Batch: 340045									
Analyte	MB MB Result	MB MB Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000150 mg/L	12/28/21	14:04	12/29/21	12:07	1

QC Sample Results

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

Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 340045									
Analyte	Spike Added	LCS Result	LCS Qualifier	D	%Rec	Limits	%Rec.		
Mercury	0.00167	0.001659	mg/L	100	80 - 120			5	

Lab Sample ID: MB 310-340047/1-A

Matrix: Water

Analysis Batch: 340217

Client Sample ID: Method Blank									
Prep Type: Total/NA									
Prep Batch: 340047									
Analyte	MB MB Result	MB MB Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000150 mg/L	12/28/21	14:08	12/29/21	13:07	1

Lab Sample ID: LCS 310-340047/2-A

Matrix: Water

Analysis Batch: 340217

Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 340047									
Analyte	Spike Added	LCS Result	LCS Qualifier	D	%Rec	Limits	%Rec.		
Mercury	0.00167	0.001510	mg/L	91	80 - 120			12	

Lab Sample ID: 310-221765-12 MS

Matrix: Water

Analysis Batch: 340217

Client Sample ID: MW-107									
Prep Type: Total/NA									
Prep Batch: 340047									
Analyte	Sample Result	Sample Qualifier	MS MS Result	MS MS Qualifier	D	%Rec	Limits		
Mercury	<0.000200		0.00167	0.001635 mg/L	98	80 - 120		13	

Lab Sample ID: 310-221765-12 MSD

Matrix: Water

Analysis Batch: 340217

Client Sample ID: MW-107									
Prep Type: Total/NA									
Prep Batch: 340047									
Analyte	Sample Result	Sample Qualifier	MSD MSD Result	MSD MSD Qualifier	D	%Rec	Limits		
Mercury	<0.000200		0.00167	0.001684 mg/L	101	80 - 120	3	20	14

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-338956/1

Matrix: Water

Analysis Batch: 338956

Client Sample ID: Method Blank									
Prep Type: Total/NA									
Analyte	MB MB Result	MB MB Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac	
Total Suspended Solids	<5.00		5.00	1.70 mg/L	12/16/21	09:30		1	

Lab Sample ID: LCS 310-338956/2

Matrix: Water

Analysis Batch: 338956

Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Analyte	Spike Added	LCS Result	LCS Qualifier	D	%Rec	Limits	%Rec.		
Total Suspended Solids	100	98.00	mg/L	98	75 - 116				

QC Sample Results

Method: SM 2540C - Solids, Total Dissolved (TDS)									
Lab Sample ID: MB 310-338887/1					Client Sample ID: Method Blank				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 338887									
Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0	Qualifier	50.0	26.0	mg/L			12/15/21 15:37	1
Lab Sample ID: LCS 310-338887/2									
Matrix: Water									
Analysis Batch: 338887									
Analyte		Spike		LCS	Unit	D	%Rec.		
Total Dissolved Solids		Added		Result	Qualifier		Limits		
		1000		992.0		99	90 - 110		
mg/L									
Lab Sample ID: MB 310-339007/1					Client Sample ID: Method Blank				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 339007									
Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0	Qualifier	50.0	26.0	mg/L			12/16/21 14:46	1
Lab Sample ID: LCS 310-339007/2									
Matrix: Water									
Analysis Batch: 339007									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									

QC Association Summary

HPLC/IC					
Analysis Batch: 339170					
Prep Batch: 338857					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-1	MW-01	Total/NA	Water	9056A	
310-221765-2	MW-2B	Total/NA	Water	9056A	
310-221765-3	MW-3R	Total/NA	Water	9056A	
310-221765-4	MW-4B	Total/NA	Water	9056A	
310-221765-5	MW-5B	Total/NA	Water	9056A	
310-221765-6	MW-06	Total/NA	Water	9056A	
310-221765-7	MW-07	Total/NA	Water	9056A	
310-221765-8	MW-08	Total/NA	Water	9056A	
310-221765-9	MW-09	Total/NA	Water	9056A	
310-221765-10	MW-102B	Total/NA	Water	9056A	
310-221765-11	EOB-02	Total/NA	Water	9056A	
310-221765-12	MW-107	Total/NA	Water	9056A	
MBS 310-339170/3	Method Blank	Total/NA	Water	9056A	
LCS 310-339170/4	Lab Control Sample	Total/NA	Water	9056A	
Metals					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-1	MW-01	Total/NA	Water	3005A	
310-221765-2	MW-2B	Total/NA	Water	3005A	

QC Association Summary

Job ID: 310-221765-1

Metals (Continued)

Analysis Batch: 339051 (Continued)				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
310-221765-10	MW-102FB	TotalINA	Water	6020A
310-221765-11	EOB-02	TotalINA	Water	6020A
310-221765-12	MW-107	TotalINA	Water	6020A
310-221765-4 DU	MW-4B	TotalINA	Water	6020A

Analysis Batch: 339294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-1	MW-07	TotalINA	Water	6020A	338857
310-221765-2	MW-2B	TotalINA	Water	6020A	338857
310-221765-3	MW-3R	TotalINA	Water	6020A	338857
310-221765-4	MW-4B	TotalINA	Water	6020A	338857
310-221765-5	MW-5B	TotalINA	Water	6020A	338857
310-221765-6	MW-06	TotalINA	Water	6020A	338857
310-221765-7	MW-07	TotalINA	Water	6020A	338857
310-221765-8	MW-08	TotalINA	Water	6020A	338857
310-221765-9	MW-09	TotalINA	Water	6020A	338857
310-221765-10	MW-102FB	TotalINA	Water	6020A	338857
310-221765-11	EOB-02	TotalINA	Water	6020A	338857
310-221765-12	MW-107	TotalINA	Water	6020A	338857
310-221765-4 DU	MW-4B	TotalINA	Water	6020A	338857

Prep Batch: 340045

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-1	MW-07	TotalINA	Water	7470A	
310-221765-2	MW-2B	TotalINA	Water	7470A	
310-221765-3	MW-3R	TotalINA	Water	7470A	
310-221765-4	MW-4B	TotalINA	Water	7470A	
310-221765-5	MW-5B	TotalINA	Water	7470A	
310-221765-6	MW-06	TotalINA	Water	7470A	
310-221765-7	MW-07	TotalINA	Water	7470A	
310-221765-8	MW-08	TotalINA	Water	7470A	
310-221765-9	MW-09	TotalINA	Water	7470A	
310-221765-10	MW-102FB	TotalINA	Water	7470A	
310-221765-11	EOB-02	TotalINA	Water	7470A	
MB 310-3400451-A	Method Blank	TotalINA	Water	7470A	
LCS 310-3400452-A	Lab Control Sample	TotalINA	Water	7470A	

Prep Batch: 340047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-12	MW-107	TotalINA	Water	7470A	
MB 310-3400471-A	Method Blank	TotalINA	Water	7470A	
LCS 310-3400472-A	Lab Control Sample	TotalINA	Water	7470A	
310-221765-12 MS	MW-107	TotalINA	Water	7470A	
310-221765-12 MSD	MW-107	TotalINA	Water	7470A	

Analysis Batch: 340179

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-1	MW-07	TotalINA	Water	7470A	340045
310-221765-2	MW-2B	TotalINA	Water	7470A	340045
310-221765-3	MW-3R	TotalINA	Water	7470A	340045
310-221765-4	MW-4B	TotalINA	Water	7470A	340045

QC Association Summary

Job ID: 310-221765-1

Metals (Continued)

Analysis Batch: 340179 (Continued)				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
310-221765-5	MW-5B	TotalINA	Water	7470A
310-221765-6	MW-06	TotalINA	Water	7470A
310-221765-7	MW-07	TotalINA	Water	7470A
310-221765-8	MW-08	TotalINA	Water	7470A
310-221765-9	MW-09	TotalINA	Water	7470A
310-221765-10	MW-102FB	TotalINA	Water	7470A
310-221765-11	EOB-02	TotalINA	Water	7470A
MB 310-3400451-A	Method Blank	TotalINA	Water	7470A
LCS 310-3400452-A	Lab Control Sample	TotalINA	Water	7470A

Analysis Batch: 340217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-12	MW-107	TotalINA	Water	7470A	340047
MB 310-3400471-A	Method Blank	TotalINA	Water	7470A	340047
LCS 310-3400472-A	Lab Control Sample	TotalINA	Water	7470A	340047
310-221765-12 MS	MW-107	TotalINA	Water	7470A	340047
310-221765-12 MSD	MW-107	TotalINA	Water	7470A	340047

General Chemistry

Analysis Batch: 338857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-1	MW-07	TotalINA	Water	SM 2540C	
310-221765-2	MW-2B	TotalINA	Water	SM 2540C	
310-221765-3	MW-3R	TotalINA	Water	SM 2540C	
310-221765-4	MW-4B	TotalINA	Water	SM 2540C	
310-221765-5	MW-5B	TotalINA	Water	SM 2540C	
310-221765-11	EOB-02	TotalINA	Water	SM 2540C	
MB 310-3388571	Method Blank	TotalINA	Water	SM 2540C	
LCS 310-3388572	Lab Control Sample	TotalINA	Water	SM 2540C	

Analysis Batch: 338956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-1	MW-07	TotalINA	Water	1-3765-85	
310-221765-2	MW-2B	TotalINA	Water	1-3765-85	
310-221765-3	MW-3R	TotalINA	Water	1-3765-85	
310-221765-4	MW-4B	TotalINA	Water	1-3765-85	
310-221765-5	MW-5B	TotalINA	Water	1-3765-85	
310-221765-6	MW-06	TotalINA	Water	1-3765-85	
310-221765-7	MW-07	TotalINA	Water	1-3765-85	
310-221765-8	MW-08	TotalINA	Water	1-3765-85	
310-221765-9	MW-09	TotalINA	Water	1-3765-85	
310-221765-10	MW-102FB	TotalINA	Water	1-3765-85	
310-221765-11	EOB-02	TotalINA	Water	1-3765-85	
310-221765-12	MW-107	TotalINA	Water	1-3765-85	
MB 310-3389561	Method Blank	TotalINA	Water	1-3765-85	
LCS 310-3389562	Lab Control Sample	TotalINA	Water	1-3765-85	

Analysis Batch: 339007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-6	MW-06	TotalINA	Water	SM 2540C	

Client: Hastings Utilities
Project/Site: WEC MW Sampling

QC Association Summary

Job ID: 310-221765-1

General Chemistry (Continued)

Analysis Batch: 339007 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-221765-7	MW-07	Total/NA	Water	SM 2540C	
310-221765-8	MW-08	Total/NA	Water	SM 2540C	
310-221765-9	MW-09	Total/NA	Water	SM 2540C	
310-221765-10	MW-102FB	Total/NA	Water	SM 2540C	
310-221765-12	MW-107	Total/NA	Water	SM 2540C	
MB 310-339007/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-339007/2	Lab Control Sample	Total/NA	Water	SM 2540C	

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Client: Hastings Utilities
Project/Site: WEC MW Sampling

Lab Chronicle

Job ID: 310-221765-1

Client Sample ID: MW-01

Date Collected: 12/07/21 14:30

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 10:45	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 19:54	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 14:59	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:39	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	338887	12/15/21 15:37	ARG	TAL CF

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Client Sample ID: MW-2B

Date Collected: 12/07/21 15:05

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 11:01	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 19:57	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 15:01	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:41	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	338887	12/15/21 15:37	ARG	TAL CF

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Client Sample ID: MW-3R

Date Collected: 12/07/21 13:15

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 11:16	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:00	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 15:04	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:43	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	338887	12/15/21 15:37	ARG	TAL CF

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Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-4B

Date Collected: 12/07/21 12:45

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 11:32	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:13	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 15:07	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:46	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	338887	12/15/21 15:37	ARG	TAL CF

Client Sample ID: MW-5B

Date Collected: 12/07/21 09:10

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 11:47	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:18	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 15:50	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:48	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	338887	12/15/21 15:37	ARG	TAL CF

Client Sample ID: MW-06

Date Collected: 12/07/21 10:20

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 12:34	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:21	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 15:52	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:54	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	339007	12/16/21 14:46	ARG	TAL CF

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-221765-1

Client Sample ID: MW-07

Date Collected: 12/07/21 13:50

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 12:50	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:24	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 15:55	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:56	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	339007	12/16/21 14:46	ARG	TAL CF

Client Sample ID: MW-08

Date Collected: 12/07/21 15:35

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		20	339170	12/16/21 00:21	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:26	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 15:58	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 12:58	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	339007	12/16/21 14:46	ARG	TAL CF

Client Sample ID: MW-09

Date Collected: 12/07/21 09:45

Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		10	339170	12/16/21 00:37	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:29	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 16:00	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 13:01	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	339007	12/16/21 14:46	ARG	TAL CF

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Lab Chronicle

Job ID: 310-221765-1

Client Sample ID: MW-102FB
Date Collected: 12/07/21 15:08
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	339170	12/16/21 00:52	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:32	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 16:03	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 13:03	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	339007	12/16/21 14:46	ARG	TAL CF

Client Sample ID: EQB-02

Date Collected: 12/09/21 11:30
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	339170	12/16/21 01:08	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:35	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 16:06	SAP	TAL CF
Total/NA	Prep	7470A			340045	12/28/21 14:04	EAM	TAL CF
Total/NA	Analysis	7470A		1	340179	12/29/21 13:05	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	338887	12/15/21 15:37	ARG	TAL CF

Client Sample ID: MW-107

Date Collected: 12/07/21 08:30
Date Received: 12/15/21 09:20

Lab Sample ID: 310-221765-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	339170	12/16/21 13:05	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339051	12/16/21 20:37	SAP	TAL CF
Total/NA	Prep	3005A			338857	12/16/21 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	339294	12/17/21 16:09	SAP	TAL CF
Total/NA	Prep	7470A			340047	12/28/21 14:08	EAM	TAL CF
Total/NA	Analysis	7470A		1	340217	12/29/21 13:11	EAM	TAL CF
Total/NA	Analysis	1-3765-85		1	338956	12/16/21 09:30	SAS	TAL CF
Total/NA	Analysis	SM 2540C		1	339007	12/16/21 14:46	ARG	TAL CF

Laboratory References:

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

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Accreditation/Certification Summary

Job ID: 310-221765-1

Laboratory: Eurofins 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	IA100031 (OR)	09-29-22
Georgia	State	IA100031 (OR)	09-29-22
Illinois	NELAP	200024	11-29-22
Iowa	State	007	12-01-21 *
Kansas	NELAP	E-10341	01-31-22
Minnesota	NELAP	019-999-319	12-31-22
Minnesota (Petroleum)	State	3349	04-06-23
North Dakota	State	R-186	09-29-22
Oregon	NELAP	IA100031	09-29-22
USDA	US Federal Programs	P330-19-00003	01-02-22

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

Method Summary

Job ID: 310-221765-1

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
1-3765-85	Residue, Non-filterable (TSS)	USGS	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3005A	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.
USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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

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Environment Testing
TestAmerica



310-221765 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information	
Client: <u>PP&A</u>	City/State: <u>Hastings NE</u>
Date/Time Received: <u>DATE</u>	Project: <u>NE</u>
Delivery Type: ☒ UPS ☐ FedEx ☐ Lab Courier ☐ Lab Field Services	Received By: <u>DATE</u>
Condition of Cooler/Containers	
Sample(s) received in Cooler? ☒ Yes ☐ No	If yes: Cooler ID: _____
Multiple Coolers? ☐ Yes ☒ No	If yes: Cooler # _____ of _____
Cooler Custody Seals Present? ☒ Yes ☐ No	If yes: Cooler custody seals intact? ☒ Yes ☐ No
Sample Custody Seals Present? ☐ Yes ☒ No	If yes: Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present? ☐ Yes ☒ No	If yes: Which VOA samples are in cooler? <u>1</u>
Temperature Record	
Coolant: ☒ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ Other: _____	Correction Factor (°C): <u>+0.0</u>
Thermometer ID: <u>N</u>	Corrected Temp (°C): _____
Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature	
Uncorrected Temp (°C): _____	Corrected Temp (°C): _____
Sample Container Temperature	
Container(s) used: <u>CONTAINER 1</u>	CONTAINER 2
Uncorrected Temp (°C): <u>1.7</u>	Corrected Temp (°C): <u>1.7</u>
Exceptions/Notes:	
1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No a) If yes: Is there evidence that the chilling process began? ☐ Yes ☐ No	
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No	
NOTE: If yes, contact PM before proceeding. If no, proceed with login	
Additional Comments	

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Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact		Project Manager: Jenny Sidlo		Site Contact:		Date:		COC No:	
PPGA		Tel/Fax:		Lab Contact:		Carrier:		of COCs	
Analysis Turnaround Time		Sample Type		# of Cont.		Sample Identification		Sample Specific Notes:	
☐ CALENDAR DAYS ☐ WORKING DAYS		(C=Comp, G=Grab)							
TAT if different from Below									
☐ 2 weeks									
☐ 1 week									
☐ 2 days									
☐ 1 day									
Hastings, NE 68901									
(xxx) xxx-xxxx	Phone								
(xxx) xxx-xxxx	FAX								
Project Name: WEC MW Sampling									
CCR wells									
P O #6041									
MW-01	12/7/21	14:30	G	2	N	X	X	X	X
MW-2B	12/7/21	15:05	G	2	N	X	X	X	X
MW-3R	12/7/21	13:15	G	2	N	X	X	X	X
MW-4B	12/7/21	12:45	G	2	N	X	X	X	X
MW-5B	12/7/21	9:10	G	2	N	X	X	X	X
MW-06	12/7/21	10:20	G	2	N	X	X	X	X
MW-07	12/7/21	13:50	G	2	N	X	X	X	X
MW-08	12/7/21	15:35	G	2	N	X	X	X	X
MW-09	12/7/21	9:45	G	2	N	X	X	X	X
MW-102FB	12/7/21	15:08	G	2	N	X	X	X	X
EQB-02	12-9-21	11:30	G	2	N	X	X	X	X
MW-107	12-7-21	8:30	G	2	N	X	X	X	X
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other									
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.									
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown									
Special Instructions/QC Requirements & Comments: Please report MDL and RL on lab results report.									
Custody Seals Intact: ☐ Yes ☐ No									
Custody Seal No.:									
Cooler Temp. (°C): Obs'd: Corr'd: Therm ID No.:									
Relinquished by: Company: Hastings Utilities Date/Time: 12/14/21 11:50									
Relinquished by: Company: Date/Time:									
Relinquished by: Company: Date/Time: 12/15/21 0920									

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Login Sample Receipt Checklist

Client: Hastings Utilities

Login Number: 221765
List Number: 1
Creator: Homolar, Dana J

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.

N/A

Sample custody seals, if present, are intact.

True

The cooler or samples do not appear to have been compromised or tampered with.

True

Samples were received on ice.

True

Cooler Temperature is acceptable.

True

Cooler Temperature is recorded.

True

COC is present.

True

COC is filled out in ink and legible.

True

COC is filled out with all pertinent information.

True

Is the Field Sampler's name present on COC?

True

There are no discrepancies between the containers received and the COC.

True

Samples are received within Holding Time (excluding tests with immediate HTS)

False

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.

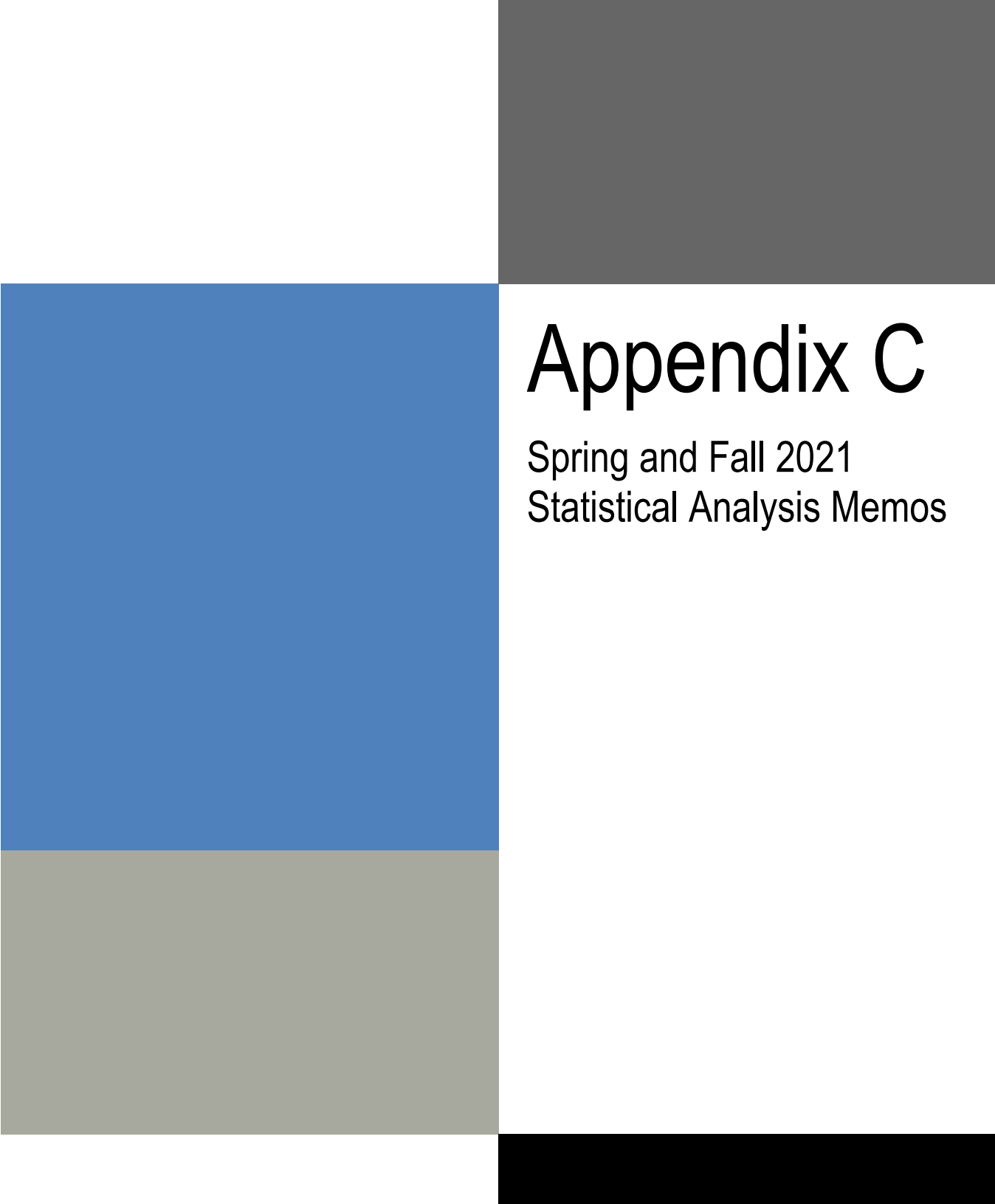
True

Samples do not require splitting or composting.

True

Residual Chlorine Checked.

N/A



Appendix C

Spring and Fall 2021
Statistical Analysis Memos

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Memo

Date: Wednesday, July 14, 2021

To: Public Power Generation Agency (PPGA)

From: HDR Engineering, Inc.

Subject: Summary of Statistical Analysis and Evaluation for SSIs and SSLs – Spring 2021
WEC Temporary Ash Disposal Area
CCR Groundwater Monitoring Network

Whelan Energy Center (WEC), operated by City of Hastings Utilities (Hastings), is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. WEC consists of two fossil fuel combustion units. WEC Unit No. 1 (WEC1) is owned and operated by Hastings. WEC Unit No. 2 (WEC2) is owned by Public Power Generation Agency (PPGA), of which Hastings is a member and acts as operating agent for PPGA. WEC Temporary Ash Disposal Area is currently an existing unlined CCR surface impoundment of approximately 23.2 acres and serves the two fossil fuel combustion units.

On March 1, 2018, WEC published statistically significant increases (SSIs) in downgradient monitoring wells at the WEC Temporary Ash Disposal Area. An alternate source demonstration (ASD) was conducted for the published SSIs (dated May 1, 2018), but the ASD did not fully demonstrate an alternate source for all of the detected SSIs. As a result, WEC initiated an assessment monitoring program, as required by the CCR rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in 40 CFR §257.95 and Title 132 Chapter 7 Section 004. Groundwater sampling was conducted as part of initiating the assessment monitoring program for the WEC Temporary Ash Disposal Area in July 2018, as specified in 40 CFR §257.95(b), and October 2018, as specified in CFR §257.95(d).

The semiannual spring 2021 sampling event was analyzed for all parameters in the Appendix III and Appendix IV list, as required by 40 CFR §257.95(b). The statistical analysis was performed in accordance with the methods described in the *Groundwater Monitoring Statistical Certification* for the WEC Temporary Ash Disposal Area, dated February 9, 2018, and the Title 132 Groundwater Sampling and Analysis Plan (SAP), dated February 21, 2020. Monitoring results used to calculate background threshold values (BTVs) were obtained during sampling events conducted between November 2016 and November 2020. Background data sets will be updated every two years or during a monitoring program transition, as recommended by the United States Environmental Protection Agency's (U.S. EPA) Unified Guidance (2009).

Downgradient sampling results from the spring 2021 assessment monitoring event were used to evaluate for SSIs over background and statistically significant levels (SSLs) over the groundwater protection standard (GWPS). The calculated BTVs and the evaluation for SSIs above BTVs for the Appendix III and Appendix IV constituents are provided in **Table D1**.

Table D1. Summary of Evaluation for SSIs over Background

Well ID:		MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8	
Constituent	BTV (UPL):	Unit	Assessment Monitoring Results in accordance with §257.95(b)(1) – April 2021					
Appendix III Constituents								
Boron	1.71	mg/L	1.06	0.542	0.951	0.706	1.03	0.855
Calcium	78.8	mg/L	27.3	69.2	79.3	27.1	32.7	46.3
Chloride	35.2	mg/L	24.2	25.2	22.8	24.1	21.1	27.4
Fluoride	1.59	mg/L	0.316J	<0.500	0.374J	0.892	1.11	0.433J
pH	6.15 – 7.53*	SU	6.94	6.93	6.68	6.78	7.17	6.86
Sulfate	199	mg/L	149	144	265	138	139	145
TDS	591	mg/L	344	410	568	312	346	370
Appendix IV Constituents								
Antimony	0.001	mg/l	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	0.00666	mg/l	0.00367	0.00204	0.00234	0.00345	0.00589	0.00229
Barium	0.0858	mg/l	0.0726	0.193	0.0585	0.0276	0.0423	0.0481
Beryllium	0.001	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	0.0001	mg/l	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Chromium	0.0514	mg/l	0.0323	0.0171	0.0233	0.0267	0.0445	0.0225
Cobalt	0.0005	mg/l	0.0000930J	<0.000500	0.000806	<0.000500	0.000140J	<0.000500
Fluoride	1.59	mg/l	0.316J	<0.500	<0.500	0.892	1.11	0.433J
Lead	0.0207	mg/l	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	0.0175	mg/l	0.00997J	0.0138	0.0271	0.015	0.0108	0.0136
Mercury	0.0002	mg/l	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	0.0489	mg/l	0.0281	0.00265	0.0122	0.0172	0.0444	0.01
Radium 226+228	2.03	pCi/l	0.647	0.768	0.184U	0.375	1.17	1.22
Selenium	0.158	mg/l	0.0385	0.0339	0.0382	0.025	0.122	0.0406
Thallium	0.001	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100

Bold and underlined concentration indicates an SSI over background.

* indicates the lower bound of the range is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).

"J" indicates that the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

The calculated lower confidence levels (LCLs) and the evaluation for SSLs over the GWPS for the Appendix IV constituents are provided in **Table D2**. As shown in **Table D2**, no Appendix IV constituents were detected over the GWPS during the spring 2021 sampling event; therefore, the WEC Temporary Ash Disposal Area will remain in assessment monitoring for the fall 2021 sampling event.



Table D2. Summary of Evaluation for SSLs over GWPS

Well ID:			MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Constituent	GWPS ^[1]	Unit	Confidence Intervals in accordance with §257.95(d)(1)					
Antimony	0.006	mg/L	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058
Arsenic	0.01	mg/L	0.003515	0.00203	0.002238	0.002436	0.00343	0.003704
Barium	2.00	mg/L	0.0721	0.1657	0.07226	0.03177	0.05115	0.04126
Beryllium	0.004	mg/L	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
Cadmium	0.005	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Chromium	0.1	mg/L	0.02966	0.01608	0.004936	0.0025	0.01649	0.03428
Cobalt	0.006	mg/L	0.000105	0.000374	0.0003	0.000091	0.000164	0.000122
Fluoride	4.00	mg/L	0.28	0.29	0.29	0.3487	0.3652	0.7621
Lead	0.0207 ^[2]	mg/L	0.00027	0.00027	0.00027	0.00027	0.000497	0.000302
Lithium	0.04	mg/L	0.0107	0.0138	0.0266	0.02615	0.0126	0.0103
Mercury	0.002	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	0.100	mg/L	0.03398	0.00249	0.003452	0.005072	0.02002	0.03919
Radium 226+228	5.00	pCi/L	0.8057	1.157	0.8314	0.5281	0.8109	0.4181
Selenium	0.158 ^[2]	mg/L	0.038	0.03377	0.0331	0.02352	0.04619	0.04049
Thallium	0.002	mg/L	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026

^[1] GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2) unless specified otherwise.

^[2] GWPS is established as the upper tolerance limit when the background level is higher than the U.S. EPA MCL.

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Memo

Date: Tuesday, January 25, 2022

To: Public Power Generation Agency (PPGA)

From: HDR Engineering, Inc.

Subject: Summary of Statistical Analysis and Evaluation for SSIs and SSLs – Fall 2021
WEC Temporary Ash Disposal Area
CCR Groundwater Monitoring Network

Whelan Energy Center (WEC), operated by Hastings Utilities, City of Hastings (Hastings), is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. WEC consists of two fossil fuel combustion units. WEC Unit No. 1 (WEC1) is owned and operated by Hastings. WEC Unit No. 2 (WEC2) is owned by Public Power Generation Agency (PPGA), of which Hastings is a member and acts as operating agent for PPGA. WEC Temporary Ash Disposal Area is currently an existing unlined CCR surface impoundment of approximately 23.2 acres and serves the two fossil fuel combustion units.

On March 1, 2018, WEC published statistically significant increases (SSIs) in downgradient monitoring wells at the WEC Temporary Ash Disposal Area. An alternate source demonstration (ASD) was conducted for the published SSIs (dated May 1, 2018), but the ASD did not fully demonstrate an alternate source for all of the detected SSIs. As a result, WEC initiated an assessment monitoring program, as required by the CCR rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in 40 CFR §257.95 and Title 132 Chapter 7 Section 004. Groundwater sampling was conducted as part of initiating the assessment monitoring program for the WEC Temporary Ash Disposal Area in July 2018, as specified in 40 CFR §257.95(b), and October 2018, as specified in CFR §257.95(d).

The semiannual fall 2021 sampling event was analyzed for all parameters in the Appendix III and Appendix IV list, as required by 40 CFR §257.95(b). The statistical analysis was performed in accordance with the methods described in the *Groundwater Monitoring Statistical Certification* for the WEC Temporary Ash Disposal Area, dated February 9, 2018, and the Title 132 Groundwater Sampling and Analysis Plan (SAP), dated August 6, 2021. Monitoring results used to calculate background threshold values (BTVs) were obtained during sampling events conducted between November 2016 and November 2020. Background data sets will be updated every two years or during a monitoring program transition, as recommended by the United States Environmental Protection Agency's (U.S. EPA) Unified Guidance, "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (2009).

Downgradient sampling results from the fall 2021 assessment monitoring event were used to evaluate for SSIs over background and statistically significant levels (SSLs) over the groundwater protection standard (GWPS). The calculated BTVs and the evaluation for SSIs above BTVs for the Appendix III and Appendix IV constituents are provided in **Table D1**.

Table D1. Summary of Evaluation for SSIs over Background

Well ID:		MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8	
Constituent	BTV (UPL):	Unit	Assessment Monitoring Results in accordance with §257.95(b)(1) – December 2021					
Appendix III Constituents								
Boron	1.71	mg/L	1.19	0.537	0.616	0.687	1.31	1.24
Calcium	78.8	mg/L	35.7	71.7	67.2	54.7	79.7	32.8
Chloride	35.2	mg/L	29.2	28.4	31.9	26.2	47.5	34.8
Fluoride	1.59	mg/L	0.663	0.667	0.498J	0.732	0.670	3.17
pH	6.15 – 7.53*	SU	6.72	6.83	6.62	6.54	6.52	7.26
Sulfate	199	mg/L	169	150	201	227	348	156
TDS	591	mg/L	342	394	418	384	608	316
Appendix IV Constituents								
Antimony	0.001	mg/l	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	0.00666	mg/l	0.00298	0.00174J	0.00190J	0.00227	0.00279	0.00444
Barium	0.0858	mg/l	0.0797	0.162	0.0648	0.0623	0.0639	0.0380
Beryllium	0.001	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	0.0001	mg/l	<0.000100	<0.000100	<0.000100	0.0000520J	<0.000100	<0.000100
Chromium	0.0514	mg/l	0.0324	0.0178	0.0353	<0.00500	0.0148	0.0486
Cobalt	0.0005	mg/l	<0.000500	<0.000500	0.000873	<0.000500	<0.000500	<0.000500
Fluoride	1.59	mg/l	0.663	0.667	0.498J	0.732	0.670	3.17
Lead	0.0207	mg/l	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	0.0175	mg/l	0.00981J	0.0132	0.0248	0.0214	0.0168	0.0101
Mercury	0.0002	mg/l	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	0.0489	mg/l	0.0432	0.00300	0.0114	0.0108	0.0221	0.0435
Radium 226+228	2.03	pCi/l	**	**	**	**	**	**
Selenium	0.158	mg/l	0.0720	0.0359	0.0495	0.0445	0.0545	0.0428
Thallium	0.001	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100

Bold and underlined concentration indicates an SSI over background.

* Indicates the lower bound of the range which is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).

** The contracted laboratory had not returned radium results at the time the 2021 annual CCR report was placed in the facility's operating record. This information will be provided as an addendum.

"J" indicates that the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

The calculated lower confidence levels (LCLs) and the evaluation for SSLs over the GWPS for the Appendix IV constituents are provided in **Table D2**. As shown in **Table D2**, no Appendix IV constituents were detected over the GWPS during the fall 2021 sampling event; therefore, the WEC Temporary Ash Disposal Area will remain in assessment monitoring for the spring 2022 sampling event.

Table D2. Summary of Evaluation for SSLs over GWPS

Well ID:		MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8	
Constituent	GWPS ^[1]	Unit	Confidence Intervals in accordance with §257.95(d)(1)					
Antimony	0.006	mg/L	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058
Arsenic	0.01	mg/L	0.003499	0.001917	0.002003	0.002313	0.00327	0.003592
Barium	2.00	mg/L	0.06314	0.1671	0.05984	0.02834	0.03925	0.0346
Beryllium	0.004	mg/L	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
Cadmium	0.005	mg/L	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039
Chromium	0.1	mg/L	0.03033	0.01611	0.002075	0.007427	0.01794	0.0342
Cobalt	0.006	mg/L	0.000093	0.0001	0.0001059	0.000091	0.000091	0.000091
Fluoride	4.00	mg/L	0.3075	0.2009	0.23	0.2714	0.3207	0.782
Lead	0.0207 ^[2]	mg/L	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
Lithium	0.04	mg/L	0.009281	0.0129	0.02637	0.01685	0.01042	0.009185
Mercury	0.002	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	0.100	mg/L	0.03614	0.00248	0.004533	0.008039	0.02146	0.03259
Radium 226+228	5.00	pCi/L	**	**	**	**	**	**
Selenium	0.158 ^[2]	mg/L	0.03273	0.03446	0.035	0.02333	0.03346	0.03125
Thallium	0.002	mg/L	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026

^[1] GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2) unless specified otherwise.

^[2] GWPS is established as the upper tolerance limit when the background level is higher than the U.S. EPA MCL.

**The contracted laboratory had not returned radium results at the time the 2021 annual CCR report was placed in the facility's operating record. This information will be provided as an addendum.

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