Prepared for
Zimmer Power Company, LLC

Date
January 31, 2024

Project No.
1940103649-016

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

LANDFILL

ZIMMER POWER PLANT

MOSCOW, OHIO

CCR UNIT 122

RAMBOLL Bright ideas. Sustainable change.

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT ZIMMER POWER PLANT LANDFILL

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Checked by	**Nicole M. Pagano**
Approved by	**Nicole M. Pagano**
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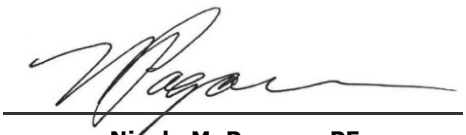
Ramboll
234 W. Florida Street
Fifth Floor
Milwaukee, WI 53204
USA

T 414-837-3607
F 414-837-3608
https://ramboll.com

Lauren D. Cook
Managing Scientist



Nicole M. Pagano, PE
Senior Managing Engineer

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ACRONYMS AND ABBREVIATIONS

40 C.F.R.	Title 40 of the Code of Federal Regulations
A6	Quarter 1, 2023 Assessment Monitoring sampling event
A6R	Quarter 2, 2023 Assessment Monitoring resampling event
A6D	Quarter 3, 2023 Assessment Monitoring sampling event
ASD	Alternative Source Demonstration
CCR	coal combustion residuals
CMA	Corrective Measures Assessment
GWPS	groundwater protection standard
NA	not applicable
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SAP	Multi-Site Sampling and Analysis Plan
SSI	statistically significant increase
SSL	statistically significant level
TBD	to be determined
ZPP	Zimmer Power Plant

EXECUTIVE SUMMARY

This report has been prepared to provide the information required by Title 40 of the Code of Federal Regulations (40 C.F.R.) Section (§) 257.90(e) for the Landfill located at the Zimmer Power Plant (ZPP) near Moscow, Ohio.

Groundwater is being monitored at the Landfill in accordance with the Assessment Monitoring Program requirements specified in 40 C.F.R. § 257.95. Assessment Monitoring was initiated at the Landfill on April 9, 2018.

No changes were made to the monitoring system in 2023 (no wells were installed or decommissioned).

The following Statistically Significant Levels (SSLs) of 40 C.F.R. § 257 Appendix IV parameters over groundwater protection standards (GWPSs) were determined:

- Lithium at well MW-D

An Alternative Source Demonstration (ASD) was completed in 2023 for the lithium SSL referenced above. Since no SSLs of 40 C.F.R. § 257 Appendix IV parameters over GWPSs were determined in 2023, a Corrective Measures Assessment (CMA) is not required. Statistically significant increases (SSIs) of Appendix III parameters above background values were determined as discussed in **Section 3**; therefore, the AP remains in the Assessment Monitoring Program.

1. INTRODUCTION

This report has been prepared by Ramboll Americas Engineering Solutions, Inc. (Ramboll) on behalf of Zimmer Power Company, LLC, to provide the information required by 40 C.F.R. § 257.90(e) for the Landfill located at the ZPP near Moscow, Ohio.

In accordance with 40 C.F.R. § 257.90(e), the owner or operator of a coal combustion residuals (CCR) unit must prepare an Annual Groundwater Monitoring and Corrective Action Report for the preceding calendar year that documents the status of the Groundwater Monitoring and Corrective Action Program for the CCR unit (**Section 2**), summarizes key actions completed (**Section 3**), describes any problems encountered and actions to resolve the problems (**Section 4**), and projects key activities for the upcoming year (**Section 5**). At a minimum, the annual report must contain the following information, to the extent available:

1. A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit (**Figure 1**).
2. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken (**Section 3**, paragraph 1).
3. In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the Detection Monitoring or Assessment Monitoring Programs (**Section 3, Table A**).
4. A narrative discussion of any transition between monitoring programs (*e.g.*, the date and circumstances for transitioning from Detection Monitoring to Assessment Monitoring in addition to identifying the constituent(s) detected at a statistically significant increase relative to background levels) (**Section 3**).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.
6. A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit (see **Executive Summary**). At a minimum, the summary must specify all of the following:
    i. At the start of the current annual reporting period, whether the CCR unit was operating under the Detection Monitoring Program in §257.94 or the Assessment Monitoring Program in §257.95.
    ii. At the end of the current annual reporting period, whether the CCR unit was operating under the Detection Monitoring Program in §257.94 or the Assessment Monitoring Program in §257.95.
    iii. If it was determined that there was a statistically significant increase over background for one or more constituents listed in Appendix III of §257 pursuant to §257.94(e):
        A. Identify those constituents listed in Appendix III of §257 and the names of the monitoring wells associated with such an increase.

B. Provide the date when the Assessment Monitoring Program was initiated for the CCR unit.

iv. If it was determined that there was a statistically significant level above the groundwater protection standard [GWPS] for one or more constituents listed in Appendix IV of §257 pursuant to §257.95(g) include all of the following:

A. Identify those constituents listed in Appendix IV of §257 and the names of the monitoring wells associated with such an increase.

B. Provide the date when the assessment of corrective measures was initiated for the CCR unit.

C. Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit.

D. Provide the date when the assessment of corrective measures was completed for the CCR unit.

v. Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection.

vi. Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

This report provides the required information for the Landfill for calendar year 2023.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

No changes have occurred to the monitoring program status in calendar year 2023 and the Landfill remains in the Assessment Monitoring Program in accordance with 40 C.F.R. § 257.95.

3. KEY ACTIONS COMPLETED IN 2023

A summary of the samples collected from background and compliance monitoring wells in 2023 under the Assessment Monitoring Program is included in **Table A** on the following page. The groundwater monitoring system, including the CCR unit and all background and compliance monitoring wells, is presented in **Figure 1**. No changes were made to the monitoring system in 2023 (no wells were installed or decommissioned).

One groundwater sample was collected from each background and compliance well during each monitoring event. [1] All samples were collected and analyzed in accordance with the Multi-Site Sampling and Analysis Plan (SAP) (Ramboll, 2023).

Potentiometric surfaces are included in **Figures 2 and 3**. All monitoring data and analytical results obtained under 40 C.F.R. § 257.90 through 257.98 in 2023 are presented in **Tables 1 through 3**. All associated laboratory reports and field data sheets are included in **Appendix A**.

Analytical data were evaluated in accordance with the Multi-Site Statistical Analysis Plan (Ramboll, 2022a), the Multi-Site Quality Assurance Project Plan (Ramboll, 2022b), and the Multi-Site Data Management Plan (Ramboll, 2022c) to determine any SSLs of Appendix IV parameters over GWPSs and SSIs of Appendix III parameters above background values. SSL notifications were completed in accordance with 40 C.F.R. § 257.95(g). SSIs are highlighted in **Table 2**. Statistical background values are provided in **Table 4** and GWPSs in **Table 5**. A flow chart showing the statistical methodology for determination of background values is included as **Appendix B**. A summary of the determination of SSLs in included in **Table 6**. A flow chart showing the statistical methodology for determination of SSLs is included as **Appendix C**.

Potential alternative sources were evaluated as outlined in the 40 C.F.R. § 257.94(e)(2). An ASD was completed in 2023 for the SSI summarized in Table A. The date the ASD was completed is also provided in Table A. The ASD was certified by a qualified professional engineer and is included in Appendix D. The Landfill remains in the Assessment Monitoring Program.

[1] Sampling was limited to MW-3, MW-9DR, MW-11D, MW-13S, MW-18, MW-21, MW-22, MW-24, MW-D, MW-E, and MW-F during the June 14, 2023 sampling event to confirm SSLs of select Appendix IV parameters initially detected at concentrations greater than GWPS in the preceding sampling event, as allowed by the Multi-Site Statistical Analysis Plan (Ramboll, 2022a).
A sample was not collected from MW-18 during the September 2023 sampling event because the well was dry at the time of sampling.

Table A. 2023 Assessment Monitoring Program Summary

Event ID	Sampling Dates [1, 2, 3]	Analytical Data Receipt Date	SSL(s) Determination Date	SSL(s)	ASD Completion Date
A6	March 20, 2023	May 3, 2023	August 1, 2023	Lithium at well MW-D	October 30, 2023
A6R [4]	June 14, 2023	July 3, 2023	NA	NA	NA
A6D [5]	September 18, 2023	November 30, 2023	February 28, 2024	TBD	TBD

Notes:

ASD: Alternative Source Demonstration

NA: not applicable

SSL: Statistically Significant Level

TBD: to be determined in 2024

[1] All samples were analyzed for Appendix III parameters listed in 40 C.F.R. § 257.94(e) and Appendix IV parameters listed in 40 C.F.R. § 257.95(g).

[2] The following background wells were sampled for each event: MW-3, MW-13S, MW-18, and MW-21

[3] The following compliance wells were sampled for each event: MW-11D, MW-16D, MW-20D, MW-22, MW-24, MW-9DR, MW-D, MW-E, MW-F, MW-G, and MW-H

[4] Groundwater sample analysis was limited to MW-3, MW-9DR, MW-11D, MW-13S, MW-18, MW-21, MW-22, MW-24, MW-D, MW E, and MW-F during the June 14, 2023 sampling event to confirm SSLs of select Appendix IV parameters initially detected at concentrations greater than GWPS in the preceding sampling event, as allowed by the Multi-Site Statistical Analysis Plan

[5] A sample was not collected from MW-18 because the well was dry at the time of sampling.

4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the groundwater monitoring program during 2023. Groundwater samples were collected and analyzed in accordance with the SAP and all data were accepted.

5. KEY ACTIVITIES PLANNED FOR 2024

The following key activities are planned for 2024:

- Continuation of the Assessment Monitoring Program with semiannual sampling scheduled for the first and third quarters of 2024.
- Complete evaluation of analytical data from the compliance wells using updated background data to determine whether an SSL of Appendix IV parameters above GWPSs has occurred.
- If an SSL is identified, potential alternate sources (*i.e.,* a source other than the CCR unit caused the SSL or that the SSL resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality) will be evaluated.
  - If an alternate source is identified to be the cause of the SSL, a written demonstration will be completed within 90 days of SSL determination and included in the 2024 Annual Groundwater Monitoring and Corrective Action Report.
  - If an alternate source(s) is not identified to be the cause of the SSL, the applicable requirements of 40 C.F.R. §§ 257.94 through 257.98 (*e.g.,* assessment of corrective measures) as may apply in 2024 will be met, including associated recordkeeping/notifications required by 40 C.F.R. §§ 257.105 through 257.108.

6. REFERENCES

Code of Federal Regulations, Title 40, Chapter I, Subchapter I, Part 257, Subpart D, Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments, effective April 17, 2015. Accessed from URL https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D#page-top

Ramboll Americas Engineering Solutions, Inc. (Ramboll), 2022a. Multi-Site Statistical Analysis Plan, 40 C.F.R. § 257. December 28, 2022.

Ramboll Americas Engineering Solutions, Inc. (Ramboll), 2022b. Multi-Site Quality Assurance Project Plan. December 28, 2022.

Ramboll Americas Engineering Solutions, Inc. (Ramboll), 2022c. Multi-Site Data Management Plan. December 28, 2022.

Ramboll Americas Engineering Solutions, Inc. (Ramboll), 2023. Multi-Site Sampling and Analysis Plan, Revision 1. October 10, 2023.

TABLES

TABLE 1
GROUNDWATER ELEVATION DATA
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
MW-3	Background	UA	03/20/2023	10.79	862.06
MW-3	Background	UA	06/14/2023	12.01	860.84
MW-3	Background	UA	09/18/2023	13.11	859.74
MW-9DR	Compliance	UA	03/20/2023	31.29	826.62
MW-9DR	Compliance	UA	09/18/2023	31.48	826.43
MW-11D	Compliance	UA	03/20/2023	17.58	834.27
MW-11D	Compliance	UA	06/14/2023	17.98	833.87
MW-11D	Compliance	UA	09/18/2023	18.37	833.48
MW-13S	Background	UA	03/20/2023	9.29	852.81
MW-13S	Background	UA	06/14/2023	Dry	Dry
MW-13S	Background	UA	09/18/2023	Dry	Dry
MW-16D	Compliance	UA	03/20/2023	9.39	815.83
MW-16D	Compliance	UA	09/18/2023	9.93	815.29
MW-18	Background	UA	03/20/2023	13.19	875.38
MW-18	Background	UA	06/14/2023	Dry	Dry
MW-18	Background	UA	09/18/2023	16.83	871.74
MW-20D	Compliance	UA	03/20/2023	21.89	802.79
MW-20D	Compliance	UA	09/18/2023	21.53	803.15
MW-21	Background	UA	03/20/2023	11.82	850.33
MW-21	Background	UA	06/14/2023	11.95	850.20
MW-21	Background	UA	09/18/2023	13.90	848.25
MW-22	Compliance	UA	03/20/2023	15.42	851.52
MW-22	Compliance	UA	06/14/2023	17.96	848.98
MW-22	Compliance	UA	09/18/2023	18.63	848.31
MW-24	Compliance	UA	03/20/2023	18.86	833.50
MW-24	Compliance	UA	06/14/2023	23.39	828.97
MW-24	Compliance	UA	09/18/2023	21.57	830.79
MW-D	Compliance	UA	03/20/2023	18.37	833.97
MW-D	Compliance	UA	06/14/2023	18.65	833.69
MW-D	Compliance	UA	09/18/2023	18.33	834.01
MW-E	Compliance	UA	03/20/2023	25.45	837.97
MW-E	Compliance	UA	06/14/2023	25.48	837.94
MW-E	Compliance	UA	09/18/2023	25.88	837.54
MW-F	Compliance	UA	03/20/2023	10.27	873.75
MW-F	Compliance	UA	06/14/2023	11.12	872.90
MW-F	Compliance	UA	09/18/2023	12.97	871.05
MW-G	Compliance	UA	03/20/2023	34.32	787.08
MW-G	Compliance	UA	09/18/2023	34.75	786.65
MW-H	Compliance	UA	03/20/2023	10.54	800.59
MW-H	Compliance	UA	09/18/2023	10.84	800.29

Notes:
Only wells with groundwater elevations measured are included.
BMP = below measuring point
NAVD88 = North American Vertical Datum of 1988
Monitored Unit Abbreviations:

UA = uppermost aquifer

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TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Well Type	Date	Event ID	Parameter	Unit	Result	Background	SSI Type
MW-3	UA	Background	03/22/2023	A6	Boron, total	mg/L	0.0533	NA	NA
MW-3	UA	Background	06/15/2023	A6R	Boron, total	mg/L	0.0403	NA	NA
MW-3	UA	Background	09/20/2023	A6D	Boron, total	mg/L	0.0732 J	NA	NA
MW-3	UA	Background	03/22/2023	A6	Calcium, total	mg/L	201	NA	NA
MW-3	UA	Background	06/15/2023	A6R	Calcium, total	mg/L	198	NA	NA
MW-3	UA	Background	09/20/2023	A6D	Calcium, total	mg/L	186	NA	NA
MW-3	UA	Background	03/22/2023	A6	Chloride, total	mg/L	248	NA	NA
MW-3	UA	Background	06/15/2023	A6R	Chloride, total	mg/L	227	NA	NA
MW-3	UA	Background	09/20/2023	A6D	Chloride, total	mg/L	234	NA	NA
MW-3	UA	Background	03/22/2023	A6	Fluoride, total	mg/L	0.158 J+	NA	NA
MW-3	UA	Background	--	A6R	Fluoride, total	mg/L	--	NA	NA
MW-3	UA	Background	09/20/2023	A6D	Fluoride, total	mg/L	0.156	NA	NA
MW-3	UA	Background	03/22/2023	A6	pH (field)	SU	6.7	NA	NA
MW-3	UA	Background	--	A6R	pH (field)	SU	--	NA	NA
MW-3	UA	Background	09/20/2023	A6D	pH (field)	SU	6.8	NA	NA
MW-3	UA	Background	03/22/2023	A6	Sulfate, total	mg/L	52.3	NA	NA
MW-3	UA	Background	06/15/2023	A6R	Sulfate, total	mg/L	55.0	NA	NA
MW-3	UA	Background	09/20/2023	A6D	Sulfate, total	mg/L	55.8	NA	NA
MW-3	UA	Background	03/22/2023	A6	Total Dissolved Solids	mg/L	1,030	NA	NA
MW-3	UA	Background	06/15/2023	A6R	Total Dissolved Solids	mg/L	936	NA	NA
MW-3	UA	Background	09/20/2023	A6D	Total Dissolved Solids	mg/L	938 J	NA	NA
MW-13S	UA	Background	03/22/2023	A6	Boron, total	mg/L	0.0169 J	NA	NA
MW-13S	UA	Background	03/22/2023	A6	Calcium, total	mg/L	78.7	NA	NA
MW-13S	UA	Background	03/22/2023	A6	Chloride, total	mg/L	86.2	NA	NA
MW-13S	UA	Background	03/22/2023	A6	Fluoride, total	mg/L	0.278 J+	NA	NA
MW-13S	UA	Background	03/22/2023	A6	pH (field)	SU	7.0	NA	NA
MW-13S	UA	Background	03/22/2023	A6	Sulfate, total	mg/L	27.3	NA	NA
MW-13S	UA	Background	03/22/2023	A6	Total Dissolved Solids	mg/L	349	NA	NA
MW-18	UA	Background	03/22/2023	A6	Boron, total	mg/L	0.106	NA	NA
MW-18	UA	Background	03/22/2023	A6	Calcium, total	mg/L	104	NA	NA
MW-18	UA	Background	03/22/2023	A6	Chloride, total	mg/L	18.4	NA	NA
MW-18	UA	Background	03/22/2023	A6	Fluoride, total	mg/L	0.267 J+	NA	NA
MW-18	UA	Background	03/22/2023	A6	pH (field)	SU	7.1	NA	NA
MW-18	UA	Background	03/22/2023	A6	Sulfate, total	mg/L	189	NA	NA
MW-18	UA	Background	03/22/2023	A6	Total Dissolved Solids	mg/L	707	NA	NA
MW-21	UA	Background	03/22/2023	A6	Boron, total	mg/L	1.45	NA	NA
MW-21	UA	Background	06/14/2023	A6R	Boron, total	mg/L	1.52	NA	NA
MW-21	UA	Background	09/20/2023	A6D	Boron, total	mg/L	1.47	NA	NA
MW-21	UA	Background	03/22/2023	A6	Calcium, total	mg/L	87.2	NA	NA
MW-21	UA	Background	06/14/2023	A6R	Calcium, total	mg/L	91.6	NA	NA
MW-21	UA	Background	09/20/2023	A6D	Calcium, total	mg/L	90.0	NA	NA
MW-21	UA	Background	03/22/2023	A6	Chloride, total	mg/L	164	NA	NA
MW-21	UA	Background	06/14/2023	A6R	Chloride, total	mg/L	139	NA	NA
MW-21	UA	Background	09/20/2023	A6D	Chloride, total	mg/L	142	NA	NA
MW-21	UA	Background	03/22/2023	A6	Fluoride, total	mg/L	0.575 J+	NA	NA
MW-21	UA	Background	--	A6R	Fluoride, total	mg/L	--	NA	NA

TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Well Type	Date	Event ID	Parameter	Unit	Result	Background	SSI Type
MW-21	UA	Background	09/20/2023	A6D	Fluoride, total	mg/L	0.545	NA	NA
MW-21	UA	Background	03/22/2023	A6	pH (field)	SU	7.1	NA	NA
MW-21	UA	Background	--	A6R	pH (field)	SU	--	NA	NA
MW-21	UA	Background	09/20/2023	A6D	pH (field)	SU	7.0	NA	NA
MW-21	UA	Background	03/22/2023	A6	Sulfate, total	mg/L	72.0	NA	NA
MW-21	UA	Background	06/14/2023	A6R	Sulfate, total	mg/L	73.7	NA	NA
MW-21	UA	Background	09/20/2023	A6D	Sulfate, total	mg/L	72.0	NA	NA
MW-21	UA	Background	03/22/2023	A6	Total Dissolved Solids	mg/L	738	NA	NA
MW-21	UA	Background	06/14/2023	A6R	Total Dissolved Solids	mg/L	733	NA	NA
MW-21	UA	Background	09/20/2023	A6D	Total Dissolved Solids	mg/L	700	NA	NA
MW-9DR	UA	Compliance	03/22/2023	A6	Boron, total	mg/L	0.923	1.88	No Exceedance
MW-9DR	UA	Compliance	06/14/2023	A6R	Boron, total	mg/L	1.48	1.88	No Exceedance
MW-9DR	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	1.30	1.88	TBD
MW-9DR	UA	Compliance	03/22/2023	A6	Calcium, total	mg/L	85.5	274	No Exceedance
MW-9DR	UA	Compliance	06/14/2023	A6R	Calcium, total	mg/L	68.6	274	No Exceedance
MW-9DR	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	72.6	274	TBD
MW-9DR	UA	Compliance	03/22/2023	A6	Chloride, total	mg/L	224	246	No Exceedance
MW-9DR	UA	Compliance	06/14/2023	A6R	Chloride, total	mg/L	371	246	Determined
MW-9DR	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	362	246	TBD
MW-9DR	UA	Compliance	03/22/2023	A6	Fluoride, total	mg/L	0.302 J+	0.761	No Exceedance
MW-9DR	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.363	0.761	TBD
MW-9DR	UA	Compliance	03/22/2023	A6	pH (field)	SU	7.0	6.7/7.4	No Exceedance
MW-9DR	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.1	6.7/7.4	TBD
MW-9DR	UA	Compliance	03/22/2023	A6	Sulfate, total	mg/L	0.94 J	209	No Exceedance
MW-9DR	UA	Compliance	06/14/2023	A6R	Sulfate, total	mg/L	3.14 J	209	No Exceedance
MW-9DR	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	3.18 J	209	TBD
MW-9DR	UA	Compliance	03/22/2023	A6	Total Dissolved Solids	mg/L	794	1170	No Exceedance
MW-9DR	UA	Compliance	06/14/2023	A6R	Total Dissolved Solids	mg/L	998	1170	No Exceedance
MW-9DR	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	940 J	1170	TBD
MW-11D	UA	Compliance	03/22/2023	A6	Boron, total	mg/L	0.165	1.88	No Exceedance
MW-11D	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	0.174	1.88	TBD
MW-11D	UA	Compliance	03/22/2023	A6	Calcium, total	mg/L	74.6	274	No Exceedance
MW-11D	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	73.7	274	TBD
MW-11D	UA	Compliance	03/22/2023	A6	Chloride, total	mg/L	5.81	246	No Exceedance
MW-11D	UA	Compliance	06/14/2023	A6R	Chloride, total	mg/L	5.24	246	No Exceedance
MW-11D	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	5.43	246	TBD
MW-11D	UA	Compliance	03/22/2023	A6	Fluoride, total	mg/L	0.292 J+	0.761	No Exceedance
MW-11D	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.261	0.761	TBD
MW-11D	UA	Compliance	03/22/2023	A6	pH (field)	SU	7.2	6.7/7.4	No Exceedance
MW-11D	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.2	6.7/7.4	TBD
MW-11D	UA	Compliance	03/22/2023	A6	Sulfate, total	mg/L	11.3	209	No Exceedance
MW-11D	UA	Compliance	06/14/2023	A6R	Sulfate, total	mg/L	12.2	209	No Exceedance
MW-11D	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	12.7	209	TBD
MW-11D	UA	Compliance	03/22/2023	A6	Total Dissolved Solids	mg/L	365	1170	No Exceedance
MW-11D	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	366	1170	TBD
MW-16D	UA	Compliance	03/20/2023	A6	Boron, total	mg/L	1.31	1.88	No Exceedance

TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Well Type	Date	Event ID	Parameter	Unit	Result	Background	SSI Type
MW-16D	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	1.12	1.88	TBD
MW-16D	UA	Compliance	03/20/2023	A6	Calcium, total	mg/L	52.1	274	No Exceedance
MW-16D	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	48.7	274	TBD
MW-16D	UA	Compliance	03/20/2023	A6	Chloride, total	mg/L	54.7	246	No Exceedance
MW-16D	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	68.6	246	TBD
MW-16D	UA	Compliance	03/20/2023	A6	Fluoride, total	mg/L	0.549 J+	0.761	No Exceedance
MW-16D	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.532	0.761	TBD
MW-16D	UA	Compliance	03/20/2023	A6	pH (field)	SU	7.3	6.7/7.4	No Exceedance
MW-16D	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.3	6.7/7.4	TBD
MW-16D	UA	Compliance	03/20/2023	A6	Sulfate, total	mg/L	0.627 J	209	No Exceedance
MW-16D	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	0.809 J	209	TBD
MW-16D	UA	Compliance	03/20/2023	A6	Total Dissolved Solids	mg/L	493	1170	No Exceedance
MW-16D	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	537	1170	TBD
MW-20D	UA	Compliance	03/21/2023	A6	Boron, total	mg/L	0.360	1.88	No Exceedance
MW-20D	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	0.245	1.88	TBD
MW-20D	UA	Compliance	03/21/2023	A6	Calcium, total	mg/L	79.4	274	No Exceedance
MW-20D	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	77.8	274	TBD
MW-20D	UA	Compliance	03/21/2023	A6	Chloride, total	mg/L	19.1	246	No Exceedance
MW-20D	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	18.5	246	TBD
MW-20D	UA	Compliance	03/21/2023	A6	Fluoride, total	mg/L	0.257 J+	0.761	No Exceedance
MW-20D	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.246	0.761	TBD
MW-20D	UA	Compliance	03/21/2023	A6	pH (field)	SU	7.2	6.7/7.4	No Exceedance
MW-20D	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.2	6.7/7.4	TBD
MW-20D	UA	Compliance	03/21/2023	A6	Sulfate, total	mg/L	19.4	209	No Exceedance
MW-20D	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	20.2	209	TBD
MW-20D	UA	Compliance	03/21/2023	A6	Total Dissolved Solids	mg/L	344	1170	No Exceedance
MW-20D	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	355	1170	TBD
MW-22	UA	Compliance	03/22/2023	A6	Boron, total	mg/L	0.447	1.88	No Exceedance
MW-22	UA	Compliance	06/15/2023	A6R	Boron, total	mg/L	0.501	1.88	No Exceedance
MW-22	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	0.474	1.88	TBD
MW-22	UA	Compliance	03/22/2023	A6	Calcium, total	mg/L	117	274	No Exceedance
MW-22	UA	Compliance	06/15/2023	A6R	Calcium, total	mg/L	122	274	No Exceedance
MW-22	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	118	274	TBD
MW-22	UA	Compliance	03/22/2023	A6	Chloride, total	mg/L	35.5	246	No Exceedance
MW-22	UA	Compliance	06/15/2023	A6R	Chloride, total	mg/L	36.1	246	No Exceedance
MW-22	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	37.8	246	TBD
MW-22	UA	Compliance	03/22/2023	A6	Fluoride, total	mg/L	0.323 J+	0.761	No Exceedance
MW-22	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.311	0.761	TBD
MW-22	UA	Compliance	03/22/2023	A6	pH (field)	SU	7.0	6.7/7.4	No Exceedance
MW-22	UA	Compliance	09/20/2023	A6D	pH (field)	SU	6.9	6.7/7.4	TBD
MW-22	UA	Compliance	03/22/2023	A6	Sulfate, total	mg/L	96.6	209	No Exceedance
MW-22	UA	Compliance	06/15/2023	A6R	Sulfate, total	mg/L	101	209	No Exceedance
MW-22	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	99.1	209	TBD
MW-22	UA	Compliance	03/22/2023	A6	Total Dissolved Solids	mg/L	571	1170	No Exceedance
MW-22	UA	Compliance	06/15/2023	A6R	Total Dissolved Solids	mg/L	592	1170	No Exceedance
MW-22	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	575	1170	TBD

TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Well Type	Date	Event ID	Parameter	Unit	Result	Background	SSI Type
MW-24	UA	Compliance	03/21/2023	A6	Boron, total	mg/L	0.114	1.88	No Exceedance
MW-24	UA	Compliance	06/14/2023	A6R	Boron, total	mg/L	0.0680	1.88	No Exceedance
MW-24	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	0.0924 J	1.88	TBD
MW-24	UA	Compliance	03/21/2023	A6	Calcium, total	mg/L	61.9	274	No Exceedance
MW-24	UA	Compliance	06/14/2023	A6R	Calcium, total	mg/L	66.7	274	No Exceedance
MW-24	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	65.1	274	TBD
MW-24	UA	Compliance	03/21/2023	A6	Chloride, total	mg/L	4.64	246	No Exceedance
MW-24	UA	Compliance	06/14/2023	A6R	Chloride, total	mg/L	5.07	246	No Exceedance
MW-24	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	5.58	246	TBD
MW-24	UA	Compliance	03/21/2023	A6	Fluoride, total	mg/L	0.296 J+	0.761	No Exceedance
MW-24	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.256	0.761	TBD
MW-24	UA	Compliance	03/21/2023	A6	pH (field)	SU	7.3	6.7/7.4	No Exceedance
MW-24	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.3	6.7/7.4	TBD
MW-24	UA	Compliance	03/21/2023	A6	Sulfate, total	mg/L	19.4	209	No Exceedance
MW-24	UA	Compliance	06/14/2023	A6R	Sulfate, total	mg/L	20.8 J-	209	No Exceedance
MW-24	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	22.3	209	TBD
MW-24	UA	Compliance	03/21/2023	A6	Total Dissolved Solids	mg/L	274	1170	No Exceedance
MW-24	UA	Compliance	06/14/2023	A6R	Total Dissolved Solids	mg/L	290	1170	No Exceedance
MW-24	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	291	1170	TBD
MW-D	UA	Compliance	03/21/2023	A6	Boron, total	mg/L	4.57	1.88	Confirmed
MW-D	UA	Compliance	06/14/2023	A6R	Boron, total	mg/L	4.89	1.88	Confirmed
MW-D	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	4.78	1.88	TBD
MW-D	UA	Compliance	03/21/2023	A6	Calcium, total	mg/L	3.20	274	No Exceedance
MW-D	UA	Compliance	06/14/2023	A6R	Calcium, total	mg/L	3.54	274	No Exceedance
MW-D	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	3.08	274	TBD
MW-D	UA	Compliance	03/21/2023	A6	Chloride, total	mg/L	24.2	246	No Exceedance
MW-D	UA	Compliance	06/14/2023	A6R	Chloride, total	mg/L	25.1	246	No Exceedance
MW-D	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	21.2	246	TBD
MW-D	UA	Compliance	03/21/2023	A6	Fluoride, total	mg/L	1.91	0.761	Determined
MW-D	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	1.85	0.761	TBD
MW-D	UA	Compliance	03/21/2023	A6	pH (field)	SU	8.5	6.7/7.4	Confirmed
MW-D	UA	Compliance	09/20/2023	A6D	pH (field)	SU	8.5	6.7/7.4	TBD
MW-D	UA	Compliance	03/21/2023	A6	Sulfate, total	mg/L	12.3	209	No Exceedance
MW-D	UA	Compliance	06/14/2023	A6R	Sulfate, total	mg/L	13.5	209	No Exceedance
MW-D	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	14.0	209	TBD
MW-D	UA	Compliance	03/21/2023	A6	Total Dissolved Solids	mg/L	507	1170	No Exceedance
MW-D	UA	Compliance	06/14/2023	A6R	Total Dissolved Solids	mg/L	526	1170	No Exceedance
MW-D	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	503	1170	TBD
MW-E	UA	Compliance	03/22/2023	A6	Boron, total	mg/L	0.880	1.88	No Exceedance
MW-E	UA	Compliance	06/14/2023	A6R	Boron, total	mg/L	1.03	1.88	No Exceedance
MW-E	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	1.65	1.88	TBD
MW-E	UA	Compliance	03/22/2023	A6	Calcium, total	mg/L	52.3	274	No Exceedance
MW-E	UA	Compliance	06/14/2023	A6R	Calcium, total	mg/L	55.3	274	No Exceedance
MW-E	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	46.5	274	TBD
MW-E	UA	Compliance	03/22/2023	A6	Chloride, total	mg/L	17.2	246	No Exceedance
MW-E	UA	Compliance	06/14/2023	A6R	Chloride, total	mg/L	18.8	246	No Exceedance

TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Well Type	Date	Event ID	Parameter	Unit	Result	Background	SSI Type
MW-E	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	57.1 J-	246	TBD
MW-E	UA	Compliance	03/22/2023	A6	Fluoride, total	mg/L	0.703 J+	0.761	No Exceedance
MW-E	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.883	0.761	TBD
MW-E	UA	Compliance	03/22/2023	A6	pH (field)	SU	7.3	6.7/7.4	No Exceedance
MW-E	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.4	6.7/7.4	TBD
MW-E	UA	Compliance	03/22/2023	A6	Sulfate, total	mg/L	18.8	209	No Exceedance
MW-E	UA	Compliance	06/14/2023	A6R	Sulfate, total	mg/L	19.6	209	No Exceedance
MW-E	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	26.2	209	TBD
MW-E	UA	Compliance	03/22/2023	A6	Total Dissolved Solids	mg/L	344	1170	No Exceedance
MW-E	UA	Compliance	06/14/2023	A6R	Total Dissolved Solids	mg/L	373	1170	No Exceedance
MW-E	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	462	1170	TBD
MW-F	UA	Compliance	03/22/2023	A6	Boron, total	mg/L	4.56	1.88	Confirmed
MW-F	UA	Compliance	06/14/2023	A6R	Boron, total	mg/L	5.11	1.88	Confirmed
MW-F	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	4.38	1.88	TBD
MW-F	UA	Compliance	03/22/2023	A6	Calcium, total	mg/L	96.3	274	No Exceedance
MW-F	UA	Compliance	06/14/2023	A6R	Calcium, total	mg/L	99.4	274	No Exceedance
MW-F	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	107	274	TBD
MW-F	UA	Compliance	03/22/2023	A6	Chloride, total	mg/L	546	246	Confirmed
MW-F	UA	Compliance	06/14/2023	A6R	Chloride, total	mg/L	546	246	Confirmed
MW-F	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	536	246	TBD
MW-F	UA	Compliance	03/22/2023	A6	Fluoride, total	mg/L	0.912	0.761	Determined
MW-F	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.773	0.761	TBD
MW-F	UA	Compliance	03/22/2023	A6	pH (field)	SU	7.5	6.7/7.4	Confirmed
MW-F	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.1	6.7/7.4	TBD
MW-F	UA	Compliance	03/22/2023	A6	Sulfate, total	mg/L	157	209	No Exceedance
MW-F	UA	Compliance	06/14/2023	A6R	Sulfate, total	mg/L	152	209	No Exceedance
MW-F	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	159	209	TBD
MW-F	UA	Compliance	03/22/2023	A6	Total Dissolved Solids	mg/L	1,390	1170	Confirmed
MW-F	UA	Compliance	06/14/2023	A6R	Total Dissolved Solids	mg/L	1,560	1170	Confirmed
MW-F	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	1,380	1170	TBD
MW-G	UA	Compliance	03/21/2023	A6	Boron, total	mg/L	0.953 J	1.88	No Exceedance
MW-G	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	1.04	1.88	TBD
MW-G	UA	Compliance	03/21/2023	A6	Calcium, total	mg/L	67.6 J	274	No Exceedance
MW-G	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	71.2	274	TBD
MW-G	UA	Compliance	03/21/2023	A6	Chloride, total	mg/L	169 J	246	No Exceedance
MW-G	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	179	246	TBD
MW-G	UA	Compliance	03/21/2023	A6	Fluoride, total	mg/L	0.444 J+	0.761	No Exceedance
MW-G	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.440	0.761	TBD
MW-G	UA	Compliance	03/21/2023	A6	pH (field)	SU	7.2	6.7/7.4	No Exceedance
MW-G	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.2	6.7/7.4	TBD
MW-G	UA	Compliance	03/21/2023	A6	Sulfate, total	mg/L	0.594 U	209	No Exceedance
MW-G	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	1.35 J	209	TBD
MW-G	UA	Compliance	03/21/2023	A6	Total Dissolved Solids	mg/L	678 J	1170	No Exceedance
MW-G	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	685	1170	TBD
MW-H	UA	Compliance	03/22/2023	A6	Boron, total	mg/L	0.538	1.88	No Exceedance
MW-H	UA	Compliance	09/20/2023	A6D	Boron, total	mg/L	0.591	1.88	TBD

TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Well Type	Date	Event ID	Parameter	Unit	Result	Background	SSI Type
MW-H	UA	Compliance	03/22/2023	A6	Calcium, total	mg/L	112	274	No Exceedance
MW-H	UA	Compliance	09/20/2023	A6D	Calcium, total	mg/L	114	274	TBD
MW-H	UA	Compliance	03/22/2023	A6	Chloride, total	mg/L	117	246	No Exceedance
MW-H	UA	Compliance	09/20/2023	A6D	Chloride, total	mg/L	116	246	TBD
MW-H	UA	Compliance	03/22/2023	A6	Fluoride, total	mg/L	0.438 J+	0.761	No Exceedance
MW-H	UA	Compliance	09/20/2023	A6D	Fluoride, total	mg/L	0.460	0.761	TBD
MW-H	UA	Compliance	03/22/2023	A6	pH (field)	SU	7.0	6.7/7.4	No Exceedance
MW-H	UA	Compliance	09/20/2023	A6D	pH (field)	SU	7.0	6.7/7.4	TBD
MW-H	UA	Compliance	03/22/2023	A6	Sulfate, total	mg/L	22.3	209	No Exceedance
MW-H	UA	Compliance	09/20/2023	A6D	Sulfate, total	mg/L	25.0	209	TBD
MW-H	UA	Compliance	03/22/2023	A6	Total Dissolved Solids	mg/L	680	1170	No Exceedance
MW-H	UA	Compliance	09/20/2023	A6D	Total Dissolved Solids	mg/L	628	1170	TBD

Notes:
HSU = hydrostratigraphic unit:

UA = Uppermost Aquifer

ID = identification
mg/L = milligrams per liter
NA = not applicable
R = resample
Statistically Significant Increase (SSI) Type:

TBD: To be determined in 2024.

No Exceedance: No exceedance of the background.

Determined: An exceedance was determined without comparison to a resample.

Confirmed: An exceedance was determined with comparison to a resample. If a determined exceedance is confirmed by resample, both the sample and resample are noted as confirmed.

SU = Standard Units
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J- = The result is an estimated quantity, but the result may be biased low.
J+ = The result is an estimated quantity, but the result may be biased high.
U = The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

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TABLE 3
ANALYTICAL RESULTS - APPENDIX IV PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	Well Type	Date	Event ID	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Cadmium, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	Radium 226 + 228 (pCi/L)	Selenium, total (mg/L)	Thallium, total (mg/L)
MW-3	B	03/22/2023	A6	0.00103 U	0.00018 U	0.0565	0.00019 U	0.000499 J	0.00124 U	0.0000596 U	0.158 J+	0.000849 U	0.0115	0.0001 U	0.000348 U	0.390	0.0003 U	0.000121 U
MW-3	B	06/15/2023	A6R	--	--	--	--	--	--	--	--	--	0.0139	--	--	--	--	--
MW-3	B	09/20/2023	A6D	--	0.00018 U	0.0736	0.00019 U	0.00015 U	0.00124 U	0.0000596 U	0.156	0.000849 U	0.0124	--	0.000348 U	0.784	0.0003 U	0.000121 U
MW-13S	B	03/22/2023	A6	0.00103 U	0.00018 U	0.0328	0.00019 U	0.00015 U	0.00151 J	0.0000864 J	0.278 J+	0.000849 U	0.00560	0.0001 U	0.000348 U	1.37	0.0003 U	0.000121 U
MW-18	B	03/22/2023	A6	0.00103 U	0.00018 U	0.0162	0.00019 U	0.00015 U	0.00124 U	0.000156 J	0.267 J+	0.000849 U	0.0862	0.0001 U	0.000348 U	0.707	0.0003 U	0.000121 U
MW-21	B	03/22/2023	A6	0.00103 U	0.000373 J	0.0775	0.00019 U	0.00015 U	0.00124 U	0.000072 J	0.575 J+	0.000849 U	0.0793	0.0001 U	0.000353 J	1.15	0.0003 U	0.000121 U
MW-21	B	06/14/2023	A6R	--	--	--	--	--	--	--	--	--	0.0776	--	--	--	--	--
MW-21	B	09/20/2023	A6D	--	0.00033 J	0.0810	0.00019 U	0.00015 U	0.00124 U	0.0000596 U	0.545	0.000849 U	0.0701	--	0.000348 U	1.87	0.0003 U	0.000121 U
MW-9DR	C	03/22/2023	A6	0.00103 U	0.00350	0.582	0.00019 U	0.00015 U	0.00124 U	0.0013 J	0.302 J+	0.000849 U	0.0471	0.0001 U	0.000348 U	4.05	0.0003 U	0.000121 U
MW-9DR	C	06/14/2023	A6R	--	--	--	--	--	--	--	--	--	0.0935	--	--	--	--	--
MW-9DR	C	09/20/2023	A6D	--	0.00267	0.758	0.00019 U	0.00015 U	0.00124 U	0.00263	0.363	0.000849 U	0.0736	--	0.000394 J	2.25	0.0003 U	0.000121 U
MW-11D	C	03/22/2023	A6	0.00103 U	0.00214	0.164	0.00019 U	0.000518 J	0.00124 U	0.0000726 J	0.292 J+	0.000849 U	0.00689	0.0001 U	0.000485 J	0.562	0.0003 U	0.000121 U
MW-11D	C	09/20/2023	A6D	--	0.00242	0.162	0.00019 U	0.00015 U	0.00124 U	0.0000935 J	0.261	0.000849 U	0.00722	--	0.000472 J	0.806	0.0003 U	0.000121 U
MW-16D	C	03/20/2023	A6	0.00103 U	0.00723	0.111	0.00019 U	0.00015 U	0.00136 J	0.000157 J	0.549 J+	0.000849 U	0.0411	0.0001 U	0.00126 J	0.229	0.0003 U	0.000121 U
MW-16D	C	09/20/2023	A6D	--	0.00535	0.108	0.00019 U	0.00015 U	0.00124 U	0.000151 J	0.532	0.000849 U	0.0443	--	0.000991 J	1.38	0.0003 U	0.000121 U
MW-20D	C	03/21/2023	A6	0.00103 U	0.00129 J	0.137	0.00019 U	0.00015 U	0.00127 J	0.000205 J	0.257 J+	0.000849 U	0.0145	0.0001 U	0.00535	1.27	0.0003 U	0.000121 U
MW-20D	C	09/20/2023	A6D	--	0.00139 J	0.140	0.00019 U	0.00015 U	0.00124 U	0.00032 J	0.246	0.000849 U	0.0133	--	0.00501	0.426	0.0003 U	0.000121 U
MW-22	C	03/22/2023	A6	0.00103 U	0.00137 J	0.0503	0.00019 U	0.00015 U	0.00124 U	0.000117 J	0.323 J+	0.000849 U	0.0233	0.0001 U	0.000356 J	1.01	0.0003 U	0.000121 U
MW-22	C	06/15/2023	A6R	--	--	--	--	--	--	--	--	--	0.0247 J	--	--	--	--	--
MW-22	C	09/20/2023	A6D	--	0.00157 J	0.0489	0.00019 U	0.000474 J	0.00124 U	0.000114 J	0.311	0.00109 J	0.0217	--	0.000355 J	0.655	0.0003 U	0.000121 U
MW-24	C	03/21/2023	A6	0.00103 U	0.000186 J	0.0476	0.00019 U	0.00015 U	0.00124 U	0.0000596 U	0.296 J+	0.000849 U	0.0146	0.0001 U	0.000348 U	0.154	0.0003 U	0.000121 U
MW-24	C	06/14/2023	A6R	--	--	--	--	--	--	--	--	--	0.0168	--	--	--	--	--
MW-24	C	09/20/2023	A6D	--	0.00018 U	0.0501	0.00019 U	0.00015 U	0.00124 U	0.0000596 U	0.256	0.000849 U	0.0151	--	0.000348 U	0.460	0.0003 U	0.000121 U
MW-D	C	03/21/2023	A6	0.00103 U	0.00032 J	0.0279	0.00019 U	0.00015 U	0.00147 J	0.0000596 U	1.91	0.000849 U	0.116	0.0001 U	0.000348 U	0.247	0.0003 U	0.000121 U
MW-D	C	06/14/2023	A6R	--	--	--	--	--	--	--	--	--	0.126	--	--	--	--	--
MW-D	C	09/20/2023	A6D	--	0.000254 J	0.0280	0.00019 U	0.00015 U	0.00124 U	0.0000596 U	1.85	0.000849 U	0.112	--	0.000348 U	0.0793	0.0003 U	0.000121 U

TABLE 3
ANALYTICAL RESULTS - APPENDIX IV PARAMETERS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	Well Type	Date	Event ID	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Cadmium, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	Radium 226 + 228 (pCi/L)	Selenium, total (mg/L)	Thallium, total (mg/L)
MW-E	C	03/22/2023	A6	0.00103 U	0.0002 J	0.190	0.00019 U	0.00015 U	0.00127 J	0.000202 J	0.703 J+	0.000849 U	0.0327	0.0001 U	0.00122 J	2.10	0.0003 U	0.000121 U
MW-E	C	06/14/2023	A6R	--	--	--	--	--	--	--	--	--	0.0364	--	--	--	--	--
MW-E	C	09/20/2023	A6D	--	0.000243 J	0.305	0.00019 U	0.00015 U	0.00159 J	0.0005 J	0.883	0.000849 U	0.0478	--	0.000697 J	1.76	0.0003 U	0.000121 U
MW-F	C	03/22/2023	A6	0.00103 U	0.000457 J	0.0367	0.00019 U	0.000334 J	0.00124 U	0.000303 J	0.912	0.00204	0.225	0.0001 U	0.00194 J	1.91	0.0003 U	0.000121 U
MW-F	C	06/14/2023	A6R	--	--	--	--	--	--	--	--	--	0.237	--	--	--	--	--
MW-F	C	09/20/2023	A6D	--	0.000304 J	0.0410	0.00019 U	0.00015 U	0.00124 U	0.0000897 J	0.773	0.000849 U	0.242	--	0.00127 J	1.95	0.0003 U	0.000121 U
MW-G	C	03/21/2023	A6	0.00103 U	0.00199 J	0.424 J	0.00019 U	0.00015 U	0.00124 U	0.00018 J	0.444 J+	0.000849 U	0.0359 J	0.0001 U	0.00102 J	1.14	0.0003 U	0.000121 U
MW-G	C	09/20/2023	A6D	--	0.00205	0.471	0.00019 U	0.00015 U	0.00124 U	0.000205 J	0.440	0.000849 U	0.0413	--	0.001 J	3.35	0.0003 U	0.000121 U
MW-H	C	03/22/2023	A6	0.00103 U	0.000757 J	0.114	0.00019 U	0.00015 U	0.00124 U	0.0000596 U	0.438 J+	0.000849 U	0.0341	0.0001 U	0.000348 U	0.439	0.0003 U	0.000121 U
MW-H	C	09/20/2023	A6D	--	0.000752 J	0.119	0.00019 U	0.00015 U	0.00124 U	0.0000596 U	0.460	0.000849 U	0.0356	--	0.000348 U	0.483	0.0003 U	0.000121 U

Notes:
– = no data available
ID = identification
mg/L = milligrams per liter
pCi/L = picoCuries per liter
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
U = The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.
Well Type:

B = Background

C = Compliance

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TABLE 4
STATISTICAL BACKGROUND VALUES
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Parameter	Date Range	Sample Count	Percent Non-Detects	Statistical Calculation	Statistical Background Value (LPL/UPL)
Boron (mg/L)	01/26/2016 - 03/21/2022	54	33	Non-Parametric UPL	1.88
Calcium (mg/L)	01/26/2016 - 03/21/2022	54	0	Non-Parametric UPL	274
Chloride (mg/L)	01/26/2016 - 03/21/2022	54	4	Non-Parametric UPL	246
Fluoride (mg/L)	01/26/2016 - 03/21/2022	52	63	Non-Parametric UPL	0.761
pH (field) (SU)	01/26/2016 - 03/21/2022	50	0	Parametric LPL/UPL	6.7/7.4
Sulfate (mg/L)	01/26/2016 - 03/21/2022	53	8	Parametric UPL (log-transformed)	209
Total Dissolved Solids (mg/L)	01/26/2016 - 03/21/2022	54	0	Parametric UPL (log-transformed)	1170

Notes:
LPL = lower prediction limit (applicable for pH only)
mg/L = milligrams per liter
SU = standard units
UPL = upper prediction limit

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TABLE 5
GROUNDWATER PROTECTION STANDARDS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Parameter	Background					MCL/HBL	Groundwater Protection Standard*	Groundwater Protection Standard Source
	Date Range	Sample Count	Percent Non-Detects	Statistical Calculation	Value			
Antimony (mg/L)	01/26/2016 - 03/21/2022	44	93	Non-parametric UTL	0.00309	0.006	0.006	MCL/HBL
Arsenic (mg/L)	01/26/2016 - 03/21/2022	56	96	Non-parametric UTL	0.00594	0.010	0.010	MCL/HBL
Barium (mg/L)	01/26/2016 - 03/21/2022	56	20	Non-parametric UTL	0.0955	2.0	2.0	MCL/HBL
Beryllium (mg/L)	01/26/2016 - 03/21/2022	52	100	All ND - Last Reporting Limit	0.002	0.004	0.004	MCL/HBL
Cadmium (mg/L)	01/26/2016 - 03/21/2022	52	100	All ND - Last Reporting Limit	0.001	0.005	0.005	MCL/HBL
Chromium (mg/L)	01/26/2016 - 03/21/2022	56	89	Non-parametric UTL	0.00782	0.1	0.1	MCL/HBL
Cobalt (mg/L)	01/26/2016 - 03/21/2022	52	92	Non-parametric UTL	0.00333	0.006	0.006	MCL/HBL
Fluoride (mg/L)	01/26/2016 - 03/21/2022	52	63	Non-parametric UTL	0.761	4.0	4.0	MCL/HBL
Lead (mg/L)	01/26/2016 - 03/21/2022	52	96	Non-parametric UTL	0.00224	0.015	0.015	MCL/HBL
Lithium (mg/L)	01/26/2016 - 03/21/2022	56	20	Non-parametric UTL	0.112	0.04	0.112	Background
Mercury (mg/L)	01/26/2016 - 03/21/2022	44	100	All ND - Last Reporting Limit	0.0002	0.002	0.002	MCL/HBL
Molybdenum (mg/L)	01/26/2016 - 03/21/2022	52	100	All ND - Last Reporting Limit	0.005	0.1	0.1	MCL/HBL
Radium 226 + Radium 228 (pCi/L)	01/26/2016 - 03/21/2022	56	0	Non-parametric UTL	2.39	5	5	MCL/HBL
Selenium (mg/L)	01/26/2016 - 03/21/2022	52	100	All ND - Last Reporting Limit	0.002	0.05	0.05	MCL/HBL
Thallium (mg/L)	01/26/2016 - 03/21/2022	41	95	Non-parametric UTL	0.00159	0.002	0.002	MCL/HBL

Notes:
* Groundwater Protection Standard is the higher of the MCL/HBL or background.
MCL/HBL = maximum contaminant level/health-based level
mg/L = milligrams per liter
ND = non-detect
pCi/L = picoCuries per liter
UTL = upper tolerance limit

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TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-9DR	UA	A6	Antimony, total	mg/L	01/26/2016 - 03/22/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Antimony, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-9DR	UA	A6	Arsenic, total	mg/L	01/26/2016 - 03/22/2023	19	11	CI around median	0.00221	0.010	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Arsenic, total	mg/L	--	--	--	--	--	0.010	MCL/HBL	--
MW-9DR	UA	A6	Barium, total	mg/L	01/26/2016 - 03/22/2023	19	0	CI around mean	0.585	2.0	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Barium, total	mg/L	--	--	--	--	--	2.0	MCL/HBL	--
MW-9DR	UA	A6	Beryllium, total	mg/L	01/26/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Beryllium, total	mg/L	--	--	--	--	--	0.004	MCL/HBL	--
MW-9DR	UA	A6	Cadmium, total	mg/L	01/26/2016 - 03/22/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Cadmium, total	mg/L	--	--	--	--	--	0.005	MCL/HBL	--
MW-9DR	UA	A6	Chromium, total	mg/L	01/26/2016 - 03/22/2023	19	53	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Chromium, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-9DR	UA	A6	Cobalt, total	mg/L	01/26/2016 - 03/22/2023	18	28	CI around geomean	0.0015	0.006	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Cobalt, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-9DR	UA	A6	Fluoride, total	mg/L	01/26/2016 - 03/22/2023	20	55	CI around median	0.277	4.0	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Fluoride, total	mg/L	--	--	--	--	--	4.0	MCL/HBL	--
MW-9DR	UA	A6	Lead, total	mg/L	01/26/2016 - 03/22/2023	18	72	CI around median	0.001	0.015	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Lead, total	mg/L	--	--	--	--	--	0.015	MCL/HBL	--
MW-9DR	UA	A6	Lithium, total	mg/L	01/26/2016 - 03/22/2023	19	16	CI around mean	0.0461	0.112	Background	No Exceedance
MW-9DR	UA	A6R	Lithium, total	mg/L	01/26/2016 - 06/14/2023	20	15	CI around mean	0.0427	0.112	Background	No Exceedance
MW-9DR	UA	A6	Mercury, total	mg/L	01/26/2016 - 03/22/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Mercury, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-9DR	UA	A6	Molybdenum, total	mg/L	01/26/2016 - 03/22/2023	18	100	All ND - Last	0.005	0.1	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Molybdenum, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-9DR	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/26/2016 - 03/22/2023	19	0	CI around mean	2.19	5	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Radium 226 + Radium 228, total	pCi/L	--	--	--	--	--	5	MCL/HBL	--
MW-9DR	UA	A6	Selenium, total	mg/L	01/26/2016 - 03/22/2023	18	94	CI around median	0.002	0.05	MCL/HBL	No Exceedance

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-9DR	UA	A6R	Selenium, total	mg/L	--	--	--	--	--	0.05	MCL/HBL	--
MW-9DR	UA	A6	Thallium, total	mg/L	01/26/2016 - 03/22/2023	13	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance
MW-9DR	UA	A6R	Thallium, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-11D	UA	A6	Antimony, total	mg/L	01/27/2016 - 03/22/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-11D	UA	A6	Arsenic, total	mg/L	01/27/2016 - 03/22/2023	19	16	CI around median	0.0019	0.010	MCL/HBL	No Exceedance
MW-11D	UA	A6	Barium, total	mg/L	01/27/2016 - 03/22/2023	19	5.3	CI around median	0.161	2.0	MCL/HBL	No Exceedance
MW-11D	UA	A6	Beryllium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-11D	UA	A6	Cadmium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-11D	UA	A6	Chromium, total	mg/L	01/27/2016 - 03/22/2023	19	89	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-11D	UA	A6	Cobalt, total	mg/L	01/27/2016 - 03/22/2023	18	94	CB around T-S line	0.0005	0.006	MCL/HBL	No Exceedance
MW-11D	UA	A6	Fluoride, total	mg/L	01/27/2016 - 03/22/2023	20	55	CI around median	0.273	4.0	MCL/HBL	No Exceedance
MW-11D	UA	A6	Lead, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.015	MCL/HBL	No Exceedance
MW-11D	UA	A6	Lithium, total	mg/L	01/27/2016 - 03/22/2023	19	37	CB around linear reg	-0.021	0.112	Background	No Exceedance
MW-11D	UA	A6	Mercury, total	mg/L	01/27/2016 - 03/22/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-11D	UA	A6	Molybdenum, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.005	0.1	MCL/HBL	No Exceedance
MW-11D	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/27/2016 - 03/22/2023	19	0	CI around geomean	0.388	5	MCL/HBL	No Exceedance
MW-11D	UA	A6	Selenium, total	mg/L	01/27/2016 - 03/22/2023	18	94	CI around median	0.002	0.05	MCL/HBL	No Exceedance
MW-11D	UA	A6	Thallium, total	mg/L	01/27/2016 - 03/22/2023	13	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance
MW-16D	UA	A6	Antimony, total	mg/L	01/28/2016 - 03/20/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-16D	UA	A6	Arsenic, total	mg/L	01/28/2016 - 03/20/2023	19	0	CI around mean	0.00626	0.010	MCL/HBL	No Exceedance
MW-16D	UA	A6	Barium, total	mg/L	01/28/2016 - 03/20/2023	19	11	CI around median	0.106	2.0	MCL/HBL	No Exceedance
MW-16D	UA	A6	Beryllium, total	mg/L	01/28/2016 - 03/20/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-16D	UA	A6	Cadmium, total	mg/L	01/28/2016 - 03/20/2023	18	94	CI around median	0.001	0.005	MCL/HBL	No Exceedance
MW-16D	UA	A6	Chromium, total	mg/L	01/28/2016 - 03/20/2023	19	95	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-16D	UA	A6	Cobalt, total	mg/L	01/28/2016 - 03/20/2023	18	100	All ND - Last	0.002	0.006	MCL/HBL	No Exceedance
MW-16D	UA	A6	Fluoride, total	mg/L	01/28/2016 - 03/20/2023	20	55	CI around median	0.479	4.0	MCL/HBL	No Exceedance
MW-16D	UA	A6	Lead, total	mg/L	01/28/2016 - 03/20/2023	18	100	All ND - Last	0.002	0.015	MCL/HBL	No Exceedance

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-16D	UA	A6	Lithium, total	mg/L	01/28/2016 - 03/20/2023	19	32	CI around median	0.0414	0.112	Background	No Exceedance
MW-16D	UA	A6	Mercury, total	mg/L	01/28/2016 - 03/20/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-16D	UA	A6	Molybdenum, total	mg/L	01/28/2016 - 03/20/2023	18	94	CI around median	0.005	0.1	MCL/HBL	No Exceedance
MW-16D	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/28/2016 - 03/20/2023	19	0	CI around geomean	0.297	5	MCL/HBL	No Exceedance
MW-16D	UA	A6	Selenium, total	mg/L	01/28/2016 - 03/20/2023	18	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance
MW-16D	UA	A6	Thallium, total	mg/L	01/28/2016 - 03/20/2023	13	92	CB around T-S line	0.001	0.002	MCL/HBL	No Exceedance
MW-20D	UA	A6	Antimony, total	mg/L	01/28/2016 - 03/21/2023	13	92	CI around median	0.002	0.006	MCL/HBL	No Exceedance
MW-20D	UA	A6	Arsenic, total	mg/L	01/28/2016 - 03/21/2023	19	47	CB around T-S line	0.00169	0.010	MCL/HBL	No Exceedance
MW-20D	UA	A6	Barium, total	mg/L	01/28/2016 - 03/21/2023	19	11	CI around median	0.128	2.0	MCL/HBL	No Exceedance
MW-20D	UA	A6	Beryllium, total	mg/L	01/28/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-20D	UA	A6	Cadmium, total	mg/L	01/28/2016 - 03/21/2023	18	94	CI around median	0.001	0.005	MCL/HBL	No Exceedance
MW-20D	UA	A6	Chromium, total	mg/L	01/28/2016 - 03/21/2023	19	79	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-20D	UA	A6	Cobalt, total	mg/L	01/28/2016 - 03/21/2023	18	94	CB around T-S line	0.0005	0.006	MCL/HBL	No Exceedance
MW-20D	UA	A6	Fluoride, total	mg/L	01/28/2016 - 03/21/2023	20	55	CI around median	0.257	4.0	MCL/HBL	No Exceedance
MW-20D	UA	A6	Lead, total	mg/L	01/28/2016 - 03/21/2023	18	94	CB around T-S line	0.001	0.015	MCL/HBL	No Exceedance
MW-20D	UA	A6	Lithium, total	mg/L	01/28/2016 - 03/21/2023	19	37	CB around linear reg	-0.0108	0.112	Background	No Exceedance
MW-20D	UA	A6	Mercury, total	mg/L	01/28/2016 - 03/21/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-20D	UA	A6	Molybdenum, total	mg/L	01/28/2016 - 03/21/2023	18	33	CI around median	0.005	0.1	MCL/HBL	No Exceedance
MW-20D	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/28/2016 - 03/21/2023	19	0	CI around mean	0.426	5	MCL/HBL	No Exceedance
MW-20D	UA	A6	Selenium, total	mg/L	01/28/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance
MW-20D	UA	A6	Thallium, total	mg/L	01/28/2016 - 03/21/2023	13	92	CI around median	0.001	0.002	MCL/HBL	No Exceedance
MW-22	UA	A6	Antimony, total	mg/L	01/26/2016 - 03/22/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-22	UA	A6R	Antimony, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-22	UA	A6	Arsenic, total	mg/L	01/26/2016 - 03/22/2023	19	26	CI around median	0.002	0.010	MCL/HBL	No Exceedance
MW-22	UA	A6R	Arsenic, total	mg/L	--	--	--	--	--	0.010	MCL/HBL	--
MW-22	UA	A6	Barium, total	mg/L	01/26/2016 - 03/22/2023	19	11	CI around median	0.0484	2.0	MCL/HBL	No Exceedance
MW-22	UA	A6R	Barium, total	mg/L	--	--	--	--	--	2.0	MCL/HBL	--

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-22	UA	A6	Beryllium, total	mg/L	01/26/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-22	UA	A6R	Beryllium, total	mg/L	--	--	--	--	--	0.004	MCL/HBL	--
MW-22	UA	A6	Cadmium, total	mg/L	01/26/2016 - 03/22/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-22	UA	A6R	Cadmium, total	mg/L	--	--	--	--	--	0.005	MCL/HBL	--
MW-22	UA	A6	Chromium, total	mg/L	01/26/2016 - 03/22/2023	19	89	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-22	UA	A6R	Chromium, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-22	UA	A6	Cobalt, total	mg/L	01/26/2016 - 03/22/2023	18	94	CB around T-S line	0.0005	0.006	MCL/HBL	No Exceedance
MW-22	UA	A6R	Cobalt, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-22	UA	A6	Fluoride, total	mg/L	01/26/2016 - 03/22/2023	20	60	CI around median	0.289	4.0	MCL/HBL	No Exceedance
MW-22	UA	A6R	Fluoride, total	mg/L	--	--	--	--	--	4.0	MCL/HBL	--
MW-22	UA	A6	Lead, total	mg/L	01/26/2016 - 03/22/2023	18	94	CB around T-S line	0.001	0.015	MCL/HBL	No Exceedance
MW-22	UA	A6R	Lead, total	mg/L	--	--	--	--	--	0.015	MCL/HBL	--
MW-22	UA	A6	Lithium, total	mg/L	01/26/2016 - 03/22/2023	19	37	CB around linear reg	0.00374	0.112	Background	No Exceedance
MW-22	UA	A6R	Lithium, total	mg/L	01/26/2016 - 06/15/2023	20	35	CI around median	0.0227	0.112	Background	No Exceedance
MW-22	UA	A6	Mercury, total	mg/L	01/26/2016 - 03/22/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-22	UA	A6R	Mercury, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-22	UA	A6	Molybdenum, total	mg/L	01/26/2016 - 03/22/2023	18	94	CI around median	0.005	0.1	MCL/HBL	No Exceedance
MW-22	UA	A6R	Molybdenum, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-22	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/26/2016 - 03/22/2023	19	0	CI around mean	0.607	5	MCL/HBL	No Exceedance
MW-22	UA	A6R	Radium 226 + Radium 228, total	pCi/L	--	--	--	--	--	5	MCL/HBL	--
MW-22	UA	A6	Selenium, total	mg/L	01/26/2016 - 03/22/2023	18	94	CI around median	0.002	0.05	MCL/HBL	No Exceedance
MW-22	UA	A6R	Selenium, total	mg/L	--	--	--	--	--	0.05	MCL/HBL	--
MW-22	UA	A6	Thallium, total	mg/L	01/26/2016 - 03/22/2023	13	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance
MW-22	UA	A6R	Thallium, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-24	UA	A6	Antimony, total	mg/L	01/27/2016 - 03/21/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-24	UA	A6R	Antimony, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-24	UA	A6	Arsenic, total	mg/L	01/27/2016 - 03/21/2023	19	95	CB around T-S line	0.001	0.010	MCL/HBL	No Exceedance

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-24	UA	A6R	Arsenic, total	mg/L	--	--	--	--	--	0.010	MCL/HBL	--
MW-24	UA	A6	Barium, total	mg/L	01/27/2016 - 03/21/2023	19	11	CB around T-S line	0.0466	2.0	MCL/HBL	No Exceedance
MW-24	UA	A6R	Barium, total	mg/L	--	--	--	--	--	2.0	MCL/HBL	--
MW-24	UA	A6	Beryllium, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-24	UA	A6R	Beryllium, total	mg/L	--	--	--	--	--	0.004	MCL/HBL	--
MW-24	UA	A6	Cadmium, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-24	UA	A6R	Cadmium, total	mg/L	--	--	--	--	--	0.005	MCL/HBL	--
MW-24	UA	A6	Chromium, total	mg/L	01/27/2016 - 03/21/2023	19	100	All ND - Last	0.002	0.1	MCL/HBL	No Exceedance
MW-24	UA	A6R	Chromium, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-24	UA	A6	Cobalt, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.006	MCL/HBL	No Exceedance
MW-24	UA	A6R	Cobalt, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-24	UA	A6	Fluoride, total	mg/L	01/27/2016 - 03/21/2023	20	55	CB around T-S line	-0.0647	4.0	MCL/HBL	No Exceedance
MW-24	UA	A6R	Fluoride, total	mg/L	--	--	--	--	--	4.0	MCL/HBL	--
MW-24	UA	A6	Lead, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.015	MCL/HBL	No Exceedance
MW-24	UA	A6R	Lead, total	mg/L	--	--	--	--	--	0.015	MCL/HBL	--
MW-24	UA	A6	Lithium, total	mg/L	01/27/2016 - 03/21/2023	19	37	CB around linear reg	-0.00764	0.112	Background	No Exceedance
MW-24	UA	A6R	Lithium, total	mg/L	01/27/2016 - 06/14/2023	20	35	CB around linear reg	-0.00556	0.112	Background	No Exceedance
MW-24	UA	A6	Mercury, total	mg/L	01/27/2016 - 03/21/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-24	UA	A6R	Mercury, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-24	UA	A6	Molybdenum, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.005	0.1	MCL/HBL	No Exceedance
MW-24	UA	A6R	Molybdenum, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-24	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/27/2016 - 03/21/2023	19	0	CI around geomean	0.215	5	MCL/HBL	No Exceedance
MW-24	UA	A6R	Radium 226 + Radium 228, total	pCi/L	--	--	--	--	--	5	MCL/HBL	--
MW-24	UA	A6	Selenium, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance
MW-24	UA	A6R	Selenium, total	mg/L	--	--	--	--	--	0.05	MCL/HBL	--
MW-24	UA	A6	Thallium, total	mg/L	01/27/2016 - 03/21/2023	13	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance
MW-24	UA	A6R	Thallium, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-D	UA	A6	Antimony, total	mg/L	01/28/2016 - 03/21/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-D	UA	A6R	Antimony, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-D	UA	A6	Arsenic, total	mg/L	01/28/2016 - 03/21/2023	19	95	CB around T-S line	0.001	0.010	MCL/HBL	No Exceedance
MW-D	UA	A6R	Arsenic, total	mg/L	--	--	--	--	--	0.010	MCL/HBL	--
MW-D	UA	A6	Barium, total	mg/L	01/28/2016 - 03/21/2023	19	11	CB around T-S line	0.028	2.0	MCL/HBL	No Exceedance
MW-D	UA	A6R	Barium, total	mg/L	--	--	--	--	--	2.0	MCL/HBL	--
MW-D	UA	A6	Beryllium, total	mg/L	01/28/2016 - 03/21/2023	18	94	CI around median	0.001	0.004	MCL/HBL	No Exceedance
MW-D	UA	A6R	Beryllium, total	mg/L	--	--	--	--	--	0.004	MCL/HBL	--
MW-D	UA	A6	Cadmium, total	mg/L	01/28/2016 - 03/21/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-D	UA	A6R	Cadmium, total	mg/L	--	--	--	--	--	0.005	MCL/HBL	--
MW-D	UA	A6	Chromium, total	mg/L	01/28/2016 - 03/21/2023	19	84	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-D	UA	A6R	Chromium, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-D	UA	A6	Cobalt, total	mg/L	01/28/2016 - 03/21/2023	18	94	CB around T-S line	0.0005	0.006	MCL/HBL	No Exceedance
MW-D	UA	A6R	Cobalt, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-D	UA	A6	Fluoride, total	mg/L	01/28/2016 - 03/21/2023	20	0	CI around mean	1.87	4.0	MCL/HBL	No Exceedance
MW-D	UA	A6R	Fluoride, total	mg/L	--	--	--	--	--	4.0	MCL/HBL	--
MW-D	UA	A6	Lead, total	mg/L	01/28/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.015	MCL/HBL	No Exceedance
MW-D	UA	A6R	Lead, total	mg/L	--	--	--	--	--	0.015	MCL/HBL	--
MW-D	UA	A6	Lithium, total	mg/L	01/28/2016 - 03/21/2023	19	0	CI around mean	0.114	0.112	Background	Confirmed
MW-D	UA	A6R	Lithium, total	mg/L	01/28/2016 - 06/14/2023	20	0	CI around mean	0.114	0.112	Background	Confirmed
MW-D	UA	A6	Mercury, total	mg/L	01/28/2016 - 03/21/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-D	UA	A6R	Mercury, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-D	UA	A6	Molybdenum, total	mg/L	01/28/2016 - 03/21/2023	18	94	CI around median	0.005	0.1	MCL/HBL	No Exceedance
MW-D	UA	A6R	Molybdenum, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-D	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/28/2016 - 03/21/2023	19	0	CI around mean	0.217	5	MCL/HBL	No Exceedance
MW-D	UA	A6R	Radium 226 + Radium 228, total	pCi/L	--	--	--	--	--	5	MCL/HBL	--
MW-D	UA	A6	Selenium, total	mg/L	01/28/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-D	UA	A6R	Selenium, total	mg/L	--	--	--	--	--	0.05	MCL/HBL	--
MW-D	UA	A6	Thallium, total	mg/L	01/28/2016 - 03/21/2023	13	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance
MW-D	UA	A6R	Thallium, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-E	UA	A6	Antimony, total	mg/L	01/27/2016 - 03/22/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-E	UA	A6R	Antimony, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-E	UA	A6	Arsenic, total	mg/L	01/27/2016 - 03/22/2023	19	68	CI around median	0.001	0.010	MCL/HBL	No Exceedance
MW-E	UA	A6R	Arsenic, total	mg/L	--	--	--	--	--	0.010	MCL/HBL	--
MW-E	UA	A6	Barium, total	mg/L	01/27/2016 - 03/22/2023	19	5.3	CI around mean	0.195	2.0	MCL/HBL	No Exceedance
MW-E	UA	A6R	Barium, total	mg/L	--	--	--	--	--	2.0	MCL/HBL	--
MW-E	UA	A6	Beryllium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-E	UA	A6R	Beryllium, total	mg/L	--	--	--	--	--	0.004	MCL/HBL	--
MW-E	UA	A6	Cadmium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-E	UA	A6R	Cadmium, total	mg/L	--	--	--	--	--	0.005	MCL/HBL	--
MW-E	UA	A6	Chromium, total	mg/L	01/27/2016 - 03/22/2023	19	53	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-E	UA	A6R	Chromium, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-E	UA	A6	Cobalt, total	mg/L	01/27/2016 - 03/22/2023	18	44	CI around geomean	0.000939	0.006	MCL/HBL	No Exceedance
MW-E	UA	A6R	Cobalt, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-E	UA	A6	Fluoride, total	mg/L	01/27/2016 - 03/22/2023	20	50	CB around T-S line	0.526	4.0	MCL/HBL	No Exceedance
MW-E	UA	A6R	Fluoride, total	mg/L	--	--	--	--	--	4.0	MCL/HBL	--
MW-E	UA	A6	Lead, total	mg/L	01/27/2016 - 03/22/2023	18	56	CI around median	0.00131	0.015	MCL/HBL	No Exceedance
MW-E	UA	A6R	Lead, total	mg/L	--	--	--	--	--	0.015	MCL/HBL	--
MW-E	UA	A6	Lithium, total	mg/L	01/27/2016 - 03/22/2023	19	21	CB around T-S line	-0.0587	0.112	Background	No Exceedance
MW-E	UA	A6R	Lithium, total	mg/L	01/27/2016 - 06/14/2023	20	20	CB around T-S line	-0.0588	0.112	Background	No Exceedance
MW-E	UA	A6	Mercury, total	mg/L	01/27/2016 - 03/22/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-E	UA	A6R	Mercury, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-E	UA	A6	Molybdenum, total	mg/L	01/27/2016 - 03/22/2023	18	67	CI around median	0.005	0.1	MCL/HBL	No Exceedance
MW-E	UA	A6R	Molybdenum, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--

TABLE 6
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2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-E	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/27/2016 - 03/22/2023	19	0	CI around mean	0.931	5	MCL/HBL	No Exceedance
MW-E	UA	A6R	Radium 226 + Radium 228, total	pCi/L	--	--	--	--	--	5	MCL/HBL	--
MW-E	UA	A6	Selenium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance
MW-E	UA	A6R	Selenium, total	mg/L	--	--	--	--	--	0.05	MCL/HBL	--
MW-E	UA	A6	Thallium, total	mg/L	01/27/2016 - 03/22/2023	13	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance
MW-E	UA	A6R	Thallium, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-F	UA	A6	Antimony, total	mg/L	01/28/2016 - 03/22/2023	14	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-F	UA	A6R	Antimony, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-F	UA	A6	Arsenic, total	mg/L	01/28/2016 - 03/22/2023	20	75	CI around median	0.001	0.010	MCL/HBL	No Exceedance
MW-F	UA	A6R	Arsenic, total	mg/L	--	--	--	--	--	0.010	MCL/HBL	--
MW-F	UA	A6	Barium, total	mg/L	01/28/2016 - 03/22/2023	20	5.0	CB around T-S line	-0.121	2.0	MCL/HBL	No Exceedance
MW-F	UA	A6R	Barium, total	mg/L	--	--	--	--	--	2.0	MCL/HBL	--
MW-F	UA	A6	Beryllium, total	mg/L	01/28/2016 - 03/22/2023	19	95	CI around median	0.001	0.004	MCL/HBL	No Exceedance
MW-F	UA	A6R	Beryllium, total	mg/L	--	--	--	--	--	0.004	MCL/HBL	--
MW-F	UA	A6	Cadmium, total	mg/L	01/28/2016 - 03/22/2023	19	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-F	UA	A6R	Cadmium, total	mg/L	--	--	--	--	--	0.005	MCL/HBL	--
MW-F	UA	A6	Chromium, total	mg/L	01/28/2016 - 03/22/2023	20	75	CB around T-S line	-0.022	0.1	MCL/HBL	No Exceedance
MW-F	UA	A6R	Chromium, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-F	UA	A6	Cobalt, total	mg/L	01/28/2016 - 03/22/2023	19	68	CI around median	0.000653	0.006	MCL/HBL	No Exceedance
MW-F	UA	A6R	Cobalt, total	mg/L	--	--	--	--	--	0.006	MCL/HBL	--
MW-F	UA	A6	Fluoride, total	mg/L	01/28/2016 - 03/22/2023	21	48	CI around median	0.674	4.0	MCL/HBL	No Exceedance
MW-F	UA	A6R	Fluoride, total	mg/L	--	--	--	--	--	4.0	MCL/HBL	--
MW-F	UA	A6	Lead, total	mg/L	01/28/2016 - 03/22/2023	19	68	CI around median	0.001	0.015	MCL/HBL	No Exceedance
MW-F	UA	A6R	Lead, total	mg/L	--	--	--	--	--	0.015	MCL/HBL	--
MW-F	UA	A6	Lithium, total	mg/L	01/28/2016 - 03/22/2023	20	0	CB around linear reg	0.0803	0.112	Background	No Exceedance
MW-F	UA	A6R	Lithium, total	mg/L	01/28/2016 - 06/14/2023	21	0	CB around linear reg	0.096	0.112	Background	No Exceedance
MW-F	UA	A6	Mercury, total	mg/L	01/28/2016 - 03/22/2023	15	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-F	UA	A6R	Mercury, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-F	UA	A6	Molybdenum, total	mg/L	01/28/2016 - 03/22/2023	19	100	All ND - Last	0.005	0.1	MCL/HBL	No Exceedance
MW-F	UA	A6R	Molybdenum, total	mg/L	--	--	--	--	--	0.1	MCL/HBL	--
MW-F	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/28/2016 - 03/22/2023	19	0	CI around geomean	1.31	5	MCL/HBL	No Exceedance
MW-F	UA	A6R	Radium 226 + Radium 228, total	pCi/L	--	--	--	--	--	5	MCL/HBL	--
MW-F	UA	A6	Selenium, total	mg/L	01/28/2016 - 03/22/2023	19	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance
MW-F	UA	A6R	Selenium, total	mg/L	--	--	--	--	--	0.05	MCL/HBL	--
MW-F	UA	A6	Thallium, total	mg/L	01/28/2016 - 03/22/2023	14	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance
MW-F	UA	A6R	Thallium, total	mg/L	--	--	--	--	--	0.002	MCL/HBL	--
MW-G	UA	A6	Antimony, total	mg/L	01/27/2016 - 03/21/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-G	UA	A6	Arsenic, total	mg/L	01/27/2016 - 03/21/2023	19	37	CB around T-S line	-0.00197	0.010	MCL/HBL	No Exceedance
MW-G	UA	A6	Barium, total	mg/L	01/27/2016 - 03/21/2023	19	0	CI around mean	0.416	2.0	MCL/HBL	No Exceedance
MW-G	UA	A6	Beryllium, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-G	UA	A6	Cadmium, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-G	UA	A6	Chromium, total	mg/L	01/27/2016 - 03/21/2023	19	100	All ND - Last	0.002	0.1	MCL/HBL	No Exceedance
MW-G	UA	A6	Cobalt, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.006	MCL/HBL	No Exceedance
MW-G	UA	A6	Fluoride, total	mg/L	01/27/2016 - 03/21/2023	20	55	CI around median	0.434	4.0	MCL/HBL	No Exceedance
MW-G	UA	A6	Lead, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.015	MCL/HBL	No Exceedance
MW-G	UA	A6	Lithium, total	mg/L	01/27/2016 - 03/21/2023	19	37	CI around mean	0.0353	0.112	Background	No Exceedance
MW-G	UA	A6	Mercury, total	mg/L	01/27/2016 - 03/21/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-G	UA	A6	Molybdenum, total	mg/L	01/27/2016 - 03/21/2023	18	94	CI around median	0.005	0.1	MCL/HBL	No Exceedance
MW-G	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/27/2016 - 03/21/2023	19	0	CI around mean	1.08	5	MCL/HBL	No Exceedance
MW-G	UA	A6	Selenium, total	mg/L	01/27/2016 - 03/21/2023	18	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance
MW-G	UA	A6	Thallium, total	mg/L	01/27/2016 - 03/21/2023	13	92	CB around T-S line	0.001	0.002	MCL/HBL	No Exceedance
MW-H	UA	A6	Antimony, total	mg/L	01/27/2016 - 03/22/2023	13	100	All ND - Last	0.004	0.006	MCL/HBL	No Exceedance
MW-H	UA	A6	Arsenic, total	mg/L	01/27/2016 - 03/22/2023	19	58	CI around median	0.00105	0.010	MCL/HBL	No Exceedance
MW-H	UA	A6	Barium, total	mg/L	01/27/2016 - 03/22/2023	19	11	CI around median	0.103	2.0	MCL/HBL	No Exceedance

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Well ID	HSU	Event ID	Parameter	Units	Date Range	Sample Count	Percent ND	Statistical Calculation	Statistical Result	GWPS	GWPS Source	SSL Type
MW-H	UA	A6	Beryllium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.004	MCL/HBL	No Exceedance
MW-H	UA	A6	Cadmium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.001	0.005	MCL/HBL	No Exceedance
MW-H	UA	A6	Chromium, total	mg/L	01/27/2016 - 03/22/2023	19	89	CI around median	0.002	0.1	MCL/HBL	No Exceedance
MW-H	UA	A6	Cobalt, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.006	MCL/HBL	No Exceedance
MW-H	UA	A6	Fluoride, total	mg/L	01/27/2016 - 03/22/2023	20	55	CI around median	0.438	4.0	MCL/HBL	No Exceedance
MW-H	UA	A6	Lead, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.015	MCL/HBL	No Exceedance
MW-H	UA	A6	Lithium, total	mg/L	01/27/2016 - 03/22/2023	19	37	CI around median	0.0339	0.112	Background	No Exceedance
MW-H	UA	A6	Mercury, total	mg/L	01/27/2016 - 03/22/2023	14	100	All ND - Last	0.0002	0.002	MCL/HBL	No Exceedance
MW-H	UA	A6	Molybdenum, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.005	0.1	MCL/HBL	No Exceedance
MW-H	UA	A6	Radium 226 + Radium 228, total	pCi/L	01/27/2016 - 03/22/2023	17	0	CI around mean	0.351	5	MCL/HBL	No Exceedance
MW-H	UA	A6	Selenium, total	mg/L	01/27/2016 - 03/22/2023	18	100	All ND - Last	0.002	0.05	MCL/HBL	No Exceedance
MW-H	UA	A6	Thallium, total	mg/L	01/27/2016 - 03/22/2023	13	100	All ND - Last	0.002	0.002	MCL/HBL	No Exceedance

TABLE 6
DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS
2023 40 C.F.R. § 257 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT
LANDFILL
MOSCOW, OH

Notes:
Only SSLs determined in 2023 (see Table A) for 40 C.F.R. § 257 are included
– = no data available
Statistically Significant Level (SSL) Type:

No Exceedance: No exceedance of the GWPS and no resample was collected.

Confirmed: An exceedance was determined with comparison to a resample. If a determined exceedance is confirmed by resample, both the sample and resample are noted as confirmed.

GWPS = Groundwater Protection Standard
GWPS Source:

Background = background concentration

MCL/HBL = maximum contaminant level/health-based level

HSU = hydrostratigraphic unit:

UA = Uppermost Aquifer

ID = identification
mg/L = milligrams per liter
ND = non-detect
pCi/L = picocuries per liter
R = resample
Sample Count = number of samples from Sampled Date Range used to calculate the Statistical Result
Statistical Calculation = method used to calculate the statistical result:

All ND - Last = All results were below the reporting limit, and the last determined reporting limit is shown
CB around T-S line = Confidence band around Thiel-Sen line
CB around linear reg = Confidence band around linear regression
CI around geomean = Confidence interval around the geometric mean
CI around mean = Confidence interval around the mean
CI around median = Confidence interval around the median

Statistical Result = calculated in accordance with Statistical Analysis Plan using constituent concentrations observed at monitoring well during all sampling events within the specified date range

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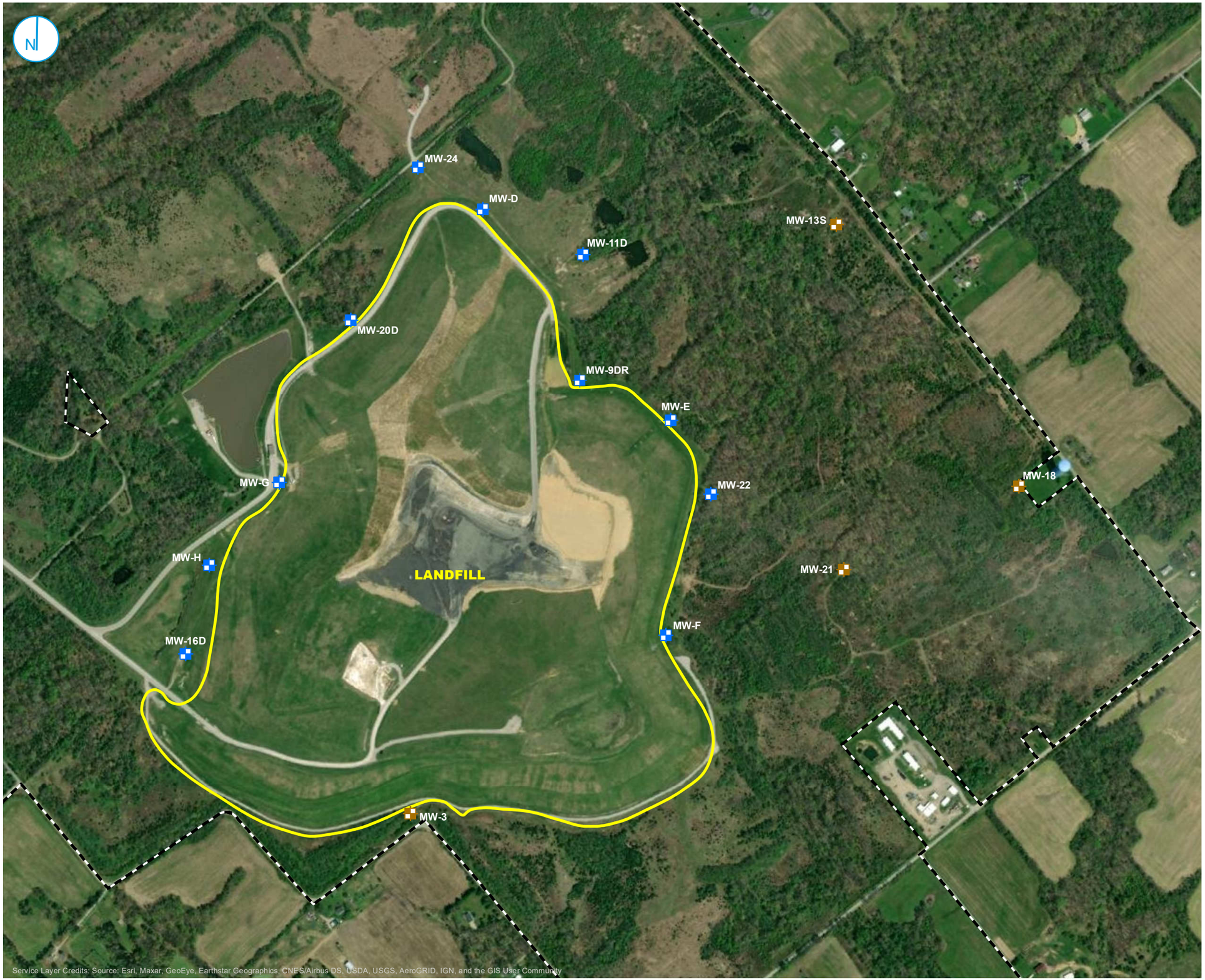
FIGURES



BACKGROUND WELL
COMPLIANCE WELL
REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 300 600
Feet

MONITORING WELL LOCATION MAP

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
LANDFILL
ZIMMER POWER PLANT
MOSCOW, OHIO

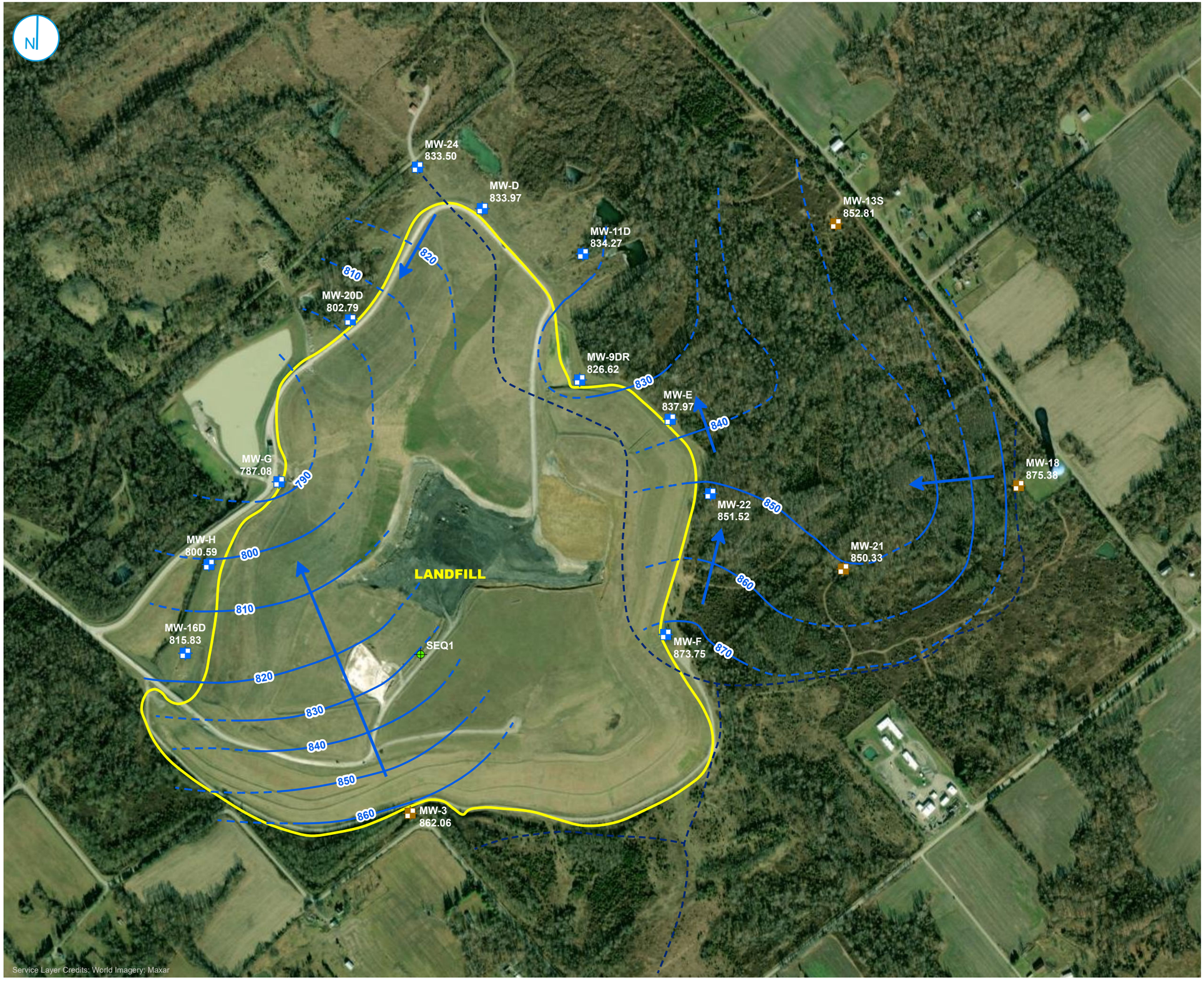
FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\Mapping\Projects\22\22851\MXD\2021_AnnualGWM_CAR\Zimmer\LF_122\Figure 1 ZIM LF MW Location Map.mxd

PROJECT: 169000XXXX | DATED: 12/30/2021 | DESIGNER: galammc



- COMPLIANCE MONITORING WELL
- BACKGROUND MONITORING WELL
- LEACHATE WELL
- GROUNDWATER ELEVATION CONTOUR (10-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER DIVIDE
- REGULATED UNIT (SUBJECT UNIT)
- PROPERTY BOUNDARY

NOTES:
1. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

0 300 600 Feet

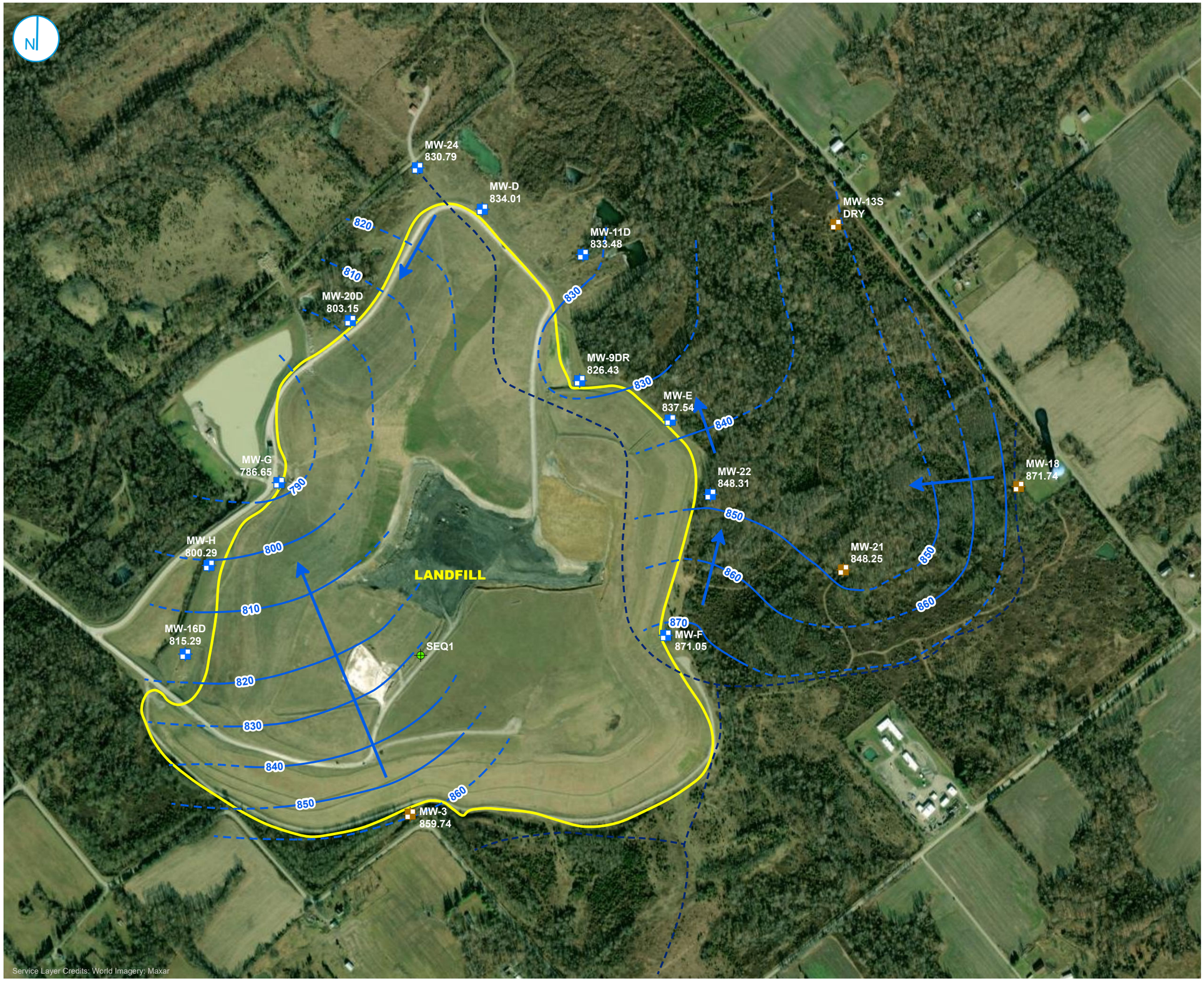
POTENTIOMETRIC SURFACE MAP MARCH 20, 2023

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
LANDFILL
ZIMMER POWER PLANT
MOSCOW, OHIO

FIGURE 2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



- COMPLIANCE MONITORING WELL
- BACKGROUND MONITORING WELL
- LEACHATE WELL
- GROUNDWATER ELEVATION CONTOUR (10-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER DIVIDE
- REGULATED UNIT (SUBJECT UNIT)
- PROPERTY BOUNDARY

NOTES:
1. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

0 300 600 Feet

POTENTIOMETRIC SURFACE MAP SEPTEMBER 18, 2023

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
LANDFILL
ZIMMER POWER PLANT
MOSCOW, OHIO

FIGURE 3

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

APPENDICES

APPENDIX A
LABORATORY REPORTS AND FIELD DATA SHEETS

Pace Analytical®

ANALYTICAL REPORT

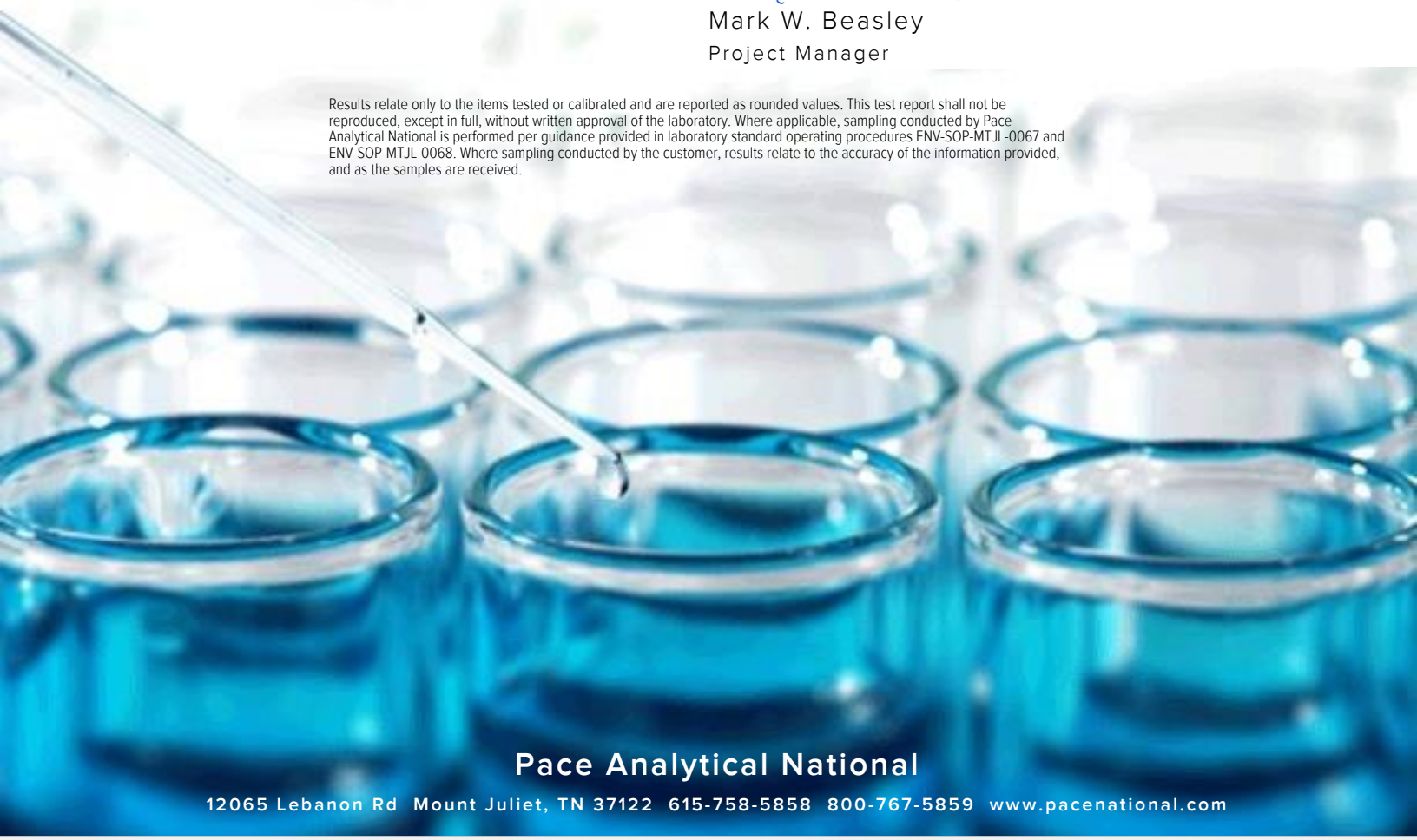
March 30, 2023

S&ME - Nashville, TN

Sample Delivery Group:	L1597585
Samples Received:	03/23/2023
Project Number:	7217-17-001D
Description:	Zimmer Station
Site:	WHZ UNIT 122 (LANDFILL)
Report To:	Vince Epps 862 East Crescentville Road Cincinnati, OH 45246

Entire Report Reviewed By:

Mark W. Beasley
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

MW-03 L1597585-01 GW

Collected by: Carter H | Collected date/time: 03/22/23 12:30 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 15:15	03/28/23 15:15	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	1	03/29/23 09:56	03/29/23 09:56	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	10	03/29/23 10:10	03/29/23 10:10	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030401	1	03/28/23 17:37	03/29/23 10:06	SRT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 19:41	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:39	03/29/23 12:53	JPD	Mt. Juliet, TN

MW-09DR L1597585-02 GW

Collected by: Carter H | Collected date/time: 03/22/23 10:15 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 15:20	03/28/23 15:20	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	1	03/29/23 10:23	03/29/23 10:23	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	10	03/29/23 10:37	03/29/23 10:37	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030401	1	03/28/23 17:37	03/29/23 10:08	SRT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 19:44	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	5	03/24/23 10:39	03/27/23 20:35	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:39	03/29/23 12:57	JPD	Mt. Juliet, TN

MW-11D L1597585-03 GW

Collected by: Carter H | Collected date/time: 03/22/23 11:05 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 15:25	03/28/23 15:25	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	1	03/29/23 10:50	03/29/23 10:50	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030401	1	03/28/23 17:37	03/29/23 09:28	SRT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 19:00	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:39	03/29/23 12:02	JPD	Mt. Juliet, TN

MW-13S L1597585-04 GW

Collected by: Carter H | Collected date/time: 03/22/23 13:00 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 15:41	03/28/23 15:41	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	1	03/29/23 11:44	03/29/23 11:44	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030401	1	03/28/23 17:37	03/29/23 10:11	SRT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 19:48	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:39	03/29/23 13:00	JPD	Mt. Juliet, TN

MW-16D L1597585-05 GW

Collected by: Carter H | Collected date/time: 03/20/23 16:15 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029488	1	03/25/23 09:17	03/25/23 10:02	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 15:47	03/28/23 15:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	1	03/29/23 12:51	03/29/23 12:51	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030401	1	03/28/23 17:37	03/29/23 10:31	SRT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 19:51	LD	Mt. Juliet, TN

SAMPLE SUMMARY

MW-16D L1597585-05 GW

Collected by: Carter H | Collected date/time: 03/20/23 16:15 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020	WG2029251	10	03/24/23 10:39	03/27/23 20:38	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:39	03/29/23 13:03	JPD	Mt. Juliet, TN

MW-18 L1597585-06 GW

Collected by: Carter H | Collected date/time: 03/22/23 13:40 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 15:52	03/28/23 15:52	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031537	1	03/29/23 13:04	03/29/23 13:04	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030401	1	03/28/23 17:37	03/29/23 10:33	SRT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 19:54	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:39	03/29/23 13:07	JPD	Mt. Juliet, TN

MW-20D L1597585-07 GW

Collected by: Carter H | Collected date/time: 03/21/23 11:45 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 15:57	03/28/23 15:57	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 03:40	03/29/23 03:40	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:00	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 19:58	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	5	03/24/23 10:39	03/27/23 20:42	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:41	03/29/23 13:10	JPD	Mt. Juliet, TN

MW-21 L1597585-08 GW

Collected by: Carter H | Collected date/time: 03/22/23 09:05 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 16:01	03/28/23 16:01	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 03:53	03/29/23 03:53	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:09	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 20:01	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	10	03/24/23 10:39	03/27/23 22:01	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:44	03/29/23 13:21	JPD	Mt. Juliet, TN

MW-22 L1597585-09 GW

Collected by: Carter H | Collected date/time: 03/22/23 14:50 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 16:06	03/28/23 16:06	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 04:19	03/29/23 04:19	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:11	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 20:15	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	5	03/24/23 10:39	03/28/23 10:43	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:44	03/29/23 13:24	JPD	Mt. Juliet, TN

SAMPLE SUMMARY

MW-24 L1597585-10 GW

Collected by: Carter H | Collected date/time: 03/21/23 12:40 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 16:11	03/28/23 16:11	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 04:45	03/29/23 04:45	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:13	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 20:18	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:44	03/29/23 13:27	JPD	Mt. Juliet, TN

MW-D L1597585-11 GW

Collected by: Carter H | Collected date/time: 03/21/23 14:35 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 16:17	03/28/23 16:17	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 05:23	03/29/23 05:23	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:15	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 20:21	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	50	03/24/23 10:39	03/28/23 10:47	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:41	03/29/23 13:30	JPD	Mt. Juliet, TN

MW-E L1597585-12 GW

Collected by: Carter H | Collected date/time: 03/22/23 14:40 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2029579	1	03/25/23 05:12	03/25/23 06:22	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 16:22	03/28/23 16:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 06:15	03/29/23 06:15	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:17	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 20:25	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	10	03/24/23 10:39	03/28/23 10:50	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031519	1	03/28/23 15:44	03/29/23 13:34	JPD	Mt. Juliet, TN

MW-F L1597585-13 GW

Collected by: Carter H | Collected date/time: 03/22/23 10:55 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2030627	1	03/27/23 16:43	03/27/23 21:57	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 16:38	03/28/23 16:38	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 06:28	03/29/23 06:28	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	10	03/29/23 06:41	03/29/23 06:41	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:19	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 20:29	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	50	03/24/23 10:39	03/28/23 10:53	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031061	1	03/28/23 09:40	03/29/23 13:15	SJM	Mt. Juliet, TN

MW-G L1597585-14 GW

Collected by: Carter H | Collected date/time: 03/21/23 09:35 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2030515	1	03/27/23 11:03	03/27/23 14:41	AS	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031151	1	03/28/23 16:43	03/28/23 16:43	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 06:54	03/29/23 06:54	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:21	AKB	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

SAMPLE SUMMARY

MW-G L1597585-14 GW

Collected by: Carter H | Collected date/time: 03/21/23 09:35 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020	WG2029251	1	03/24/23 10:39	03/27/23 20:32	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029251	10	03/24/23 10:39	03/28/23 10:57	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031061	1	03/28/23 09:40	03/29/23 13:18	SJM	Mt. Juliet, TN

MW-H L1597585-15 GW

Collected by: Carter H | Collected date/time: 03/22/23 13:40 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2030627	1	03/27/23 16:43	03/27/23 21:57	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031278	1	03/29/23 13:21	03/29/23 13:21	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 07:07	03/29/23 07:07	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:23	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	1	03/27/23 13:38	03/28/23 12:02	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	5	03/27/23 13:38	03/28/23 11:32	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031521	1	03/29/23 08:30	03/29/23 14:04	JPD	Mt. Juliet, TN

SEQ1 LEACHATE L1597585-16 GW

Collected by: Carter H | Collected date/time: 03/21/23 10:10 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2030515	1	03/27/23 11:03	03/27/23 14:41	AS	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031278	1	03/29/23 13:25	03/29/23 13:25	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	10	03/29/23 07:20	03/29/23 07:20	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	100	03/29/23 07:58	03/29/23 07:58	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:25	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	10	03/27/23 13:38	03/28/23 12:05	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	100	03/27/23 13:38	03/28/23 11:35	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031521	10	03/29/23 08:30	03/29/23 14:07	JPD	Mt. Juliet, TN

DUP-1 L1597585-17 GW

Collected by: Carter H | Collected date/time: 03/21/23 00:00 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2030515	1	03/27/23 11:03	03/27/23 14:41	AS	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031278	1	03/29/23 13:30	03/29/23 13:30	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 08:11	03/29/23 08:11	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:27	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	1	03/27/23 13:38	03/28/23 12:08	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	50	03/27/23 13:38	03/28/23 11:39	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031521	1	03/29/23 08:30	03/29/23 14:10	JPD	Mt. Juliet, TN

DUP-2 L1597585-18 GW

Collected by: Carter H | Collected date/time: 03/22/23 00:00 | Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2030627	1	03/27/23 16:43	03/27/23 21:57	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2031278	1	03/29/23 13:36	03/29/23 13:36	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2031539	1	03/29/23 08:24	03/29/23 08:24	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2030402	1	03/28/23 09:31	03/28/23 19:33	AKB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	1	03/27/23 13:38	03/28/23 12:11	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2029252	5	03/27/23 13:38	03/28/23 11:42	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2031521	1	03/29/23 08:30	03/29/23 13:50	JPD	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1030000		20000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	318000		8450	20000	1	03/28/2023 15:15	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 15:15	WG2031151

Sample Narrative:

L1597585-01 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	248000		3790	10000	10	03/29/2023 10:10	WG2031537
Fluoride	158	B	64.0	150	1	03/29/2023 09:56	WG2031537
Sulfate	52300		594	5000	1	03/29/2023 09:56	WG2031537

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/29/2023 10:06	WG2030401

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 19:41	WG2029251
Arsenic	U		0.180	2.00	1	03/27/2023 19:41	WG2029251
Barium	56.5		0.381	2.00	1	03/27/2023 19:41	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 19:41	WG2029251
Boron	53.3		9.63	30.0	1	03/27/2023 19:41	WG2029251
Cadmium	0.499	J	0.150	1.00	1	03/27/2023 19:41	WG2029251
Calcium	201000		93.6	1000	1	03/27/2023 19:41	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 19:41	WG2029251
Cobalt	U		0.0596	2.00	1	03/27/2023 19:41	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 19:41	WG2029251
Magnesium	28400		73.5	1000	1	03/27/2023 19:41	WG2029251
Molybdenum	U		0.348	5.00	1	03/27/2023 19:41	WG2029251
Potassium	2100		108	2000	1	03/27/2023 19:41	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 19:41	WG2029251
Sodium	38200		376	2000	1	03/27/2023 19:41	WG2029251
Strontium	1490		0.590	10.0	1	03/27/2023 19:41	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 19:41	WG2029251
Lithium	11.5		0.695	2.00	1	03/29/2023 12:53	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	794000		20000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	492000		8450	20000	1	03/28/2023 15:20	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 15:20	WG2031151

Sample Narrative:

L1597585-02 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	224000		3790	10000	10	03/29/2023 10:37	WG2031537
Fluoride	302	B	64.0	150	1	03/29/2023 10:23	WG2031537
Sulfate	940	J	594	5000	1	03/29/2023 10:23	WG2031537

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/29/2023 10:08	WG2030401

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 19:44	WG2029251
Arsenic	3.50		0.180	2.00	1	03/27/2023 19:44	WG2029251
Barium	582		0.381	2.00	1	03/27/2023 19:44	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 19:44	WG2029251
Boron	923		48.2	150	5	03/27/2023 20:35	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 19:44	WG2029251
Calcium	85500		93.6	1000	1	03/27/2023 19:44	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 19:44	WG2029251
Cobalt	1.30	J	0.0596	2.00	1	03/27/2023 19:44	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 19:44	WG2029251
Magnesium	36500		73.5	1000	1	03/27/2023 19:44	WG2029251
Molybdenum	U		0.348	5.00	1	03/27/2023 19:44	WG2029251
Potassium	6920		108	2000	1	03/27/2023 19:44	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 19:44	WG2029251
Sodium	194000		376	2000	1	03/27/2023 19:44	WG2029251
Strontium	2790		0.590	10.0	1	03/27/2023 19:44	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 19:44	WG2029251
Lithium	47.1		0.695	2.00	1	03/29/2023 12:57	WG2031519

MW-11D

SAMPLE RESULTS - 03

Collected date/time: 03/22/23 11:05

L1597585

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	365000		10000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	374000		8450	20000	1	03/28/2023 15:25	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 15:25	WG2031151

Sample Narrative:

L1597585-03 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	5810		379	1000	1	03/29/2023 10:50	WG2031537
Fluoride	292	B	64.0	150	1	03/29/2023 10:50	WG2031537
Sulfate	11300		594	5000	1	03/29/2023 10:50	WG2031537

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/29/2023 09:28	WG2030401

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 19:00	WG2029251
Arsenic	2.14		0.180	2.00	1	03/27/2023 19:00	WG2029251
Barium	164		0.381	2.00	1	03/27/2023 19:00	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 19:00	WG2029251
Boron	165		9.63	30.0	1	03/27/2023 19:00	WG2029251
Cadmium	0.518	J	0.150	1.00	1	03/27/2023 19:00	WG2029251
Calcium	74600		93.6	1000	1	03/27/2023 19:00	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 19:00	WG2029251
Cobalt	0.0726	J	0.0596	2.00	1	03/27/2023 19:00	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 19:00	WG2029251
Magnesium	34800	V	73.5	1000	1	03/27/2023 19:00	WG2029251
Molybdenum	0.485	J	0.348	5.00	1	03/27/2023 19:00	WG2029251
Potassium	880	J	108	2000	1	03/27/2023 19:00	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 19:00	WG2029251
Sodium	18900		376	2000	1	03/27/2023 19:00	WG2029251
Strontium	1000	V	0.590	10.0	1	03/27/2023 19:00	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 19:00	WG2029251
Lithium	6.89		0.695	2.00	1	03/29/2023 12:02	WG2031519

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	349000		10000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	189000		8450	20000	1	03/28/2023 15:41	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 15:41	WG2031151

Sample Narrative:

L1597585-04 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	86200		379	1000	1	03/29/2023 11:44	WG2031537
Fluoride	278	B	64.0	150	1	03/29/2023 11:44	WG2031537
Sulfate	27300		594	5000	1	03/29/2023 11:44	WG2031537

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/29/2023 10:11	WG2030401

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 19:48	WG2029251
Arsenic	U		0.180	2.00	1	03/27/2023 19:48	WG2029251
Barium	32.8		0.381	2.00	1	03/27/2023 19:48	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 19:48	WG2029251
Boron	16.9	J	9.63	30.0	1	03/27/2023 19:48	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 19:48	WG2029251
Calcium	78700		93.6	1000	1	03/27/2023 19:48	WG2029251
Chromium	1.51	J	1.24	2.00	1	03/27/2023 19:48	WG2029251
Cobalt	0.0864	J	0.0596	2.00	1	03/27/2023 19:48	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 19:48	WG2029251
Magnesium	17200		73.5	1000	1	03/27/2023 19:48	WG2029251
Molybdenum	U		0.348	5.00	1	03/27/2023 19:48	WG2029251
Potassium	197	J	108	2000	1	03/27/2023 19:48	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 19:48	WG2029251
Sodium	33000		376	2000	1	03/27/2023 19:48	WG2029251
Strontium	242		0.590	10.0	1	03/27/2023 19:48	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 19:48	WG2029251
Lithium	5.60		0.695	2.00	1	03/29/2023 13:00	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	493000		10000	1	03/25/2023 10:02	WG2029488

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	444000		8450	20000	1	03/28/2023 15:47	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 15:47	WG2031151

Sample Narrative:

L1597585-05 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	54700		379	1000	1	03/29/2023 12:51	WG2031537
Fluoride	549	B	64.0	150	1	03/29/2023 12:51	WG2031537
Sulfate	627	J	594	5000	1	03/29/2023 12:51	WG2031537

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/29/2023 10:31	WG2030401

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 19:51	WG2029251
Arsenic	7.23		0.180	2.00	1	03/27/2023 19:51	WG2029251
Barium	111		0.381	2.00	1	03/27/2023 19:51	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 19:51	WG2029251
Boron	1310		96.3	300	10	03/27/2023 20:38	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 19:51	WG2029251
Calcium	52100		93.6	1000	1	03/27/2023 19:51	WG2029251
Chromium	1.36	J	1.24	2.00	1	03/27/2023 19:51	WG2029251
Cobalt	0.157	J	0.0596	2.00	1	03/27/2023 19:51	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 19:51	WG2029251
Magnesium	28500		73.5	1000	1	03/27/2023 19:51	WG2029251
Molybdenum	1.26	J	0.348	5.00	1	03/27/2023 19:51	WG2029251
Potassium	2370		108	2000	1	03/27/2023 19:51	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 19:51	WG2029251
Sodium	126000		376	2000	1	03/27/2023 19:51	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 19:51	WG2029251
Lithium	41.1		0.695	2.00	1	03/29/2023 13:03	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	707000		13300	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	407000		8450	20000	1	03/28/2023 15:52	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 15:52	WG2031151

Sample Narrative:

L1597585-06 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	18400		379	1000	1	03/29/2023 13:04	WG2031537
Fluoride	267	B	64.0	150	1	03/29/2023 13:04	WG2031537
Sulfate	189000		594	5000	1	03/29/2023 13:04	WG2031537

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/29/2023 10:33	WG2030401

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 19:54	WG2029251
Arsenic	U		0.180	2.00	1	03/27/2023 19:54	WG2029251
Barium	16.2		0.381	2.00	1	03/27/2023 19:54	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 19:54	WG2029251
Boron	106		9.63	30.0	1	03/27/2023 19:54	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 19:54	WG2029251
Calcium	104000		93.6	1000	1	03/27/2023 19:54	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 19:54	WG2029251
Cobalt	0.156	J	0.0596	2.00	1	03/27/2023 19:54	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 19:54	WG2029251
Magnesium	86500		73.5	1000	1	03/27/2023 19:54	WG2029251
Molybdenum	U		0.348	5.00	1	03/27/2023 19:54	WG2029251
Potassium	3100		108	2000	1	03/27/2023 19:54	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 19:54	WG2029251
Sodium	13700		376	2000	1	03/27/2023 19:54	WG2029251
Strontium	1130		0.590	10.0	1	03/27/2023 19:54	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 19:54	WG2029251
Lithium	86.2		0.695	2.00	1	03/29/2023 13:07	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	344000		10000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	305000		8450	20000	1	03/28/2023 15:57	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 15:57	WG2031151

Sample Narrative:

L1597585-07 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	19100		379	1000	1	03/29/2023 03:40	WG2031539
Fluoride	257		64.0	150	1	03/29/2023 03:40	WG2031539
Sulfate	19400		594	5000	1	03/29/2023 03:40	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:00	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 19:58	WG2029251
Arsenic	1.29	J	0.180	2.00	1	03/27/2023 19:58	WG2029251
Barium	137		0.381	2.00	1	03/27/2023 19:58	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 19:58	WG2029251
Boron	360		48.2	150	5	03/27/2023 20:42	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 19:58	WG2029251
Calcium	79400		93.6	1000	1	03/27/2023 19:58	WG2029251
Chromium	1.27	J	1.24	2.00	1	03/27/2023 19:58	WG2029251
Cobalt	0.205	J	0.0596	2.00	1	03/27/2023 19:58	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 19:58	WG2029251
Magnesium	18000		73.5	1000	1	03/27/2023 19:58	WG2029251
Molybdenum	5.35		0.348	5.00	1	03/27/2023 19:58	WG2029251
Potassium	2540		108	2000	1	03/27/2023 19:58	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 19:58	WG2029251
Sodium	33200		376	2000	1	03/27/2023 19:58	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 19:58	WG2029251
Lithium	14.5		0.695	2.00	1	03/29/2023 13:10	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	738000		20000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	412000		8450	20000	1	03/28/2023 16:01	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 16:01	WG2031151

Sample Narrative:

L1597585-08 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	164000		379	1000	1	03/29/2023 03:53	WG2031539
Fluoride	575		64.0	150	1	03/29/2023 03:53	WG2031539
Sulfate	72000		594	5000	1	03/29/2023 03:53	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:09	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 20:01	WG2029251
Arsenic	0.373	J	0.180	2.00	1	03/27/2023 20:01	WG2029251
Barium	77.5		0.381	2.00	1	03/27/2023 20:01	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 20:01	WG2029251
Boron	1450		96.3	300	10	03/27/2023 22:01	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 20:01	WG2029251
Calcium	87200		93.6	1000	1	03/27/2023 20:01	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 20:01	WG2029251
Cobalt	0.0720	J	0.0596	2.00	1	03/27/2023 20:01	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 20:01	WG2029251
Magnesium	29400		73.5	1000	1	03/27/2023 20:01	WG2029251
Molybdenum	0.353	J	0.348	5.00	1	03/27/2023 20:01	WG2029251
Potassium	8250		108	2000	1	03/27/2023 20:01	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 20:01	WG2029251
Sodium	170000		376	2000	1	03/27/2023 20:01	WG2029251
Strontium	3770		0.590	10.0	1	03/27/2023 20:01	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 20:01	WG2029251
Lithium	79.3		0.695	2.00	1	03/29/2023 13:21	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	571000		13300	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	417000		8450	20000	1	03/28/2023 16:06	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 16:06	WG2031151

Sample Narrative:

L1597585-09 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	35500		379	1000	1	03/29/2023 04:19	WG2031539
Fluoride	323		64.0	150	1	03/29/2023 04:19	WG2031539
Sulfate	96600		594	5000	1	03/29/2023 04:19	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:11	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 20:15	WG2029251
Arsenic	1.37	J	0.180	2.00	1	03/27/2023 20:15	WG2029251
Barium	50.3		0.381	2.00	1	03/27/2023 20:15	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 20:15	WG2029251
Boron	447		48.2	150	5	03/28/2023 10:43	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 20:15	WG2029251
Calcium	117000		93.6	1000	1	03/27/2023 20:15	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 20:15	WG2029251
Cobalt	0.117	J	0.0596	2.00	1	03/27/2023 20:15	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 20:15	WG2029251
Magnesium	35200		73.5	1000	1	03/27/2023 20:15	WG2029251
Molybdenum	0.356	J	0.348	5.00	1	03/27/2023 20:15	WG2029251
Potassium	3090		108	2000	1	03/27/2023 20:15	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 20:15	WG2029251
Sodium	49800		376	2000	1	03/27/2023 20:15	WG2029251
Strontium	1660		0.590	10.0	1	03/27/2023 20:15	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 20:15	WG2029251
Lithium	23.3		0.695	2.00	1	03/29/2023 13:24	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	274000		10000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	257000		8450	20000	1	03/28/2023 16:11	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 16:11	WG2031151

Sample Narrative:

L1597585-10 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	4640		379	1000	1	03/29/2023 04:45	WG2031539
Fluoride	296		64.0	150	1	03/29/2023 04:45	WG2031539
Sulfate	19400		594	5000	1	03/29/2023 04:45	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:13	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 20:18	WG2029251
Arsenic	0.186	J	0.180	2.00	1	03/27/2023 20:18	WG2029251
Barium	47.6		0.381	2.00	1	03/27/2023 20:18	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 20:18	WG2029251
Boron	114		9.63	30.0	1	03/27/2023 20:18	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 20:18	WG2029251
Calcium	61900		93.6	1000	1	03/27/2023 20:18	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 20:18	WG2029251
Cobalt	U		0.0596	2.00	1	03/27/2023 20:18	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 20:18	WG2029251
Magnesium	21400		73.5	1000	1	03/27/2023 20:18	WG2029251
Molybdenum	U		0.348	5.00	1	03/27/2023 20:18	WG2029251
Potassium	1440	J	108	2000	1	03/27/2023 20:18	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 20:18	WG2029251
Sodium	13000		376	2000	1	03/27/2023 20:18	WG2029251
Strontium	426		0.590	10.0	1	03/27/2023 20:18	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 20:18	WG2029251
Lithium	14.6		0.695	2.00	1	03/29/2023 13:27	WG2031519

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	507000		10000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	406000		8450	20000	1	03/28/2023 16:17	WG2031151
Alkalinity,Carbonate	21900		8450	20000	1	03/28/2023 16:17	WG2031151

Sample Narrative:

L1597585-11 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	24200		379	1000	1	03/29/2023 05:23	WG2031539
Fluoride	1910		64.0	150	1	03/29/2023 05:23	WG2031539
Sulfate	12300		594	5000	1	03/29/2023 05:23	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:15	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 20:21	WG2029251
Arsenic	0.320	J	0.180	2.00	1	03/27/2023 20:21	WG2029251
Barium	27.9		0.381	2.00	1	03/27/2023 20:21	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 20:21	WG2029251
Boron	4570		482	1500	50	03/28/2023 10:47	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 20:21	WG2029251
Calcium	3200		93.6	1000	1	03/27/2023 20:21	WG2029251
Chromium	1.47	J	1.24	2.00	1	03/27/2023 20:21	WG2029251
Cobalt	U		0.0596	2.00	1	03/27/2023 20:21	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 20:21	WG2029251
Magnesium	1100		73.5	1000	1	03/27/2023 20:21	WG2029251
Molybdenum	U		0.348	5.00	1	03/27/2023 20:21	WG2029251
Potassium	5280		108	2000	1	03/27/2023 20:21	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 20:21	WG2029251
Sodium	211000		376	2000	1	03/27/2023 20:21	WG2029251
Strontium	283		0.590	10.0	1	03/27/2023 20:21	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 20:21	WG2029251
Lithium	116		0.695	2.00	1	03/29/2023 13:30	WG2031519

MW-E SAMPLE RESULTS - 12

Client Sample ID: MW-E Project ID: 7217-17-001D Lab Sample ID: L1597585-12

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	344000		10000	1	03/25/2023 06:22	WG2029579

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	308000		8450	20000	1	03/28/2023 16:22	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 16:22	WG2031151

Sample Narrative:

L1597585-12 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	17200		379	1000	1	03/29/2023 06:15	WG2031539
Fluoride	703		64.0	150	1	03/29/2023 06:15	WG2031539
Sulfate	18800		594	5000	1	03/29/2023 06:15	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:17	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 20:25	WG2029251
Arsenic	0.200	J	0.180	2.00	1	03/27/2023 20:25	WG2029251
Barium	190		0.381	2.00	1	03/27/2023 20:25	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 20:25	WG2029251
Boron	880		96.3	300	10	03/28/2023 10:50	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 20:25	WG2029251
Calcium	52300		93.6	1000	1	03/27/2023 20:25	WG2029251
Chromium	1.27	J	1.24	2.00	1	03/27/2023 20:25	WG2029251
Cobalt	0.202	J	0.0596	2.00	1	03/27/2023 20:25	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 20:25	WG2029251
Magnesium	23300		73.5	1000	1	03/27/2023 20:25	WG2029251
Molybdenum	1.22	J	0.348	5.00	1	03/27/2023 20:25	WG2029251
Potassium	5980		108	2000	1	03/27/2023 20:25	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 20:25	WG2029251
Sodium	55500		376	2000	1	03/27/2023 20:25	WG2029251
Strontium	2290		0.590	10.0	1	03/27/2023 20:25	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 20:25	WG2029251
Lithium	32.7		0.695	2.00	1	03/29/2023 13:34	WG2031519

SAMPLE RESULTS - 13

MW-F

Collected date/time: 03/22/23 10:55 L1597585

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1390000		50000	1	03/27/2023 21:57	WG2030627

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	359000		8450	20000	1	03/28/2023 16:38	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 16:38	WG2031151

Sample Narrative:

L1597585-13 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	546000		3790	10000	10	03/29/2023 06:41	WG2031539
Fluoride	912		64.0	150	1	03/29/2023 06:28	WG2031539
Sulfate	157000		594	5000	1	03/29/2023 06:28	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:19	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 20:29	WG2029251
Arsenic	0.457	J	0.180	2.00	1	03/27/2023 20:29	WG2029251
Barium	36.7		0.381	2.00	1	03/27/2023 20:29	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 20:29	WG2029251
Boron	4560		482	1500	50	03/28/2023 10:53	WG2029251
Cadmium	0.334	J	0.150	1.00	1	03/27/2023 20:29	WG2029251
Calcium	96300		93.6	1000	1	03/27/2023 20:29	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 20:29	WG2029251
Cobalt	0.303	J	0.0596	2.00	1	03/27/2023 20:29	WG2029251
Lead	2.04		0.849	2.00	1	03/27/2023 20:29	WG2029251
Magnesium	41100		73.5	1000	1	03/27/2023 20:29	WG2029251
Molybdenum	1.94	J	0.348	5.00	1	03/27/2023 20:29	WG2029251
Potassium	13800		108	2000	1	03/27/2023 20:29	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 20:29	WG2029251
Sodium	406000		376	2000	1	03/27/2023 20:29	WG2029251
Strontium	5940		0.590	10.0	1	03/27/2023 20:29	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 20:29	WG2029251
Lithium	225		0.695	2.00	1	03/29/2023 13:15	WG2031061

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	678000		20000	1	03/27/2023 14:41	WG2030515

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	438000		8450	20000	1	03/28/2023 16:43	WG2031151
Alkalinity,Carbonate	U		8450	20000	1	03/28/2023 16:43	WG2031151

Sample Narrative:

L1597585-14 WG2031151: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	169000		379	1000	1	03/29/2023 06:54	WG2031539
Fluoride	444		64.0	150	1	03/29/2023 06:54	WG2031539
Sulfate	U		594	5000	1	03/29/2023 06:54	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:21	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/27/2023 20:32	WG2029251
Arsenic	1.99	J	0.180	2.00	1	03/27/2023 20:32	WG2029251
Barium	424		0.381	2.00	1	03/27/2023 20:32	WG2029251
Beryllium	U		0.190	2.00	1	03/27/2023 20:32	WG2029251
Boron	953		96.3	300	10	03/28/2023 10:57	WG2029251
Cadmium	U		0.150	1.00	1	03/27/2023 20:32	WG2029251
Calcium	67600		93.6	1000	1	03/27/2023 20:32	WG2029251
Chromium	U		1.24	2.00	1	03/27/2023 20:32	WG2029251
Cobalt	0.180	J	0.0596	2.00	1	03/27/2023 20:32	WG2029251
Lead	U		0.849	2.00	1	03/27/2023 20:32	WG2029251
Magnesium	23600		73.5	1000	1	03/27/2023 20:32	WG2029251
Molybdenum	1.02	J	0.348	5.00	1	03/27/2023 20:32	WG2029251
Potassium	4320		108	2000	1	03/27/2023 20:32	WG2029251
Selenium	U		0.300	2.00	1	03/27/2023 20:32	WG2029251
Sodium	184000		376	2000	1	03/27/2023 20:32	WG2029251
Thallium	U		0.121	2.00	1	03/27/2023 20:32	WG2029251
Lithium	35.9		0.695	2.00	1	03/29/2023 13:18	WG2031061

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	680000		13300	1	03/27/2023 21:57	WG2030627

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	450000		8450	20000	1	03/29/2023 13:21	WG2031278
Alkalinity,Carbonate	U		8450	20000	1	03/29/2023 13:21	WG2031278

Sample Narrative:

L1597585-15 WG2031278: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	117000		379	1000	1	03/29/2023 07:07	WG2031539
Fluoride	438		64.0	150	1	03/29/2023 07:07	WG2031539
Sulfate	22300		594	5000	1	03/29/2023 07:07	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:23	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/28/2023 12:02	WG2029252
Arsenic	0.757	J	0.180	2.00	1	03/28/2023 12:02	WG2029252
Barium	114		0.381	2.00	1	03/28/2023 12:02	WG2029252
Beryllium	U		0.190	2.00	1	03/28/2023 12:02	WG2029252
Boron	538		48.2	150	5	03/28/2023 11:32	WG2029252
Cadmium	U		0.150	1.00	1	03/28/2023 12:02	WG2029252
Calcium	112000		93.6	1000	1	03/28/2023 12:02	WG2029252
Chromium	U		1.24	2.00	1	03/28/2023 12:02	WG2029252
Cobalt	U		0.0596	2.00	1	03/28/2023 12:02	WG2029252
Lead	U		0.849	2.00	1	03/28/2023 12:02	WG2029252
Magnesium	46500		73.5	1000	1	03/28/2023 12:02	WG2029252
Molybdenum	U		0.348	5.00	1	03/28/2023 12:02	WG2029252
Potassium	2980		108	2000	1	03/28/2023 12:02	WG2029252
Selenium	U		0.300	2.00	1	03/28/2023 12:02	WG2029252
Sodium	71400		376	2000	1	03/28/2023 12:02	WG2029252
Thallium	U		0.121	2.00	1	03/28/2023 12:02	WG2029252
Lithium	34.1		0.695	2.00	1	03/29/2023 14:04	WG2031521

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	4020000		100000	1	03/27/2023 14:41	WG2030515

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	514000		8450	20000	1	03/29/2023 13:25	WG2031278
Alkalinity,Carbonate	142000		8450	20000	1	03/29/2023 13:25	WG2031278

Sample Narrative:

L1597585-16 WG2031278: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	1140000		3790	10000	10	03/29/2023 07:20	WG2031539
Fluoride	1070	J	640	1500	10	03/29/2023 07:20	WG2031539
Sulfate	2050000		59400	500000	100	03/29/2023 07:58	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	0.907		0.100	0.200	1	03/28/2023 19:25	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		10.3	40.0	10	03/28/2023 12:05	WG2029252
Arsenic	81.9		1.80	20.0	10	03/28/2023 12:05	WG2029252
Barium	57.4		3.81	20.0	10	03/28/2023 12:05	WG2029252
Beryllium	U		1.90	20.0	10	03/28/2023 12:05	WG2029252
Boron	16100		963	3000	100	03/28/2023 11:35	WG2029252
Cadmium	U		1.50	10.0	10	03/28/2023 12:05	WG2029252
Calcium	977000		936	10000	10	03/28/2023 12:05	WG2029252
Chromium	U		12.4	20.0	10	03/28/2023 12:05	WG2029252
Cobalt	U		0.596	20.0	10	03/28/2023 12:05	WG2029252
Lead	U		8.49	20.0	10	03/28/2023 12:05	WG2029252
Magnesium	13500		735	10000	10	03/28/2023 12:05	WG2029252
Molybdenum	105		3.48	50.0	10	03/28/2023 12:05	WG2029252
Potassium	400000		1080	20000	10	03/28/2023 12:05	WG2029252
Selenium	50.2		3.00	20.0	10	03/28/2023 12:05	WG2029252
Sodium	684000		3760	20000	10	03/28/2023 12:05	WG2029252
Strontium	7760		5.90	100	10	03/28/2023 12:05	WG2029252
Thallium	U		1.21	20.0	10	03/28/2023 12:05	WG2029252
Lithium	1880		6.95	20.0	10	03/29/2023 14:07	WG2031521

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	496000		10000	1	03/27/2023 14:41	WG2030515

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	383000		8450	20000	1	03/29/2023 13:30	WG2031278
Alkalinity,Carbonate	25000		8450	20000	1	03/29/2023 13:30	WG2031278

Sample Narrative:

L1597585-17 WG2031278: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	24400		379	1000	1	03/29/2023 08:11	WG2031539
Fluoride	2010		64.0	150	1	03/29/2023 08:11	WG2031539
Sulfate	12100		594	5000	1	03/29/2023 08:11	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:27	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/28/2023 12:08	WG2029252
Arsenic	0.278	J	0.180	2.00	1	03/28/2023 12:08	WG2029252
Barium	28.6		0.381	2.00	1	03/28/2023 12:08	WG2029252
Beryllium	U		0.190	2.00	1	03/28/2023 12:08	WG2029252
Boron	4920		482	1500	50	03/28/2023 11:39	WG2029252
Cadmium	U		0.150	1.00	1	03/28/2023 12:08	WG2029252
Calcium	3190		93.6	1000	1	03/28/2023 12:08	WG2029252
Chromium	U		1.24	2.00	1	03/28/2023 12:08	WG2029252
Cobalt	U		0.0596	2.00	1	03/28/2023 12:08	WG2029252
Lead	0.862	J	0.849	2.00	1	03/28/2023 12:08	WG2029252
Magnesium	1090		73.5	1000	1	03/28/2023 12:08	WG2029252
Molybdenum	U		0.348	5.00	1	03/28/2023 12:08	WG2029252
Potassium	5300		108	2000	1	03/28/2023 12:08	WG2029252
Selenium	U		0.300	2.00	1	03/28/2023 12:08	WG2029252
Sodium	209000		376	2000	1	03/28/2023 12:08	WG2029252
Strontium	296		0.590	10.0	1	03/28/2023 12:08	WG2029252
Thallium	U		0.121	2.00	1	03/28/2023 12:08	WG2029252
Lithium	120		0.695	2.00	1	03/29/2023 14:10	WG2031521

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	584000		13300	1	03/27/2023 21:57	WG2030627

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	400000		8450	20000	1	03/29/2023 13:36	WG2031278
Alkalinity,Carbonate	U		8450	20000	1	03/29/2023 13:36	WG2031278

Sample Narrative:

L1597585-18 WG2031278: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	34700		379	1000	1	03/29/2023 08:24	WG2031539
Fluoride	309		64.0	150	1	03/29/2023 08:24	WG2031539
Sulfate	96200		594	5000	1	03/29/2023 08:24	WG2031539

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	03/28/2023 19:33	WG2030402

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		1.03	4.00	1	03/28/2023 12:11	WG2029252
Arsenic	1.53	J	0.180	2.00	1	03/28/2023 12:11	WG2029252
Barium	52.1		0.381	2.00	1	03/28/2023 12:11	WG2029252
Beryllium	U		0.190	2.00	1	03/28/2023 12:11	WG2029252
Boron	470		48.2	150	5	03/28/2023 11:42	WG2029252
Cadmium	U		0.150	1.00	1	03/28/2023 12:11	WG2029252
Calcium	120000		93.6	1000	1	03/28/2023 12:11	WG2029252
Chromium	U		1.24	2.00	1	03/28/2023 12:11	WG2029252
Cobalt	0.0935	J	0.0596	2.00	1	03/28/2023 12:11	WG2029252
Lead	U		0.849	2.00	1	03/28/2023 12:11	WG2029252
Magnesium	34500		73.5	1000	1	03/28/2023 12:11	WG2029252
Molybdenum	U		0.348	5.00	1	03/28/2023 12:11	WG2029252
Potassium	3140		108	2000	1	03/28/2023 12:11	WG2029252
Selenium	U		0.300	2.00	1	03/28/2023 12:11	WG2029252
Sodium	48700		376	2000	1	03/28/2023 12:11	WG2029252
Strontium	1760		0.590	10.0	1	03/28/2023 12:11	WG2029252
Thallium	U		0.121	2.00	1	03/28/2023 12:11	WG2029252
Lithium	22.8		0.695	2.00	1	03/29/2023 13:50	WG2031521

L1597585-05

Method Blank (MB)

(MB) R3906492-1 03/25/23 10:02

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		10000	10000

L1596618-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1596618-01 03/25/23 10:02 • (DUP) R3906492-3 03/25/23 10:02

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	796000	806000	1	1.25		5

L1596819-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1596819-01 03/25/23 10:02 • (DUP) R3906492-4 03/25/23 10:02

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	5570000	5960000	1	6.76	J3	5

Laboratory Control Sample (LCS)

(LCS) R3906492-2 03/25/23 10:02

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	6840000	77.7	77.3-123	

Method Blank (MB)

(MB) R3906470-1 03/25/23 06:22

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		10000	10000

L1597500-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1597500-06 03/25/23 06:22 • (DUP) R3906470-3 03/25/23 06:22

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	669000	699000	1	4.29		5

L1597575-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1597575-01 03/25/23 06:22 • (DUP) R3906470-4 03/25/23 06:22

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	925000	955000	1	3.12		5

Laboratory Control Sample (LCS)

(LCS) R3906470-2 03/25/23 06:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8500000	96.6	77.3-123	

L1597585-14,16,17

Method Blank (MB)

(MB) R3906565-1 03/27/23 14:41

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		10000	10000

L1597000-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1597000-01 03/27/23 14:41 • (DUP) R3906565-3 03/27/23 14:41

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	753000	791000	1	4.84		5

L1597566-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1597566-01 03/27/23 14:41 • (DUP) R3906565-4 03/27/23 14:41

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1120000	1130000	1	1.24		5

Laboratory Control Sample (LCS)

(LCS) R3906565-2 03/27/23 14:41

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	7030000	79.9	77.3-123	

Method Blank (MB)

(MB) R3907012-1 03/27/23 21:57

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		10000	10000

L1597819-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1597819-02 03/27/23 21:57 • (DUP) R3907012-3 03/27/23 21:57

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	786000	1000000	1	24.2	J3	5

L1597826-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1597826-01 03/27/23 21:57 • (DUP) R3907012-4 03/27/23 21:57

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1250000	1230000	1	1.78		5

Laboratory Control Sample (LCS)

(LCS) R3907012-2 03/27/23 21:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8220000	93.4	77.3-123	

Method Blank (MB)

(MB) R3906586-2 03/28/23 14:43

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Alkalinity,Bicarbonate	U		8450	20000
Alkalinity,Carbonate	U		8450	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1598039-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1598039-01 03/28/23 14:54 • (DUP) R3906586-3 03/28/23 14:58

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity,Bicarbonate	727000	733000	1	0.837		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1598041-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1598041-05 03/28/23 16:48 • (DUP) R3906586-4 03/28/23 16:52

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity,Bicarbonate	381000	384000	1	0.779		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Method Blank (MB)

(MB) R3907113-2 03/29/23 12:03

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Alkalinity,Bicarbonate	U		8450	20000
Alkalinity,Carbonate	U		8450	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1598041-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1598041-01 03/29/23 12:14 • (DUP) R3907113-3 03/29/23 12:18

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity,Bicarbonate	540000	534000	1	1.10		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1598041-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1598041-04 03/29/23 14:01 • (DUP) R3907113-4 03/29/23 14:05

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity,Bicarbonate	385000	386000	1	0.268		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Method Blank (MB)

(MB) R3907338-1 03/29/23 01:54

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	438	J	379	1000
Fluoride	80.8	J	64.0	150
Sulfate	U		594	5000

L1597585-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1597585-03 03/29/23 10:50 • (DUP) R3907338-3 03/29/23 11:03

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	5810	5790	1	0.412		15
Fluoride	292	270	1	7.86		15
Sulfate	11300	11200	1	0.913		15

L1597585-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1597585-04 03/29/23 11:44 • (DUP) R3907338-6 03/29/23 11:57

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	86200	87200	1	1.20		15
Fluoride	278	278	1	0.216		15
Sulfate	27300	27600	1	0.998		15

Laboratory Control Sample (LCS)

(LCS) R3907338-2 03/29/23 02:07

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39900	99.7	80.0-120	
Fluoride	8000	8470	106	80.0-120	
Sulfate	40000	41500	104	80.0-120	

L1597585-01,02,03,04,05,06

L1597585-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597585-03 03/29/23 10:50 • (MS) R3907338-4 03/29/23 11:17 • (MSD) R3907338-5 03/29/23 11:30

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	5810	54400	54200	97.2	96.8	1	80.0-120			0.341	15
Fluoride	5000	292	5270	5260	99.5	99.4	1	80.0-120			0.146	15
Sulfate	50000	11300	61000	60900	99.4	99.2	1	80.0-120			0.221	15

L1597585-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1597585-04 03/29/23 11:44 • (MS) R3907338-7 03/29/23 12:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	86200	131000	89.4	1	80.0-120	
Fluoride	5000	278	5290	100	1	80.0-120	
Sulfate	50000	27300	76300	98.1	1	80.0-120	

L1597585-01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18

Method Blank (MB)

(MB) R3907045-1 03/29/23 02:49

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	382	J	379	1000
Fluoride	U		64.0	150
Sulfate	U		594	5000

L1597585-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1597585-11 03/29/23 05:23 • (DUP) R3907045-3 03/29/23 05:36

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	24200	24400	1	0.527		15
Fluoride	1910	1910	1	0.0315		15
Sulfate	12300	12100	1	1.24		15

L1597881-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1597881-01 03/29/23 10:41 • (DUP) R3907045-6 03/29/23 10:54

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	57600	57500	1	0.119		15
Fluoride	67.9	U	1	200	P1	15
Sulfate	15900	15800	1	0.432		15

Laboratory Control Sample (LCS)

(LCS) R3907045-2 03/29/23 03:02

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	38600	96.6	80.0-120	
Fluoride	8000	8180	102	80.0-120	
Sulfate	40000	38900	97.2	80.0-120	

L1597585-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597585-11 03/29/23 05:23 • (MS) R3907045-4 03/29/23 05:49 • (MSD) R3907045-5 03/29/23 06:02

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	24200	72500	72900	96.6	97.2	1	80.0-120			0.459	15
Fluoride	5000	1910	7080	7070	103	103	1	80.0-120			0.0947	15
Sulfate	50000	12300	60500	61000	96.5	97.5	1	80.0-120			0.884	15

L1597881-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1597881-01 03/29/23 10:41 • (MS) R3907045-7 03/29/23 11:07

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	57600	104000	92.2	1	80.0-120	
Fluoride	5000	67.9	5030	99.2	1	80.0-120	
Sulfate	50000	15900	63800	95.8	1	80.0-120	

Method Blank (MB)

(MB) R3906722-1 03/29/23 09:19

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Mercury	U		0.100	0.200

Laboratory Control Sample (LCS)

(LCS) R3906722-2 03/29/23 09:21

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Mercury	3.00	2.88	95.9	80.0-120	

L1597585-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597585-03 03/29/23 09:28 • (MS) R3906722-3 03/29/23 09:30 • (MSD) R3906722-4 03/29/23 09:32

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Mercury	3.00	U	2.96	2.97	98.6	99.2	1	75.0-125			0.556	20

Method Blank (MB)

(MB) R3906518-1 03/28/23 18:50

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Mercury	U		0.100	0.200

Laboratory Control Sample (LCS)

(LCS) R3906518-2 03/28/23 18:52

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	3.00	2.94	98.1	80.0-120	

L1597618-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597618-02 03/28/23 18:54 • (MS) R3906518-3 03/28/23 18:56 • (MSD) R3906518-4 03/28/23 18:58

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	2.69	2.65	89.7	88.4	1	75.0-125			1.38	20

Method Blank (MB)

(MB) R3906008-1 03/27/23 18:54

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Antimony	U		1.03	4.00
Arsenic	U		0.180	2.00
Barium	U		0.381	2.00
Beryllium	U		0.190	2.00
Boron	U		9.63	30.0
Cadmium	U		0.150	1.00
Calcium	U		93.6	1000
Chromium	U		1.24	2.00
Cobalt	U		0.0596	2.00
Lead	U		0.849	2.00
Magnesium	U		73.5	1000
Molybdenum	U		0.348	5.00
Potassium	U		108	2000
Selenium	U		0.300	2.00
Sodium	U		376	2000
Strontium	U		0.590	10.0
Thallium	U		0.121	2.00

Laboratory Control Sample (LCS)

(LCS) R3906008-2 03/27/23 18:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	50.0	47.7	95.4	80.0-120	
Arsenic	50.0	47.8	95.7	80.0-120	
Barium	50.0	46.2	92.4	80.0-120	
Beryllium	50.0	45.0	90.1	80.0-120	
Boron	50.0	51.8	104	80.0-120	
Cadmium	50.0	52.2	104	80.0-120	
Calcium	5000	4880	97.5	80.0-120	
Chromium	50.0	50.3	101	80.0-120	
Cobalt	50.0	50.3	101	80.0-120	
Lead	50.0	48.1	96.2	80.0-120	
Magnesium	5000	4820	96.5	80.0-120	
Molybdenum	50.0	48.9	97.9	80.0-120	
Potassium	5000	4710	94.1	80.0-120	
Selenium	50.0	50.0	100	80.0-120	
Sodium	5000	5010	100	80.0-120	
Strontium	50.0	46.1	92.2	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3906008-2 03/27/23 18:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Thallium	50.0	48.8	97.6	80.0-120	

L1597585-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597585-03 03/27/23 19:00 • (MS) R3906008-4 03/27/23 19:07 • (MSD) R3906008-5 03/27/23 19:10

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	50.0	U	49.4	50.3	98.7	101	1	75.0-125			1.98	20
Arsenic	50.0	2.14	50.9	52.0	97.5	99.8	1	75.0-125			2.18	20
Barium	50.0	164	209	215	89.5	101	1	75.0-125			2.75	20
Beryllium	50.0	U	44.7	47.3	89.4	94.5	1	75.0-125			5.53	20
Boron	50.0	165	207	217	83.0	104	1	75.0-125	E	E	4.93	20
Cadmium	50.0	0.518	54.1	54.7	107	108	1	75.0-125			0.953	20
Calcium	5000	74600	78800	80800	85.3	124	1	75.0-125			2.44	20
Chromium	50.0	U	51.1	51.5	102	103	1	75.0-125			0.773	20
Cobalt	50.0	0.0726	49.4	51.1	98.7	102	1	75.0-125			3.39	20
Lead	50.0	U	51.8	51.8	104	104	1	75.0-125			0.0438	20
Magnesium	5000	34800	40000	41100	104	127	1	75.0-125		V	2.82	20
Molybdenum	50.0	0.485	51.0	51.7	101	102	1	75.0-125			1.32	20
Potassium	5000	880	5670	5830	95.8	99.0	1	75.0-125			2.77	20
Selenium	50.0	U	53.0	52.8	106	106	1	75.0-125			0.338	20
Sodium	5000	18900	23700	24200	97.9	107	1	75.0-125			1.88	20
Strontium	50.0	1000	1050	1070	103	141	1	75.0-125		V	1.81	20
Thallium	50.0	U	51.2	50.3	102	101	1	75.0-125			1.75	20

L1597585-15,16,17,18

Method Blank (MB)

(MB) R3906259-1 03/28/23 11:12

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Antimony	U		1.03	4.00
Arsenic	U		0.180	2.00
Barium	U		0.381	2.00
Beryllium	U		0.190	2.00
Boron	U		9.63	30.0
Cadmium	U		0.150	1.00
Calcium	99.0	J	93.6	1000
Chromium	U		1.24	2.00
Cobalt	U		0.0596	2.00
Lead	U		0.849	2.00
Magnesium	U		73.5	1000
Molybdenum	U		0.348	5.00
Potassium	U		108	2000
Selenium	U		0.300	2.00
Sodium	U		376	2000
Strontium	0.982	J	0.590	10.0
Thallium	U		0.121	2.00

Laboratory Control Sample (LCS)

(LCS) R3906259-2 03/28/23 11:15

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	50.0	48.9	97.8	80.0-120	
Arsenic	50.0	47.5	95.0	80.0-120	
Barium	50.0	47.5	94.9	80.0-120	
Beryllium	50.0	46.5	92.9	80.0-120	
Boron	50.0	49.9	99.7	80.0-120	
Cadmium	50.0	50.0	100	80.0-120	
Calcium	5000	5120	102	80.0-120	
Chromium	50.0	48.2	96.4	80.0-120	
Cobalt	50.0	48.7	97.5	80.0-120	
Lead	50.0	47.7	95.4	80.0-120	
Magnesium	5000	4780	95.7	80.0-120	
Molybdenum	50.0	49.3	98.7	80.0-120	
Potassium	5000	4720	94.4	80.0-120	
Selenium	50.0	51.4	103	80.0-120	
Sodium	5000	4930	98.5	80.0-120	
Strontium	50.0	51.6	103	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3906259-2 03/28/23 11:15

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Thallium	50.0	47.7	95.4	80.0-120	

L1597742-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597742-01 03/28/23 11:19 • (MS) R3906259-4 03/28/23 11:26 • (MSD) R3906259-5 03/28/23 11:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	50.0	U	53.5	53.2	107	106	1	75.0-125			0.572	20
Arsenic	50.0	2.88	53.0	53.3	100	101	1	75.0-125			0.645	20
Barium	50.0	14.5	63.0	64.8	96.9	101	1	75.0-125			2.83	20
Beryllium	50.0	U	46.6	47.5	93.2	94.9	1	75.0-125			1.85	20
Boron	50.0	294	344	352	99.3	115	1	75.0-125	E	E	2.27	20
Cadmium	50.0	U	51.0	51.2	102	102	1	75.0-125			0.387	20
Calcium	5000	251000	259000	251000	176	11.1	1	75.0-125	V	V	3.22	20
Chromium	50.0	9.58	58.7	59.1	98.2	99.1	1	75.0-125			0.769	20
Cobalt	50.0	U	49.2	49.7	98.4	99.4	1	75.0-125			1.01	20
Lead	50.0	U	49.5	50.9	99.1	102	1	75.0-125			2.70	20
Magnesium	5000	94400	99100	100000	94.3	116	1	75.0-125			1.10	20
Molybdenum	50.0	2.70	56.7	57.3	108	109	1	75.0-125			1.09	20
Potassium	5000	3650	8520	8490	97.5	96.8	1	75.0-125			0.430	20
Selenium	50.0	3.89	58.3	57.5	109	107	1	75.0-125			1.37	20
Sodium	5000	503000	515000	517000	241	280	1	75.0-125	V	V	0.378	20
Strontium	50.0	4830	4930	4870	198	78.5	1	75.0-125	V		1.22	20
Thallium	50.0	U	49.3	48.7	98.6	97.3	1	75.0-125			1.30	20

Method Blank (MB)

(MB) R3906628-1 03/29/23 01:27

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Lithium	U		0.695	2.00

Method Blank (MB)

(MB) R3906901-1 03/29/23 12:55

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Lithium	U		0.695	2.00

Laboratory Control Sample (LCS)

(LCS) R3906901-2 03/29/23 12:59

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Lithium	50.0	47.1	94.1	80.0-120	

L1598671-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1598671-08 03/29/23 13:02 • (MS) R3906901-4 03/29/23 13:09 • (MSD) R3906901-5 03/29/23 13:12

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Lithium	50.0	4.86	52.2	53.4	94.8	97.0	1	75.0-125			2.12	20

Method Blank (MB)

(MB) R3906870-1 03/29/23 11:55

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Lithium	U		0.695	2.00

Laboratory Control Sample (LCS)

(LCS) R3906870-2 03/29/23 11:59

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Lithium	50.0	48.7	97.5	80.0-120	

L1597585-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597585-03 03/29/23 12:02 • (MS) R3906870-4 03/29/23 12:09 • (MSD) R3906870-5 03/29/23 12:12

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Lithium	50.0	6.89	55.9	53.5	98.1	93.2	1	75.0-125			4.46	20

L1597585-15,16,17,18

Method Blank (MB)

(MB) R3906900-1 03/29/23 13:44

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Lithium	U		0.695	2.00

Laboratory Control Sample (LCS)

(LCS) R3906900-2 03/29/23 13:47

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Lithium	50.0	48.2	96.4	80.0-120	

L1597585-18 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597585-18 03/29/23 13:50 • (MS) R3906900-4 03/29/23 13:57 • (MSD) R3906900-5 03/29/23 14:00

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Lithium	50.0	22.8	71.3	69.4	97.0	93.2	1	75.0-125			2.71	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
SMMPE Cincinnati
862 E. Crescentville Rd.
Cincinnati. OH 45246

Billing Information:
Accounts Payable
AP@smeinc.com

Report to: Vince Epps
Email To: vepps@smeinc.com
Project Description: Zimmer Station
City/State Collected: Moscow, OH
Please Circle: PT MT CT ET
Phone: 513-771-8471
Client Project # 7217-17-001D
Lab Project # LITEGNTN-ZIMMER
Collected by (print): Tom Reed
Site/Facility ID # WHZ Unit 122 (Landfill)
P.O. #
Collected by (signature):
Immediately Packed on Ice N ___ Y X
Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day
Quote #
Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE H-	CCR Metals+B, Li, K, Na, Mg, Sr 250mlHDF	RA-226/228COMB 1L-HPE-HNO3	SR-89/90 1LHDPE-Add HNO3	TDS 250mlHDPE-NonPres	Boron Isotope Ratio	Remarks	Sample # (lab only)
MW-03	Grab	GW	NA	3.22.23	12:3Φ	7	X		X	X	X	X	X		01
MW-09DR	Grab	GW	NA	3.22.23	10!15	6	X		X	X	X	X	X		02
MW-11D	Grab	GW	NA	3.22.23	11:Φ5	6	X		X	X	X	X	X		03
MW-13S	Grab	GW	NA	3.22.23	13ΦΦ	6	X		X	X	X	X	X		04
• MW-16D	Grab	GW	NA	3.2Φ.23	1615	5	X	X		X		X			05
MW-18	Grab	GW	NA	3.22.23	134Φ	6	X		X	X	X	X	X		06
• MW-20D	Grab	GW	NA	3.21.23	1145	5	X	X		X		X			07
MW-21	Grab	GW	NA	3.22.23	ΦΦ5	6	X		X	X	X	X	X		08
MW-22	Grab	GW	NA	3.22.23	145Φ	6	X		X	X	X	X	X		09
• MW-24	Grab	GW	NA	3.21.23	124Φ	6	X		X	X	X	X	X		10

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE
12065 Lebanon Rd Mount Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1597585
H066
Acctnum: LITEGNTN
Template:
Prelogin:
PM: 134
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier __ _____
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	3.22.23	16!Φ	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No HCL / MeoH TBR
Temp: °C Bottles Received: 14
Date: 3/23/23 Time: 0915
If preservation required by Login: Date/Time
Hold: Condition: NCF / OK

Company Name/Address:
SMME - Cincinnati
862 E. Crescentville Rd.
Cincinnati. OH 45246

Billing Information:
Accounts Payable
AP@smeinc.com

Report to: Vince Epps
Email To: vepps@smeinc.com

Project Description: Zimmer Station
City/State Collected: Moscow, OH
Please Circle: PT MT CT ET

Phone: 513-771-8471
Client Project # 7217-17-001D
Lab Project # LITEGNTN-ZIMMER

Collected by (print): Tom Reed
Site/Facility ID # WHZ Unit 122 (Landfill)
P.O. #

Collected by (signature):
Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Date Results Needed

Quote #

Pace
PEOPLE ADVANCING SCIENCE
12065 Lebanon Rd Mount Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Chain of Custody Page ___ of ___

SDG # L1597585
Table #
Acctnum: LITEGNTN
Template:
Prelogin:
PM: 134
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE	CCR Metals+B, Li, K, Na, Mg, Sr 250mlHDF	RA-226/228COMB 1L-HPE-HNO3	SR-89/90 1LHDPE-Add HNO3	TDS 250mlHDPE-NonPres	Boron Isotope Ratio	Remarks	Sample # (lab only)
MW-D	Grab	GW	NA	3.21.23	1435	6	X		X	X	X	X	X		11
MW-E	Grab	GW	NA	3.22.23	1440	6	X		X	X	X	X	X		12
MW-F	Grab	GW	NA	3.22.23	1055	6	X		X	X	X	X	X		13
MW-G	Grab	GW	NA	3.21.23	0935	5	X	X		X		X			14
MW-H	Grab	GW	NA	3.22.23	1340	5	X	X		X		X			15
SEQ1 Leachate	Grab	GW	NA	3.21.23	1010	5	X		X	X		X			16
DUP-1	Grab	GW	NA	3.21.23	—	3	X		X			X			17
DUP-2	Grab	GW	NA	3.22.23	—	3	X		X			X			18
MS/MSD	Grab	GW	NA	3.22.23	1105	6	X		X	X	X	X	X		67

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	3.22.23	1610	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR
Temp: °C Bottles Received: 11
If preservation required by Login: Date/Time
Date: 3/23/23 Time: 0805
Hold: Condition: NCF / OK

Tracking Numbers	Temperature
635799175154	4.5 to 4.5 NSAT
4732	4.8 to 4.8 NSAT
4743	3.5 to 3.5 NSAT
4710	7.8 to 7.8 NSAT

Pace Analytical®

ANALYTICAL REPORT

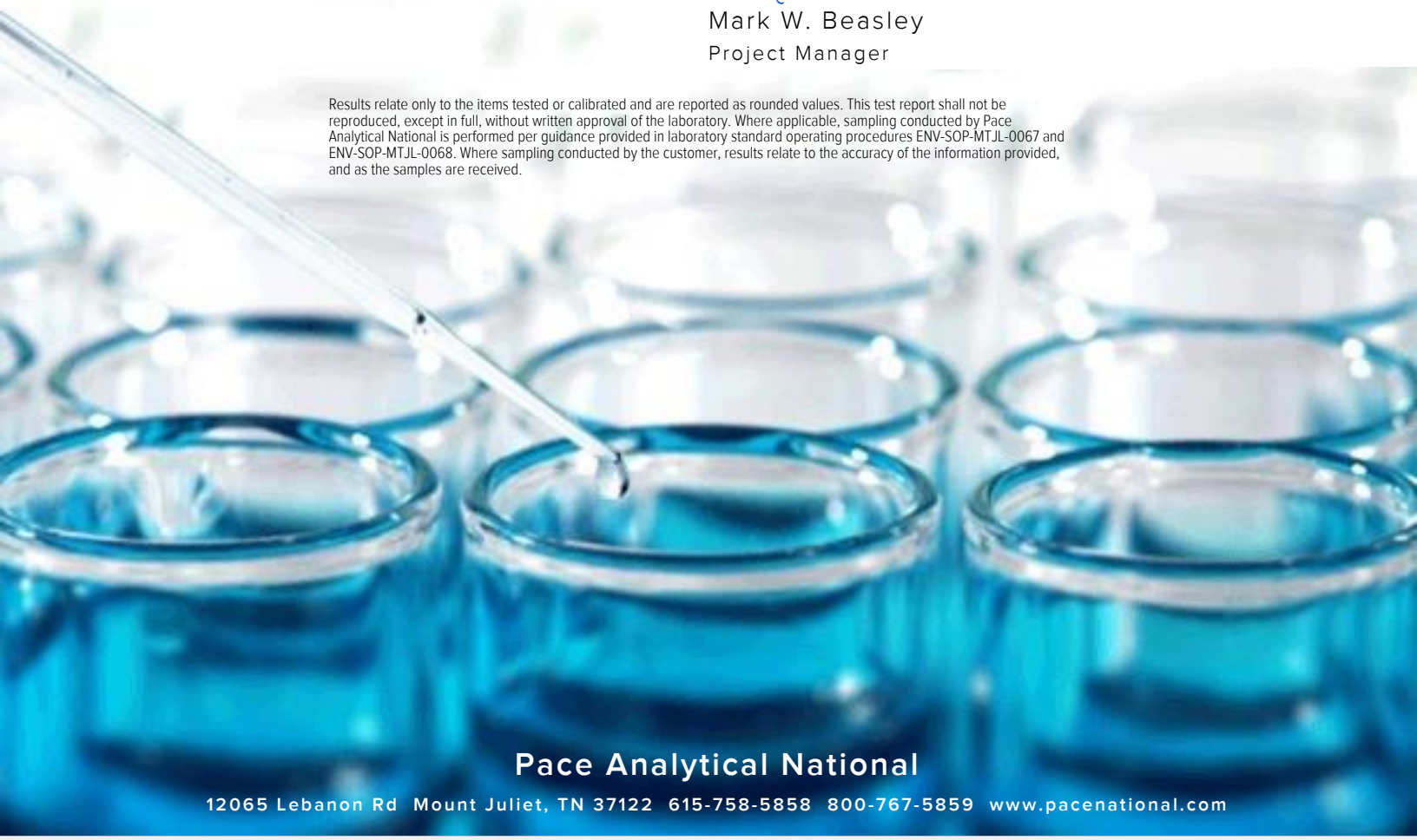
May 03, 2023

S&ME - Nashville, TN

Sample Delivery Group:	L1597617
Samples Received:	03/23/2023
Project Number:	7217-17-001D
Description:	Zimmer Station
Site:	WHZ UNIT 122 (LANDFILL)
Report To:	Vince Epps 862 East Crescentville Road Cincinnati, OH 45246

Entire Report Reviewed By:

Mark W. Beasley
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

MW-03 L1597617-01 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/22/23 12:30
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044320	1	04/19/23 12:37	04/21/23 10:57	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN

MW-09DR L1597617-02 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/22/23 10:15
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044320	1	04/19/23 12:37	04/21/23 10:57	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN

MW-11D L1597617-03 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/22/23 11:05
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044320	1	04/19/23 12:37	04/21/23 10:57	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN

MW-13S L1597617-04 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/22/23 13:00
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN

MW-16D L1597617-05 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/20/23 16:15
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN

MW-18 L1597617-06 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/22/23 13:40
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

MW-20D L1597617-07 Non-Potable Water

Collected by	Collected date/time	Received date/time
Carter H.	03/21/23 11:45	03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:01	RGT	Mt. Juliet, TN

MW-21 L1597617-08 Non-Potable Water

Collected by	Collected date/time	Received date/time
Carter H.	03/22/23 09:05	03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

MW-22 L1597617-09 Non-Potable Water

Collected by	Collected date/time	Received date/time
Carter H.	03/22/23 14:50	03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

MW-24 L1597617-10 Non-Potable Water

Collected by	Collected date/time	Received date/time
Carter H.	03/21/23 12:40	03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

MW-D L1597617-11 Non-Potable Water

Collected by	Collected date/time	Received date/time
Carter H.	03/21/23 14:35	03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

MW-E L1597617-12 Non-Potable Water

Collected by	Collected date/time	Received date/time
Carter H.	03/22/23 14:40	03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

MW-F L1597617-13 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/22/23 10:55
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method 905	WG2047600	1	04/24/23 11:48	04/26/23 04:25	RRE	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

MW-G L1597617-14 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/21/23 09:35
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

MW-H L1597617-15 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/22/23 13:40
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

SEQ1 LEACHATE L1597617-16 Non-Potable Water

Collected by: Carter H.
Collected date/time: 03/21/23 10:10
Received date/time: 03/23/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2044836	1	04/19/23 17:30	04/24/23 11:03	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2034933	1	04/20/23 11:57	04/24/23 11:03	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2034933	1	04/20/23 11:57	04/21/23 17:02	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.149	U	0.282	0.527	04/21/2023 10:57	WG2044320
(T) Barium	*113*			*30.0-143*	*04/21/2023 10:57*	WG2044320
(T) Yttrium	*95.5*			*30.0-136*	*04/21/2023 10:57*	WG2044320

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	0.0248	U	6.21	10.4	04/26/2023 04:25	WG2047600
STRONTIUM-90	0.0155	U	0.368	1.08	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*91.5*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.390	J	0.366	0.601	04/21/2023 17:01	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.241	J	0.233	0.289	04/21/2023 17:01	WG2034933
(T) Barium-133	*76.1*			*30.0-143*	*04/21/2023 17:01*	WG2034933

MW-09DR

SAMPLE RESULTS - 02

Collected date/time: 03/22/23 10:15

L1597617

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.62		0.254	0.418	04/21/2023 10:57	WG2044320
(T) Barium	*109*			*30.0-143*	*04/21/2023 10:57*	WG2044320
(T) Yttrium	*107*			*30.0-136*	*04/21/2023 10:57*	WG2044320

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	0.407	U	6.37	10.7	04/26/2023 04:25	WG2047600
STRONTIUM-90	0.253	U	0.624	1.82	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*60.3*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	4.05		0.652	0.512	04/21/2023 17:01	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	2.44		0.601	0.295	04/21/2023 17:01	WG2034933
(T) Barium-133	*96.6*			*30.0-143*	*04/21/2023 17:01*	WG2034933

MW-11D SAMPLE RESULTS - 03

Collected date/time: 03/22/23 11:05 L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.0118	U	0.213	0.405	04/21/2023 10:57	WG2044320
(T) Barium	*96.8*			*30.0-143*	*04/21/2023 10:57*	WG2044320
(T) Yttrium	*103*			*30.0-136*	*04/21/2023 10:57*	WG2044320

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	-0.0989	U	6.48	10.9	04/26/2023 04:25	WG2047600
STRONTIUM-90	-0.0615	U	0.445	1.31	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*84.7*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.562		0.385	0.494	04/21/2023 17:01	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.562		0.321	0.283	04/21/2023 17:01	WG2034933
(T) Barium-133	*75.2*			*30.0-143*	*04/21/2023 17:01*	WG2034933

MW-13S SAMPLE RESULTS - 04

Collected date/time: 03/22/23 13:00 L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.513		0.268	0.477	04/24/2023 11:03	WG2044836
(T) Barium	*99.1*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*91.2*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	-0.0403	U	6.73	11.3	04/26/2023 04:25	WG2047600
STRONTIUM-90	-0.0251	U	0.437	1.28	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*92.1*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.37		0.448	0.529	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.853		0.359	0.229	04/21/2023 17:01	WG2034933
(T) Barium-133	*94.1*			*30.0-143*	*04/21/2023 17:01*	WG2034933

MW-16D

SAMPLE RESULTS - 05

Collected date/time: 03/20/23 10:15

L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.144	U	0.291	0.528	04/24/2023 11:03	WG2044836
(T) Barium	*100*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*103*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.229	U	0.334	0.591	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0845	U	0.163	0.266	04/21/2023 17:01	WG2034933
(T) Barium-133	*81.7*			*30.0-143*	*04/21/2023 17:01*	WG2034933

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.149	U	0.305	0.554	04/24/2023 11:03	WG2044836
(T) Barium	*88.2*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*105*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	-1.11	U	6.20	10.4	04/26/2023 04:25	WG2047600
STRONTIUM-90	-0.689	U	0.580	1.74	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*60.5*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.707		0.421	0.605	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.558		0.290	0.244	04/21/2023 17:01	WG2034933
(T) Barium-133	*94.0*			*30.0-143*	*04/21/2023 17:01*	WG2034933

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.462	J	0.321	0.576	04/24/2023 11:03	WG2044836
(T) Barium	*89.8*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*111*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.27		0.473	0.641	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.806		0.348	0.281	04/21/2023 17:01	WG2034933
(T) Barium-133	*102*			*30.0-143*	*04/21/2023 17:01*	WG2034933

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

MW-21 SAMPLE RESULTS - 08

Collected date/time: 03/22/23 09:05 L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.340	J	0.280	0.504	04/24/2023 11:03	WG2044836
(T) Barium	*96.5*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*97.2*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	-0.449	U	6.17	10.4	04/26/2023 04:25	WG2047600
STRONTIUM-90	-0.279	U	0.348	1.04	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*94.2*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.15		0.511	0.640	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.810		0.427	0.395	04/21/2023 17:02	WG2034933
(T) Barium-133	*81.6*			*30.0-143*	*04/21/2023 17:02*	WG2034933

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.640		0.243	0.428	04/24/2023 11:03	WG2044836
(T) Barium	*99.8*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*108*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
STRONTIUM-89	-0.454	U	6.11	10.3	04/26/2023 04:25	WG2047600
STRONTIUM-90	-0.283	U	0.352	1.05	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*89.6*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.01		0.364	0.509	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.375		0.271	0.275	04/21/2023 17:02	WG2034933
(T) Barium-133	*90.3*			*30.0-143*	*04/21/2023 17:02*	WG2034933

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.107	U	0.228	0.424	04/24/2023 11:03	WG2044836
(T) Barium	*95.6*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*115*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	0.350	U	6.03	10.1	04/26/2023 04:25	WG2047600
STRONTIUM-90	0.215	U	0.350	1.02	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*84.9*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.154	U	0.311	0.526	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.154	J	0.212	0.311	04/21/2023 17:02	WG2034933
(T) Barium-133	*87.6*			*30.0-143*	*04/21/2023 17:02*	WG2034933

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.164	U	0.203	0.382	04/24/2023 11:03	WG2044836
(T) Barium	*97.0*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*106*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	-0.0579	U	6.46	10.8	04/26/2023 04:25	WG2047600
STRONTIUM-90	-0.964	U	0.519	1.57	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*72.4*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.247	J	0.326	0.507	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.247	J	0.255	0.333	04/21/2023 17:02	WG2034933
(T) Barium-133	*81.8*			*30.0-143*	*04/21/2023 17:02*	WG2034933

MW-E SAMPLE RESULTS - 12

Client Sample ID: MW-E Client Project ID: ZIM-257-122 Lab Sample ID: L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.05		0.268	0.462	04/24/2023 11:03	WG2044836
(T) Barium	*105*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*110*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	0.00443	U	6.05	10.2	04/26/2023 04:25	WG2047600
STRONTIUM-90	0.0746	U	0.326	0.954	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*95.4*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.10		0.498	0.552	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.05		0.420	0.303	04/21/2023 17:02	WG2034933
(T) Barium-133	*93.1*			*30.0-143*	*04/21/2023 17:02*	WG2034933

MW-F SAMPLE RESULTS - 13

Sample Delivery Group: L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.771		0.226	0.391	04/24/2023 11:03	WG2044836
(T) Barium	*94.7*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*113*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method 905

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
STRONTIUM-89	-0.0196	U	6.14	10.3	04/26/2023 04:25	WG2047600
STRONTIUM-90	-0.330	U	0.375	1.12	04/26/2023 04:25	WG2047600
(T) STRONTIUM	*86.6*			*30.0-110*	*04/26/2023 04:25*	WG2047600

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.91		0.482	0.454	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.13		0.426	0.231	04/21/2023 17:02	WG2034933
(T) Barium-133	*71.2*			*30.0-143*	*04/21/2023 17:02*	WG2034933

MW-C

SAMPLE RESULTS - 14

Collected date/time: 03/21/23 09:35 L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.590		0.235	0.415	04/24/2023 11:03	WG2044836
(T) Barium	*99.2*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*106*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.14		0.411	0.551	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.553		0.337	0.363	04/21/2023 17:02	WG2034933
(T) Barium-133	*89.6*			*30.0-143*	*04/21/2023 17:02*	WG2034933

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.291	U	0.303	0.566	04/24/2023 11:03	WG2044836
(T) Barium	*88.3*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*101*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.439	J	0.436	0.659	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.439		0.313	0.337	04/21/2023 17:02	WG2034933
(T) Barium-133	*78.4*			*30.0-143*	*04/21/2023 17:02*	WG2034933

SE01 LEACHATE

SAMPLE RESULTS - 16

Collected date/time: 03/21/23 10:10

L1597617

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.521	J	0.356	0.639	04/24/2023 11:03	WG2044836
(T) Barium	*101*			*30.0-143*	*04/24/2023 11:03*	WG2044836
(T) Yttrium	*110*			*30.0-136*	*04/24/2023 11:03*	WG2044836

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.737	J	0.449	0.747	04/24/2023 11:03	WG2034933

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.216	J	0.274	0.386	04/21/2023 17:02	WG2034933
(T) Barium-133	*87.7*			*30.0-143*	*04/21/2023 17:02*	WG2034933

L1597617-01,02,03

Method Blank (MB)

(MB) R3916733-1 04/21/23 10:57

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.150	J	0.126	0.234
(T) Barium	*113*		*113*	
(T) Yttrium	*116*		*116*	

L1597559-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1597559-01 04/21/23 10:57 • (DUP) R3916733-5 04/21/23 10:57

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.225	0.237	0.419	0.691	0.335	0.419	1	102	1.14		20	3
(T) Barium	*111*			*117*	*117*							
(T) Yttrium	*105*			*99.5*	*99.5*							

Laboratory Control Sample (LCS)

(LCS) R3916733-2 04/21/23 10:57

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.38	108	80.0-120	
(T) Barium			*113*		
(T) Yttrium			*109*		

L1597617-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597617-03 04/21/23 10:57 • (MS) R3916733-3 04/21/23 10:57 • (MSD) R3916733-4 04/21/23 10:57

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	-0.0118	9.99	9.26	99.9	92.6	1	70.0-130			7.57		20
(T) Barium		*96.8*			*108*	*111*							
(T) Yttrium		*103*			*104*	*100*							

Method Blank (MB)

(MB) R3916745-1 04/24/23 11:03

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.210	J	0.136	0.245
(T) Barium	*102*		*102*	
(T) Yttrium	*98.0*		*98.0*	

L1597617-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1597617-04 04/24/23 11:03 • (DUP) R3916745-5 04/24/23 11:03

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.513	0.268	0.477	0.869	0.353	0.477	1	51.5	0.803		20	3
(T) Barium	*99.1*			*98.0*	*98.0*							
(T) Yttrium	*91.2*			*114*	*114*							

Laboratory Control Sample (LCS)

(LCS) R3916745-2 04/24/23 11:03

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.28	106	80.0-120	
(T) Barium			*108*		
(T) Yttrium			*112*		

L1597952-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597952-01 04/24/23 11:03 • (MS) R3916745-3 04/24/23 11:03 • (MSD) R3916745-4 04/24/23 11:03

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.147	9.29	10.9	91.4	107	1	70.0-130			15.5		20
(T) Barium		*103*			*103*	*107*							
(T) Yttrium		*114*			*101*	*112*							

Method Blank (MB)

(MB) R3920010-1 04/26/23 04:25

Analyte	MB Result	MB Qualifier	MB Uncertainty	MB MDA
	pCi/l		+ / -	pCi/l
STRONTIUM-89	-0.120	U	3.06	5.14
STRONTIUM-90	-0.118	U	0.224	0.667
(T) STRONTIUM	*64.8*		*64.8*	

L1597617-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1597617-01 04/26/23 04:25 • (DUP) R3920010-5 04/26/23 04:25

Analyte	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	+ / -	pCi/l		%			%	
STRONTIUM-89	0.0248	6.21	10.4	-0.120	6.21	10.4	1	200	0.0165	U	20	3
STRONTIUM-90	0.0155	0.368	1.08	-0.118	0.310	1.08	1	200	0.277	U	20	3
(T) STRONTIUM	*91.5*			*108*	*108*							

Laboratory Control Sample (LCS)

(LCS) R3920010-2 04/26/23 04:25

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
STRONTIUM-89	2.98	2.92	97.9	80.0-120	
STRONTIUM-90	2.93	2.87	97.9	80.0-120	
(T) STRONTIUM			*75.1*		

L1597617-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597617-03 04/26/23 04:25 • (MS) R3920010-3 04/26/23 04:25 • (MSD) R3920010-4 04/26/23 04:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
STRONTIUM-89	5.96	-0.0989	5.37	6.43	90.0	108	1	75.0-125			18.0		20
STRONTIUM-90	5.86	-0.0615	5.37	6.32	91.6	108	1	75.0-125			16.4		20
(T) STRONTIUM		*84.7*			*78.0*	*73.7*							

Method Blank (MB)

(MB) R3917184-1 04/21/23 17:01

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-226	0.00404	U	0.0468	0.0889
(T) Barium-133	*80.9*		*80.9*	

L1597617-15 Original Sample (OS) • Duplicate (DUP)

(OS) L1597617-15 04/21/23 17:02 • (DUP) R3917184-5 04/21/23 17:01

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.439	0.313	0.337	0.130	0.189	0.337	1	109	0.845	J	20	3
(T) Barium-133	*78.4*			*79.9*	*79.9*							

Laboratory Control Sample (LCS)

(LCS) R3917184-2 04/21/23 17:01

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.01	4.94	98.5	80.0-120	
(T) Barium-133			*74.4*		

L1597617-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1597617-03 04/21/23 17:01 • (MS) R3917184-3 04/21/23 17:01 • (MSD) R3917184-4 04/21/23 17:01

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	0.562	20.6	18.8	100	91.3	1	75.0-125			8.84		20
(T) Barium-133		*75.2*			*79.3*	*82.1*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
S&ME - Cincinnati
862 E. Crescentville Rd.
Cincinnati. OH 45246

Billing Information:
Accounts Payable
AP@smeinc.com

Pres Chk

Report to: **Vince Epps**

Email To: **vepps@smeinc.com**

Project Description: **Zimmer Station**

City/State Collected: **Moscow, OH**

Please Circle: PT MT CT ET

Phone: **513-771-8471**

Client Project # **7217-17-001D**

Lab Project # **LITEGNTN-ZIMMER**

Collected by (print): **Tom Reed**

Site/Facility ID # **WHZ Unit 122 (Landfill)**

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE-HNO3	CCR Metals+B, Li, K, Na, Mg, Sr 250mlHDF	RA-226/228COMB 1L-HPE-HNO3	SR-89/90 1LHDPE-Add HNO3	TDS 250mlHDPE-NonPres	Boron Isotope Ratio				Remarks	Sample # (lab only)
MW-03	Grab	GW	NA	3.22.23	12:30	7	X		X	X	X	X	X					01
MW-09DR	Grab	GW	NA	3.22.23	10:15	6	X		X	X	X	X	X					02
MW-11D	Grab	GW	NA	3.22.23	11:05	6	X		X	X	X	X	X					03
MW-13S	Grab	GW	NA	3.22.23	1300	6	X		X	X	X	X	X					04
• MW-16D	Grab	GW	NA	3.20.23	1615	5	X	X		X		X						05
MW-18	Grab	GW	NA	3.22.23	1340	6	X		X	X	X	X	X					06
• MW-20D	Grab	GW	NA	3.21.23	1145	5	X	X		X		X						07
MW-21	Grab	GW	NA	3.22.23	0905	6	X		X	X	X	X	X					08
MW-22	Grab	GW	NA	3.22.23	1450	6	X		X	X	X	X	X					09
• MW-24	Grab	GW	NA	3.21.23	1240	6	X		X	X	X	X	X					10

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Relinquished by : (Signature) Date: 3.22.23 Time: 1610

Received by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Relinquished by : (Signature) Date: Time:

Received by: (Signature)

Temp: °C Bottles Received: 14

If preservation required by Login: Date/Time

Relinquished by : (Signature) Date: Time:

Received for lab by: (Signature)

Date: 3/23/23 Time: 0905

Hold:

Condition: NCF / OK

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

12065 Lebanon Rd Mount Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1597617
H066

Acctnum: LITEGNTN
Template:
Prelogin:
PM: 134
PB:
Shipped Via:

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

APPENDIX A.
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT - QUARTER 1, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-257-122

Company / Address: **S&ME - Cincinnati**
862 E. Crescentville Rd.
Cincinnati. OH 45246

Attention To: **Accounts Payable**
AP@smeinc.com

Pres Chk

Report to: **Vince Epps**

Email To: **vepps@smeinc.com**

Project Description: **Zimmer Station**

City/State Collected: **Moscow, OH**

Please Circle: PT MT CT ET

Phone: **513-771-8471**

Client Project # **7217-17-001D**

Lab Project # **LITEGNTN-ZIMMER**

Collected by (print): **Tom Rees**

Site/Facility ID # **WHZ Unit 122 (Landfill)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

12065 Lebanon Rd Mount Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L159760

Table #

Acctnum: **LITEGNTN**

Template:

Prelogin:

PM: **134**

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE	CCR Metals+B, Li, K, Na, Mg, Sr 250mlHDF	RA-226/228COMB 1L-HPE-HNO3	SR-89/90 1LHDPE-Add HNO3	TDS 250mlHDPE-NonPres	Boron Isotope Ratio			Remarks	Sample # (lab only)
MW-D	Grab	GW	NA	3.21.23	1435	6	X		X	X	X	X	X				11
MW-E	Grab	GW	NA	3.22.23	1440	6	X		X	X	X	X	X				12
MW-F	Grab	GW	NA	3.22.23	1055	6	X		X	X	X	X	X				13
MW-G	Grab	GW	NA	3.21.23	0935	5	X	X		X		X					14
MW-H	Grab	GW	NA	3.22.23	1340	5	X	X		X		X					15
SEQ1 Leachate	Grab	GW	NA	3.21.23	1010	5	X		X	X		X					16
DUP-1	Grab	GW	NA	3.21.23	—	3	X		X			X					17
DUP-2	Grab	GW	NA	3.22.23	—	3	X		X			X					18
MS/MSD	Grab	GW	NA	3.22.23	1105	6	X		X	X	X	X	X				03

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

Relinquished by : (Signature)	Date: 3.22.23	Time: 1610	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 14 — If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/23/23 Time: 0905 — Hold: — Condition: NCF / OK

Tracking Numbers	Temperature
635799175154	4.5 to 4.5 NSAT
4732	4.8 to 4.8 NSAT
4743	3.5 to 3.5 NSAT
4710	3.8 to 3.8 NSAT

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-03	Purge Time:	29 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Carter Harlan	Sample Time:	12:30
Weather:	Overcast	Air Temp:	45F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				10.78	ft-TOC
Total Well Depth:				35.34	ft-TOC
Height of Water Column:				24.56	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	16.0	Gal
3 * Well Volume	48.09	Gal
5 * Well Volume	80.16	Gal

Well Purging Information

Purge Method:	Bladder Pump	Start Time:	11:56	End Time:	12:25		
(If Used) Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:		ft-TOC					
Water Column Above Pump Intake:		feet	Flow Through Cell Vol:		200	mL	
DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**				
Final Volume Purged:	1.3	Gallons					
Final Volume Purge Rate:	150	mL/min					
Well Purged Dry?:		(Yes/No)					

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	11:56	0.0	---	---	---	---	---	---	---	---	Start Purging
	12:00	0.3	300	12.33	12.4	6.8	1.541	0.4	91	2.15	Clear, no odor
	12:05	0.5	150	12.51						1.10	Dead YSI battery
	12:10	0.7	150	12.90	11.9	6.7	1.585	1.4	90	1.06	Clear, no odor
	12:15	0.9	150	13.18	12.1	6.7	1.588	1.2	90	1.11	Clear, no odor
	12:20	1.1	150	13.24	12.2	6.7	1.586	1.3	89	0.61	Clear, no odor
	12:25	1.3	150	13.62	12.3	6.7	1.585	1.2	89	0.45	Clear, no odor
Final:	12:25	1.3	150	13.62	12.3	6.7	1.585	1.2	89	0.5	End of Purging

Sample Method: Bladder Pump Sample Start Time: 12:30 Sample End Time: 12:45

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-09D	Purge Time:	45 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Carter Harlan	Sample Time:	10:15
Weather:	Overcast	Air Temp:	46F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				31.31	ft-TOC
Total Well Depth:				69.53	ft-TOC
Height of Water Column:				38.22	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	6.2	Gal
3 * Well Volume	18.71	Gal
5 * Well Volume	31.19	Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	9:25	End Time:	10:10
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		3.6		Gallons			
Final Volume Purge Rate:		300		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	09:25	0.0	---	---	---	---	---	---	---	---	Start Purging
	09:30	0.4	300	31.30	12.1	7.2	2.667	0.6	92	38.8	Cloudy, no odor
	09:35	0.8	300	31.31	12.8	7.2	3.137	0.5	91	66.8	Cloudy, no odor
	09:40	1.2	300	31.31	13.0	7.2	2.959	0.5	91	29.0	Cloudy, no odor
	09:45	1.6	300	31.31	12.8	7.1	2.253	0.3	92	16.0	Clear, no odor
	09:50	2.0	300	31.31	12.5	7.1	2.058	0.3	92	15.9	Clear, no odor
	09:55	2.4	300	31.31	12.4	7.1	2.036	0.3	92	15.9	Clear, no odor
	10:00	2.8	300	31.30	12.7	7.0	1.989	0.3	91	12.0	Clear, no odor
	10:05	3.2	300	31.31	12.9	7.0	1.903	0.2	92	9.83	Clear, no odor
	10:10	3.6	300	31.31	13.1	7.0	1.837	0.2	92	9.90	Clear, no odor
Final:	10:10	3.6	300	31.31	13.1	7.0	1.837	0.2	92	9.9	End of Purging

Sample Method: Bladder Pump Sample Start Time: 10:15 Sample End Time: 10:30

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-11D	Purge Time:	23 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Carter Harlan	Sample Time:	11:05
Weather:	Overcast	Air Temp:	47F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				17.60	ft-TOC
Total Well Depth:				35.79	ft-TOC
Height of Water Column:				18.19	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	11.9	Gal
3 * Well Volume	35.62	Gal
5 * Well Volume	59.37	Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	10:37	End Time:	11:00
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		1.4		Gallons	Matrix Spike collected		
Final Volume Purge Rate:		250		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:37	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:40	0.2	200	17.62	12.0	7.3	0.722	0.3	93	11.6	Clear, no odor
	10:45	0.4	200	17.65	12.2	7.2	0.746	0.2	91	1.48	Clear, no odor
	10:50	0.8	250	17.65	12.5	7.2	0.747	0.2	91	1.73	Clear, no odor
	10:55	1.1	250	17.65	12.6	7.2	0.749	0.2	91	2.42	Clear, no odor
	11:00	1.4	250	17.65	12.7	7.2	0.750	0.2	91	1.34	Clear, no odor
Final:	11:00	1.4	250	17.65	12.7	7.2	0.750	0.2	91	1.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 11:05 Sample End Time: 11:30

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes: Matrix Spike collected

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-13S	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Tom Reed	Sample Time:	13:00
Weather:	Overcast	Air Temp:	51F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	9.65	ft-TOC
			Total Well Depth:	19.01	ft-TOC
			Height of Water Column:	9.36	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	6.1	Gal
3 * Well Volume	18.33	Gal
5 * Well Volume	30.55	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	12:30	End Time:	13:00	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	0.9	Gallons				
	Final Volume Purge Rate:	100	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	12:30	0.0	---	---	---	---	---	---	---	---	Start Purging
	12:35	0.3	200	10.15	9.7	7.1	0.534	3.5	45	38.7	Clear
	12:40	0.4	100	10.41	9.7	7.0	0.553	2.8	52	26.1	Clear
	12:45	0.5	100	10.49	9.8	7.0	0.567	2.8	54	19.7	Clear
	12:50	0.7	100	10.55	9.9	7.0	0.602	2.3	54	8.22	Clear
	12:55	0.8	100	10.60	9.9	7.0	0.614	2.2	54	5.56	Clear
	13:00	0.9	100	10.60	10.0	7.0	0.619	2.2	53	4.51	Clear
Final:	13:00	0.9	100	10.60	10.0	7.0	0.619	2.2	53	4.51	End of Purging

Sample Method: Bladder Pump Sample Start Time: 13:00 Sample End Time: 13:25

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 20, 2023
Source Well:	MW-16D	Purge Time:	45 Minutes
Locked?:	Yes	Sample Date:	March 20, 2023
Sampled By:	Tom Reed	Sample Time:	16:15
Weather:	Sunny	Air Temp:	50F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	9.45	ft-TOC
			Total Well Depth:	30.07	ft-TOC
			Height of Water Column:	20.62	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	13.5	Gal
3 * Well Volume	40.38	Gal
5 * Well Volume	67.30	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	15:25	End Time:	16:10	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	2.4	Gallons				
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	15:25	0.0	---	---	---	---	---	---	---	---	Start Purging
	15:30	0.3	200	9.45	13.4	7.3	0.949	0.1	-130	35.3	Clear
	15:35	0.5	200	9.45	13.3	7.3	0.948	0.0	-133	18.7	Clear
	15:40	0.8	200	9.45	13.4	7.3	0.942	0.0	-133	11.9	Clear
	15:45	1.1	200	9.45	13.4	7.3	0.938	0.0	-134	10.9	Clear
	15:50	1.3	200	9.45	13.3	7.3	0.933	-0.1	-135	11.5	Clear
	15:55	1.6	200	9.45	13.3	7.3	0.929	-0.1	-134	10.2	Clear
	16:00	1.8	200	9.46	13.3	7.3	0.922	-0.1	-134	11.3	Clear
	16:05	2.1	200	9.46	13.3	7.3	0.920	-0.1	-134	7.59	Clear
	16:10	2.4	200	9.47	14.4	7.3	0.917	-0.1	-134	7.29	Clear
Final:	16:10	2.4	200	9.47	14.4	7.3	0.917	-0.1	-134	7.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 16:15 Sample End Time: 16:25

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-18	Purge Time:	20 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Tom Reed	Sample Time:	13:40
Weather:	Overcast	Air Temp:	46F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				13.09	ft-TOC
Total Well Depth:				17.47	ft-TOC
Height of Water Column:				4.38	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	0.7	Gal
3 * Well Volume	2.14	Gal
5 * Well Volume	3.57	Gal

Well Purging Information

Purge Method:	Bladder Pump	Start Time:	9:35	End Time:	9:55		
(If Used) Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:		ft-TOC					
Water Column Above Pump Intake:		feet	Flow Through Cell Vol:		200	mL	
DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**				
Final Volume Purged:	0.9	Gallons	Water level went below pump intake during purging and was sampled after recharge. WL = water level, TOP = top of pump				
Final Volume Purge Rate:	150	mL/min					
Well Purged Dry?:	Yes	(Yes/No)					

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	09:35	0.0	---	---	---	---	---	---	---	---	Start Purging
	09:40	0.3	200	13.09	11.4	7.3	0.770	1.3	45	23.5	Clear
	09:45	0.5	200	—	11.5	7.1	0.907	0.4	46	35.4	Clear
	09:50	0.7	150	—	11.6	7.1	0.925	0.4	46	37.0	WL below TOP
	09:55	0.9	150		11.1	7.1	0.944	0.3	49		
Final:	09:55	0.9	150	13.09	11.1	7.1	0.944	0.3	49	37.0	End of Purging

Sample Method: Bladder Pump Sample Start Time: 13:40 Sample End Time: 14:00

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 21, 2023
Source Well:	MW-20D	Purge Time:	55 Minutes
Locked?:	Yes	Sample Date:	March 21, 2023
Sampled By:	Tom Reed	Sample Time:	11:45
Weather:	Sunny	Air Temp:	47F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				21.78	ft-TOC
Total Well Depth:				38.61	ft-TOC
Height of Water Column:				16.83	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	11.0	Gal
3 * Well Volume	32.96	Gal
5 * Well Volume	54.93	Gal

Well Purging Information

Purge Method:	Bladder Pump		Start Time:	10:45	End Time:	11:40	
(If Used) Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:			ft-TOC				
Water Column Above Pump Intake:			feet		Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:			ft-TOC	**Comments:**			
Final Volume Purged:	2.8		Gallons				
Final Volume Purge Rate:	100		mL/min				
Well Purged Dry?:			(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:50	0.3	200	21.78	13.0	7.2	0.557	3.6	-205	205	Clear
	10:55	0.5	200	21.93	13.0	7.2	0.566	3.6	-197	137	Clear
	11:00	0.8	200	21.95	13.0	7.2	0.566	3.0	-186	102	Clear
	11:05	1.1	200	21.95	13.2	7.2	0.571	2.7	-179	79.3	Clear
	11:10	1.3	200	21.95	13.3	7.2	0.582	2.7	-168	62.5	Clear
	11:15	1.6	200	21.95	13.2	7.2	0.588	2.5	-163	46.5	Clear
	11:20	1.8	200	21.95	13.4	7.2	0.592	2.4	-159	42.5	Clear
	11:25	2.1	200	21.95	13.4	7.2	0.597	2.2	-154	35.9	Clear
	11:30	2.4	200	21.95	13.5	7.2	0.600	2.0	-150	31.6	Clear
	11:35	2.6	200	21.95	13.5	7.2	0.605	1.8	-147	25.9	Clear
	11:40	2.8	100	21.95	13.6	7.2	0.608	1.7	-144	23.1	Clear
Final:	11:40	2.8	100	21.95	13.6	7.2	0.608	1.7	-144	23.1	End of Purging

Sample Method: Bladder Pump Sample Start Time: 11:45 Sample End Time: 11:55

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-21	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Tom Reed	Sample Time:	9:05
Weather:	Rain	Air Temp:	46F

Water Level & Well Data

Measuring Point:			Top of Casing		
Depth to Water:			12.20	ft-TOC	
Total Well Depth:				ft-TOC	
Height of Water Column:				feet	
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	8:30	End Time:	9:00
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		1.6		Gallons	Air bubbles in hose - leaky tubing?		
Final Volume Purge Rate:		200		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	08:30	0.0	---	---	---	---	---	---	---	---	Start Purging
	08:35	0.3	200	12.20	12.1	7.4	1.717	3.5	60	10.5	Clear
	08:40	0.5	200	12.30	12.2	7.4	1.167	7.9	51	4.94	Clear
	08:45	0.8	200	12.30	12.2	7.2	1.369	2.0	70	1.88	Clear
	08:50	1.1	200	12.30	12.2	7.1	1.303	2.0	-27	0.95	Clear
	08:55	1.3	200	12.30	12.2	7.1	1.283	2.0	-36	0.94	Clear
	09:00	1.6	200	12.30	12.2	7.1	1.271	2.0	-36	0.58	Clear
Final:	09:00	1.6	200	12.30	12.2	7.1	1.271	2.0	-36	0.6	End of Purging

Sample Method: Bladder Pump Sample Start Time: 09:05 Sample End Time: 09:15

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-22	Purge Time:	40 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Tom Reed	Sample Time:	14:50
Weather:	Overcast	Air Temp:	55F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				18.12	ft-TOC
Total Well Depth:				37.29	ft-TOC
Height of Water Column:				19.17	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	12.5	Gal
3 * Well Volume	37.54	Gal
5 * Well Volume	62.57	Gal

Well Purging Information

Purge Method:	Bladder Pump		Start Time:	14:10	End Time:	14:50	
(If Used) Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:			ft-TOC				
Water Column Above Pump Intake:			feet		Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:			ft-TOC	**Comments:**			
Final Volume Purged:	1.6		Gallons	Duplicate sample collected (DUP-2). Bubbles entrained in tubing.			
Final Volume Purge Rate:	150		mL/min				
Well Purged Dry?:			(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	14:10	0.0	---	---	---	---	---	---	---	---	Start Purging
	14:15	0.2	150	18.40	10.4	7.1	0.887	5.3	8	5.23	Clear
	14:20	0.4	150	18.48	11.9	7.0	0.889	2.1	26	39.3	Clear
	14:25	0.6	150	18.55	12.0	7.0	0.885	2.2	32	32.7	Clear
	14:30	0.8	150	18.55	12.0	7.0	0.888	2.1	24	14.5	Clear
	14:35	1.0	150	18.55	12.0	7.0	0.893	1.3	23	10.5	Clear
	14:40	1.2	150	18.58	12.0	7.0	0.898	1.1	9	6.80	Clear
	14:45	1.4	150	18.85	12.0	7.0	0.904	0.9	-16	5.49	Clear
	14:50	1.6	150	18.85	12.0	7.0	0.907	0.8	-26	4.31	Clear
Final:	14:50	1.6	150	18.85	12.0	7.0	0.907	0.8	-26	4.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 14:50 Sample End Time:

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes: DUP 2 Collected

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 21, 2022
Source Well:	MW-24	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	March 21, 2022
Sampled By:	Tom Reed	Sample Time:	12:40
Weather:	Sunny	Air Temp:	54F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				18.85	ft-TOC
Total Well Depth:				34.41	ft-TOC
Height of Water Column:				15.56	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	10.2	Gal
3 * Well Volume	30.47	Gal
5 * Well Volume	50.78	Gal

Well Purging Information

Purge Method:	Bladder Pump	Start Time:	12:10	End Time:	12:35		
(If Used) Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:		ft-TOC					
Water Column Above Pump Intake:		feet	Flow Through Cell Vol:		200	mL	
DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**				
Final Volume Purged:	1.3	Gallons					
Final Volume Purge Rate:	200	mL/min					
Well Purged Dry?:		(Yes/No)					

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	12:10	0.0	---	---	---	---	---	---	---	---	Start Purging
	12:15	0.3	200	20.08	13.8	7.3	0.495	0.2	-63	23.1	Clear
	12:20	0.5	200	20.95	13.8	7.3	0.495	0.0	-64	3.12	Clear
	12:25	0.8	200	21.35	13.8	7.3	0.495	0.0	-65	1.28	Clear
	12:30	1.1	200	21.65	13.9	7.3	0.495	0.0	-69	0.94	Clear
	12:35	1.3	200	21.65	13.9	7.3	0.495	-0.1	-68	0.68	Clear
Final:	12:35	1.3	200	21.65	13.9	7.3	0.495	-0.1	-68	0.7	End of Purging

Sample Method: Bladder Pump Sample Start Time: 12:40 Sample End Time: 12:50

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

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LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 21, 2023
Source Well:	MW-D	Purge Time:	50 Minutes
Locked?:	Yes	Sample Date:	March 21, 2023
Sampled By:	Tom Reed	Sample Time:	14:35
Weather:	Sunny	Air Temp:	55F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				18.39	ft-TOC
Total Well Depth:				35.02	ft-TOC
Height of Water Column:				16.63	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	10.9	Gal
3 * Well Volume	32.57	Gal
5 * Well Volume	54.28	Gal

Well Purging Information

Purge Method:	Bladder Pump	Start Time:	13:45	End Time:	14:35		
(If Used) Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:		ft-TOC					
Water Column Above Pump Intake:		feet	Flow Through Cell Vol:		200	mL	
DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**				
Final Volume Purged:	2.6	Gallons	Duplicate sample collected (DUP-1).				
Final Volume Purge Rate:	200	mL/min					
Well Purged Dry?:		(Yes/No)					

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	13:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	13:50	0.3	200	18.39	13.9	8.4	0.831	3.6	-21	2.01	Clear
	13:55	0.5	200	21.51	13.9	8.4	0.830	3.6	-22	1.35	Clear
	14:00	0.8	200	23.42	13.9	8.5	0.831	3.5	-25	0.79	Clear
	14:05	1.1	200	24.13	13.9	8.5	0.831	3.4	-26	0.80	Clear
	14:10	1.3	200	26.32	13.9	8.5	0.833	3.3	-27	0.97	Clear
	14:15	1.6	200	27.25	14.0	8.5	0.833	3.1	-28	0.87	Clear
	14:20	1.8	200	27.91	14.4	8.5	0.835	2.9	-29	0.98	Clear
	14:25	2.1	200	28.22	14.2	8.5	0.835	2.1	-29	1.03	Clear
	14:30	2.4	200	28.33	14.1	8.5	0.837	2.0	-31	1.50	Clear
	14:35	2.6	200	28.42	14.1	8.5	0.837	1.9	-31	1.88	Clear
Final:	14:35	2.6	200	28.42	14.1	8.5	0.837	1.9	-31	1.9	End of Purging

Sample Method: Bladder Pump Sample Start Time: 14:35 Sample End Time: 14:45

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

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LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-E	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Carter Harlan	Sample Time:	14:40
Weather:	Overcast	Air Temp:	45F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	25.58	ft-TOC
			Total Well Depth:	32.73	ft-TOC
			Height of Water Column:	7.15	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	4.7	Gal
3 * Well Volume	14.00	Gal
5 * Well Volume	23.34	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	14:10	End Time:	14:35	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.3	Gallons				
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:	No	(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	14:10	0.0	---	---	---	---	---	---	---	---	Start Purging
	14:15	0.3	200	26.05	12.4	7.3	0.709	0.6	91	7.53	Clear, no odor
	14:20	0.5	200	26.39	12.7	7.3	0.699	0.5	90	4.25	Clear, no odor
	14:25	0.8	200	26.81	12.7	7.3	0.675	0.5	90	6.28	Clear, no odor
	14:30	1.1	200	27.19	12.8	7.3	0.671	0.5	90	9.14	Clear, no odor
	14:35	1.3	200	27.63	12.9	7.3	0.676	0.5	90	9.04	Clear, no odor
Final:	14:35	1.3	200	27.63	12.9	7.3	0.676	0.5	90	9.0	End of Purging

Sample Method: Bladder Pump Sample Start Time: 14:40 Sample End Time: 14:55

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-F	Purge Time:	35 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Tom Reed	Sample Time:	10:55
Weather:	Overcast	Air Temp:	48F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	10.23	ft-TOC
			Total Well Depth:	29.78	ft-TOC
			Height of Water Column:	19.55	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	12.8	Gal
3 * Well Volume	38.28	Gal
5 * Well Volume	63.81	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	10:20	End Time:	10:55	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.3	Gallons				
	Final Volume Purge Rate:	100	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:20	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:25	0.3	200	12.05	12.3	7.5	2.636	3.4	-75	19.1	Clear
	10:30	0.5	150	13.15	11.7	7.5	2.531	3.3	-67	11.7	Clear
	10:35	0.7	150	14.00	11.6	7.5	2.448	3.3	-53	12.2	Clear
	10:40	0.9	150	15.60	11.6	7.5	2.444	3.1	-50	13.9	Clear
	10:45	1.0	100	15.93	10.9	7.5	2.433	3.2	-46	10.7	Clear
	10:50	1.1	100	16.82	10.9	7.5	2.446	3.2	-50	11.0	Clear
	10:55	1.3	100	17.40	11.0	7.5	2.453	3.2	-55	9.29	Clear
Final:	10:55	1.3	100	17.40	11.0	7.5	2.453	3.2	-55	9.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 10:55 Sample End Time: 11:30

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 21, 2023
Source Well:	MW-G	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	March 21, 2023
Sampled By:	Tom Reed	Sample Time:	9:35
Weather:	Sunny	Air Temp:	34F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	34.25	ft-TOC
			Total Well Depth:	67.70	ft-TOC
			Height of Water Column:	33.45	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	21.8	Gal
3 * Well Volume	65.50	Gal
5 * Well Volume	109.17	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	9:05	End Time:	9:30	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.3	Gallons				
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	09:05	0.0	---	---	---	---	---	---	---	---	Start Purging
	09:10	0.3	200	34.25	13.6	7.1	1.286	0.0	-88	0.95	Clear
	09:15	0.5	200	34.34	14.0	7.2	1.346	0.0	-115	3.64	Clear
	09:20	0.8	200	34.40	14.2	7.2	1.298	0.0	-124	1.18	Clear
	09:25	1.1	200	34.40	14.4	7.2	1.269	0.0	-129	0.65	Clear
	09:30	1.3	200	34.40	14.5	7.2	1.263	0.1	-131	0.34	Clear
Final:	09:30	1.3	200	34.40	14.5	7.2	1.263	0.1	-131	0.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 09:35 Sample End Time: 09:45

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes: Zimmer-LF-DUP-1

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 22, 2023
Source Well:	MW-H	Purge Time:	24 Minutes
Locked?:	Yes	Sample Date:	March 22, 2023
Sampled By:	Carter Harlan	Sample Time:	13:40
Weather:	Overcast	Air Temp:	46F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	10.50	ft-TOC
			Total Well Depth:	27.02	ft-TOC
			Height of Water Column:	16.52	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	10.8	Gal
3 * Well Volume	32.35	Gal
5 * Well Volume	53.92	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	13:11	End Time:	13:35	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.9	Gallons				
	Final Volume Purge Rate:	300	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	13:11	0.0	---	---	---	---	---	---	---	---	Start Purging
	13:15	0.3	300	10.50	12.0	7.0	1.246	0.6	91	2.97	Clear, no odor
	13:20	0.7	300	10.50	11.9	7.0	1.237	0.5	90	3.21	Clear, no odor
	13:25	1.1	300	10.50	12.0	6.9	1.256	0.5	89	2.67	Clear, no odor
	13:30	1.5	300	10.50	12.2	6.9	1.285	0.4	90	2.85	Clear, no odor
	13:35	1.9	300	10.50	12.4	6.9	1.309	0.3	90	2.28	Clear, no odor
Final:	13:35	1.9	300	10.50	12.4	7.0	1.309	0.3	90	2.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 13:40 Sample End Time: 13:55

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	March 21, 2023
Source Well:	Seq. 1 Source Water	Purge Time:	5 Minutes
Locked?:	Yes	Sample Date:	March 21, 2023
Sampled By:	Tom Reed	Sample Time:	10:10
Weather:	Clear	Air Temp:	42F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:					ft-TOC
Total Well Depth:					ft-TOC
Height of Water Column:					feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	10:05	End Time:	10:10
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		0.7		Gallons			
Final Volume Purge Rate:		500		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:05	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:10	0.7	500		15.6	9.1	7.742	5.7	-340		Cloudy
Final:	10:10	0.7	500		15.6	9.1	7.742	5.7	-340		End of Purging

Sample Method: Bladder Pump Sample Start Time: 10:10 Sample End Time: 10:15

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

Zimmer Landfill - Unit 122			
Well ID	**Date**	**Time**	**Depth to Water**
Zimmer Landfill - Unit 122			
MW-3	3/20/2023	13:20	10.79
MW-9D	3/20/2023	10:50	31.29
MW-11D	3/20/2023	7:55	17.58
MW-13S	3/20/2023	11:59	9.29
MW-16D	3/20/2023	12:43	9.39
MW-18	3/20/2023	11:45	13.19
MW-20D	3/20/2023	9:57	21.89
MW-21	3/20/2023	11:28	11.82
MW-22	3/20/2023	10:58	15.42
MW-24	3/20/2023	10:04	18.86
MW-D	3/20/2023	10:20	18.37
MW-E	3/20/2023	10:55	25.45
MW-F	3/20/2023	11:16	10.27
MW-G	3/20/2023	9:33	34.32
MW-H	3/20/2023	12:45	10.54

APPENDIX A.
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT - QUARTER 1, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-257-122

Well I.D.	Date	Time	Depth	Temp	pH	Spec. Cond.	Dissolved Oxygen	ORP*	Turbidity
MW-3	3/22/2023	12:30	10.79	12.3	6.71	1.585	1.23	89.2	0.45
MW-9D	3/22/2023	10:15	31.29	13.1	7.01	1.837	0.23	91.5	9.9
MW-11D	3/22/2023	11:05	17.58	12.7	7.16	0.750	0.21	91.0	1.34
MW-13S	3/22/2023	13:00	9.29	10	7.04	0.619	2.15	53.0	4.51
MW-16D	3/20/2023	16:15	9.39	14.4	7.31	0.917	-0.13	-133.8	7.29
MW-18	3/22/2023	13:40	13.19	11.1	7.06	0.944	0.30	48.9	37
MW-20D	3/21/2023	11:45	21.89	13.6	7.19	0.608	1.66	-144.2	23.10
MW-21	3/22/2023	9:05	11.82	12.2	7.13	1.271	2.04	-36.0	0.58
MW-22	3/22/2023	14:50	15.42	12	7.01	0.907	0.76	-25.6	4.31
MW-24	3/21/2022	12:40	18.86	13.9	7.30	0.495	-0.05	-68.0	0.68
MW-D	3/21/2023	14:35	18.37	14.1	8.52	0.837	1.90	-31.0	1.88
MW-E	3/22/2023	14:40	25.45	12.9	7.27	0.676	0.48	90.0	9.04
MW-F	3/22/2023	10:55	10.27	11	7.50	2.453	3.22	-55.0	9.29
MW-G	3/21/2023	9:35	34.32	14.5	7.22	1.263	0.09	-130.7	0.34
MW-H	3/22/2023	13:40	10.54	12.4	6.96	1.309	0.27	89.5	2.28

Pace Analytical®

ANALYTICAL REPORT

July 03, 2023

S&ME - Nashville, TN

Sample Delivery Group:	L1626851
Samples Received:	06/16/2023
Project Number:	2285
Description:	Zimmer LF

Report To: Vince Epps
862 East Crescentville Road
Cincinnati, OH 45246

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

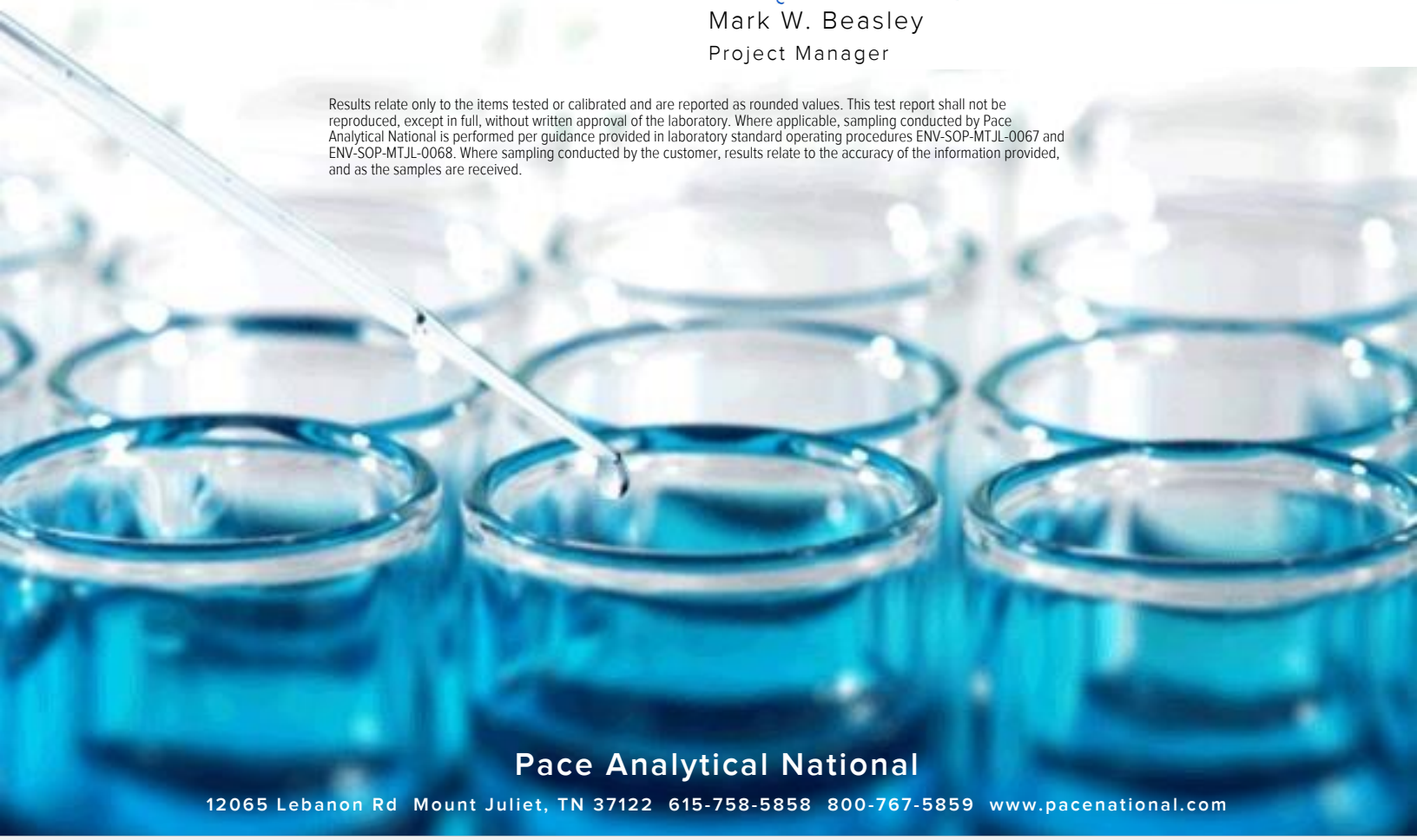


TABLE OF CONTENTS

SAMPLE SUMMARY

MW-3 L1626851-01 GW

Collected by: Carter H.
Collected date/time: 06/15/23 09:50
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:27	06/23/23 10:27	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/02/23 22:26	07/02/23 22:26	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	5	07/02/23 22:39	07/02/23 22:39	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:04	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 17:31	LD	Mt. Juliet, TN

MW-9D L1626851-02 GW

Collected by: Carter H.
Collected date/time: 06/14/23 16:20
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:30	06/23/23 10:30	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/02/23 22:51	07/02/23 22:51	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	5	07/02/23 23:04	07/02/23 23:04	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:07	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	10	06/21/23 13:39	06/22/23 17:34	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	5	06/21/23 13:39	06/22/23 17:24	LD	Mt. Juliet, TN

MW-11D L1626851-03 GW

Collected by: Carter H.
Collected date/time: 06/14/23 10:20
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:39	06/23/23 10:39	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/02/23 23:17	07/02/23 23:17	GEB	Mt. Juliet, TN

MW-21 L1626851-04 GW

Collected by: Carter H.
Collected date/time: 06/14/23 14:40
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:43	06/23/23 10:43	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/02/23 23:29	07/02/23 23:29	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:10	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	10	06/21/23 13:39	06/22/23 17:37	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	5	06/21/23 13:39	06/22/23 17:28	LD	Mt. Juliet, TN

MW-22 L1626851-05 GW

Collected by: Carter H.
Collected date/time: 06/15/23 11:00
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:48	06/23/23 10:48	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/02/23 23:42	07/02/23 23:42	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:14	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	5	06/21/23 13:39	06/22/23 17:41	LD	Mt. Juliet, TN

SAMPLE SUMMARY

MW-24 L1626851-06 GW

Collected by: Carter H.
Collected date/time: 06/14/23 12:15
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:51	06/23/23 10:51	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/03/23 00:20	07/03/23 00:20	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:17	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 17:44	LD	Mt. Juliet, TN

MW-D L1626851-07 GW

Collected by: Carter H.
Collected date/time: 06/14/23 11:10
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:55	06/23/23 10:55	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/03/23 01:10	07/03/23 01:10	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:21	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	50	06/21/23 13:39	06/22/23 17:47	LD	Mt. Juliet, TN

MW-E L1626851-08 GW

Collected by: Carter H.
Collected date/time: 06/14/23 17:20
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 10:59	06/23/23 10:59	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/03/23 01:23	07/03/23 01:23	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:32	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	10	06/21/23 13:39	06/22/23 17:51	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	5	06/21/23 13:39	06/22/23 17:31	LD	Mt. Juliet, TN

MW-F L1626851-09 GW

Collected by: Carter H.
Collected date/time: 06/14/23 12:10
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 11:03	06/23/23 11:03	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	5	07/03/23 02:00	07/03/23 02:00	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:36	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	5	06/21/23 13:39	06/22/23 17:35	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	50	06/21/23 13:39	06/22/23 17:54	LD	Mt. Juliet, TN

SEQ-1 L1626851-10 GW

Collected by: Carter H.
Collected date/time: 06/14/23 15:15
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 11:07	06/23/23 11:07	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	100	07/03/23 02:13	07/03/23 02:13	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 16:39	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	10	06/21/23 13:39	06/22/23 16:48	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	100	06/21/23 13:39	06/22/23 17:57	LD	Mt. Juliet, TN

SAMPLE SUMMARY

DUP-1 L1626851-11 GW

Collected by	Collected date/time	Received date/time
Carter H.	06/15/23 00:00	06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2081545	1	06/21/23 09:41	06/21/23 10:42	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2082640	1	06/23/23 11:11	06/23/23 11:11	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2088440	1	07/03/23 02:51	07/03/23 02:51	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2080520	1	06/21/23 13:39	06/22/23 14:51	LD	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

MW-3 SAMPLE RESULTS - 01

L1626851-01

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	936000		20000	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	312000		8450	20000	1	06/23/2023 10:27	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 10:27	WG2082640

Sample Narrative:

L1626851-01 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	227000		1900	5000	5	07/02/2023 22:39	WG2088440
Sulfate	55000		594	5000	1	07/02/2023 22:26	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	40.3		9.63	30.0	1	06/22/2023 17:31	WG2080520
Calcium	198000		93.6	1000	1	06/22/2023 16:04	WG2080520
Magnesium	30900		73.5	1000	1	06/22/2023 16:04	WG2080520
Potassium	2550		108	2000	1	06/22/2023 16:04	WG2080520
Sodium	34500		376	2000	1	06/22/2023 16:04	WG2080520
Strontium	1840		0.590	10.0	1	06/22/2023 16:04	WG2080520
Lithium	13.9		0.695	2.00	1	06/22/2023 16:04	WG2080520

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	998000		25000	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	485000		8450	20000	1	06/23/2023 10:30	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 10:30	WG2082640

Sample Narrative:

L1626851-02 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	371000		1900	5000	5	07/02/2023 23:04	WG2088440
Sulfate	3140	J	594	5000	1	07/02/2023 22:51	WG2088440

Sample Narrative:

L1626851-02 WG2088440: Dilution due to matrix.

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	1480		96.3	300	10	06/22/2023 17:34	WG2080520
Calcium	68600		93.6	1000	1	06/22/2023 16:07	WG2080520
Magnesium	32500		73.5	1000	1	06/22/2023 16:07	WG2080520
Potassium	12400		108	2000	1	06/22/2023 16:07	WG2080520
Sodium	308000		376	2000	1	06/22/2023 16:07	WG2080520
Strontium	3780		2.95	50.0	5	06/22/2023 17:24	WG2080520
Lithium	93.5		0.695	2.00	1	06/22/2023 16:07	WG2080520

MW-11D SAMPLE RESULTS - 03

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Alkalinity	358000		8450	20000	1	06/23/2023 10:39	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 10:39	WG2082640

Sample Narrative:

L1626851-03 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	5240		379	1000	1	07/02/2023 23:17	WG2088440
Sulfate	12200		594	5000	1	07/02/2023 23:17	WG2088440

MW-21 SAMPLE RESULTS - 04

Collected date/time: 06/14/23 14:40 L1626851

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	733000		13300	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	386000		8450	20000	1	06/23/2023 10:43	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 10:43	WG2082640

Sample Narrative:

L1626851-04 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	139000		379	1000	1	07/02/2023 23:29	WG2088440
Sulfate	73700		594	5000	1	07/02/2023 23:29	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	1520		96.3	300	10	06/22/2023 17:37	WG2080520
Calcium	91600		93.6	1000	1	06/22/2023 16:10	WG2080520
Magnesium	30400		73.5	1000	1	06/22/2023 16:10	WG2080520
Potassium	7710		108	2000	1	06/22/2023 16:10	WG2080520
Sodium	141000		376	2000	1	06/22/2023 16:10	WG2080520
Strontium	3730		2.95	50.0	5	06/22/2023 17:28	WG2080520
Lithium	77.6		0.695	2.00	1	06/22/2023 16:10	WG2080520

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	592000		13300	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	393000		8450	20000	1	06/23/2023 10:48	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 10:48	WG2082640

Sample Narrative:

L1626851-05 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	36100		379	1000	1	07/02/2023 23:42	WG2088440
Sulfate	101000		594	5000	1	07/02/2023 23:42	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	501		48.2	150	5	06/22/2023 17:41	WG2080520
Calcium	122000		93.6	1000	1	06/22/2023 16:14	WG2080520
Magnesium	35800		73.5	1000	1	06/22/2023 16:14	WG2080520
Potassium	2970		108	2000	1	06/22/2023 16:14	WG2080520
Sodium	47400		376	2000	1	06/22/2023 16:14	WG2080520
Strontium	1670		0.590	10.0	1	06/22/2023 16:14	WG2080520
Lithium	24.7		0.695	2.00	1	06/22/2023 16:14	WG2080520

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	290000		10000	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	252000		8450	20000	1	06/23/2023 10:51	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 10:51	WG2082640

Sample Narrative:

L1626851-06 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	5070		379	1000	1	07/03/2023 00:20	WG2088440
Sulfate	20800	J3 J6	594	5000	1	07/03/2023 00:20	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	68.0		9.63	30.0	1	06/22/2023 17:44	WG2080520
Calcium	66700		93.6	1000	1	06/22/2023 16:17	WG2080520
Magnesium	22900		73.5	1000	1	06/22/2023 16:17	WG2080520
Potassium	1410	J	108	2000	1	06/22/2023 16:17	WG2080520
Sodium	12000		376	2000	1	06/22/2023 16:17	WG2080520
Strontium	475		0.590	10.0	1	06/22/2023 16:17	WG2080520
Lithium	16.8		0.695	2.00	1	06/22/2023 16:17	WG2080520

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	526000		10000	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	409000		8450	20000	1	06/23/2023 10:55	WG2082640
Alkalinity,Carbonate	13800	J	8450	20000	1	06/23/2023 10:55	WG2082640

Sample Narrative:

L1626851-07 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	25100		379	1000	1	07/03/2023 01:10	WG2088440
Sulfate	13500		594	5000	1	07/03/2023 01:10	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	4890		482	1500	50	06/22/2023 17:47	WG2080520
Calcium	3540		93.6	1000	1	06/22/2023 16:21	WG2080520
Magnesium	1170		73.5	1000	1	06/22/2023 16:21	WG2080520
Potassium	5340		108	2000	1	06/22/2023 16:21	WG2080520
Sodium	203000		376	2000	1	06/22/2023 16:21	WG2080520
Strontium	310		0.590	10.0	1	06/22/2023 16:21	WG2080520
Lithium	126		0.695	2.00	1	06/22/2023 16:21	WG2080520

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	373000		10000	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	291000		8450	20000	1	06/23/2023 10:59	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 10:59	WG2082640

Sample Narrative:

L1626851-08 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	18800		379	1000	1	07/03/2023 01:23	WG2088440
Sulfate	19600		594	5000	1	07/03/2023 01:23	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	1030		96.3	300	10	06/22/2023 17:51	WG2080520
Calcium	55300		93.6	1000	1	06/22/2023 16:32	WG2080520
Magnesium	23200		73.5	1000	1	06/22/2023 16:32	WG2080520
Potassium	6660		108	2000	1	06/22/2023 16:32	WG2080520
Sodium	54200		376	2000	1	06/22/2023 16:32	WG2080520
Strontium	2530		2.95	50.0	5	06/22/2023 17:31	WG2080520
Lithium	36.4		0.695	2.00	1	06/22/2023 16:32	WG2080520

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1560000		50000	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	348000		8450	20000	1	06/23/2023 11:03	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 11:03	WG2082640

Sample Narrative:

L1626851-09 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	546000		1900	5000	5	07/03/2023 02:00	WG2088440
Sulfate	152000		2970	25000	5	07/03/2023 02:00	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	5110		482	1500	50	06/22/2023 17:54	WG2080520
Calcium	99400		93.6	1000	1	06/22/2023 16:36	WG2080520
Magnesium	41600		73.5	1000	1	06/22/2023 16:36	WG2080520
Potassium	13100		108	2000	1	06/22/2023 16:36	WG2080520
Sodium	389000		376	2000	1	06/22/2023 16:36	WG2080520
Strontium	6340		2.95	50.0	5	06/22/2023 17:35	WG2080520
Lithium	237		0.695	2.00	1	06/22/2023 16:36	WG2080520

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	6820000		100000	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	773000		8450	20000	1	06/23/2023 11:07	WG2082640
Alkalinity,Carbonate	154000		8450	20000	1	06/23/2023 11:07	WG2082640

Sample Narrative:

L1626851-10 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	1220000		37900	100000	100	07/03/2023 02:13	WG2088440
Sulfate	2040000		59400	500000	100	07/03/2023 02:13	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	16700		963	3000	100	06/22/2023 17:57	WG2080520
Calcium	1060000		936	10000	10	06/22/2023 16:48	WG2080520
Magnesium	12400		73.5	1000	1	06/22/2023 16:39	WG2080520
Potassium	441000		108	2000	1	06/22/2023 16:39	WG2080520
Sodium	707000		376	2000	1	06/22/2023 16:39	WG2080520
Strontium	8710		5.90	100	10	06/22/2023 16:48	WG2080520
Lithium	1280		0.695	2.00	1	06/22/2023 16:39	WG2080520

SAMPLE RESULTS - 11

DUP-1 L1626851-11

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	591000		13300	1	06/21/2023 10:42	WG2081545

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	400000		8450	20000	1	06/23/2023 11:11	WG2082640
Alkalinity,Carbonate	U		8450	20000	1	06/23/2023 11:11	WG2082640

Sample Narrative:

L1626851-11 WG2082640: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	36900		379	1000	1	07/03/2023 02:51	WG2088440
Sulfate	101000		594	5000	1	07/03/2023 02:51	WG2088440

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	424	V	9.63	30.0	1	06/22/2023 14:51	WG2080520
Calcium	118000		93.6	1000	1	06/22/2023 14:51	WG2080520
Magnesium	34100		73.5	1000	1	06/22/2023 14:51	WG2080520
Potassium	3050		108	2000	1	06/22/2023 14:51	WG2080520
Sodium	47800		376	2000	1	06/22/2023 14:51	WG2080520
Strontium	1650	V	0.590	10.0	1	06/22/2023 14:51	WG2080520
Lithium	19.1		0.695	2.00	1	06/22/2023 14:51	WG2080520

Method Blank (MB)

(MB) R3940270-1 06/21/23 10:42

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		10000	10000

L1626123-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1626123-05 06/21/23 10:42 • (DUP) R3940270-3 06/21/23 10:42

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	311000	310000	1	0.322		5

L1626851-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1626851-06 06/21/23 10:42 • (DUP) R3940270-4 06/21/23 10:42

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	290000	293000	1	1.03		5

Laboratory Control Sample (LCS)

(LCS) R3940270-2 06/21/23 10:42

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8730000	99.2	77.3-123	

Method Blank (MB)

(MB) R3940635-2 06/23/23 09:36

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Alkalinity	U		8450	20000
Alkalinity,Carbonate	U		8450	20000

Sample Narrative:
BLANK: Endpoint pH 4.5

L1626704-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1626704-02 06/23/23 10:13 • (DUP) R3940635-3 06/23/23 10:17

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	285000	284000	1	0.475		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:
OS: Endpoint pH 4.5 Headspace
DUP: Endpoint pH 4.5

L1626968-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1626968-02 06/23/23 11:21 • (DUP) R3940635-4 06/23/23 11:24

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	626000	627000	1	0.156		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:
OS: Endpoint pH 4.5 Headspace
DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3940635-1 06/23/23 09:32

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100000	97300	97.3	90.0-110	

Laboratory Control Sample (LCS)

(LCS) R3940635-1 06/23/23 09:32

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3944109-1 07/02/23 10:49

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		379	1000
Sulfate	U		594	5000

L1626851-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1626851-08 07/03/23 01:23 • (DUP) R3944109-6 07/03/23 01:35

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	18800	18800	1	0.343		15
Sulfate	19600	19600	1	0.198		15

L1626851-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1626851-06 07/03/23 00:20 • (DUP) R3944109-8 07/03/23 05:35

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	5070	4980	1	1.88		15
Sulfate	20800	20600	1	1.12		15

Laboratory Control Sample (LCS)

(LCS) R3944109-2 07/02/23 11:01

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39200	98.0	80.0-120	
Sulfate	40000	39100	97.8	80.0-120	

L1626851-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1626851-06 07/03/23 00:20 • (MS) R3944109-4 07/03/23 00:45 • (MSD) R3944109-5 07/03/23 00:57

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	5070	57200	56700	104	103	1	80.0-120			0.901	15
Sulfate	50000	20800	U	72900	0.000	104	1	80.0-120	J6	J3	200	15

Sample Narrative:

MS: Matrix spike failure due to matrix.

APPENDIX A:
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT - QUARTER 2, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-257-122

L1626851-01,02,03,04,05,06,07,08,09,10,11

L1626851-08 Original Sample (OS) • Matrix Spike (MS)

(OS) L1626851-08 07/03/23 01:23 • (MS) R3944109-7 07/03/23 01:48

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	18800	68100	98.6	1	80.0-120	
Sulfate	50000	19600	70400	102	1	80.0-120	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3940233-1 06/22/23 14:44

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Boron	U		9.63	30.0
Calcium	U		93.6	1000
Magnesium	U		73.5	1000
Potassium	U		108	2000
Sodium	U		376	2000
Strontium	U		0.590	10.0
Lithium	U		0.695	2.00

Laboratory Control Sample (LCS)

(LCS) R3940233-2 06/22/23 14:48

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	50.0	48.3	96.6	80.0-120	
Calcium	5000	5160	103	80.0-120	
Magnesium	5000	5140	103	80.0-120	
Potassium	5000	5110	102	80.0-120	
Sodium	5000	5140	103	80.0-120	
Strontium	50.0	48.9	97.8	80.0-120	
Lithium	50.0	44.1	88.2	80.0-120	

L1626851-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1626851-11 06/22/23 14:51 • (MS) R3940233-4 06/22/23 14:58 • (MSD) R3940233-5 06/22/23 15:01

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	50.0	424	483	496	117	144	1	75.0-125		V	2.72	20
Calcium	5000	118000	123000	123000	104	94.9	1	75.0-125			0.381	20
Magnesium	5000	34100	39200	39100	102	99.4	1	75.0-125			0.281	20
Potassium	5000	3050	8020	7910	99.3	97.2	1	75.0-125			1.32	20
Sodium	5000	47800	52700	52200	97.9	87.3	1	75.0-125			1.02	20
Strontium	50.0	1650	1680	1690	66.8	86.8	1	75.0-125	V		0.593	20
Lithium	50.0	19.1	60.7	60.9	83.3	83.7	1	75.0-125			0.350	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

APPENDIX A
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT, QUARTER 2, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-257-122

Company Name/Address: **S&ME Nashville, TN**
862 East Crescentville Road
Cincinnati, OH 45246

Billing Information:
Accounts Payable
658 Grassmere Park Dr, Ste 100
Nashville, TN 37211

Pres Chk

Report to: **Vince Epps**

Email To: **vepps@smeinc.com;eric.bauer@ramboll.com**

Project Description: Zimmer LF

City/State Collected: Moscow, OH

Please Circle: PT MT CT (ET)

Phone: **513-771-8471**

Client Project # **2285**

Lab Project # **LITENGNTN-ZIMMER**

Collected by (print): Carter Harden

Site/Facility ID #

P.O. #

Collected by (signature): Carter Harden

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	6020 Metals 250mlHDPE-HNO3	ALKBI,ALKCA,CL,SO4 125mlHDPE-NoPres	TDS 1L-HDPE NoPres	Remarks	Sample # (lab only)
MW-3	G	GW	N/A	6/15/23	950	3	X	X	X		-01
MW-9D		GW		6/14/23	1620	3	X	X	X		-02
MW-11D		GW		6/14/23	1020	1		X			-03
MW-21		GW		6/14/23	1440	3	X	X	X		-04
MW-22		GW		6/15/23	1100		X	X	X		-05
MW-24		GW		6/14/23	1215		X	X	X		-06
MW-D		GW		6/14/23	1110		X	X	X		-07
MW-E		GW		6/14/23	1720		X	X	X		-08
MW-F		GW		6/14/23	1210		X	X	X		-09
SEQ-1		GW		6/14/23	1515		X	X	X		-10

PH-10BDH4321 TRC-2144141
CR6-20221

Chain of Custody Page 1 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1626851
D223

Acctnum: **LITENGNTN**
Template: **T230486**
Prelogin: **P999757**
PM: **134 - Mark W. Beasley**
PB: BF 5/19/23
Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:6020 Metals=BG,CAG,KG,LIG,MGG,NAG,SRG

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Carter Harden	6/15/23	1645	To FedEx
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Kayla T @

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 31

Date: 6/16/23 Time: 915

If preservation required by Login: Date/Time

Hold: Condition NCF / OK

APPENDIX A
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT, QUARTER 2, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-25

Company Name/Address:
S&ME - Nashville, TN
8622 East Crescentville Road
Cincinnati, OH 45246

Billing Information:
Accounts Payable
658 Grassmere Park Dr, Ste 100
Nashville, TN 37211

Report to: **Vince Epps**

Email To: **vepps@smeinc.com;eric.bauer@ramboll.com**

Project Description: Zimmer LF

City/State Collected: Moscow, OH

Please Circle: PT MT CT (ET)

Phone: **513-771-8471**

Client Project # **2285**

Lab Project # **LITENGNTN-ZIMMER**

Collected by (print): Carter Harlan

Site/Facility ID #

P.O. #

Collected by (signature): Carter Harlan

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk: X

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	6020 Metals 250mlHDPE-HNO3	ALKBI,ALKCA,CL,SO4 125mlHDPE-NoPres	TDS 1L-HDPE NoPres	Remarks	Sample # (lab only)
DUP-1	G	GW	N/A	6/15/23	—	3	X	X	X		-11
		GW									
		GW									
		GW									
		GW									
		GW									

Chain of Custody Page 2 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1626851

Table #

Acctnum: **LITENGNTN**
Template: **T230486**
Prelogin: **P999757**
PM: **134 - Mark W. Beasley**
PB: BF 5/19/23

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:6020 Metals=BG,CAG,KG,LIG,MGG,NAG,SRG

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Carter Harlan	6/15/23	1645	To FedEx
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Kayla (9)

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: °C Bottles Received: 31

Date: 6/16/23 Time: 915

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

L1626851

Tracking Numbers	Temperature
6481 5471 1445	GBAT 1.9+0=1.9
6481 5471 1456	GBAT 4.7+0=4.7

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 15, 2023
Source Well:	MW-03	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	June 15, 2023
Sampled By:	Carter Harlan	Sample Time:	9:50
Weather:	Overcast	Air Temp:	67F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				12.16	ft-TOC
Total Well Depth:				35.34	ft-TOC
Height of Water Column:				23.18	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	3.8	Gal
3 * Well Volume	11.35	Gal
5 * Well Volume	18.91	Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	9:20	End Time:	9:45
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		1.0		Gallons			
Final Volume Purge Rate:		150		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	09:20	0.0	---	---	---	---	---	---	---	---	Start Purging
	09:25	0.3	250	13.55	13.8	6.9	1.091	1.4	202	1.17	Clear, no odor
	09:30	0.5	100	13.78	14.3	6.9	1.097	0.6	185	1.08	Clear, no odor
	09:35	0.6	100	14.20	14.0	6.9	1.086	0.2	173	0.89	Clear, no odor
	09:40	0.8	150	14.65	13.9	6.9	1.083	0.2	166	0.61	Clear, no odor
	09:45	1.0	150	15.00	13.8	6.9	1.080	0.3	161	1.21	Clear, no odor
Final:	09:45	1.0	150	15.00	13.8	6.9	1.080	0.3	161	1.2	End of Purging

Sample Method: Bladder Pump Sample Start Time: 09:50 Sample End Time: 10:10

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-09D	Purge Time:	35 Minutes
Locked?:	Yes	Sample Date:	June 14, 2023
Sampled By:	Carter Harlan	Sample Time:	16:20
Weather:	Sunny	Air Temp:	79F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				31.23	ft-TOC
Total Well Depth:				69.53	ft-TOC
Height of Water Column:				38.30	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	6.3	Gal
3 * Well Volume	18.75	Gal
5 * Well Volume	31.25	Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	15:45	End Time:	16:20
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		1.8		Gallons			
Final Volume Purge Rate:		200		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	15:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	15:50	0.3	200	31.25	15.3	7.2	1.661	2.0	-64	10.0	Clear, no odor
	15:55	0.5	200	31.26	15.1	7.2	2.313	0.8	-100	6.13	Clear, no odor
	16:00	0.8	200	31.25	15.5	7.2	2.369	0.4	-108	4.71	Clear, no odor
	16:05	1.1	200	31.22	16.2	7.2	2.495	0.1	-114	3.76	Clear, no odor
	16:10	1.3	200	31.24	16.9	7.2	2.448	0.1	-118	2.69	Clear, no odor
	16:15	1.6	200	31.25	17.1	7.2	2.332	0.1	-118	3.14	Clear, no odor
	16:20	1.8	200	31.21	16.8	7.2	2.276	0.2	-115	3.29	Clear, no odor
Final:	16:20	1.8	200	31.21	16.8	7.2	2.276	0.2	-115	3.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 16:20 Sample End Time: 16:45

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-11D	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	June 14, 2023
Sampled By:	Carter Harlan	Sample Time:	10:20
Weather:	Overcast	Air Temp:	70F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	18.10	ft-TOC
			Total Well Depth:	35.79	ft-TOC
			Height of Water Column:	17.69	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.9	Gal
3 * Well Volume	8.66	Gal
5 * Well Volume	14.43	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	9:50	End Time:	10:20	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.6	Gallons				
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	09:50	0.0	---	---	---	---	---	---	---	---	Start Purging
	09:55	0.3	200	18.15	13.7	7.3	0.562	2.0	-44	1.77	Clear, no odor
	10:00	0.5	200	18.16	13.6	7.3	0.574	0.9	-92	0.56	Clear, no odor
	10:05	0.8	200	18.16	13.5	7.3	0.574	0.6	-106	0.48	Clear, no odor
	10:10	1.1	200	18.16	13.5	7.3	0.575	0.5	-111	0.75	Clear, no odor
	10:15	1.3	200	18.16	13.5	7.3	0.566	0.6	-108	0.82	Clear, no odor
	10:20	1.6	200	18.16	13.5	7.3	0.570	0.6	-109	0.40	Clear, no odor
Final:	10:20	1.6	200	18.16	13.5	7.3	0.570	0.6	-109	0.4	End of Purging

Sample Method: Bladder Pump Sample Start Time: 10:20 Sample End Time: 10:22

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes: Matrix Spike collected

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-13S	Purge Time:	#VALUE! Minutes
Locked?:	Yes	Sample Date:	
Sampled By:	Carter Harlan	Sample Time:	
Weather:	Sunny	Air Temp:	78F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	Dry	ft-TOC
			Total Well Depth:	19.01	ft-TOC
			Height of Water Column:	#VALUE!	feet
Screen Length:	20	feet Stickup:			ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	#VALUE!	Gal
3 * Well Volume	#VALUE!	Gal
5 * Well Volume	#VALUE!	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:		End Time:	13:20	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:		Gallons	Water level was below pump intake.			
	Final Volume Purge Rate:		mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
		0.0	---	---	---	---	---	---	---	---	Start Purging
	13:20			Dry							
Final:	13:20			#N/A							End of Purging

Sample Method: Bladder Pump Sample Start Time: Sample End Time:

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-18	Purge Time:	#VALUE! Minutes
Locked?:	Yes	Sample Date:	
Sampled By:	Carter Harlan	Sample Time:	
Weather:	Sunny	Air Temp:	78F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	Dry	ft-TOC
			Total Well Depth:	17.47	ft-TOC
			Height of Water Column:	#VALUE!	feet
Screen Length:	20	feet Stickup:			ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	#VALUE!	Gal
3 * Well Volume	#VALUE!	Gal
5 * Well Volume	#VALUE!	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:		End Time:	13:35	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:		Gallons	Water level was below pump intake			
	Final Volume Purge Rate:		mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
		0.0	---	---	---	---	---	---	---	---	Start Purging
	13:35			Dry							
Final:	13:35			#N/A							End of Purging

Sample Method: Bladder Pump Sample Start Time: Sample End Time:

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-21	Purge Time:	35 Minutes
Locked?:	Yes	Sample Date:	June 14, 2023
Sampled By:	Elisa Flynn	Sample Time:	14:40
Weather:	Sunny	Air Temp:	78F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				12.05	ft-TOC
Total Well Depth:					ft-TOC
Height of Water Column:					feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	14:05	End Time:	14:40
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		1.9		Gallons			
Final Volume Purge Rate:		200		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	14:05	0.0	---	---	---	---	---	---	---	---	Start Purging
	14:10	0.3	250	12.50	13.2	7.3	1.805	2.2	67	2.29	Clear, no odor
	14:15	0.6	200	12.41	13.4	7.3	1.363	2.4	55	1.40	Clear, no odor
	14:20	0.9	200	12.45	13.5	7.2	1.353	1.6	44	1.25	Clear, no odor
	14:25	1.1	200	12.52	13.4	7.2	1.317	1.4	33	0.92	Clear, no odor
	14:30	1.4	200	12.60	13.2	7.1	1.285	1.3	16	1.04	Clear, no odor
	14:35	1.7	200	12.79	13.1	7.1	1.241	1.1	2	0.66	Clear, no odor
	14:40	1.9	200	12.67	12.9	7.1	1.194	0.9	-8	1.04	Clear, no odor
Final:	14:40	1.9	200	12.67	12.9	7.1	1.194	0.9	-8	1.0	End of Purging

Sample Method: Bladder Pump Sample Start Time: 14:40 Sample End Time: 15:05

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 15, 2023
Source Well:	MW-22	Purge Time:	40 Minutes
Locked?:	Yes	Sample Date:	June 15, 2023
Sampled By:	Carter Harlan	Sample Time:	11:00
Weather:	Overcast	Air Temp:	68F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	18.04	ft-TOC
			Total Well Depth:	37.29	ft-TOC
			Height of Water Column:	19.25	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	3.1	Gal
3 * Well Volume	9.42	Gal
5 * Well Volume	15.71	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	10:20	End Time:	11:00	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	1.8	Gallons	Duplicate sample collected (DUP-1)			
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:20	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:25	0.2	150	18.74	13.4	7.0	0.761	2.2	-10	5.22	Clear, no odor
	10:30	0.4	150	18.76	13.3	7.0	0.745	1.5	16	9.07	Clear, no odor
	10:35	0.6	150	18.90	13.2	7.0	0.746	1.2	23	4.22	Clear, no odor
	10:40	0.8	150	18.86	13.1	6.9	0.748	1.0	18	3.83	Clear, no odor
	10:45	1.0	150	18.86	13.3	7.0	0.753	0.9	6	2.27	Clear, no odor
	10:50	1.3	200	18.86	13.4	7.0	0.757	0.2	-11	1.22	Clear, no odor
	10:55	1.5	200	18.86	13.4	7.0	0.759	0.2	-14	0.90	Clear, no odor
	11:00	1.8	200	18.73	13.5	7.0	0.760	0.1	-18	1.10	Clear, no odor
Final:	11:00	1.8	200	18.73	13.5	7.0	0.760	0.1	-18	1.1	End of Purging

Sample Method: Bladder Pump Sample Start Time: 11:00 Sample End Time: 11:35

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes: DUP-1 Collected

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-24	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	June 14, 2023
Sampled By:	Carter Harlan	Sample Time:	12:15
Weather:	Sunny	Air Temp:	76F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	20.55	ft-TOC
			Total Well Depth:	34.41	ft-TOC
			Height of Water Column:	13.86	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.3	Gal
3 * Well Volume	6.79	Gal
5 * Well Volume	11.31	Gal

Well Purging Information

		Purge Method:	Bladder Pump	Start Time:	11:45	End Time:	12:15
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
	Pump Intake Depth from Top of Casing:			ft-TOC			
	Water Column Above Pump Intake:			feet	Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:			ft-TOC	**Comments:**		
	Final Volume Purged:		1.3	Gallons			
	Final Volume Purge Rate:		150	mL/min			
	Well Purged Dry?:			(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	11:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	11:50	0.3	200	21.89	14.2	7.2	0.441	0.5	35	3.85	clear,no odor
	11:55	0.5	150	22.05	14.3	7.3	0.443	0.1	23	3.46	clear,no odor
	12:00	0.7	150	22.31	14.2	7.3	0.443	0.0	17	2.69	clear, no odor
	12:05	0.9	150	21.95	14.9	7.3	0.451	0.0	16	2.25	clear, no odor
	12:10	1.1	150	21.93	14.6	7.3	0.447	0.0	10	1.36	clear, no odor
	12:15	1.3	150								
Final:	12:15	1.3	150	21.93	14.6	7.3	0.447	0.0	10	1.4	End of Purging

Sample Method: Bladder Pump Sample Start Time: 12:15 Sample End Time: 12:45

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-D	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	June 14, 2023
Sampled By:	Elisa Flynn	Sample Time:	11:10
Weather:	Sunny	Air Temp:	74F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				18.71	ft-TOC
Total Well Depth:				35.02	ft-TOC
Height of Water Column:				16.31	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.7	Gal
3 * Well Volume	7.98	Gal
5 * Well Volume	13.31	Gal

Well Purging Information

Purge Method:	Bladder Pump	Start Time:	10:45	End Time:	11:10		
(If Used) Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:		ft-TOC					
Water Column Above Pump Intake:		feet	Flow Through Cell Vol:		200	mL	
DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**				
Final Volume Purged:	0.9	Gallons					
Final Volume Purge Rate:	100	mL/min					
Well Purged Dry?:		(Yes/No)					

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:50	0.3	200	21.79	14.1	8.4	0.745	2.6	-25	5.21	Clear, no odor
	10:55	0.5	150	23.15	14.3	8.4	0.750	1.8	-29	2.31	Clear, no odor
	11:00	0.6	100	23.61	15.5	8.4	0.766	1.7	-30	1.66	Clear, no odor
	11:05	0.7	100	24.00	15.3	8.4	0.769	1.6	-26	1.10	Clear, no odor
	11:10	0.9	100	24.62	14.8	8.4	0.759	1.5	-23	1.31	Clear, no odor
Final:	11:10	0.9	100	24.62	14.8	8.4	0.759	1.5	-23	1.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 11:10 Sample End Time: 11:30

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	MW-E	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	June 14, 2023
Sampled By:	Carter Harlan	Sample Time:	17:20
Weather:	Sunny	Air Temp:	79F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	25.55	ft-TOC
			Total Well Depth:	32.73	ft-TOC
			Height of Water Column:	7.18	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	1.2	Gal
3 * Well Volume	3.52	Gal
5 * Well Volume	5.86	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	16:45	End Time:	17:15	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	1.3	Gallons	2nd isotope bottle not colelcted due to no water being pumped.			
	Final Volume Purge Rate:	150	mL/min				
	Well Purged Dry?:	No	(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	16:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	16:50	0.3	250	26.27	14.4	7.3	0.540	3.3	61	4.33	clear,no odor
	16:55	0.5	150	26.75	14.9	7.3	0.534	2.9	64	4.54	clear,no odor
	17:00	0.7	150	27.45	14.8	7.4	0.535	2.2	63	10.3	clear,no odor
	17:05	0.9	150	28.11	14.5	7.3	0.549	1.9	61	14.9	clear,no odor
	17:10	1.1	150	28.43	15.1	7.4	0.556	1.9	61	16.5	clear,no odor
	17:15	1.3	150	28.81	16.1	7.4	0.577	1.8	63	15.1	clear,no odor
Final:	17:15	1.3	150	28.81	16.1	7.4	0.577	1.8	63	15.1	End of Purging

Sample Method: Bladder Pump Sample Start Time: 17:20 Sample End Time: 17:45

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 15, 2023
Source Well:	MW-F	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	June 15, 2023
Sampled By:	Elisa Flynn	Sample Time:	12:10
Weather:	Sunny	Air Temp:	

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				11.21	ft-TOC
Total Well Depth:					ft-TOC
Height of Water Column:					feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	11:40	End Time:	12:10
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		0.9		Gallons			
Final Volume Purge Rate:		100		mL/min			
Well Purged Dry?:		No		(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	11:40	0.0	---	---	---	---	---	---	---	---	Start Purging
	11:45	0.3	200	12.52	14.1	7.3	2.605	2.6	-43	11.3	Clear, no odor
	11:50	0.4	100	13.50	14.7	7.3	2.282	1.7	-62	5.15	Clear, no odor
	11:55	0.5	100	14.73	14.6	7.3	2.206	1.5	-57	4.32	Clear, no odor
	12:00	0.7	100	15.10	14.9	7.3	2.183	1.5	-47	2.90	Clear, no odor
	12:05	0.8	100	15.81	14.3	7.3	2.111	1.5	-42	1.98	Clear, no odor
	12:10	0.9	100	16.60	14.1	7.3	2.079	1.6	-35	1.52	Clear, no odor
Final:	12:10	0.9	100	16.60	14.1	7.3	2.079	1.6	-35	1.5	End of Purging

Sample Method: Bladder Pump Sample Start Time: 12:10 Sample End Time: 12:35

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	June 14, 2023
Source Well:	Seq. 1 Source Water	Purge Time:	5 Minutes
Locked?:	Yes	Sample Date:	June 14, 2023
Sampled By:	Carter Harlan	Sample Time:	15:15
Weather:	Sunny	Air Temp:	79F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	N/A	ft-TOC
			Total Well Depth:		ft-TOC
			Height of Water Column:		feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	15:10	End Time:	15:15	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet	Flow Through Cell Vol:		200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	0.3	Gallons				
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	15:10	0.0	---	---	---	---	---	---	---	---	Start Purging
	15:15	0.3	200		15.2	8.9	7.649	6.0	-329		
Final:	15:15	0.3	200		15.2	8.9	7.649	6.0	-329		End of Purging

Sample Method: Bladder Pump Sample Start Time: 15:15 Sample End Time: 15:20

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

Zimmer Landfill - Unit 122			
Well ID	**Date**	**Time**	**Depth to Water**
Zimmer Landfill - Unit 122			
MW-3	6/14/2023	9:40	12.01
MW-9D	6/14/2023	8:40	31.15
MW-11D	6/14/2023	8:05	17.98
MW-13S	6/14/2023	9:25	DRY
MW-18	6/14/2023	9:20	DRY
MW-21	6/14/2023	9:35	11.95
MW-22	6/14/2023	8:50	17.96
MW-24	6/14/2023	8:25	23.39
MW-D	6/14/2023	8:45	18.65
MW-E	6/14/2023	8:55	25.48
MW-F	6/14/2023	9:10	11.12

APPENDIX A.
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT - QUARTER 2, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-257-122

Well I.D.	Date	Time	Depth	Temp	pH	Spec. Cond.	Dissolved Oxygen	ORP*	Turbidity
MW-3	6/15/2023	9:50	12.01	13.8	6.86	1.08	0.26	160.6	1.21
MW-9D	6/14/2023	16:20	31.15	16.8	7.17	2.276	0.15	-115.3	3.29
MW-11D	6/14/2023	10:20	17.98	13.5	7.25	0.57	0.61	-109.4	0.4
MW-13S	NA		DRY						
MW-18	NA		DRY						
MW-21	6/14/2023	14:40	11.95	12.9	7.06	1.194	0.88	-8	1.04
MW-22	6/15/2023	11:00	17.96	13.5	6.96	0.76	0.1	-18	1.10
MW-24	6/14/2023	12:15	23.39	14.6	7.29	0.4473	0.02	9.6	1.36
MW-D	6/14/2023	11:10	18.65	14.8	8.41	0.759	1.45	-22.7	1.31
MW-E	6/14/2023	17:20	25.48	16.1	7.35	0.577	1.8	62.7	15.10
MW-F	6/15/2023	12:10	11.12	14.1	7.33	2.079	1.56	-35	1.52

Pace Analytical®

ANALYTICAL REPORT

November 30, 2023

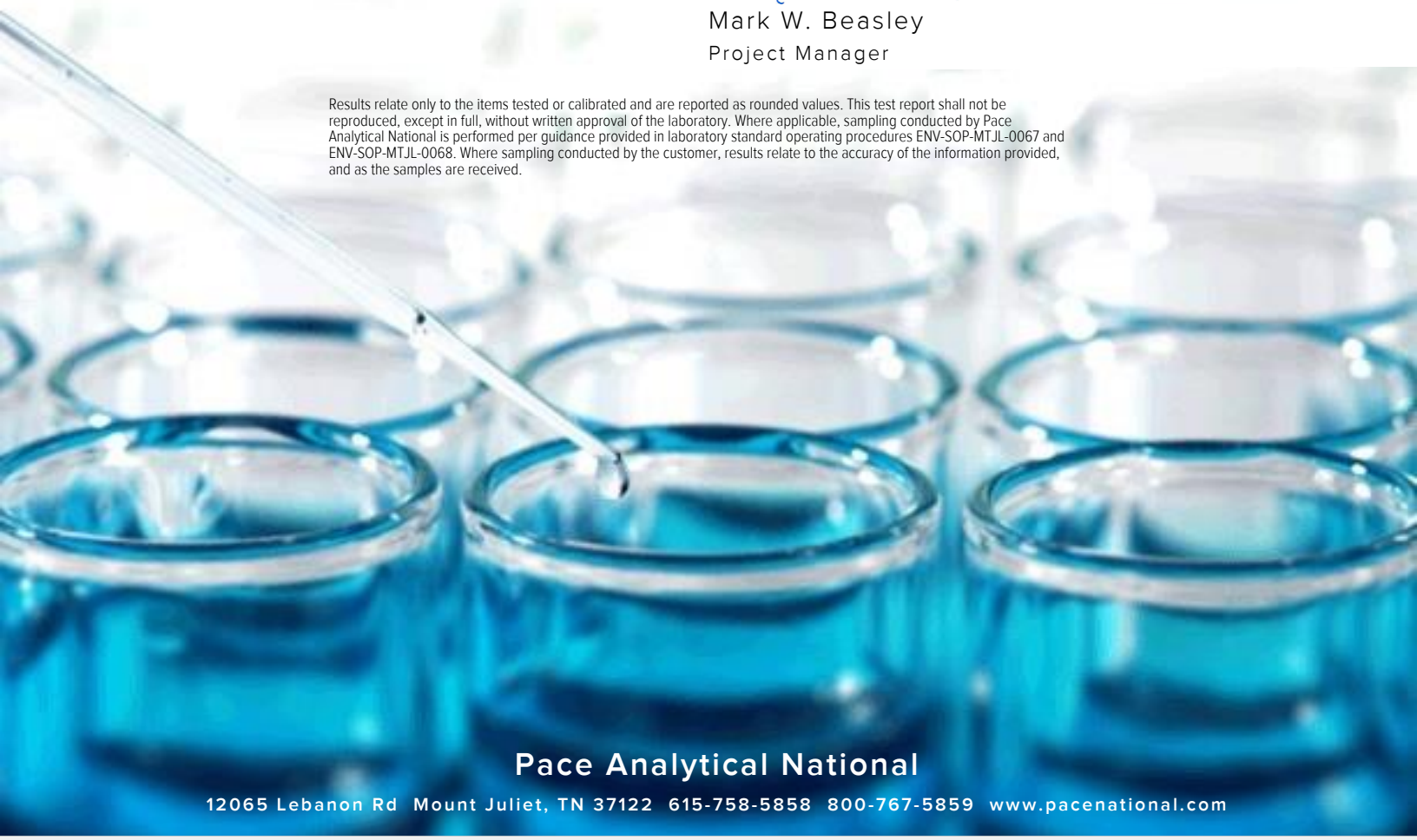
Revised Report

S&ME - Nashville, TN

Sample Delivery Group:	L1658218
Samples Received:	09/21/2023
Project Number:	7217-17-001D
Description:	
Site:	WHZ UNIT 122 LANDFILL
Report To:	Vince Epps 862 East Crescentville Road Cincinnati, OH 45246

Entire Report Reviewed By:

Mark W. Beasley
Project Manager



Pace Analytical National
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SAMPLE SUMMARY

MW-03 L1658218-01 GW

Collected by | Collected date/time 09/19/23 13:15 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139720	1	09/28/23 11:05	09/28/23 11:05	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140146	1	09/27/23 14:20	09/27/23 14:20	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140146	5	09/27/23 14:34	09/27/23 14:34	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 13:18	SJM	Mt. Juliet, TN

MW-03 L1658218-02 Non-Potable Water

Collected by | Collected date/time 09/19/23 13:15 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 17:21	RGT	Mt. Juliet, TN

MW-09DR L1658218-03 GW

Collected by | Collected date/time 09/18/23 14:00 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139720	1	09/28/23 11:12	09/28/23 11:12	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140146	1	09/27/23 15:14	09/27/23 15:14	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140146	5	09/27/23 15:28	09/27/23 15:28	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 14:18	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	10	09/28/23 12:12	10/06/23 13:21	SJM	Mt. Juliet, TN

MW-09DR L1658218-04 Non-Potable Water

Collected by | Collected date/time 09/18/23 14:00 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 17:21	RGT	Mt. Juliet, TN

MW-11D L1658218-05 GW

Collected by | Collected date/time 09/18/23 16:25 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139720	1	09/28/23 11:19	09/28/23 11:19	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140146	1	09/27/23 15:42	09/27/23 15:42	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 13:24	SJM	Mt. Juliet, TN

MW-11D L1658218-06 Non-Potable Water

Collected by | Collected date/time 09/18/23 16:25 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 17:21	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

MW-16D L1658218-07 GW

	Collected by	Collected date/time	Received date/time
		09/20/23 12:55	09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137500	1	09/22/23 10:03	09/25/23 09:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139720	1	09/28/23 11:54	09/28/23 11:54	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140474	1	09/28/23 00:05	09/28/23 00:05	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 14:27	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	10	09/28/23 12:12	10/06/23 13:28	SJM	Mt. Juliet, TN

MW-16D L1658218-08 Non-Potable Water

	Collected by	Collected date/time	Received date/time
		09/20/23 12:55	09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/16/23 13:50	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/16/23 13:50	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 17:21	RGT	Mt. Juliet, TN

MW-20D L1658218-09 GW

	Collected by	Collected date/time	Received date/time
		09/19/23 16:40	09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137500	1	09/22/23 10:03	09/25/23 09:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139720	1	09/28/23 12:00	09/28/23 12:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140474	1	09/28/23 00:19	09/28/23 00:19	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 14:31	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	5	09/28/23 12:12	10/06/23 12:29	SJM	Mt. Juliet, TN

MW-20D L1658218-10 Non-Potable Water

	Collected by	Collected date/time	Received date/time
		09/19/23 16:40	09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 17:21	RGT	Mt. Juliet, TN

MW-21 L1658218-11 GW

	Collected by	Collected date/time	Received date/time
		09/19/23 14:30	09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137500	1	09/22/23 10:03	09/25/23 09:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139720	1	09/28/23 11:39	09/28/23 11:39	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140474	1	09/28/23 00:32	09/28/23 00:32	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 14:56	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	10	09/28/23 12:12	10/06/23 13:31	SJM	Mt. Juliet, TN

MW-21 L1658218-12 Non-Potable Water

	Collected by	Collected date/time	Received date/time
		09/19/23 14:30	09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 17:21	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

MW-22 L1658218-13 GW

Collected by | Collected date/time 09/19/23 12:00 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137500	1	09/22/23 10:03	09/25/23 09:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139720	1	09/28/23 12:07	09/28/23 12:07	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140474	1	09/28/23 01:00	09/28/23 01:00	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 14:59	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	5	09/28/23 12:12	10/06/23 12:36	SJM	Mt. Juliet, TN

MW-22 L1658218-14 Non-Potable Water

Collected by | Collected date/time 09/19/23 12:00 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 17:21	RGT	Mt. Juliet, TN

MW-24 L1658218-15 GW

Collected by | Collected date/time 09/20/23 10:25 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139723	1	09/27/23 10:10	09/27/23 10:10	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140474	1	09/28/23 01:13	09/28/23 01:13	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 13:34	SJM	Mt. Juliet, TN

MW-24 L1658218-16 Non-Potable Water

Collected by | Collected date/time 09/20/23 10:25 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 23:29	RGT	Mt. Juliet, TN

MW-D L1658218-17 GW

Collected by | Collected date/time 09/20/23 09:25 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139723	1	09/27/23 09:47	09/27/23 09:47	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140474	1	09/28/23 01:27	09/28/23 01:27	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 15:06	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	50	09/28/23 12:12	10/06/23 13:38	SJM	Mt. Juliet, TN

MW-D L1658218-18 Non-Potable Water

Collected by | Collected date/time 09/19/23 09:25 | Received date/time 09/21/23 16:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 23:29	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

MW-E L1658218-19 GW

			Collected by	Collected date/time	Received date/time	
				09/19/23 09:25	09/21/23 16:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139723	1	09/27/23 10:19	09/27/23 10:19	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140474	1	09/28/23 01:40	09/28/23 01:40	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	1	09/28/23 12:12	10/06/23 15:09	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137853	20	09/28/23 12:12	10/06/23 13:41	SJM	Mt. Juliet, TN

MW-E L1658218-20 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				09/19/23 09:25	09/21/23 16:45	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2141583	1	09/29/23 19:41	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/04/23 17:26	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 23:29	RGT	Mt. Juliet, TN

MW-F L1658218-21 GW

			Collected by	Collected date/time	Received date/time	
				09/19/23 10:50	09/21/23 09:00	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139575	1	09/27/23 09:26	09/27/23 09:26	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	1	09/27/23 20:00	09/27/23 20:00	ASM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	5	09/27/23 20:17	09/27/23 20:17	ASM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	1	09/29/23 08:01	10/11/23 16:32	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	5	09/29/23 08:01	10/11/23 12:37	LD	Mt. Juliet, TN

MW-F L1658218-22 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				09/19/23 10:50	09/21/23 09:00	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2140673	1	09/27/23 22:22	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2137491	1	09/25/23 15:11	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2137491	1	09/25/23 15:11	09/26/23 15:47	RGT	Mt. Juliet, TN

MW-G L1658218-23 GW

			Collected by	Collected date/time	Received date/time	
				09/20/23 11:55	09/21/23 09:00	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137500	1	09/22/23 10:03	09/25/23 09:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139575	1	09/27/23 11:03	09/27/23 11:03	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	1	09/27/23 20:34	09/27/23 20:34	ASM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	1	09/29/23 08:01	10/11/23 16:18	LD	Mt. Juliet, TN

MW-G L1658218-24 Non-Potable Water

			Collected by	Collected date/time	Received date/time	
				09/20/23 11:55	09/21/23 09:00	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2140673	1	09/27/23 22:22	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2137491	1	09/25/23 12:34	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2137491	1	09/25/23 12:34	09/25/23 19:20	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

MW-H L1658218-25 GW

Collected by | Collected date/time: 09/20/23 13:45 | Received date/time: 09/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137500	1	09/22/23 10:03	09/25/23 09:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139575	1	09/27/23 10:01	09/27/23 10:01	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	1	09/27/23 22:15	09/27/23 22:15	ASM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	1	09/29/23 08:01	10/11/23 15:24	LD	Mt. Juliet, TN

MW-H L1658218-26 Non-Potable Water

Collected by | Collected date/time: 09/20/23 13:45 | Received date/time: 09/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2140673	1	09/27/23 22:22	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 23:29	RGT	Mt. Juliet, TN

SEQ1 LEACHATE L1658218-27 GW

Collected by | Collected date/time: 09/19/23 15:10 | Received date/time: 09/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2139843	1	09/26/23 18:21	09/27/23 00:24	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139575	1	09/27/23 10:09	09/27/23 10:09	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	10	09/27/23 22:32	09/27/23 22:32	ASM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	100	09/27/23 22:49	09/27/23 22:49	ASM	Mt. Juliet, TN
Mercury by Method 7470A	WG2139758	1	09/28/23 17:21	09/29/23 11:52	LAS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	5	09/29/23 08:01	10/11/23 13:10	JDG	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	50	09/29/23 08:01	10/11/23 13:37	LD	Mt. Juliet, TN

SEQ1 LEACHATE L1658218-28 Non-Potable Water

Collected by | Collected date/time: 09/19/23 15:10 | Received date/time: 09/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2140673	1	09/27/23 22:22	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2139384	1	09/26/23 15:13	10/02/23 16:33	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2139384	1	09/26/23 15:13	09/27/23 23:29	RGT	Mt. Juliet, TN

DUP-1 L1658218-29 GW

Collected by | Collected date/time: 09/19/23 00:00 | Received date/time: 09/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137500	1	09/22/23 10:03	09/25/23 09:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139575	1	09/27/23 10:17	09/27/23 10:17	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	1	09/27/23 23:06	09/27/23 23:06	ASM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140132	5	09/27/23 23:23	09/27/23 23:23	ASM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	1	09/29/23 08:01	10/11/23 15:34	LD	Mt. Juliet, TN

DUP-2 L1658218-31 GW

Collected by | Collected date/time: 09/20/23 00:00 | Received date/time: 09/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2137507	1	09/22/23 10:05	09/24/23 16:55	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2139575	1	09/27/23 10:24	09/27/23 10:24	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2140146	1	09/27/23 16:36	09/27/23 16:36	GEB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2137848	1	09/29/23 08:01	10/11/23 15:38	LD	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Report Revision History

Level II Report - Version 1: 10/17/23 17:13
Level II Report - Version 2: 11/28/23 18:47
Level II Report - Version 3: 11/29/23 10:40

Project Narrative

Revised COC added

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	938000	J3	20000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	338000		8450	20000	1	09/28/2023 11:05	WG2139720
Alkalinity,Bicarbonate	338000		8450	20000	1	09/28/2023 11:05	WG2139720
Alkalinity,Carbonate	U		8450	20000	1	09/28/2023 11:05	WG2139720

Sample Narrative:

L1658218-01 WG2139720: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	234000		1900	5000	5	09/27/2023 14:34	WG2140146
Fluoride	156		64.0	150	1	09/27/2023 14:20	WG2140146
Sulfate	55800		594	5000	1	09/27/2023 14:20	WG2140146

Sample Narrative:

L1658218-01 WG2140146: Dilution due to matrix.

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	U		0.180	2.00	1	10/06/2023 13:18	WG2137853
Barium	73.6		0.381	2.00	1	10/06/2023 13:18	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 13:18	WG2137853
Boron	73.2		9.63	30.0	1	10/06/2023 13:18	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 13:18	WG2137853
Calcium	186000	V	93.6	1000	1	10/06/2023 13:18	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 13:18	WG2137853
Cobalt	U		0.0596	2.00	1	10/06/2023 13:18	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 13:18	WG2137853
Magnesium	33400	V	73.5	1000	1	10/06/2023 13:18	WG2137853
Molybdenum	U		0.348	5.00	1	10/06/2023 13:18	WG2137853
Potassium	3240		108	2000	1	10/06/2023 13:18	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 13:18	WG2137853
Sodium	37800		376	2000	1	10/06/2023 13:18	WG2137853
Strontium	2370	V	0.590	10.0	1	10/06/2023 13:18	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 13:18	WG2137853
Lithium	12.4		0.695	2.00	1	10/06/2023 13:18	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.0505	U	0.242		0.454		10/04/2023 17:26	WG2141583
(T) Barium	*139*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*86.7*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.784		0.461	0.581	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.784		0.392		0.362		09/27/2023 17:21	WG2139384
(T) Barium-133	*84.8*					*30.0-143*	*09/27/2023 17:21*	WG2139384

MW-09DR SAMPLE RESULTS - 03

Collected date/time: 09/18/23 14:00 L1658218

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	940000	J3	20000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	486000		8450	20000	1	09/28/2023 11:12	WG2139720
Alkalinity,Bicarbonate	486000		8450	20000	1	09/28/2023 11:12	WG2139720
Alkalinity,Carbonate	U		8450	20000	1	09/28/2023 11:12	WG2139720

Sample Narrative:

L1658218-03 WG2139720: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	362000		1900	5000	5	09/27/2023 15:28	WG2140146
Fluoride	363		64.0	150	1	09/27/2023 15:14	WG2140146
Sulfate	3180	J	594	5000	1	09/27/2023 15:14	WG2140146

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	2.67		0.180	2.00	1	10/06/2023 14:18	WG2137853
Barium	758		0.381	2.00	1	10/06/2023 14:18	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 14:18	WG2137853
Boron	1300		96.3	300	10	10/06/2023 13:21	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 14:18	WG2137853
Calcium	72600		93.6	1000	1	10/06/2023 14:18	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 14:18	WG2137853
Cobalt	2.63		0.0596	2.00	1	10/06/2023 14:18	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 14:18	WG2137853
Magnesium	33000		73.5	1000	1	10/06/2023 14:18	WG2137853
Molybdenum	0.394	J	0.348	5.00	1	10/06/2023 14:18	WG2137853
Potassium	10700		108	2000	1	10/06/2023 14:18	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 14:18	WG2137853
Sodium	293000		376	2000	1	10/06/2023 14:18	WG2137853
Strontium	3370		0.590	10.0	1	10/06/2023 14:18	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 14:18	WG2137853
Lithium	73.6		0.695	2.00	1	10/06/2023 14:18	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.976		0.263		0.456		10/04/2023 17:26	WG2141583
(T) Barium	*141*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*90.7*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.25		0.518	0.550	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.27		0.446		0.307		09/27/2023 17:21	WG2139384
(T) Barium-133	*95.1*					*30.0-143*	*09/27/2023 17:21*	WG2139384

MW-11D — SAMPLE RESULTS - 05

Collected date/time: 09/18/23 16:25 — L1658218

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	366000		10000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	363000		8450	20000	1	09/28/2023 11:19	WG2139720
Alkalinity,Bicarbonate	363000		8450	20000	1	09/28/2023 11:19	WG2139720
Alkalinity,Carbonate	U		8450	20000	1	09/28/2023 11:19	WG2139720

Sample Narrative:

L1658218-05 WG2139720: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	5430		379	1000	1	09/27/2023 15:42	WG2140146
Fluoride	261		64.0	150	1	09/27/2023 15:42	WG2140146
Sulfate	12700		594	5000	1	09/27/2023 15:42	WG2140146

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	2.42		0.180	2.00	1	10/06/2023 13:24	WG2137853
Barium	162		0.381	2.00	1	10/06/2023 13:24	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 13:24	WG2137853
Boron	174		9.63	30.0	1	10/06/2023 13:24	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 13:24	WG2137853
Calcium	73700		93.6	1000	1	10/06/2023 13:24	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 13:24	WG2137853
Cobalt	0.0935	J	0.0596	2.00	1	10/06/2023 13:24	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 13:24	WG2137853
Magnesium	36600		73.5	1000	1	10/06/2023 13:24	WG2137853
Molybdenum	0.472	J	0.348	5.00	1	10/06/2023 13:24	WG2137853
Potassium	1080	J	108	2000	1	10/06/2023 13:24	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 13:24	WG2137853
Sodium	22300		376	2000	1	10/06/2023 13:24	WG2137853
Strontium	952		0.590	10.0	1	10/06/2023 13:24	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 13:24	WG2137853
Lithium	7.22		0.695	2.00	1	10/06/2023 13:24	WG2137853

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.100	U	0.263		0.484		10/04/2023 17:26	WG2141583
(T) Barium	*127*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*96.7*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.806		0.472	0.615	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.706		0.392		0.379		09/27/2023 17:21	WG2139384
(T) Barium-133	*90.3*					*30.0-143*	*09/27/2023 17:21*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	537000		10000	1	09/25/2023 09:32	WG2137500

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	443000		8450	20000	1	09/28/2023 11:54	WG2139720
Alkalinity,Bicarbonate	443000		8450	20000	1	09/28/2023 11:54	WG2139720
Alkalinity,Carbonate	U		8450	20000	1	09/28/2023 11:54	WG2139720

Sample Narrative:

L1658218-07 WG2139720: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	68600		379	1000	1	09/28/2023 00:05	WG2140474
Fluoride	532		64.0	150	1	09/28/2023 00:05	WG2140474
Sulfate	809	B J	594	5000	1	09/28/2023 00:05	WG2140474

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	5.35		0.180	2.00	1	10/06/2023 14:27	WG2137853
Barium	108		0.381	2.00	1	10/06/2023 14:27	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 14:27	WG2137853
Boron	1120		96.3	300	10	10/06/2023 13:28	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 14:27	WG2137853
Calcium	48700		93.6	1000	1	10/06/2023 14:27	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 14:27	WG2137853
Cobalt	0.151	J	0.0596	2.00	1	10/06/2023 14:27	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 14:27	WG2137853
Magnesium	26000		73.5	1000	1	10/06/2023 14:27	WG2137853
Molybdenum	0.991	J	0.348	5.00	1	10/06/2023 14:27	WG2137853
Potassium	2400		108	2000	1	10/06/2023 14:27	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 14:27	WG2137853
Sodium	137000		376	2000	1	10/06/2023 14:27	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 14:27	WG2137853
Lithium	44.3		0.695	2.00	1	10/06/2023 14:27	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.08		0.319		0.540		10/16/2023 13:50	WG2141583
(T) Barium	*112*					*30.0-143*	*10/16/2023 13:50*	WG2141583
(T) Yttrium	*77.0*					*30.0-136*	*10/16/2023 13:50*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.38		0.474	0.724	10/16/2023 13:50	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.298	J	0.350		0.482		09/27/2023 17:21	WG2139384
(T) Barium-133	*70.5*					*30.0-143*	*09/27/2023 17:21*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	355000		10000	1	09/25/2023 09:32	WG2137500

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	306000		8450	20000	1	09/28/2023 12:00	WG2139720
Alkalinity,Bicarbonate	306000		8450	20000	1	09/28/2023 12:00	WG2139720
Alkalinity,Carbonate	U		8450	20000	1	09/28/2023 12:00	WG2139720

Sample Narrative:

L1658218-09 WG2139720: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	18500		379	1000	1	09/28/2023 00:19	WG2140474
Fluoride	246		64.0	150	1	09/28/2023 00:19	WG2140474
Sulfate	20200		594	5000	1	09/28/2023 00:19	WG2140474

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	1.39	J	0.180	2.00	1	10/06/2023 14:31	WG2137853
Barium	140		0.381	2.00	1	10/06/2023 14:31	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 14:31	WG2137853
Boron	245		48.2	150	5	10/06/2023 12:29	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 14:31	WG2137853
Calcium	77800		93.6	1000	1	10/06/2023 14:31	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 14:31	WG2137853
Cobalt	0.320	J	0.0596	2.00	1	10/06/2023 14:31	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 14:31	WG2137853
Magnesium	18100		73.5	1000	1	10/06/2023 14:31	WG2137853
Molybdenum	5.01		0.348	5.00	1	10/06/2023 14:31	WG2137853
Potassium	2660		108	2000	1	10/06/2023 14:31	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 14:31	WG2137853
Sodium	35300		376	2000	1	10/06/2023 14:31	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 14:31	WG2137853
Lithium	13.3		0.695	2.00	1	10/06/2023 14:31	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.211	J	0.254		0.463		10/04/2023 17:26	WG2141583
(T) Barium	*136*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*99.4*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.426	J	0.342	0.553	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.216	J	0.229		0.302		09/27/2023 17:21	WG2139384
(T) Barium-133	*89.8*					*30.0-143*	*09/27/2023 17:21*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	700000		13300	1	09/25/2023 09:32	WG2137500

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	399000		8450	20000	1	09/28/2023 11:39	WG2139720
Alkalinity,Bicarbonate	399000		8450	20000	1	09/28/2023 11:39	WG2139720
Alkalinity,Carbonate	U		8450	20000	1	09/28/2023 11:39	WG2139720

Sample Narrative:

L1658218-11 WG2139720: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	142000		379	1000	1	09/28/2023 00:32	WG2140474
Fluoride	545		64.0	150	1	09/28/2023 00:32	WG2140474
Sulfate	72000		594	5000	1	09/28/2023 00:32	WG2140474

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	0.330	J	0.180	2.00	1	10/06/2023 14:56	WG2137853
Barium	81.0		0.381	2.00	1	10/06/2023 14:56	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 14:56	WG2137853
Boron	1470		96.3	300	10	10/06/2023 13:31	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 14:56	WG2137853
Calcium	90000		93.6	1000	1	10/06/2023 14:56	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 14:56	WG2137853
Cobalt	U		0.0596	2.00	1	10/06/2023 14:56	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 14:56	WG2137853
Magnesium	30200		73.5	1000	1	10/06/2023 14:56	WG2137853
Molybdenum	U		0.348	5.00	1	10/06/2023 14:56	WG2137853
Potassium	7990		108	2000	1	10/06/2023 14:56	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 14:56	WG2137853
Sodium	150000		376	2000	1	10/06/2023 14:56	WG2137853
Strontium	3560		0.590	10.0	1	10/06/2023 14:56	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 14:56	WG2137853
Lithium	70.1		0.695	2.00	1	10/06/2023 14:56	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.901		0.261		0.457		10/04/2023 17:26	WG2141583
(T) Barium	*112*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*99.8*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.87		0.478	0.548	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.972		0.401		0.303		09/27/2023 17:21	WG2139384
(T) Barium-133	*86.2*					*30.0-143*	*09/27/2023 17:21*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	575000		13300	1	09/25/2023 09:32	WG2137500

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	412000		8450	20000	1	09/28/2023 12:07	WG2139720
Alkalinity,Bicarbonate	412000		8450	20000	1	09/28/2023 12:07	WG2139720
Alkalinity,Carbonate	U		8450	20000	1	09/28/2023 12:07	WG2139720

Sample Narrative:

L1658218-13 WG2139720: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	37800		379	1000	1	09/28/2023 01:00	WG2140474
Fluoride	311		64.0	150	1	09/28/2023 01:00	WG2140474
Sulfate	99100		594	5000	1	09/28/2023 01:00	WG2140474

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	1.57	J	0.180	2.00	1	10/06/2023 14:59	WG2137853
Barium	48.9		0.381	2.00	1	10/06/2023 14:59	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 14:59	WG2137853
Boron	474		48.2	150	5	10/06/2023 12:36	WG2137853
Cadmium	0.474	J	0.150	1.00	1	10/06/2023 14:59	WG2137853
Calcium	118000		93.6	1000	1	10/06/2023 14:59	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 14:59	WG2137853
Cobalt	0.114	J	0.0596	2.00	1	10/06/2023 14:59	WG2137853
Lead	1.09	J	0.849	2.00	1	10/06/2023 14:59	WG2137853
Magnesium	35300		73.5	1000	1	10/06/2023 14:59	WG2137853
Molybdenum	0.355	J	0.348	5.00	1	10/06/2023 14:59	WG2137853
Potassium	3000		108	2000	1	10/06/2023 14:59	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 14:59	WG2137853
Sodium	49500		376	2000	1	10/06/2023 14:59	WG2137853
Strontium	1690		0.590	10.0	1	10/06/2023 14:59	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 14:59	WG2137853
Lithium	21.7		0.695	2.00	1	10/06/2023 14:59	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.408	J	0.265		0.478		10/04/2023 17:26	WG2141583
(T) Barium	*106*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*97.9*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.655		0.389	0.617	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.247	J	0.285		0.390		09/27/2023 17:21	WG2139384
(T) Barium-133	*85.0*					*30.0-143*	*09/27/2023 17:21*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	291000		10000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	268000		8450	20000	1	09/27/2023 10:10	WG2139723
Alkalinity,Bicarbonate	268000		8450	20000	1	09/27/2023 10:10	WG2139723
Alkalinity,Carbonate	U		8450	20000	1	09/27/2023 10:10	WG2139723

Sample Narrative:

L1658218-15 WG2139723: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	5580		379	1000	1	09/28/2023 01:13	WG2140474
Fluoride	256		64.0	150	1	09/28/2023 01:13	WG2140474
Sulfate	22300		594	5000	1	09/28/2023 01:13	WG2140474

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	U		0.180	2.00	1	10/06/2023 13:34	WG2137853
Barium	50.1		0.381	2.00	1	10/06/2023 13:34	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 13:34	WG2137853
Boron	92.4		9.63	30.0	1	10/06/2023 13:34	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 13:34	WG2137853
Calcium	65100		93.6	1000	1	10/06/2023 13:34	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 13:34	WG2137853
Cobalt	U		0.0596	2.00	1	10/06/2023 13:34	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 13:34	WG2137853
Magnesium	22900		73.5	1000	1	10/06/2023 13:34	WG2137853
Molybdenum	U		0.348	5.00	1	10/06/2023 13:34	WG2137853
Potassium	1400	J	108	2000	1	10/06/2023 13:34	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 13:34	WG2137853
Sodium	13000		376	2000	1	10/06/2023 13:34	WG2137853
Strontium	414		0.590	10.0	1	10/06/2023 13:34	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 13:34	WG2137853
Lithium	15.1		0.695	2.00	1	10/06/2023 13:34	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.217	U	0.295		0.538		10/04/2023 17:26	WG2141583
(T) Barium	*130*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*96.6*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.460	J	0.411	0.667	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.242	J	0.286		0.395		09/27/2023 23:29	WG2139384
(T) Barium-133	*73.9*					*30.0-143*	*09/27/2023 23:29*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	503000		10000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	417000		8450	20000	1	09/27/2023 09:47	WG2139723
Alkalinity,Bicarbonate	390000		8450	20000	1	09/27/2023 09:47	WG2139723
Alkalinity,Carbonate	27600		8450	20000	1	09/27/2023 09:47	WG2139723

Sample Narrative:

L1658218-17 WG2139723: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	21200		379	1000	1	09/28/2023 01:27	WG2140474
Fluoride	1850		64.0	150	1	09/28/2023 01:27	WG2140474
Sulfate	14000		594	5000	1	09/28/2023 01:27	WG2140474

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	0.254	J	0.180	2.00	1	10/06/2023 15:06	WG2137853
Barium	28.0		0.381	2.00	1	10/06/2023 15:06	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 15:06	WG2137853
Boron	4780		482	1500	50	10/06/2023 13:38	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 15:06	WG2137853
Calcium	3080		93.6	1000	1	10/06/2023 15:06	WG2137853
Chromium	U		1.24	2.00	1	10/06/2023 15:06	WG2137853
Cobalt	U		0.0596	2.00	1	10/06/2023 15:06	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 15:06	WG2137853
Magnesium	1100		73.5	1000	1	10/06/2023 15:06	WG2137853
Molybdenum	U		0.348	5.00	1	10/06/2023 15:06	WG2137853
Potassium	5290		108	2000	1	10/06/2023 15:06	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 15:06	WG2137853
Sodium	204000		376	2000	1	10/06/2023 15:06	WG2137853
Strontium	278		0.590	10.0	1	10/06/2023 15:06	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 15:06	WG2137853
Lithium	112		0.695	2.00	1	10/06/2023 15:06	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.192	U	0.313		0.580		10/04/2023 17:26	WG2141583
(T) Barium	*117*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*94.2*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.0793	U	0.380	0.687	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0793	U	0.215		0.368		09/27/2023 23:29	WG2139384
(T) Barium-133	*82.7*					*30.0-143*	*09/27/2023 23:29*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	462000		10000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	322000		8450	20000	1	09/27/2023 10:19	WG2139723
Alkalinity,Bicarbonate	322000		8450	20000	1	09/27/2023 10:19	WG2139723
Alkalinity,Carbonate	U		8450	20000	1	09/27/2023 10:19	WG2139723

Sample Narrative:

L1658218-19 WG2139723: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	57100	J6	379	1000	1	09/28/2023 01:40	WG2140474
Fluoride	883		64.0	150	1	09/28/2023 01:40	WG2140474
Sulfate	26200		594	5000	1	09/28/2023 01:40	WG2140474

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	0.243	J	0.180	2.00	1	10/06/2023 15:09	WG2137853
Barium	305		0.381	2.00	1	10/06/2023 15:09	WG2137853
Beryllium	U		0.190	2.00	1	10/06/2023 15:09	WG2137853
Boron	1650		193	600	20	10/06/2023 13:41	WG2137853
Cadmium	U		0.150	1.00	1	10/06/2023 15:09	WG2137853
Calcium	46500		93.6	1000	1	10/06/2023 15:09	WG2137853
Chromium	1.59	J	1.24	2.00	1	10/06/2023 15:09	WG2137853
Cobalt	0.500	J	0.0596	2.00	1	10/06/2023 15:09	WG2137853
Lead	U		0.849	2.00	1	10/06/2023 15:09	WG2137853
Magnesium	21900		73.5	1000	1	10/06/2023 15:09	WG2137853
Molybdenum	0.697	J	0.348	5.00	1	10/06/2023 15:09	WG2137853
Potassium	8390		108	2000	1	10/06/2023 15:09	WG2137853
Selenium	U		0.300	2.00	1	10/06/2023 15:09	WG2137853
Sodium	89800		376	2000	1	10/06/2023 15:09	WG2137853
Strontium	2930		0.590	10.0	1	10/06/2023 15:09	WG2137853
Thallium	U		0.121	2.00	1	10/06/2023 15:09	WG2137853
Lithium	47.8		0.695	2.00	1	10/06/2023 15:09	WG2137853

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.09		0.290		0.505		10/04/2023 17:26	WG2141583
(T) Barium	*114*					*30.0-143*	*10/04/2023 17:26*	WG2141583
(T) Yttrium	*94.0*					*30.0-136*	*10/04/2023 17:26*	WG2141583

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.76		0.448	0.609	10/04/2023 17:26	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.676		0.341		0.340		09/27/2023 23:29	WG2139384
(T) Barium-133	*97.6*					*30.0-143*	*09/27/2023 23:29*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1380000		50000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	385000		8450	20000	1	09/27/2023 09:26	WG2139575
Alkalinity,Bicarbonate	385000		8450	20000	1	09/27/2023 09:26	WG2139575
Alkalinity,Carbonate	U		8450	20000	1	09/27/2023 09:26	WG2139575

Sample Narrative:

L1658218-21 WG2139575: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	536000		1900	5000	5	09/27/2023 20:17	WG2140132
Fluoride	773		64.0	150	1	09/27/2023 20:00	WG2140132
Sulfate	159000		594	5000	1	09/27/2023 20:00	WG2140132

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	0.304	J	0.180	2.00	1	10/11/2023 16:32	WG2137848
Barium	41.0		0.381	2.00	1	10/11/2023 16:32	WG2137848
Beryllium	U		0.190	2.00	1	10/11/2023 16:32	WG2137848
Boron	4380		48.2	150	5	10/11/2023 12:37	WG2137848
Cadmium	U		0.150	1.00	1	10/11/2023 16:32	WG2137848
Calcium	107000		93.6	1000	1	10/11/2023 16:32	WG2137848
Chromium	U		1.24	2.00	1	10/11/2023 16:32	WG2137848
Cobalt	0.0897	J	0.0596	2.00	1	10/11/2023 16:32	WG2137848
Lead	U		0.849	2.00	1	10/11/2023 16:32	WG2137848
Magnesium	43700		73.5	1000	1	10/11/2023 16:32	WG2137848
Molybdenum	1.27	J	0.348	5.00	1	10/11/2023 16:32	WG2137848
Potassium	13400		108	2000	1	10/11/2023 16:32	WG2137848
Selenium	U		0.300	2.00	1	10/11/2023 16:32	WG2137848
Sodium	385000		376	2000	1	10/11/2023 16:32	WG2137848
Strontium	6120		2.95	50.0	5	10/11/2023 12:37	WG2137848
Thallium	U		0.121	2.00	1	10/11/2023 16:32	WG2137848
Lithium	242		0.695	2.00	1	10/11/2023 16:32	WG2137848

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.813		0.268		0.466		10/02/2023 16:33	WG2140673
(T) Barium	*116*					*30.0-143*	*10/02/2023 16:33*	WG2140673
(T) Yttrium	*100*					*30.0-136*	*10/02/2023 16:33*	WG2140673

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.95		0.485	0.525	10/02/2023 16:33	WG2137491

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.14		0.404		0.241		09/26/2023 15:47	WG2137491
(T) Barium-133	*92.3*					*30.0-143*	*09/26/2023 15:47*	WG2137491

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	685000		13300	1	09/25/2023 09:32	WG2137500

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	445000		8450	20000	1	09/27/2023 11:03	WG2139575
Alkalinity,Bicarbonate	445000		8450	20000	1	09/27/2023 11:03	WG2139575
Alkalinity,Carbonate	U		8450	20000	1	09/27/2023 11:03	WG2139575

Sample Narrative:

L1658218-23 WG2139575: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	179000	V	379	1000	1	09/27/2023 20:34	WG2140132
Fluoride	440		64.0	150	1	09/27/2023 20:34	WG2140132
Sulfate	1350	J	594	5000	1	09/27/2023 20:34	WG2140132

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	2.05		0.180	2.00	1	10/11/2023 16:18	WG2137848
Barium	471	V	0.381	2.00	1	10/11/2023 16:18	WG2137848
Beryllium	U		0.190	2.00	1	10/11/2023 16:18	WG2137848
Boron	1040	V	9.63	30.0	1	10/11/2023 16:18	WG2137848
Cadmium	U		0.150	1.00	1	10/11/2023 16:18	WG2137848
Calcium	71200		93.6	1000	1	10/11/2023 16:18	WG2137848
Chromium	U		1.24	2.00	1	10/11/2023 16:18	WG2137848
Cobalt	0.205	J	0.0596	2.00	1	10/11/2023 16:18	WG2137848
Lead	U		0.849	2.00	1	10/11/2023 16:18	WG2137848
Magnesium	24900		73.5	1000	1	10/11/2023 16:18	WG2137848
Molybdenum	1.00	J	0.348	5.00	1	10/11/2023 16:18	WG2137848
Potassium	4540		108	2000	1	10/11/2023 16:18	WG2137848
Selenium	U		0.300	2.00	1	10/11/2023 16:18	WG2137848
Sodium	182000	V	376	2000	1	10/11/2023 16:18	WG2137848
Thallium	U		0.121	2.00	1	10/11/2023 16:18	WG2137848
Lithium	41.3		0.695	2.00	1	10/11/2023 16:18	WG2137848

MW-C

Collected date/time: 09/20/23 11:55

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.62		0.421		0.722		10/02/2023 16:33	WG2140673
(T) Barium	*122*					*30.0-143*	*10/02/2023 16:33*	WG2140673
(T) Yttrium	*95.1*					*30.0-136*	*10/02/2023 16:33*	WG2140673

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	3.35		0.672	0.782	10/02/2023 16:33	WG2137491

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.73		0.524		0.300		09/25/2023 19:20	WG2137491
(T) Barium-133	*102*					*30.0-143*	*09/25/2023 19:20*	WG2137491

MW-H

SAMPLE RESULTS - 25

Collected date/time: 09/20/23 13:45

L1658218

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	628000		13300	1	09/25/2023 09:32	WG2137500

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	449000		8450	20000	1	09/27/2023 10:01	WG2139575
Alkalinity,Bicarbonate	449000		8450	20000	1	09/27/2023 10:01	WG2139575
Alkalinity,Carbonate	U		8450	20000	1	09/27/2023 10:01	WG2139575

Sample Narrative:

L1658218-25 WG2139575: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	116000		379	1000	1	09/27/2023 22:15	WG2140132
Fluoride	460		64.0	150	1	09/27/2023 22:15	WG2140132
Sulfate	25000		594	5000	1	09/27/2023 22:15	WG2140132

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	0.752	J	0.180	2.00	1	10/11/2023 15:24	WG2137848
Barium	119		0.381	2.00	1	10/11/2023 15:24	WG2137848
Beryllium	U		0.190	2.00	1	10/11/2023 15:24	WG2137848
Boron	591		9.63	30.0	1	10/11/2023 15:24	WG2137848
Cadmium	U		0.150	1.00	1	10/11/2023 15:24	WG2137848
Calcium	114000		93.6	1000	1	10/11/2023 15:24	WG2137848
Chromium	U		1.24	2.00	1	10/11/2023 15:24	WG2137848
Cobalt	U		0.0596	2.00	1	10/11/2023 15:24	WG2137848
Lead	U		0.849	2.00	1	10/11/2023 15:24	WG2137848
Magnesium	46300		73.5	1000	1	10/11/2023 15:24	WG2137848
Molybdenum	U		0.348	5.00	1	10/11/2023 15:24	WG2137848
Potassium	3270		108	2000	1	10/11/2023 15:24	WG2137848
Selenium	U		0.300	2.00	1	10/11/2023 15:24	WG2137848
Sodium	75100		376	2000	1	10/11/2023 15:24	WG2137848
Thallium	U		0.121	2.00	1	10/11/2023 15:24	WG2137848
Lithium	35.6		0.695	2.00	1	10/11/2023 15:24	WG2137848

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

MW-H

SAMPLE RESULTS - 26

Collected date/time: 09/20/23 13:45

L1658218

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.202	U	0.330		0.593		10/02/2023 16:33	WG2140673
(T) Barium	*107*					*30.0-143*	*10/02/2023 16:33*	WG2140673
(T) Yttrium	*90.7*					*30.0-136*	*10/02/2023 16:33*	WG2140673

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.483	J	0.458	0.734	10/02/2023 16:33	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.281	J	0.317		0.432		09/27/2023 23:29	WG2139384
(T) Barium-133	*71.1*					*30.0-143*	*09/27/2023 23:29*	WG2139384

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	6350000		100000	1	09/27/2023 00:24	WG2139843

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	969000		8450	20000	1	09/27/2023 10:09	WG2139575
Alkalinity,Bicarbonate	789000		8450	20000	1	09/27/2023 10:09	WG2139575
Alkalinity,Carbonate	180000		8450	20000	1	09/27/2023 10:09	WG2139575

Sample Narrative:

L1658218-27 WG2139575: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	1290000		3790	10000	10	09/27/2023 22:32	WG2140132
Fluoride	816	J	640	1500	10	09/27/2023 22:32	WG2140132
Sulfate	1690000		59400	500000	100	09/27/2023 22:49	WG2140132

Mercury by Method 7470A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Mercury	U		0.100	0.200	1	09/29/2023 11:52	WG2139758

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Antimony	U		5.15	20.0	5	10/11/2023 13:10	WG2137848
Arsenic	69.0		0.900	10.0	5	10/11/2023 13:10	WG2137848
Barium	65.7		1.90	10.0	5	10/11/2023 13:10	WG2137848
Beryllium	U		0.950	10.0	5	10/11/2023 13:10	WG2137848
Boron	15100		482	1500	50	10/11/2023 13:37	WG2137848
Cadmium	U		0.750	5.00	5	10/11/2023 13:10	WG2137848
Calcium	1080000		468	5000	5	10/11/2023 13:10	WG2137848
Chromium	U		6.20	10.0	5	10/11/2023 13:10	WG2137848
Cobalt	U		0.298	10.0	5	10/11/2023 13:10	WG2137848
Lead	U		4.24	10.0	5	10/11/2023 13:10	WG2137848
Magnesium	9640		368	5000	5	10/11/2023 13:10	WG2137848
Molybdenum	29.6		1.74	25.0	5	10/11/2023 13:10	WG2137848
Potassium	471000		540	10000	5	10/11/2023 13:10	WG2137848
Selenium	35.1		1.50	10.0	5	10/11/2023 13:10	WG2137848
Sodium	726000		1880	10000	5	10/11/2023 13:10	WG2137848
Strontium	8990		2.95	50.0	5	10/11/2023 13:10	WG2137848
Thallium	U		0.605	10.0	5	10/11/2023 13:10	WG2137848
Lithium	1470		3.48	10.0	5	10/11/2023 13:10	WG2137848

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.535	U	0.304		0.563		10/02/2023 16:33	WG2140673
(T) Barium	*103*					*30.0-143*	*10/02/2023 16:33*	WG2140673
(T) Yttrium	*99.4*					*30.0-136*	*10/02/2023 16:33*	WG2140673

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.241	U	0.408	0.673	10/02/2023 16:33	WG2139384

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.241	J	0.272		0.369		09/27/2023 23:29	WG2139384
(T) Barium-133	*79.1*					*30.0-143*	*09/27/2023 23:29*	WG2139384

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	942000		20000	1	09/25/2023 09:32	WG2137500

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	342000		8450	20000	1	09/27/2023 10:17	WG2139575
Alkalinity,Bicarbonate	342000		8450	20000	1	09/27/2023 10:17	WG2139575
Alkalinity,Carbonate	U		8450	20000	1	09/27/2023 10:17	WG2139575

Sample Narrative:

L1658218-29 WG2139575: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	233000		1900	5000	5	09/27/2023 23:23	WG2140132
Fluoride	136	J	64.0	150	1	09/27/2023 23:06	WG2140132
Sulfate	56600		594	5000	1	09/27/2023 23:06	WG2140132

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	U		0.180	2.00	1	10/11/2023 15:34	WG2137848
Barium	82.7		0.381	2.00	1	10/11/2023 15:34	WG2137848
Beryllium	U		0.190	2.00	1	10/11/2023 15:34	WG2137848
Boron	190		9.63	30.0	1	10/11/2023 15:34	WG2137848
Cadmium	U		0.150	1.00	1	10/11/2023 15:34	WG2137848
Calcium	201000		93.6	1000	1	10/11/2023 15:34	WG2137848
Chromium	U		1.24	2.00	1	10/11/2023 15:34	WG2137848
Cobalt	U		0.0596	2.00	1	10/11/2023 15:34	WG2137848
Lead	U		0.849	2.00	1	10/11/2023 15:34	WG2137848
Magnesium	34900		73.5	1000	1	10/11/2023 15:34	WG2137848
Molybdenum	U		0.348	5.00	1	10/11/2023 15:34	WG2137848
Potassium	3220		108	2000	1	10/11/2023 15:34	WG2137848
Selenium	U		0.300	2.00	1	10/11/2023 15:34	WG2137848
Sodium	36600		376	2000	1	10/11/2023 15:34	WG2137848
Thallium	U		0.121	2.00	1	10/11/2023 15:34	WG2137848
Lithium	15.9		0.695	2.00	1	10/11/2023 15:34	WG2137848

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Dissolved Solids	291000		10000	1	09/24/2023 16:55	WG2137507

Wet Chemistry by Method 2320 B-2011

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Alkalinity	264000		8450	20000	1	09/27/2023 10:24	WG2139575
Alkalinity,Bicarbonate	264000		8450	20000	1	09/27/2023 10:24	WG2139575
Alkalinity,Carbonate	U		8450	20000	1	09/27/2023 10:24	WG2139575

Sample Narrative:

L1658218-31 WG2139575: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	5940		379	1000	1	09/27/2023 16:36	WG2140146
Fluoride	237		64.0	150	1	09/27/2023 16:36	WG2140146
Sulfate	24000		594	5000	1	09/27/2023 16:36	WG2140146

Metals (ICPMS) by Method 6020

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	U		0.180	2.00	1	10/11/2023 15:38	WG2137848
Barium	54.2		0.381	2.00	1	10/11/2023 15:38	WG2137848
Beryllium	U		0.190	2.00	1	10/11/2023 15:38	WG2137848
Boron	143		9.63	30.0	1	10/11/2023 15:38	WG2137848
Cadmium	U		0.150	1.00	1	10/11/2023 15:38	WG2137848
Calcium	69500		93.6	1000	1	10/11/2023 15:38	WG2137848
Chromium	U		1.24	2.00	1	10/11/2023 15:38	WG2137848
Cobalt	0.0800	J	0.0596	2.00	1	10/11/2023 15:38	WG2137848
Lead	U		0.849	2.00	1	10/11/2023 15:38	WG2137848
Magnesium	23600		73.5	1000	1	10/11/2023 15:38	WG2137848
Molybdenum	U		0.348	5.00	1	10/11/2023 15:38	WG2137848
Potassium	1520	J	108	2000	1	10/11/2023 15:38	WG2137848
Selenium	U		0.300	2.00	1	10/11/2023 15:38	WG2137848
Sodium	13000		376	2000	1	10/11/2023 15:38	WG2137848
Thallium	U		0.121	2.00	1	10/11/2023 15:38	WG2137848
Lithium	17.0		0.695	2.00	1	10/11/2023 15:38	WG2137848

1,2,3,4,5,6,7,8,9,10,11,13,23,25,29

Method Blank (MB)

(MB) R3978403-1 09/25/23 09:32

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		10000	10000

L1658103-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1658103-06 09/25/23 09:32 • (DUP) R3978403-3 09/25/23 09:32

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1440000	1410000	1	1.75		5

L1658199-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1658199-05 09/25/23 09:32 • (DUP) R3978403-4 09/25/23 09:32

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	991000	985000	1	0.540		5

Laboratory Control Sample (LCS)

(LCS) R3978403-2 09/25/23 09:32

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8610000	97.8	77.3-123	

Method Blank (MB)

(MB) R3977896-1 09/24/23 16:55

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U	J	10000	10000

L1658218-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-01 09/24/23 16:55 • (DUP) R3977896-3 09/24/23 16:55

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	938000	1010000	1	7.39	J3	5

L1658218-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-03 09/24/23 16:55 • (DUP) R3977896-4 09/24/23 16:55

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	940000	990000	1	5.18	J3	5

Laboratory Control Sample (LCS)

(LCS) R3977896-2 09/24/23 16:55

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	7810000	88.8	77.3-123	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3979543-1 09/27/23 00:24

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Dissolved Solids	U		10000	10000

L1659303-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1659303-04 09/27/23 00:24 • (DUP) R3979543-3 09/27/23 00:24

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	672000	691000	1	2.74		5

L1659386-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1659386-01 09/27/23 00:24 • (DUP) R3979543-4 09/27/23 00:24

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	723000	736000	1	1.83		5

Laboratory Control Sample (LCS)

(LCS) R3979543-2 09/27/23 00:24

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8530000	96.9	77.3-123	

Method Blank (MB)

(MB) R3982620-1 10/02/23 16:33

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.655		0.191	0.329	
(T) Barium	*109*		*109*		
(T) Yttrium	*91.7*		*91.7*		

L1658200-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1658200-04 10/02/23 16:33 • (DUP) R3982620-5 10/02/23 16:33

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.843	0.391	0.687		-0.682	0.401	0.756		200	2.72	U	20	3
(T) Barium	*114*				*94.7*	*94.7*							
(T) Yttrium	*89.3*				*86.2*	*86.2*							

Laboratory Control Sample (LCS)

(LCS) R3982620-2 10/02/23 16:33

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.91	98.2	80.0-120	
(T) Barium			*108*		
(T) Yttrium			*108*		

L1658218-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-24 10/02/23 16:33 • (MS) R3982620-3 10/02/23 16:33 • (MSD) R3982620-4 10/02/23 16:33

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	1.62	19.1	18.9	105	104	1	70.0-130			1.10		20
(T) Barium		*122*			*112*	*119*							
(T) Yttrium		*95.1*			*106*	*100*							

1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20

Method Blank (MB)

(MB) R3984999-1 10/04/23 17:26

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.440		0.192	0.343	
(T) Barium	*108*		*108*		
(T) Yttrium	*89.0*		*89.0*		

L1654251-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1654251-04 10/04/23 17:26 • (DUP) R3984999-5 10/04/23 17:26

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.839	0.313	0.554		0.229	0.317	0.584		114	1.37	U	20	3
(T) Barium	*129*				*123*	*123*							
(T) Yttrium	*104*				*94.0*	*94.0*							

Laboratory Control Sample (LCS)

(LCS) R3984999-2 10/04/23 17:26

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.43	88.7	80.0-120	
(T) Barium			*126*		
(T) Yttrium			*104*		

L1654335-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1654335-01 10/04/23 17:26 • (MS) R3984999-3 10/04/23 17:26 • (MSD) R3984999-4 10/04/23 17:26

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	0.479	18.1	16.3	106	94.7	1	70.0-130			10.6		20
(T) Barium		*128*			*111*	*136*							
(T) Yttrium		*93.5*			*93.6*	*95.9*							

Method Blank (MB)

(MB) R3982569-1 09/25/23 19:20

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-226	0.0295	U	0.0634	0.105	
(T) Barium-133	*72.4*		*72.4*		

L1658192-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1658192-02 09/25/23 19:20 • (DUP) R3982569-5 09/25/23 19:20

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.238	0.266	0.358		1.59	0.522	0.359		148	2.31		20	3
(T) Barium-133	*84.2*				*101*	*101*							

Laboratory Control Sample (LCS)

(LCS) R3982569-2 09/25/23 19:20

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.01	5.40	108	80.0-120	
(T) Barium-133			*71.8*		

L1658218-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-24 09/25/23 19:20 • (MS) R3982569-3 09/25/23 19:20 • (MSD) R3982569-4 09/25/23 19:20

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	1.73	19.4	19.4	88.3	88.4	1	75.0-125			0.103		20
(T) Barium-133		*102*			*92.4*	*86.2*							

Method Blank (MB)

(MB) R3980648-5 09/27/23 23:29

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-226	-0.00462	U	0.0301	0.0595	
(T) Barium-133	*74.5*		*74.5*		

L1658218-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-04 09/27/23 17:21 • (DUP) R3980648-4 09/27/23 17:21

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	1.27	0.446	0.307		2.02	0.555	0.307		45.2	1.04		20	3
(T) Barium-133	*95.1*				*99.0*	*99.0*							

Laboratory Control Sample (LCS)

(LCS) R3980648-1 09/27/23 17:21

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.01	5.19	104	80.0-120	
(T) Barium-133			*69.3*		

L1659083-19 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1659083-19 09/27/23 23:29 • (MS) R3980648-2 09/27/23 17:21 • (MSD) R3980648-3 09/27/23 17:21

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	0.528	17.5	17.2	84.9	83.4	1	75.0-125			1.79		20
(T) Barium-133		*76.6*			*64.9*	*53.9*							

Method Blank (MB)

(MB) R3978339-2 09/27/23 08:30

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Alkalinity	U		8450	20000
Alkalinity,Bicarbonate	U		8450	20000
Alkalinity,Carbonate	U		8450	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1658146-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1658146-01 09/27/23 08:54 • (DUP) R3978339-3 09/27/23 08:59

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	1410000	1280000	1	9.53		20
Alkalinity,Bicarbonate	1410000	1280000	1	9.53		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1658218-23 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-23 09/27/23 11:03 • (DUP) R3978339-4 09/27/23 11:10

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	445000	441000	1	0.946		20
Alkalinity,Bicarbonate	445000	441000	1	0.946		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3978339-1 09/27/23 08:23

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100000	107000	107	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3978984-2 09/28/23 08:38

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Alkalinity	U		8450	20000
Alkalinity,Bicarbonate	U		8450	20000
Alkalinity,Carbonate	U		8450	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1657721-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1657721-01 09/28/23 09:28 • (DUP) R3978984-3 09/28/23 09:33

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	49700	50500	1	1.65		20
Alkalinity,Bicarbonate	49700	50500	1	1.65		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1658218-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-11 09/28/23 11:39 • (DUP) R3978984-4 09/28/23 11:47

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	399000	404000	1	1.20		20
Alkalinity,Bicarbonate	399000	404000	1	1.20		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3978984-1 09/28/23 08:28

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100000	101000	101	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3978349-2 09/27/23 08:34

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Alkalinity	U		8450	20000
Alkalinity,Bicarbonate	U		8450	20000
Alkalinity,Carbonate	U		8450	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1658218-17 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-17 09/27/23 09:47 • (DUP) R3978349-4 09/27/23 09:59

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	417000	414000	1	0.772		20
Alkalinity,Bicarbonate	390000	382000	1	2.02		20
Alkalinity,Carbonate	27600	32200	1	15.3		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1658482-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1658482-01 09/27/23 12:37 • (DUP) R3978349-6 09/27/23 12:41

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	336000	336000	1	0.0540		20
Alkalinity,Bicarbonate	336000	336000	1	0.0540		20
Alkalinity,Carbonate	U	U	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

APPENDIX A:
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT - QUARTER 3, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-257-122

L1658218-15,17,19

Laboratory Control Sample (LCS)

(LCS) R3978349-1 09/27/23 08:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100000	101000	101	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3978811-1 09/27/23 09:13

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	444	J	379	1000
Fluoride	U		64.0	150
Sulfate	U		594	5000

L1658136-21 Original Sample (OS) • Duplicate (DUP)

(OS) L1658136-21 09/27/23 12:40 • (DUP) R3978811-3 09/27/23 12:57

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	111000	111000	1	0.0122		15
Fluoride	247	252	1	1.68		15
Sulfate	43900	44000	1	0.0303		15

L1658218-23 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-23 09/27/23 20:34 • (DUP) R3978811-6 09/27/23 20:51

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	179000	179000	1	0.0675		15
Fluoride	440	437	1	0.593		15
Sulfate	1350	1310	1	2.99	J	15

Laboratory Control Sample (LCS)

(LCS) R3978811-2 09/27/23 09:30

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39500	98.7	80.0-120	
Fluoride	8000	8220	103	80.0-120	
Sulfate	40000	39400	98.4	80.0-120	

L1658136-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658136-21 09/27/23 12:40 • (MS) R3978811-4 09/27/23 13:14 • (MSD) R3978811-5 09/27/23 13:31

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40000	111000	130000	129000	46.6	45.9	1	80.0-120	J6	J6	0.223	15
Fluoride	8000	247	8160	8020	99.0	97.2	1	80.0-120			1.74	15
Sulfate	40000	43900	75600	76100	79.0	80.3	1	80.0-120	J6		0.668	15

L1658218-23 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-23 09/27/23 20:34 • (MS) R3978811-7 09/27/23 21:41 • (MSD) R3978811-8 09/27/23 21:58

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40000	179000	184000	184000	13.1	13.0	1	80.0-120	V	V	0.0265	15
Fluoride	8000	440	8490	8380	101	99.3	1	80.0-120			1.25	15
Sulfate	40000	1350	40400	39800	97.6	96.2	1	80.0-120			1.40	15

Method Blank (MB)

(MB) R3978883-1 09/27/23 11:53

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		379	1000
Fluoride	U		64.0	150
Sulfate	U		594	5000

L1658218-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-05 09/27/23 15:42 • (DUP) R3978883-3 09/27/23 15:55

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	5430	5390	1	0.828		15
Fluoride	261	262	1	0.153		15
Sulfate	12700	12700	1	0.148		15

L1658414-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1658414-08 09/27/23 20:46 • (DUP) R3978883-6 09/27/23 20:59

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	14800	14500	1	1.89		15
Fluoride	665	622	1	6.74		15
Sulfate	83500	83600	1	0.0442		15

Laboratory Control Sample (LCS)

(LCS) R3978883-2 09/27/23 12:06

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39500	98.7	80.0-120	
Fluoride	8000	7900	98.8	80.0-120	
Sulfate	40000	38600	96.6	80.0-120	

L1658218-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-05 09/27/23 15:42 • (MS) R3978883-4 09/27/23 16:09 • (MSD) R3978883-5 09/27/23 16:22

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40000	5430	43200	43100	94.4	94.1	1	80.0-120			0.269	15
Fluoride	8000	261	8080	8060	97.7	97.5	1	80.0-120			0.169	15
Sulfate	40000	12700	49000	48900	90.8	90.5	1	80.0-120			0.236	15

L1658414-08 Original Sample (OS) • Matrix Spike (MS)

(OS) L1658414-08 09/27/23 20:46 • (MS) R3978883-7 09/27/23 21:12

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40000	14800	50700	89.7	1	80.0-120	
Fluoride	8000	665	8500	97.9	1	80.0-120	
Sulfate	40000	83500	106000	56.3	1	80.0-120	J6

Method Blank (MB)

(MB) R3979451-1 09/27/23 23:38

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		379	1000
Fluoride	U		64.0	150
Sulfate	676	J	594	5000

L1658218-19 Original Sample (OS) • Duplicate (DUP)

(OS) L1658218-19 09/28/23 01:40 • (DUP) R3979451-3 09/28/23 02:21

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	57100	57100	1	0.0683		15
Fluoride	883	869	1	1.58		15
Sulfate	26200	26100	1	0.549		15

L1658529-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1658529-06 09/28/23 04:10 • (DUP) R3979451-6 09/28/23 04:23

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	29000	29000	1	0.138		15
Fluoride	361	520	1	36.0	P1	15
Sulfate	28700	28900	1	0.506		15

Laboratory Control Sample (LCS)

(LCS) R3979451-2 09/27/23 23:52

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39900	99.6	80.0-120	
Fluoride	8000	8320	104	80.0-120	
Sulfate	40000	39800	99.5	80.0-120	

L1658218-19 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-19 09/28/23 01:40 • (MS) R3979451-4 09/28/23 02:35 • (MSD) R3979451-5 09/28/23 02:48

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40000	57100	86300	85500	73.1	71.0	1	80.0-120	J6	J6	0.940	15
Fluoride	8000	883	8990	9200	101	104	1	80.0-120			2.37	15
Sulfate	40000	26200	61400	60800	87.9	86.5	1	80.0-120			0.885	15

L1658529-06 Original Sample (OS) • Matrix Spike (MS)

(OS) L1658529-06 09/28/23 04:10 • (MS) R3979451-7 09/28/23 05:04

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40000	29000	63800	87.1	1	80.0-120	
Fluoride	8000	361	8810	106	1	80.0-120	
Sulfate	40000	28700	63800	87.6	1	80.0-120	

Method Blank (MB)

(MB) R3979487-1 09/29/23 11:26

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Mercury	U		0.100	0.200

Laboratory Control Sample (LCS)

(LCS) R3979487-5 09/29/23 12:51

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	3.00	2.86	95.2	80.0-120	

L1658218-23 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-23 09/29/23 11:31 • (MS) R3979487-3 09/29/23 11:34 • (MSD) R3979487-4 09/29/23 11:36

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	U	2.47	2.58	82.3	85.9	1	75.0-125			4.37	20

Method Blank (MB)

(MB) R3984820-1 10/11/23 12:17

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Antimony	U		1.03	4.00
Arsenic	U		0.180	2.00
Barium	0.920	J	0.381	2.00
Beryllium	U		0.190	2.00
Boron	U		9.63	30.0
Cadmium	U		0.150	1.00
Calcium	U		93.6	1000
Chromium	U		1.24	2.00
Cobalt	U		0.0596	2.00
Lead	U		0.849	2.00
Magnesium	U		73.5	1000
Molybdenum	U		0.348	5.00
Potassium	U		108	2000
Selenium	U		0.300	2.00
Sodium	U		376	2000
Strontium	U		0.590	10.0
Thallium	U		0.121	2.00
Lithium	U		0.695	2.00

Laboratory Control Sample (LCS)

(LCS) R3984820-2 10/11/23 12:20

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	50.0	48.9	97.7	80.0-120	
Arsenic	50.0	54.1	108	80.0-120	
Barium	50.0	48.8	97.6	80.0-120	
Beryllium	50.0	52.4	105	80.0-120	
Boron	50.0	56.4	113	80.0-120	
Cadmium	50.0	53.6	107	80.0-120	
Calcium	5000	5270	105	80.0-120	
Chromium	50.0	54.3	109	80.0-120	
Cobalt	50.0	54.7	109	80.0-120	
Lead	50.0	52.1	104	80.0-120	
Magnesium	5000	5250	105	80.0-120	
Molybdenum	50.0	50.0	100	80.0-120	
Potassium	5000	5310	106	80.0-120	
Selenium	50.0	54.7	109	80.0-120	
Sodium	5000	5320	106	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3984820-2 10/11/23 12:20

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Strontium	50.0	49.3	98.6	80.0-120	
Thallium	50.0	50.8	102	80.0-120	
Lithium	50.0	49.1	98.3	80.0-120	

L1658218-23 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-23 10/11/23 16:18 • (MS) R3984820-7 10/11/23 16:25 • (MSD) R3984820-8 10/11/23 16:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	50.0	U	53.8	55.0	108	110	1	75.0-125			2.09	20
Arsenic	50.0	2.05	55.8	56.2	108	108	1	75.0-125			0.755	20
Barium	50.0	471	507	526	72.3	109	1	75.0-125	V		3.57	20
Beryllium	50.0	U	52.0	53.3	104	107	1	75.0-125			2.48	20
Boron	50.0	1040	1050	1100	30.6	128	1	75.0-125	V	V	4.54	20
Cadmium	50.0	U	54.7	55.0	109	110	1	75.0-125			0.487	20
Calcium	5000	71200	74900	77200	75.6	120	1	75.0-125			2.92	20
Chromium	50.0	U	52.7	54.0	105	108	1	75.0-125			2.42	20
Cobalt	50.0	0.205	52.8	53.1	105	106	1	75.0-125			0.631	20
Lead	50.0	U	50.7	52.5	101	105	1	75.0-125			3.55	20
Magnesium	5000	24900	29200	29900	86.0	99.7	1	75.0-125			2.31	20
Molybdenum	50.0	1.00	54.3	56.6	107	111	1	75.0-125			4.17	20
Potassium	5000	4540	9650	9780	102	105	1	75.0-125			1.35	20
Selenium	50.0	U	54.0	56.2	108	112	1	75.0-125			3.97	20
Sodium	5000	182000	185000	185000	72.4	61.0	1	75.0-125	V	V	0.310	20
Strontium	50.0	1650	1660	1680	14.3	70.2	1	75.0-125	V	V	1.67	20
Thallium	50.0	U	49.0	50.9	98.1	102	1	75.0-125			3.63	20
Lithium	50.0	41.3	89.5	92.8	96.2	103	1	75.0-125			3.62	20

Method Blank (MB)

(MB) R3983375-1 10/06/23 13:58

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Arsenic	U		0.180	2.00
Barium	U		0.381	2.00
Beryllium	U		0.190	2.00
Boron	U		9.63	30.0
Cadmium	U		0.150	1.00
Calcium	U		93.6	1000
Chromium	U		1.24	2.00
Cobalt	U		0.0596	2.00
Lead	U		0.849	2.00
Magnesium	U		73.5	1000
Molybdenum	U		0.348	5.00
Potassium	U		108	2000
Selenium	U		0.300	2.00
Sodium	U		376	2000
Strontium	U		0.590	10.0
Thallium	U		0.121	2.00
Lithium	U		0.695	2.00

Laboratory Control Sample (LCS)

(LCS) R3983375-2 10/06/23 14:01

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	50.0	51.6	103	80.0-120	
Barium	50.0	51.0	102	80.0-120	
Beryllium	50.0	49.4	98.7	80.0-120	
Boron	50.0	56.0	112	80.0-120	
Cadmium	50.0	53.6	107	80.0-120	
Calcium	5000	5240	105	80.0-120	
Chromium	50.0	53.6	107	80.0-120	
Cobalt	50.0	52.3	105	80.0-120	
Lead	50.0	50.4	101	80.0-120	
Magnesium	5000	5330	107	80.0-120	
Molybdenum	50.0	51.2	102	80.0-120	
Potassium	5000	5310	106	80.0-120	
Selenium	50.0	52.9	106	80.0-120	
Sodium	5000	5700	114	80.0-120	
Strontium	50.0	52.0	104	80.0-120	
Thallium	50.0	49.9	99.9	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3983375-2 10/06/23 14:01

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Lithium	50.0	48.9	97.7	80.0-120	

L1658218-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1658218-01 10/06/23 13:18 • (MS) R3983375-4 10/06/23 14:11 • (MSD) R3983375-5 10/06/23 14:15

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	50.0	U	51.1	50.1	102	100	1	75.0-125			1.92	20
Barium	50.0	73.6	122	127	96.5	107	1	75.0-125			4.14	20
Beryllium	50.0	U	50.1	49.6	100	99.3	1	75.0-125			0.883	20
Boron	50.0	73.2	123	124	100	103	1	75.0-125			0.897	20
Cadmium	50.0	U	53.6	51.7	107	103	1	75.0-125			3.59	20
Calcium	5000	186000	192000	194000	136	166	1	75.0-125	V	V	0.766	20
Chromium	50.0	U	51.5	49.4	103	98.8	1	75.0-125			4.13	20
Cobalt	50.0	U	51.3	49.1	103	98.3	1	75.0-125			4.40	20
Lead	50.0	U	48.7	47.3	97.4	94.6	1	75.0-125			2.92	20
Magnesium	5000	33400	40600	40000	144	133	1	75.0-125	V	V	1.45	20
Molybdenum	50.0	U	52.1	51.6	104	103	1	75.0-125			0.979	20
Potassium	5000	3240	8430	7970	104	94.8	1	75.0-125			5.54	20
Selenium	50.0	U	53.0	50.5	106	101	1	75.0-125			4.90	20
Sodium	5000	37800	43500	43600	114	115	1	75.0-125			0.175	20
Strontium	50.0	2370	2290	2360	0.000	0.000	1	75.0-125	V	V	2.85	20
Thallium	50.0	U	47.4	49.2	94.7	98.3	1	75.0-125			3.74	20
Lithium	50.0	12.4	59.7	59.0	94.5	93.0	1	75.0-125			1.27	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
U	Below Detectable Limits: Indicates that the analyte was not detected.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
S&ME - Cincinnati
862 E. Crescentville Rd.
Cincinnati. OH 45246

Billing Information:
Accounts Payable
smeinc_invoice@concursolutions.com

Report to: **Vince Epps**
Email To: **vepps@smeinc.com**
Project Description: **Zimmer Station**
City/State Collected: **Moscow, OH**
Please Circle: PT MT CT ET
Phone: **513-771-8471**
Client Project # **7217-17-001D**
Lab Project # **LITEGNTN-ZIMMER**
Collected by (print): **Carter Harlan**
Site/Facility ID # **WHZ Unit 122 (Landfill)**
P.O. #
Collected by (signature): **Carter Hehn**
Immediately Packed on Ice N ____ Y X
Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day
Quote #
Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE-HNO3	Strontium-Total	RA-226/228COMB 1L-HPE-HNO3	TDS 250mlHDPE-NonPres	Remarks	Sample # (lab only)
MW-03	Grab	GW	NA	9/19/23	1315	5	X	X	X	X	X		01/07
MW-09DR	Grab	GW	NA	9/18/23	1400		X	X	X	X	X		07/07
MW-11D	Grab	GW	NA	9/18/23	1625		X	X	X	X	X		05/01
~~MW-13S~~	~~Grab~~	~~GW~~	~~NA~~				~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		
MW-16D	Grab	GW	NA	9/20/23	1255		X	X		X	X		07/03
~~MW-18~~	~~Grab~~	~~GW~~	~~NA~~				~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		DNQ 9/21 1/22
MW-20D	Grab	GW	NA	9/19/23	1640		X	X		X	X		04/15
MW-21	Grab	GW	NA	9/19/23	1430		X	X	X	X	X		11/12
MW-22	Grab	GW	NA	9/19/23	1200		X	X	X	X	X		13/14
MW-24	Grab	GW	NA	9/20/23	1025		X	X	X	X	X		15/16

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
Log Rad to same SDG as different dash #s as EX 10 day TAT
CCR Metals: As, Ba, Be, B, Cd, Ca, Cr, Co, K, Pb, Li, Mg, Mo, Na, Se, Tl
PH-10BDH4321 TRC 2362362
CR6-20221V

pH _____ Temp _____
Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____
Tracking #

Relinquished by: (Signature) Carter Hehn — Date: 9/20/23 — Time: — Received by: (Signature) FedEx
Relinquished by : (Signature) — Date: — Time: — Received by: (Signature)
Relinquished by : (Signature) — Date: — Time: — Received for lab by: (Signature) M. Hall

Trip Blank Received: Yes / No HCL / MeoH TBR
Temp: °C Bottles Received: 82
Date: 9/21/23 Time: 0900

Hold: — Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

If preservation required by Login: Date/Time

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE
12065 Lebanon Rd Mount Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1657214
A229
Acctnum: LITEGNTN
Template:
Prelogin:
PM: 134
PB:
Shipped Via:

Company Name/Address:
SCME - Cincinnati
862 E. Crescentville Rd.
Cincinnati. OH 45246

Billing Information:
Accounts Payable
smeinc_invoice@concursolutions.com

Report to: **Vince Epps**
Email To: **vepps@smeinc.com**
Project Description: **Zimmer Station**
City/State Collected: **Moscow, OH**
Please Circle: PT MT CT ET
Phone: **513-771-8471**
Client Project # **7217-17-001D**
Lab Project # **LITEGNTN-ZIMMER**
Collected by (print): Carter Harden
Site/Facility ID # **WHZ Unit 122 (Landfill)**
P.O. #
Collected by (signature):
Immediately Packed on Ice N ___ Y X
Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day
Quote #
Date Results Needed

Pace PEOPLE ADVANCING SCIENCE
12065 Lebanon Rd Mount Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Chain of Custody Page ___ of ___
SDG # U657218
Table #
Acctnum: LITEGNTN
Template:
Prelogin:
PM: 134
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE-HNO3	Strontium-Total	RA-226/228COMB 1L-HPE-HNO3	Antimony and Mercury - Total	TDS 250mlHDPE-NonPres	Remarks	Sample # (lab only)
MW-D	Grab	GW	NA	9/20/23	925	5	X	X	X	X		X		17/17
MW-E	Grab	GW	NA	9/19/23	925	1	X	X	X	X		X		15/21
MW-F	Grab	GW	NA	9/19/23	1050	1	X	X	X	X		X		24/22
MW-G	Grab	GW	NA	9/20/23	1100	1	X	X		X		X	MS/MSD	23/24
MW-H	Grab	GW	NA	~~9/20/23~~ 9/19/23	~~1510~~ 1345	1	X	X		X		X		25/25
SEQ1 Leachate	Grab	GW	NA	9/19/23	1510	6 NF 9/21/23	X	X	X	X	X	X		27/23
DUP-1	Grab	GW	NA	9/19/23	—	3	X	X	X			X		29/30 MS 9/21/23
DUP-2	Grab	GW	NA	9/20/23	—	3	X	X	X			X		31/32
MS/MSD	Grab	GW	NA	9/20/23	1105	5	X	X	X	X	X	X		23/24 77/74 MS 9/21/23

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
Log Rad to same SDG as different dash #s as EX 10 day TAT
CCR Metals: As, Ba, Be, B, Cd, Ca, Cr, Co, K, Pb, Li, Mg, Mo, Na, Se, Tl

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	9/20/23		FedEx
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No HCL / MeoH TBR
Temp: °C Bottles Received: 8
Date: 9/21/23 Time: 0900
If preservation required by Login: Date/Time
Hold:
Condition: NCF / OK

Tracking Numbers		Tempature
7019 5685 2434		2.8 +0 = 2.8 DRAFT
0503		0.9 +0 = 0.9
2447		1.5 +0 1.5
2458		2.3 +0 2.3
2425		1.8 +0 1.8
6643 4303 1133		1.5 +0 = 1.5

APPENDIX A.
ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT - QUARTER 3, 2023
ZIMMER POWER PLANT, LANDFILL
ZIM-257-122

Company Name/Address:
S&ME - Cincinnati
862 E. Crescentville Rd.
Cincinnati. OH 45246

Billing Information:
Accounts Payable
smeinc_invoice@concursolutions.com

Report to: Vince Epps
Email To: vepps@smeinc.com

Project Description: Zimmer Station
City/State Collected: Moscow, OH
Please Circle: PT MT CT ET

Phone: 513-771-8471
Client Project # 7217-17-001D
Lab Project # LITEGNTN-ZIMMER

Collected by (print): Carter Harlan
Site/Facility ID # WHZ Unit 122 (Landfill)
P.O. #

Collected by (signature):
Immediately Packed on Ice N ___ Y X
Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day
Quote #
Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE-HNO3	Strontium-Total	RA-226/228COMB 1L-HPE-HNO3	TDS 250mlHDPE-NonPres	Remarks	Sample # (lab only)
MW-03	Grab	GW	NA	9/19/23	1315	5	X	X	X	X	X		01/07
MW-09DR	Grab	GW	NA	9/18/23	1400		X	X	X	X	X		03/07
MW-11D	Grab	GW	NA	9/18/23	1625		X	X	X	X	X		05/06
~~MW-13S~~	~~Grab~~	~~GW~~	~~NA~~				~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		
MW-16D	Grab	GW	NA	9/2023	1250		X	X		X	X		07/03
~~MW-18~~	~~Grab~~	~~GW~~	~~NA~~				~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		09/04/23
MW-20D	Grab	GW	NA	9/19/23	1640		X	X		X	X		04/05
MW-21	Grab	GW	NA	9/19/23	1430		X	X	X	X	X		11/12
MW-22	Grab	GW	NA	9/19/23	1200		X	X	X	X	X		13/14
MW-24	Grab	GW	NA	9/20/23	1025		X	X	X	X	X		15/16

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
Log Rad to same SDG as different dash #s as EX 10 day TAT
CCR Metals: As, Ba, Be, B, Cd, Ca, Cr, Co, K, Pb, Li, Mg, Mo, Na, Se, Tl
PH-10BDH4321 TR(23[illegible]
CR6-20221V

pH _____ Temp _____
_____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____
Tracking #

Relinquished by: (Signature) Carter Harlan Date: 9/20/23 Time: 1430
Received by: (Signature) FedEx

Relinquished by : (Signature) Date: Time:
Received by: (Signature)

Relinquished by : (Signature) Date: Time:
Received for lab by: (Signature) M. Jank Date: 9/21/23 Time: 0900

Trip Blank Received: Yes / No HCL / MeoH TBR
Temp: °C Bottles Received: 82
If preservation required by Login: Date/Time
Hold: Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE
12065 Lebanon Rd Mount Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
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SDG # U653218
A229
Acctnum: LITEGNTN
Template:
Prelogin:
PM: 134
PB:
Shipped Via:

Company Name/Address:
S&ME - Cincinnati
862 E. Crescentville Rd.
Cincinnati. OH 45246

Billing Information:
Accounts Payable
smeinc_invoice@concursolutions.com

Report to: Vince Epps
Email To: vepps@smeinc.com

Project Description: Zimmer Station
City/State Collected: Moscow, OH
Please Circle: PT MT CT ET

Phone: 513-771-8471
Client Project # 7217-17-001D
Lab Project # LITEGNTN-ZIMMER

Collected by (print): Carter Harden
Site/Facility ID # WHZ Unit 122 (Landfill)
P.O. #

Collected by (signature):
Immediately Packed on Ice N ___ Y X
Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day
Quote #
Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Alk Bi/Ca, Cl, F, SO4 125mlHDPE-NonPres	CCR Metals+B, Li, K, Na, Mg 250mlHDPE	Strontium-Total	RA-226/228COMB 1L-HPE-HNO3	Antimony and Mercury - Total	TDS 250mlHDPE-NonPres	Remarks	Sample # (lab only)
MW-D	Grab	GW	NA	9/20/23	925	5	X	X	X	X		X		17/12
MW-E	Grab	GW	NA	9/19/23	925		X	X	X	X		X		18/19
MW-F	Grab	GW	NA	9/19/23	1050		X	X	X	X		X		4/22
MW-G	Grab	GW	NA	9/20/23	1150		X	X		X		X	MS/MSD	23/24
MW-H	Grab	GW	NA	9/20/23	1345		X	X		X		X		25/26
SEQ1 Leachate	Grab	GW	NA	9/19/23	1510	6 NCF	X	X	X	X	X	X		27/28
DUP-1	Grab	GW	NA	9/19/23	—	3	X	X	X			X		29/30
DUP-2	Grab	GW	NA	9/20/23	—	3	X	X	X			X		31/32
MS/MSD	Grab	GW	NA	9/20/23	1605	5	X	X	X	X	X	X		33/34

Chain of Custody Page ___ of ___

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SDG # U65718
Table #
Acctnum: LITEGNTN
Template:
Prelogin:
PM: 134
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:
Log Rad to same SDG as different dash #s as EX 10 day TAT
CCR Metals: As, Ba, Be, B, Cd, Ca, Cr, Co, K, Pb, Li, Mg, Mo, Na, Se, Tl

pH ___ Temp ___
Flow ___ Other ___

Samples returned via: __ UPS __ FedEx __ Courier __ ___
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	9/20/23	1450	FedEx	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 82
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/21/23 Time: 0900

If preservation required by Login: Date/Time
Hold:
Condition: NCF / OK

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 19, 2023
Source Well:	MW-03	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	September 19, 2023
Sampled By:	CJH & AKL	Sample Time:	13:15
Weather:	Sunny	Air Temp:	75F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	13.15	ft-TOC
			Total Well Depth:	35.34	ft-TOC
			Height of Water Column:	22.19	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	3.6	Gal
3 * Well Volume	10.86	Gal
5 * Well Volume	18.11	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	12:50	End Time:	13:15	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	0.7	Gallons	Duplicate sample collected (DUP-1).			
	Final Volume Purge Rate:	100	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	12:50	0.0	---	---	---	---	---	---	---	---	Start purging
	12:55	0.2	150	15.40	14.6	6.8	1.521	2.6	72	0.73	Clear, no odor
	13:00	0.3	100	15.52	16.4	6.8	1.520	0.6	72	0.63	Clear, no odor
	13:05	0.5	100	15.52	17.0	6.8	1.521	0.2	75	0.41	Clear, no odor
	13:10	0.6	100	15.43	17.5	6.8	1.520	0.2	76	0.51	Clear, no odor
	13:15	0.7	100	15.65	15.2	6.8	1.530	0.2	84	0.29	Clear, no odor
Final:	13:15	0.7	100	15.65	15.2	6.8	1.530	0.2	84	0.3	End of Purging

Sample Method: Bladder Pump Sample Start Time: 13:15 Sample End Time: 14:00

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 18, 2023
Source Well:	MW-09D	Purge Time:	40 Minutes
Locked?:	Yes	Sample Date:	September 18, 2023
Sampled By:	CJH & AKL	Sample Time:	14:00
Weather:	Sunny	Air Temp:	73F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	31.48	ft-TOC
			Total Well Depth:	69.53	ft-TOC
			Height of Water Column:	38.05	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	6.2	Gal
3 * Well Volume	18.63	Gal
5 * Well Volume	31.05	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	13:20	End Time:	14:00	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	1.5	Gallons				
	Final Volume Purge Rate:	150	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	13:20	0.0	---	---	---	---	---	---	---	---	Start Purging
	13:25	0.1	100	31.36	17.2	7.2	2.887	0.0	-94	9.25	Clear, no odor
	13:30	0.3	100	31.39	15.7	7.2	2.610	0.0	-98	6.09	Clear, no odor
	13:35	0.5	150	31.38	15.5	7.2	2.416	0.0	-99	4.82	Clear, no odor
	13:40	0.7	150	31.38	15.4	7.2	2.212	0.1	-97	3.92	Clear, no odor
	13:45	0.9	150	31.39	15.2	7.1	1.972	0.0	-100	3.41	Clear, no odor
	13:50	1.1	150	31.39	15.9	7.1	1.859	0.1	-100	3.20	Clear, no odor
	13:55	1.3	150	31.39	16.2	7.1	1.843	0.1	-102	2.89	Clear, no odor
	14:00	1.5	150	31.39	16.5	7.1	1.876	0.1	-102	5.12	Clear, no odor
Final:	14:00	1.5	150	31.39	16.5	7.1	1.876	0.1	-102	5.1	End of Purging

Sample Method: Bladder Pump Sample Start Time: 14:00 Sample End Time: 14:30

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 18, 2023
Source Well:	MW-11D	Purge Time:	35 Minutes
Locked?:	Yes	Sample Date:	September 18, 2023
Sampled By:	CJH & AKL	Sample Time:	16:25
Weather:	Overcast	Air Temp:	75F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	18.24	ft-TOC
			Total Well Depth:	35.79	ft-TOC
			Height of Water Column:	17.55	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.9	Gal
3 * Well Volume	8.59	Gal
5 * Well Volume	14.32	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	15:50	End Time:	16:25	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.7	Gallons				
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	15:50	0.0	---	---	---	---	---	---	---	---	Start purging
	15:55	0.2	150	18.40	15.3	7.2	0.667	0.5	-68	1.96	Clear, no odor
	16:01	0.4	150	18.41	14.6	7.2	0.676	0.2	-90	0.93	Clear, no odor
	16:05	0.6	150	18.41	14.2	7.2	0.676	0.5	-94	0.73	Clear, no odor
	16:10	0.9	200	18.43	13.9	7.2	0.676	0.6	-93	0.57	Clear, no odor
	16:14	1.1	200	18.42	13.7	7.2	0.677	0.1	-99	0.50	Clear, no odor
	16:20	1.4	200	18.42	14.0	7.2	0.677	0.0	-104	0.36	Clear, no odor
	16:25	1.7	200	18.42	13.9	7.2	0.679	0.0	-108	0.20	Clear, no odor
Final:	16:25	1.7	200	18.42	13.9	7.2	0.679	0.0	-108	0.2	End of Purging

Sample Method: Bladder Pump Sample Start Time: 16:25 Sample End Time: 16:55

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes: Matrix Spike collected

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station	Purge Date:	
Project Location:	Moscow, Ohio	Purge Time:	Minutes
Project Number:	7217-17-001D	Sample Date:	
Source Well:	MW-13S	Sample Time:	
Locked?:	Yes	Air Temp:	
Sampled By:			
Weather:			

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:		ft-TOC
			Total Well Depth:	19.01	ft-TOC
			Height of Water Column:	19.01	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	12.4	Gal
3 * Well Volume	37.23	Gal
5 * Well Volume	62.04	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:		End Time:		
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:		Gallons				
	Final Volume Purge Rate:		mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
		0.0	---	---	---	---	---	---	---	---	Start Purging
Final:											End of Purging

Sample Method: Bladder Pump Sample Start Time: Sample End Time:

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 20, 2023
Source Well:	MW-16D	Purge Time:	20 Minutes
Locked?:	Yes	Sample Date:	September 20, 2023
Sampled By:	AKL & CJH	Sample Time:	12:55
Weather:	Sunny	Air Temp:	75F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	9.92	ft-TOC
			Total Well Depth:	30.07	ft-TOC
			Height of Water Column:	20.15	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	3.3	Gal
3 * Well Volume	9.86	Gal
5 * Well Volume	16.44	Gal

Well Purging Information

		Purge Method:	Bladder Pump	Start Time:	12:30	End Time:	12:50
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
	Pump Intake Depth from Top of Casing:			ft-TOC			
	Water Column Above Pump Intake:			feet	Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:			ft-TOC	**Comments:**		
	Final Volume Purged:		1.1	Gallons			
	Final Volume Purge Rate:		200	mL/min			
	Well Purged Dry?:			(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	12:30	0.0	---	---	---	---	---	---	---	---	Start Purging
	12:35	0.3	200	9.95	17.5	7.2	0.984	0.4	-67	7.74	Clear, no odor
	12:40	0.5	200	9.95	17.0	7.3	0.988	0.0	-99	4.33	Clear, no odor
	12:45	0.8	200	9.95	17.3	7.3	0.989	-0.1	-109	2.87	Clear, no odor
	12:50	1.1	200	9.95	17.4	7.3	0.992	-0.1	-111	1.74	Clear, no odor
Final:	12:50	1.1	200	9.95	17.4	7.3	0.992	-0.1	-111	1.7	End of Purging

Sample Method: Bladder Pump Sample Start Time: 12:55 Sample End Time: 13:10

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station	Purge Date:	
Project Location:	Moscow, Ohio	Purge Time:	Minutes
Project Number:	7217-17-001D	Sample Date:	
Source Well:	MW-18	Sample Time:	
Locked?:	Yes	Air Temp:	
Sampled By:			
Weather:			

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:		ft-TOC
			Total Well Depth:	17.47	ft-TOC
			Height of Water Column:	17.47	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.9	Gal
3 * Well Volume	8.55	Gal
5 * Well Volume	14.25	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:		End Time:		
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:		Gallons				
	Final Volume Purge Rate:		mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
		0.0	---	---	---	---	---	---	---	---	Start Purging
Final:											End of Purging

Sample Method: Bladder Pump Sample Start Time: Sample End Time:

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 19, 2023
Source Well:	MW-20D	Purge Time:	50 Minutes
Locked?:	Yes	Sample Date:	September 19, 2023
Sampled By:	CJH & AKL	Sample Time:	16:40
Weather:	Sunny	Air Temp:	78F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	21.50	ft-TOC
			Total Well Depth:		ft-TOC
			Height of Water Column:		feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

	Purge Method:	Bladder Pump		Start Time:	15:45	End Time:	16:35
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
	Pump Intake Depth from Top of Casing:			ft-TOC			
	Water Column Above Pump Intake:			feet	Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:			ft-TOC	**Comments:**		
	Final Volume Purged:	2.5		Gallons			
	Final Volume Purge Rate:	200		mL/min			
	Well Purged Dry?:			(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	15:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	15:50	0.3	200	21.46	16.4	7.6	0.625	3.3	-79	42.2	Cloudy, no odor
	15:55	0.4	100	21.45	17.7	7.4	0.613	2.2	-77	92.7	Cloudy, no odor
	16:00	0.7	200	21.58	14.4	7.3	0.617	1.4	-73	83.0	Cloudy, no odor
	16:05	0.9	200	21.56	14.4	7.3	0.628	1.3	-72	67.5	Cloudy, no odor
	16:10	1.2	200	21.57	14.3	7.2	0.639	0.9	-75	66.2	Cloudy, no odor
	16:15	1.5	200	21.55	14.3	7.2	0.651	0.6	-78	58.9	Cloudy, no odor
	16:20	1.7	200	21.57	14.3	7.2	0.659	0.6	-78	54.6	Cloudy, no odor
	16:25	2.0	200	21.60	14.0	7.2	0.664	0.5	-79	34.9	Cloudy, no odor
	16:30	2.2	200	21.65	13.7	7.2	0.673	0.3	-83	35.3	Cloudy, no odor
	16:35	2.5	200	21.65	13.8	7.2	0.678	0.2	-85	33.5	Cloudy, no odor
Final:	16:35	2.5	200	21.65	13.8	7.2	0.678	0.2	-85	33.5	End of Purging

Sample Method: Bladder Pump Sample Start Time: 16:40 Sample End Time: 17:05

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 19, 2023
Source Well:	MW-21	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	September 19, 2023
Sampled By:	CJH & AKL	Sample Time:	14:30
Weather:	Sunny	Air Temp:	77F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				13.95	ft-TOC
Total Well Depth:					ft-TOC
Height of Water Column:					feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:	14:00	End Time:	14:30
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		1.2		Gallons			
Final Volume Purge Rate:		150		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	14:00	0.0	---	---	---	---	---	---	---	---	Start Purging
	14:05	0.1	100	14.14	14.2	7.3	2.912	4.4	80	1.93	Clear, no odor
	14:10	0.4	200	14.39	13.5	7.2	1.802	1.9	62	1.80	Clear, no odor
	14:15	0.6	150	14.30	13.7	7.1	1.588	0.5	60	1.26	Clear, no odor
	14:20	0.8	150	14.40	13.8	7.0	1.533	0.3	42	1.21	Clear, no odor
	14:25	1.0	150	14.42	13.5	7.0	1.458	0.2	23	0.84	Clear, no odor
	14:30	1.2	150	14.52	13.1	7.0	1.416	0.1	10	1.19	Clear, no odor
Final:	14:30	1.2	150	14.52	13.1	7.0	1.416	0.1	10	1.2	End of Purging

Sample Method: Bladder Pump Sample Start Time: 14:30 Sample End Time: 15:00

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 19, 2023
Source Well:	MW-22	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	September 19, 2023
Sampled By:	CJH & AKL	Sample Time:	12:00
Weather:	Sunny	Air Temp:	70F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	18.71	ft-TOC
			Total Well Depth:	37.29	ft-TOC
			Height of Water Column:	18.58	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	3.0	Gal
3 * Well Volume	9.10	Gal
5 * Well Volume	15.16	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	11:25	End Time:	11:55	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.3	Gallons				
	Final Volume Purge Rate:	150	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	11:25	0.0	---	---	---	---	---	---	---	---	Start Purging
	11:30	0.3	200	19.03	13.5	7.0	1.093	3.2	-39	7.66	Clear, no odor
	11:35	0.5	200	19.20	13.3	6.9	1.074	1.5	-27	15.6	Clear, no odor
	11:40	0.7	150	19.11	13.4	6.9	1.072	0.9	-29	5.79	Clear, no odor
	11:45	0.9	150	19.16	13.2	6.9	1.077	0.6	-31	4.57	Clear, no odor
	11:50	1.1	150	19.27	13.1	6.9	1.080	0.5	-31	4.33	Clear, no odor
	11:55	1.3	150	19.29	13.0	6.9	1.078	0.4	-31	2.69	Clear, no odor
Final:	11:55	1.3	150	19.29	13.0	6.9	1.078	0.4	-31	2.7	End of Purging

Sample Method: Bladder Pump Sample Start Time: 12:00 Sample End Time: 12:30

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 20, 2023
Source Well:	MW-24	Purge Time:	20 Minutes
Locked?:	Yes	Sample Date:	September 20, 2023
Sampled By:	CJH & AKL	Sample Time:	10:25
Weather:	Sunny	Air Temp:	75F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	21.56	ft-TOC
			Total Well Depth:	34.41	ft-TOC
			Height of Water Column:	12.85	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.1	Gal
3 * Well Volume	6.29	Gal
5 * Well Volume	10.48	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	10:05	End Time:	10:25	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	0.6	Gallons	Duplicate sample collected (DUP-2)			
	Final Volume Purge Rate:	100	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:05	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:10	0.2	150	22.51	15.1	7.3	0.529	0.7	17	9.69	Clear, no odor
	10:15	0.3	100	22.49	15.6	7.3	0.527	0.3	18	4.36	Clear, no odor
	10:20	0.5	100	22.50	15.7	7.3	0.531	0.2	16	4.39	Clear, no odor
	10:25	0.6	100	22.53	15.5	7.3	0.532	0.1	16	2.81	Clear, no odor
Final:	10:25	0.6	100	22.53	15.5	7.3	0.532	0.1	16	2.8	End of Purging

Sample Method: Bladder Pump Sample Start Time: 10:25 Sample End Time: 11:05

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 20, 2023
Source Well:	MW-D	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	September 20, 2023
Sampled By:	CJH & AKL	Sample Time:	9:25
Weather:	Sunny	Air Temp:	65F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	19.37	ft-TOC
			Total Well Depth:	35.02	ft-TOC
			Height of Water Column:	15.65	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.6	Gal
3 * Well Volume	7.66	Gal
5 * Well Volume	12.77	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	8:55	End Time:	9:20	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	0.7	Gallons				
	Final Volume Purge Rate:	100	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	08:55	0.0	---	---	---	---	---	---	---	---	Start Purging
	09:00	0.2	150	21.49	14.5	8.5	0.871	1.5	-13	12.9	Clear, no odor
	09:05	0.3	100	22.06	14.4	8.5	0.861	1.4	-13	7.07	Clear, no odor
	09:10	0.5	100	22.63	15.1	8.5	0.859	1.2	-14	4.10	Clear, no odor
	09:15	0.6	100	23.09	15.3	8.5	0.858	1.3	-13	3.09	Clear, no odor
	09:20	0.7	100	23.53	15.7	8.5	0.856	1.2	-14	3.04	Clear, no odor
Final:	09:20	0.7	100	23.53	15.7	8.5	0.856	1.2	-14	3.0	End of Purging

Sample Method: Bladder Pump Sample Start Time: 09:25 Sample End Time: 09:55

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 18, 2023
Source Well:	MW-E	Purge Time:	45 Minutes
Locked?:	Yes	Sample Date:	September 19, 2023
Sampled By:	CJH & AKL	Sample Time:	9:25
Weather:	Sunny	Air Temp:	75F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				26.38	ft-TOC
Total Well Depth:				32.73	ft-TOC
Height of Water Column:				6.35	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume	4.1	Gal
3 * Well Volume	12.43	Gal
5 * Well Volume	20.72	Gal

Well Purging Information

Purge Method:		Bladder Pump	Start Time:	14:45	End Time:	15:30	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
Pump Intake Depth from Top of Casing:			ft-TOC				
Water Column Above Pump Intake:			feet		Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:			ft-TOC	**Comments:**			
Final Volume Purged:		1.4	Gallons	Could not read water level starting at at 15:10,			
Final Volume Purge Rate:		30	mL/min	due to pump head. Well went dry at 15:33.			
Well Purged Dry?:		No	(Yes/No)	Well sampled on 9/19/23.			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	14:45	0.0	---	---	---	---	---	---	---	---	Start Purging
	14:50	0.3	250	27.64	14.5	7.4	0.662	4.3	71	10.6	Clear, no odor
	14:55	0.5	150	28.06	15.7	7.4	0.671	3.2	64	19.2	Clear, no odor
	15:00	0.7	150	28.36	15.8	7.4	0.687	3.0	65	23.0	Clear, no odor
	15:05	0.9	150	28.76	15.1	7.4	0.697	2.7	65	18.6	Clear, no odor
	15:10	1.1	100		15.9	7.4	0.695	2.0	61	21.2	Clear, no odor
	15:15	1.2	100		16.3	7.4	0.707	1.7	58	38.7	Clear, no odor
	15:20	1.3	75		16.9	7.4	0.710	1.4	55	64.9	Clear, no odor
	15:25	1.4	50		17.6	7.4	0.714	1.3	52	81.8	Clear, no odor
	15:30	1.4	30		19.3	7.4	0.723	0.8	48	88.2	Clear, no odor
Final:	15:30	1.4	30	28.76	19.3	7.4	0.723	0.8	48	88.2	End of Purging

Sample Method: Bladder Pump Sample Start Time: 09:25 Sample End Time: 10:00

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 19, 2023
Source Well:	MW-F	Purge Time:	30 Minutes
Locked?:	Yes	Sample Date:	September 19, 2023
Sampled By:	CJH & AKL	Sample Time:	10:50
Weather:	Sunny	Air Temp:	72F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	12.96	ft-TOC
			Total Well Depth:	29.78	ft-TOC
			Height of Water Column:	16.82	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.7	Gal
3 * Well Volume	8.23	Gal
5 * Well Volume	13.72	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	10:20	End Time:	10:50	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	0.9	Gallons				
	Final Volume Purge Rate:	100	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	10:20	0.0	---	---	---	---	---	---	---	---	Start Purging
	10:25	0.3	200	15.24	14.0	7.2	3.216	2.0	-51	3.69	Clear, no odor
	10:30	0.4	100	15.72	14.4	7.1	2.891	1.2	-32	2.52	Clear, no odor
	10:35	0.5	100	16.48	14.4	7.1	2.865	1.0	-26	1.60	Clear, no odor
	10:40	0.7	100	17.50	14.2	7.1	2.825	1.3	-20	0.90	Clear, no odor
	10:45	0.8	100	17.87	14.5	7.1	2.808	1.4	-16	1.00	Clear, no odor
	10:50	0.9	100	18.45	14.7	7.1	2.810	1.5	-14	0.91	Clear, no odor
Final:	10:50	0.9	100	18.45	14.7	7.1	2.810	1.5	-14	0.9	End of Purging

Sample Method: Bladder Pump Sample Start Time: 10:50 Sample End Time:

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 20, 2023
Source Well:	MW-G	Purge Time:	20 Minutes
Locked?:	No	Sample Date:	September 20, 2023
Sampled By:	CJH & AKL	Sample Time:	11:55
Weather:	Sunny	Air Temp:	78F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	34.66	ft-TOC
			Total Well Depth:	67.70	ft-TOC
			Height of Water Column:	33.04	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	5.4	Gal
3 * Well Volume	16.18	Gal
5 * Well Volume	26.96	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	11:30	End Time:	11:50	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC	**Comments:**			
	Final Volume Purged:	1.2	Gallons	MS/MSD			
	Final Volume Purge Rate:	250	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	11:30	0.0	---	---	---	---	---	---	---	---	Start Purging
	11:35	0.2	150	34.66	19.5	6.8	1.356	0.3	-72	2.09	Clear, no odor
	11:40	0.5	250	34.69	17.1	7.1	1.421	0.2	-115	1.49	Clear, no odor
	11:45	0.9	250	34.70	17.2	7.2	1.385	0.2	-125	2.38	Clear, no odor
	11:50	1.2	250	34.69	17.2	7.2	1.364	0.2	-127	0.85	Clear, no odor
Final:	11:50	1.2	250	34.69	17.2	7.2	1.364	0.2	-127	0.9	End of Purging

Sample Method: Bladder Pump Sample Start Time: 11:55 Sample End Time: 12:40

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 20, 2023
Source Well:	MW-H	Purge Time:	25 Minutes
Locked?:	Yes	Sample Date:	September 20, 2023
Sampled By:	CJH & AKL	Sample Time:	13:45
Weather:	Overcast	Air Temp:	80F

Water Level & Well Data

			Measuring Point:	Top of Casing	
			Depth to Water:	10.89	ft-TOC
			Total Well Depth:	27.02	ft-TOC
			Height of Water Column:	16.13	feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	2	inch
Water Volume	2.6	Gal
3 * Well Volume	7.90	Gal
5 * Well Volume	13.16	Gal

Well Purging Information

	Purge Method:	Bladder Pump	Start Time:	13:20	End Time:	13:45	
(If Used)	Bladder Pump Control Settings:	On (sec):	Off (sec):		Pressure:		psi
	Pump Intake Depth from Top of Casing:		ft-TOC				
	Water Column Above Pump Intake:		feet		Flow Through Cell Vol:	200	mL
	DTW-TOC at 25% Drawdown of WC Above Pump:		ft-TOC		**Comments:**		
	Final Volume Purged:	1.3	Gallons				
	Final Volume Purge Rate:	200	mL/min				
	Well Purged Dry?:		(Yes/No)				

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
	13:20	0.0	---	---	---	---	---	---	---	---	Start Purging
	13:25	0.3	200	10.83	16.6	7.0	1.143	0.3	-55	0.75	Clear, no odor
	13:30	0.5	200	10.83	16.6	7.0	1.160	0.0	-67	0.68	Clear, no odor
	13:35	0.8	200	10.81	16.6	7.0	1.165	0.1	-72	0.58	Clear, no odor
	13:40	1.1	200	10.82	16.2	7.0	1.178	0.0	-76	0.57	Clear, no odor
	13:45	1.3	200	10.84	16.0	7.0	1.186	0.0	-79	0.68	Clear, no odor
Final:	13:45	1.3	200	10.84	16.0	7.0	1.186	0.0	-79	0.7	End of Purging

Sample Method: Bladder Pump Sample Start Time: 13:45 Sample End Time: 14:05

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

Notes:

Form Revision Date: 2/12/18 16:00

LOW FLOW GROUNDWATER SAMPLING FORM

Project Name:	Zimmer Station		
Project Location:	Moscow, Ohio		
Project Number:	7217-17-001D	Purge Date:	September 19, 2023
Source Well:	Seq. 1 Source Water	Purge Time:	#VALUE! Minutes
Locked?:	No	Sample Date:	September 19, 2023
Sampled By:	CJH & AKL	Sample Time:	15:10
Weather:	Sunny	Air Temp:	78F

Water Level & Well Data

Measuring Point:				Top of Casing	
Depth to Water:				N/A	ft-TOC
Total Well Depth:					ft-TOC
Height of Water Column:					feet
Screen Length:	20	feet	Stickup:		ft-GRD

Well Volume		
Well Diameter	4	inch
Water Volume		Gal
3 * Well Volume		Gal
5 * Well Volume		Gal

Well Purging Information

Purge Method:		Bladder Pump		Start Time:		End Time:	15:05
(If Used)	Bladder Pump Control Settings:	On (sec):		Off (sec):		Pressure:	psi
Pump Intake Depth from Top of Casing:				ft-TOC			
Water Column Above Pump Intake:				feet	Flow Through Cell Vol:	200	mL
DTW-TOC at 25% Drawdown of WC Above Pump:				ft-TOC	**Comments:**		
Final Volume Purged:		#VALUE!		Gallons			
Final Volume Purge Rate:		#N/A		mL/min			
Well Purged Dry?:				(Yes/No)			

Field Parameters (Taken at time intervals ≥ 5 minutes and purge volumes ≥ 1 flow-through cell volume)

	Time	Volume Purged (gal)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (s.u.)	Spec. Cond. (mS/cm)	Dissolved Oxygen (mg/L)	ORP* (mV)	Turbidity (NTU)	Comment
		0.0	---	---	---	---	---	---	---	---	Start Purging
	15:05	#VALUE!	N/A	N/A	19.5	9.1	9.750	3.3	-400		
Final:	15:05	#VALUE!	#N/A	#N/A	19.5	9.1	9.750	3.3	-400		End of Purging

Sample Method: Bladder Pump Sample Start Time: 15:10 Sample End Time: 15:20

Analytical Data

Method	Qty	Container	Preservative	Method	Qty	Container	Preservative

Name	Signature	Date
(1)		

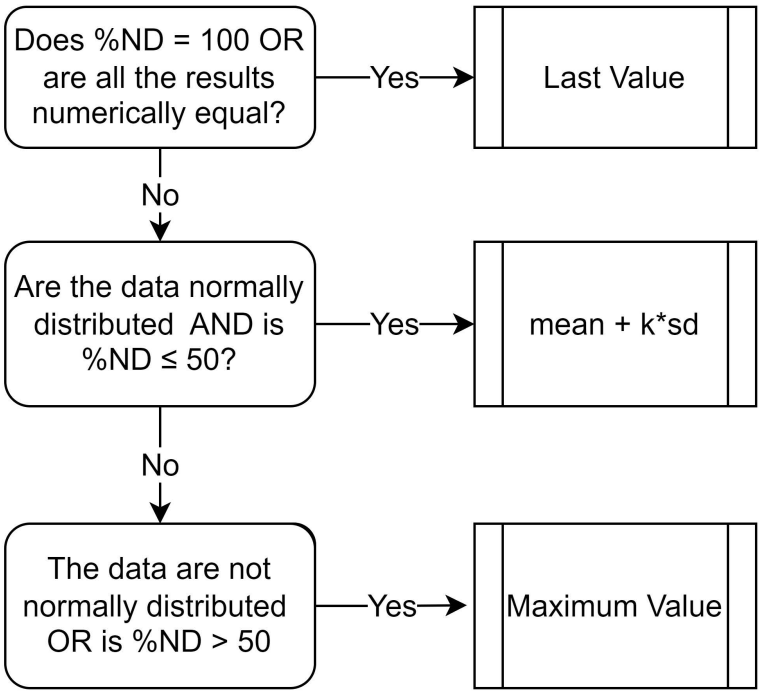
Notes:

Form Revision Date: 2/12/18 16:00

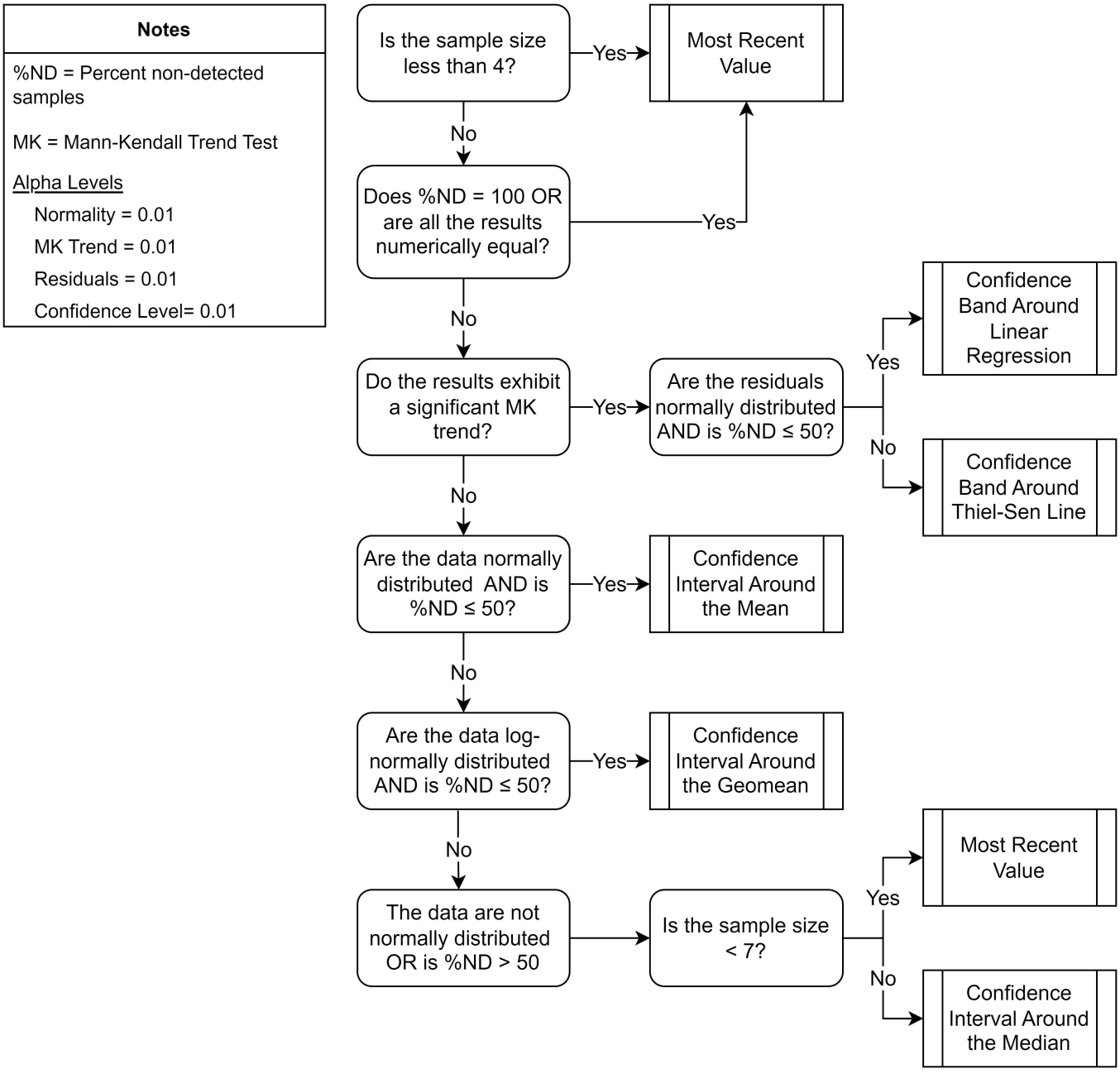
Zimmer Landfill - Unit 122			
Well ID	**Date**	**Time**	**Depth to Water**
Zimmer Landfill - Unit 122			
MW-3	9/18/2023	11:30	13.11
MW-9D	9/18/2023	12:04	31.48
MW-11D	9/18/2023	10:32	18.37
MW-13S	9/18/2023	10:50	Dry
MW-16D	9/18/2023	11:36	9.93
MW-18	9/18/2023	11:07	16.83
MW-20D	9/18/2023	11:58	21.53
MW-21	9/18/2023	11:20	13.90
MW-22	9/18/2023	12:13	18.63
MW-24	9/18/2023	10:40	21.57
MW-D	9/18/2023	10:37	18.33
MW-E	9/18/2023	12:09	25.88
MW-F	9/18/2023	12:18	12.97
MW-G	9/18/2023	11:52	34.75
MW-H	9/18/2023	11:40	10.84

APPENDIX B
STATISTICAL METHODOLOGY FOR DETERMINATION OF BACKGROUND VALUES

Notes
%ND = Percent non-detected samples sd = standard deviation k = kappa for tolerance limit (95% confidence/95% coverage)



APPENDIX C
STATISTICAL METHODOLGY FOR DETERMINATION OF STATISTICALLY SIGNIFICANT LEVELS


Notes
%ND = Percent non-detected samples
MK = Mann-Kendall Trend Test
Alpha Levels
Normality = 0.01
MK Trend = 0.01
Residuals = 0.01
Confidence Level= 0.01
Is the sample size less than 4?
Yes
Most Recent Value
No
Does %ND = 100 OR are all the results numerically equal?
Yes
No
Do the results exhibit a significant MK trend?
Yes
Are the residuals normally distributed AND is %ND ≤ 50?
Yes
Confidence Band Around Linear Regression
No
Confidence Band Around Thiel-Sen Line
No
Are the data normally distributed AND is %ND ≤ 50?
Yes
Confidence Interval Around the Mean
No
Are the data log-normally distributed AND is %ND ≤ 50?
Yes
Confidence Interval Around the Geomean
No
The data are not normally distributed OR is %ND > 50
Is the sample size < 7?
Yes
Most Recent Value
No
Confidence Interval Around the Median

APPENDIX D
ALTERNATIVE SOURCE DEMONSTRATIONS

Intended for
Zimmer Power Company, LLC

Date
October 30, 2023

Project No.
1940103649-016

40 C.F.R. § 257.95(g)(3)(ii): ALTERNATIVE SOURCE DEMONSTRATION

ZIMMER POWER PLANT

LANDFILL

CCR UNIT 122

RAMBOLL Bright ideas. Sustainable change.

CERTIFICATIONS

I, Nicole M. Pagano, a qualified professional engineer in good standing in the State of Ohio, certify that the information in this report is accurate as of the date of my signature below. The content of this report is not to be used other than for its intended purpose and meaning, or for extrapolations beyond the interpretations contained herein.

Nicole M. Pagano
Qualified Professional Engineer
85428
Ohio
Ramboll Americas Engineering Solutions, Inc.
Date: October 30, 2023

I, Brian G. Hennings, certify that the information in this report is accurate as of the date of my signature below. The content of this report is not to be used other than for its intended purpose and meaning, or for extrapolations beyond the interpretations contained herein.

Brian G. Hennings
Senior Managing Hydrogeologist
Ramboll Americas Engineering Solutions, Inc.
Date: October 30, 2023

Ramboll
234 W. Florida Street
Fifth Floor
Milwaukee, WI 53204
USA
T 414-837-3607
F 414-837-3608
https://ramboll.com

CONTENTS

FIGURES (IN TEXT)

FIGURES (ATTACHED)

APPENDICES

ACRONYMS AND ABBREVIATIONS

‰	parts per thousand or *per mil* variations
$\delta^{11}B$	Boron isotopic ratio
^{10}B	boron-10
^{11}B	boron-11
^{86}Sr	strontium-86
^{87}Sr	strontium-87
$^{87}Sr/^{86}Sr$	isotopic ratio of strontium-87 to strontium-86
40 C.F.R.	Title 40 of the Code of Federal Regulation
A6	Assessment Monitoring Event A6
ASD	Alternative Source Demonstration
CCR	coal combustion residuals
GWPS	Groundwater Protection Standard
LOE(s)	line(s) of evidence
NAVD88	North American Vertical Datum of 1988
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SAHRA	Sustainability of semi-Arid Hydrology and Riparian Areas
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
std	standard
ZPP	Zimmer Power Plant

1. INTRODUCTION

Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257.95(g)(3)(ii) allows the owner or operator of a coal combustion residuals (CCR) unit 90 days from the date of determination of Statistically Significant Levels (SSLs) over Groundwater Protection Standards (GWPSs) of groundwater constituents listed in Appendix IV of 40 C.F.R. § 257 to complete a written demonstration that a source other than the CCR Unit being monitored caused the SSL(s), or that the SSL(s) resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality (Alternative Source Demonstration [ASD]).

This ASD has been prepared on behalf of Zimmer Power Company, LLC, by Ramboll Americas Engineering Solutions, Inc. (Ramboll), to provide pertinent information pursuant to 40 C.F.R. § 257.95(g)(3)(ii) for the Zimmer Power Plant (ZPP) Landfill located near Moscow, Ohio.

The most recent Assessment Monitoring sampling event (A6) samples were collected on March 20 and 21, 2023 and analytical data were received on May 3, 2023. Analytical data from A6 were evaluated in accordance with the Multi-Site Statistical Analysis Plan (Ramboll, 2022) to determine any Statistically Significant Increases (SSIs) of Appendix III parameters over background concentrations or SSLs of Appendix IV parameters over GWPSs. That evaluation identified one SSL at a downgradient monitoring well as follows:

- Lithium at well MW-D

In accordance with the Multi-Site Statistical Analysis Plan (Ramboll, 2022), all wells with SSLs were resampled on June 14 and 15, 2023. Following evaluation of analytical data from the resample event, the following SSLs remained:

- Lithium at well MW-D

Pursuant to 40 C.F.R. § 257.95(g)(3)(ii), the lines of evidence (LOEs) presented in **Section 3** demonstrate that sources other than the ZPP Landfill were the cause of the lithium SSL listed above. This ASD was completed by October 30, 2023, within 90 days of determination of the SSLs (August 1, 2023), as required by 40 C.F.R. § 257.95(g)(3)(ii).

2. BACKGROUND

2.1 Site Location and Description

The ZPP is located in southwest Ohio, approximately 30 miles southeast of Cincinnati, Ohio. The Landfill is located approximately 3 miles east of the power plant and is bounded by State Route 756 on the northeast, Turkeyfoot Road on the northwest, and Fruit Ridge Road on the southwest.

The Landfill footprint covers approximately 194.5 acres (**Figure 1**). The ZPP primarily burned Northern Appalachian coal and was retired on May 31, 2022. CCR generated at the plant was trucked to the Landfill for disposal. Materials approved for disposal include fly ash, bottom ash, stabilized flue gas desulfurization wastes, and gypsum. Disposal activities commenced in January 1991 and have progressed through a series of fill areas or phases.

2.2 Groundwater Monitoring

The ZPP Landfill groundwater monitoring system for compliance with 40 C.F.R. § 257 consists of four background monitoring wells (MW-3, MW-13S, MW-18, and MW-21) and 11 compliance monitoring wells (MW-9DR, MW-11D, MW-16D, MW-20D, MW-22, MW-24, MW-D, MW-E, MW-F, MW-G, and MW-H). A map showing the groundwater monitoring system, including the CCR Unit and all background and compliance monitoring wells, is presented in **Figure 1**. **Figure 1** also shows leachate sample location SEQ1.

Groundwater samples were collected and analyzed in accordance with the Multi-Site Sampling and Analysis Plan (Ramboll, 2023). Statistical evaluation of analytical data was performed in accordance with the Multi-Site Statistical Analysis Plan (Ramboll, 2022).

2.3 Conceptual Site Model

2.3.1 Site Geology and Hydrogeology

Underlying the Landfill is a layer of unconsolidated sediments (glacial till) that ranges from 10 to 40 feet in thickness. The till is hard and consists of coarse, angular, gravel-sized material in a clay- and silt-rich matrix (AECOM, 2017).

The lower confining unit underlying the till is the bedrock unit, consisting of the interbedded shale and limestone of the Fairview and Kope Formations. These low-yielding shale and limestone formations are approximately 400- to 600-feet thick (Luft, et. al., 1973).

Groundwater yields from the bedrock strata in this region are quite limited. Generally, the bedrock is not tapped for water due to its low permeability. Those wells that do tap the bedrock aquifers generally draw water from the bedding planes and fracture zones. Due to the relatively impermeable nature of the shales and limestone underlying this region, water yields are generally insufficient for domestic use. Saline to brackish waters have been encountered at 50 feet below the surface of the Landfill. Fresh water does not typically occur at depths greater than 150 feet (AECOM, 2017).

2.3.2 Uppermost Aquifer

The Uppermost Aquifer is continuous beneath the site and is comprised of the upper 20 feet or less of the fractured and weathered bedrock near the interface between the bedrock and overlying till deposits.

Bedrock is typically encountered 15 to 25 feet below ground surface and overlain by clay, although it may be deeper in the two major surface drainage channels at the site (Little Indian Creek and an unnamed tributary to Little Indian Creek) (**Figure 2**).

Groundwater elevations (referenced to North American Vertical Datum of 1988 [NAVD88]) were obtained from measurements in monitoring wells screened in the Uppermost Aquifer on March 20, 2023, prior to sample collection, and ranged from approximately 787.08 to 875.38 feet NAVD88 (**Figure 2**). The groundwater elevations and flow direction beneath the Landfill during the A6 sampling event are shown in **Figure 2**.

A groundwater flow divide occupies the high ground between Little Indian Creek and an unnamed tributary to Little Indian Creek. The divide runs roughly northwest-southeast. Groundwater flows from the divide to the centerline of the drainage channels in the general downhill direction. These channels run roughly westward, exiting the site at the northern and western corners of the property (AECOM, 2017). Groundwater in the Uppermost Aquifer generally flows from bedrock highs towards the drainage channels, paralleling the direction of topographic slope, in a manner similar to the flow of surface runoff. This is suggested by the relatively shallow depth-to-groundwater as compared to the topographic relief of the area. However, because this groundwater occupies secondary porosity in the thin limestone units of the predominantly shale bedrock, the potential exists for locally unpredictable flow patterns, as groundwater movement may be controlled by preferential pathways created by open fractures and their degree of interconnection (AECOM, 2017).

The primary influences on groundwater flow beneath the Landfill are infiltration of rainfall and other surface water and the lack of infiltration due to temporary or permanent capping of the Landfill (AECOM, 2017).

2.4 Isotopic Evaluation

Stable isotope analysis is commonly used in age dating, provenance studies and to differentiate between sources of groundwater. Multiple studies have shown that strontium and boron isotopic ratios can be successfully used in identifying CCR impacts to groundwater (Ruhl et al, 2014; Harkness et al, 2016). When a material is altered, the mass of a given element in the resulting material may be conserved or reduced. Alteration processes, such as combustion, may also affect the isotopic ratios of a given element, referred to as fractionation. Isotopes that have minimal fractionation during the alteration process, such as strontium and boron isotopes, make good groundwater tracers; therefore, strontium and boron isotopic ratios can be used to identify CCR impacted groundwater and CCR leachate (Ruhl et al, 2014). This ASD compares strontium and boron isotopic ratios of groundwater in the vicinity of the Landfill and landfill leachate to typical published ranges for groundwater and CCR impacted waters.

2.4.1 Strontium

The ratio of stable strontium isotopes strontium-87 to strontium-86 ($^{87}Sr/^{86}Sr$) (Kendall et al, 2003), is commonly used to trace the mixing of global reservoirs and to evaluate the environmental conditions in surface waters, oceans, and sediments. Strontium isotopes are very useful for provenance identification because the isotopic signature of rock is transferred to the soil, vegetation, and up the food web with minimal isotopic fractionation (Bataille and Bowen, 2012). Strontium is readily leachable from many coal ashes (Spivak-Birndorf et al., 2012), and

the resulting isotopic signature may be used to trace CCR influence on groundwater (Ruhl et al. 2014; Harkness et al., 2016).

Strontium isotopic ratios are typically expressed and reported as an absolute ratio (*i.e.,* $^{87}Sr/^{86}Sr$) due to strontium-86 (^{86}Sr) being a stable isotope with a constant abundance (Cook and Herczeg, 2000; Sustainability of Semi-Arid Hydrology and Riparian Areas [SAHRA], 2005). This is an exception for data reporting in stable isotope analysis, since most results are reported relative to a standard, as described in further detail for boron in the following section.

2.4.2 Boron

Both coal (Williams and Hervig, 2004) and CCR (Ruhl et al., 2014) tend to be isotopically light in boron relative to natural waters. Boron is present in a highly mobile fraction of CCR (Jankowski et al., 2006) and is unlikely to be fractionated during dissolution. CCR-impacted groundwater will therefore have a similar isotopic ratio as the CCR, allowing the boron isotopic signature of groundwater to act as a tracer of CCR influence (Ruhl et al. 2014; Harkness et al., 2016).

Because variations in boron isotopic ratios are usually small, they are reported in parts per thousand or *per mil* variations, denoted ‰, from a standard.

$$\boldsymbol{\delta}^{11}\mathrm{B} = \left[\frac{(^{11}\mathrm{B}/^{10}\mathrm{B})_{\mathrm{sample}} - (^{11}\mathrm{B}/^{10}\mathrm{B})_{\mathrm{std}}}{(^{11}\mathrm{B}/^{10}\mathrm{B})_{\mathrm{std}}}\right] \times \mathbf{1000}$$

^{10}B = boron-10

^{11}B = boron-11

$\delta^{11}B$ = Boron isotopic ratio

std = standard

3. ALTERNATIVE SOURCE DEMONSTRATION: LINES OF EVIDENCE

As allowed by 40 C.F.R. § 257.95(g)(3)(ii), this ASD demonstrates that the lithium SSL did not originate from the Landfill. LOEs supporting this ASD include the following:

1. Strontium and boron isotopic ratios in groundwater near the Landfill are not consistent with literature and site-specific CCR impacted waters.
2. The landfill leachate has a different ionic composition than groundwater.

These LOEs are described and supported in greater detail below. Monitoring wells and landfill leachate sample locations are shown on **Figure 1**.

3.1 LOE #1: Strontium and Boron Isotopic Ratios in Groundwater Near the Landfill Are Not Consistent With Literature and Site-Specific CCR Impacted Waters

3.1.1 Strontium Isotopic Ratios

Strontium isotopic ratios ($^{87}Sr/^{86}Sr$) were calculated for samples collected from groundwater monitoring wells and landfill leachate (SEQ1) in February/March 2019, April 2020, and June 2023. Samples for which $^{87}Sr/^{86}Sr$ and total strontium data are available (April 2020 and June 2023) are plotted against total strontium in **Figure A** on the following page. The orange rectangle in **Figure A** indicates published $^{87}Sr/^{86}Sr$ signatures in experimental leachates from CCR derived from Appalachian, Illinois, and Powder River Basin coals, which range from 0.70975 to 0.71251, with all but one reported result greater than 0.71090 (Ruhl et al, 2014). Total strontium was not measured in samples collected in February/March 2019 and could not be included in Figure A ; therefore, **Figure B** on the following page summarizes all $^{87}Sr/^{86}Sr$ signatures in boxplots, separated by sample type (background, compliance, SSL location groundwater [MW-D], Landfill groundwater monitoring wells not in the monitoring network, leachate collected from the Landfill [SEQ1], and the literature CCR leachate range). The isotope data is included in **Appendix A**.

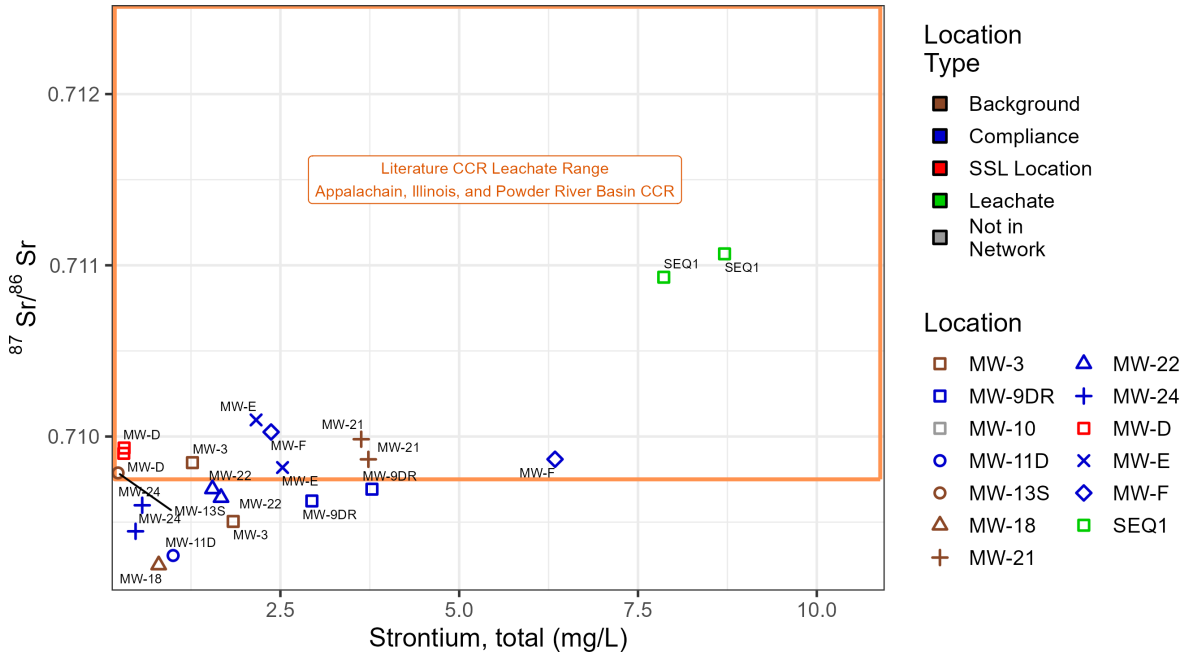


Figure A. Strontium Isotopic Ratios Compared to Strontium Concentrations

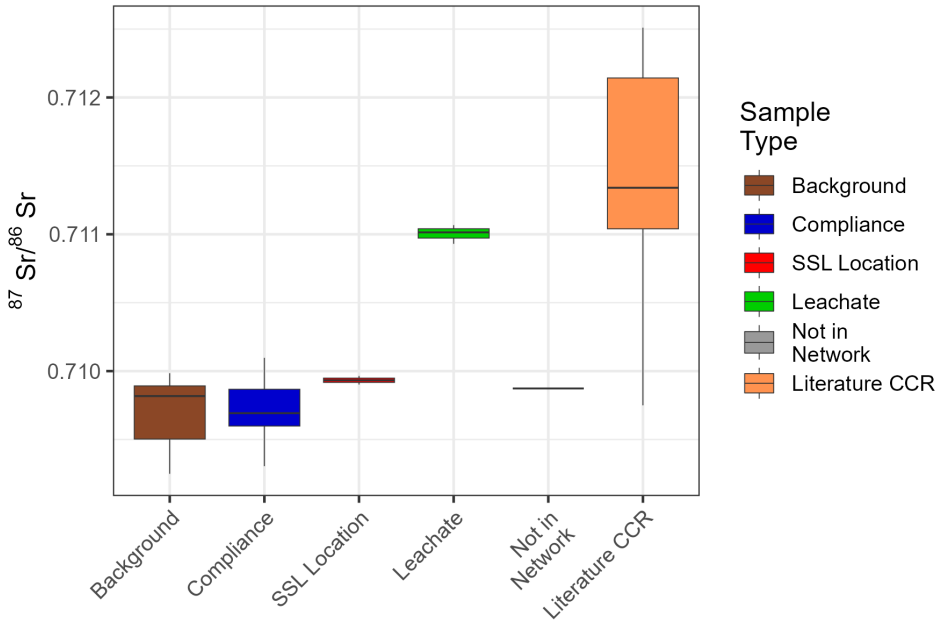


Figure B. Strontium Isotopic Ratios by Sample Type.

Figure A and **Figure B** show that the range of $^{87}Sr/^{86}Sr$ found in Landfill leachate samples (0.71093 to 0.71107) is consistent with the literature range reported for CCR leachate (Ruhl et al., 2014). The background groundwater $^{87}Sr/^{86}Sr$ range at the Landfill (0.70925 to 0.70998) is substantially lower than the site-specific leachate $^{87}Sr/^{86}Sr$ signature, although it overlaps slightly with the lowermost end of the literature CCR leachate range. The compliance groundwater

$^{87}Sr/^{86}Sr$ signature, including samples from MW-D (the location of the lithium SSL), ranges from 0.70930 to 0.71010. This signature is consistent with (*i.e.,* very similar to) site-specific background $^{87}Sr/^{86}Sr$ signatures and lower than site specific CCR leachate. **Figure A** also shows that $^{87}Sr/^{86}Sr$ in background and compliance groundwater near the Landfill are well grouped, and that the $^{87}Sr/^{86}Sr$ in landfill leachate (SEQ1) is distinctly different than groundwater near the Landfill. The $^{87}Sr/^{86}Sr$ in groundwater near the Landfill indicate that groundwater is not influenced by CCR impacted waters, including landfill leachate (SEQ1). These results are consistent with a compliance groundwater $^{87}Sr/^{86}Sr$ signature. Therefore, lithium in groundwater near the Landfill is likely from a source other than the CCR Unit and the associated Landfill leachate.

3.1.2 Boron Isotopic Ratios

Boron isotopic ratios ($\delta^{11}B$) for samples collected from groundwater monitoring wells and landfill leachate (SEQ1) in February/March 2019, April 2020, and June 2023 are plotted in **Figure C** below. The green rectangle in **Figure C** represents the published typical range of $\delta^{11}B$ for groundwater in North American shales (Werner et al., 2013) and in aquifers in the region of the Site (Buczka et al., 2004), which ranges from 4.0‰ to 34.0‰, with all but one reported value greater than 9.9‰. The orange rectangle in **Figure C** represents the published typical range of $\delta^{11}B$ for CCR and CCR impacted water derived from Appalachian, Illinois, and Powder River Basin coal (all of which have been used during the operational history at the ZPP), which has a generally negative $\delta^{11}B$ signature ranging from -17.6‰ to 6.3‰ with only one reported value greater than 0‰ (Ruhl et al, 2014). The literature ranges for CCR and groundwater signatures overlap between 4.0‰ and 6.3‰. Interpretation of data within this overlapping range depends on additional factors, such as site-specific conditions and total boron concentrations. The isotope data is included in **Appendix A**.

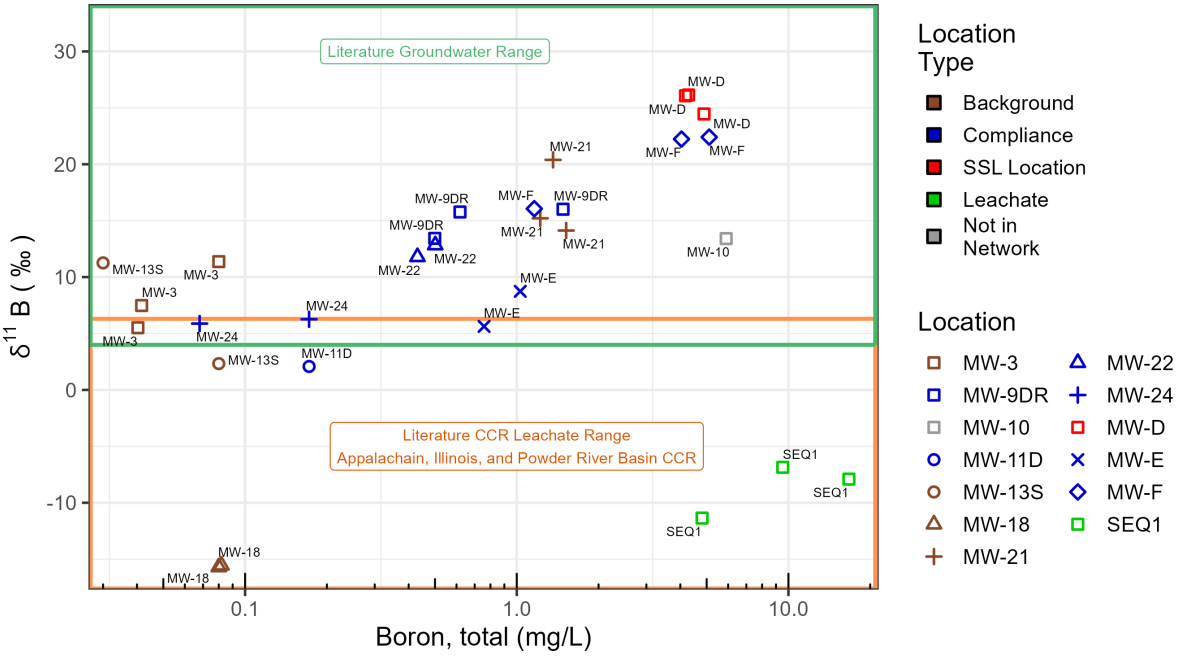


Figure C. Boron Isotopic Ratios Compared to Boron Concentrations (Note: sample results with total boron concentrations below the detection level were not included).

Figure C shows that water collected from CCR leachate has a negative $\delta^{11}B$ signature (-11.4‰ to -6.9‰), which is consistent with the reported literature range (Ruhl et al., 2014), and boron concentrations in the leachate are elevated (4.8 milligrams per liter [mg/L] to 16.7 mg/L). **Figure C** also shows that background groundwater at the site (*i.e.*, upgradient from the unit at wells MW-3, MW-13S, and MW-21) has a more enriched $\delta^{11}B$ signature (2.3‰ to 20.4‰) compared to the leachate at SEQ1 (-11.36‰ to -6.86‰). Background wells MW-12 and MW-13S have a lower $\delta^{11}B$ signature compared to MW-21, with some samples' $\delta^{11}B$ signature falling in the overlapping range between literature CCR leachate and literature groundwater signatures or slightly more depleted than the literature groundwater signature. MW-18 has a distinctly negative $\delta^{11}B$ signature (-15.7‰ to -15.6‰). However, these wells have low overall boron concentrations and are located upgradient from the CCR unit and are therefore unlikely to be impacted by CCR. These site-specific results for background confirm the conclusions in the literature that CCR-impacted water would have elevated boron concentrations characterized by a depleted $\delta^{11}B$ signature.

Figure C also shows that $\delta^{11}B$ in compliance groundwater (*i.e.*, downgradient of the CCR unit) near the Landfill is largely more enriched than literature CCR leachate $\delta^{11}B$ signatures. The few samples that fall within the literature CCR leachate and groundwater $\delta^{11}B$ overlap or below literature groundwater $\delta^{11}B$ signatures are within the range of site-specific background, and none are less than 0‰ (the majority of literature CCR leachate $\delta^{11}B$ signatures are negative; Ruhl et al., 2014). Compliance well MW-D, the location with the lithium SSL, has an enriched $\delta^{11}B$ signature (24.4‰ to 26.1‰) consistent with literature groundwater values and distinct from both literature and site-specific CCR affected $\delta^{11}B$ signatures. Furthermore, higher boron concentrations in compliance groundwater around the Landfill are consistently associated with a more enriched $\delta^{11}B$ signature, which is inconsistent with the source of the boron being CCR leachate. Therefore, lithium in downgradient groundwater near the Landfill is from a source other than the CCR Unit and the associated landfill leachate.

3.1.3 Combined Isotopic Signature

Figure D on the following page shows the Landfill groundwater and leachate $\delta^{11}B$ and $^{87}Sr/^{86}Sr$ isotopic signatures plotted against one another. The low $\delta^{11}B$ signature and high $^{87}Sr/^{86}Sr$ signature in leachate samples is clearly distinct from the lower $^{87}Sr/^{86}Sr$ and generally higher $\delta^{11}B$ signatures of the background and compliance groundwater (including MW-D, the location with the SSL exceedance). Therefore, a source of the lithium SSL at MW-D is not likely to be the CCR unit.

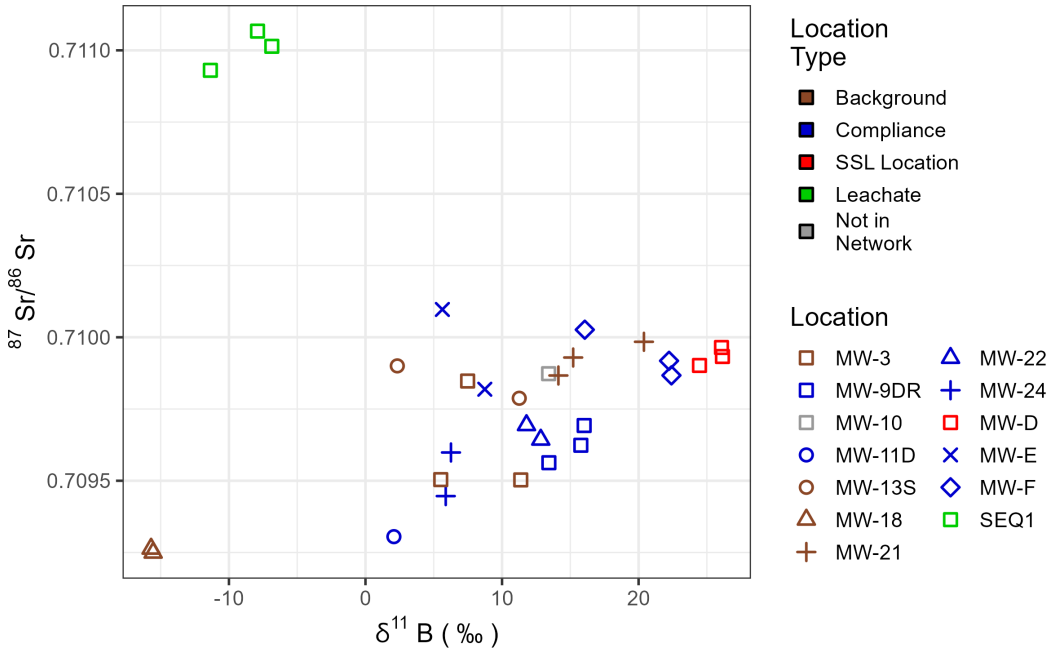


Figure D. Boron Isotopic Signatures Compared to Strontium Isotopic Signatures for Groundwater and Leachate

3.2 LOE #2: The Landfill Leachate has a Different Ionic Composition Than Groundwater

Stiff diagrams graphically represent ionic composition of aqueous solutions. Polygons with similar shapes indicate solutions with similar ionic compositions, whereas polygons with different shapes indicate solutions with dissimilar ionic compositions. The larger the area of the polygon, the greater the concentration of the various ions.

Groundwater samples collected from Landfill monitoring wells from March 20 and 21, 2023, and a Landfill leachate sample collected from leachate well SEQ1 on March 21, 2023, were analyzed for ionic composition (major ions). **Figure E** on the following page shows a series of Stiff diagrams that display the ionic compositions of groundwater from background monitoring wells (brown), compliance monitoring wells (blue), the location with the SSL exceedance (Red), and Landfill leachate (green).

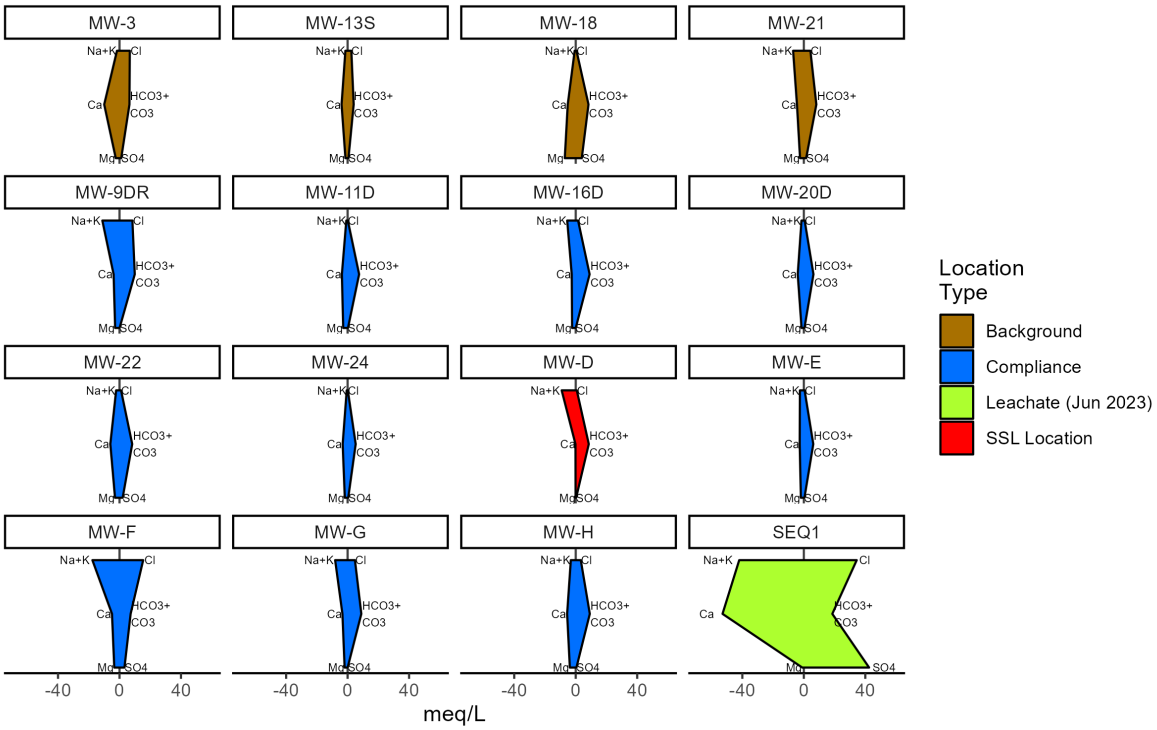


Figure E. Stiff Diagram Showing Ionic Composition of Samples of Landfill Background (Brown), Compliance Groundwater (Blue), the location with the SSL exceedance (Red), and Landfill Leachate (Green).

The ionic compositions of the groundwater and Landfill leachate represented by **Figure E** are discussed in more detail below.

- The ionic composition of the groundwater in compliance monitoring wells (blue polygons) and the location with the SSL exceedance (red polygon) is similar to that in background monitoring wells MW-3 and MW-21 (brown polygons), with one exception (MW-F), as represented by the similarity of the Stiff diagram sizes and shapes.
  - The dominant cations in compliance monitoring wells MW-16D, MW-9DR, MW-D (the location with the SSL exceedance), MW-F, and MW-G and background monitoring wells MW-13S MW-21 are sodium and potassium (Na+K).
  - The dominant cations in compliance monitoring wells MW-11D, MW-20D, MW-22, MW-24, MW-E, and MW-H and background monitoring well MW-3 are calcium (Ca).
  - The dominant anions in compliance monitoring wells (except MW-F), the location with the SSL exceedance (MW-D), and background monitoring wells (MW-3, MW-13S, MW-18, and MW-21) are bicarbonate-carbonate (HCO_3+CO_3).
  - The dominant anion in compliance monitoring well MW-F is chloride (Cl).
- The dominant cation in the leachate sample (green polygon) is calcium and the dominant anion in the leachate sample is sulfate (SO_4).

The ionic composition of the Landfill leachate is different than the ionic composition of the groundwater. The difference between the Landfill leachate ionic composition and the ionic composition of groundwater at MW-D indicates that MW-D is not influenced by the Landfill.

4. CONCLUSIONS

Based on the following two lines of evidence, it has been demonstrated that the lithium SSL at MW-D is not due to the Landfill but is from a source other than the CCR Unit being monitored:

1. Strontium and boron isotopic ratios in groundwater near the Landfill are not consistent with literature and site-specific CCR impacted waters.
2. The landfill leachate has a different ionic composition than groundwater.

This information serves as the written ASD prepared in accordance with 40 C.F.R. § 257.95(g)(3)(ii) that the SSL observed during the A6 sampling event was not due to the ZPP Landfill. Therefore, a corrective measures assessment is not required, and the Landfill will remain in assessment monitoring.

5. REFERENCES

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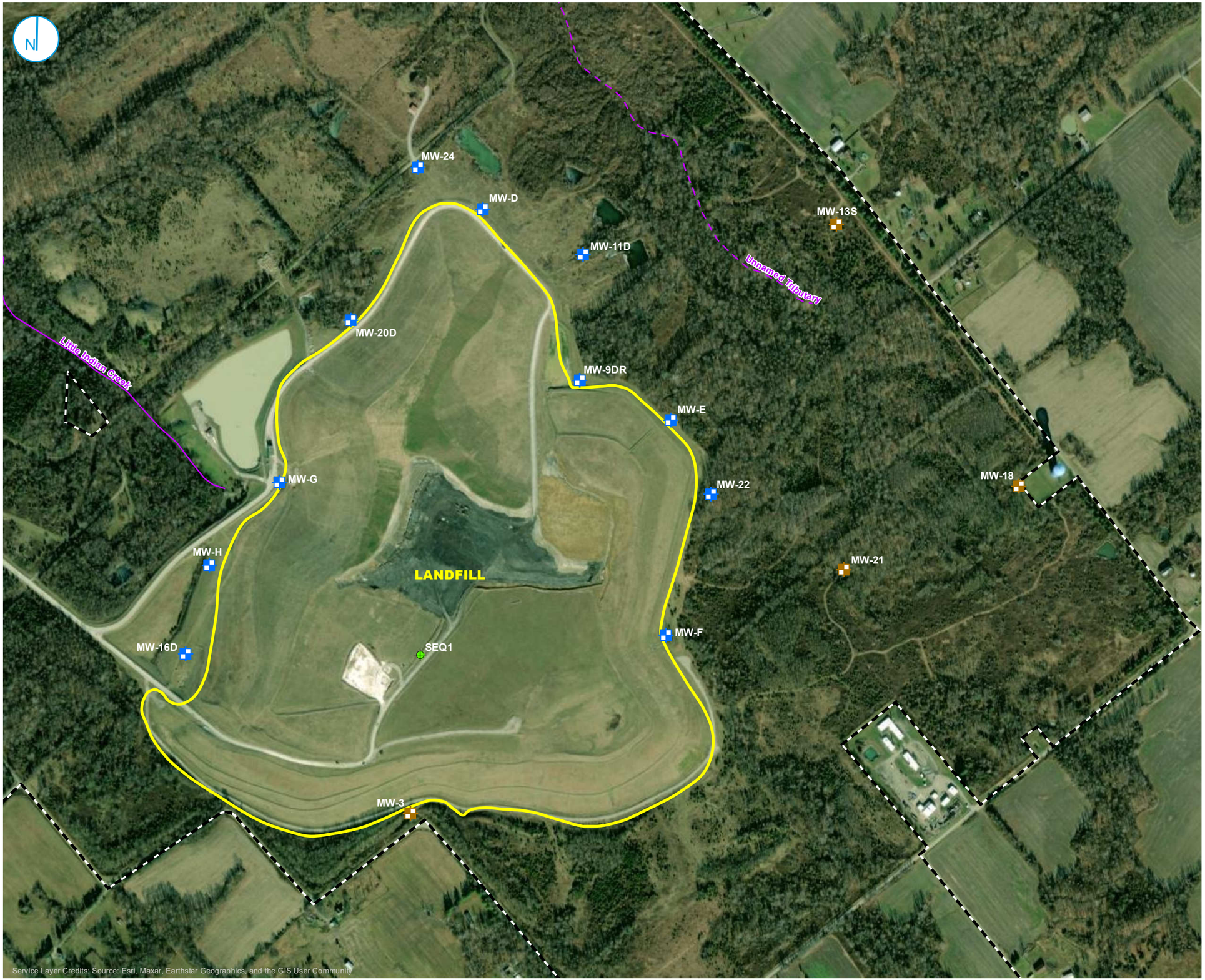
FIGURES



COMPLIANCE WELL
BACKGROUND WELL
LEACHATE WELL

NATIONAL HYDROGRAPHY DATASET
PERENNIAL STREAM
INTERMITTENT STREAM
40 C.F.R. § 257 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 300 600
Feet

MONITORING WELL LOCATION MAP

ALTERNATIVE SOURCE DEMONSTRATION
LANDFILL
ZIMMER POWER PLANT
MOSCOW, OHIO

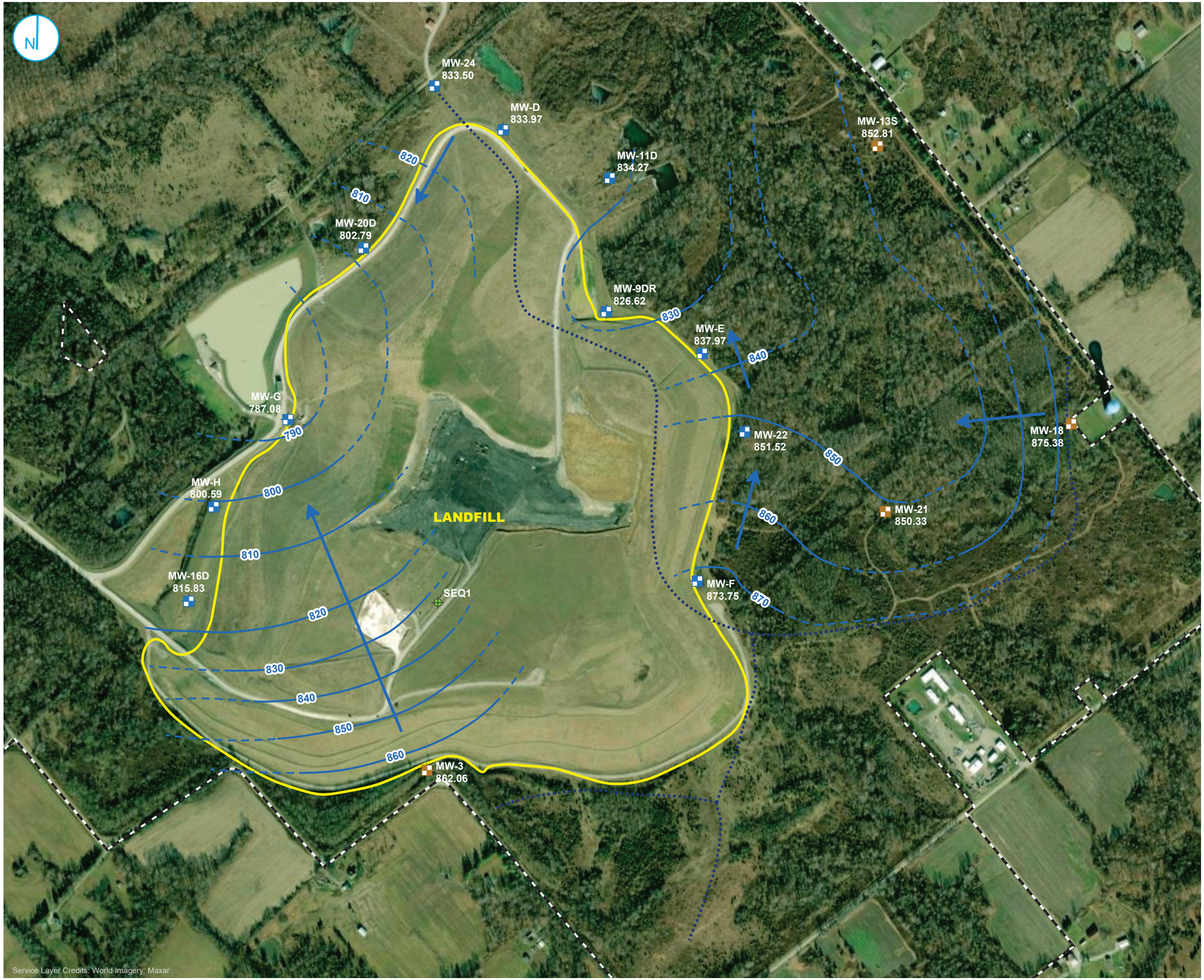
FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\Mapping\Projects\22\2285\MXD\Alt_Source_Dem\Zimmer\A6\Figure 1. Well Location Map.mxd

PROJECT: 169000XXXX | DATED: 10/5/2023 | DESIGNER: GALARNMC



COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
LEACHATE WELL
GROUNDWATER ELEVATION CONTOUR (10-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION
GROUNDWATER DIVIDE
REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

NOTES:
1. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

0 300 600
Feet

POTENTIOMETRIC SURFACE MAP MARCH 20, 2023

ALTERNATIVE SOURCE DEMOSTRATION
LANDFILL
ZIMMER POWER PLANT
MOSCOW, OHIO

FIGURE 2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\Mapping\Projects\22\12285\MXD\GW_Contours\Round_2023\Zimmer\LF_122\Zimmer_LF122_March2023.aprx

PROJECT: 169000XXXX | DATED: 10/12/2023 | DESIGNER: egreaves

APPENDIX A
ISOTOPE DATA

Rapport

L1908520

1H16PX0F1JD

Ankomstdatum **2019-03-25**
Utfärdad **2019-03-29**

OBG Part of Ramboll
Jeff Ramey
Natural Resource Technology
234 W. Florida St. Fifth Floor
Milwaukee, WI 53204
United States

Projekt **Saknas**

Analys: IR

Er beteckning	**Leachate Sequence 1**				
Provtagare	**Vistra (L);S&ME (GW)**				
Labnummer	U11581695				
Parameter	**Resultat**	**Enhet**	**Metod**	**Utf**	**Sign**
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-D**				
Provtagare	**Vistra (L);S&ME (GW)**				
Labnummer	U11581696				
Parameter	**Resultat**	**Enhet**	**Metod**	**Utf**	**Sign**
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-F**				
Provtagare	**Vistra (L);S&ME (GW)**				
Labnummer	U11581697				
Parameter	**Resultat**	**Enhet**	**Metod**	**Utf**	**Sign**
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-3**				
Provtagare	**Vistra (L);S&ME (GW)**				
Labnummer	U11581698				
Parameter	**Resultat**	**Enhet**	**Metod**	**Utf**	**Sign**
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-9D**				
Provtagare	**Vistra (L);S&ME (GW)**				
Labnummer	U11581699				
Parameter	**Resultat**	**Enhet**	**Metod**	**Utf**	**Sign**
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-10**
Provtagare	**Vistra (L);S&ME (GW)**
Labnummer	U11581700

Parameter	Resultat	Enhet	Metod	Utf	Sign
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-13S**
Provtagare	**Vistra (L);S&ME (GW)**
Labnummer	U11581701

Parameter	Resultat	Enhet	Metod	Utf	Sign
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-18**
Provtagare	**Vistra (L);S&ME (GW)**
Labnummer	U11581702

Parameter	Resultat	Enhet	Metod	Utf	Sign
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-21**
Provtagare	**Vistra (L);S&ME (GW)**
Labnummer	U11581703

Parameter	Resultat	Enhet	Metod	Utf	Sign
Report in Excel *	**yes**		1	I	IR

Er beteckning	**MW-23D**
Provtagare	**Vistra (L);S&ME (GW)**
Labnummer	U11581704

Parameter	Resultat	Enhet	Metod	Utf	Sign
Report in Excel *	**yes**		1	I	IR

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Webb: www.alsglobal.se
E-post: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

Dokumentet är godkänt och digitalt signerat av

Kristina Berglund
2019.03.29 13:05:07
ALS Scandinavia AB
Client Service
kristina.berglund@alsglobal.com

	Metod
1	Analys enligt see separate report in excel.

	Godkännare
IR	Ilia Rodioushkine

	Utf[1]
I	Man.Inm.

* efter parameternamn indikerar icke ackrediterad analys.

Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg skriftligen godkänt annat.
Resultaten gäller endast det identifierade, mottagna och provade materialet.
Beträffande laboratoriets ansvar i samband med uppdrag, se aktuell produktkatalog eller vår webbplats www.alsglobal.se

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[1] Utförande teknisk enhet (inom ALS Scandinavia) eller anlitat laboratorium (underleverantör).

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Webb: www.alsglobal.se
E-post: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

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Kristina Berglund
2019.03.29 13:05:07
ALS Scandinavia AB
Client Service
kristina.berglund@alsglobal.com

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	OBG Part of Ramboll
Date of receipt:	2020-05-11
Date of analysis:	2020-05-15
Order number (our):	L2011366
Your reference:	Heath Bush
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	δ11B, ‰	2SD, ‰	$^{87}Sr/^{86}Sr$	2SD
MW-3	U11736072	7.48	0.44	0.70985	0.00003
MW-13S	U11736073	11.26	0.64	0.70979	0.00003
MW-9D	U11736074	15.77	0.76	0.70962	0.00003
MW-11D	U11736075	2.08	1.04	0.70931	0.00003
MW-18	U11736076	-15.55	0.93	0.70925	0.00003
MW-21	U11736077	20.39	1.28	0.70998	0.00008
MW-21, r.2	U11736077	19.81	0.66	0.70997	0.00005
MW-22	U11736078	11.79	0.78	0.70969	0.00002
MW-24	U11736079	6.26	1.04	0.70960	0.00004
MW-D	U11736080	26.14	0.58	0.70993	0.00007
MW-E	U11736081	5.63	1.26	0.71010	0.00002
MW-F	U11736082	16.06	0.44	0.71003	0.00004
Seq. 1 Leachate	U11736083	-11.36	0.56	0.71093	0.00002
Seq. 1 Leachate, r.2	U11736083	-10.89	0.62	0.71094	0.00002

Comments

The analysis is carried out by MC-ICP-MS (NEPTUNE Plus, ThermoScientific) using external calibration with bracketing isotope SRMs

Boron delta values calculated to NIST SRM 951 RM

Analysis is carried out after ion exchange separation

SD calculated from two independent consequintive measurements

Signature Ilia Rodushkin

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

ANALYSIS REPORT

Issued by:	ALS Scandinavia Luleå, Aurorum 10, SE-977 75 LULEÅ, Sweden
Client:	S&ME, INC.
Date of receipt:	2023-07-21
Date of analysis:	2023-08-02
Order number(our):	LE2310514
Your reference:	Vince Epps
Our reference:	Cora Paulukat

		δ^7Li, ‰	2SD, ‰	δ11B, ‰	2SD, ‰	$^{87}Sr/^{86}Sr$	2 SD
Lab number(our)	**Sample name**						
LE2310514-1	**MW-03**	**10.09**	**0.65**	**5.51**	*0.58*	**0.70950**	0.00002
LE2310514-1	**MW-03, r.2**	**9.21**	**0.57**	**4.99**	*0.83*	**0.70948**	0.00004
LE2310514-2	**MW-9D**	**16.00**	**0.51**	**16.01**	*0.52*	**0.70969**	0.00002
LE2310514-3	**MW-21**	**18.22**	**0.54**	**14.13**	*0.63*	**0.70987**	0.00002
LE2310514-4	**MW-22**	**15.87**	**0.69**	**12.84**	*0.56*	**0.70964**	0.00004
LE2310514-5	**MW-24**	**10.16**	**0.74**	**5.88**	*0.53*	**0.70945**	0.00002
LE2310514-6	**MW-D**	**15.11**	**0.52**	**24.46**	*0.51*	**0.70990**	0.00004
LE2310514-6	**MW-D**	**15.92**	**0.67**	**24.37**	*0.53*	**0.70999**	0.00004
LE2310514-7	**MW-E**	**10.34**	**0.50**	**8.74**	*0.50*	**0.70982**	0.00002
LE2310514-8	**MW-F**	**16.54**	**0.52**	**22.40**	*0.56*	**0.70987**	0.00004
LE2310514-9	**SEQ-1**	**16.10**	**0.51**	**-7.91**	*0.60*	**0.71107**	0.00002
LE2310514-9	**SEQ-1**	**15.70**	**0.56**	**-8.12**	*0.54*	**0.71108**	0.00002

Comments

The analysis is carried out by MC-ICP-MS (NEPTUNE Plus) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Li delta value calculated against LSVEC NIST 8545 RM

Boron delta values calculated to NIST SRM 951 RM

SD calculated from two independent consequintive measurements

Signature

Cora Paulukat
Chemist
LABORATORY MANAGER
ALS Scandinavia AB