2023 Annual Leachate Report

Walter Scott Jr. Energy Center Monofill
Council Bluffs, Iowa
Permit 78-SDP-26-06P

MidAmerican Energy Company

January 31, 2024

→ The Power of Commitment

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1. Introduction

The MidAmerican Energy Company (MidAmerican) Walter Scott Jr. Energy Center (WSEC) Coal Combustion Residual (CCR) Monofill is located in the southwest quarter of Section 31, Township 74 North, and Range 43 West; the northwest quarter of Section 6, Township 73 North, and Range 43 West; and the northeast quarter of Section 1, Township 73 North, and Range 44 West in Pottawattamie and Mills counties, Iowa. The location of the site is depicted in Figure 1.1. Figure 1.2 depicts pertinent site features and locations of monitoring wells present at the Monofill.

The Monofill is permitted under Iowa Department of Natural Resources (IDNR) Operating Permit No. 78-SDP-26-06P issued May 2, 2007, with subsequent amendments. A renewed operating permit was issued January 12, 2018, and incorporated all amendments. The site was developed as a Monofill in 2007 (Cell 1) and began receiving CCR in September 2007. The Monofill was constructed with a composite liner system including a 2-foot compacted clay liner and 60-mil high density polyethylene (HDPE) plastic liner. Additional cells were added after 2007 and include Cells 2, 3S, and 3N (2008), Cell 4 (2010), Cell 5 (2011), Cell 6 (2012), Cell 7 (2016), Cell 8 (2020), and Cell 9 (2022).

GHD prepared this Leachate Report to document leachate management activities for the WSEC CCR Monofill. This report summarizes the leachate control system performance and leachate analytical data.

2. Leachate Control System Performance Evaluation and Sampling

The Monofill has a leachate collection system with a composite liner, which meets the requirements of Iowa Administrative Code (IAC) 567—113.7(5)a(1) and a leachate collection system, which meets the requirements of IAC 567—113.7(5)b. The leachate collection system consists of leachate collection media (sand or bottom ash), 8-inch diameter HDPE conveyance pipes, pipe bedding, and a geocomposite drainage liner. Leachate flows toward a collection sump in each cell. Each sump includes an 18-inch diameter recovery pipe (riser pipe) from which leachate is pumped into a lined holding pond. The system automatically turns on the applicable sump pumps before levels reach 12 inches above the liner for permit compliance. MidAmerican's contractor pumps the collected leachate from the leachate pond into tanker trucks. The trucks then transport the leachate to the active fill areas where the leachate is used within the lined area (i.e., the area underlain with the geocomposite drainage liner) of the Monofill for dust control and to aid in solidification of CCR. As a backup disposal option for excess leachate, MidAmerican entered into a contractual agreement with the City of Council Bluffs Water Pollution Control Plant (CBWPCP), located immediately north of the Monofill, to accept excess leachate. Leachate is not used for dust suppression outside of the lined area of the Monofill. Groundwater from a water-supply well is used for dust control on roads outside of the lined Monofill area.

2.1 Volume of Leachate Collected

The volume of leachate collected and removed from the leachate pond was recorded by the leachate pond load out flow system. Between January 1, 2023, and December 31, 2023, approximately 5,254,498 gallons were removed from the leachate pond, loaded into trucks, and used for dust control and CCR solidification within the lined Monofill area. During the 2023 reporting period, the facility did not transport excess leachate to the CBWPCP for disposal. The 2023 monthly totals of leachate used for dust control and CCR solidification are summarized in Table 1.

2.2 Leachate Head Measurements

In 2010, MidAmerican constructed an automated leachate handling/pumping system. Prior to the use of this automated system, leachate levels were measured using an electronic water level meter. The current automated system includes dedicated pressure transducers for measurement of leachate head in each cell. This system allows MidAmerican to automatically monitor and record leachate levels in each cell (in inches) and automatically turn on the applicable sump pumps before levels reach 12 inches above the liner. The system is also equipped with a series of alarms that will alert MidAmerican if a component of the system is not functioning properly. Monthly leachate levels are summarized in Table 2. During the period from January 2023 through December 2023, leachate levels did not exceed 12 inches above the liner.

2.3 Leachate Sampling

During the monitoring events conducted on April 24, 2023, and October 2, 2023, leachate samples were collected from each leachate lift station (Leachate Lift Station #1 through Leachate Lift Station #3). The locations of the three leachate lift stations are depicted on Figure 1.2. Leachate sample collection was conducted via bailer. WSEC personnel operated the leachate pump system at each leachate lift station prior to sample collection. The stagnant leachate was removed from the sump at each lift station with fresh leachate pumped from cells into the sump during each monitoring event. Physical and chemical parameters of the leachate (temperature, pH, specific conductance, oxidation-reduction potential [ORP], dissolved oxygen [DO], and turbidity) were measured using an Aquatroll 600 multiparameter probe during sample collection from each of the leachate sample locations. The leachate sample field parameters are summarized in Table 3.

Leachate samples were collected in laboratory-supplied containers and submitted to Eurofins Environment Testing North Central, LLC for analysis of Appendix III (detection monitoring) and Appendix IV (assessment monitoring) constituents. Laboratory analytical results are summarized in Table 4 for the leachate samples. The leachate sample collection records and the laboratory analytical reports for the leachate samples are provided in Appendix A and Appendix B, respectively.

3. Leachate Monitoring Results

The following constituents were analyzed in the leachate samples collected during the 2023 reporting period:

- **Boron**: Boron is a Detection Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, boron concentrations in the leachate samples ranged from 1.81 to 3.38 milligrams per liter (mg/L).
- **Calcium**: Calcium is a Detection Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of calcium concentrations in leachate samples was from 42.5 to 269 mg/L.
- **Chloride**: Chloride is a Detection Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the chloride concentrations in the leachate samples ranged from 240 to 648 mg/L.
- **Fluoride**: Fluoride is both a Detection Monitoring and Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, there were no detections of fluoride in leachate samples.
- **pH**: pH is a Detection Monitoring constituent under the Federal CCR rule. The laboratory pH measurements during 2023 ranged from 10.1 to 11.9 standard units.
- **Sulfate**: Sulfate is a Detection Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the sulfate concentrations in the leachate samples ranged from 3,070 to 6,200 mg/L.
- **Total Dissolved Solids (TDS)**: TDS is a Detection Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of TDS values measured in leachate samples was from 5,520 to 10,700 mg/L.

- **Antimony:** Antimony is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the antimony concentrations in the leachate samples ranged from non-detect at reporting limit (RL) of 0.002 mg/L to 0.002 J+ mg/L.
- **Arsenic:** Arsenic is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of arsenic concentrations in leachate samples was from 0.00733 to 0.0474 mg/L.
- **Barium:** Barium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the barium concentrations in the leachate samples ranged from 0.0229 to 0.0564 mg/L.
- **Beryllium:** Beryllium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, beryllium was not detected in any of the leachate samples (RL of 0.001 mg/L).
- **Cadmium:** Cadmium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of cadmium concentrations in the leachate samples was from 0.000417 to 0.00282 mg/L.
- **Chromium:** Chromium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the chromium concentrations in leachate samples ranged from not detected at an RL of 0.005 mg/L to 0.980 mg/L.
- **Cobalt:** Cobalt is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of cobalt concentrations in the leachate samples was from 0.000570 to 0.00151 mg/L.
- **Lead:** Lead is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, lead was not detected in any of the leachate samples (RL of 0.0005 mg/L).
- **Lithium:** Lithium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of lithium concentrations in the leachate samples was non-detect (RL of 0.01 mg/L) to 0.102 mg/L.
- **Mercury:** Mercury is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, mercury was not detected in any of the leachate samples (RL of 0.0002 mg/L).
- **Molybdenum:** Molybdenum is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of molybdenum concentrations in the leachate samples was 1.80 to 6.27 mg/L.
- **Radium-226 & 228 (combined):** Radium-226 & 228 (combined) is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the Radium-226 & 228 (combined) was not detected in any of the leachate samples at RLs ranging from 0.653 to 1.13 picocuries per liter.
- **Selenium:** Selenium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, the range of selenium concentrations in leachate samples was 0.145 to 0.420 mg/L.
- **Thallium:** Thallium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2023 reporting period, thallium was not detected in any of the leachate samples (RL of 0.001 mg/L).

4. Recommendations

This report documents leachate management and monitoring conducted at the Monofill during the 2023 reporting period.

During 2023, the leachate control and management system at the site appeared to be functioning properly. Approximately 5,254,498 gallons were recovered during the period from January 2023 through December 2023 via the leachate collection system and applied for dust suppression and CCR solidification. No changes to the current operating and maintenance protocols for the leachate control system are proposed or necessary.

During 2024, leachate samples will be collected concurrently with semiannual groundwater monitoring required under the Federal CCR rule. During 2024, the semiannual leachate samples will be analyzed for the Appendix III and Appendix IV constituents.

Tables

Table 1

Leachate Use Summary
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Month	End of Month Totalizer Readings (gallons)	Leachate Used for Dust Control (gallons)	Leachate Hauled to POTW (gallons)
Jan-2023	22,118,392	0	0
Feb-2023	22,132,700	14,308	0
Mar-2023	22,168,430	35,730	0
Apr-2023	24,355,270	2,186,840	0
May-2023	24,921,270	566,000	0
Jun-2023	25,331,890	410,620	0
Jul-2023	25,608,310	276,420	0
Aug-2023	25,853,360	245,050	0
Sep-2023	26,115,540	262,180	0
Oct-2023	26,722,630	607,090	0
Nov-2023	27,372,890	650,260	0
Dec-23	27,372,890	0	0
Totals		**5,254,498**	**0**

Note:
POTW = Publicly Owned Treatment Works (City of Council Bluffs Water Pollution Control Plant).

Table 2

Leachate Elevation Measurements
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Month/Year	Cell Number	Leachate Level Measurement (inches above transducer)	Top of Liner Level (inches above transducer)	Leachate Level Above Top of Liner (inches)	In Compliance (Yes/No)
Jan-2023	Cell 1	17.0	15.2	1.8	Yes
Jan-2023	Cell 2	11.0	12.7	-1.7	Yes
Jan-2023	Cell 3N	18.0	12.9	5.1	Yes
Jan-2023	Cell 3S	20.0	14.6	5.4	Yes
Jan-2023	Cell 4N	19.0	18.7	0.3	Yes
Jan-2023	Cell 4S	19.0	18.7	0.3	Yes
Jan-2023	Cell 5	24.0	18.7	5.3	Yes
Jan-2023	Cell 6N	15.0	18.7	-3.7	Yes
Jan-2023	Cell 6S	23.0	18.7	4.3	Yes
Jan-2023	Cell 7N	19.0	18.7	0.3	Yes
Jan-2023	Cell 7S	17.0	18.7	-1.7	Yes
Jan-2023	Cell 8S	23.0	18.7	4.3	Yes
Jan-2023	Cell 8C	27.0	18.7	8.3	Yes
Jan-2023	Cell 8N	25.0	18.7	6.3	Yes
Jan-2023	Cell 9W	23.0	18.7	4.3	Yes
Jan-2023	Cell 9E	16.0	18.7	-2.7	Yes
Feb-2023	Cell 1	11.0	15.2	-4.2	Yes
Feb-2023	Cell 2	18.0	12.7	5.3	Yes
Feb-2023	Cell 3N	13.0	12.9	0.1	Yes
Feb-2023	Cell 3S	18.0	14.6	3.4	Yes
Feb-2023	Cell 4N	24.0	18.7	5.3	Yes
Feb-2023	Cell 4S	24.0	18.7	5.3	Yes
Feb-2023	Cell 5	21.0	18.7	2.3	Yes
Feb-2023	Cell 6N	8.0	18.7	-10.7	Yes
Feb-2023	Cell 6S	10.0	18.7	-8.7	Yes
Feb-2023	Cell 7N	18.0	18.7	-0.7	Yes
Feb-2023	Cell 7S	21.0	18.7	2.3	Yes
Feb-2023	Cell 8S	18.0	18.7	-0.7	Yes
Feb-2023	Cell 8C	23.0	18.7	4.3	Yes
Feb-2023	Cell 8N	23.0	18.7	4.3	Yes
Feb-2023	Cell 9W	24.0	18.7	5.3	Yes
Feb-2023	Cell 9E	13.0	18.7	-5.7	Yes
Mar-2023	Cell 1	14.0	15.2	-1.2	Yes
Mar-2023	Cell 2	12.0	12.7	-0.7	Yes
Mar-2023	Cell 3N	17.0	12.9	4.1	Yes
Mar-2023	Cell 3S	9.0	14.6	-5.6	Yes
Mar-2023	Cell 4N	22.0	18.7	3.3	Yes
Mar-2023	Cell 4S	11.0	18.7	-7.7	Yes
Mar-2023	Cell 5	21.0	18.7	2.3	Yes
Mar-2023	Cell 6N	18.0	18.7	-0.7	Yes
Mar-2023	Cell 6S	19.0	18.7	0.3	Yes
Mar-2023	Cell 7N	24.0	18.7	5.3	Yes
Mar-2023	Cell 7S	29.0	18.7	10.3	Yes
Mar-2023	Cell 8S	24.0	18.7	5.3	Yes
Mar-2023	Cell 8C	13.0	18.7	-5.7	Yes
Mar-2023	Cell 8N	8.0	18.7	-10.7	Yes
Mar-2023	Cell 9W	18.0	18.7	-0.7	Yes
Mar-2023	Cell 9E	24.0	18.7	5.3	Yes

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Apr-2023	Cell 1	18.0	15.2	2.8	Yes
Apr-2023	Cell 2	12.0	12.7	-0.7	Yes
Apr-2023	Cell 3N	14.0	12.9	1.1	Yes
Apr-2023	Cell 3S	8.0	14.6	-6.6	Yes
Apr-2023	Cell 4N	22.0	18.7	3.3	Yes
Apr-2023	Cell 4S	23.0	18.7	4.3	Yes
Apr-2023	Cell 5	18.0	18.7	-0.7	Yes
Apr-2023	Cell 6N	22.0	18.7	3.3	Yes
Apr-2023	Cell 6S	10.0	18.7	-8.7	Yes
Apr-2023	Cell 7N	21.0	18.7	2.3	Yes
Apr-2023	Cell 7S	27.0	18.7	8.3	Yes
Apr-2023	Cell 8S	10.0	18.7	-8.7	Yes
Apr-2023	Cell 8C	15.0	18.7	-3.7	Yes
Apr-2023	Cell 8N	19.0	18.7	0.3	Yes
Apr-2023	Cell 9W	17.0	18.7	-1.7	Yes
Apr-2023	Cell 9E	12.0	18.7	-6.7	Yes
May-2023	Cell 1	10.0	15.2	-5.2	Yes
May-2023	Cell 2	14.0	12.7	1.3	Yes
May-2023	Cell 3N	17.0	12.9	4.1	Yes
May-2023	Cell 3S	17.0	14.6	2.4	Yes
May-2023	Cell 4N	16.0	18.7	-2.7	Yes
May-2023	Cell 4S	12.0	18.7	-6.7	Yes
May-2023	Cell 5	21.0	18.7	2.3	Yes
May-2023	Cell 6N	18.0	18.7	-0.7	Yes
May-2023	Cell 6S	14.0	18.7	-4.7	Yes
May-2023	Cell 7N	22.0	18.7	3.3	Yes
May-2023	Cell 7S	30.0	18.7	11.3	Yes
May-2023	Cell 8S	22.0	18.7	3.3	Yes
May-2023	Cell 8C	26.0	18.7	7.3	Yes
May-2023	Cell 8N	25.0	18.7	6.3	Yes
May-2023	Cell 9W	22.0	18.7	3.3	Yes
May-2023	Cell 9E	20.0	18.7	1.3	Yes
Jun-2023	Cell 1	12.0	15.2	-3.2	Yes
Jun-2023	Cell 2	12.0	12.7	-0.7	Yes
Jun-2023	Cell 3N	13.0	12.9	0.1	Yes
Jun-2023	Cell 3S	10.0	14.6	-4.6	Yes
Jun-2023	Cell 4N	20.0	18.7	1.3	Yes
Jun-2023	Cell 4S	16.0	18.7	-2.7	Yes
Jun-2023	Cell 5	23.0	18.7	4.3	Yes
Jun-2023	Cell 6N	18.0	18.7	-0.7	Yes
Jun-2023	Cell 6S	23.0	18.7	4.3	Yes
Jun-2023	Cell 7N	26.0	18.7	7.3	Yes
Jun-2023	Cell 7S	23.0	18.7	4.3	Yes
Jun-2023	Cell 8S	23.0	18.7	4.3	Yes
Jun-2023	Cell 8C	26.0	18.7	7.3	Yes
Jun-2023	Cell 8N	21.0	18.7	2.3	Yes
Jun-2023	Cell 9W	14.0	18.7	-4.7	Yes
Jun-2023	Cell 9E	22.0	18.7	3.3	Yes

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Jul-2023	Cell 1	18.0	15.2	2.8	Yes
Jul-2023	Cell 2	15.0	12.7	2.3	Yes
Jul-2023	Cell 3N	16.0	12.9	3.1	Yes
Jul-2023	Cell 3S	17.0	14.6	2.4	Yes
Jul-2023	Cell 4N	12.0	18.7	-6.7	Yes
Jul-2023	Cell 4S	15.0	18.7	-3.7	Yes
Jul-2023	Cell 5	24.0	18.7	5.3	Yes
Jul-2023	Cell 6N	19.0	18.7	0.3	Yes
Jul-2023	Cell 6S	18.0	18.7	-0.7	Yes
Jul-2023	Cell 7N	28.0	18.7	9.3	Yes
Jul-2023	Cell 7S	30.0	18.7	11.3	Yes
Jul-2023	Cell 8S	22.0	18.7	3.3	Yes
Jul-2023	Cell 8C	26.0	18.7	7.3	Yes
Jul-2023	Cell 8N	24.0	18.7	5.3	Yes
Jul-2023	Cell 9W	24.0	18.7	5.3	Yes
Jul-2023	Cell 9E	24.0	18.7	5.3	Yes
Aug-2023	Cell 1	16.0	15.2	0.8	Yes
Aug-2023	Cell 2	12.0	12.7	-0.7	Yes
Aug-2023	Cell 3N	11.0	12.9	-1.9	Yes
Aug-2023	Cell 3S	7.0	14.6	-7.6	Yes
Aug-2023	Cell 4N	18.0	18.7	-0.7	Yes
Aug-2023	Cell 4S	14.0	18.7	-4.7	Yes
Aug-2023	Cell 5	25.0	18.7	6.3	Yes
Aug-2023	Cell 6N	19.0	18.7	0.3	Yes
Aug-2023	Cell 6S	18.0	18.7	-0.7	Yes
Aug-2023	Cell 7N	25.0	18.7	6.3	Yes
Aug-2023	Cell 7S	28.0	18.7	9.3	Yes
Aug-2023	Cell 8S	21.0	18.7	2.3	Yes
Aug-2023	Cell 8C	25.0	18.7	6.3	Yes
Aug-2023	Cell 8N	19.0	18.7	0.3	Yes
Aug-2023	Cell 9W	24.0	19.7	4.3	Yes
Aug-2023	Cell 9E	21.0	20.7	0.3	Yes
Sep-2023	Cell 1	16.0	15.2	0.8	Yes
Sep-2023	Cell 2	12.0	12.7	-0.7	Yes
Sep-2023	Cell 3N	15.0	12.9	2.1	Yes
Sep-2023	Cell 3S	11.5	14.6	-3.1	Yes
Sep-2023	Cell 4N	18.0	18.7	-0.7	Yes
Sep-2023	Cell 4S	13.0	18.7	-5.7	Yes
Sep-2023	Cell 5	19.0	18.7	0.3	Yes
Sep-2023	Cell 6N	19.0	18.7	0.3	Yes
Sep-2023	Cell 6S	18.0	18.7	-0.7	Yes
Sep-2023	Cell 7N	30.0	18.7	11.3	Yes
Sep-2023	Cell 7S	30.0	18.7	11.3	Yes
Sep-2023	Cell 8S	24.0	18.7	5.3	Yes
Sep-2023	Cell 8C	27.0	18.7	8.3	Yes
Sep-2023	Cell 8N	20.0	18.7	1.3	Yes
Sep-2023	Cell 9W	24.0	19.7	4.3	Yes
Sep-2023	Cell 9E	20.0	20.7	-0.7	Yes

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Leachate Elevation Measurements
MidAmerican Energy Company
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Council Bluffs, Iowa

Month/Year	Cell Number	Leachate Level Measurement (inches above transducer)	Top of Liner Level (inches above transducer)	Leachate Level Above Top of Liner (inches)	In Compliance (Yes/No)
Oct-2023	Cell 1	17.0	15.2	1.8	Yes
Oct-2023	Cell 2	19.0	12.7	6.3	Yes
Oct-2023	Cell 3N	15.0	12.9	2.1	Yes
Oct-2023	Cell 3S	16.0	14.6	1.4	Yes
Oct-2023	Cell 4N	19.0	18.7	0.3	Yes
Oct-2023	Cell 4S	19.0	18.7	0.3	Yes
Oct-2023	Cell 5	24.0	18.7	5.3	Yes
Oct-2023	Cell 6N	19.0	18.7	0.3	Yes
Oct-2023	Cell 6S	19.0	18.7	0.3	Yes
Oct-2023	Cell 7N	30.0	18.7	11.3	Yes
Oct-2023	Cell 7S	30.0	18.7	11.3	Yes
Oct-2023	Cell 8S	23.0	18.7	4.3	Yes
Oct-2023	Cell 8C	27.0	18.7	8.3	Yes
Oct-2023	Cell 8N	22.0	18.7	3.3	Yes
Oct-2023	Cell 9W	20.0	19.7	0.3	Yes
Oct-2023	Cell 9E	23.0	20.7	2.3	Yes
Nov-2023	Cell 1	15.0	15.2	-0.2	Yes
Nov-2023	Cell 2	13.0	12.7	0.3	Yes
Nov-2023	Cell 3N	15.0	12.9	2.1	Yes
Nov-2023	Cell 3S	11.4	14.6	-3.2	Yes
Nov-2023	Cell 4N	21.0	18.7	2.3	Yes
Nov-2023	Cell 4S	15.0	18.7	-3.7	Yes
Nov-2023	Cell 5	23.0	18.7	4.3	Yes
Nov-2023	Cell 6N	25.0	18.7	6.3	Yes
Nov-2023	Cell 6S	24.0	18.7	5.3	Yes
Nov-2023	Cell 7N	28.0	18.7	9.3	Yes
Nov-2023	Cell 7S	26.0	18.7	7.3	Yes
Nov-2023	Cell 8S	22.0	18.7	3.3	Yes
Nov-2023	Cell 8C	25.0	18.7	6.3	Yes
Nov-2023	Cell 8N	22.0	18.7	3.3	Yes
Nov-2023	Cell 9W	23.0	19.7	3.3	Yes
Nov-2023	Cell 9E	14.0	20.7	-6.7	Yes
Dec-2023	Cell 1	14.0	15.2	-1.2	Yes
Dec-2023	Cell 2	18.0	12.7	5.3	Yes
Dec-2023	Cell 3N	1.5	12.9	-11.4	Yes
Dec-2023	Cell 3S	14.9	14.6	0.3	Yes
Dec-2023	Cell 4N	15.0	18.7	-3.7	Yes
Dec-2023	Cell 4S	13.0	18.7	-5.7	Yes
Dec-2023	Cell 5	23.0	18.7	4.3	Yes
Dec-2023	Cell 6N	21.0	18.7	2.3	Yes
Dec-2023	Cell 6S	25.0	18.7	6.3	Yes
Dec-2023	Cell 7N	27.0	18.7	8.3	Yes
Dec-2023	Cell 7S	26.0	18.7	7.3	Yes
Dec-2023	Cell 8S	24.0	18.7	5.3	Yes
Dec-2023	Cell 8C	27.0	18.7	8.3	Yes
Dec-2023	Cell 8N	18.0	18.7	-0.7	Yes
Dec-2023	Cell 9W	23.0	19.7	3.3	Yes
Dec-2023	Cell 9E	21.0	20.7	0.3	Yes

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MidAmerican Energy Company
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Council Bluffs, Iowa

Month/Year	Cell Number	Leachate Level Measurement (inches above transducer)	Top of Liner Level (inches above transducer)	Leachate Level Above Top of Liner (inches)	In Compliance (Yes/No)

Notes:
The Monofill has been designed with a composite liner system with leachate collection. Leachate is composed of water that percolates through the coal combustion residual (CCR) in the Monofill and may include water soluble compounds from the CCR. Leachate is managed to protect soils, surface water, and groundwater and to maintain the integrity of the composite liner system by preventing a significant accumulation of standing leachate on the liner (e.g. less than 12 inches of head on the liner).

The maximum leachate level allowed is 12 inches above the following measurements. Cell 1 - Top of the Liner Level (TOLL) = 15.2 inches; Cell 2 TOLL = 12.7 inches; Cell 3N TOLL = 12.9 inches; Cell 3S TOLL = 14.6 inches; Cell 4N TOLL = 18.7 inches; Cell 4S TOLL = 18.7 inches; Cell 5 TOLL = 18.7 inches; Cell 6N TOLL = 18.7 inches; Cell 6S TOLL = 18.7 inches; Cell 7N TOLL = 18.7 inches; Cell 7S TOLL = 18.7 inches; Cell 8S TOLL = 18.7 inches; Cell 8C TOLL = 18.7 inches; Cell 8N TOLL = 18.7 inches; Cell 9W TOLL = 18.7 inches; Cell 9E TOLL = 18.7 inches.

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	pH, Field (s.u.)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	10.94	10.39	
3/18/2016	10.03	10.73	
5/18/2016	11.86	12.19	
7/20/2016	11.33	11.93	
10/6/2016	10.63	12.05	
1/31/2017	11.66	11.43	
7/12/2017	9.92	11.71	
8/16/2017	9.68	10.93	8.93
10/10/2017	10.10	11.28	11.58
5/3/2018	9.84	9.81	9.05
10/10/2018	11.54	10.04	10.92
4/18/2019	11.46	10.42	12.03
10/30/2019	12.91	9.83	12.83
4/21/2020	12.39	11.21	12.35
10/14/2020	11.52	10.96	11.51
4/21/2021	12.54	12.76	12.72
10/28/2021	11.11	11.47	11.69
4/29/2022	10.96	10.72	12.41
10/10/2022	11.18	10.00	11.45
4/25/2023	10.73	10.43	11.62
10/4/2023	11.48	9.93	11.62

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Temperature (°C)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	12.83	14.99	
3/18/2016	12.47	13.81	
5/18/2016	17.49	19.09	
7/20/2016	21.27	22.17	
10/6/2016	15.97	17.40	
1/31/2017	10.05	12.63	
7/12/2017	20.51	20.28	
8/16/2017	19.66	19.46	20.65
10/10/2017	13.03	13.85	15.62
5/3/2018	12.90	15.07	14.48
10/10/2018	16.34	14.03	14.28
4/18/2019	13.69	15.42	13.46
10/30/2019	8.65	12.43	14.10
4/21/2020	13.78	15.79	15.46
10/14/2020	17.60	18.26	19.84
4/21/2021	12.71	12.10	12.56
10/28/2021	14.66	15.44	15.38
4/29/2022	14.12	16.03	17.18
10/10/2022	18.78	19.05	19.19
4/25/2023	11.97	15.31	13.79
10/4/2023	18.23	18.41	17.79

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Conductivity (mS/cm)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	7.51	11.1	
3/18/2016	9.87	14.3	
5/18/2016	7.84	16.6	
7/20/2016	6.14	15.2	
10/6/2016	9.47	16.3	
1/31/2017	12.0	15.3	
7/12/2017	9.18	13.8	
8/16/2017	8.15	12.2	4.19
10/10/2017	9.23	14.0	10.9
5/3/2018	9.55	9.86	4.61
10/10/2018	8.73		8.15
4/18/2019	8.86	11.9	8.25
10/30/2019	10.8	9.95	7.93
4/21/2020	9.67	15.20	11.5
10/14/2020	10.1	15.00	7.54
4/21/2021	8.36	12.30	11.9
10/28/2021	8.33	11.80	7.08
4/29/2022		12.70	
10/10/2022	9.37	13.94	8.85
4/25/2023	14.24	17.01	10.74
10/4/2023	9.54	14.22	8.75

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Turbidity (NTU)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	3.5	0.0	
3/18/2016	0.0	4.4	
5/18/2016	0.0	0.0	
7/20/2016	3.3	0.6	
10/6/2016	0.0	0.0	
1/31/2017	0.0	0.0	
7/12/2017	0.0	0.0	
8/16/2017	0.0	0.0	0.0
10/10/2017	18.3	30.9	39.4
5/3/2018	2.4	0.9	1.8
10/10/2018	2.9	2.2	2.8
4/18/2019	17.9	0.0	15.6
10/30/2019	201	12.4	45.7
4/21/2020	0.0	0.0	469
10/14/2020	12.4	0.2	11.7
4/21/2021	19.7	5.7	171
10/28/2021	30.4	41.3	37.4
4/29/2022	0.4	9.1	0.0
10/10/2022	22.1	7.3	4.5
4/25/2023	22.2	2.2	5.9
10/4/2023	12.9	0.0	0.0

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Oxidation-Reduction Potential (mV)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	126	133	
3/18/2016	108	-230	
5/18/2016	74	28	
7/20/2016	-13	-66	
10/6/2016	58	50	
1/31/2017	16	-27	
7/12/2017	61	6	
8/16/2017	55	32	115
10/10/2017	90	53	51
5/3/2018	118	140	137
10/10/2018	-58	24	-32
4/18/2019	19	2	-42
10/30/2019	-151	-150	-51
4/21/2020	-46	-16	-103
10/14/2020	-1	17	-3
4/21/2021	1	-34	-34
10/28/2021	49	-6	0
4/29/2022	-9	-10	-75
10/10/2022	161	207	27
4/25/2023	211	198	179
10/4/2023	58	157	9.2

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Dissolved Oxygen (mg/L)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	10.50	5.54	
3/18/2016	5.44	6.43	
5/18/2016	4.52	2.40	
7/20/2016	1.73	1.23	
10/6/2016	2.75	5.32	
1/31/2017	3.51	4.88	
7/12/2017	2.93	3.05	
8/16/2017	0.82	0.83	6.64
10/10/2017	4.81	5.08	3.70
5/3/2018	5.05	6.20	6.85
10/10/2018	4.53	3.94	0.00
4/18/2019	0.83	0.62	0.58
10/30/2019	6.14	6.42	5.97
4/21/2020	5.34	2.38	1.77
10/14/2020	0.65	4.64	6.47
4/21/2021	2.96	0.56	0.70
10/28/2021	2.21	0.86	5.34
4/29/2022	3.02	0.80	5.74
10/10/2022	0.50	0.04	1.83
4/25/2023	5.56	2.46	5.59
10/4/2023	4.34	3.09	2.95

Notes:
Parameters measured using a multiparameter probe.
°C = Degrees Celsius.
mS/cm = milli-Siemens per centimeter.
NTU = Nephelometric Turbidity Unit.
mV = millivolt.
mg/L = milligrams per liter.
s.u. = standard unit.
Blank cells indicate parameter was not measured.

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**
Sample ID:		**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**
Sample Date:		**03/18/2016**	**05/18/2016**	**07/20/2016**	**10/06/2016**	**01/31/2017**	**04/12/2017**	**07/12/2017**
Parameters	**Units**							
Appendix III								
Boron	mg/L	1.4	0.88	0.811	1.08	1.82	1.54	1.94
Calcium	mg/L	135	205	281	229	80.7	150	116
Chloride	mg/L	281	247	148	206	415	282	266
Fluoride	mg/L	0.966	<0.500	<0.500	0.512	<0.500	0.667	<0.500
pH, lab	s.u.	10.2	11.5	10.9	10.7	11.3	10.7	9.8
Sulfate	mg/L	4670	3010	2760	5900	5380	3950	4720
Total dissolved solids (TDS)	mg/L	8600	6950	5340	7480	10000	8200	8500
Appendix IV								
Antimony	mg/L	0.00111	<0.001	<0.001	0.00129	0.00124	<0.001	0.00121
Arsenic	mg/L	0.0261	0.0170	0.0133	0.0170	0.0210	0.0153	0.0174
Barium	mg/L	0.0621	0.0681	0.0945	0.0841	0.0525	0.0526	0.0507
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.000856	<0.0005	<0.0005	0.000622	0.00103	0.000782	0.000761
Chromium	mg/L	0.0352	0.0583	0.0225	0.133	0.0189	0.0210	0.0306
Cobalt	mg/L	0.00129	0.000613	<0.0005	0.000619	0.000976	0.000765	0.000777
Lead	mg/L	<0.00250	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005
Lithium	mg/L	<0.250	<0.200	0.110	<0.200	<0.300	<0.150	<0.250
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	4.32	2.30	2.00	3.48	4.74	3.86	4.17
Radium-226 & 228	pCi/L	0.446	0.671	0.653	0.790	0.501	0.502	1.07
Selenium	mg/L	0.280	0.185	0.150	0.234	0.375	0.305	0.254
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**
Sample ID:		**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**
Sample Date:		**08/16/2017**	**10/10/2017**	**05/03/2018**	**10/10/2018**	**04/18/2019**	**10/30/2019**	**04/21/2020**
Parameters	**Units**							
Appendix III								
Boron	mg/L	1.74	1.57	1.99	3.73	1.17	1.75	1.65
Calcium	mg/L	93.3	148	126	199	190	508	186
Chloride	mg/L	324	269	318	281	291	272	312
Fluoride	mg/L	0.614	0.534	0.913	<0.500	<0.500	<0.500	<0.500
pH, lab	s.u.	9.9	10	9	11.1	9.2	11.7	11.8
Sulfate	mg/L	4900	4730	4840	3540	3910	3320	3890
Total dissolved solids (TDS)	mg/L	9480	8520	9180	7280	6840	7240	7820
Appendix IV								
Antimony	mg/L	0.00125	--	--	--	--	--	--
Arsenic	mg/L	0.0155	--	--	--	--	--	--
Barium	mg/L	0.0504	--	--	--	--	--	--
Beryllium	mg/L	<0.001	--	--	--	--	--	--
Cadmium	mg/L	<0.0005	--	--	--	--	--	--
Chromium	mg/L	0.0184	--	--	--	--	--	--
Cobalt	mg/L	0.000780	--	--	--	--	--	--
Lead	mg/L	<0.0005	--	--	--	--	--	--
Lithium	mg/L	<0.250	--	--	--	--	--	--
Mercury	mg/L	<0.0002	--	--	--	--	--	--
Molybdenum	mg/L	3.79	--	--	--	--	--	--
Radium-226 & 228	pCi/L	0.558	--	--	--	--	--	--
Selenium	mg/L	0.260	--	--	--	--	--	--
Thallium	mg/L	<0.001	--	--	--	--	--	--

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		Lift Station 1	Lift Station 1	Lift Station 1	Lift Station 1	Lift Station 1	Lift Station 1	Lift Station 1
Sample ID:		Leachate (Lift Station) #1	Leachate (Lift Station) #1	Leachate (Lift Station) #1	Leachate-1	LS1-1022	LS1-0423	LS1-1023
Sample Date:		10/14/2020	04/21/2021	10/28/2021	04/29/2022	10/10/2022	04/25/2023	10/04/2023
Parameters	**Units**							
Appendix III								
Boron	mg/L	1.63	1.53	2.01	1.81	1.69	2.36	1.81
Calcium	mg/L	159	170	138	127	69.1	104	87.4
Chloride	mg/L	278	233	263	271	288	289	293
Fluoride	mg/L	<1.00	0.687	4.14	4.98	6.35	<1.00	<1.00
pH, lab	s.u.	11.1	11.3	11.4	10.9 J	11.7 J	11.0 J	11.8 J
Sulfate	mg/L	5040	3930	3700	4970	3850	5500	3980
Total dissolved solids (TDS)	mg/L	8100	6760	5360	7390	7310	8020	7010
Appendix IV								
Antimony	mg/L	--	--	--	--	--	0.00200 J+	<0.00200
Arsenic	mg/L	--	--	--	--	--	0.0474	0.0371
Barium	mg/L	--	--	--	--	--	0.0325	0.0357
Beryllium	mg/L	--	--	--	--	--	<0.00100	<0.00100
Cadmium	mg/L	--	--	--	--	--	0.00282	0.00200
Chromium	mg/L	--	--	--	--	--	0.00546	<0.00500
Cobalt	mg/L	--	--	--	--	--	0.00151	0.000945
Lead	mg/L	--	--	--	--	--	<0.000500	<0.000500
Lithium	mg/L	--	--	--	--	--	0.0824	0.102
Mercury	mg/L	--	--	--	--	--	<0.000200	<0.000200
Molybdenum	mg/L	--	--	--	--	--	6.27	4.96
Radium-226 & 228	pCi/L	--	--	--	--	--	<0.346	<0.387
Selenium	mg/L	--	--	--	--	--	0.420	0.371
Thallium	mg/L	--	--	--	--	--	<0.00100	<0.00100

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**
Sample ID:		**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**
Sample Date:		**03/18/2016**	**05/18/2016**	**07/20/2016**	**10/06/2016**	**01/31/2017**	**04/12/2017**	**07/12/2017**
Parameters	**Units**							
Appendix III								
Boron	mg/L	1.81	1.68	1.7	1.51	1.65	2.57	2.03
Calcium	mg/L	123	144	119	109	74.2	106	68.8
Chloride	mg/L	438	710	592	633	635	608	629
Fluoride	mg/L	<0.500	<0.500	<0.500	<0.500	13.5	<0.500	<0.500
pH, lab	s.u.	10.9	11.8	11.7	11.9	11.5	10.3	11.4
Sulfate	mg/L	6000	6930	6750	7670	7440	6520	6350
Total dissolved solids (TDS)	mg/L	11500	13000	12600	12500	13500	13100	13000
Appendix IV								
Antimony	mg/L	<0.001	<0.001	<0.001	<0.001	0.00113	<0.001	<0.001
Arsenic	mg/L	0.0368	0.0160	0.0196	0.0156	0.0322	0.0152	0.0186
Barium	mg/L	0.0569	0.0942	0.0807	0.0753	0.0482	0.0697	0.0529
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.00124	0.000715	0.000602	0.000806	0.00124	0.000892	0.000920
Chromium	mg/L	0.0402	0.0839	0.0452	0.0330	0.0210	0.0613	0.0241
Cobalt	mg/L	0.00193	0.000541	0.000614	0.000564	0.00157	0.00111	0.000675
Lead	mg/L	<0.00250	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005
Lithium	mg/L	<0.300	<0.300	<0.350	<0.400	<0.400	<0.350	<0.350
Mercury	mg/L	<0.0002	<0.0002	0.000267	<0.0002	<0.0002	<0.0002	0.000252
Molybdenum	mg/L	5.81	4.32	4.27	4.58	5.43	3.80	5.10
Radium-226 & 228	pCi/L	0.495	0.399	0.114	1.71	1.17	0.433	0.190
Selenium	mg/L	0.408	0.370	0.384	0.370	0.425	0.374	0.417
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**
Sample ID:		**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**
Sample Date:		**08/16/2017**	**10/10/2017**	**05/03/2018**	**10/10/2018**	**04/18/2019**	**10/30/2019**	**04/21/2020**
Parameters	**Units**							
Appendix III								
Boron	mg/L	2.28	1.67	1.81	1.42	2.06	2.38	2.97
Calcium	mg/L	36.4	180	155	152	93.3	210	93.7
Chloride	mg/L	607	514	644	357	471	183	487
Fluoride	mg/L	<0.500	<0.500	0.698	<0.500	<0.500	<0.500	<0.500
pH, lab	s.u.	11.4	11.1	9.3	9.6	10.1	9.2	10.6
Sulfate	mg/L	6610	6650	4950	4930	5210	2490	5880
Total dissolved solids (TDS)	mg/L	13000	12200	8460	9200	9960	8640	11400
Appendix IV								
Antimony	mg/L	<0.01	--	--	--	--	--	--
Arsenic	mg/L	0.0160	--	--	--	--	--	--
Barium	mg/L	0.0410	--	--	--	--	--	--
Beryllium	mg/L	<0.001	--	--	--	--	--	--
Cadmium	mg/L	<0.005	--	--	--	--	--	--
Chromium	mg/L	0.0190	--	--	--	--	--	--
Cobalt	mg/L	0.000668	--	--	--	--	--	--
Lead	mg/L	<0.0005	--	--	--	--	--	--
Lithium	mg/L	<0.350	--	--	--	--	--	--
Mercury	mg/L	<0.0002	--	--	--	--	--	--
Molybdenum	mg/L	4.79	--	--	--	--	--	--
Radium-226 & 228	pCi/L	0.258	--	--	--	--	--	--
Selenium	mg/L	0.427	--	--	--	--	--	--
Thallium	mg/L	<0.001	--	--	--	--	--	--

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**
Sample ID:		**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate-2**	**LS2-1022**	**LS2-0423**	**LS2-1023**
Sample Date:		**10/14/2020**	**04/21/2021**	**10/28/2021**	**04/29/2022**	**10/10/2022**	**04/25/2023**	**10/04/2023**
Parameters	**Units**							
Appendix III								
Boron	mg/L	2.66	2.86	2.82	2.12	2.15	3.38	1.91
Calcium	mg/L	28.6	55	53.9	36.7	26.2	269	46.6
Chloride	mg/L	586	428	453	618	549	648	564
Fluoride	mg/L	<1.00	<0.500	11.9	12.8	14.7	<1.00	<1.00
pH, lab	s.u.	11	11.3	11.3	11.1 J	10.7 J	10.6 J	10.1 J
Sulfate	mg/L	7810	5660	5350	6530	5680	6200	5900
Total dissolved solids (TDS)	mg/L	12500	9400	9640	10500	11200	9750	10700
Appendix IV								
Antimony	mg/L	--	--	--	--	--	<0.00200	<0.00200
Arsenic	mg/L	--	--	--	--	--	0.00733	0.0188
Barium	mg/L	--	--	--	--	--	0.0526	0.0229
Beryllium	mg/L	--	--	--	--	--	<0.00100	<0.00100
Cadmium	mg/L	--	--	--	--	--	0.00179	0.00254
Chromium	mg/L	--	--	--	--	--	0.980	<0.00500
Cobalt	mg/L	--	--	--	--	--	0.00122	0.000824
Lead	mg/L	--	--	--	--	--	<0.000500	<0.000500
Lithium	mg/L	--	--	--	--	--	0.0147	0.0396
Mercury	mg/L	--	--	--	--	--	<0.000200	<0.000200
Molybdenum	mg/L	--	--	--	--	--	4.19	5.22
Radium-226 & 228	pCi/L	--	--	--	--	--	<0.305	<0.369
Selenium	mg/L	--	--	--	--	--	0.249	0.367
Thallium	mg/L	--	--	--	--	--	<0.00100	<0.00400

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

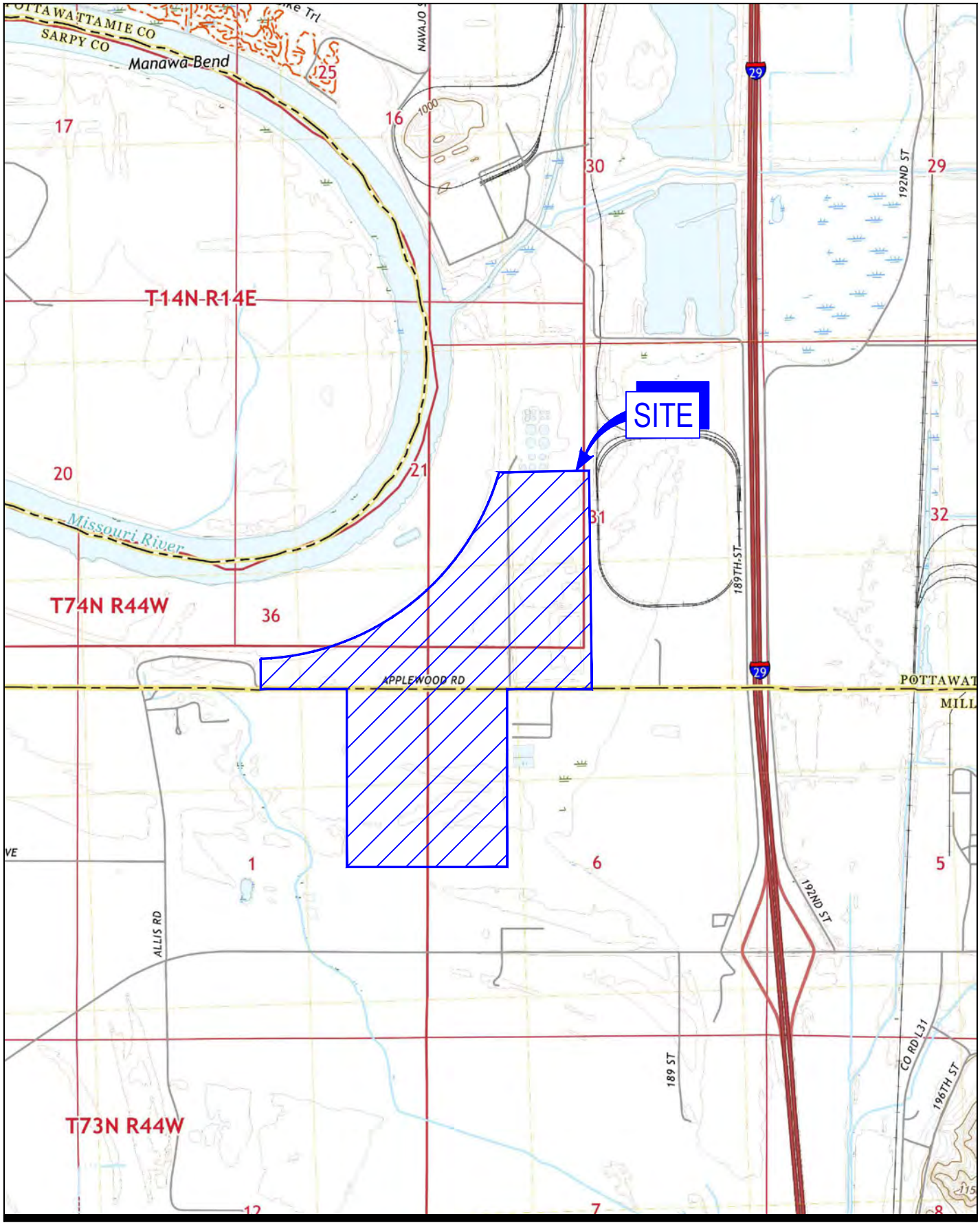
Sample Location:		**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**
Sample ID:		**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**
Sample Date:		**08/16/2017**	**10/10/2017**	**05/03/2018**	**10/10/2018**	**04/18/2019**	**10/30/2019**	**04/21/2020**
Parameters	**Units**							
Appendix III								
Boron	mg/L	4.85	4.27	4.24	1.57	2.01	1.49	4.11
Calcium	mg/L	224	218	168	137	108	103	158
Chloride	mg/L	156	354	158	273	232	264	501
Fluoride	mg/L	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
pH, lab	s.u.	8.8	11.4	8.7	10.3	11.5	11.8	10.6
Sulfate	mg/L	2120	4930	1940	3430	3440	4480	4190
Total dissolved solids (TDS)	mg/L	5040	10200	3840	6520	6320	5580	9020
Appendix IV								
Antimony	mg/L	<0.001	--	--	--	--	--	--
Arsenic	mg/L	0.00293	--	--	--	--	--	--
Barium	mg/L	0.0556	--	--	--	--	--	--
Beryllium	mg/L	<0.001	--	--	--	--	--	--
Cadmium	mg/L	<0.0005	--	--	--	--	--	--
Chromium	mg/L	0.0505	--	--	--	--	--	--
Cobalt	mg/L	0.000607	--	--	--	--	--	--
Lead	mg/L	<0.0005	--	--	--	--	--	--
Lithium	mg/L	<0.250	--	--	--	--	--	--
Mercury	mg/L	<0.0002	--	--	--	--	--	--
Molybdenum	mg/L	1.08	--	--	--	--	--	--
Radium-226 & 228	pCi/L	0.303	--	--	--	--	--	--
Selenium	mg/L	0.0623	--	--	--	--	--	--
Thallium	mg/L	<0.001	--	--	--	--	--	--

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		Lift Station 3	Lift Station 3	Lift Station 3	Lift Station 3	Lift Station 3	Lift Station 3	Lift Station 3
Sample ID:		Leachate (Lift Station) #3	Leachate (Lift Station) #3	Leachate (Lift Station) #3	Leachate-3	LS3-1022	LS3-0423	LS3-1023
Sample Date:		10/14/2020	04/21/2021	10/28/2021	04/29/2022	10/10/2022	04/25/2023	10/04/2023
Parameters	**Units**							
Appendix III								
Boron	mg/L	4.36	5.53	3.47	3.56	2.40	2.09	1.94
Calcium	mg/L	316	544	191	144	77.4	135	42.5
Chloride	mg/L	306	408	317	321	315	240	317
Fluoride	mg/L	<0.500	0.515	3.2	3.69	4.82	<1.00	<1.00
pH, lab	s.u.	11	11.6	11.3	11.3 J	11.9 J	11.9 J	11.9 J
Sulfate	mg/L	3590	3920	2690	2500	2910	3300	3070
Total dissolved solids (TDS)	mg/L	5710	7260	4260	5400	6680	5520	6330
Appendix IV								
Antimony	mg/L	--	--	--	--	--	<0.00200	<0.00200
Arsenic	mg/L	--	--	--	--	--	0.0108	0.0170
Barium	mg/L	--	--	--	--	--	0.0564	0.0248
Beryllium	mg/L	--	--	--	--	--	<0.00100	<0.00100
Cadmium	mg/L	--	--	--	--	--	0.000790	0.000417
Chromium	mg/L	--	--	--	--	--	0.0103	<0.00500
Cobalt	mg/L	--	--	--	--	--	0.000683	0.000570
Lead	mg/L	--	--	--	--	--	<0.000500	<0.000500
Lithium	mg/L	--	--	--	--	--	<0.0100	<0.0100
Mercury	mg/L	--	--	--	--	--	<0.000200	<0.000200
Molybdenum	mg/L	--	--	--	--	--	1.80	2.33
Radium-226 & 228	pCi/L	--	--	--	--	--	<-0.0661	<0.585
Selenium	mg/L	--	--	--	--	--	0.145	0.231
Thallium	mg/L	--	--	--	--	--	<0.00100	<0.00100

Figures



0 1000 2000 ft

1" = 2000 ft

Coordinate System:
I83-SF

N

GHD

MIDAMERICAN ENERGY COMAPNY
WALTER SCOTT JR. ENERGY CENTER
CCR MONOFILL
COUNCIL BLUFFS, IOWA

Project No. **12592594**
Date **December 2023**

SITE LOCATION MAP

FIGURE 1.1

Filename: N:\US\Des Moines\Projects\563\12592594\Digital_Design\ACAD\Figures\RPT010\12592594-GHD-00-00-RPT-EN-D001_GB-010.dwg
Plot Date: 15 December 2023 2:08 PM

Data Source: USGS Quadrangle Map, Council Bluffs South, IA (2022).

CITY OF COUNCIL BLUFFS
WATER POLLUTION CONTROL
PLANT (CBWPCP)

MISSOURI RIVER

CROPLAND

LEVEE

MW-105
MW-108
MW-133
MW-248
MW-250
MW-241R
MW-242
MW-247
MW-240R
LS-3
MW-246
MW-233
MW-243
MW-244
MW-227
LS-2
MW-245
DW-1
MW-191
MW-156
MW-249
MW-143
DW-2
MW-190
MW-157
LS-1
MW-159
MW-158
MW-149
MW-301
MW-302
MW-303
MW-304
MW-305
MW-306
MW-307

CELL 9
CELL 8
CELL 6
CELL 5
CELL 7
CELL 4
CELL 3N
CELL 2
CELL 3S
CELL 1

LEACHATE POND
LEACHATE MANAGEMENT POND
DETENTION BASIN

LEGEND

- PROPERTY BOUNDARY
- FENCING
- MW-245 MONITORING WELL
- MW-233 DECOMMISSIONED WELL
- DW-1 DEWATERING WELL
- LS-1 LEACHATE LIFT STATION
- DOWNGRADIENT SAMPLING LOCATION
- BACKGROUND SAMPLING LOCATION
- GAUGING LOCATION

0 250 500 ft
1" = 500 ft

Coordinate System:
IA83-SF

N

GHD

MIDAMERICAN ENERGY COMPANY
WALTER SCOTT JR. ENERGY CENTER
CCR MONOFILL
COUNCIL BLUFFS, IOWA

SITE MAP AND MONITORING NETWORK

Project No. **12592594**
Date **December 2023**

FIGURE 1.2

Filename: N:\US\Des Moines\Projects\563\12592594\Digital_Design\ACAD\Figures\RPT010\12592594-GHD-00-00-RPT-EN-D101_GB-010.dwg
Plot Date: 15 December 2023 2:08 PM

Data Source: 05157640C32 Terracon Consulting Engineers and Scientists, Rec'd 10/2022

Appendices

Appendix A

Sample Collection Records

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 4/25/2023 SITE: WSEC CCR Monofill PROJECT 12592594

WEATHER: Cloudy, 50-60 degrees F

WELL IDENTIFICATION

LS1
(Lift Station #1)

DEPTH TO WATER (ft bTOC): --

WELL TOTAL DEPTH (ft bTOC): --

WELL DIAMETER (inches): --

PURGING:

CASING VOLUME CALCULATION: -- ft of water in casing X -- gallon/foot = -- total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump (Bailer) Other:

Time (24 hr)	Amount Purged (mL)	Flow Rate (mL/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
Scott Burns purged >/= 5 minutes prior to sampling									
Continued on back (circle one) yes (no)									

Well Purged Below Top of Pump? (Y/N): -- Time to Recharge: -- Depth to Water (ft bTOC): --

SAMPLING Equipment Used: (Same as Above) Other:

Sample Time (24 hr)	Total Purged (mL)	pH	Temp (C)	Conductivity (uS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0815	--	10.73	11.97	14,237	22.23	211.0	5.56	--	--

FINAL DEPTH TO WATER (ft bTOC): -- TIME FINAL DEPTH TAKEN: --

SAMPLE ID: LS1-0423 SAMPLE FOR QC: --

PARAMETERS REQUESTD FOR ANALYSIS: Appendix III and Appendix IV to 40 CFR Part 257

IDW PURGE WATER TOTAL (mL): -- FLOW THROUGH CELL MODEL #: Aquatroll 600 (SN 809048)

Well Condition	Remarks
Concrete Pad?	
Bumper Posts?	
Protective Casing?	
Paint and Label?	
Lock?	
Well Casing?	
Reference Point?	

Field Sampler(s) Name(s): Paige LaPlant

	NAME	SIGNATURE	DATE
PREPARED:	Paige LaPlant	Paige LaPlant	4/25/2023

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 4/25/2023 SITE: WSEC CCR Monofill PROJECT 12592594

WEATHER: Cloudy, 50-60 degrees F

WELL IDENTIFICATION

LS2
(Lift Station #2)

DEPTH TO WATER (ft bTOC): --

WELL TOTAL DEPTH (ft bTOC): --

WELL DIAMETER (inches): --

PURGING:

CASING VOLUME CALCULATION: -- ft of water in casing X -- gallon/foot = -- total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump (Bailer) Other:

Time (24 hr)	Amount Purged (mL)	Flow Rate (mL/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
Scott Burns purged >/= 5 minutes prior to sampling									
Continued on back (circle one) yes (no)									

Well Purged Below Top of Pump? (Y/N): -- Time to Recharge: -- Depth to Water (ft bTOC): --

SAMPLING Equipment Used: (Same as Above) Other:

Sample Time (24 hr)	Total Purged (mL)	pH	Temp (C)	Conductivity (uS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0855	--	10.43	15.31	17,011	2.18	197.5	2.46	--	--

FINAL DEPTH TO WATER (ft bTOC): -- TIME FINAL DEPTH TAKEN: --

SAMPLE ID: LS2-0423 SAMPLE FOR QC: --

PARAMETERS REQUESTD FOR ANALYSIS: Appendix III and Appendix IV to 40 CFR Part 257

IDW PURGE WATER TOTAL (mL): -- FLOW THROUGH CELL MODEL #: Aquatroll 600 (SN 809048)

Well Condition	Remarks
Concrete Pad?	
Bumper Posts?	
Protective Casing?	
Paint and Label?	
Lock?	
Well Casing?	
Reference Point?	

Field Sampler(s) Name(s): Paige LaPlant

	NAME	SIGNATURE	DATE
PREPARED:	Paige LaPlant	Paige LaPlant	4/25/2023

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 4/25/2023 SITE: WSEC CCR Monofill PROJECT 12592594

WEATHER: Cloudy, 50-60 degrees F

WELL IDENTIFICATION

LS3
(Lift Station #3)

DEPTH TO WATER (ft bTOC): --

WELL TOTAL DEPTH (ft bTOC): --

WELL DIAMETER (inches): --

PURGING:

CASING VOLUME CALCULATION: -- ft of water in casing X -- gallon/foot = -- total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump (Bailer) Other:

Time (24 hr)	Amount Purged (mL)	Flow Rate (mL/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
Scott Burns purged >/= 5 minutes prior to sampling									
Continued on back (circle one) yes (no)									

Well Purged Below Top of Pump? (Y/N): -- Time to Recharge: -- Depth to Water (ft bTOC): --

SAMPLING Equipment Used: (Same as Above) Other:

Sample Time (24 hr)	Total Purged (mL)	pH	Temp (C)	Conductivity (uS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0827	--	11.62	13.79	10,742	5.90	179.2	5.59	--	--

FINAL DEPTH TO WATER (ft bTOC): -- TIME FINAL DEPTH TAKEN: --

SAMPLE ID: LS3-0423 SAMPLE FOR QC: --

PARAMETERS REQUESTD FOR ANALYSIS: Appendix III and Appendix IV to 40 CFR Part 257

IDW PURGE WATER TOTAL (mL): -- FLOW THROUGH CELL MODEL #: Aquatroll 600 (SN 809048)

Well Condition	Remarks
Concrete Pad?	
Bumper Posts?	
Protective Casing?	
Paint and Label?	
Lock?	
Well Casing?	
Reference Point?	

Field Sampler(s) Name(s): Paige LaPlant

	NAME	SIGNATURE	DATE
PREPARED:	Paige LaPlant	Paige LaPlant	4/25/2023

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 10/4/2023 SITE: WSEC CCR Monofill PROJECT 12592594

WEATHER: Partly cloudy, mid-60 degrees F

WELL IDENTIFICATION

LS1
(Lift Station #1)

DEPTH TO WATER (ft bTOC): --

WELL TOTAL DEPTH (ft bTOC): --

WELL DIAMETER (inches): --

PURGING:

CASING VOLUME CALCULATION: -- ft of water in casing X -- gallon/foot = -- total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump (Bailer) Other:

Time (24 hr)	Amount Purged (mL)	Flow Rate (mL/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
Scott Burns purged >/= 5 minutes prior to sampling									
Continued on back (circle one) yes (no)									

Well Purged Below Top of Pump? (Y/N): -- Time to Recharge: -- Depth to Water (ft bTOC): --

SAMPLING Equipment Used: (Same as Above) Other:

Sample Time (24 hr)	Total Purged (mL)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1020	--	11.48	18.23	9.54	12.86	58.1	4.34	--	--

FINAL DEPTH TO WATER (ft bTOC): -- TIME FINAL DEPTH TAKEN: --

SAMPLE ID: LS1-1023 SAMPLE FOR QC: --

PARAMETERS REQUESTD FOR ANALYSIS: Appendix III and Appendix IV to 40 CFR Part 257

IDW PURGE WATER TOTAL (mL): -- FLOW THROUGH CELL MODEL #: Aquatroll 600 (SN 1050309)

Well Condition	Remarks
Concrete Pad?	
Bumper Posts?	
Protective Casing?	
Paint and Label?	
Lock?	
Well Casing?	
Reference Point?	

Field Sampler(s) Name(s): Paige Richards

	NAME	SIGNATURE	DATE
PREPARED:	Paige Richards	Paige Richards	10/4/2023

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 10/4/2023 SITE: WSEC CCR Monofill PROJECT 12592594

WEATHER: Partly cloudy, mid-60 degrees F

WELL IDENTIFICATION

LS2
(Lift Station #2)

DEPTH TO WATER (ft bTOC): --

WELL TOTAL DEPTH (ft bTOC): --

WELL DIAMETER (inches): --

PURGING:

CASING VOLUME CALCULATION: -- ft of water in casing X -- gallon/foot = -- total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump (Bailer) Other:

Time (24 hr)	Amount Purged (mL)	Flow Rate (mL/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
Scott Burns purged >/= 5 minutes prior to sampling									
Continued on back (circle one) yes (no)									

Well Purged Below Top of Pump? (Y/N): -- Time to Recharge: -- Depth to Water (ft bTOC): --

SAMPLING Equipment Used: (Same as Above) Other:

Sample Time (24 hr)	Total Purged (mL)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0955	--	9.93	18.41	14.22	0.00	156.9	3.09	--	--

FINAL DEPTH TO WATER (ft bTOC): -- TIME FINAL DEPTH TAKEN: --

SAMPLE ID: LS2-1023 SAMPLE FOR QC: --

PARAMETERS REQUESTD FOR ANALYSIS: Appendix III and Appendix IV to 40 CFR Part 257

IDW PURGE WATER TOTAL (mL): -- FLOW THROUGH CELL MODEL #: Aquatroll 600 (SN 1050309)

Well Condition	**Remarks**
Concrete Pad?	
Bumper Posts?	
Protective Casing?	
Paint and Label?	
Lock?	
Well Casing?	
Reference Point?	

Field Sampler(s) Name(s): Paige Richards

	NAME	SIGNATURE	DATE
PREPARED:	Paige Richards	Paige Richards	10/4/2023

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 10/4/2023 SITE: WSEC CCR Monofill PROJECT 12592594

WEATHER: Partly cloudy, mid-60 degrees F

WELL IDENTIFICATION

LS3
(Lift Station #3)

DEPTH TO WATER (ft bTOC): --

WELL TOTAL DEPTH (ft bTOC): --

WELL DIAMETER (inches): --

PURGING:

CASING VOLUME CALCULATION: -- ft of water in casing X -- gallon/foot = -- total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump (Bailer) Other:

Time (24 hr)	Amount Purged (mL)	Flow Rate (mL/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
Scott Burns purged >/= 5 minutes prior to sampling									
Continued on back (circle one) yes (no)									

Well Purged Below Top of Pump? (Y/N): -- Time to Recharge: -- Depth to Water (ft bTOC): --

SAMPLING Equipment Used: (Same as Above) Other:

Sample Time (24 hr)	Total Purged (mL)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1048	--	11.62	17.79	8.75	0.00	9.2	2.95	--	--

FINAL DEPTH TO WATER (ft bTOC): -- TIME FINAL DEPTH TAKEN: --

SAMPLE ID: LS3-1023 SAMPLE FOR QC: --

PARAMETERS REQUESTD FOR ANALYSIS: Appendix III and Appendix IV to 40 CFR Part 257

IDW PURGE WATER TOTAL (mL): -- FLOW THROUGH CELL MODEL #: Aquatroll 600 (SN 1050309)

Well Condition	**Remarks**
Concrete Pad?	
Bumper Posts?	
Protective Casing?	
Paint and Label?	
Lock?	
Well Casing?	
Reference Point?	

Field Sampler(s) Name(s): Paige Richards

	NAME	SIGNATURE	DATE
PREPARED:	Paige Richards	Paige Richards	10/4/2023

Appendix B

Laboratory Analytical Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Kevin Armstrong
GHD Services Inc.
11228 Aurora Avenue
Des Moines, Iowa 50322-7905

Generated 6/6/2023 4:30:49 PM Revision 2

JOB DESCRIPTION

MEC Walter Scott CCR (WSEC)

JOB NUMBER

310-254375-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

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

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

Authorization

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6/6/2023 4:30:49 PM
Revision 2

Authorized for release by
Meredith Liechti, Service Center Manager
meredith.liechti@et.eurofinsus.com
(319)277-2401

Table of Contents

Job ID: 310-254375-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-254375-1

REVISION

The report being provided is a revision of the original report sent on 6/1/2023. The report (revision 2) is being revised due to Wrong Project Number used. Revised with correct Project number.

Report revision history
Revision 1 - 6/1/2023 - Reason - Project number set up wrong under project file, as well as the DFC.

Receipt
The samples were received on 4/26/2023 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7°C and 0.9°C

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

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

General Chemistry
Method SM4500_H+: Sample exceeded top CCV. LS3-0423 (310-254375-3)

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

Narrative

Job Narrative
310-254375-2

REVISION

The report being provided is a revision of the original report sent on 6/1/2023. The report (revision 1) is being revised due to Project is set up under the project number, Wrong associated with project number..

Receipt
The samples were received on 4/26/2023 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7°C and 0.9°C

Gas Flow Proportional Counter
Method 9315_Ra226: Radium-226 Prep Batch 160-610671The following samples were prepared at a reduced aliquot due to Matrix: LS1-0423 (310-254375-1), LS2-0423 (310-254375-2) and LS3-0423 (310-254375-3). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method 9315_Ra226: Radium-226 prep batch 160-610671:Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.LS1-0423 (310-254375-1), LS2-0423 (310-254375-2), LS3-0423 (310-254375-3), (LCS 160-610671/2-A), (LCSD 160-610671/3-A) and (MB 160-610671/1-A)

Method 9320_Ra228: Radium-228 Prep Batch 160-610692The following samples were prepared at a reduced aliquot due to Matrix:

Job ID: 310-254375-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

LS1-0423 (310-254375-1), LS2-0423 (310-254375-2) and LS3-0423 (310-254375-3). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method 9320_Ra228: Radium-228 prep batch 160-610692:The following sample(s) 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. LS1-0423 (310-254375-1)

Method 9320_Ra228: Radium-228 prep batch 160-610692:Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.LS1-0423 (310-254375-1), LS2-0423 (310-254375-2), LS3-0423 (310-254375-3), (LCS 160-610692/2-A), (LCSD 160-610692/3-A) and (MB 160-610692/1-A)

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

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

Sample Summary

Client: GHD Services Inc.
Job ID: 310-254375-1
Project/Site: MEC Walter Scott CCR (WSEC)

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-254375-1	LS1-0423	Water	04/25/23 08:15	04/26/23 09:15
310-254375-2	LS2-0423	Water	04/25/23 08:55	04/26/23 09:15
310-254375-3	LS3-0423	Water	04/25/23 08:27	04/26/23 09:15

Detection Summary

Client: GHD Services Inc.
Project/Site: MEC Walter Scott CCR (WSEC)

Job ID: 310-254375-1

Client Sample ID: LS1-0423 — Lab Sample ID: 310-254375-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	289		5.00		mg/L	5		9056A	Total/NA
Sulfate	5500		100		mg/L	100		9056A	Total/NA
Antimony	0.00200		0.00200		mg/L	1		6020B	Total/NA
Arsenic	0.0474		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0325		0.00200		mg/L	1		6020B	Total/NA
Boron	2.36		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.00282		0.000200		mg/L	1		6020B	Total/NA
Calcium	104		0.500		mg/L	1		6020B	Total/NA
Chromium	0.00546		0.00500		mg/L	1		6020B	Total/NA
Cobalt	0.00151		0.000500		mg/L	1		6020B	Total/NA
Lithium	0.0824		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	6.27		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.420		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	8020		250		mg/L	1		SM 2540C	Total/NA
pH	11.0	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS2-0423 — Lab Sample ID: 310-254375-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	648		100		mg/L	100		9056A	Total/NA
Sulfate	6200		100		mg/L	100		9056A	Total/NA
Arsenic	0.00733		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0526		0.00200		mg/L	1		6020B	Total/NA
Boron	3.38		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.00179		0.000200		mg/L	1		6020B	Total/NA
Calcium	269		0.500		mg/L	1		6020B	Total/NA
Chromium	0.980		0.00500		mg/L	1		6020B	Total/NA
Cobalt	0.00122		0.000500		mg/L	1		6020B	Total/NA
Lithium	0.0147		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	4.19		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.249		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	9750		250		mg/L	1		SM 2540C	Total/NA
pH	10.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS3-0423 — Lab Sample ID: 310-254375-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	240		5.00		mg/L	5		9056A	Total/NA
Sulfate	3300		100		mg/L	100		9056A	Total/NA
Arsenic	0.0108		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0564		0.00200		mg/L	1		6020B	Total/NA
Boron	2.09		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.000790		0.000200		mg/L	1		6020B	Total/NA
Calcium	135		0.500		mg/L	1		6020B	Total/NA
Chromium	0.0103		0.00500		mg/L	1		6020B	Total/NA
Cobalt	0.000683		0.000500		mg/L	1		6020B	Total/NA
Molybdenum	1.80		0.00200		mg/L	1		6020B	Total/NA
Selenium	0.145		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	5520		250		mg/L	1		SM 2540C	Total/NA
pH	11.9	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: GHD Services Inc.
Project/Site: MEC Walter Scott CCR (WSEC)

Job ID: 310-254375-1

Client Sample ID: LS1-0423

Date Collected: 04/25/23 08:15
Date Received: 04/26/23 09:15

Lab Sample ID: 310-254375-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**289**		5.00		mg/L			05/08/23 12:19	5
Fluoride	<1.00		1.00		mg/L			05/08/23 12:19	5
Sulfate	**5500**		100		mg/L			05/08/23 12:32	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00200**		0.00200		mg/L		04/27/23 08:10	04/30/23 16:08	1
Arsenic	**0.0474**		0.00200		mg/L		04/27/23 08:10	04/28/23 17:07	1
Barium	**0.0325**		0.00200		mg/L		04/27/23 08:10	04/28/23 17:07	1
Beryllium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 17:07	1
Boron	**2.36**		0.100		mg/L		04/27/23 08:10	04/28/23 17:07	1
Cadmium	**0.00282**		0.000200		mg/L		04/27/23 08:10	04/28/23 17:07	1
Calcium	**104**		0.500		mg/L		04/27/23 08:10	04/28/23 17:07	1
Chromium	**0.00546**		0.00500		mg/L		04/27/23 08:10	04/28/23 17:07	1
Cobalt	**0.00151**		0.000500		mg/L		04/27/23 08:10	04/28/23 17:07	1
Lithium	**0.0824**		0.0100		mg/L		04/27/23 08:10	04/28/23 17:07	1
Lead	<0.000500		0.000500		mg/L		04/27/23 08:10	04/28/23 17:07	1
Molybdenum	**6.27**		0.00800		mg/L		04/27/23 08:10	04/30/23 16:05	4
Selenium	**0.420**		0.00500		mg/L		04/27/23 08:10	04/28/23 17:07	1
Thallium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 17:07	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/28/23 12:44	05/01/23 11:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**8020**		250		mg/L			04/27/23 13:12	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**11.0**	**HF**	0.1		SU			04/26/23 12:36	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.280	U	0.157	0.157	1.00	0.280	pCi/L	05/09/23 10:03	05/31/23 15:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*54.7*		*30 - 110*	*05/09/23 10:03*	*05/31/23 15:00*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<1.13	U G	0.642	0.643	1.00	1.13	pCi/L	05/09/23 12:01	05/26/23 16:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*54.7*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:03*	*1*
Y Carrier	*82.0*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:03*	*1*

Client Sample Results

Client: GHD Services Inc.
Project/Site: MEC Walter Scott CCR (WSEC)

Job ID: 310-254375-1

Client Sample ID: LS1-0423
Date Collected: 04/25/23 08:15
Date Received: 04/26/23 09:15

Lab Sample ID: 310-254375-1
Matrix: Water

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<1.13	U	0.661	0.662	5.00	1.13	pCi/L		06/01/23 15:09	1

Client Sample ID: LS2-0423

Date Collected: 04/25/23 08:55
Date Received: 04/26/23 09:15

Lab Sample ID: 310-254375-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**648**		100		mg/L			05/08/23 12:59	100
Fluoride	<1.00		1.00		mg/L			05/08/23 12:45	5
Sulfate	**6200**		100		mg/L			05/08/23 12:59	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/27/23 08:10	04/30/23 16:14	1
Arsenic	**0.00733**		0.00200		mg/L		04/27/23 08:10	04/28/23 17:10	1
Barium	**0.0526**		0.00200		mg/L		04/27/23 08:10	04/28/23 17:10	1
Beryllium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 17:10	1
Boron	**3.38**		0.100		mg/L		04/27/23 08:10	04/28/23 17:10	1
Cadmium	**0.00179**		0.000200		mg/L		04/27/23 08:10	04/28/23 17:10	1
Calcium	**269**		0.500		mg/L		04/27/23 08:10	04/28/23 17:10	1
Chromium	**0.980**		0.00500		mg/L		04/27/23 08:10	04/28/23 17:10	1
Cobalt	**0.00122**		0.000500		mg/L		04/27/23 08:10	04/28/23 17:10	1
Lithium	**0.0147**		0.0100		mg/L		04/27/23 08:10	04/28/23 17:10	1
Lead	<0.000500		0.000500		mg/L		04/27/23 08:10	04/28/23 17:10	1
Molybdenum	**4.19**		0.00800		mg/L		04/27/23 08:10	04/30/23 16:11	4
Selenium	**0.249**		0.00500		mg/L		04/27/23 08:10	04/28/23 17:10	1
Thallium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 17:10	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/28/23 12:44	05/01/23 11:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**9750**		250		mg/L			04/27/23 13:12	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**10.6**	**HF**	0.1		SU			04/26/23 12:38	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.165	U	0.0778	0.0778	1.00	0.165	pCi/L	05/09/23 10:03	05/31/23 15:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.5*		*30 - 110*	*05/09/23 10:03*	*05/31/23 15:00*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.668	U	0.400	0.401	1.00	0.668	pCi/L	05/09/23 12:01	05/26/23 16:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.5*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:04*	*1*
Y Carrier	*80.6*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:04*	*1*

Client Sample Results

Client: GHD Services Inc.
Project/Site: MEC Walter Scott CCR (WSEC)

Job ID: 310-254375-1

Client Sample ID: LS2-0423

Date Collected: 04/25/23 08:55
Date Received: 04/26/23 09:15

Lab Sample ID: 310-254375-2

Matrix: Water

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.668	U	0.407	0.408	5.00	0.668	pCi/L		06/01/23 15:09	1

Client Sample ID: LS3-0423
Lab Sample ID: 310-254375-3

Date Collected: 04/25/23 08:27
Matrix: Water
Date Received: 04/26/23 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		5.00		mg/L			05/08/23 13:38	5
Fluoride	<1.00		1.00		mg/L			05/08/23 13:38	5
Sulfate	**3300**		100		mg/L			05/08/23 13:51	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/27/23 08:10	04/30/23 16:17	1
Arsenic	**0.0108**		0.00200		mg/L		04/27/23 08:10	04/28/23 17:13	1
Barium	**0.0564**		0.00200		mg/L		04/27/23 08:10	04/28/23 17:13	1
Beryllium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 17:13	1
Boron	**2.09**		0.100		mg/L		04/27/23 08:10	04/28/23 17:13	1
Cadmium	**0.000790**		0.000200		mg/L		04/27/23 08:10	04/28/23 17:13	1
Calcium	**135**		0.500		mg/L		04/27/23 08:10	04/28/23 17:13	1
Chromium	**0.0103**		0.00500		mg/L		04/27/23 08:10	04/28/23 17:13	1
Cobalt	**0.000683**		0.000500		mg/L		04/27/23 08:10	04/28/23 17:13	1
Lithium	<0.0100		0.0100		mg/L		04/27/23 08:10	04/28/23 17:13	1
Lead	<0.000500		0.000500		mg/L		04/27/23 08:10	04/28/23 17:13	1
Molybdenum	**1.80**		0.00200		mg/L		04/27/23 08:10	04/28/23 17:13	1
Selenium	**0.145**		0.00500		mg/L		04/27/23 08:10	04/28/23 17:13	1
Thallium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 17:13	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/28/23 12:44	05/01/23 11:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**5520**		250		mg/L			04/27/23 13:12	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**11.9**	**HF**	0.1		SU			04/26/23 12:39	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.181	U	0.108	0.108	1.00	0.181	pCi/L	05/09/23 10:03	05/31/23 15:02	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*30 - 110*	*05/09/23 10:03*	*05/31/23 15:02*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.653	U	0.321	0.321	1.00	0.653	pCi/L	05/09/23 12:01	05/26/23 16:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:03*	*1*
Y Carrier	*81.7*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:03*	*1*

Client Sample Results

Client: GHD Services Inc.
Job ID: 310-254375-1
Project/Site: MEC Walter Scott CCR (WSEC)

Client Sample ID: LS3-0423
Lab Sample ID: 310-254375-3
Date Collected: 04/25/23 08:27
Matrix: Water
Date Received: 04/26/23 09:15

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.653	U	0.339	0.339	5.00	0.653	pCi/L		06/01/23 15:09	1

Definitions/Glossary

Client: GHD Services Inc. Job ID: 310-254375-1
Project/Site: MEC Walter Scott CCR (WSEC)

Qualifiers

General Chemistry

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

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-387079/3
Matrix: Water
Analysis Batch: 387079

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			05/08/23 11:27	1
Fluoride	<0.200		0.200		mg/L			05/08/23 11:27	1
Sulfate	<1.00		1.00		mg/L			05/08/23 11:27	1

Lab Sample ID: LCS 310-387079/38
Matrix: Water
Analysis Batch: 387079

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	2.00	2.179		mg/L		109	90 - 110

Lab Sample ID: LCS 310-387079/4
Matrix: Water
Analysis Batch: 387079

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.919		mg/L		99	90 - 110

Lab Sample ID: LCS 310-387079/47
Matrix: Water
Analysis Batch: 387079

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.029		mg/L		90	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-385625/1-A
Matrix: Water
Analysis Batch: 385897

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 385625

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/27/23 08:10	04/28/23 16:48	1
Arsenic	<0.00200		0.00200		mg/L		04/27/23 08:10	04/28/23 16:48	1
Barium	<0.00200		0.00200		mg/L		04/27/23 08:10	04/28/23 16:48	1
Beryllium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 16:48	1
Boron	<0.100		0.100		mg/L		04/27/23 08:10	04/28/23 16:48	1
Cadmium	<0.000200		0.000200		mg/L		04/27/23 08:10	04/28/23 16:48	1
Calcium	<0.500		0.500		mg/L		04/27/23 08:10	04/28/23 16:48	1
Chromium	<0.00500		0.00500		mg/L		04/27/23 08:10	04/28/23 16:48	1
Cobalt	<0.000500		0.000500		mg/L		04/27/23 08:10	04/28/23 16:48	1
Lithium	<0.0100		0.0100		mg/L		04/27/23 08:10	04/28/23 16:48	1
Lead	<0.000500		0.000500		mg/L		04/27/23 08:10	04/28/23 16:48	1
Molybdenum	<0.00200		0.00200		mg/L		04/27/23 08:10	04/28/23 16:48	1
Selenium	<0.00500		0.00500		mg/L		04/27/23 08:10	04/28/23 16:48	1
Thallium	<0.00100		0.00100		mg/L		04/27/23 08:10	04/28/23 16:48	1

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

Lab Sample ID: LCS 310-385625/2-A
Matrix: Water
Analysis Batch: 385979

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 385625

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.2246		mg/L		112	80 - 120
Arsenic	0.200	0.2003		mg/L		100	80 - 120
Barium	0.100	0.1002		mg/L		100	80 - 120
Beryllium	0.100	0.1091		mg/L		109	80 - 120
Boron	0.200	0.1862		mg/L		93	80 - 120
Cadmium	0.100	0.1008		mg/L		101	80 - 120
Calcium	2.00	1.953		mg/L		98	80 - 120
Chromium	0.100	0.09701		mg/L		97	80 - 120
Cobalt	0.100	0.1104		mg/L		110	80 - 120
Lithium	0.200	0.2133		mg/L		107	80 - 120
Lead	0.200	0.2097		mg/L		105	80 - 120
Molybdenum	0.200	0.1955		mg/L		98	80 - 120
Selenium	0.400	0.3979		mg/L		99	80 - 120
Thallium	0.200	0.1651		mg/L		83	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-385832/1-A
Matrix: Water
Analysis Batch: 386020

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 385832

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/28/23 12:44	05/01/23 11:24	1

Lab Sample ID: LCS 310-385832/2-A
Matrix: Water
Analysis Batch: 386020

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 385832

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001689		mg/L		101	80 - 120

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

Lab Sample ID: MB 310-385724/1
Matrix: Water
Analysis Batch: 385724

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			04/27/23 13:12	1

Lab Sample ID: LCS 310-385724/2
Matrix: Water
Analysis Batch: 385724

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	988.0		mg/L		99	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-385575/1
Matrix: Water
Analysis Batch: 385575

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

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

Lab Sample ID: 310-254375-1 DU
Matrix: Water
Analysis Batch: 385575

Client Sample ID: LS1-0423
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	11.0	HF		11.0		SU				0.2	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-610671/1-A
Matrix: Water
Analysis Batch: 613860

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 610671

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.131	U	0.0669	0.0669	1.00	0.131	pCi/L	05/09/23 10:03	05/31/23 14:58	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.9*		*30 - 110*	*05/09/23 10:03*	*05/31/23 14:58*	*1*

Lab Sample ID: LCS 160-610671/2-A
Matrix: Water
Analysis Batch: 613860

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 610671

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.80		1.15	1.00	0.119	pCi/L	95	75 - 113		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.1*		*30 - 110*

Lab Sample ID: LCSD 160-610671/3-A
Matrix: Water
Analysis Batch: 613860

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 610671

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	10.76		1.15	1.00	0.121	pCi/L	95	75 - 113	0.02	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*94.4*		*30 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-610692/1-A
Matrix: Water
Analysis Batch: 613347

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 610692

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.5381		0.312	0.316	1.00	0.442	pCi/L	05/09/23 12:01	05/26/23 16:02	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.9*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:02*	*1*
Y Carrier	*84.0*		*30 - 110*	*05/09/23 12:01*	*05/26/23 16:02*	*1*

Lab Sample ID: LCS 160-610692/2-A
Matrix: Water
Analysis Batch: 613347

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 610692

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.17	9.352		1.27	1.00	0.522	pCi/L	114	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.1*		*30 - 110*
Y Carrier	*81.5*		*30 - 110*

Lab Sample ID: LCSD 160-610692/3-A
Matrix: Water
Analysis Batch: 613347

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 610692

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.17	9.152		1.24	1.00	0.501	pCi/L	112	75 - 125	0.08	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*94.4*		*30 - 110*
Y Carrier	*81.2*		*30 - 110*

HPLC/IC

Analysis Batch: 387079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	9056A	
310-254375-1	LS1-0423	Total/NA	Water	9056A	
310-254375-2	LS2-0423	Total/NA	Water	9056A	
310-254375-2	LS2-0423	Total/NA	Water	9056A	
310-254375-3	LS3-0423	Total/NA	Water	9056A	
310-254375-3	LS3-0423	Total/NA	Water	9056A	
MB 310-387079/3	Method Blank	Total/NA	Water	9056A	
LCS 310-387079/38	Lab Control Sample	Total/NA	Water	9056A	
LCS 310-387079/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 310-387079/47	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 385625

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	3005A	
310-254375-2	LS2-0423	Total/NA	Water	3005A	
310-254375-3	LS3-0423	Total/NA	Water	3005A	
MB 310-385625/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-385625/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 385832

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	7470A	
310-254375-2	LS2-0423	Total/NA	Water	7470A	
310-254375-3	LS3-0423	Total/NA	Water	7470A	
MB 310-385832/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-385832/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 385897

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	6020B	385625
310-254375-2	LS2-0423	Total/NA	Water	6020B	385625
310-254375-3	LS3-0423	Total/NA	Water	6020B	385625
MB 310-385625/1-A	Method Blank	Total/NA	Water	6020B	385625

Analysis Batch: 385979

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	6020B	385625
310-254375-1	LS1-0423	Total/NA	Water	6020B	385625
310-254375-2	LS2-0423	Total/NA	Water	6020B	385625
310-254375-2	LS2-0423	Total/NA	Water	6020B	385625
310-254375-3	LS3-0423	Total/NA	Water	6020B	385625
LCS 310-385625/2-A	Lab Control Sample	Total/NA	Water	6020B	385625

Analysis Batch: 386020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	7470A	385832
310-254375-2	LS2-0423	Total/NA	Water	7470A	385832
310-254375-3	LS3-0423	Total/NA	Water	7470A	385832
MB 310-385832/1-A	Method Blank	Total/NA	Water	7470A	385832

Metals (Continued)

Analysis Batch: 386020 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-385832/2-A	Lab Control Sample	Total/NA	Water	7470A	385832

General Chemistry

Analysis Batch: 385575

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	SM 4500 H+ B	
310-254375-2	LS2-0423	Total/NA	Water	SM 4500 H+ B	
310-254375-3	LS3-0423	Total/NA	Water	SM 4500 H+ B	
LCS 310-385575/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-254375-1 DU	LS1-0423	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 385724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	SM 2540C	
310-254375-2	LS2-0423	Total/NA	Water	SM 2540C	
310-254375-3	LS3-0423	Total/NA	Water	SM 2540C	
MB 310-385724/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-385724/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 610671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	PrecSep-21	
310-254375-2	LS2-0423	Total/NA	Water	PrecSep-21	
310-254375-3	LS3-0423	Total/NA	Water	PrecSep-21	
MB 160-610671/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-610671/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-610671/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 610692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254375-1	LS1-0423	Total/NA	Water	PrecSep_0	
310-254375-2	LS2-0423	Total/NA	Water	PrecSep_0	
310-254375-3	LS3-0423	Total/NA	Water	PrecSep_0	
MB 160-610692/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-610692/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-610692/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: GHD Services Inc.
Job ID: 310-254375-1
Project/Site: MEC Walter Scott CCR (WSEC)

Client Sample ID: LS1-0423
Lab Sample ID: 310-254375-1
Date Collected: 04/25/23 08:15
Matrix: Water
Date Received: 04/26/23 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	387079	QTZ5	EET CF	05/08/23 12:19
Total/NA	Analysis	9056A		100	387079	QTZ5	EET CF	05/08/23 12:32
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		1	385897	ZRI4	EET CF	04/28/23 17:07
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		4	385979	ZRI4	EET CF	04/30/23 16:05
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		1	385979	ZRI4	EET CF	04/30/23 16:08
Total/NA	Prep	7470A			385832	XXW3	EET CF	04/28/23 12:44
Total/NA	Analysis	7470A		1	386020	XXW3	EET CF	05/01/23 11:52
Total/NA	Analysis	SM 2540C		1	385724	ENB7	EET CF	04/27/23 13:12
Total/NA	Analysis	SM 4500 H+ B		1	385575	A3GU	EET CF	04/26/23 12:36
Total/NA	Prep	PrecSep-21			610671	KAC	EET SL	05/09/23 10:03
Total/NA	Analysis	9315		1	613860	SCB	EET SL	05/31/23 15:00
Total/NA	Prep	PrecSep_0			610692	KAC	EET SL	05/09/23 12:01
Total/NA	Analysis	9320		1	613347	SCB	EET SL	05/26/23 16:03
Total/NA	Analysis	Ra226_Ra228		1	614186	SCB	EET SL	06/01/23 15:09

Client Sample ID: LS2-0423
Lab Sample ID: 310-254375-2
Date Collected: 04/25/23 08:55
Matrix: Water
Date Received: 04/26/23 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	387079	QTZ5	EET CF	05/08/23 12:45
Total/NA	Analysis	9056A		100	387079	QTZ5	EET CF	05/08/23 12:59
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		1	385897	ZRI4	EET CF	04/28/23 17:10
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		4	385979	ZRI4	EET CF	04/30/23 16:11
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		1	385979	ZRI4	EET CF	04/30/23 16:14
Total/NA	Prep	7470A			385832	XXW3	EET CF	04/28/23 12:44
Total/NA	Analysis	7470A		1	386020	XXW3	EET CF	05/01/23 11:54
Total/NA	Analysis	SM 2540C		1	385724	ENB7	EET CF	04/27/23 13:12
Total/NA	Analysis	SM 4500 H+ B		1	385575	A3GU	EET CF	04/26/23 12:38
Total/NA	Prep	PrecSep-21			610671	KAC	EET SL	05/09/23 10:03
Total/NA	Analysis	9315		1	613860	SCB	EET SL	05/31/23 15:00
Total/NA	Prep	PrecSep_0			610692	KAC	EET SL	05/09/23 12:01
Total/NA	Analysis	9320		1	613347	SCB	EET SL	05/26/23 16:04
Total/NA	Analysis	Ra226_Ra228		1	614186	SCB	EET SL	06/01/23 15:09

Lab Chronicle

Client: GHD Services Inc.
Job ID: 310-254375-1
Project/Site: MEC Walter Scott CCR (WSEC)

Client Sample ID: LS3-0423
Date Collected: 04/25/23 08:27
Date Received: 04/26/23 09:15

Lab Sample ID: 310-254375-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	387079	QTZ5	EET CF	05/08/23 13:38
Total/NA	Analysis	9056A		100	387079	QTZ5	EET CF	05/08/23 13:51
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		1	385897	ZRI4	EET CF	04/28/23 17:13
Total/NA	Prep	3005A			385625	DHM5	EET CF	04/27/23 08:10
Total/NA	Analysis	6020B		1	385979	ZRI4	EET CF	04/30/23 16:17
Total/NA	Prep	7470A			385832	XXW3	EET CF	04/28/23 12:44
Total/NA	Analysis	7470A		1	386020	XXW3	EET CF	05/01/23 11:56
Total/NA	Analysis	SM 2540C		1	385724	ENB7	EET CF	04/27/23 13:12
Total/NA	Analysis	SM 4500 H+ B		1	385575	A3GU	EET CF	04/26/23 12:39
Total/NA	Prep	PrecSep-21			610671	KAC	EET SL	05/09/23 10:03
Total/NA	Analysis	9315		1	613861	SCB	EET SL	05/31/23 15:02
Total/NA	Prep	PrecSep_0			610692	KAC	EET SL	05/09/23 12:01
Total/NA	Analysis	9320		1	613347	SCB	EET SL	05/26/23 16:03
Total/NA	Analysis	Ra226_Ra228		1	614186	SCB	EET SL	06/01/23 15:09

Laboratory References:

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

Accreditation/Certification Summary

Client: GHD Services Inc.
Job ID: 310-254375-1
Project/Site: MEC Walter Scott CCR (WSEC)

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

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

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

Laboratory: Eurofins St. Louis

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

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

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

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: GHD Services Inc.
Job ID: 310-254375-1
Project/Site: MEC Walter Scott CCR (WSEC)

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

Protocol References:

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

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

Laboratory References:

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

eurofins | Environment Testing America

310-254375 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information					
Client:	GHD Semrau				
City/State:	CITY: Des Moines		STATE: IA	Project:	
Receipt Information					
Date/Time Received:	DATE: 4/12/23		TIME: 0915	Received By: JJ	
Delivery Type:	☐ UPS	☒ FedEx	☐ FedEx Ground	☐ US Mail	☐ Spee-Dee
	☐ Lab Courier	☐ Lab Field Services	☐ Client Drop-off	☐ Other:_____	
Condition of Cooler/Containers					
Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:		
Multiple Coolers?	☐ Yes	☒ No	*If yes:* Cooler # 1 of 2		
Cooler Custody Seals Present?	☒ Yes	☐ No	*If yes:* Cooler custody seals intact?	☒ Yes	☐ No
Sample Custody Seals Present?	☐ Yes	☒ No	*If yes:* Sample custody seals intact?	☐ Yes	☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓		
Temperature Record					
Coolant:	☒ Wet ice	☐ Blue ice	☐ Dry ice	☐ Other:_____	☐ NONE
Thermometer ID:	W		Correction Factor (°C):	+0	
• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature					
Uncorrected Temp (°C):	0.7		Corrected Temp (°C):	0.7	
• **Sample Container Temperature**					
Container(s) used:	CONTAINER 1		CONTAINER 2		
Uncorrected Temp (°C):					
Corrected Temp (°C):					
Exceptions Noted					
1) If temperature exceeds criteria, was sample(s) received same day of sampling?			☐ Yes	☐ No	
a) *If yes:* Is there evidence that the chilling process began?			☐ Yes	☐ No	
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)			☐ Yes	☐ No	
NOTE: If yes, contact PM before proceeding. If no, proceed with login					
Additional Comments					

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GHD Service

City/State: CITY Des Moines | STATE IA | Project:

Receipt Information

Date/Time Received: DATE 4/26/23 | TIME 0915 | Received By: JJ

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☒ Yes	☐ No	*If yes:* Cooler # 2 of 2
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes:* Cooler custody seals intact? ☒ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: W | Correction Factor (°C): +0

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

Uncorrected Temp (°C): 0.9 | Corrected Temp (°C): 0.9

• **Sample Container Temperature**

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

TestAmerica Des Moines SC
214

Client Information	Sampler: Paige L. / Brooke W.	Lab PM: Shirley Thompson	Carrier Tracking No(s):	COC No:
Client Contact: Kevin Armstrong	Phone: 515-414-3933	E-Mail: Shirley.Thompson@et.eurofinsus.com		Page: 1 of 1
Company: GHD Services Inc.				Job #:

Address: 11228 Aurora Avenue	Due Date Requested:	
City: Des Moines	TAT Requested (days): Standard	
State, Zip: IA, 50322-7905		
Phone: 515-414-3935	PO #: 340-008087	
Email: Kevin.Armstrong@ghd com	WO #:	
Project Name: MidAmerican WSEC CCR Monofill Leachate	Eurofins Project #: 31007314	
Project Number: 12592594.DEL.001	SSOW#: 12592594-001	

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Rad226/Rad228/Rad228/228 combined	6020A CCR Metals List, 7470A Mercury	2540C TDS	9056A Chloride, Fluoride, Sulfate	SM4500_H+ pH	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	N	N		
LS1-0423	4/25/23	0815	G	W	N	N	X	X	X	X	X	5	
LS2-0423	4/25/23	0855	G	W	N	N	X	X	X	X	X	5	
LS3-0423	4/25/23	0827	G	W	N	N	X	X	X	X	X	5	

PL PL

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ■ Unknown ☐ Radiological	**Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)** ☐ Return To Client ■ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested I, II, III, IV, Other (specify)	Special Instructions/QC Requirements.

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

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Paige Leplant	4/25/23 1400	GHD	MC	4-26-23 915	
2						
3						

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

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 310-254375-1

Login Number: 254375
List Number: 1
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

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

Tracer/Carrier Summary

Client: GHD Services Inc.
Project/Site: MEC Walter Scott CCR (WSEC)

Job ID: 310-254375-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
310-254375-1	LS1-0423	54.7
310-254375-2	LS2-0423	92.5
310-254375-3	LS3-0423	94.6
LCS 160-610671/2-A	Lab Control Sample	95.1
LCSD 160-610671/3-A	Lab Control Sample Dup	94.4
MB 160-610671/1-A	Method Blank	93.9

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
310-254375-1	LS1-0423	54.7	82.0
310-254375-2	LS2-0423	92.5	80.6
310-254375-3	LS3-0423	94.6	81.7
LCS 160-610692/2-A	Lab Control Sample	95.1	81.5
LCSD 160-610692/3-A	Lab Control Sample Dup	94.4	81.2
MB 160-610692/1-A	Method Blank	93.9	84.0

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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ANALYTICAL REPORT

PREPARED FOR

Attn: Kevin Armstrong
GHD Services Inc.
11228 Aurora Avenue
Des Moines, Iowa 50322-7905

Generated 11/7/2023 8:44:33 PM

JOB DESCRIPTION

MidAmerican WSEC CCR Monofill Leachate

JOB NUMBER

310-266418-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

myEOL

Job Notes

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

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

Authorization

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Authorized for release by
Meredith Liechti, Service Center Manager
meredith.liechti@et.eurofinsus.com
(319)277-2401

Table of Contents

Case Narrative

Client: GHD Services Inc. Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Job ID: 310-266418-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-266418-1

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

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

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

Receipt
The samples were received on 10/5/2023 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 time was 1.3°C

HPLC/IC
Method 9056A_ORGFM_28D: The following samples were diluted due to the nature of the sample matrix: LS1-1023 (310-266418-1), LS2-1023 (310-266418-2) and LS3-1023 (310-266418-3). Elevated reporting limits (RLs) are provided.

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

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

General Chemistry
Method SM4500_H+: pH of sample LS3-1023 (310-266418-3) is over the top standard of 11

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

Narrative

Job Narrative
310-266418-2

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

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

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

Receipt
The samples were received on 10/5/2023 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 time was 1.3°C

Gas Flow Proportional Counter

Job ID: 310-266418-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

Method 9315_Ra226: Radium-226 prep batch 160-631087:

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. LS1-1023 (310-266418-1), (LCS 160-631087/2-A), (MB 160-631087/1-A), (380-65471-BY-1-A) and (380-65471-BV-1-A DU)

Method 9320_Ra228: Radium-228 batch 631088
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
LS1-1023 (310-266418-1), (LCS 160-631088/2-A), (MB 160-631088/1-A), (380-65471-BY-1-B) and (380-65471-BV-1-B DU)

Method 9320_Ra228: Radium-228 batch 631090
The detection goal was not met for the following sample(s). Samples were prepped at a reduced volume due to the presence of matrix interferences: LS1-1023 (310-266418-1) and LS2-1023 (310-266418-2). Analytical results are reported with the detection limit achieved.

Method 9320_Ra228: Radium-228 batch 631090
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
LS1-1023 (310-266418-1), LS2-1023 (310-266418-2), LS3-1023 (310-266418-3), (LCS 160-631090/2-A), (MB 160-631090/1-A), (810-80115-A-1-C) and (810-80115-A-1-D DU)

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

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

Sample Summary

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-266418-1	LS1-1023	Water	10/04/23 10:20	10/05/23 09:30
310-266418-2	LS2-1023	Water	10/04/23 09:55	10/05/23 09:30
310-266418-3	LS3-1023	Water	10/04/23 10:48	10/05/23 09:30

Detection Summary

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS1-1023 — Lab Sample ID: 310-266418-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	293		5.00		mg/L	5		9056A	Total/NA
Sulfate	3980		100		mg/L	100		9056A	Total/NA
Arsenic	0.0371		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0357		0.00200		mg/L	1		6020B	Total/NA
Boron	1.81		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.00200		0.000200		mg/L	1		6020B	Total/NA
Calcium	87.4		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000945		0.000500		mg/L	1		6020B	Total/NA
Lithium	0.102		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	4.96		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.371		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	7010		250		mg/L	1		SM 2540C	Total/NA
pH	11.8	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS2-1023 — Lab Sample ID: 310-266418-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	564		100		mg/L	100		9056A	Total/NA
Sulfate	5900		100		mg/L	100		9056A	Total/NA
Arsenic	0.0188		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0229		0.00200		mg/L	1		6020B	Total/NA
Boron	1.91		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.00254		0.000800		mg/L	4		6020B	Total/NA
Calcium	46.6		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000824		0.000500		mg/L	1		6020B	Total/NA
Lithium	0.0396		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	5.22		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.367		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	10700		250		mg/L	1		SM 2540C	Total/NA
pH	10.1	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS3-1023 — Lab Sample ID: 310-266418-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	317		5.00		mg/L	5		9056A	Total/NA
Sulfate	3070		100		mg/L	100		9056A	Total/NA
Arsenic	0.0170		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0248		0.00200		mg/L	1		6020B	Total/NA
Boron	1.94		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.000417		0.000200		mg/L	1		6020B	Total/NA
Calcium	42.5		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000570		0.000500		mg/L	1		6020B	Total/NA
Molybdenum	2.33		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.231		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	6330		250		mg/L	1		SM 2540C	Total/NA
pH	11.9	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: LS1-1023 — Lab Sample ID: 310-266418-1

Date Collected: 10/04/23 10:20 — **Matrix: Water**
Date Received: 10/05/23 09:30

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**293**		5.00		mg/L			10/13/23 20:36	5
Fluoride	<1.00		1.00		mg/L			10/13/23 20:36	5
Sulfate	**3980**		100		mg/L			10/13/23 20:48	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/06/23 09:05	10/17/23 23:23	1
Arsenic	**0.0371**		0.00200		mg/L		10/06/23 09:05	10/17/23 23:23	1
Barium	**0.0357**		0.00200		mg/L		10/06/23 09:05	10/17/23 23:23	1
Beryllium	<0.00100		0.00100		mg/L		10/06/23 09:05	10/17/23 23:23	1
Boron	**1.81**		0.100		mg/L		10/06/23 09:05	10/17/23 23:23	1
Cadmium	**0.00200**		0.000200		mg/L		10/06/23 09:05	10/17/23 23:23	1
Calcium	**87.4**		0.500		mg/L		10/06/23 09:05	10/17/23 23:23	1
Chromium	<0.00500		0.00500		mg/L		10/06/23 09:05	10/17/23 23:23	1
Cobalt	**0.000945**		0.000500		mg/L		10/06/23 09:05	10/17/23 23:23	1
Lithium	**0.102**		0.0100		mg/L		10/06/23 09:05	10/17/23 23:23	1
Lead	<0.000500		0.000500		mg/L		10/06/23 09:05	10/17/23 23:23	1
Molybdenum	**4.96**		0.00800		mg/L		10/06/23 09:05	10/18/23 15:40	4
Selenium	**0.371**		0.00500		mg/L		10/06/23 09:05	10/17/23 23:23	1
Thallium	<0.00100		0.00100		mg/L		10/06/23 09:05	10/17/23 23:23	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/10/23 10:43	10/11/23 11:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**7010**		250		mg/L			10/10/23 13:38	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**11.8**	**HF**	1.0		SU			10/05/23 13:11	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.178	U	0.115	0.115	1.00	0.178	pCi/L	10/09/23 09:52	10/31/23 11:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.1*		*30 - 110*	*10/09/23 09:52*	*10/31/23 11:40*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.765	U	0.448	0.449	1.00	0.765	pCi/L	10/09/23 09:57	10/25/23 11:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.1*		*30 - 110*	*10/09/23 09:57*	*10/25/23 11:23*	*1*
Y Carrier	*87.1*		*30 - 110*	*10/09/23 09:57*	*10/25/23 11:23*	*1*

Client Sample Results

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS1-1023
Lab Sample ID: 310-266418-1
Date Collected: 10/04/23 10:20
Matrix: Water
Date Received: 10/05/23 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.765	U	0.463	0.463	5.00	0.765	pCi/L		11/07/23 15:17	1

Client Sample ID: LS2-1023 — Lab Sample ID: 310-266418-2

Date Collected: 10/04/23 09:55 — **Matrix: Water**
Date Received: 10/05/23 09:30

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**564**		100		mg/L			10/13/23 21:12	100
Fluoride	<1.00		1.00		mg/L			10/13/23 21:00	5
Sulfate	**5900**		100		mg/L			10/13/23 21:12	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/06/23 09:05	10/17/23 15:01	1
Arsenic	**0.0188**		0.00200		mg/L		10/06/23 09:05	10/17/23 15:01	1
Barium	**0.0229**		0.00200		mg/L		10/06/23 09:05	10/17/23 15:01	1
Beryllium	<0.00100		0.00100		mg/L		10/06/23 09:05	10/17/23 15:01	1
Boron	**1.91**		0.100		mg/L		10/06/23 09:05	10/17/23 15:01	1
Cadmium	**0.00254**		0.000800		mg/L		10/06/23 09:05	10/17/23 23:26	4
Calcium	**46.6**		0.500		mg/L		10/06/23 09:05	10/17/23 15:01	1
Chromium	<0.00500		0.00500		mg/L		10/06/23 09:05	10/17/23 15:01	1
Cobalt	**0.000824**		0.000500		mg/L		10/06/23 09:05	10/17/23 15:01	1
Lithium	**0.0396**		0.0100		mg/L		10/06/23 09:05	10/17/23 15:01	1
Lead	<0.000500		0.000500		mg/L		10/06/23 09:05	10/17/23 15:01	1
Molybdenum	**5.22**		0.00800		mg/L		10/06/23 09:05	10/17/23 23:26	4
Selenium	**0.367**		0.00500		mg/L		10/06/23 09:05	10/17/23 15:01	1
Thallium	<0.00400		0.00400		mg/L		10/06/23 09:05	10/17/23 23:26	4

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/10/23 10:43	10/11/23 11:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**10700**		250		mg/L			10/10/23 13:38	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**10.1**	**HF**	1.0		SU			10/05/23 13:10	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.176	U	0.0895	0.0895	1.00	0.176	pCi/L	10/09/23 09:59	10/31/23 19:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.3*		*30 - 110*	*10/09/23 09:59*	*10/31/23 19:22*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<1.13	U G	0.659	0.660	1.00	1.13	pCi/L	10/09/23 10:06	10/25/23 11:13	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.3*		*30 - 110*	*10/09/23 10:06*	*10/25/23 11:13*	*1*
Y Carrier	*75.1*		*30 - 110*	*10/09/23 10:06*	*10/25/23 11:13*	*1*

Client Sample Results

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS2-1023
Lab Sample ID: 310-266418-2
Date Collected: 10/04/23 09:55
Matrix: Water
Date Received: 10/05/23 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<1.13	U	0.665	0.666	5.00	1.13	pCi/L		11/07/23 15:17	1

Client Sample ID: LS3-1023 — Lab Sample ID: 310-266418-3

Date Collected: 10/04/23 10:48 — **Matrix: Water**
Date Received: 10/05/23 09:30

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**317**		5.00		mg/L			10/13/23 21:24	5
Fluoride	<1.00		1.00		mg/L			10/13/23 21:24	5
Sulfate	**3070**		100		mg/L			10/13/23 21:36	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/06/23 09:05	10/17/23 15:05	1
Arsenic	**0.0170**		0.00200		mg/L		10/06/23 09:05	10/17/23 15:05	1
Barium	**0.0248**		0.00200		mg/L		10/06/23 09:05	10/17/23 15:05	1
Beryllium	<0.00100		0.00100		mg/L		10/06/23 09:05	10/17/23 15:05	1
Boron	**1.94**		0.100		mg/L		10/06/23 09:05	10/17/23 15:05	1
Cadmium	**0.000417**		0.000200		mg/L		10/06/23 09:05	10/17/23 15:05	1
Calcium	**42.5**		0.500		mg/L		10/06/23 09:05	10/17/23 15:05	1
Chromium	<0.00500		0.00500		mg/L		10/06/23 09:05	10/17/23 15:05	1
Cobalt	**0.000570**		0.000500		mg/L		10/06/23 09:05	10/17/23 15:05	1
Lithium	<0.0100		0.0100		mg/L		10/06/23 09:05	10/17/23 15:05	1
Lead	<0.000500		0.000500		mg/L		10/06/23 09:05	10/17/23 15:05	1
Molybdenum	**2.33**		0.00800		mg/L		10/06/23 09:05	10/17/23 23:28	4
Selenium	**0.231**		0.00500		mg/L		10/06/23 09:05	10/17/23 15:05	1
Thallium	<0.00100		0.00100		mg/L		10/06/23 09:05	10/17/23 15:05	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/10/23 10:43	10/11/23 11:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**6330**		250		mg/L			10/10/23 13:38	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**11.9**	**HF**	1.0		SU			10/05/23 13:09	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.186	U	0.125	0.126	1.00	0.186	pCi/L	10/09/23 09:59	10/31/23 19:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.2*		*30 - 110*	*10/09/23 09:59*	*10/31/23 19:22*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.650	U	0.408	0.410	1.00	0.650	pCi/L	10/09/23 10:06	10/25/23 11:13	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.2*		*30 - 110*	*10/09/23 10:06*	*10/25/23 11:13*	*1*
Y Carrier	*81.9*		*30 - 110*	*10/09/23 10:06*	*10/25/23 11:13*	*1*

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS3-1023
Lab Sample ID: 310-266418-3
Date Collected: 10/04/23 10:48
Matrix: Water
Date Received: 10/05/23 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.650	U	0.427	0.429	5.00	0.650	pCi/L		11/07/23 15:17	1

Definitions/Glossary

Client: GHD Services Inc. Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Qualifiers

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-402633/3
Matrix: Water
Analysis Batch: 402633

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			10/13/23 18:35	1
Fluoride	<0.200		0.200		mg/L			10/13/23 18:35	1
Sulfate	<1.00		1.00		mg/L			10/13/23 18:35	1

Lab Sample ID: LCS 310-402633/4
Matrix: Water
Analysis Batch: 402633

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.691		mg/L		97	90 - 110
Fluoride	2.00	2.034		mg/L		102	90 - 110
Sulfate	10.0	9.900		mg/L		99	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-401660/1-A
Matrix: Water
Analysis Batch: 402577

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 401660

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/06/23 09:05	10/14/23 02:45	1
Arsenic	<0.00200		0.00200		mg/L		10/06/23 09:05	10/14/23 02:45	1
Barium	<0.00200		0.00200		mg/L		10/06/23 09:05	10/14/23 02:45	1
Boron	<0.100		0.100		mg/L		10/06/23 09:05	10/14/23 02:45	1
Cadmium	<0.000200		0.000200		mg/L		10/06/23 09:05	10/14/23 02:45	1
Calcium	<0.500		0.500		mg/L		10/06/23 09:05	10/14/23 02:45	1
Chromium	<0.00500		0.00500		mg/L		10/06/23 09:05	10/14/23 02:45	1
Cobalt	<0.000500		0.000500		mg/L		10/06/23 09:05	10/14/23 02:45	1
Lead	<0.000500		0.000500		mg/L		10/06/23 09:05	10/14/23 02:45	1
Molybdenum	<0.00200		0.00200		mg/L		10/06/23 09:05	10/14/23 02:45	1
Selenium	<0.00500		0.00500		mg/L		10/06/23 09:05	10/14/23 02:45	1
Thallium	<0.00100		0.00100		mg/L		10/06/23 09:05	10/14/23 02:45	1

Lab Sample ID: LCS 310-401660/2-A
Matrix: Water
Analysis Batch: 402577

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 401660

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.2308		mg/L		115	80 - 120
Arsenic	0.200	0.2119		mg/L		106	80 - 120
Barium	0.100	0.1010		mg/L		101	80 - 120
Boron	0.200	0.2057		mg/L		103	80 - 120
Cadmium	0.100	0.1067		mg/L		107	80 - 120
Calcium	2.00	1.648		mg/L		82	80 - 120
Chromium	0.100	0.1061		mg/L		106	80 - 120
Cobalt	0.100	0.1084		mg/L		108	80 - 120
Lead	0.200	0.2198		mg/L		110	80 - 120
Molybdenum	0.200	0.2025		mg/L		101	80 - 120
Selenium	0.400	0.3848		mg/L		96	80 - 120

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

Lab Sample ID: LCS 310-401660/2-A
Matrix: Water
Analysis Batch: 402577

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 401660

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	0.200	0.1617		mg/L		81	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-402053/1-A
Matrix: Water
Analysis Batch: 402229

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 402053

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/10/23 10:43	10/11/23 10:28	1

Lab Sample ID: LCS 310-402053/2-A
Matrix: Water
Analysis Batch: 402229

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 402053

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001674		mg/L		100	80 - 120

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

Lab Sample ID: MB 310-402079/1
Matrix: Water
Analysis Batch: 402079

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			10/10/23 13:38	1

Lab Sample ID: LCS 310-402079/2
Matrix: Water
Analysis Batch: 402079

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	1008		mg/L		101	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-401638/1
Matrix: Water
Analysis Batch: 401638

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		101	98 - 102

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-631087/1-A
Matrix: Water
Analysis Batch: 634581

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 631087

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.105	U	0.0532	0.0532	1.00	0.105	pCi/L	10/09/23 09:52	10/31/23 09:25	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.3*		*30 - 110*	*10/09/23 09:52*	*10/31/23 09:25*	*1*

Lab Sample ID: LCS 160-631087/2-A
Matrix: Water
Analysis Batch: 634581

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 631087

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	11.06		1.16	1.00	0.128	pCi/L	98	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*98.8*		*30 - 110*

Lab Sample ID: MB 160-631089/1-A
Matrix: Water
Analysis Batch: 634581

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 631089

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.110	U	0.0600	0.0600	1.00	0.110	pCi/L	10/09/23 09:59	10/31/23 19:21	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.8*		*30 - 110*	*10/09/23 09:59*	*10/31/23 19:21*	*1*

Lab Sample ID: LCS 160-631089/2-A
Matrix: Water
Analysis Batch: 634581

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 631089

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	11.59		1.21	1.00	0.123	pCi/L	102	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.8*		*30 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-631088/1-A
Matrix: Water
Analysis Batch: 633416

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 631088

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.416	U	0.279	0.281	1.00	0.416	pCi/L	10/09/23 09:57	10/25/23 11:23	1

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

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	99.3		30 - 110	10/09/23 09:57	10/25/23 11:23	1
Y Carrier	84.5		30 - 110	10/09/23 09:57	10/25/23 11:23	1

Lab Sample ID: LCS 160-631088/2-A
Matrix: Water
Analysis Batch: 633416

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 631088

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			7.77	8.331		1.15	1.00	0.519	pCi/L	107	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	98.8		30 - 110
Y Carrier	84.1		30 - 110

Lab Sample ID: MB 160-631090/1-A
Matrix: Water
Analysis Batch: 633327

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 631090

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.490	U	0.296	0.297	1.00	0.490	pCi/L	10/09/23 10:06	10/25/23 11:14	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.8		30 - 110	10/09/23 10:06	10/25/23 11:14	1
Y Carrier	82.2		30 - 110	10/09/23 10:06	10/25/23 11:14	1

Lab Sample ID: LCS 160-631090/2-A
Matrix: Water
Analysis Batch: 633327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 631090

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			7.77	8.349		1.16	1.00	0.464	pCi/L	107	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	96.8		30 - 110
Y Carrier	81.1		30 - 110

QC Association Summary

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

HPLC/IC

Analysis Batch: 402633

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	9056A	
310-266418-1	LS1-1023	Total/NA	Water	9056A	
310-266418-2	LS2-1023	Total/NA	Water	9056A	
310-266418-2	LS2-1023	Total/NA	Water	9056A	
310-266418-3	LS3-1023	Total/NA	Water	9056A	
310-266418-3	LS3-1023	Total/NA	Water	9056A	
MB 310-402633/3	Method Blank	Total/NA	Water	9056A	
LCS 310-402633/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 401660

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	3005A	
310-266418-2	LS2-1023	Total/NA	Water	3005A	
310-266418-3	LS3-1023	Total/NA	Water	3005A	
MB 310-401660/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-401660/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 402053

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	7470A	
310-266418-2	LS2-1023	Total/NA	Water	7470A	
310-266418-3	LS3-1023	Total/NA	Water	7470A	
MB 310-402053/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-402053/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 402229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	7470A	402053
310-266418-2	LS2-1023	Total/NA	Water	7470A	402053
310-266418-3	LS3-1023	Total/NA	Water	7470A	402053
MB 310-402053/1-A	Method Blank	Total/NA	Water	7470A	402053
LCS 310-402053/2-A	Lab Control Sample	Total/NA	Water	7470A	402053

Analysis Batch: 402577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-401660/1-A	Method Blank	Total/NA	Water	6020B	401660
LCS 310-401660/2-A	Lab Control Sample	Total/NA	Water	6020B	401660

Analysis Batch: 402830

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-2	LS2-1023	Total/NA	Water	6020B	401660
310-266418-3	LS3-1023	Total/NA	Water	6020B	401660

Analysis Batch: 402883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	6020B	401660
310-266418-2	LS2-1023	Total/NA	Water	6020B	401660
310-266418-3	LS3-1023	Total/NA	Water	6020B	401660

QC Association Summary

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Metals

Analysis Batch: 402992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	6020B	401660

General Chemistry

Analysis Batch: 401638

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	SM 4500 H+ B	
310-266418-2	LS2-1023	Total/NA	Water	SM 4500 H+ B	
310-266418-3	LS3-1023	Total/NA	Water	SM 4500 H+ B	
LCS 310-401638/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 402079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	SM 2540C	
310-266418-2	LS2-1023	Total/NA	Water	SM 2540C	
310-266418-3	LS3-1023	Total/NA	Water	SM 2540C	
MB 310-402079/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-402079/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 631087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	PrecSep-21	
MB 160-631087/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-631087/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 631088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-1	LS1-1023	Total/NA	Water	PrecSep_0	
MB 160-631088/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-631088/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 631089

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-2	LS2-1023	Total/NA	Water	PrecSep-21	
310-266418-3	LS3-1023	Total/NA	Water	PrecSep-21	
MB 160-631089/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-631089/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 631090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266418-2	LS2-1023	Total/NA	Water	PrecSep_0	
310-266418-3	LS3-1023	Total/NA	Water	PrecSep_0	
MB 160-631090/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-631090/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: GHD Services Inc. Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS1-1023 — Lab Sample ID: 310-266418-1

Date Collected: 10/04/23 10:20 **Matrix: Water**
Date Received: 10/05/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	402633	QTZ5	EET CF	10/13/23 20:36
Total/NA	Analysis	9056A		100	402633	QTZ5	EET CF	10/13/23 20:48
Total/NA	Prep	3005A			401660	KCK5	EET CF	10/06/23 09:05
Total/NA	Analysis	6020B		4	402992	A6US	EET CF	10/18/23 15:40
Total/NA	Prep	3005A			401660	KCK5	EET CF	10/06/23 09:05
Total/NA	Analysis	6020B		1	402883	A6US	EET CF	10/17/23 23:23
Total/NA	Prep	7470A			402053	NFT2	EET CF	10/10/23 10:43
Total/NA	Analysis	7470A		1	402229	NFT2	EET CF	10/11/23 11:02
Total/NA	Analysis	SM 2540C		1	402079	ENB7	EET CF	10/10/23 13:38
Total/NA	Analysis	SM 4500 H+ B		1	401638	W9YR	EET CF	10/05/23 13:11
Total/NA	Prep	PrecSep-21			631087	KAC	EET SL	10/09/23 09:52
Total/NA	Analysis	9315		1	634583	FLC	EET SL	10/31/23 11:40
Total/NA	Prep	PrecSep_0			631088	KAC	EET SL	10/09/23 09:57
Total/NA	Analysis	9320		1	633418	FLC	EET SL	10/25/23 11:23
Total/NA	Analysis	Ra226_Ra228		1	635692	CAH	EET SL	11/07/23 15:17

Client Sample ID: LS2-1023 — Lab Sample ID: 310-266418-2

Date Collected: 10/04/23 09:55 **Matrix: Water**
Date Received: 10/05/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	402633	QTZ5	EET CF	10/13/23 21:00
Total/NA	Analysis	9056A		100	402633	QTZ5	EET CF	10/13/23 21:12
Total/NA	Prep	3005A			401660	KCK5	EET CF	10/06/23 09:05
Total/NA	Analysis	6020B		1	402830	A6US	EET CF	10/17/23 15:01
Total/NA	Prep	3005A			401660	KCK5	EET CF	10/06/23 09:05
Total/NA	Analysis	6020B		4	402883	A6US	EET CF	10/17/23 23:26
Total/NA	Prep	7470A			402053	NFT2	EET CF	10/10/23 10:43
Total/NA	Analysis	7470A		1	402229	NFT2	EET CF	10/11/23 11:04
Total/NA	Analysis	SM 2540C		1	402079	ENB7	EET CF	10/10/23 13:38
Total/NA	Analysis	SM 4500 H+ B		1	401638	W9YR	EET CF	10/05/23 13:10
Total/NA	Prep	PrecSep-21			631089	KAC	EET SL	10/09/23 09:59
Total/NA	Analysis	9315		1	634581	FLC	EET SL	10/31/23 19:22
Total/NA	Prep	PrecSep_0			631090	KAC	EET SL	10/09/23 10:06
Total/NA	Analysis	9320		1	633327	FLC	EET SL	10/25/23 11:13
Total/NA	Analysis	Ra226_Ra228		1	635692	CAH	EET SL	11/07/23 15:17

Client Sample ID: LS3-1023 — Lab Sample ID: 310-266418-3

Date Collected: 10/04/23 10:48 **Matrix: Water**
Date Received: 10/05/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	402633	QTZ5	EET CF	10/13/23 21:24
Total/NA	Analysis	9056A		100	402633	QTZ5	EET CF	10/13/23 21:36

Lab Chronicle

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS3-1023
Date Collected: 10/04/23 10:48
Date Received: 10/05/23 09:30

Lab Sample ID: 310-266418-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			401660	KCK5	EET CF	10/06/23 09:05
Total/NA	Analysis	6020B		1	402830	A6US	EET CF	10/17/23 15:05
Total/NA	Prep	3005A			401660	KCK5	EET CF	10/06/23 09:05
Total/NA	Analysis	6020B		4	402883	A6US	EET CF	10/17/23 23:28
Total/NA	Prep	7470A			402053	NFT2	EET CF	10/10/23 10:43
Total/NA	Analysis	7470A		1	402229	NFT2	EET CF	10/11/23 11:06
Total/NA	Analysis	SM 2540C		1	402079	ENB7	EET CF	10/10/23 13:38
Total/NA	Analysis	SM 4500 H+ B		1	401638	W9YR	EET CF	10/05/23 13:09
Total/NA	Prep	PrecSep-21			631089	KAC	EET SL	10/09/23 09:59
Total/NA	Analysis	9315		1	634581	FLC	EET SL	10/31/23 19:22
Total/NA	Prep	PrecSep_0			631090	KAC	EET SL	10/09/23 10:06
Total/NA	Analysis	9320		1	633327	FLC	EET SL	10/25/23 11:13
Total/NA	Analysis	Ra226_Ra228		1	635692	CAH	EET SL	11/07/23 15:17

Laboratory References:

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

Accreditation/Certification Summary

Client: GHD Services Inc. Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

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

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

Laboratory: Eurofins St. Louis

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

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

Method Summary

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

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

Protocol References:

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

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

Laboratory References:

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

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310-266418 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: GHD			
City/State:	CITY	STATE JA	Project:
Receipt Information			
Date/Time Received:	DATE 10-5-23	TIME 930	Received By: MC

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

Condition of Cooler/Containers

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

Temperature Record

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

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

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

Uncorrected Temp (°C): 1.3	Corrected Temp (°C): 1.3

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

TestAmerica Des Moines SC
214

Client Information	Sampler: Paige Richards	Lab PM: Liechti, Meredith	Carrier Tracking No(s):	COC No:
Client Contact: Kevin Armstrong	Phone: 515-414-3933	E-Mail: meredith.liechti@et.eurofinsus.com		Page: 1 of 1
Company: GHD Services Inc.				Job #:
Address: 11228 Aurora Avenue	Due Date Requested:			
City: Des Moines	TAT Requested (days): Standard			
State, Zip: IA, 50322-7905				
Phone: 515-414-3935	PO #: 340-008087			
Email: Kevin.Armstrong@ghd com	WO #:			
Project Name: MidAmerican WSEC CCR Monofill Leachate	Eurofins Project #: 31007314			
Project Number: 12592594.DEL.001	SSOW#: 12592594-001			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Rad226/Rad228/Rad228/228 combined	6020A CCR Metals List, 7470A Mercury	2540C TDS	9056A Chloride, Fluoride, Sulfate	SM4500_H+ pH								Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	N	N									
LS1-1023	10/4/23	1020	G	W	N	N	X	X	X	X	X								5	
LS2-1023	10/4/23	0955	G	W	N	N	X	X	X	X	X								5	
LS3-1023	10/4/23	1048	G	W	N	N	X	X	X	X	X								5	

PR

PR

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

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

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

Special Instructions/QC Requirements. Database Facility Code GD-MidAmerican-01723

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Paige Richards	10/4/23 1230	GHD	[illegible]	10-5-23 930	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

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11/7/2023

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

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Liechti, Meredith L	Carrier Tracking No(s):	COC No: 310-66011.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: meredith.liechti@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State - Iowa		Job #: 310-266418-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 11/8/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: MidAmerican WSEC CCR Monofill Leachate	Project #: 31015237			
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
LS1-1023 (310-266418-1)	10/4/23	10:20 Central		Water			X	X	X	2	
LS2-1023 (310-266418-2)	10/4/23	09:55 Central		Water			X	X	X	2	
LS3-1023 (310-266418-3)	10/4/23	10:48 Central		Water			X	X	X	2	

Preservation Codes:

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

Other:

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

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

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10/5/23 1610		Fedex		
Relinquished by: Fedex	Date/Time:	Company	Received by: M. Pinette	Date/Time: OCT 06 2023 0850	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 310-266418-2

Login Number: 266418
List Number: 1
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

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

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 310-266418-2

Login Number: 266418
List Number: 2
Creator: Pinette, Meadow L

List Source: Eurofins St. Louis
List Creation: 10/06/23 01:29 PM

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

Tracer/Carrier Summary

Client: GHD Services Inc.
Job ID: 310-266418-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Method: 9315 - Radium-226 (GFPC)

Matrix: Water
Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
310-266418-1	LS1-1023	84.1
310-266418-2	LS2-1023	77.3
310-266418-3	LS3-1023	93.2
LCS 160-631087/2-A	Lab Control Sample	98.8
LCS 160-631089/2-A	Lab Control Sample	96.8
MB 160-631087/1-A	Method Blank	99.3
MB 160-631089/1-A	Method Blank	97.8

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water
Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
310-266418-1	LS1-1023	84.1	87.1
310-266418-2	LS2-1023	77.3	75.1
310-266418-3	LS3-1023	93.2	81.9
LCS 160-631088/2-A	Lab Control Sample	98.8	84.1
LCS 160-631090/2-A	Lab Control Sample	96.8	81.1
MB 160-631088/1-A	Method Blank	99.3	84.5
MB 160-631090/1-A	Method Blank	97.8	82.2

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier