REPORT

2024 Annual Groundwater Monitoring & Corrective Action Report

RD Morrow Generating Station, Purvis, Lamar County, Mississippi, USA

Submitted to:

Cooperative Energy
7037 US Hwy 49, Hattiesburg, MS 39402

Submitted by:

WSP USA Inc.
46850 Magellan Drive, Suite 190,
Novi, Michigan, USA 48377
+1 248 295-0135

January 31, 2025

Executive Summary

This report presents the *2024 Annual Groundwater Monitoring & Corrective Action Report, R.D. Morrow, Sr. Generating Station, Purvis, Lamar County, Mississippi*. Groundwater monitoring and reporting for the Site is performed in accordance with the United States Environmental Protection Agency (US EPA) Coal Combustion Residual (CCR) Rule published in the Code of Federal Regulations Title 40 Part 257 (40 CFR Part 257, Subpart D) dated April 17, 2015, 40 CFR § 257.50 through § 257.107. As required in 40 CFR § 257.90(e), this Annual Report describes the status of the groundwater monitoring program, summarizes key actions completed, describes any problems encountered, discusses actions to resolve the problems, and presents key activities for the upcoming year.

The CCR Landfill located at the *R.D. Morrow, Sr. Generating Station* (Site or RD Morrow) is the only unit regulated by the CCR Rule at the Site. The CCR Landfill Unit is subject to Assessment Monitoring requirements in accordance with § 257.95. On May 16, 2018, Cooperative Energy filed a Notice of Establishment of Assessment Monitoring Program. The Site began and ended the 2024 annual reporting period in assessment monitoring.

2024 Groundwater Monitoring Activities for the CCR Landfill Unit

- A Corrective Action Groundwater Monitoring Program was completed on August 16, 2023, in accordance with § 257.98. In 2024, Cooperative Energy continued with the selected remedy of Monitored Natural Attenuation (MNA) for corrective action at the CCR Landfill.
- Cooperative Energy conducted semi-annual groundwater monitoring events for the CCR Landfill Unit in April and September 2024. Groundwater samples were collected and analyzed for both Appendix III and Appendix IV constituents from the Landfill unit CCR monitoring well network.
- Pursuant to 40 CFR § 257.90 (e)(6)(iii)-(iv), the following table presents the Appendix III and IV constituents with Statistically Significant Increases (SSIs) or Statistically Significant Levels (SSLs), respectively, for the CCR Landfill Unit.

Statistically Significant Increases (SSIs)		
Appendix III Constituent	**April 2024**	**September 2024**
Boron	MW-03, MW-04, MW-05	MW-03, MW-04, MW-05
Calcium	MW-03, MW-04, MW-05	MW-03, MW-04, MW-05
Chloride	MW-05	MW-05
pH	MW-03, MW-05	MW-03, MW-05
Sulfate	MW-03, MW-04, MW-05	MW-03, MW-04, MW-05
TDS	MW-03, MW-04, MW-05	MW-03, MW-04, MW-05
Statistically Significant Levels (SSLs)		
Appendix IV Constituent	**April 2024**	**September 2024**
Lithium	MW-05	MW-05
Molybdenum	MW-05	MW-05

- At the end of 2024, Cooperative Energy remains in assessment monitoring. Remedial activities were conducted and are ongoing through 2024 and will continue in 2025.

Based on review of the Appendix III and Appendix IV statistical results completed for the groundwater monitoring and corrective action program during the 2024 reporting period, the CCR Landfill Unit will remain in assessment monitoring.

Table of Contents

FIGURES

TABLES

APPENDICES

Certification

This *2024 Annual Groundwater Monitoring & Corrective Action Report, R.D. Morrow, Sr. Generating Station*, *Purvis, Lamar County, Mississippi, USA* has been prepared to comply with the United States Environmental Protection Agency (EPA) Coal Combustion Residuals (CCR) rule (40 CFR Part 257 Subpart D, published in 80 Fed. Reg. 21302 (April 17, 2015) under the direction of a licensed professional engineer, with WSP USA Inc.

WSP USA Inc.

Brian Yelen
Senior Geologist

Dawn L. Prell, CPG
Technical Principal, Hydrogeologist

I hereby certify that this *2024 Annual Groundwater Monitoring & Corrective Action Report, R.D. Morrow, Sr. Generating Station* located at 304 Old Okahola School Road, Purvis, Lamar County, MS 39475 has been prepared to meet the requirements of 40 CFR § 257.90(e).

Daniel Smith, PE
Senior Associate, Engineer-Civil
Mississippi PE No, 32180

1.0 INTRODUCTION

This *2024 Annual Groundwater Monitoring and Corrective Action Report* (Annual Report) has been prepared by WSP USA Inc. (WSP) for the RD Morrow Generating Station (RD Morrow or Site) operated by Cooperative Energy.

1.1 Purpose

The United States Environmental Protection Agency (US EPA) Coal Combustion Residual (CCR) Rule was published in the Code of Federal Regulations Title 40 Part 257 (40 CFR Part 257, Subpart D) on April 17, 2015. The Rule identifies an effective date of October 19, 2015. The CCR Rule regulates CCRs as non-hazardous waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA) and applies to new and existing landfills and surface impoundments.

As required in 40 CFR § 257.90(e), this Annual Report describes the status of the groundwater monitoring program and corrective action program for the CCR unit, summarizes key actions completed, describes any problems encountered, discusses actions to resolve the problems, and presents project key activities for the upcoming year. Groundwater monitoring and reporting for RD Morrow are performed in accordance with the requirements of 40 CFR § 257.90 through § 257.98. This report documents the activities completed during the 2024 calendar year.

1.2 Site Description and Background

RD Morrow is located in the community of Okahola, a rural area of Lamar County, approximately 4.5 miles north of the City of Purvis and 8 miles southwest of Hattiesburg. Old Okahola School Road bisects the property into a northern and southern parcel. The location of the Site and surrounding area are shown on Figure 1, Site Location Map.

The CCR Landfill Unit is the only CCR unit on-site currently subject to the CCR Rule. Previously, a surface impoundment unit was subject to the CCR Rule and remained in detection monitoring until completion of closure by removal. The associated wells were decommissioned and abandoned in 2022. Figure 2 identifies the CCR Landfill Unit within the south parcel at RD Morrow.

1.3 CCR Landfill Unit Groundwater Monitoring Well Network

The groundwater monitoring network for the CCR Landfill Unit consists of five (5) detection monitoring wells and one (1) assessment monitoring well. Site monitoring wells are depicted on Figure 2. The site has completed an assessment of corrective measures and is currently performing corrective action monitoring in addition to assessment monitoring. Monitoring wells MW-04, MW-05, MW-06 and MW-10 also serve as corrective action monitoring locations following the *Corrective Action Groundwater Monitoring Program* (WSP 2023b). CCR monitoring wells are included in the monitoring network screened within the reworked Citronelle sequence underlying the CCR Landfill Unit. In accordance with 40 CFR § 257.91, the CCR Landfill Unit groundwater monitoring network contains monitoring wells, installed at the waste boundary, and represents the quality of groundwater in the uppermost aquifer. The network for the events covered by this Annual Report include:

Detection Monitoring Well Network	Assessment Monitoring Well Network	Corrective Action Groundwater Monitoring Well Network
MW-02 (upgradient)	MW-10	MW-04
MW-03 (downgradient)	--	MW-05
MW-04 (downgradient)	--	MW-06
MW-05 (downgradient)	--	MW-10
MW-06 (downgradient)	--	--

There were no changes to the landfill certified detection groundwater monitoring network or the assessment monitoring network during the 2024 calendar year.

Additional monitoring well-related activities to ensure continued compliance with 40 CFR § 257.91(e) included a visual inspection of well conditions for the CCR Landfill Unit monitoring well network prior to sampling, recording the site conditions, and any site maintenance to provide safe access for sampling. The network wells were found to be of sound integrity and in proper working order during each of the sampling events and did not require any repairs.

2.0 CCR LANDFILL UNIT GROUNDWATER MONITORING ACTIVITIES

In accordance with 40 CFR § 257.90(e), the following describes monitoring-related activities performed during the 2023 calendar year. Groundwater sampling was performed in accordance with 40 CFR § 257.93, as follows:

2.1 CCR Landfill Unit Assessment Monitoring

Cooperative Energy posted a Notice of Establishment of Assessment Monitoring Program for RD Morrow CCR Landfill Unit, dated May 16, 2018. Groundwater samples were collected for both Appendix III and Appendix IV constituents from each of the detection and assessment monitoring wells in 2024. The 2024 semi-annual monitoring events were conducted in April and September 2024.

2.2 Groundwater Sampling and Laboratory Analysis

The following sections describe methods used to conduct groundwater monitoring at the CCR Landfill Unit.

2.2.1 Groundwater Level Measurements

Prior to sampling, Environmental Management Services, Inc. recorded groundwater elevations from each detection and assessment monitoring well on April 2, 2024 and September 16, 2024. These data are summarized in Table 1. The April and September 2024 elevation data were used to develop potentiometric surface elevation contour maps to confirm the groundwater flow direction and to confirm that the groundwater monitoring well network for the CCR Landfill Unit remains sufficient to monitor groundwater downgradient of the unit. The direction of groundwater flow has not changed, which has been consistent since the inception of the CCR monitoring program at RD Morrow. Groundwater flows south, based on 2024 groundwater elevation contour maps, included as Figure 3, First Semi-Annual 2024 Potentiometric Surface Elevation Contour Map (April 2, 2024)

and Figure 4, Second Semi-Annual 2024 Potentiometric Surface Elevation Contour Map (September 16, 2024). No changes to the monitoring well network are necessary based on groundwater elevation data.

2.2.2 Groundwater Gradient and Flow Velocity

Groundwater flow rates at the Site were calculated based on hydraulic gradients, hydraulic conductivity from previous slug test results, and an estimated effective porosity of the screened horizon. Based on slug test data at the Site (EMS, 2020 and EMS, 2022), an average hydraulic conductivity value of 4.8 is used in the flow calculations. The hydraulic gradients were calculated between well pairs as shown below. Based on historical groundwater investigation (EMS, 2022), the effective porosity of 0.30 was used in the calculation.

Horizontal flow velocity was calculated using the commonly used derivative of Darcy's Law:

$$V = \frac{K * i}{n_e}$$

Where:

V = Groundwater flow velocity $\left(\frac{feet}{day}\right)$

K = Average Hydraulic Conductivity of the aquifer $\left(\frac{feet}{day}\right)$

i = Horizontal hydraulic gradient $\left(\frac{feet}{feet}\right)$

n_e = Effective porosity

Using this equation and groundwater elevations collected during both April 2024 and September 2024 sampling events, horizontal groundwater velocities are calculated for various areas of the Site and shown below.

Table 2.2.2 Groundwater Flow Velocity

Well Pairs	Date	Δ H (feet) [1]	Δ L (feet) [2]	Hydraulic Gradient [3] (Δ H/Δ L)	Average Hydraulic Conductivity[4], K (feet per day)	Assumed Effective Porosity[5] (n_e)	Average Linear Groundwater Velocity [6]	
							(feet per day)	(feet per year)
MW-2 / MW-5	4/2/2024	4.54	884	0.0051	4.8	0.30	0.08	30.0
	9/16/2024	2.68		0.0030			0.049	17.7
MW-5 / MW-10	4/2/2024	12.14	1090	0.0111	4.8		0.18	65.0
	9/16/2024	11.71		0.0107			0.17	62.7

Notes:
1. Δ H = Change in groundwater elevation.
2. Δ L = Distance along flow path.
3. I = Δ H / Δ L. Hydraulic gradient determined from groundwater well pairs along with potentiometric surface elevation contour maps.
4. K value is based on the *38th Landfill Groundwater Monitoring Event Report* by Environmental Management Services, Inc., dated August 23, 2022 and aquifer performance tests presented in the CCR Landfill Assessment Monitoring Well Installation Certification Report by Environmental Management Services, Inc., dated March 5, 2020.
5. Effective porosity based on the *38th Landfill Groundwater Monitoring Event Report* by Environmental Management Services, Inc., dated August 23, 2022.
6. Velocity = $(I * K)/n_e$

As presented above, groundwater flow velocity at the Site ranges from approximately 0.049 to 0.18 ft/day (approximately 18 to 65 ft/year) in 2024. These calculated groundwater velocities at the Site are generally consistent with historical calculations, therefore, confirming the groundwater monitoring network is properly located to monitor the uppermost aquifer for the CCR Landfill Unit.

2.2.3 Groundwater Sampling

Groundwater samples were collected from detection and assessment monitoring wells in April and September 2024. Monitoring wells were purged and sampled using low-flow sampling procedures. Sample stabilization criteria is identified on field sampling forms. Following well stabilization, unfiltered samples were collected directly into appropriately preserved laboratory supplied sample containers, placed in iced coolers, and submitted to the laboratory following standard chain-of-custody protocol. Field data forms and chain-of-custody records are provided in Appendix A.

Groundwater samples were collected in accordance with 40 CFR § 257.93(a). Field sampling procedures included sample collection, field quality assurance/quality control (QA/QC), chain-of-custody controls, and field documentation. The groundwater samples for the CCR Landfill Unit for 2024 sampling events were analyzed for Appendix III and Appendix IV constituents, and results are summarized in Table 2 - Analytical Data Summary – CCR Landfill (April 2024), and Table 3 -Analytical Data Summary – CCR Landfill (September 2024). Analytical methods used for groundwater monitoring parameters are provided in laboratory reports. Laboratory analyses were performed by Micro Methods Laboratory, Inc. and Pace Analytical Services, LLC and are included in Appendix A.

3.0 COMPARATIVE STATISTICAL ANALYSES

Pursuant to 40 CFR § 257.93(f), the statistical methodology selected for RD Morrow meets the criteria referenced in the CCR Rule and the 2009 EPA Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities Unified Guidance (EPA, 2009) and is consistent with the *Statistical Analysis Plan* (EMS, 2017).

Statistical analyses of Appendix III constituents were completed for the CCR Landfill Unit. In the sections below, Cooperative Energy provides a summary of the comparative statistical analyses completed in 2024, which includes the analyses for both semi-annual monitoring events for the CCR Landfill Unit.

3.1 Groundwater Protection Standards (GWPS)

Interwell tolerance limits were used to calculate background limits from pooled upgradient well data for Appendix IV parameters with a target of 95% confidence and 95% coverage in accordance with the *Statistical Analysis Plan* (EMS, 2017). Results of the statistical analyses for both the April 2024 and September 2024 monitoring events are included in Appendix B.

A GWPS has been established for statistical comparison of each Appendix IV constituent for the CCR Landfill Unit. The Summary of Background Levels and GWPS table presented below, summarizes the site-specific background concentration for each monitoring event and the GWPS established under Federal rules. Where the background concentration is higher than the federal MCL, the background concentration is utilized as the GWPS for that constituent.

If the comparison of the constituent's lower confidence interval is greater than the GWPS, a statistically significant level (SSL) is identified for that well.

Table 3.1 Summary of Background Levels and GWPS

Analyte[1]	Units	Site Specific Background		Federal MCL	GWPS	
		April 2024	September 2024		April 2024	September 2024
Barium	mg/L	0.0325	0.0325	2	2	2
Beryllium	mg/L	0.009758	0.009772	0.004	0.009758	0.009772
Cobalt	mg/L	0.187	0.1716	0.006	0.187	0.1716
Fluoride	mg/L	1.094	1.068	4	4	4
Lead	mg/L	0.009856	0.009754	0.015	0.015	0.015
Lithium[2]	mg/L	1.42	1.42	0.04	1.42	1.42
Molybdenum	mg/L	0.0025	0.005	0.1	0.1	0.1
Radium (226 + 228)	pCi/L	2.037	2.043	5	5	5

Notes:
mg/L - milligrams per liter
pCi/L - picocuries per liter
[1] Analytes not detected in 2024 are not presented in Table 3.1.
[2] The lithium GWPS was calculated using data from MW-02, MW-03 and MW-04 through 2020 when the ASD was documented because naturally-occurring lithium is present in soils and bedrock at the Site. Therefore, it was necessary to adjust the lithium GWPS for the Site accordingly. *See* Golder, 2020, Alternate Source Demonstration RD Morrow Generating Station – Landfill CCR Unit, Purvis, Mississippi. Golder Prepared for Cooperative Energy, Inc. September 11, 2020; and Supplemental Alternate Source Demonstration Cooperative Energy RD Morrow CCR Landfill, prepared by WSP USA Inc., January 31, 2024.

3.2 CCR Landfill Unit Statistical Analyses

Analytical data from the April 2024 and September 2024 monitoring events for the CCR Landfill Unit monitoring network have been statistically analyzed in accordance with the Site's certified statistical analysis method. Review of the Sanitas™ results indicates that verified exceedances of the established prediction limits for various Appendix III constituents continue to be observed. Using the GWPS established according to 40 CFR § 257.95(h), SSLs were identified at MW-05 for lithium and molybdenum following the 2024 monitoring events.

4.0 ALTERNATE SOURCE DEMONSTRATION

Pursuant to 40 CFR § 257.94(e)(2), in 2020, WSP prepared an ASD to address the noted SSLs for lithium that have been identified at monitoring wells MW-03 and MW-04 (Golder, 2020; WSP, 2024). The original 2020 ASD and the Supplemental ASD dated January 31, 2024, included in the 2023 Annual Report, presents multiple lines of evidence that conclude that the source of the elevated concentrations of lithium historically present at MW-03 and MW-04 are not the result of a release from the CCR Landfill Unit but can be attributed to naturally-occurring lithium in subsurface aquifer materials. The Supplemental ASD, which summarized the additional soil lithium data collected in late 2022 and analyzed in 2023, was revised and finalized during the beginning of the 2024 reporting period and is therefore included in this 2024 Annual Report as Appendix C

5.0 ASSESSMENT OF CORRECTIVE MEASURES

Following the requirements of 40 CFR § 257.96, RD Morrow initiated an Assessment of Corrective Measures (ACM). Notification of this action was placed in the operating record on September 12, 2019 (Golder, 2019) and a public meeting was held on September 27, 2022.

6.0 REMEDY SELECTION

Pursuant to 40 CFR § 257.97(a), Cooperative Energy completed and posted a final *Remedy Selection Report* (WSP 2023b). Cooperative Energy selected monitored natural attenuation (MNA) as its remedy. Cooperative Energy continued to implement the *Corrective Action Groundwater Monitoring Program* (CAMP; WSP, 2023c) during the 2024 reporting period.

6.1 Corrective Action Program

The CAMP provides for sampling and analysis of the corrective action monitoring wells (MW-04, MW-05, MW-06, and MW-10). The CAMP provides for evaluation of the following:

1) Demonstrate natural attenuation is occurring.

2) Detect changes in environmental conditions.

3) Identify any potentially toxic and/or mobile transformation products.

4) Verify that the plume is not expanding downgradient, laterally, or vertically.

5) Verify no unacceptable impacts to downgradient receptors.

6) Detect new releases of contaminants to the environment.

7) Demonstrate the efficacy of institutional controls.

8) Verify attainment of remedial objectives.

April 2024 and September 2024 monitoring events were subject to corrective action program evaluation. The following summarizes findings based on review of the results.

Based on review of time series plots and trend plots for molybdenum and lithium at MW-05, it can be ascertained that natural attenuation is occurring. A significant and continued downward trend is observed following the April and September 2024 events for both lithium (April 2024 -0.9857 and September 2024 -0.927) and molybdenum (April 2024 -0.8017 and September 2024 -0.7925; See Appendix B). Additionally, the geochemical model of molybdenum MNA documented in the Remedy Selection Report (WSP 2023) compared to the current concentrations shows that current molybdenum and lithium concentrations are decreasing and consistent with the model projections. Based on the modeled data, molybdenum and lithium concentrations at MW-05 are slightly ahead of the modeled time projections to reach the GWPS of 0.1 mg/L.

There have been no new detections of Appendix IV constituents above the GWPS at the Site. Concentrations of lithium and molybdenum at corrective action wells remain below the groundwater protection standards, and therefore, there are no unacceptable impacts to downgradient receptors.

In general, review of the Appendix III site geochemistry indicates that boron continued to trend downwards at MW-05 during the 2024 monitoring period (-4.104 after the September 2024 event). Additionally, calcium, chloride, sulfate and TDS have also shown an overall decreasing trend at MW-05. Sulfate concentrations are similar to that of MW-03 and MW-04 during the 2024 reporting period while TDS has remained elevated primarily because of the elevated alkalinity remaining at MW-05.

The pH at MW-05 remains elevated compared to the rest of the Site monitoring wells (~6.5 vs ~4.5) which explains the elevated molybdenum concentrations above the GWPS. Molybdenum attenuates better at lower pH because it forms an anionic species. Due to the presence of elevated alkalinity, which acts as a buffer, the localized pH at MW-05 has not yet decreased to the site background which slows molybdenum attenuation.

Based on the data evaluated to date and the geochemical model, the objectives of the MNA corrective action at the site are being met.

7.0 PROGRAM TRANSITION

Cooperative Energy initiated the Corrective Action Monitoring Program for the CCR Landfill Unit in 2023. The groundwater monitoring program remained in assessment monitoring with ongoing Corrective Action Monitoring during the 2024 reporting period.

8.0 PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE IN 2024

There were no specific problems encountered with the CCR Landfill Unit monitoring well system in 2024.

9.0 CONCLUSIONS & FUTURE ACTIONS

This *2024 Annual Groundwater Monitoring and Corrective Action Report* has been prepared in accordance with 40 CFR § 257.90(e) and describes the status of the groundwater monitoring program during the 2024 calendar year and key actions for the upcoming calendar year 2025.

Project Key Activities for 2025

The proposed activities for the 2025 calendar year include semi-annual assessment and corrective action monitoring, as required by 40 CFR § 257.94, 40 CFR § 257.95 and 40 CFR § 257.98. Cooperative Energy will continue implementation of the Corrective Action Groundwater Monitoring Program to assure continued performance of the selected remedy.

10.0 REFERENCES

Aylmore, M.G., Merigot, K., Quadir, Z., Rickard, W.D., Evans, N.J., McDonald, B.J., Catovic, E. and Spitalny, P., 2018. Applications of advanced analytical and mass spectrometry techniques to the characterisation of micaceous lithium-bearing ores. Minerals Engineering, 116, pp.182-195.

EMS, 2020. CCR Landfill Assessment Monitoring Well Installation Certification Report, RD Morrow Generating Plant, Lamar County, Mississippi. Environmental Management Services, Inc. Prepared for Cooperative Energy. March 5, 2020

EMS, 2022. 38th Landfill Groundwater Monitoring Event Report by Environmental Management Services, Inc, RD Morrow Generating Plant, Lamar County, Mississippi. Environmental Management Services, Inc. Prepared for Cooperative Energy. August 23, 2022.

EMS, 2017. Statistical Analysis Plan, RD Morrow Generating Station, Lamar County, Mississippi. Environmental Management Services, Inc. Prepared for Cooperative Energy, Inc. December 21, 2017.

Golder, 2019, Assessment of Corrective Measures RD Morrow Generating Station – Landfill CCR Unit, Hattiesburg, Mississippi. Golder Prepared for Cooperative Energy, Inc. September 12, 2019.

Golder, 2020, Alternate Source Demonstration RD Morrow Generating Station – Landfill CCR Unit, Purvis, Mississippi. Golder Prepared for Cooperative Energy, Inc. September 11, 2020.

Grammatikopoulos, T. and Downing, S., 2020. The disruptive role of process mineralogy in geology and mineral processing industry. Asp. Min. Miner. Sci, 5, pp.571-579.

Layton-Matthews, D. and McClenaghan, M.B., 2021. Current Techniques and Applications of Mineral Chemistry to Mineral Exploration; Examples from Glaciated Terrain: A Review. Minerals, 12(1), p.59.

USEPA, 2015, Federal Register. volume 80. No. 74. Friday April 17, 2015. Part II. Environmental Protection Agency. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. [EPA HQ RCRA–2009–0640; FRL–9919–44–OSWER]. RIN–2050–AE81

Vermeesch, P., Rittner, M., Petrou, E., Omma, J., Mattinson, C. and Garzanti, E., 2017. High throughput petrochronology and sedimentary provenance analysis by automated phase mapping and LAICPMS. Geochemistry, Geophysics, Geosystems, 18(11), pp.4096-4109.

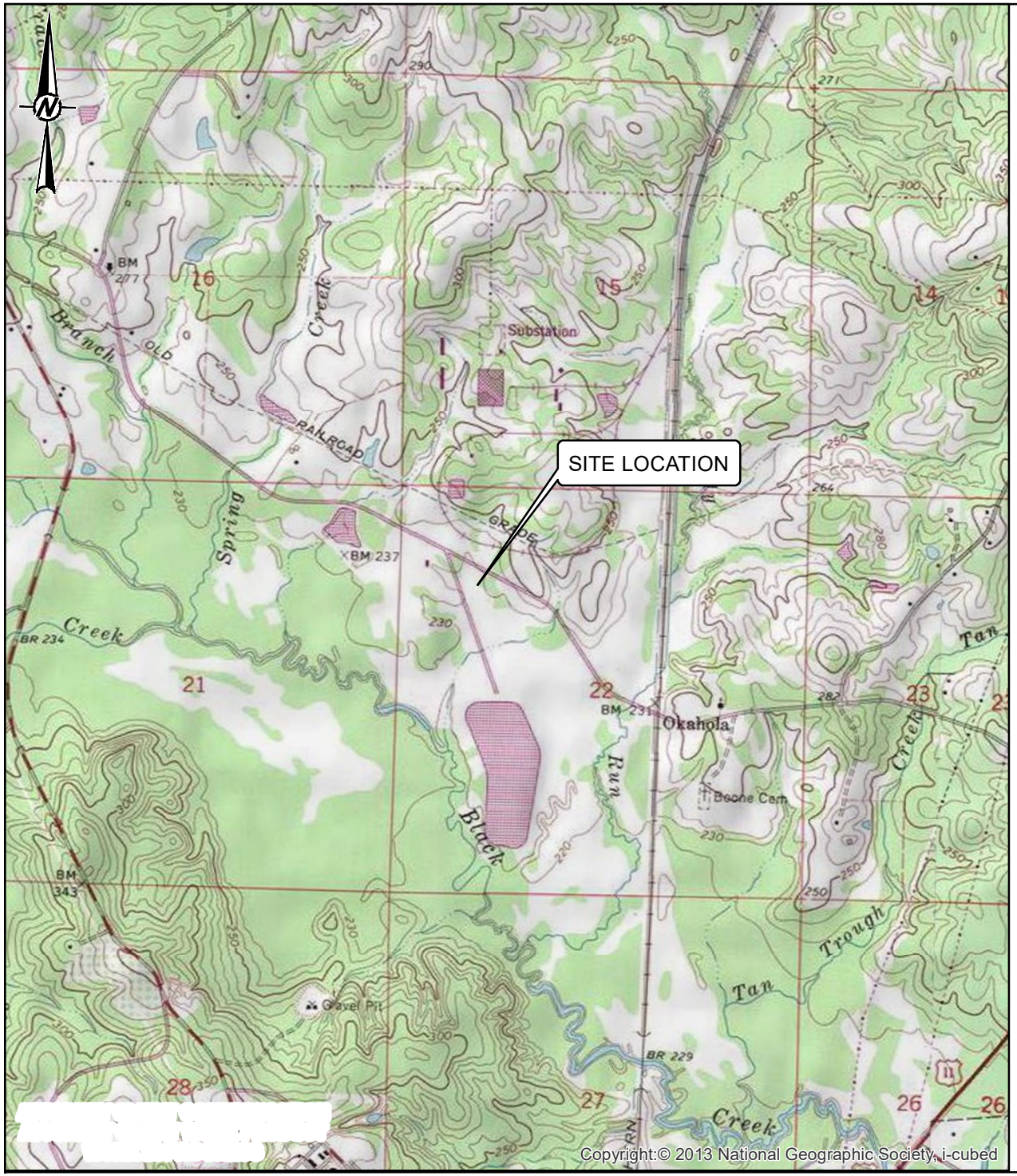
WSP 2023a. Remedy Selection Report- Cooperative Energy, R.D. Morrow Sr. Generating Station – CCR Landfill Unit, prepared by WSP USA, Inc., dated May 18, 2023.

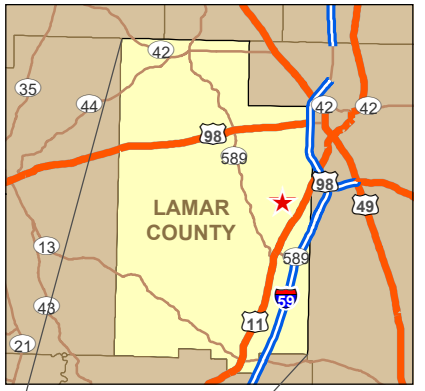
WSP 2023b. Corrective Action Groundwater Monitoring Program – Cooperative Energy, R.D. Morrow Sr. Generating Station – CCR Landfill Unit, prepared by WSP USA, Inc., dated August 16, 2023.

WSP 2024, Revision 1. Supplemental Alternate Source Demonstration – Cooperative Energy R.D. Morrow CCR Landfill, prepared by WSP USA, Inc., dated January 31, 2024.

Figures

Path: H:\21x-Projects\GL21453914-Cooperative Energy LLC\figures\A-RSR\GL21453914A000-GIS.mxd





CLIENT
COOPERATIVE ENERGY

PROJECT
RD MORROW GENERATING STATION
PURVIS, MISSISSIPPI

TITLE
SITE LOCATION MAP

CONSULTANT
wsp

YYYY-MM-DD	2024-10-23
PREPARED	CAG
DESIGN	DLK
REVIEW	BMY
APPROVED	DLP

PROJECT No.	CONTROL	Rev.	FIGURE
GL21453914	GL21453914A000-GIS.mxd	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

LEGEND

- MW-XX — LANDFILL UNIT MONITORING WELL LOCATION
- X — FENCE
- CCR LANDFILL BOUNDARY

REFERENCE

BASE MAP TAKEN FROM ENVIRONMENTAL MANAGEMENT SERVICES, INC., MONITORING WELL LOCATIONS, DATED 2017-02-17 DELIVERED IN .DWG FORMAT.

CLIENT
COOPERATIVE ENERGY

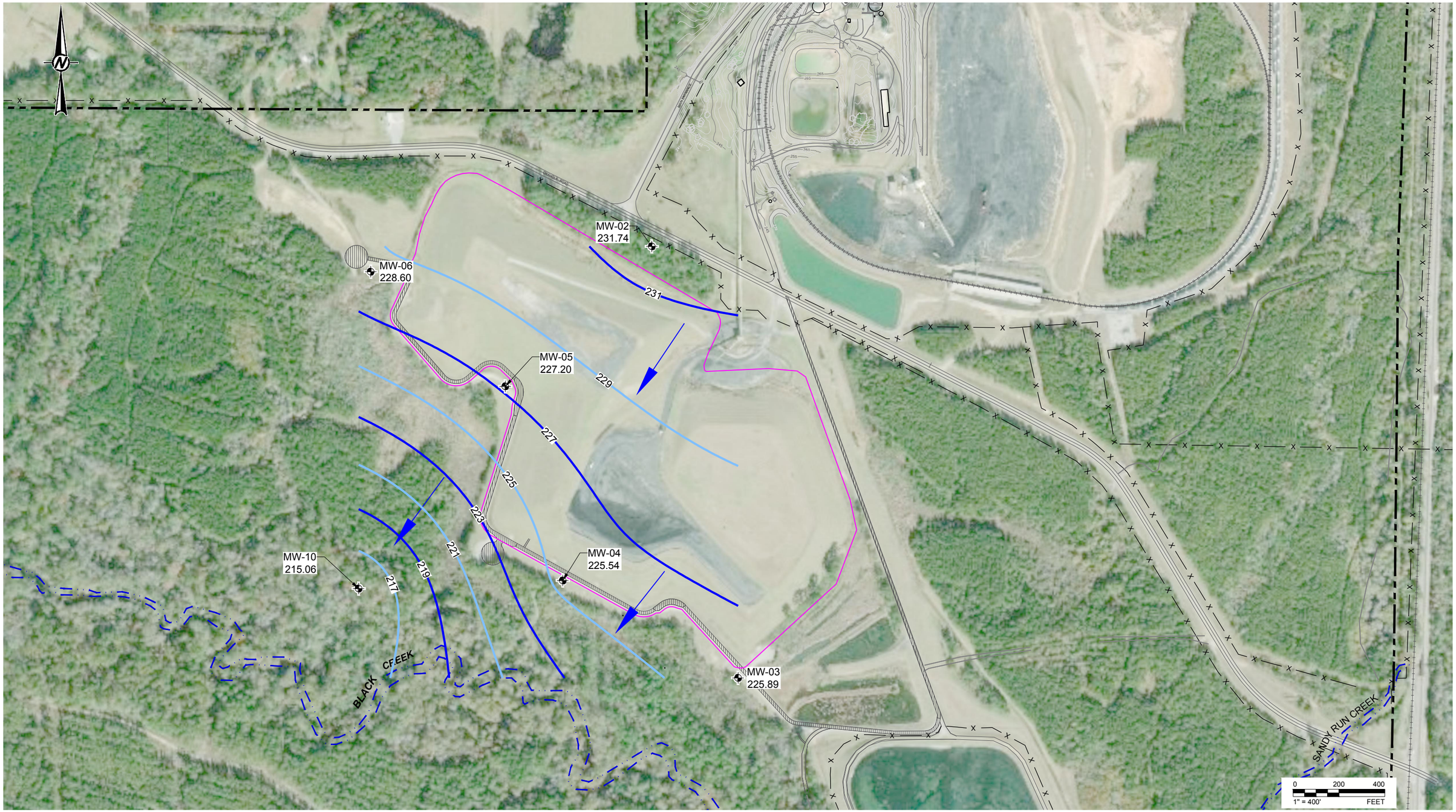
CONSULTANT
wsp

YYYY-MM-DD	2024-10-23
DESIGNED	DLK
PREPARED	CAG
REVIEWED	BMY
APPROVED	DLP

PROJECT
RD MORROW GENERATING STATION
PURVIS, MISSISSIPPI

TITLE
WELL LOCATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
GL21453914.002	GL21453914E011.dwg	0	2



LEGEND

- PROPERTY BOUNDARY
- MW-XX — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
- 220 — GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION

REFERENCE

BASE MAP TAKEN FROM ENVIRONMENTAL MANAGEMENT SERVICES, INC., MONITORING WELL LOCATIONS, DATED 2017-02-17 DELIVERED IN .DWG FORMAT.

CLIENT
COOPERATIVE ENERGY

CONSULTANT
wsp

YYYY-MM-DD	2024-10-23
DESIGNED	DLP
PREPARED	CAG
REVIEWED	BMY
APPROVED	DLP

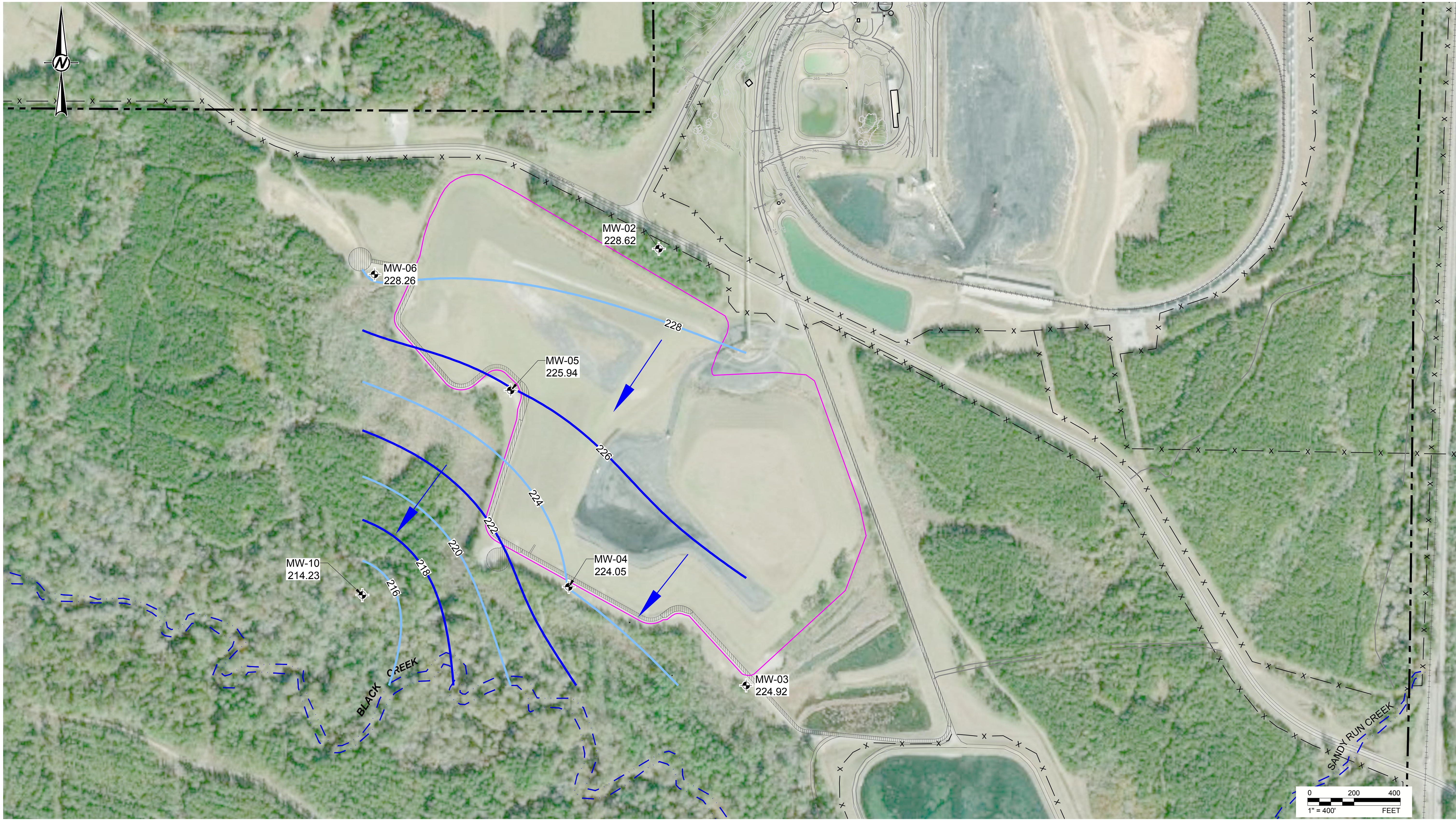
PROJECT
RD MORROW GENERATING STATION
PURVIS, MISSISSIPPI

TITLE
FIRST SEMIANNUAL 2024 POTENTIOMETRIC SURFACE ELEVATION CONTOUR MAP
APRIL 2, 2024

PROJECT NO.	CONTROL	REV.	FIGURE
GL21453914.002	GL21453914H012.dwg	0	3

Path: \\corp.pbwan.net\US\Central\Data\USDET100\CAD\Projects\21x\Projects\21453914-Coop Energy\PRODUCT\2024 GW MONITORING\ | File Name: GL21453914H012.dwg | Last Edited By: usegr729933 Date: 2024-10-23 Time:8:20:22 AM | Printed By: USCG729933 Date: 2024-10-23 Time:9:13:56 AM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



LEGEND

PROPERTY BOUNDARY

MW-XX MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION

220 GROUNDWATER ELEVATION CONTOUR

GROUNDWATER FLOW DIRECTION

REFERENCE

BASE MAP TAKEN FROM ENVIRONMENTAL MANAGEMENT SERVICES, INC., MONITORING WELL LOCATIONS, DATED 2017-02-17 DELIVERED IN .DWG FORMAT.

CLIENT
COOPERATIVE ENERGY

PROJECT
RD MORROW GENERATING STATION
PURVIS, MISSISSIPPI

CONSULTANT

YYYY-MM-DD	2024-10-23
DESIGNED	DLP
PREPARED	CAG
REVIEWED	BMY
APPROVED	DLP

TITLE
SECOND SEMIANNUAL 2024 POTENTIOMETRIC SURFACE ELEVATION CONTOUR MAP
SEPTEMBER 16, 2024

PROJECT NO.	CONTROL	REV.	FIGURE
GL21453914.002	GL21453914H013.dwg	0	4

Tables

TABLE 1.
GROUNDWATER ELEVATION SUMMARY - April & September 2024
RD Morrow Generating Station - CCR Landfill Unit
Purvis, Mississippi

Monitoring Well ID	**DETECTION MONITORING WELLS**										**ASSESSMENT MONITORING WELL**	
	MW-02		MW-03		MW-04		MW-05		MW-06		MW-10	
Date Installed	2/6/2005		2/6/2005		2/1/2005		2/6/2005		2/6/2005		8/6/2019	
Top of Casing Elevation (feet AMSL)	241.83		231.50		234.32		233.85		232.44		226.42	
Geologic Unit of Screened Interval	Gravel and Sand		Silty Sand and Gravel		Sand with Gravel		Sand with Gravel		Sand with Gravel		Sand with Gravel and Clay	
Screened Interval Elevation (feet AMSL)	220.44 to 225.44		216.27 to 221.27		211.51 to 216.51		211.55 to 216.55		212.37 to 217.37		203.63 to 208.63	
Measurement Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet)	Depth to Water (feet BTOC)	Groundwater Elevation (feet)	Depth to Water (feet BTOC)	Groundwater Elevation (feet)	Depth to Water (feet BTOC)	Groundwater Elevation (feet)	Depth to Water (feet BTOC)	Groundwater Elevation (feet)	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
4/2/2024	10.09	231.74	5.61	225.89	8.78	225.54	6.65	227.20	3.84	228.60	11.36	215.06
9/16/2024	13.21	228.62	6.58	224.92	10.27	224.05	7.91	225.94	4.18	228.26	12.19	214.23

NOTES:

Elevations are reported in feet relative to the North American Vertical datum of 1988.

feet AMSL = feet Above Mean Sea Level

feet BTOC = feet Below Top Of Casing

TABLE 2.
ANALYTICAL DATA SUMMARY - April 2024
RD Morrow Generating Station - CCR Landfill Unit
Purvis, Mississippi

Analyte	Units	DETECTION MONITORING WELLS					ASSESSMENT MONITORING WELL
		MW-02	MW-03	MW-04	MW-05	MW-06	MW-10
	Sample Date:	4/2/2024	4/3/2024	4/2/2024	4/2/2024	4/2/2024	4/2/2024
Appendix III							
BORON, TOTAL	mg/L	0.501	**5.81**	**8.89**	**18.8**	0.071	4.99
CALCIUM, TOTAL	mg/L	33.2	**447**	**459**	**525**	2.69	102
CHLORIDE, TOTAL	mg/L	54.1	114	154	**424**	8.94	233
FLUORIDE, TOTAL	mg/L	<0.5	<0.50	<0.50	<0.50	<0.50	0.61
pH	S.U.	4.79	**5.44**	4.99	**6.18**	4.84	3.69
SULFATE, TOTAL	mg/L	126	**1640**	**1790**	**2090**	10.6	576
TOTAL DISSOLVED SOLIDS	mg/L	278	**2668**	**2562**	**3848**	39	1136
Appendix IV							
ANTIMONY, TOTAL	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
ARSENIC, TOTAL	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.00224
BARIUM, TOTAL	mg/L	0.0325	0.0360	0.0311	0.0481	0.125	0.0260
BERYLLIUM, TOTAL	mg/L	<0.00400	<0.00400	<0.00400	<0.00400	<0.00400	0.0107
CADMIUM, TOTAL	mg/L	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
CHROMIUM, TOTAL	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
COBALT, TOTAL	mg/L	0.0417	0.0207	0.0320	0.0637	0.00244	0.135
FLUORIDE, TOTAL	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.61
LEAD, TOTAL	mg/L	0.00132	0.00606	0.00105	0.00131	<0.00100	0.00326
LITHIUM, TOTAL	mg/L	<0.040	0.348	0.273	**2.34**	<0.040	0.418
MERCURY, TOTAL	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
MOLYBDENUM, TOTAL	mg/L	<0.00500	<0.00500	<0.00500	**1.26**	<0.00500	<0.00500
RADIUM (226 + 228)	pCi/L	1.80	2.15	2.51	1.61	1.47	1.73
SELENIUM, TOTAL	mg/L	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
THALLIUM, TOTAL	mg/L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100

NOTES:

1. mg/L - Milligrams per Liter; pCi/L - picocuries per Liter
2. < - Constituent was analyzed for, but was not detected above the minium reporting limit (MRL) and is considered a non-detect. Value is displayed as less than the MRL.
3. Radium data is a combination of radium isotopes 226 and 228. When results are reported below the MDC (Minimum Detectable Concentration), data is displayed with an accompanying U. The MDC varies depending upon the sample amount and elapsed time of the measurement.
4. **Bolded** data indicates an exceedance of the PL for appendix III constituents or a statistically significant level based on 95% confidence interval above the Groundwater Protection Standard (GWPS) for appendix IV constituents.

TABLE 3.
ANALYTICAL DATA SUMMARY - September 2024
RD Morrow Generating Station - CCR Landfill Unit
Purvis, Mississippi

Analyte	Units	DETECTION MONITORING WELLS					ASSESSMENT MONITORING WELL
		MW-02	MW-03	MW-04	MW-05	MW-06	MW-10
	Sample Date:	9/16/2024	9/17/2024	9/17/2024	9/16/2024	9/16/2024	9/16/2024
Appendix III							
BORON, TOTAL	mg/L	0.488	**5.03**	**8.44**	**24.2**	0.094	3.78
CALCIUM, TOTAL	mg/L	31.2	**411**	**394**	**554**	2.46	61.7
CHLORIDE, TOTAL	mg/L	40.9	106	136	**496**	8.77	120
FLUORIDE, TOTAL	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
pH	S.U.	4.33	**5.32**	4.82	**6.15**	4.64	3.18
SULFATE, TOTAL	mg/L	136	**1,640**	**1,560**	**2,230**	11.8	313
TOTAL DISSOLVED SOLIDS	mg/L	289	**2,640**	**2,613**	**4,863**	43	770
Appendix IV							
ANTIMONY, TOTAL	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
ARSENIC, TOTAL	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
BARIUM, TOTAL	mg/L	0.0283	0.0368	0.0387	0.0565	0.118	0.0232
BERYLLIUM, TOTAL	mg/L	<0.00400	<0.00400	<0.00400	<0.00400	<0.00400	0.00584
CADMIUM, TOTAL	mg/L	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
CHROMIUM, TOTAL	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
COBALT, TOTAL	mg/L	0.0403	0.0185	0.0492	0.0597	0.00226	0.0632
FLUORIDE, TOTAL	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
LEAD, TOTAL	mg/L	0.00351	0.00679	0.00168	<0.00100	<0.00100	0.00212
LITHIUM, TOTAL	mg/L	<0.040	0.126	0.119	**2.67**	<0.040	0.162
MERCURY, TOTAL	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
MOLYBDENUM, TOTAL	mg/L	<0.00500	<0.00500	<0.00500	**1.56**	<0.00500	<0.00500
RADIUM (226 + 228)	pCi/L	1.59	2.25	2.19	1.62	1.93	1.77
SELENIUM, TOTAL	mg/L	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
THALLIUM, TOTAL	mg/L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100

NOTES:

1. mg/L - Milligrams per Liter; pCi/L - picocuries per Liter
2. < - Constituent was analyzed for, but was not detected above the minium reporting limit (MRL) and is considered a non-detect. Value is displayed as less than the MRL.
3. Radium data is a combination of radium isotopes 226 and 228. When results are reported below the MDC (Minimum Detectable Concentration), data is displayed with an accompanying U. The MDC varies depending upon the sample amount and elapsed time of the measurement.
4. **Bolded** data indicates an exceedance of the PL for appendix III constituents or a statistically significant level based on 95% confidence interval above the Groundwater Protection Standard (GWPS) for appendix IV constituents.

APPENDIX A

Analytical Data and Field Data Forms

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-02

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	4-2-24 9:30	Sampling date/time	4-2-24 10:15
Method of evacuation	Peristaltic pump	Method of sampling	low flow
Top of casing to water	10.09	Gallons per well volume	
Top of casing to bottom	22.41	Total gallons evacuated	1.25 gal
Water level after evac	10.17		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
9:37	19.7	2.10	548	4.84	196.8	10.19	clear
9:42	19.2	0.88	462.3	4.82	254.9	10.58	"
9:47	19.3	0.69	459.7	4.83	302.5	14.34	"
9:52	19.3	0.61	457.2	4.83	321.8	17.38	"
9:57	19.5	0.51	449.8	4.81	333.7	17.96	"
10:03	19.5	0.50	448.2	4.81	338.5	18.24	"
10:08	19.6	0.47	445.6	4.79	346.3	17.93	

General Information

Weather Condition: Overcast 70s

Sample Characteristics:

Containers/Amounts: (2) 1L Radiological, (1) 1L for wetlab (1) 500mL for Metals (1) 250mL for Alkalinity

Recommend/Observations:

Sampler/Collector: Allan Niven

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN

Well Number: MW-3

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	(4-2-24 16:52) 4-3-24 7:41	Sampling date/time	4-3-24 8:40
Method of evacuation	Peristaltic pump	Method of sampling	Low flow
Top of casing to water	(5.61') 5.42	Gallons per well volume	
Top of casing to bottom	17.72	Total gallons evacuated	2.0 gal
Water level after evac	5.85		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
7:57	17.7	0.95	2960	5.47	7.3	41.28	clear
8:02	17.7	0.49	2948	5.52	-19.2	25.35	Orange nodules
8:07	18.0	0.41	2944	5.52	-24.5	24.80	
8:12	17.8	0.37	2941	5.52	-28.3	25.01	
8:17	18.0	0.34	2938	5.50	-26.9	27.83	
8:22	18.1	0.31	2929	5.42	-19.0	24.03	
8:27	18.1	0.31	2932	5.44	-21.5	19.93	
8:32	18.0	0.29	2925	5.44	-22.5	15.78	

General Information

Weather Condition: few clouds cool

Sample Characteristics:

Containers/Amounts: (4) 1L for Radiological (2) 1L for wet lab (2) 500mL for Metals (2) 250 mL for Alkalinity

BD-1 < 4-3-24 7:30 >

Recommend/Observations:

Sampler/Collector: [signature]

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]				
1/2"=0.0205	1"=0.041	2"=0.164 SS	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-04

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	4-2-24 15:25	Sampling date/time	4-2-24 16:10
Method of evacuation	Peristaltic pump	Method of sampling	Low flow
Top of casing to water	8.78	Gallons per well volume	
Top of casing to bottom	22.72	Total gallons evacuated	1.25gal
Water level after evac	8.91		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
15:39	20.8	1.30	3130	5.05	190.7	3.88	clear
15:44	20.3	0.43	3099	5.02	231.9	4.60	"
15:49	20.2	0.37	3096	5.01	245.5	4.69	"
15:54	20.2	0.34	3094	5.00	250.6	4.63	"
15:59	20.1	0.32	3092	4.99	252.9	4.11	"

General Information

Weather Condition: Partly cloudy Windy

Sample Characteristics:

Containers/Amounts: (4) 1L for Radiological (2) 1L for Wetlab (2) 500mL for Metals (2) 250mL for Alkalinity

Recommend/Observations:

Sampler/Collector:

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN — Well Number: MW-05

Collector/Operator: A. Nixon

Monitoring Well Information

Evacuation date/time	4-2-24 14:00	Sampling date/time	4-2-24 15:00
Method of evacuation	Peristaltic pump	Method of sampling	Low flow
Top of casing to water	6.63	Gallons per well volume	
Top of casing to bottom	20.02	Total gallons evacuated	1.75 gal
Water level after evac	6.80		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
14:23	21.9	1.10	3825	6.21	61.7	3.05	clear
14:28	21.7	0.78	4001	6.20	52.4	3.01	"
14:33	21.7	0.70	4111	6.20	49.0	3.09	"
14:38	21.3	0.60	4215	6.19	46.3	3.30	"
14:43	21.8	0.54	4281	6.18	44.1	3.09	"
14:48	21.4	0.49	4341	6.18	41.7	3.66	"
14:53	21.2	0.47	4355	6.18	40.7	4.20	"

General Information

Weather Condition: Cloudy, windy

Sample Characteristics:

Containers/Amounts: (2) 1L for Radiological (1) 1L for Wetlab (1) 500mL for Metals (1) 250mL for Alkalinity

Recommend/Observations:

Sampler/Collector:

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.163 SS	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-6

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	4-2-24 12:13	Sampling date/time	4-2-24 13:00
Method of evacuation	Peristaltic	Method of sampling	Low flow
Top of casing to water	3.84	Gallons per well volume	
Top of casing to bottom	12.76	Total gallons evacuated	1.25gal
Water level after evac	4.03		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
12:26	23.3	2.25	86.4	4.94	279.8	6.80	clear
12:31	22.5	1.84	80.6	4.93	291.4	9.87	"
12:37	22.1	1.75	79.9	4.90	298.5	7.67	"
12:42	22.3	1.74	79.9	4.88	299.9	7.01	"
12:47	22.0	1.71	79.8	4.87	302.4	7.34	"
12:52	23.0	1.69	80.4	4.84	301.5	4.77	"
12:57	23.0	1.69	80.0	4.84	308.1	6.17	"

General Information

Weather Condition: Partly Cloudy Hot

Sample Characteristics:

Containers/Amounts: (2) 1L for Radiological (1) 1L for Wetlab (1) 500mL for Metals (1) 250mL for Alkalinity

Recommend/Observations:

Sampler/Collector: Allan Niven

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN

Well Number: MW-10

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	4-2-24 10:50	Sampling date/time	4-2-24 11:35
Method of evacuation	Peristaltic pump	Method of sampling	low flow
Top of casing to water	11.36	Gallons per well volume	
Top of casing to bottom	22.45	Total gallons evacuated	1.0 gal
Water level after evac	11.40		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
11:05	19.5	1.19	1477	3.66	406.2	13.96	clear
11:10	19.3	0.58	1476	3.67	419.3	14.27	"
11:15	19.2	0.44	1471	3.68	409.8	15.64	"
11:20	19.2	0.42	1465	3.68	401.8	14.98	"
11:25	19.4	0.41	1458	3.68	390.0	13.79	"
11:30	19.3	0.40	1455	3.69	383.1	11.57	

General Information

Weather Condition: Overcast

Sample Characteristics:

Containers/Amounts: (2) 1L for Radiological (2) 1L for Wet lab (1) 500mL for Metals (1) 250mL for Alkalinity

Recommend/Observations:

Sampler/Collector: Allan Niven

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164 SS	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

MICRO-METHODS LABORATORY, INC.

Mailing Address:
PO Box 1410
Ocean Springs, MS
39566-1410

6500 Sunplex Drive
Ocean Springs, MS 39564
228.875.6420 Phone
228.875.6423 Fax

DOCUMENT CHANGE NOTICE

Revised Report

June 20, 2024

Ken Ruckstuhl

Work Order # : 2404107

Environmental Management Services
PO Box 15369
Hattiesburg, MS 39404-5369

Purchase Order # SOU2-23-001

RE: Cooperative Energy CCR Semiannual

Enclosed is the revised report for samples received by the laboratory on 04/03/2024 11:14. This report supercedes any previous version of the above noted work order. If you have any questions concerning this report, please feel free to contact the office.

Sincerely,

Mitch Spicer

Lab Director

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date/Time Sampled	Sampled by	Date/Time Received
MW-2	2404107-01	Water	04/02/2024 10:15	*Alan Niven*	04/03/2024 11:14
MW-3	2404107-02	Water	04/03/2024 08:40	*Alan Niven*	04/03/2024 11:14
MW-4	2404107-03	Water	04/02/2024 16:10	*Alan Niven*	04/03/2024 11:14
MW-5	2404107-04	Water	04/02/2024 15:00	*Alan Niven*	04/03/2024 11:14
MW-6	2404107-05	Water	04/02/2024 13:00	*Alan Niven*	04/03/2024 11:14
MW-10	2404107-06	Water	04/02/2024 11:35	*Alan Niven*	04/03/2024 11:14
BD-1	2404107-07	Water	04/03/2024 07:30	*Alan Niven*	04/03/2024 11:14

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Sample Receipt Conditions

Date/Time Received: 4/3/2024 11:14:00AM
Received by: Sarah E. Tomek
Date/Time Logged: 4/3/2024 12:04:00PM
Cooler ID: **#1126**

Shipped by: Client Delivery
Submitted by: Alan Niven
Logged by: Sarah E. Tomek
Receipt Temperature: 0.6 °C

Cooler Custody Seals Present	No	*Received on Ice but Not Frozen*	Yes
Containers Intact	Yes	*No Ice, Short Trip*	No
COC/Labels Agree	Yes	*Obvious Contamination*	No
Labels Complete	Yes	*Rush to meet HT*	No
COC Complete	Yes	*Received within HT*	Yes
Volatile Vial Headspace >6mm	No	*Proper Containers for Analysis*	Yes
Field Sheet/Instructions Included	No	*Correct Preservation*	Yes
Samples Rejected/Documented in Log	No	*Adequate Sample for Analysis*	Yes
Temp Taken From Temp Blank	Yes	*Sample Custody Seals Present*	No
Temp Taken From Sample Container	No	*Samples Missing from COC/Cooler*	No
Temp Taken From Cooler	No		
COC meets acceptance criteria	Yes		

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Cooler ID: #1127

Receipt Temperature: 1.1 °C

Cooler Custody Seals Present	No	*Received on Ice but Not Frozen*	Yes
Containers Intact	Yes	*No Ice, Short Trip*	No
COC/Labels Agree	Yes	*Obvious Contamination*	No
Labels Complete	Yes	*Rush to meet HT*	No
COC Complete	Yes	*Received within HT*	Yes
Volatile Vial Headspace >6mm	No	*Proper Containers for Analysis*	Yes
Field Sheet/Instructions Included	No	*Correct Preservation*	Yes
Samples Rejected/Documented in Log	No	*Adequate Sample for Analysis*	Yes
Temp Taken From Temp Blank	Yes	*Sample Custody Seals Present*	No
Temp Taken From Sample Container	No	*Samples Missing from COC/Cooler*	No
Temp Taken From Cooler	No		
COC meets acceptance criteria	Yes		

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: [none]	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	06/20/2024 08:23

CASE NARRATIVE SUMMARY

All reported results are within Micro-Methods Laboratory, Inc.defined laboratory quality control objectives unless detailed in narrative summary or identified as qualifications. NOTE: All results listed on this report are calculated on a wet weight basis (as received by the laboratory) unless otherwise noted in the analysis qualification sections.

Summary Comments:

Sample 2404107-06 pH is 3.77; below test required pH of 8.3, 4.3 and 4.1. Alkalinity, Carbonate and Bicarbonate. SM 2320B. TKM

TDS BD-1 result confirmed by duplicate analysis. Resubmit corrected report. TKM

See attached results from Sub-Contract Laboratory

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: [none]	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	06/20/2024 08:23

Total Metals-EPA 200.7 Rev 4.4

Qualification:

M2 MS/MSD Recovery below acceptable limit.

Iron 259.940 [Radial]

4D05026-MSD1

Total Metals-EPA 200.8 Rev 5.4

Qualification:

B-09 The analyte value in the BLK or CCB is >=1/2xMRL. Reported results are <MRL.

Arsenic [NG]

2404107-01[MW-2], 2404107-02[MW-3], 2404107-03[MW-4], 2404107-05[MW-6], 4D05022-BLK1, 4D05022-BS1, 4D05022-BSD1, 4D05022-MS1, 4D05022-MSD1

B-10 The analyte value in the BLK or CCB is >=1/2xMRL but <MRL.

Arsenic [NG]

2404107-06[MW-10], 2404107-07[BD-1]

CC-01 CCV outside acceptance limits. Sample results reported from this calibration were below the reporting limits.

Selenium [NG]

2404107-01[MW-2], 2404107-02[MW-3], 2404107-03[MW-4], 2404107-04[MW-5], 2404107-05[MW-6], 2404107-06[MW-10], 2404107-07[BD-1]

CC-03 CCV outside acceptance limits. QC Results reported from this calibration within acceptance limits.

Selenium [NG]

4D05022-BLK1, 4D05022-BS1, 4D05022-BSD1, 4D05022-MS1, 4D05022-MSD1

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: [none]	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	06/20/2024 08:23

Alkalinity, Bicarbonate as CaCO3-SM 2320B 2011

Qualification:

SN See Case Narrative Summary

Bicarbonate Alkalinity, Carbonate Alkalinity, Total Alkalinity

2404107-06[MW-10]

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

MW-2

2404107-01 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Notes
Classical Chemistry Parameters										
Bicarbonate Alkalinity	ND	10.0	mg/L	1.0	4D04069	TKM	04/04/2024 14:41	04/04/2024 16:10	SM 2320B 2011	
Carbonate Alkalinity	ND	10.0	"	"	4D04068	TKM	04/04/2024 15:43	04/04/2024 16:05	"	
Total Alkalinity	ND	10.0	"	"	4D04066	TKM	04/04/2024 13:41	04/04/2024 16:01	"	
Chloride	**54.1**	2.00	"	"	4D08033	DLW	04/08/2024 11:00	04/08/2024 12:39	ASTM D 512-12C	
Fluoride	ND	0.50	"	"	4D10070	CRG	04/10/2024 10:00	04/10/2024 16:15	SM 4500-F C 2011	
Sulfate as SO4	**126**	25.0	"	5.0	4D05028	ASW	04/05/2024 13:17	04/05/2024 14:09	SM 4500-SO42 E 2011	
Total Dissolved Solids	**278**	1	"	1.0	4D04060	CRG	04/04/2024 14:55	04/09/2024 15:36	SM 2540 C-2015	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**0.501**	0.050	mg/L	1.0	4D05026	CLV	04/05/2024 10:30	04/22/2024 15:24	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**33.2**	0.050	"	"	"	CLV	"	"	"	
Iron 259.940 [Radial]	**0.535**	0.050	"	"	"	CLV	"	"	"	
Lithium 610.362 [Axial]	ND	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**21.0**	0.050	"	"	"	CLV	"	"	"	
Manganese 257.610 [Axial]	**0.695**	0.050	"	"	"	CLV	"	"	"	
Potassium 766.490 [Radial]	**1.37**	0.100	"	"	"	CLV	"	"	"	
Sodium 589.592 [Radial]	**14.0**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4D05022	SCH	"	04/09/2024 13:19	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	B-09
Barium [He]	**0.0325**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0417**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00132**	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	CC-01
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4D09044	CLV	04/08/2024 09:00	04/17/2024 15:22	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

MW-3

2404107-02 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Notes
Classical Chemistry Parameters										
Bicarbonate Alkalinity	**82.5**	10.0	mg/L	1.0	4D04069	TKM	04/04/2024 14:41	04/04/2024 16:10	SM 2320B 2011	
Carbonate Alkalinity	**82.5**	10.0	"	"	4D04068	TKM	04/04/2024 15:43	04/04/2024 16:05	"	
Total Alkalinity	**85.7**	10.0	"	"	4D04066	TKM	04/04/2024 13:41	04/04/2024 16:01	"	
Chloride	**114**	4.00	"	2.0	4D08033	DLW	04/08/2024 11:00	04/08/2024 12:39	ASTM D 512-12C	
Fluoride	ND	0.50	"	1.0	4D10070	CRG	04/10/2024 10:00	04/10/2024 16:15	SM 4500-F C 2011	
Sulfate as SO4	**1640**	250	"	50.0	4D05028	ASW	04/05/2024 13:17	04/05/2024 14:09	SM 4500-SO42 E 2011	
Total Dissolved Solids	**2668**	2	"	1.0	4D04060	CRG	04/04/2024 14:55	04/09/2024 15:36	SM 2540 C-2015	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**5.81**	0.050	mg/L	1.0	4D05026	CLV	04/05/2024 10:30	04/22/2024 15:28	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**447**	0.500	"	10.0	"	CLV	"	04/22/2024 14:25	"	
Iron 259.940 [Radial]	**4.86**	0.050	"	1.0	"	CLV	"	04/22/2024 15:28	"	
Lithium 610.362 [Axial]	**0.348**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**148**	0.500	"	10.0	"	CLV	"	04/22/2024 14:25	"	
Manganese 257.610 [Axial]	**2.19**	0.050	"	1.0	"	CLV	"	04/22/2024 15:28	"	
Potassium 766.490 [Radial]	**81.2**	1.00	"	10.0	"	CLV	"	04/22/2024 14:25	"	
Sodium 589.592 [Radial]	**51.6**	1.00	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4D05022	SCH	"	04/09/2024 13:25	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	B-09
Barium [He]	**0.0360**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0207**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00606**	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	CC-01
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4D09044	CLV	04/08/2024 09:00	04/17/2024 15:27	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

MW-4

2404107-03 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Notes
Classical Chemistry Parameters										
Bicarbonate Alkalinity	**32.6**	10.0	mg/L	1.0	4D04069	TKM	04/04/2024 14:41	04/04/2024 16:10	SM 2320B 2011	
Carbonate Alkalinity	**32.6**	10.0	"	"	4D04068	TKM	04/04/2024 15:43	04/04/2024 16:05	"	
Total Alkalinity	**36.9**	10.0	"	"	4D04066	TKM	04/04/2024 13:41	04/04/2024 16:01	"	
Chloride	**154**	4.00	"	2.0	4D08033	DLW	04/08/2024 11:00	04/08/2024 12:39	ASTM D 512-12C	
Fluoride	ND	0.50	"	1.0	4D10070	CRG	04/10/2024 10:00	04/10/2024 16:15	SM 4500-F C 2011	
Sulfate as SO4	**1790**	250	"	50.0	4D05028	ASW	04/05/2024 13:17	04/05/2024 14:09	SM 4500-SO42 E 2011	
Total Dissolved Solids	**2562**	2	"	1.0	4D04060	CRG	04/04/2024 14:55	04/09/2024 15:36	SM 2540 C-2015	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**8.89**	0.050	mg/L	1.0	4D05026	CLV	04/05/2024 10:30	04/22/2024 15:31	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**459**	1.00	"	20.0	"	CLV	"	04/22/2024 14:56	"	
Iron 259.940 [Radial]	**0.945**	0.050	"	1.0	"	CLV	"	04/22/2024 15:31	"	
Lithium 610.362 [Axial]	**0.273**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**157**	0.500	"	10.0	"	CLV	"	04/22/2024 14:29	"	
Manganese 257.610 [Axial]	**3.00**	0.050	"	1.0	"	CLV	"	04/22/2024 15:31	"	
Potassium 766.490 [Radial]	**82.4**	1.00	"	10.0	"	CLV	"	04/22/2024 14:29	"	
Sodium 589.592 [Radial]	**65.6**	1.00	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4D05022	SCH	"	04/09/2024 13:31	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	B-09
Barium [He]	**0.0311**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0320**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00105**	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	CC-01
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4D09044	CLV	04/08/2024 09:00	04/17/2024 15:31	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

MW-5

2404107-04 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Notes
Classical Chemistry Parameters										
Bicarbonate Alkalinity	**405**	10.0	mg/L	1.0	4D04069	TKM	04/04/2024 14:41	04/04/2024 16:10	SM 2320B 2011	
Carbonate Alkalinity	**405**	10.0	"	"	4D04068	TKM	04/04/2024 15:43	04/04/2024 16:05	"	
Total Alkalinity	**406**	10.0	"	"	4D04066	TKM	04/04/2024 13:41	04/04/2024 16:01	"	
Chloride	**424**	20.0	"	10.0	4D08033	DLW	04/08/2024 11:00	04/08/2024 12:39	ASTM D 512-12C	
Fluoride	ND	0.50	"	1.0	4D10070	CRG	04/10/2024 10:00	04/10/2024 16:15	SM 4500-F C 2011	
Sulfate as SO4	**2090**	250	"	50.0	4D05028	ASW	04/05/2024 13:17	04/05/2024 14:09	SM 4500-SO42 E 2011	
Total Dissolved Solids	**3848**	2	"	1.0	4D04060	CRG	04/04/2024 14:55	04/09/2024 15:36	SM 2540 C-2015	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**18.8**	0.500	mg/L	10.0	4D05026	CLV	04/05/2024 10:30	04/22/2024 14:36	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**525**	1.00	"	20.0	"	CLV	"	04/22/2024 15:03	"	
Iron 259.940 [Radial]	**2.30**	0.050	"	1.0	"	CLV	"	04/22/2024 15:42	"	
Lithium 610.362 [Axial]	**2.34**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**286**	0.500	"	10.0	"	CLV	"	04/22/2024 14:36	"	
Manganese 257.610 [Axial]	**2.55**	0.050	"	1.0	"	CLV	"	04/22/2024 15:42	"	
Molybdenum 202.030 [Axial]	**1.26**	0.050	"	"	"	CLV	"	"	"	
Potassium 766.490 [Radial]	**145**	1.00	"	10.0	"	CLV	"	04/22/2024 14:36	"	
Sodium 589.592 [Radial]	**98.5**	1.00	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4D05022	SCH	"	04/09/2024 13:50	EPA 200.8 Rev 5.4	
Arsenic [He]	ND	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.0481**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0637**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00131**	0.00100	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	CC-01
Thallium [He]	**0.00228**	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4D09044	CLV	04/08/2024 09:00	04/17/2024 15:36	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

MW-6

2404107-05 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Notes
Classical Chemistry Parameters										
Bicarbonate Alkalinity	ND	10.0	mg/L	1.0	4D04069	TKM	04/04/2024 14:41	04/04/2024 16:10	SM 2320B 2011	
Carbonate Alkalinity	ND	10.0	"	"	4D04068	TKM	04/04/2024 15:43	04/04/2024 16:05	"	
Total Alkalinity	ND	10.0	"	"	4D04066	TKM	04/04/2024 13:41	04/04/2024 16:01	"	
Chloride	**8.94**	2.00	"	"	4D08033	DLW	04/08/2024 11:00	04/08/2024 12:39	ASTM D 512-12C	
Fluoride	ND	0.50	"	"	4D10070	CRG	04/10/2024 10:00	04/10/2024 16:15	SM 4500-F C 2011	
Sulfate as SO4	**10.6**	5.00	"	"	4D05028	ASW	04/05/2024 13:17	04/05/2024 14:09	SM 4500-SO42 E 2011	
Total Dissolved Solids	**39**	1	"	"	4D04060	CRG	04/04/2024 14:55	04/09/2024 15:36	SM 2540 C-2015	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**0.071**	0.050	mg/L	1.0	4D05026	CLV	04/05/2024 10:30	04/22/2024 15:46	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**2.69**	0.050	"	"	"	CLV	"	"	"	
Iron 259.940 [Radial]	**0.132**	0.050	"	"	"	CLV	"	"	"	
Lithium 610.362 [Axial]	ND	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**3.12**	0.050	"	"	"	CLV	"	"	"	
Manganese 257.610 [Axial]	**0.117**	0.050	"	"	"	CLV	"	"	"	
Potassium 766.490 [Radial]	**1.20**	0.100	"	"	"	CLV	"	"	"	
Sodium 589.592 [Radial]	**4.68**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4D05022	SCH	"	04/09/2024 13:57	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	B-09
Barium [He]	**0.125**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.00244**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	CC-01
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4D09044	CLV	04/08/2024 09:00	04/17/2024 15:39	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

MW-10

2404107-06 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Notes
Classical Chemistry Parameters										
Bicarbonate Alkalinity	ND	10.0	mg/L	1.0	4D04069	TKM	04/04/2024 14:41	04/04/2024 16:10	SM 2320B 2011	SN
Carbonate Alkalinity	ND	10.0	"	"	4D04068	TKM	04/04/2024 15:43	04/04/2024 16:05	"	SN
Total Alkalinity	ND	10.0	"	"	4D04066	TKM	04/04/2024 13:41	04/04/2024 16:01	"	SN
Chloride	**233**	8.00	"	4.0	4D08033	DLW	04/08/2024 11:00	04/08/2024 12:39	ASTM D 512-12C	
Fluoride	**0.61**	0.50	"	1.0	4D10070	CRG	04/10/2024 10:00	04/10/2024 16:15	SM 4500-F C 2011	
Sulfate as SO4	**576**	100	"	20.0	4D05028	ASW	04/05/2024 13:17	04/05/2024 14:09	SM 4500-SO42 E 2011	
Total Dissolved Solids	**1136**	1	"	1.0	4D04060	CRG	04/04/2024 14:55	04/09/2024 15:36	SM 2540 C-2015	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**4.99**	0.050	mg/L	1.0	4D05026	CLV	04/05/2024 10:30	04/22/2024 15:49	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**102**	0.500	"	10.0	"	CLV	"	04/22/2024 14:43	"	
Iron 259.940 [Radial]	**0.985**	0.050	"	1.0	"	CLV	"	04/22/2024 15:49	"	
Lithium 610.362 [Axial]	**0.418**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**95.5**	0.500	"	10.0	"	CLV	"	04/22/2024 14:43	"	
Manganese 257.610 [Axial]	**6.73**	0.050	"	1.0	"	CLV	"	04/22/2024 15:49	"	
Potassium 766.490 [Radial]	**17.6**	0.100	"	"	"	CLV	"	"	"	
Sodium 589.592 [Radial]	**53.2**	1.00	"	10.0	"	CLV	"	04/22/2024 14:43	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4D05022	SCH	"	04/09/2024 14:03	EPA 200.8 Rev 5.4	
Arsenic [NG]	**0.00224**	0.00200	"	"	"	SCH	"	"	"	B-10
Barium [He]	**0.0260**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	**0.0107**	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.135**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00326**	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	CC-01
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4D09044	CLV	04/08/2024 09:00	04/17/2024 15:42	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

BD-1

2404107-07 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Notes
Classical Chemistry Parameters										
Bicarbonate Alkalinity	**84.6**	10.0	mg/L	1.0	4D04069	TKM	04/04/2024 14:41	04/04/2024 16:10	SM 2320B 2011	
Carbonate Alkalinity	**84.6**	10.0	"	"	4D04068	TKM	04/04/2024 15:43	04/04/2024 16:05	"	
Total Alkalinity	**85.7**	10.0	"	"	4D04066	TKM	04/04/2024 13:41	04/04/2024 16:01	"	
Chloride	**118**	4.00	"	2.0	4D08033	DLW	04/08/2024 11:00	04/08/2024 12:39	ASTM D 512-12C	
Fluoride	ND	0.50	"	1.0	4D10070	CRG	04/10/2024 10:00	04/10/2024 16:15	SM 4500-F C 2011	
Sulfate as SO4	**1730**	250	"	50.0	4D05028	ASW	04/05/2024 13:17	04/05/2024 14:09	SM 4500-SO42 E 2011	
Total Dissolved Solids	**2627**	2	"	1.0	4D04060	CRG	04/04/2024 14:55	04/09/2024 15:36	SM 2540 C-2015	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**5.61**	0.050	mg/L	1.0	4D05026	CLV	04/05/2024 10:30	04/22/2024 15:53	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**446**	0.500	"	10.0	"	CLV	"	04/22/2024 14:47	"	
Iron 259.940 [Radial]	**4.95**	0.050	"	1.0	"	CLV	"	04/22/2024 15:53	"	
Lithium 610.362 [Axial]	**0.343**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**147**	0.500	"	10.0	"	CLV	"	04/22/2024 14:47	"	
Manganese 257.610 [Axial]	**2.13**	0.050	"	1.0	"	CLV	"	04/22/2024 15:53	"	
Potassium 766.490 [Radial]	**79.7**	1.00	"	10.0	"	CLV	"	04/22/2024 14:47	"	
Sodium 589.592 [Radial]	**44.7**	0.100	"	1.0	"	CLV	"	04/22/2024 15:53	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4D05022	SCH	"	04/09/2024 15:18	EPA 200.8 Rev 5.4	
Arsenic [NG]	**0.00420**	0.00200	"	"	"	SCH	"	"	"	B-10
Barium [He]	**0.0372**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0226**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00646**	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	CC-01
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4D09044	CLV	04/08/2024 09:00	04/17/2024 15:45	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D04060 - Default Prep GenChem											
Blank (4D04060-BLK1)											
Total Dissolved Solids	4/9/24 15:36	ND	1	mg/L							
LCS (4D04060-BS1)											
Total Dissolved Solids	4/9/24 15:36	83	1	mg/L	99.2		83.7	69.8-100			
LCS Dup (4D04060-BSD1)											
Total Dissolved Solids	4/9/24 15:36	87	1	mg/L	99.2		87.7	69.8-100	4.71	10	
Duplicate (4D04060-DUP1)			**Source: 2404037-01**								
Total Dissolved Solids	4/9/24 15:36	1928	2	mg/L		1812			6.20	10	
Duplicate (4D04060-DUP2)			**Source: 2404114-01**								
Total Dissolved Solids	4/9/24 15:36	254	1	mg/L		256			0.784	10	
Batch 4D04066 - Default Prep GenChem											
Blank (4D04066-BLK1)											
Total Alkalinity	4/4/24 16:01	ND	10.0	mg/L							
LCS (4D04066-BS1)											
Total Alkalinity	4/4/24 16:01	922	10.0	mg/L	1000		92.2	85-115			
Duplicate (4D04066-DUP1)			**Source: 2404107-03**								
Total Alkalinity	4/4/24 16:01	36.9	10.0	mg/L		36.9			0.00	30	
Batch 4D04068 - Default Prep GenChem											
Blank (4D04068-BLK1)											
Carbonate Alkalinity	4/4/24 16:05	ND	10.0	mg/L							

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D04068 - Default Prep GenChem											
LCS (4D04068-BS1)											
Carbonate Alkalinity	4/4/24 16:05	488	10.0	mg/L	500		97.6	85-115			
Duplicate (4D04068-DUP1)			**Source: 2404107-03**								
Carbonate Alkalinity	4/4/24 16:05	32.6	10.0	mg/L		32.6			0.00	200	
Batch 4D04069 - Default Prep GenChem											
Blank (4D04069-BLK1)											
Bicarbonate Alkalinity	4/4/24 16:10	ND	10.0	mg/L							
LCS (4D04069-BS1)											
Bicarbonate Alkalinity	4/4/24 16:10	857	10.0	mg/L	950		90.2	85-115			
Duplicate (4D04069-DUP1)			**Source: 2404107-03**								
Bicarbonate Alkalinity	4/4/24 16:10	32.6	10.0	mg/L		32.6			0.00	30	
Batch 4D05028 - Default Prep GenChem											
Blank (4D05028-BLK1)											
Sulfate as SO4	4/5/24 13:23	ND	5.00	mg/L							
LCS (4D05028-BS1)											
Sulfate as SO4	4/5/24 13:23	28.0	5.00	mg/L	30.0		93.2	88-108			
LCS Dup (4D05028-BSD1)											
Sulfate as SO4	4/5/24 13:23	30.3	5.00	mg/L	30.0		101	88-108	8.18	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D05028 - Default Prep GenChem											
Duplicate (4D05028-DUP1)			**Source: 2404107-05**								
Sulfate as SO4	4/5/24 14:09	10.2	5.00	mg/L		10.6			3.23	20	
Matrix Spike (4D05028-MS1)			**Source: 2404107-05**								
Sulfate as SO4	4/5/24 14:09	43.8	5.00	mg/L	30.0	10.6	111	74.1-129			
Matrix Spike Dup (4D05028-MSD1)			**Source: 2404107-05**								
Sulfate as SO4	4/5/24 14:09	42.8	5.00	mg/L	30.0	10.6	107	74.1-129	2.24	20	
Batch 4D08033 - Default Prep GenChem											
Blank (4D08033-BLK1)											
Chloride	4/8/24 12:02	ND	2.00	mg/L							
LCS (4D08033-BS1)											
Chloride	4/8/24 12:02	24.8	2.00	mg/L	25.0		99.2	85-115			
LCS Dup (4D08033-BSD1)											
Chloride	4/8/24 12:02	25.0	2.00	mg/L	25.0		100	85-115	0.803	30	
Duplicate (4D08033-DUP1)			**Source: 2404096-05**								
Chloride	4/8/24 12:39	20.9	2.00	mg/L		20.5			1.93	20	
Matrix Spike (4D08033-MS1)			**Source: 2404096-05**								
Chloride	4/8/24 12:39	40.5	2.00	mg/L	20.0	20.5	100	80-120			
Matrix Spike Dup (4D08033-MSD1)			**Source: 2404096-05**								
Chloride	4/8/24 12:39	39.8	2.00	mg/L	20.0	20.5	96.5	80-120	1.74	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D10070 - Default Prep GenChem											
Blank (4D10070-BLK1)											
Fluoride	4/10/24 16:15	ND	0.50	mg/L							
LCS (4D10070-BS1)											
Fluoride	4/10/24 16:15	1.98	0.50	mg/L	2.00		99.0	88.5-110			
LCS Dup (4D10070-BSD1)											
Fluoride	4/10/24 16:15	2.02	0.50	mg/L	2.00		101	88.5-110	2.00	30	
Matrix Spike (4D10070-MS1)			**Source: 2404107-01**								
Fluoride	4/10/24 16:15	2.25	0.50	mg/L	2.00	0.20	103	81.9-110			
Matrix Spike Dup (4D10070-MSD1)			**Source: 2404107-01**								
Fluoride	4/10/24 16:15	2.23	0.50	mg/L	2.00	0.20	102	81.9-110	0.893	30	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Metals by EPA 200 Series Methods ICP-AES - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D05026 - EPA 200.2 DCN 1017 Rev 10											
Blank (4D05026-BLK1)											
Boron 249.773 [Radial]	4/16/24 13:43	ND	0.050	mg/L							
Calcium 315.887 [Radial]	4/16/24 13:43	ND	0.050	"							
Iron 259.940 [Radial]	4/16/24 13:43	ND	0.050	"							
Iron 259.940 [Axial]	4/16/24 13:43	ND	0.050	"							
Lithium 610.362 [Axial]	4/16/24 13:43	ND	0.040	"							
Magnesium 285.213 [Radial]	4/16/24 13:43	ND	0.050	"							
Manganese 257.610 [Axial]	4/16/24 13:43	ND	0.050	"							
Molybdenum 202.030 [Axial]	4/16/24 13:43	ND	0.050	"							
Potassium 766.490 [Radial]	4/16/24 13:43	ND	0.100	"							
Sodium 589.592 [Radial]	4/16/24 13:43	ND	0.100	"							
LCS (4D05026-BS1)											
Boron 249.773 [Radial]	4/16/24 13:46	0.208	0.050	mg/L	0.200		104	85-115			
Calcium 315.887 [Radial]	4/16/24 13:46	0.203	0.050	"	0.200		101	85-115			
Iron 259.940 [Axial]	4/16/24 13:46	0.201	0.050	"	0.200		101	85-115			
Iron 259.940 [Radial]	4/16/24 13:46	0.205	0.050	"	0.200		103	85-115			
Lithium 610.362 [Axial]	4/16/24 13:46	0.195	0.040	"	0.200		97.4	85-115			
Magnesium 285.213 [Radial]	4/16/24 13:46	0.213	0.050	"	0.200		107	85-115			
Manganese 257.610 [Axial]	4/16/24 13:46	0.207	0.050	"	0.200		103	85-115			
Molybdenum 202.030 [Axial]	4/16/24 13:46	0.193	0.050	"	0.200		96.6	85-115			
Potassium 766.490 [Radial]	4/16/24 13:46	0.407	0.100	"	0.400		102	85-115			
Sodium 589.592 [Radial]	4/16/24 13:46	0.373	0.100	"	0.400		93.3	85-115			
LCS Dup (4D05026-BSD1)											
Boron 249.773 [Radial]	4/16/24 13:50	0.209	0.050	mg/L	0.200		105	85-115	0.439	20	
Calcium 315.887 [Radial]	4/16/24 13:50	0.208	0.050	"	0.200		104	85-115	2.68	20	
Iron 259.940 [Axial]	4/16/24 13:50	0.209	0.050	"	0.200		105	85-115	3.77	20	
Iron 259.940 [Radial]	4/16/24 13:50	0.212	0.050	"	0.200		106	85-115	3.08	20	
Lithium 610.362 [Axial]	4/16/24 13:50	0.197	0.040	"	0.200		98.4	85-115	0.992	20	
Magnesium 285.213 [Radial]	4/16/24 13:50	0.213	0.050	"	0.200		107	85-115	0.0124	20	
Manganese 257.610 [Axial]	4/16/24 13:50	0.208	0.050	"	0.200		104	85-115	0.710	20	
Molybdenum 202.030 [Axial]	4/16/24 13:50	0.197	0.050	"	0.200		98.4	85-115	1.88	20	
Potassium 766.490 [Radial]	4/16/24 13:50	0.422	0.100	"	0.400		106	85-115	3.57	20	
Sodium 589.592 [Radial]	4/16/24 13:50	0.389	0.100	"	0.400		97.2	85-115	4.03	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Metals by EPA 200 Series Methods ICP-AES - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D05026 - EPA 200.2 DCN 1017 Rev 10											
Duplicate (4D05026-DUP1)			**Source: 2404107-03**								
Boron 249.773 [Radial]	4/22/24 15:35	8.76	0.050	mg/L		8.89			1.50	20	
Calcium 315.887 [Radial]	4/22/24 15:00	463	1.00	"		459			0.872	20	
Magnesium 285.213 [Radial]	4/22/24 14:32	158	0.500	"		157			0.919	20	
Manganese 257.610 [Axial]	4/22/24 15:35	3.14	0.050	"		3.00			4.83	20	
Potassium 766.490 [Radial]	4/22/24 14:32	83.3	1.00	"		82.4			1.15	20	
Sodium 589.592 [Radial]	4/22/24 14:32	67.5	1.00	"		65.6			2.74	20	
Matrix Spike (4D05026-MS1)			**Source: 2404107-03**								
Boron 249.773 [Radial]	4/22/24 15:35	8.76	0.050	mg/L	0.200	8.89	NR	70-130			
Calcium 315.887 [Radial]	4/22/24 15:35	402	0.050	"	0.200	459	NR	70-130			
Iron 259.940 [Radial]	4/22/24 15:35	1.11	0.050	"	0.200	0.945	80.9	70-130			
Iron 259.940 [Axial]	4/22/24 15:35	1.09	0.050	"	0.200	0.924	84.9	70-130			
Lithium 610.362 [Axial]	4/22/24 15:35	0.427	0.040	"	0.200	0.273	77.2	70-130			
Molybdenum 202.030 [Axial]	4/22/24 15:35	0.174	0.050	"	0.200	ND	86.9	70-130			
Matrix Spike Dup (4D05026-MSD1)			**Source: 2404107-03**								
Boron 249.773 [Radial]	4/22/24 15:38	8.67	0.050	mg/L	0.200	8.89	NR	70-130	1.08	20	
Calcium 315.887 [Radial]	4/22/24 15:38	396	0.050	"	0.200	459	NR	70-130	1.51	20	
Iron 259.940 [Radial]	4/22/24 15:38	1.07	0.050	"	0.200	0.945	63.5	70-130	3.20	20	M2
Iron 259.940 [Axial]	4/22/24 15:38	1.06	0.050	"	0.200	0.924	67.7	70-130	3.19	20	
Lithium 610.362 [Axial]	4/22/24 15:38	0.418	0.040	"	0.200	0.273	72.7	70-130	2.12	20	
Molybdenum 202.030 [Axial]	4/22/24 15:38	0.172	0.050	"	0.200	ND	85.9	70-130	1.19	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Metals by EPA 200 Series Methods ICP-MS [Analysis Mode] - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D05022 - EPA 200.2 DCN 1017 Rev 10											
Blank (4D05022-BLK1)											
Antimony [He]	4/9/24 12:54	ND	0.00200	mg/L							
Arsenic [NG]	4/9/24 12:54	ND	0.00200	"							B-09
Arsenic [He]	4/9/24 12:54	ND	0.00200	"							
Barium [He]	4/9/24 12:54	ND	0.00100	"							
Beryllium [He]	4/9/24 12:54	ND	0.00400	"							
Cadmium [He]	4/9/24 12:54	ND	0.00500	"							
Chromium [He]	4/9/24 12:54	ND	0.0100	"							
Cobalt [He]	4/9/24 12:54	ND	0.00100	"							
Iron [He]	4/9/24 12:54	ND	0.0250	"							
Lead [He]	4/9/24 12:54	ND	0.00100	"							
Manganese [He]	4/9/24 12:54	ND	0.00100	"							
Molybdenum [He]	4/9/24 12:54	ND	0.00500	"							
Nickel [He]	4/9/24 12:54	ND	0.00100	"							
Selenium [He]	4/9/24 12:54	ND	0.0500	"							
Selenium [NG]	4/9/24 12:54	ND	0.0500	"							CC-03
Thallium [He]	4/9/24 12:54	ND	0.00100	"							
LCS (4D05022-BS1)											
Antimony [He]	4/9/24 13:00	0.105	0.00200	mg/L	0.100		105	85-115			
Arsenic [NG]	4/9/24 13:00	0.099	0.00200	"	0.100		98.9	85-115			B-09
Arsenic [He]	4/9/24 13:00	0.102	0.00200	"	0.100		102	85-115			
Barium [He]	4/9/24 13:00	0.102	0.00100	"	0.100		102	85-115			
Beryllium [He]	4/9/24 13:00	0.106	0.00100	"	0.100		106	85-115			
Cadmium [He]	4/9/24 13:00	0.103	0.00100	"	0.100		103	85-115			
Chromium [He]	4/9/24 13:00	0.101	0.00100	"	0.100		101	85-115			
Cobalt [He]	4/9/24 13:00	0.101	0.00100	"	0.100		101	85-115			
Iron [He]	4/9/24 13:00	0.101	0.0250	"	0.100		101	85-115			
Lead [He]	4/9/24 13:00	0.101	0.00100	"	0.100		101	85-115			
Manganese [He]	4/9/24 13:00	0.099	0.00100	"	0.100		99.2	85-115			
Molybdenum [He]	4/9/24 13:00	0.101	0.00100	"	0.100		101	85-115			
Nickel [He]	4/9/24 13:00	0.102	0.00100	"	0.100		102	85-115			
Selenium [He]	4/9/24 13:00	0.098	0.00200	"	0.100		97.6	85-115			
Selenium [NG]	4/9/24 13:00	0.101	0.00500	"	0.100		101	85-115			CC-03
Thallium [He]	4/9/24 13:00	0.102	0.00100	"	0.100		102	85-115			

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Metals by EPA 200 Series Methods ICP-MS [Analysis Mode] - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D05022 - EPA 200.2 DCN 1017 Rev 10											
LCS Dup (4D05022-BSD1)											
Antimony [He]	4/9/24 13:06	0.107	0.00200	mg/L	0.100		107	85-115	1.46	20	
Arsenic [NG]	4/9/24 13:06	0.102	0.00200	"	0.100		102	85-115	2.90	20	B-09
Arsenic [He]	4/9/24 13:06	0.105	0.00200	"	0.100		105	85-115	3.33	20	
Barium [He]	4/9/24 13:06	0.103	0.00100	"	0.100		103	85-115	1.73	20	
Beryllium [He]	4/9/24 13:06	0.105	0.00100	"	0.100		105	85-115	0.0782	20	
Cadmium [He]	4/9/24 13:06	0.104	0.00100	"	0.100		104	85-115	0.375	20	
Chromium [He]	4/9/24 13:06	0.104	0.00100	"	0.100		104	85-115	3.18	20	
Cobalt [He]	4/9/24 13:06	0.106	0.00100	"	0.100		106	85-115	4.31	20	
Iron [He]	4/9/24 13:06	0.105	0.0250	"	0.100		105	85-115	3.95	20	
Lead [He]	4/9/24 13:06	0.102	0.00100	"	0.100		102	85-115	0.730	20	
Manganese [He]	4/9/24 13:06	0.103	0.00100	"	0.100		103	85-115	3.41	20	
Molybdenum [He]	4/9/24 13:06	0.102	0.00100	"	0.100		102	85-115	1.43	20	
Nickel [He]	4/9/24 13:06	0.107	0.00100	"	0.100		107	85-115	4.10	20	
Selenium [He]	4/9/24 13:06	0.097	0.00200	"	0.100		96.5	85-115	1.07	20	
Selenium [NG]	4/9/24 13:06	0.103	0.00500	"	0.100		103	85-115	2.73	20	CC-03
Thallium [He]	4/9/24 13:06	0.103	0.00100	"	0.100		103	85-115	1.06	20	
Matrix Spike (4D05022-MS1)			**Source: 2404107-03**								
Antimony [He]	4/9/24 13:38	0.106	0.00200	mg/L	0.100	ND	106	70-130			
Arsenic [He]	4/9/24 13:38	0.107	0.00200	"	0.100	0.007	101	70-130			
Arsenic [NG]	4/9/24 13:38	0.103	0.00200	"	0.100	0.001	101	70-130			B-09
Barium [He]	4/9/24 13:38	0.133	0.00100	"	0.100	0.031	102	70-130			
Beryllium [He]	4/9/24 13:38	0.094	0.00100	"	0.100	0.0009	92.7	70-130			
Cadmium [He]	4/9/24 13:38	0.096	0.00100	"	0.100	0.0003	95.3	70-130			
Chromium [He]	4/9/24 13:38	0.097	0.00100	"	0.100	0.002	95.3	70-130			
Cobalt [He]	4/9/24 13:38	0.126	0.00100	"	0.100	0.032	93.6	70-130			
Iron [He]	4/9/24 13:38	1.03	0.0250	"	0.100	0.940	89.7	70-130			
Lead [He]	4/9/24 13:38	0.101	0.00100	"	0.100	0.001	99.6	70-130			
Manganese [He]	4/9/24 13:38	3.42	0.00100	"	0.100	3.40	19.4	70-130			
Molybdenum [He]	4/9/24 13:38	0.108	0.00100	"	0.100	0.0005	107	70-130			
Nickel [He]	4/9/24 13:38	0.100	0.00100	"	0.100	0.011	89.2	70-130			
Selenium [He]	4/9/24 13:38	0.168	0.00200	"	0.100	0.064	104	70-130			
Selenium [NG]	4/9/24 13:38	0.119	0.00500	"	0.100	0.010	109	70-130			CC-03
Thallium [He]	4/9/24 13:38	0.103	0.00100	"	0.100	0.0004	102	70-130			

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Metals by EPA 200 Series Methods ICP-MS [Analysis Mode] - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D05022 - EPA 200.2 DCN 1017 Rev 10											
Matrix Spike Dup (4D05022-MSD1)			**Source: 2404107-03**								
Antimony [He]	4/9/24 13:44	0.108	0.00200	mg/L	0.100	ND	108	70-130	1.34	20	
Arsenic [NG]	4/9/24 13:44	0.104	0.00200	"	0.100	0.001	102	70-130	1.05	20	B-09
Arsenic [He]	4/9/24 13:44	0.109	0.00200	"	0.100	0.007	103	70-130	1.96	20	
Barium [He]	4/9/24 13:44	0.136	0.00100	"	0.100	0.031	105	70-130	1.75	20	
Beryllium [He]	4/9/24 13:44	0.093	0.00100	"	0.100	0.0009	91.9	70-130	0.804	20	
Cadmium [He]	4/9/24 13:44	0.097	0.00100	"	0.100	0.0003	96.8	70-130	1.62	20	
Chromium [He]	4/9/24 13:44	0.096	0.00100	"	0.100	0.002	94.6	70-130	0.765	20	
Cobalt [He]	4/9/24 13:44	0.125	0.00100	"	0.100	0.032	93.3	70-130	0.256	20	
Iron [He]	4/9/24 13:44	1.02	0.0250	"	0.100	0.940	77.6	70-130	1.18	20	
Lead [He]	4/9/24 13:44	0.102	0.00100	"	0.100	0.001	101	70-130	0.864	20	
Manganese [He]	4/9/24 13:44	3.41	0.00100	"	0.100	3.40	15.7	70-130	0.109	20	
Molybdenum [He]	4/9/24 13:44	0.111	0.00100	"	0.100	0.0005	110	70-130	3.09	20	
Nickel [He]	4/9/24 13:44	0.102	0.00100	"	0.100	0.011	91.0	70-130	1.83	20	
Selenium [NG]	4/9/24 13:44	0.125	0.00500	"	0.100	0.010	115	70-130	4.82	20	CC-03
Selenium [He]	4/9/24 13:44	0.181	0.00200	"	0.100	0.064	117	70-130	7.30	20	
Thallium [He]	4/9/24 13:44	0.103	0.00100	"	0.100	0.0004	103	70-130	0.188	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: [none]
Project Manager: Ken Ruckstuhl

Reported:
06/20/2024 08:23

Mercury by EPA 200 Series Methods CVAAS - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4D09044 - EPA 245.1 DCN 1017 Rev 10											
Blank (4D09044-BLK1)											
Mercury	4/17/24 14:22	ND	0.00200	mg/L							
LCS (4D09044-BS1)											
Mercury	4/17/24 14:29	0.005	0.00200	mg/L	0.00500		104	85-115			
LCS Dup (4D09044-BSD1)											
Mercury	4/17/24 14:37	0.005	0.00200	mg/L	0.00500		106	85-115	1.90	20	
Matrix Spike (4D09044-MS1)			**Source: 2404114-01**								
Mercury	4/17/24 15:09	0.004	0.00200	mg/L	0.00500	ND	80.0	70-130			
Matrix Spike Dup (4D09044-MSD1)			**Source: 2404114-01**								
Mercury	4/17/24 15:13	0.004	0.00200	mg/L	0.00500	ND	86.0	70-130	7.23	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: [none]	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	06/20/2024 08:23

Certified Analyses Included in this Report

Analyte	Certification Code
ASTM D 512-12C in Water	
Chloride	C01,C02
EPA 200.7 Rev 4.4 in Water	
Aluminum 394.401 [Radial]	C01,C02
Aluminum 396.152 [Radial]	C01,C02
Antimony 206.833 [Axial]	C01,C02
Arsenic 193.759 [Axial]	C01,C02
Barium 455.403 [Radial]	C01,C02
Barium 493.409 [Radial]	C01,C02
Beryllium 313.042 [Axial]	C01,C02
Boron 249.773 [Radial]	C01,C02
Cadmium 228.802 [Axial]	C01,C02
Calcium 315.887 [Radial]	C01,C02
Chromium 283.563 [Axial]	C01,C02
Cobalt 228.616 [Axial]	C01,C02
Copper 324.754 [Axial]	C01,C02
Iron 259.940 [Axial]	C01,C02
Iron 259.940 [Radial]	C01,C02
Lead 220.353 [Axial]	C01,C02
Magnesium 285.213 [Radial]	C01,C02
Manganese 257.610 [Axial]	C01,C02
Molybdenum 202.030 [Axial]	C01,C02
Nickel 231.604 [Axial]	C01,C02
Potassium 766.490 [Radial]	C01,C02
Phosphorus 178.284 [Axial]	C01,C02
Phosphorus 178.284 [Radial]	C01,C02
Selenium 196.090 [Axial]	C01,C02
Silver 328.068 [Axial]	C01,C02
Sodium 589.592 [Axial]	C01,C02
Sodium 589.592 [Radial]	C01,C02
Strontium 346.446 [Radial]	C01,C02
Strontium 421.552 [Radial]	C01,C02
Thallium 190.856 [Axial]	C01,C02
Vanadium 309.311 [Axial]	C01,C02
Zinc 213.856 [Axial]	C01,C02
EPA 200.8 Rev 5.4 in Water	
Aluminum [He]	C01,C02
Antimony [He]	C01,C02
Antimony [NG]	C01,C02

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: [none]	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	06/20/2024 08:23

Arsenic [He]	C01,C02
Arsenic [NG]	C01,C02
Barium [He]	C01,C02
Beryllium [He]	C01,C02
Cadmium [He]	C01,C02
Cadmium [NG]	C01,C02
Chromium [He]	C01,C02
Cobalt [He]	C01,C02
Copper [He]	C01,C02
Copper [NG]	C01,C02
Iron [He]	C01,C02
Lead [He]	C01,C02
Lead [NG]	C01,C02
Manganese [He]	C01,C02
Molybdenum [He]	C01,C02
Nickel [He]	C01,C02
Selenium [He]	C01,C02
Selenium [NG]	C01,C02
Silver [He]	C01,C02
Silver [NG]	C01,C02
Strontium [He]	C01,C02
Thallium [He]	C01,C02
Vanadium [He]	C01,C02
Zinc [He]	C01,C02

EPA 245.1 Rev 3.0 in Water

Mercury	C01,C02

SM 2320B 2011 in Water

Total Alkalinity	C01,C02

SM 2540 C-2015 in Water

Total Dissolved Solids	C01,C02

SM 4500-SO42 E 2011 in Water

Sulfate as SO4	C01,C02

****Only compounds included in this list are associated with accredited analyses****

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: [none]	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	06/20/2024 08:23

Laboratory Accreditations/Certifications

Code	Description	Number	Expires
C01	LA Environmental Lab Accreditation Program	01960	06/30/2024
C02	The NELAC Institute (NELAP)	TNI01397	06/30/2024
C03	MS Dept of Health (Drinking Water Microbiology)	MS00021	12/31/2024
C04	MS Dept of Health (Drinking Water Chemistry)	MS00021	12/31/2024
C05	MS DEQ Lead Firm Certification	PBF-00000028	03/31/2024
C06	MSDEQ Asbestos Inspector : C.D. Bingham	ABI-00001348	02/09/2024
C07	MSDEQ Air Monitor : C.D. Bingham	AM-011572	02/10/2024
C08	MSDEQ Asbestos Inspector: C. W. Meins	ABI-00001821	09/09/2022
C09	MSDEQ Air Monitor : C.W. Meins	AM-011189	02/10/2024
C10	ADEM (Drinking Water Microbiology)	43500	12/31/2024
C11	ADEM (Drinking Water Chemistry)	43500	12/31/2024
C14	MSDEQ Lead Paint Inspector : C.D. Bingham	PBI-00003690	02/07/2024
C15	MSDEQ Lead Paint Inspector : C.W. Meins	PBI-00001740	02/07/2024

Report Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the minimum reporting limit
NR	Not Reported
RPD	Relative Percent Difference
ICV	Initial Calibration Verfiication
CCV	Continuing Calibration Verification Standard
SSV	Secondary Source Verfication Standard
LCS	Lab Control Spike - Lab matrix prepared with known concentration of analyte/s of interest analyzed by method.
MS	Matrix Spike - Sample prepared with known concentration of analyte/s of interest analyzed by method.
MSD	Matrix Spike Duplicate - Duplicate sample prepared with known concentration of anlayte/s of interest analyzed by method.
MRL	Minimum Reporting Limit
%REC	Percentage Recovery of known concentration added to matrix
Batch	Group of samples prepared for analysis not to exceed 20 samples.
Matrix	Material containing analyte/s of interest
Surrogate	Analyte added to sample to determine extraction efficiency of method.

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: [none]	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	06/20/2024 08:23

Analyst Initials Key

FullName	Initials
Alexandria S Windham	ASW
Charles L Vorhoff	CLV
Christa R Gray	CRG
Dortha L. Wells	DLW
Sarah E. Tomek	SET
Samantha C. Hall	SCH
Teresa Meins	TKM
Tina Tomek	TPT

MICRO-METHODS LABORATORY, INC.
PO Box 1410, Ocean Springs, MS 39566-1410
(228) 875-6420 FAX (228) 875-6423
www.micromethodslab.com

Chain of Custody Record

Lab ID# MS00021
LELAP ID # 01960
TNI ID # TNI01397

Print Form

M-M Lab WO # 2404107

Company Name:	EMS
Address:	7350 US Hwy 98
City:	Hattiesburg State: MS Zip: 39402
Phone:	601 544 3674
Fax:	601 544 0504
Project Manager:	Ken Ruckstuhl
Purchase Order #:	
Email Address :	kruckstuhl@env-mgt.com
Sampler Name Printed:	Alan Niven
Sampler Name Signed:	

Turn Around Time & Reporting

Our normal turn around time is 10 working days

_x_Normal __Next Day* __2nd Day* __Other*_____

*All rush order requests must be prior approved.

__Phone __Mail __Fax __Email

QC Level: Level 1 ☐ Level 2 ☐ Level 3 ☐

Project Name:	Cooperative Energy CCR Semiannual
Project #:	SOU2-23-001

List Analyses Requested

Sample Identification	Sampling Date/Time	Matrix Code	# of Containers	Grab (G) or Composite (C)	Metals (see below)	Chloride/sulfate	Total dissolved solids	Alkalinity, Total	Alkalinity, Bicarbonate	Alkalinity Carbonate	Fluoride	Radium 226/228
Preservative:												
MW-2	4-2-24 10:15	W	5	G	X	X	X	X	X	X	X	X
MW-3	4-3-24 8:40	W	5	G	X	X	X	X	X	X	X	X
MW-4	4-2-24 16:10	W	10	G	X	X	X	X	X	X	X	X
MW-5	4-2-24 15:00	W	5	G	X	X	X	X	X	X	X	X
MW-6	4-2-24 13:00	W	5	G	X	X	X	X	X	X	X	X
MW-10	4-2-24 11:35	W	5	G	X	X	X	X	X	X	X	X
BD-1	4-3-24 7:30	W	5	G	X	X	X	X	X	X	X	X

Field Testing

ID# Field Test	ID# Field Test	ID# Field Test	ID# Field Test

Matrix:
W = Water
DW = Drinking Water
S = Solid
SO = Soil
SE = Sediment
L = Liquid
A = Air
O = Oil
SL = Sludge

Preservation:
1= H2SO4
2= H3PO4
3=NaOH
4=ZnC4H10O6
5=ZnC4H10O6 & NaOH
6=HNO3
7=Na2S2O3
8=HCl
9=NaHSO4

Received on Ice? Y / N Thermometer# 5 Cooler #_____ **Receipt Temp Corrected(°C)**

Date & Time _____ By: _____ Sample_____ Blank X Cooler _____

All Temps are Corrected Values

	Printed Name	Signature	Company	Date	Time
Relinquished by	Alan Niven		EMS	4-3-24	11:14
Received by	Sarah Tomek		MM	4/3/24	1114
Relinquished by					
Received by					
Relinquished by					
Received by					

Notes: cooler # 1127 1.1°c
cooler# 1126 0.6°c
See Attached Work Order:

Metals - antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, thallium, mercury, iron, magnesium, manganese, sodium, potassium

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

April 26, 2024

Tina Tomek
Micro-Methods Lab
6500 Sunplex Drive
Ocean Springs, MS 39564

RE: Project: 2404107
Pace Project No.: 30675880

Dear Tina Tomek:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Justin P. Horn
justin.horn@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Accounts Payable, Micro-Methods Lab

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2404107
Pace Project No.: 30675880

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572023-03
New Hampshire/TNI Certification #: 297622
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2404107
Pace Project No.: 30675880

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30675880001	**2404107-01**	Water	04/02/24 10:15	04/11/24 10:00
30675880002	**2404107-02**	Water	04/03/24 08:40	04/11/24 10:00
30675880003	**2404107-03**	Water	04/02/24 16:10	04/11/24 10:00
30675880004	**2404107-04**	Water	04/02/24 15:00	04/11/24 10:00
30675880005	**2404107-05**	Water	04/02/24 13:00	04/11/24 10:00
30675880006	**2404107-06**	Water	04/02/24 11:35	04/11/24 10:00
30675880007	**2404107-07**	Water	04/03/24 07:30	04/11/24 10:00

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 2404107
Pace Project No.: 30675880

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30675880001	**2404107-01**	EPA 903.1	CLM	1
		EPA 904.0	VAL	1
		Total Radium Calculation	JAL	1
30675880002	**2404107-02**	EPA 903.1	CLM	1
		EPA 904.0	VAL	1
		Total Radium Calculation	JAL	1
30675880003	**2404107-03**	EPA 903.1	CLM	1
		EPA 904.0	VAL	1
		Total Radium Calculation	JAL	1
30675880004	**2404107-04**	EPA 903.1	CLM	1
		EPA 904.0	VAL	1
		Total Radium Calculation	JAL	1
30675880005	**2404107-05**	EPA 903.1	CLM	1
		EPA 904.0	VAL	1
		Total Radium Calculation	JAL	1
30675880006	**2404107-06**	EPA 903.1	CLM	1
		EPA 904.0	VAL	1
		Total Radium Calculation	JAL	1
30675880007	**2404107-07**	EPA 903.1	CLM	1
		EPA 904.0	VAL	1
		Total Radium Calculation	JAL	1

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2404107
Pace Project No.: 30675880

Sample: 2404107-01 **Lab ID: 30675880001** Collected: 04/02/24 10:15 Received: 04/11/24 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**-0.111 ± 0.407 (0.880) C:NA T:89%**	pCi/L	04/25/24 13:41	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.02 ± 0.515 (0.919) C:75% T:80%**	pCi/L	04/22/24 12:22	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.02 ± 0.922 (1.80)**	pCi/L	04/26/24 09:33	7440-14-4	

Sample: 2404107-02 **Lab ID: 30675880002** Collected: 04/03/24 08:40 Received: 04/11/24 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**-0.0623 ± 0.634 (1.25) C:NA T:86%**	pCi/L	04/25/24 13:41	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.33 ± 0.552 (0.901) C:79% T:82%**	pCi/L	04/22/24 12:22	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.33 ± 1.19 (2.15)**	pCi/L	04/26/24 09:33	7440-14-4	

Sample: 2404107-03 **Lab ID: 30675880003** Collected: 04/02/24 16:10 Received: 04/11/24 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.000 ± 0.786 (1.51) C:NA T:84%**	pCi/L	04/25/24 13:53	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.953 ± 0.533 (0.995) C:85% T:79%**	pCi/L	04/22/24 15:48	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.953 ± 1.32 (2.51)**	pCi/L	04/26/24 09:33	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2404107
Pace Project No.: 30675880

Sample: 2404107-04 **Lab ID: 30675880004** Collected: 04/02/24 15:00 Received: 04/11/24 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0574 ± 0.298 (0.618) C:NA T:86%**	pCi/L	04/25/24 13:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.456 ± 0.476 (0.995) C:80% T:80%**	pCi/L	04/22/24 15:48	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.513 ± 0.774 (1.61)**	pCi/L	04/26/24 09:33	7440-14-4	

Sample: 2404107-05 **Lab ID: 30675880005** Collected: 04/02/24 13:00 Received: 04/11/24 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.856 ± 0.541 (0.611) C:NA T:86%**	pCi/L	04/25/24 13:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.486 ± 0.423 (0.859) C:83% T:85%**	pCi/L	04/22/24 15:48	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.34 ± 0.964 (1.47)**	pCi/L	04/26/24 09:33	7440-14-4	

Sample: 2404107-06 **Lab ID: 30675880006** Collected: 04/02/24 11:35 Received: 04/11/24 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.372 (0.787) C:NA T:85%**	pCi/L	04/25/24 13:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.78 ± 0.633 (0.938) C:83% T:84%**	pCi/L	04/22/24 15:48	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.78 ± 1.01 (1.73)**	pCi/L	04/26/24 09:33	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2404107
Pace Project No.: 30675880

Sample: 2404107-07 **Lab ID: 30675880007** Collected: 04/03/24 07:30 Received: 04/11/24 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.278 ± 0.546 (0.968) C:NA T:89%**	pCi/L	04/25/24 13:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.99 ± 0.648 (0.877) C:84% T:76%**	pCi/L	04/22/24 15:44	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**2.27 ± 1.19 (1.85)**	pCi/L	04/26/24 09:33	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2404107
Pace Project No.: 30675880

QC Batch: 661915 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30675880001, 30675880002, 30675880003, 30675880004, 30675880005, 30675880006, 30675880007

METHOD BLANK: 3223763 Matrix: Water
Associated Lab Samples: 30675880001, 30675880002, 30675880003, 30675880004, 30675880005, 30675880006, 30675880007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0419 ± 0.218 (0.451) C:NA T:99%	pCi/L	04/25/24 13:28	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2404107
Pace Project No.: 30675880

QC Batch: 661918 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30675880001, 30675880002, 30675880003, 30675880004, 30675880005, 30675880006, 30675880007

METHOD BLANK: 3223769 Matrix: Water
Associated Lab Samples: 30675880001, 30675880002, 30675880003, 30675880004, 30675880005, 30675880006, 30675880007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.238 ± 0.285 (0.600) C:82% T:86%	pCi/L	04/22/24 11:39	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2404107
Pace Project No.: 30675880

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

MICRO-METHODS LABORATORY, INC.

WO# : 30675880 T

30675880

Sending Laboratory:

Micro-Methods Laboratory, Inc.
6500 Sunplex Drive
Ocean Springs, MS 39564
Phone: 228.875.6420
Fax: 228.875.6423

Project Manager: Teresa Meins

Subcontracted Laboratory:

Pace Analytical-7
1638 Roseytown Rd. Suites 2, 3, 4
Greensburg, PA 15601
Phone: (724) 850-5600
Fax: -

Received by Pace Greensburg
Therm ID — Corr Factor +/- —
Receipt Temp —
Corrected Temp —
Correct Preservation (Y)N

Work Order: 2404107

Analysis	Due	Expires	Comments
Sample ID: 2404107-01 ***Water Sampled: 04/02/2024 10:15 Sample Name: MW-2***			
Radium,Total 226 & 228 by EPA 903.1 & 9C	04/11/2024	04/30/2024 10:15	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			001
Sample ID: 2404107-02 ***Water Sampled: 04/03/2024 08:40 Sample Name: MW-3***			
Radium,Total 226 & 228 by EPA 903.1 & 9C	04/11/2024	05/01/2024 08:40	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			002
Sample ID: 2404107-03 ***Water Sampled: 04/02/2024 16:10 Sample Name: MW-4***			
Radium,Total 226 & 228 by EPA 903.1 & 9C	04/11/2024	04/30/2024 16:10	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C) 1000mL Plastic w/HNO3 (G) 1000mL Plastic w/HNO3 (H)			003
Sample ID: 2404107-04 ***Water Sampled: 04/02/2024 15:00 Sample Name: MW-5***			
Radium,Total 226 & 228 by EPA 903.1 & 9C	04/11/2024	04/30/2024 15:00	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			004
Sample ID: 2404107-05 ***Water Sampled: 04/02/2024 13:00 Sample Name: MW-6***			
Radium,Total 226 & 228 by EPA 903.1 & 9C	04/11/2024	04/30/2024 13:00	005

Released By	Date	Received By	Date
Sarah Jarmek	4/8/24 1630	UPS	4/8/24 1630
UPS		[signature]	4-1-24 1000

MICRO-METHODS LABORATORY, INC.

SUBCONTRACT ORDER (Continued)

Work Order: 2404107 (Continued)

Analysis	Due	Expires	Comments
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			
Sample ID: 2404107-06 ***Water Sampled: 04/02/2024 11:35 Sample Name: MW-10***			
Radium,Total 226 & 228 by EPA 903.1 & 9C	04/11/2024	04/30/2024 11:35	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			006
Sample ID: 2404107-07 ***Water Sampled: 04/03/2024 07:30 Sample Name: BD-1***			
Radium,Total 226 & 228 by EPA 903.1 & 9C	04/11/2024	05/01/2024 07:30	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			007

WO#: 30675880

PM: JPH Due Date: 05/02/24

CLIENT: MICROMETHOD

Received by Pace Greensburg
Therm ID___ Corr Factor +/-___
Receipt Temp_____
Corrected Temp___
Correct Preservation Y/N

EDL
4/11/24

Sarah Jomek 4/8/24 1630		UPS 4/8/24 1630	
Released By	Date	Received By	Date
UPS		Megan Burton	4-11-24 1000
Released By	Date	Received By	Date
Released By	Date	Received By	Date
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Client Micro-Methods Lab

Site 2404107

Page _____ of _____

Profile/EZ Login Number 14460

Notes _____

Sample Line Item	Matrix	Amber Glass					Plastic								Vials					Other									
		AG1H	AG3S	AG3U	AG5U	AG5T	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	GCUB	GJN	12GN	GN	BG1U		
001	WT						2																					
002	↓						2																					
003							4																					
004							2																					
005							2																					
006							2																					
007	↓						2																					

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unpreserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosulfate
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass NA Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserved
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
[illegible]U	250mL amber glass unpreserved	GN	General

Plastic/Misc.

GCUB	1 gallon cubitainer	EZI	5g Encore
12GN	1/2 gallon cubitainer	[illegible]	Kit Volatile Solid
SP5T	120mL c[illegible]		
BP1N	1L plasti[illegible]		
BP1U	1L plasti[illegible]		
BP3S	250mL p[illegible]		
BP3N	250mL p[illegible]		
BP3U	250mL plastic unpreserved	OL	Non-Aq Liquid
BP3C	250mL plastic NAOH	WP	Wipe
BP2S	500mL plastic H2SO4		
BP2U	500mL plastic unpreserved		

WO#: 30675880

PM: JPH **Due Date: 05/02/24**

CLIENT: MICROMETHOD

ENV-FRM-GBUR-0088 v07_Sample Condition Upon Receip

Effective Date: 01/04/2024

WO# : 30675880

PM: JPH Due Date: 05/02/24

CLIENT: MICROMETHOD

Client Name: Micro-Methods Lab

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other

Tracking Number: 1Z 353 063 03 6979 2210

Initial / Date

Examined By: EJY 4.11.24

Labeled By: EJY 4.11.24

Temped By: —

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No Seals Intact: ☐ Yes ☑ No

Thermometer Used: — Type of Ice: Wet Blue (None)

Cooler Temperature: Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

Comments:	Yes	No	NA	pH paper Lot# 10D2931 / D.P.D. Residual Chlorine Lot # —
Chain of Custody Present	✓			1.
Chain of Custody Filled Out:	✓			2.
-Were client corrections present on COC		✓		
Chain of Custody Relinquished	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC:	✓			5.
-Includes date/time/ID Matrix: WT				
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered:			✓	12.
Hex Cr Aqueous samples field filtered:			✓	13.
Organic Samples checked for dechlorination			✓	14:
Filtered volume received for dissolved tests:			✓	15:
All containers checked for preservation:	✓			16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix				pH<2
All containers meet method preservation requirements:	✓			Initial when completed EJY / Date/Time of Preservation / Lot# of added Preservative
8260C/D: Headspace in VOA Vials (> 6mm)			✓	17.
624.1: Headspace in VOA Vials (0mm)			✓	18.
Radon: Headspace in RAD Vials (0mm)			✓	19.
Trip Blank Present:			✓	Trip blank custody seal present? YES or NO
Rad Samples Screened <.05 mrem/hr.	✓			Initial when completed MKP / Date: 4-11-24 / Survey Meter SN: 2501438

Comments:

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office.
PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

Well	Date	Time	Depth to Water	Note
MW-2	9-16-24	10:49	13.21	
MW-3	9-16-24	15:15	6.58	
MW-4	9-16-24	15:11	10,27	
MW-5	9-16-24	13:53	7.91	
MW-6	9-16-24	12:30	4.18	
MW-10	9-16-24	~~12:30~~ 9:35	~~4.18~~ 12.19	
MW-11	9-16-24	15:05	8,23	
MW-12	9-16-24	15:08	13.11	
Creek Level	9-16-24	15:39	staff gauge	

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-02

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	9-16-24 10:49	Sampling date/time	9-16-24 11:40
Method of evacuation	Peristaltic	Method of sampling	Low flow
Top of casing to water	13.21	Gallons per well volume	
Top of casing to bottom	22.41	Total gallons evacuated	2.0 gal
Water level after evac	13.35		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
0 11:06	23.3	0.67	444.7	4.88	224.4	4.51	Clear
0.5	23.1	0.35	443.5	4.70	229.9	3.33	"
0.75	23.0	0.28	444.6	4.58	228.3	3.14	"
1.0	22.9	0.21	455.4	4.46	228.7	4.56	"
1.25	22.9	0.19	477.7	4.39	228.3	2.56	"
1.5	22.9	0.17	489.1	4.36	227.3	3.11	"
1.75	23.0	0.14	509	4.33	225.8	3.51	"

General Information

Weather Condition: Overcast light rain

Sample Characteristics:

Containers/Amounts: (2) 1L for Radiological, (1) L for WetLab, (1) 500mL Metal, (1) 125mL for Alkalinity

Recommend/Observations:

Sampler/Collector:

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]				
1/2"=0.0205	1"=0.041	2"=0.164 SS	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-03

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	9-17-24 8:45	Sampling date/time	9-17-24 9:35
Method of evacuation	Peristaltic pump	Method of sampling	Low Flow
Top of casing to water	5.61	Gallons per well volume	
Top of casing to bottom	17.72	Total gallons evacuated	1.5 gal
Water level after evac	5.75		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
0	25.5	0.81	2251	5.33	-37.4	16.15	orange nodules
0.25	25.5	0.42	2141	5.29	-72.8	15.76	"
0.5	25.5	0.27	2087	5.26	-91.7	11.09	"
0.75	25.6	0.24	2085	5.27	-98.2	8.53	"
1.0	25.7	0.23	2084	5.30	-103.6	6.79	"
1.25	25.7	0.19	2086	5.32	-109.9	7.98	"

General Information

Weather Condition: Overcast

Sample Characteristics:

Containers/Amounts: (4) 1L for Radiological (2) 1L for Wetlab (3) 500mL for Metals (2) 125 mL for Alkalinity

Recommend/Observations: * Blind duplicate (BD-1 9-17-24 8:45)

odor sample water

Sampler/Collector: Alan Niven

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164 SS	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-04

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	9-17-24 10:30	Sampling date/time	9-17-24 11:20
Method of evacuation	Peristaltic pump	Method of sampling	Low flow
Top of casing to water	10.26	Gallons per well volume	
Top of casing to bottom	22.72	Total gallons evacuated	1.5 gal
Water level after evac	10.32		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
0	25.4	0.45	2530	4.78	130.2	4.82	clear
0.25	25.4	0.33	2572	4.78	135.6	5.15	1
0.50	25.4	0.26	2601	4.78	141.3	5.39	1
0.75	25.4	0.23	2624	4.79	146.2	3.67	1
1.0	25.3	0.21	2627	4.80	148.3	3.63	1
1.25	25.7	0.19	2644	4.82	152.8	3.11	1

General Information

Weather Condition: overcast

Sample Characteristics:

Containers/Amounts: (4) 1L for Radiological (2) 1L for Wetlab (2) 500mL for Metals (2) 125mL for Alkalinity

Recommend/Observations:

Sampler/Collector: [signature]

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-05

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	9-16-24 13:53	Sampling date/time	9-16-24 14:40
Method of evacuation	Peristaltic pump	Method of sampling	Low flow
Top of casing to water	7.91	Gallons per well volume	
Top of casing to bottom	20.02	Total gallons evacuated	1.65 gal
Water level after evac	7.98		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
0	25.8	0.76	3760	6.13	44.7	7.75	clear
0.25	25.7	0.52	3776	6.13	37.3	4.11	"
0.5	25.7	0.35	3762	6.14	27.4	2.66	"
0.75	25.4	0.24	3683	6.14	18.3	2.60	"
1.0	25.6	0.19	3624	6.15	17.2	2.75	"
1.25	25.6	0.18	3609	6.15	17.6	3.34	"
1.5	25.6	0.16	3560	6.15	16.7	3.20	"

General Information

Weather Condition: overcast

Sample Characteristics:

Containers/Amounts: (2) 1L for Radiological, (1) 1L for Wetlab, (1) 500mL for Metals, (1) 125mL for Alkalinity

Recommend/Observations:

Sampler/Collector:

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]				
1/2"=0.0205	1"=0.041	2"=0.164	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-06

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	9-16-24 12:30	Sampling date/time	9-16-24 13:20
Method of evacuation	Peristaltic pump	Method of sampling	Low flow
Top of casing to water	4.18	Gallons per well volume	
Top of casing to bottom	17.76	Total gallons evacuated	2.25 gal
Water level after evac	4.51		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
0	25.3	1.08	277	4.97	215.6	8.74	Clear
0.25	24.9	0.59	252.6	4.83	212.5	5.07	"
0.5	24.7	0.51	244.9	4.71	210.8	6.33	"
0.75	24.5	0.52	244.5	4.66	209.7	7.93	"
1.0	24.6	0.53	244.5	4.65	209.1	11.30	"
1.25	24.6	0.54	244.0	4.65	208.2	19.94	"
1.5	24.7	0.55	243.4	4.65	208.0	22.23	"
1.75	24.8	0.55	243.7	4.64	207.9	23.58	"
2.0	24.9	0.56	243.9	4.64	207.7	25.64	"
2.25	24.9	0.56	243.6	4.64	207.6	27.20	"

General Information

Weather Condition: Overcast

Sample Characteristics:

Containers/Amounts: (2) 1L for Radiological, (1) 1L for Wetlab, (1) 500mL for Metals (1) 125mL for Alkalinity

Recommend/Observations:

Sampler/Collector: Allan Niven

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

Groundwater Sampling Field Log

Site: COEN Well Number: MW-10

Collector/Operator: A. Niven

Monitoring Well Information

Evacuation date/time	9-16-24 9:35	Sampling date/time	9-16-24 10:15
Method of evacuation	Peristaltic pump	Method of sampling	Low flow
Top of casing to water	12.19	Gallons per well volume	
Top of casing to bottom	22.45	Total gallons evacuated	1.591
Water level after evac	12.34		

Sample Data

	Temp [°C]	DO [mg/l]	Conductivity [µs/cm]	pH	ORP	NTU's	Appearance
0	22.0	0.82	1150	3.80	239.0	2.25	clear
0.25	21.8	0.47	1127	3.80	210.6	2.45	"
0.5	21.8	0.32	1115	3.80	178.4	3.26	"
0.75	22.0	0.23	1109	3.80	166.0	4.65	"
1.0	22.1	0.21	1102	3.81	159.7	6.86	"
1.5	22.0	0.18	1097	3.81	158.8	8.07	"

General Information

Weather Condition: overcast

Sample Characteristics:

Containers/Amounts: (2) 1L for Radiological, (1) 1L for wetlab (1) 250mL metals (1) 125mL for Alkalinity

Recommend/Observations:

Sampler/Collector: [signature]

Stabilization recommendations: Three successive readings within +/- 0.1 for pH, +/- 3% for conductivity, +/- 10 mV for ORP, and +/- 10% for turbidity and DO. *these are rough estimates*

Well Casing Volumes[gal/ft]

1/2"=0.0205	1"=0.041	2"=0.164 PVC	3"=0.367	6"=1.469
3/4"=0.03075	1 1/2"=0.100	2 1/2"=0.255	4"=0.656	8"=2.611

Mailing Address:
PO Box 1410
Ocean Springs, MS
39566-1410

6500 Sunplex Drive
Ocean Springs, MS 39564
228.875.6420 Phone
228.875.6423 Fax

October 14, 2024

Ken Ruckstuhl

Work Order # : 2409298

Purchase Order #:

Environmental Management Services
PO Box 15369
Hattiesburg, MS 39404-5369

RE: Cooperative Energy CCR Semiannual

Enclosed are Micro-Methods Laboratory, Inc. results of analyses performed on samples received 09/17/2024 14:07. If you have any questions concerning this report, please feel free to contact the office.

Sincerely,

Mitch Spicer

Lab Director
Micro-Methods Laboratory, Inc.

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date/Time Sampled	Sampled by	Date/Time Received
MW-2	2409298-01	Water	09/16/2024 11:40	*Alan Niven*	09/17/2024 14:07
MW-3	2409298-02	Water	09/17/2024 09:35	*Alan Niven*	09/17/2024 14:07
MW-4	2409298-03	Water	09/17/2024 11:20	*Alan Niven*	09/17/2024 14:07
MW-5	2409298-04	Water	09/16/2024 14:40	*Alan Niven*	09/17/2024 14:07
MW-6	2409298-05	Water	09/16/2024 13:20	*Alan Niven*	09/17/2024 14:07
MW-10	2409298-06	Water	09/16/2024 10:15	*Alan Niven*	09/17/2024 14:07
BD-1	2409298-07	Water	09/17/2024 08:45	*Alan Niven*	09/17/2024 14:07

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Sample Receipt Conditions

Date/Time Received: 9/17/2024 2:07:00PM
Received by: Sarah E. Tomek
Date/Time Logged: 9/17/2024 2:48:00PM
Cooler ID: #1126

Shipped by: Client Delivery
Submitted by: Alan Niven
Logged by: Sarah E. Tomek
Receipt Temperature: 0.4 °C

Cooler Custody Seals Present	No	*Received on Ice but Not Frozen*	Yes
Containers Intact	Yes	*No Ice, Short Trip*	No
COC/Labels Agree	Yes	*Obvious Contamination*	No
Labels Complete	Yes	*Rush to meet HT*	No
COC Complete	Yes	*Received within HT*	Yes
Volatile Vial Headspace >6mm	No	*Proper Containers for Analysis*	Yes
Field Sheet/Instructions Included	No	*Correct Preservation*	Yes
Samples Rejected/Documented in Log	No	*Adequate Sample for Analysis*	Yes
Temp Taken From Temp Blank	Yes	*Sample Custody Seals Present*	No
Temp Taken From Sample Container	No	*Samples Missing from COC/Cooler*	No
Temp Taken From Cooler	No		
COC meets acceptance criteria	Yes		

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Cooler ID: #1134

Receipt Temperature: -0.7 °C

Cooler Custody Seals Present	No	*Received on Ice but Not Frozen*	Yes
Containers Intact	Yes	*No Ice, Short Trip*	No
COC/Labels Agree	Yes	*Obvious Contamination*	No
Labels Complete	Yes	*Rush to meet HT*	No
COC Complete	Yes	*Received within HT*	Yes
Volatile Vial Headspace >6mm	No	*Proper Containers for Analysis*	Yes
Field Sheet/Instructions Included	No	*Correct Preservation*	Yes
Samples Rejected/Documented in Log	No	*Adequate Sample for Analysis*	Yes
Temp Taken From Temp Blank	Yes	*Sample Custody Seals Present*	No
Temp Taken From Sample Container	No	*Samples Missing from COC/Cooler*	No
Temp Taken From Cooler	No		
COC meets acceptance criteria	Yes		

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: SOU2-24-001	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	10/14/2024 12:02

CASE NARRATIVE SUMMARY

All reported results are within Micro-Methods Laboratory, Inc.defined laboratory quality control objectives unless detailed in narrative summary or identified as qualifications. NOTE: All results listed on this report are calculated on a wet weight basis (as received by the laboratory) unless otherwise noted in the analysis qualification sections.

Summary Comments:

Sample 2409298-06 pH is 3.99; below test required pH of 8.3, 4.3 and 4.1. Alkalinity, Carbonate and Bicarbonate. SM 2320B. RM

See attached results from Sub-Contract Laboratory

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: SOU2-24-001	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	10/14/2024 12:02

Total Metals-EPA 200.7 Rev 4.4

Qualifiers:

M2 MS/MSD Recovery below acceptable limit.

Calcium 315.887 [Radial], Iron 259.940 [Radial]
4I19053-MSD2, 4I19053-MSD1

Total Metals-EPA 200.8 Rev 5.4

Qualifiers:

IS-05 The internal standard(s) was below the acceptable criteria range. QC results within acceptable limits.

Lead [He], Thallium [He]
4I19047-MS1

M2 MS/MSD Recovery below acceptable limit.

Iron [He]
4I19047-MS1

Alkalinity, Bicarbonate as CaCO3-SM 2340 B-2021

Qualifiers:

SN See Case Narrative Summary

Bicarbonate Alkalinity, Carbonate Alkalinity, Total Alkalinity
2409298-06[MW-10]

Fluoride-SM 4500-F C-2021

Qualifiers:

M2 MS/MSD Recovery below acceptable limit.

Fluoride
4I23039-MS1, 4I23039-MSD1

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

MW-2

2409298-01 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Qualifiers
Classical Chemistry Parameters										
Chloride	**40.9**	1.00	mg/L	2.0	4I19029	CRG	09/18/2024 09:00	09/18/2024 19:29	SM 4110 B-2020	
Sulfate as SO4	**136**	50.0	"	10.0	"	CRG	"	09/18/2024 20:00	"	
Bicarbonate Alkalinity	ND	10.0	"	1.0	4I19037	RWM	09/18/2024 13:43	09/18/2024 16:30	SM 2340 B-2021	
Carbonate Alkalinity	ND	10.0	"	"	4I19039	RWM	"	09/18/2024 16:28	"	
Total Alkalinity	ND	10.0	"	"	4I19038	RWM	"	09/18/2024 16:30	"	
Fluoride	ND	0.50	"	"	4I23039	CDV	09/23/2024 12:03	09/23/2024 12:07	SM 4500-F C-2021	
Total Dissolved Solids	**289**	1	"	"	4I19059	DLW	09/19/2024 15:40	09/23/2024 00:00	SM 2540 C-2020	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**0.488**	0.050	mg/L	1.0	4I19053	CLV	09/19/2024 12:10	09/24/2024 13:14	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**31.2**	0.050	"	"	"	CLV	"	"	"	
Iron 259.940 [Radial]	ND	0.050	"	"	"	CLV	"	"	"	
Lithium 610.362 [Axial]	ND	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**19.3**	0.050	"	"	"	CLV	"	"	"	
Potassium 766.490 [Radial]	**1.30**	0.100	"	"	"	CLV	"	"	"	
Sodium 589.592 [Radial]	**12.9**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4I19047	SCH	09/19/2024 10:45	09/24/2024 13:17	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.0283**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0403**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00351**	0.00100	"	"	"	SCH	"	"	"	
Manganese [He]	**0.695**	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4I26027	CLV	09/24/2024 12:00	09/26/2024 12:29	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

MW-3

2409298-02 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Qualifiers
Classical Chemistry Parameters										
Chloride	**106**	5.00	mg/L	10.0	4I18053	CRG	09/17/2024 15:30	09/17/2024 18:04	SM 4110 B-2020	
Sulfate as SO4	**1640**	500	"	100.0	"	CRG	"	09/17/2024 18:35	"	
Bicarbonate Alkalinity	**82.0**	10.0	"	1.0	4I19037	RWM	09/18/2024 13:43	09/18/2024 16:30	SM 2340 B-2021	
Carbonate Alkalinity	ND	10.0	"	"	4I19039	RWM	"	09/18/2024 16:28	"	
Total Alkalinity	**85.0**	10.0	"	"	4I19038	RWM	"	09/18/2024 16:30	"	
Fluoride	ND	0.50	"	"	4I23039	CDV	09/23/2024 12:03	09/23/2024 12:07	SM 4500-F C-2021	
Total Dissolved Solids	**2640**	3	"	"	4I19059	DLW	09/19/2024 15:40	09/23/2024 00:00	SM 2540 C-2020	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**5.03**	0.050	mg/L	1.0	4I19053	CLV	09/19/2024 12:10	09/24/2024 13:18	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**411**	0.250	"	5.0	"	CLV	"	09/24/2024 14:46	"	
Iron 259.940 [Radial]	**3.33**	0.050	"	1.0	"	CLV	"	09/24/2024 13:18	"	
Lithium 610.362 [Axial]	**0.126**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**131**	0.250	"	5.0	"	CLV	"	09/24/2024 14:46	"	
Potassium 766.490 [Radial]	**71.4**	0.100	"	1.0	"	CLV	"	09/24/2024 13:18	"	
Sodium 589.592 [Radial]	**41.4**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4I19047	SCH	09/19/2024 10:45	09/24/2024 13:24	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.0368**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0185**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00679**	0.00100	"	"	"	SCH	"	"	"	
Manganese [He]	**2.17**	0.00500	"	5.0	"	SCH	"	09/24/2024 19:02	"	
Molybdenum [He]	ND	0.00500	"	1.0	"	SCH	"	09/24/2024 13:24	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4I26027	CLV	09/24/2024 12:00	09/26/2024 12:29	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

MW-4

2409298-03 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Qualifiers
Classical Chemistry Parameters										
Chloride	**136**	5.00	mg/L	10.0	4I18053	CRG	09/17/2024 15:30	09/17/2024 19:05	SM 4110 B-2020	
Sulfate as SO4	**1560**	500	"	100.0	"	CRG	"	09/17/2024 19:36	"	
Bicarbonate Alkalinity	**27.0**	10.0	"	1.0	4I19037	RWM	09/18/2024 13:43	09/18/2024 16:30	SM 2340 B-2021	
Carbonate Alkalinity	ND	10.0	"	"	4I19039	RWM	"	09/18/2024 16:28	"	
Total Alkalinity	**31.0**	10.0	"	"	4I19038	RWM	"	09/18/2024 16:30	"	
Fluoride	ND	0.50	"	"	4I23039	CDV	09/23/2024 12:03	09/23/2024 12:07	SM 4500-F C-2021	
Total Dissolved Solids	**2613**	3	"	"	4I19059	DLW	09/19/2024 15:40	09/23/2024 00:00	SM 2540 C-2020	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**8.44**	0.050	mg/L	1.0	4I19053	CLV	09/19/2024 12:10	09/24/2024 13:21	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**394**	0.250	"	5.0	"	CLV	"	09/24/2024 14:50	"	
Iron 259.940 [Radial]	**1.24**	0.050	"	1.0	"	CLV	"	09/24/2024 13:21	"	
Lithium 610.362 [Axial]	**0.119**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**146**	0.250	"	5.0	"	CLV	"	09/24/2024 14:50	"	
Potassium 766.490 [Radial]	**74.8**	0.100	"	1.0	"	CLV	"	09/24/2024 13:21	"	
Sodium 589.592 [Radial]	**57.8**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4I19047	SCH	09/19/2024 10:45	09/24/2024 13:30	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.0387**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0492**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00168**	0.00100	"	"	"	SCH	"	"	"	
Manganese [He]	**3.90**	0.00500	"	5.0	"	SCH	"	09/24/2024 19:08	"	
Molybdenum [He]	ND	0.00500	"	1.0	"	SCH	"	09/24/2024 13:30	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4I26027	CLV	09/24/2024 12:00	09/26/2024 12:29	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

MW-5

2409298-04 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Qualifiers
Classical Chemistry Parameters										
Chloride	**496**	10.0	mg/L	20.0	4I19029	CRG	09/18/2024 09:00	09/18/2024 20:31	SM 4110 B-2020	
Sulfate as SO4	**2230**	500	"	100.0	"	CRG	"	09/18/2024 21:02	"	
Bicarbonate Alkalinity	**464**	10.0	"	1.0	4I19037	RWM	09/18/2024 13:43	09/18/2024 16:30	SM 2340 B-2021	
Carbonate Alkalinity	ND	10.0	"	"	4I19039	RWM	"	09/18/2024 16:28	"	
Total Alkalinity	**470**	10.0	"	"	4I19038	RWM	"	09/18/2024 16:30	"	
Fluoride	ND	0.50	"	"	4I23039	CDV	09/23/2024 12:03	09/23/2024 12:07	SM 4500-F C-2021	
Total Dissolved Solids	**4863**	3	"	"	4I19059	DLW	09/19/2024 15:40	09/23/2024 00:00	SM 2540 C-2020	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**24.2**	0.250	mg/L	5.0	4I19053	CLV	09/19/2024 12:10	09/24/2024 14:57	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**554**	0.500	"	10.0	"	CLV	"	09/24/2024 15:43	"	
Iron 259.940 [Radial]	**2.90**	0.050	"	1.0	"	CLV	"	09/24/2024 13:32	"	
Lithium 610.362 [Axial]	**2.67**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**336**	0.500	"	10.0	"	CLV	"	09/24/2024 15:43	"	
Potassium 766.490 [Radial]	**170**	0.100	"	1.0	"	CLV	"	09/24/2024 13:32	"	
Sodium 589.592 [Radial]	**123**	0.500	"	5.0	"	CLV	"	09/24/2024 14:57	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4I19047	SCH	09/19/2024 10:45	09/24/2024 13:49	EPA 200.8 Rev 5.4	
Arsenic [NG]	**0.00245**	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.0565**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0597**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	ND	0.00100	"	"	"	SCH	"	09/25/2024 12:51	"	
Manganese [He]	**3.99**	0.00500	"	5.0	"	SCH	"	09/24/2024 19:27	"	
Molybdenum [He]	**1.56**	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	1.0	"	SCH	"	09/24/2024 13:49	"	
Thallium [He]	**0.00198**	0.00100	"	"	"	SCH	"	09/25/2024 12:51	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4I26027	CLV	09/24/2024 12:00	09/26/2024 12:29	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

MW-6

2409298-05 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Qualifiers
Classical Chemistry Parameters										
Chloride	**8.77**	0.500	mg/L	1.0	4I19029	CRG	09/18/2024 09:00	09/18/2024 21:33	SM 4110 B-2020	
Sulfate as SO4	**11.8**	5.00	"	"	"	CRG	"	"	"	
Bicarbonate Alkalinity	ND	10.0	"	"	4I19037	RWM	09/18/2024 13:43	09/18/2024 16:30	SM 2340 B-2021	
Carbonate Alkalinity	ND	10.0	"	"	4I19039	RWM	"	09/18/2024 16:28	"	
Total Alkalinity	ND	10.0	"	"	4I19038	RWM	"	09/18/2024 16:30	"	
Fluoride	ND	0.50	"	"	4I23039	CDV	09/23/2024 12:03	09/23/2024 12:07	SM 4500-F C-2021	
Total Dissolved Solids	**43**	1	"	"	4I19059	DLW	09/19/2024 15:40	09/23/2024 00:00	SM 2540 C-2020	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**0.094**	0.050	mg/L	1.0	4I19053	CLV	09/19/2024 12:10	09/24/2024 13:36	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**2.46**	0.050	"	"	"	CLV	"	"	"	
Iron 259.940 [Radial]	ND	0.050	"	"	"	CLV	"	"	"	
Lithium 610.362 [Axial]	ND	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**2.91**	0.050	"	"	"	CLV	"	"	"	
Potassium 766.490 [Radial]	**1.29**	0.100	"	"	"	CLV	"	"	"	
Sodium 589.592 [Radial]	**4.71**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4I19047	SCH	09/19/2024 10:45	09/24/2024 13:55	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.118**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.00226**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Manganese [He]	**0.116**	0.00100	"	"	"	SCH	"	"	"	
Molybdenum [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4I26027	CLV	09/24/2024 12:00	09/26/2024 12:29	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: SOU2-24-001	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	10/14/2024 12:02

MW-10

2409298-06 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Qualifiers
Classical Chemistry Parameters										
Chloride	**120**	5.00	mg/L	10.0	4I19029	CRG	09/18/2024 09:00	09/18/2024 23:05	SM 4110 B-2020	
Sulfate as SO4	**313**	200	"	40.0	"	CRG	"	09/18/2024 23:36	"	
Bicarbonate Alkalinity	ND	10.0	"	1.0	4I19037	RWM	09/18/2024 13:43	09/18/2024 16:30	SM 2340 B-2021	SN
Carbonate Alkalinity	ND	10.0	"	"	4I19039	RWM	"	09/18/2024 16:28	"	SN
Total Alkalinity	ND	10.0	"	"	4I19038	RWM	"	09/18/2024 16:30	"	SN
Fluoride	ND	0.50	"	"	4I23039	CDV	09/23/2024 12:03	09/23/2024 12:07	SM 4500-F C-2021	
Total Dissolved Solids	**770**	1	"	"	4I19059	DLW	09/19/2024 15:40	09/23/2024 00:00	SM 2540 C-2020	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**3.78**	0.050	mg/L	1.0	4I19053	CLV	09/19/2024 12:10	09/24/2024 13:40	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**61.7**	0.050	"	"	"	CLV	"	"	"	
Iron 259.940 [Radial]	**0.151**	0.050	"	"	"	CLV	"	"	"	
Lithium 610.362 [Axial]	**0.162**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**56.1**	0.250	"	5.0	"	CLV	"	09/24/2024 15:01	"	
Potassium 766.490 [Radial]	**10.6**	0.100	"	1.0	"	CLV	"	09/24/2024 13:40	"	
Sodium 589.592 [Radial]	**30.3**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4I19047	SCH	09/19/2024 10:45	09/24/2024 14:01	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.0232**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	**0.00584**	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0632**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00212**	0.00100	"	"	"	SCH	"	"	"	
Manganese [He]	**3.37**	0.00500	"	5.0	"	SCH	"	09/25/2024 12:46	"	
Molybdenum [He]	ND	0.00500	"	1.0	"	SCH	"	09/24/2024 14:01	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4I26027	CLV	09/24/2024 12:00	09/26/2024 12:29	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

BD-1

2409298-07 (Water)

Analyte	Result	MRL	Units	Dil	Batch	Analyst	Date Time Prepared	Date Time Analyzed	Method	Qualifiers
Classical Chemistry Parameters										
Chloride	**105**	5.00	mg/L	10.0	4I19029	CRG	09/18/2024 09:00	09/19/2024 00:07	SM 4110 B-2020	
Sulfate as SO4	**1590**	500	"	100.0	"	CRG	"	09/18/2024 15:53	"	
Bicarbonate Alkalinity	**83.0**	10.0	"	1.0	4I19037	RWM	09/18/2024 13:43	09/18/2024 16:30	SM 2340 B-2021	
Carbonate Alkalinity	ND	10.0	"	"	4I19039	RWM	"	09/18/2024 16:28	"	
Total Alkalinity	**86.0**	10.0	"	"	4I19038	RWM	"	09/18/2024 16:30	"	
Fluoride	ND	0.50	"	"	4I23039	CDV	09/23/2024 12:03	09/23/2024 12:07	SM 4500-F C-2021	
Total Dissolved Solids	**2647**	3	"	"	4I19059	DLW	09/19/2024 15:40	09/23/2024 00:00	SM 2540 C-2020	
Metals by EPA 200 Series Methods ICP-AES										
Boron 249.773 [Radial]	**5.79**	0.050	mg/L	1.0	4I19053	CLV	09/19/2024 12:10	09/24/2024 13:43	EPA 200.7 Rev 4.4	
Calcium 315.887 [Radial]	**407**	0.250	"	5.0	"	CLV	"	09/24/2024 15:05	"	
Iron 259.940 [Radial]	**3.77**	0.050	"	1.0	"	CLV	"	09/24/2024 13:43	"	
Lithium 610.362 [Axial]	**0.131**	0.040	"	"	"	CLV	"	"	"	
Magnesium 285.213 [Radial]	**131**	0.250	"	5.0	"	CLV	"	09/24/2024 15:05	"	
Potassium 766.490 [Radial]	**80.3**	0.100	"	1.0	"	CLV	"	09/24/2024 13:43	"	
Sodium 589.592 [Radial]	**46.5**	0.100	"	"	"	CLV	"	"	"	
Metals by EPA 200 Series Methods ICP-MS [Analysis Mode]										
Antimony [He]	ND	0.00200	mg/L	1.0	4I19047	SCH	09/19/2024 10:45	09/24/2024 14:08	EPA 200.8 Rev 5.4	
Arsenic [NG]	ND	0.00200	"	"	"	SCH	"	"	"	
Barium [He]	**0.0396**	0.00100	"	"	"	SCH	"	"	"	
Beryllium [He]	ND	0.00400	"	"	"	SCH	"	"	"	
Cadmium [He]	ND	0.00500	"	"	"	SCH	"	"	"	
Chromium [He]	ND	0.0100	"	"	"	SCH	"	"	"	
Cobalt [He]	**0.0194**	0.00100	"	"	"	SCH	"	"	"	
Lead [He]	**0.00826**	0.00100	"	"	"	SCH	"	"	"	
Manganese [He]	**2.30**	0.00500	"	5.0	"	SCH	"	09/24/2024 19:33	"	
Molybdenum [He]	ND	0.00500	"	1.0	"	SCH	"	09/24/2024 14:08	"	
Selenium [NG]	ND	0.0500	"	"	"	SCH	"	"	"	
Thallium [He]	ND	0.00100	"	"	"	SCH	"	"	"	
Mercury by EPA 200 Series Methods CVAAS										
Mercury	ND	0.00200	mg/L	1.0	4I26027	CLV	09/24/2024 12:00	09/26/2024 12:29	EPA 245.1 Rev 3.0	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I18053 - Default Prep GenChem											
Blank (4I18053-BLK1)											
Chloride	9/17/24 10:56	ND	0.500	mg/L							
Sulfate as SO4	9/17/24 10:56	ND	5.00	"							
LCS (4I18053-BS1)											
Chloride	9/17/24 11:27	9.88	0.500	mg/L	10.0		98.8	87.4-108			
Sulfate as SO4	9/17/24 11:27	10.2	5.00	"	10.0		102	83.3-109			
LCS Dup (4I18053-BSD1)											
Chloride	9/17/24 11:58	9.81	0.500	mg/L	10.0		98.1	87.4-108	0.695	20	
Sulfate as SO4	9/17/24 11:58	10.2	5.00	"	10.0		102	83.3-109	0.133	20	
Duplicate (4I18053-DUP1)			**Source: 2409298-03**								
Chloride	9/17/24 20:07	136	5.00	mg/L		136			0.104	20	
Sulfate as SO4	9/17/24 20:38	1560	500	"		1560			0.287	20	
Batch 4I19029 - Default Prep GenChem											
Blank (4I19029-BLK1)											
Sulfate as SO4	9/18/24 11:16	ND	5.00	mg/L							
LCS (4I19029-BS1)											
Chloride	9/18/24 10:14	4.77	0.500	mg/L	5.00		95.5	87.4-108			
Sulfate as SO4	9/18/24 10:14	4.89	5.00	"	5.00		97.9	83.3-109			
LCS Dup (4I19029-BSD1)											
Chloride	9/18/24 10:45	4.79	0.500	mg/L	5.00		95.8	87.4-108	0.387	20	
Sulfate as SO4	9/18/24 10:45	4.91	5.00	"	5.00		98.1	83.3-109	0.275	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19029 - Default Prep GenChem											
Matrix Spike (4I19029-MS1)			**Source: 2409298-05**								
Chloride	9/18/24 22:03	13.2	0.500	mg/L	5.00	8.77	89.3	64.8-131			
Sulfate as SO4	9/18/24 22:03	16.0	5.00	"	5.00	11.8	84.5	53.2-148			
Matrix Spike Dup (4I19029-MSD1)			**Source: 2409298-05**								
Chloride	9/18/24 22:34	13.2	0.500	mg/L	5.00	8.77	89.1	64.8-131	0.0779	20	
Sulfate as SO4	9/18/24 22:34	16.1	5.00	"	5.00	11.8	84.9	53.2-148	0.113	20	
Batch 4I19037 - Default Prep GenChem											
Blank (4I19037-BLK1)											
Bicarbonate Alkalinity	9/18/24 16:30	ND	10.0	mg/L							
LCS (4I19037-BS1)											
Bicarbonate Alkalinity	9/18/24 16:30	980		mg/L	950		103	85-115			
Duplicate (4I19037-DUP1)			**Source: 2409298-03**								
Bicarbonate Alkalinity	9/18/24 16:30	27.0	10.0	mg/L		27.0			0.00	30	
Duplicate (4I19037-DUP2)			**Source: 2409298-03**								
Bicarbonate Alkalinity	9/18/24 16:30	27.0	10.0	mg/L		27.0			0.00	30	
Batch 4I19038 - Default Prep GenChem											
Blank (4I19038-BLK1)											
Total Alkalinity	9/18/24 16:30	ND	10.0	mg/L							

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19038 - Default Prep GenChem											
LCS (4I19038-BS1)											
Total Alkalinity	9/18/24 16:30	990		mg/L	1000		99.0	85-115			
Duplicate (4I19038-DUP1)			**Source: 2409298-03**								
Total Alkalinity	9/18/24 16:30	31.0	10.0	mg/L		31.0			0.00	30	
Duplicate (4I19038-DUP2)			**Source: 2409298-03**								
Total Alkalinity	9/18/24 16:30	31.0	10.0	mg/L		31.0			0.00	30	
Batch 4I19039 - Default Prep GenChem											
Blank (4I19039-BLK1)											
Carbonate Alkalinity	9/18/24 16:28	ND	10.0	mg/L							
LCS (4I19039-BS1)											
Carbonate Alkalinity	9/18/24 16:28	480		mg/L	500		96.0	85-115			
Duplicate (4I19039-DUP1)			**Source: 2409298-03**								
Carbonate Alkalinity	9/18/24 16:28	ND	10.0	mg/L		ND				200	
Duplicate (4I19039-DUP2)			**Source: 2409298-03**								
Carbonate Alkalinity	9/18/24 16:28	ND	10.0	mg/L		ND				200	
Batch 4I19059 - Default Prep GenChem											
Blank (4I19059-BLK1)											
Total Dissolved Solids	9/23/24 0:00	ND	1	mg/L							

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19059 - Default Prep GenChem											
LCS (4I19059-BS1)											
Total Dissolved Solids	9/23/24 0:00	84	1	mg/L	99.2		84.7	69.8-100			
LCS Dup (4I19059-BSD1)											
Total Dissolved Solids	9/23/24 0:00	85	1	mg/L	99.2		85.7	69.8-100	1.18	10	
Duplicate (4I19059-DUP1)			**Source: 2409298-01**								
Total Dissolved Solids	9/23/24 0:00	287	1	mg/L		289			0.694	10	
Duplicate (4I19059-DUP2)			**Source: 2409298-07**								
Total Dissolved Solids	9/23/24 0:00	2657	3	mg/L		2647			0.377	10	
Batch 4I23039 - Default Prep GenChem											
Blank (4I23039-BLK1)											
Fluoride	9/23/24 12:07	ND	0.50	mg/L							
LCS (4I23039-BS1)											
Fluoride	9/23/24 12:07	2.03	0.50	mg/L	2.00		102	88.5-110			
LCS Dup (4I23039-BSD1)											
Fluoride	9/23/24 12:07	2.00	0.50	mg/L	2.00		100	88.5-110	1.49	30	
Duplicate (4I23039-DUP1)			**Source: 2409298-04**								
Fluoride	9/23/24 12:07	0.07	0.50	mg/L		0.08			6.09	20	
Matrix Spike (4I23039-MS1)			**Source: 2409298-01**								
Fluoride	9/23/24 12:07	1.03	0.50	mg/L	1.00	0.27	75.9	81.9-110			M2

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Classical Chemistry Parameters - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I23039 - Default Prep GenChem											
Matrix Spike Dup (4I23039-MSD1)			**Source: 2409298-01**								
Fluoride	9/23/24 12:07	1.03	0.50	mg/L	1.00	0.27	75.9	81.9-110	0.00	30	M2

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Metals by EPA 200 Series Methods ICP-AES - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19053 - EPA 200.2 DCN 1017 Rev 10											
Blank (4I19053-BLK1)											
Boron 249.773 [Radial]	9/24/24 11:12	ND	0.050	mg/L							
Calcium 315.887 [Radial]	9/24/24 11:12	ND	0.050	"							
Iron 259.940 [Radial]	9/24/24 11:12	ND	0.050	"							
Lithium 610.362 [Axial]	9/24/24 11:12	ND	0.040	"							
Magnesium 285.213 [Radial]	9/24/24 11:12	ND	0.050	"							
Potassium 766.490 [Radial]	9/24/24 11:12	ND	0.100	"							
Sodium 589.592 [Radial]	9/24/24 11:12	ND	0.100	"							
LCS (4I19053-BS1)											
Boron 249.773 [Radial]	9/24/24 11:17	0.214	0.050	mg/L	0.200		107	85-115			
Calcium 315.887 [Radial]	9/24/24 11:17	0.206	0.050	"	0.200		103	85-115			
Iron 259.940 [Radial]	9/24/24 11:17	0.202	0.050	"	0.200		101	85-115			
Lithium 610.362 [Axial]	9/24/24 11:17	0.223	0.040	"	0.200		112	85-115			
Magnesium 285.213 [Radial]	9/24/24 11:17	0.207	0.050	"	0.200		104	85-115			
Potassium 766.490 [Radial]	9/24/24 11:17	0.443	0.100	"	0.400		111	85-115			
Sodium 589.592 [Radial]	9/24/24 11:17	0.436	0.100	"	0.400		109	85-115			
LCS Dup (4I19053-BSD1)											
Boron 249.773 [Radial]	9/24/24 11:24	0.211	0.050	mg/L	0.200		106	85-115	1.21	20	
Calcium 315.887 [Radial]	9/24/24 11:24	0.210	0.050	"	0.200		105	85-115	2.08	20	
Iron 259.940 [Radial]	9/24/24 11:24	0.210	0.050	"	0.200		105	85-115	3.82	20	
Lithium 610.362 [Axial]	9/24/24 11:24	0.222	0.040	"	0.200		111	85-115	0.776	20	
Magnesium 285.213 [Radial]	9/24/24 11:24	0.206	0.050	"	0.200		103	85-115	0.572	20	
Potassium 766.490 [Radial]	9/24/24 11:24	0.438	0.100	"	0.400		110	85-115	1.01	20	
Sodium 589.592 [Radial]	9/24/24 11:24	0.431	0.100	"	0.400		108	85-115	1.12	20	
Duplicate (4I19053-DUP1)				**Source: 2409298-03**							
Boron 249.773 [Radial]	9/24/24 13:25	8.71	0.050	mg/L		8.44			3.20	20	
Calcium 315.887 [Radial]	9/24/24 14:54	379	0.250	"		394			4.03	20	
Magnesium 285.213 [Radial]	9/24/24 14:54	141	0.250	"		146			3.48	20	
Potassium 766.490 [Radial]	9/24/24 13:25	74.9	0.100	"		74.8			0.234	20	
Sodium 589.592 [Radial]	9/24/24 14:54	64.2	0.500	"		57.8			10.6	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Metals by EPA 200 Series Methods ICP-AES - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19053 - EPA 200.2 DCN 1017 Rev 10											
Duplicate (4I19053-DUP2)			**Source: 2409340-01**								
Potassium 766.490 [Radial]	9/24/24 12:02	8.17	0.100	mg/L		7.63			6.78	20	
Sodium 589.592 [Radial]	9/25/24 14:47	2310	5.00	"		2260			2.45	20	
Matrix Spike (4I19053-MS1)			**Source: 2409298-03**								
Iron 259.940 [Radial]	9/24/24 13:25	1.40	0.050	mg/L	0.200	1.24	83.8	70-130			
Lithium 610.362 [Axial]	9/24/24 13:25	0.283	0.040	"	0.200	0.119	82.1	70-130			
Matrix Spike (4I19053-MS2)			**Source: 2409340-01**								
Boron 249.773 [Radial]	9/24/24 12:02	0.257	0.050	mg/L	0.200	0.079	89.0	70-130			
Calcium 315.887 [Radial]	9/24/24 12:02	1.94	0.050	"	0.200	1.74	98.1	70-130			
Iron 259.940 [Radial]	9/24/24 12:02	1.63	0.050	"	0.200	1.45	86.6	70-130			
Lithium 610.362 [Axial]	9/25/24 12:41	0.184	0.200	"	0.200	ND	92.2	70-130			
Magnesium 285.213 [Radial]	9/24/24 12:02	0.724	0.050	"	0.200	0.548	87.7	70-130			
Matrix Spike Dup (4I19053-MSD1)			**Source: 2409298-03**								
Iron 259.940 [Radial]	9/24/24 13:29	1.36	0.050	mg/L	0.200	1.24	61.9	70-130	3.18	20	M2
Lithium 610.362 [Axial]	9/24/24 13:29	0.273	0.040	"	0.200	0.119	77.0	70-130	3.68	20	
Matrix Spike Dup (4I19053-MSD2)			**Source: 2409340-01**								
Boron 249.773 [Radial]	9/24/24 12:06	0.252	0.050	mg/L	0.200	0.079	86.8	70-130	1.78	20	
Calcium 315.887 [Radial]	9/24/24 12:06	1.84	0.050	"	0.200	1.74	50.9	70-130	4.99	20	M2
Iron 259.940 [Radial]	9/24/24 12:06	1.55	0.050	"	0.200	1.45	45.7	70-130	5.15	20	M2
Lithium 610.362 [Axial]	9/25/24 12:45	0.182	0.200	"	0.200	ND	91.0	70-130	1.32	20	
Magnesium 285.213 [Radial]	9/24/24 12:06	0.692	0.050	"	0.200	0.548	72.0	70-130	4.44	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Metals by EPA 200 Series Methods ICP-MS [Analysis Mode] - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19047 - EPA 200.2 DCN 1017 Rev 10											
Blank (4I19047-BLK1)											
Antimony [He]	9/24/24 12:47	ND	0.00200	mg/L							
Arsenic [He]	9/24/24 12:47	ND	0.00200	"							
Arsenic [NG]	9/24/24 12:47	ND	0.00200	"							
Barium [He]	9/24/24 12:47	ND	0.00100	"							
Beryllium [He]	9/24/24 12:47	ND	0.00400	"							
Cadmium [He]	9/24/24 12:47	ND	0.00500	"							
Chromium [He]	9/24/24 12:47	ND	0.0100	"							
Cobalt [He]	9/24/24 12:47	ND	0.00100	"							
Iron [He]	9/24/24 12:47	ND	0.0250	"							
Lead [He]	9/24/24 12:47	ND	0.00100	"							
Manganese [He]	9/24/24 12:47	ND	0.00100	"							
Molybdenum [He]	9/24/24 12:47	ND	0.00500	"							
Nickel [He]	9/24/24 12:47	ND	0.00100	"							
Selenium [NG]	9/24/24 12:47	ND	0.0500	"							
Selenium [He]	9/24/24 12:47	ND	0.0500	"							
Thallium [He]	9/24/24 12:47	ND	0.00100	"							
LCS (4I19047-BS1)											
Antimony [He]	9/24/24 12:53	0.104	0.00200	mg/L	0.100		104	85-115			
Arsenic [NG]	9/24/24 12:53	0.101	0.00200	"	0.100		101	85-115			
Arsenic [He]	9/24/24 12:53	0.102	0.00200	"	0.100		102	85-115			
Barium [He]	9/24/24 12:53	0.101	0.00100	"	0.100		101	85-115			
Beryllium [He]	9/24/24 12:53	0.108	0.00100	"	0.100		108	85-115			
Cadmium [He]	9/24/24 12:53	0.101	0.00100	"	0.100		101	85-115			
Chromium [He]	9/24/24 12:53	0.104	0.00100	"	0.100		104	85-115			
Cobalt [He]	9/24/24 12:53	0.106	0.00100	"	0.100		106	85-115			
Iron [He]	9/24/24 12:53	0.104	0.0250	"	0.100		104	85-115			
Lead [He]	9/24/24 12:53	0.103	0.00100	"	0.100		103	85-115			
Manganese [He]	9/24/24 12:53	0.103	0.00100	"	0.100		103	85-115			
Molybdenum [He]	9/24/24 12:53	0.099	0.00100	"	0.100		99.0	85-115			
Nickel [He]	9/24/24 12:53	0.104	0.00100	"	0.100		104	85-115			
Selenium [NG]	9/24/24 12:53	0.099	0.00500	"	0.100		98.6	85-115			
Selenium [He]	9/24/24 12:53	0.100	0.00100	"	0.100		99.8	85-115			
Thallium [He]	9/24/24 12:53	0.103	0.00100	"	0.100		103	85-115			

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Metals by EPA 200 Series Methods ICP-MS [Analysis Mode] - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19047 - EPA 200.2 DCN 1017 Rev 10											
LCS Dup (4I19047-BSD1)											
Antimony [He]	9/24/24 12:59	0.101	0.00200	mg/L	0.100		101	85-115	2.48	20	
Arsenic [He]	9/24/24 12:59	0.100	0.00200	"	0.100		99.6	85-115	2.40	20	
Arsenic [NG]	9/24/24 12:59	0.100	0.00200	"	0.100		99.7	85-115	1.56	20	
Barium [He]	9/24/24 12:59	0.100	0.00100	"	0.100		99.8	85-115	1.55	20	
Beryllium [He]	9/24/24 12:59	0.103	0.00100	"	0.100		103	85-115	5.05	20	
Cadmium [He]	9/24/24 12:59	0.099	0.00100	"	0.100		99.0	85-115	2.43	20	
Chromium [He]	9/24/24 12:59	0.102	0.00100	"	0.100		102	85-115	2.40	20	
Cobalt [He]	9/24/24 12:59	0.104	0.00100	"	0.100		104	85-115	2.07	20	
Iron [He]	9/24/24 12:59	0.103	0.0250	"	0.100		103	85-115	0.678	20	
Lead [He]	9/24/24 12:59	0.101	0.00100	"	0.100		101	85-115	2.22	20	
Manganese [He]	9/24/24 12:59	0.101	0.00100	"	0.100		101	85-115	1.71	20	
Molybdenum [He]	9/24/24 12:59	0.098	0.00100	"	0.100		97.7	85-115	1.33	20	
Nickel [He]	9/24/24 12:59	0.102	0.00100	"	0.100		102	85-115	2.31	20	
Selenium [He]	9/24/24 12:59	0.097	0.00100	"	0.100		96.9	85-115	2.95	20	
Selenium [NG]	9/24/24 12:59	0.097	0.00500	"	0.100		97.3	85-115	1.36	20	
Thallium [He]	9/24/24 12:59	0.100	0.00100	"	0.100		100	85-115	2.72	20	
Duplicate (4I19047-DUP1)			**Source: 2409298-03**								
Manganese [He]	9/24/24 19:14	3.78	0.00500	mg/L		3.90			2.99	20	
Matrix Spike (4I19047-MS1)			**Source: 2409298-03**								
Antimony [He]	9/24/24 13:36	0.101	0.00200	mg/L	0.100	ND	101	70-130			
Arsenic [NG]	9/24/24 13:36	0.106	0.00200	"	0.100	ND	106	70-130			
Arsenic [He]	9/24/24 13:36	0.117	0.00200	"	0.100	0.024	92.6	70-130			
Barium [He]	9/24/24 13:36	0.148	0.00100	"	0.100	0.039	110	70-130			
Beryllium [He]	9/24/24 13:36	0.090	0.00100	"	0.100	0.001	88.6	70-130			
Cadmium [He]	9/24/24 13:36	0.090	0.00100	"	0.100	0.0004	89.7	70-130			
Chromium [He]	9/24/24 13:36	0.094	0.00100	"	0.100	0.0003	93.4	70-130			
Cobalt [He]	9/24/24 13:36	0.138	0.00100	"	0.100	0.049	88.3	70-130			
Iron [He]	9/24/24 19:14	1.32	0.125	"	0.100	1.29	21.6	70-130			M2
Lead [He]	9/24/24 13:36	0.108	0.00100	"	0.100	0.002	106	70-130			IS-05
Molybdenum [He]	9/24/24 13:36	0.113	0.00100	"	0.100	ND	113	70-130			
Nickel [He]	9/24/24 13:36	0.098	0.00100	"	0.100	0.018	80.2	70-130			
Selenium [NG]	9/24/24 13:36	0.124	0.00500	"	0.100	0.007	117	70-130			
Selenium [He]	9/24/24 13:36	0.296	0.00100	"	0.100	0.219	77.2	70-130			
Thallium [He]	9/24/24 13:36	0.109	0.00100	"	0.100	0.0004	109	70-130			IS-05

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Metals by EPA 200 Series Methods ICP-MS [Analysis Mode] - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19047 - EPA 200.2 DCN 1017 Rev 10											
Matrix Spike (4I19047-MS2)			**Source: 2409340-01**								
Antimony [He]	9/24/24 15:47	0.507	0.0100	mg/L	0.500	0.004	101	70-130			
Arsenic [He]	9/24/24 15:47	0.483	0.0100	"	0.500	0.006	95.5	70-130			
Arsenic [NG]	9/24/24 15:47	0.524	0.0100	"	0.500	0.010	103	70-130			
Barium [He]	9/24/24 15:47	0.505	0.00500	"	0.500	0.003	101	70-130			
Beryllium [He]	9/24/24 15:47	0.429	0.00500	"	0.500	ND	85.8	70-130			
Cadmium [He]	9/24/24 15:47	0.462	0.00500	"	0.500	0.0006	92.5	70-130			
Chromium [He]	9/24/24 15:47	0.463	0.00500	"	0.500	0.002	92.3	70-130			
Cobalt [He]	9/24/24 15:47	0.445	0.00500	"	0.500	0.003	88.3	70-130			
Iron [He]	9/24/24 15:47	2.07	0.125	"	0.500	1.65	83.7	70-130			
Lead [He]	9/24/24 15:47	0.513	0.00500	"	0.500	ND	103	70-130			
Manganese [He]	9/24/24 15:47	1.71	0.00500	"	0.500	1.27	87.3	70-130			
Molybdenum [He]	9/24/24 15:47	0.565	0.00500	"	0.500	0.037	106	70-130			
Nickel [He]	9/24/24 15:47	0.494	0.00500	"	0.500	0.037	91.3	70-130			
Selenium [NG]	9/24/24 15:47	0.486	0.0250	"	0.500	0.024	92.4	70-130			
Selenium [He]	9/24/24 15:47	0.457	0.00500	"	0.500	ND	91.5	70-130			
Thallium [He]	9/24/24 15:47	0.524	0.00500	"	0.500	ND	105	70-130			
Matrix Spike Dup (4I19047-MSD1)			**Source: 2409298-03**								
Antimony [He]	9/24/24 13:42	0.106	0.00200	mg/L	0.100	ND	106	70-130	4.91	20	
Arsenic [NG]	9/24/24 13:42	0.101	0.00200	"	0.100	ND	101	70-130	4.39	20	
Arsenic [He]	9/24/24 13:42	0.118	0.00200	"	0.100	0.024	93.9	70-130	1.07	20	
Barium [He]	9/24/24 13:42	0.144	0.00100	"	0.100	0.039	105	70-130	2.97	20	
Beryllium [He]	9/24/24 13:42	0.097	0.00100	"	0.100	0.001	95.7	70-130	7.65	20	
Cadmium [He]	9/24/24 13:42	0.097	0.00100	"	0.100	0.0004	96.9	70-130	7.66	20	
Chromium [He]	9/24/24 13:42	0.098	0.00100	"	0.100	0.0003	98.1	70-130	4.95	20	
Cobalt [He]	9/24/24 13:42	0.150	0.00100	"	0.100	0.049	100	70-130	8.32	20	
Iron [He]	9/24/24 19:20	1.42	0.125	"	0.100	1.29	126	70-130	7.60	20	
Lead [He]	9/24/24 13:42	0.111	0.00100	"	0.100	0.002	109	70-130	2.83	20	
Molybdenum [He]	9/24/24 13:42	0.119	0.00100	"	0.100	ND	119	70-130	5.00	20	
Nickel [He]	9/24/24 13:42	0.107	0.00100	"	0.100	0.018	88.9	70-130	8.46	20	
Selenium [NG]	9/24/24 13:42	0.114	0.00500	"	0.100	0.007	106	70-130	8.85	20	
Selenium [He]	9/24/24 13:42	0.264	0.00100	"	0.100	0.219	45.1	70-130	11.4	20	
Thallium [He]	9/24/24 13:42	0.113	0.00100	"	0.100	0.0004	112	70-130	3.37	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Metals by EPA 200 Series Methods ICP-MS [Analysis Mode] - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I19047 - EPA 200.2 DCN 1017 Rev 10											
Matrix Spike Dup (4I19047-MSD2)			**Source: 2409340-01**								
Antimony [He]	9/24/24 15:53	0.513	0.0100	mg/L	0.500	0.004	102	70-130	1.07	20	
Arsenic [NG]	9/24/24 15:53	0.495	0.0100	"	0.500	0.010	97.2	70-130	5.55	20	
Arsenic [He]	9/24/24 15:53	0.490	0.0100	"	0.500	0.006	96.8	70-130	1.35	20	
Barium [He]	9/24/24 15:53	0.508	0.00500	"	0.500	0.003	101	70-130	0.607	20	
Beryllium [He]	9/24/24 15:53	0.443	0.00500	"	0.500	ND	88.5	70-130	3.10	20	
Cadmium [He]	9/24/24 15:53	0.472	0.00500	"	0.500	0.0006	94.4	70-130	2.02	20	
Chromium [He]	9/24/24 15:53	0.475	0.00500	"	0.500	0.002	94.7	70-130	2.60	20	
Cobalt [He]	9/24/24 15:53	0.455	0.00500	"	0.500	0.003	90.3	70-130	2.21	20	
Iron [He]	9/24/24 15:53	2.15	0.125	"	0.500	1.65	101	70-130	4.03	20	
Lead [He]	9/24/24 15:53	0.518	0.00500	"	0.500	ND	104	70-130	0.955	20	
Manganese [He]	9/24/24 15:53	1.77	0.00500	"	0.500	1.27	99.1	70-130	3.39	20	
Molybdenum [He]	9/24/24 15:53	0.571	0.00500	"	0.500	0.037	107	70-130	1.12	20	
Nickel [He]	9/24/24 15:53	0.502	0.00500	"	0.500	0.037	92.9	70-130	1.67	20	
Selenium [NG]	9/24/24 15:53	0.463	0.0250	"	0.500	0.024	87.7	70-130	4.97	20	
Selenium [He]	9/24/24 15:53	0.457	0.00500	"	0.500	ND	91.4	70-130	0.0911	20	
Thallium [He]	9/24/24 15:53	0.530	0.00500	"	0.500	ND	106	70-130	1.09	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Mercury by EPA 200 Series Methods CVAAS - Quality Control

Analyte	Analyzed	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch 4I26027 - EPA 245.1 DCN 1017 Rev 10											
Blank (4I26027-BLK1)											
Mercury	9/26/24 12:29	ND	0.00200	mg/L							
LCS (4I26027-BS1)											
Mercury	9/26/24 12:29	0.005	0.00200	mg/L	0.00500		98.0	85-115			
LCS Dup (4I26027-BSD1)											
Mercury	9/26/24 12:29	0.005	0.00200	mg/L	0.00500		100	85-115	2.02	20	
Matrix Spike (4I26027-MS1)			**Source: 2409298-03**								
Mercury	9/26/24 12:29	0.005	0.00200	mg/L	0.00500	0.0003	92.0	70-130			
Matrix Spike Dup (4I26027-MSD1)			**Source: 2409298-03**								
Mercury	9/26/24 12:29	0.005	0.00200	mg/L	0.00500	0.0003	94.0	70-130	2.02	20	

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services
PO Box 15369
Hattiesburg MS, 39404-5369

Project: Cooperative Energy CCR Semiannual
Project Number: SOU2-24-001
Project Manager: Ken Ruckstuhl

Reported:
10/14/2024 12:02

Certified Analyses Included in this Report

Analyte	Certification Code
EPA 200.7 Rev 4.4 in Water	
Aluminum 394.401 [Radial]	C01,C02
Aluminum 396.152 [Radial]	C01,C02
Antimony 206.833 [Axial]	C01,C02
Arsenic 193.759 [Axial]	C01,C02
Barium 455.403 [Radial]	C01,C02
Barium 493.409 [Radial]	C01,C02
Beryllium 313.042 [Axial]	C01,C02
Boron 249.773 [Radial]	C01,C02
Cadmium 228.802 [Axial]	C01,C02
Calcium 315.887 [Radial]	C01,C02
Chromium 283.563 [Axial]	C01,C02
Cobalt 228.616 [Axial]	C01,C02
Copper 324.754 [Axial]	C01,C02
Iron 259.940 [Axial]	C01,C02
Iron 259.940 [Radial]	C01,C02
Lead 220.353 [Axial]	C01,C02
Magnesium 285.213 [Radial]	C01,C02
Manganese 257.610 [Axial]	C01,C02
Molybdenum 202.030 [Axial]	C01,C02
Nickel 231.604 [Axial]	C01,C02
Potassium 766.490 [Radial]	C01,C02
Phosphorus 178.284 [Axial]	C01,C02
Phosphorus 178.284 [Radial]	C01,C02
Selenium 196.090 [Axial]	C01,C02
Silver 328.068 [Axial]	C01,C02
Sodium 589.592 [Axial]	C01,C02
Sodium 589.592 [Radial]	C01,C02
Strontium 346.446 [Radial]	C01,C02
Strontium 421.552 [Radial]	C01,C02
Thallium 190.856 [Axial]	C01,C02
Vanadium 309.311 [Axial]	C01,C02
Zinc 213.856 [Axial]	C01,C02
EPA 200.8 Rev 5.4 in Water	
Aluminum [He]	C01,C02
Antimony [He]	C01,C02
Antimony [NG]	C01,C02
Arsenic [He]	C01,C02
Arsenic [NG]	C01,C02
Barium [He]	C01,C02
Beryllium [He]	C01,C02
Cadmium [He]	C01,C02

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: SOU2-24-001	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	10/14/2024 12:02

Cadmium [NG]	C01,C02
Chromium [He]	C01,C02
Cobalt [He]	C01,C02
Copper [He]	C01,C02
Copper [NG]	C01,C02
Iron [He]	C01,C02
Lead [He]	C01,C02
Lead [NG]	C01,C02
Manganese [He]	C01,C02
Molybdenum [He]	C01,C02
Nickel [He]	C01,C02
Selenium [He]	C01,C02
Selenium [NG]	C01,C02
Silver [He]	C01,C02
Silver [NG]	C01,C02
Strontium [He]	C01,C02
Thallium [He]	C01,C02
Vanadium [He]	C01,C02
Zinc [He]	C01,C02

EPA 245.1 Rev 3.0 in Water

Mercury	C01,C02

SM 2340 B-2021 in Water

Total Alkalinity	C01,C02

SM 2540 C-2020 in Water

Total Dissolved Solids	C01,C02

****Only compounds included in this list are associated with accredited analyses****

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services PO Box 15369 Hattiesburg MS, 39404-5369	Project: Cooperative Energy CCR Semiannual Project Number: SOU2-24-001 Project Manager: Ken Ruckstuhl	**Reported:** 10/14/2024 12:02

Laboratory Accreditations/Certifications

Code	Description	Number	Expires
C01	*LA Environmental Lab Accreditation Program*	*01960*	*06/30/2025*
C02	*The NELAC Institute (NELAP)*	*TNI01397*	*06/30/2025*
C03	*MS Dept of Health (Drinking Water Microbiology)*	*MS00021*	*12/31/2024*
C04	*MS Dept of Health (Drinking Water Chemistry)*	*MS00021*	*12/31/2024*
C05	*MS DEQ Lead Firm Certification*	*PBF-00000028*	*03/31/2024*
C06	*MSDEQ Asbestos Inspector : C.D. Bingham*	*ABI-00001348*	*02/09/2024*
C07	*MSDEQ Air Monitor : C.D. Bingham*	*AM-011572*	*02/10/2024*
C08	*MSDEQ Asbestos Inspector: C. W. Meins*	*ABI-00001821*	*09/09/2022*
C09	*MSDEQ Air Monitor : C.W. Meins*	*AM-011189*	*02/10/2024*
C10	*ADEM (Drinking Water Microbiology)*	*43500*	*12/31/2024*
C11	*ADEM (Drinking Water Chemistry)*	*43500*	*12/31/2024*
C14	*MSDEQ Lead Paint Inspector : C.D. Bingham*	*PBI-00003690*	*02/07/2024*
C15	*MSDEQ Lead Paint Inspector : C.W. Meins*	*PBI-00001740*	*02/07/2024*

Report Definitions

TNC	Too Numerous To Count
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the minimum reporting limit
NR	Not Reported
RPD	Relative Percent Difference
ICV	Initial Calibration Verfiication
CCV	Continuing Calibration Verification Standard
SSV	Secondary Source Verfication Standard
LCS	Lab Control Spike - Lab matrix prepared with known concentration of analyte/s of interest analyzed by method.
MS	Matrix Spike - Sample prepared with known concentration of analyte/s of interest analyzed by method.
MSD	Matrix Spike Duplicate - Duplicate sample prepared with known concentration of analyte/s of interest analyzed by method.
MRL	Minimum Reporting Limit
%REC	Percentage Recovery of known concentration added to matrix
Batch	Group of samples prepared for analysis not to exceed 20 samples.
Matrix	Material containing analyte/s of interest
Surrogate	Analyte added to sample to determine extraction efficiency of method.

MICRO-METHODS LABORATORY, INC.

6500 Sunplex Drive
Ocean Springs, MS 39564
228-875-6420 Phone
228-875-6423 Fax

Environmental Management Services	Project: Cooperative Energy CCR Semiannual	
PO Box 15369	Project Number: SOU2-24-001	**Reported:**
Hattiesburg MS, 39404-5369	Project Manager: Ken Ruckstuhl	10/14/2024 12:02

Analyst Initials Key

FullName	Initials
Cristina D Vargas	CDV
Cameron J Smith	CJS
Charles L Vorhoff	CLV
Christa R Gray	CRG
Dortha L. Wells	DLW
Robert W McBeth	RWM
Sarah E. Tomek	SET
Samantha C. Hall	SCH
Teresa Meins	TKM
Tina Tomek	TPT

MICRO-METHODS LABORATORY, INC.
PO Box 1410, Ocean Springs, MS 39566-1410
(228) 875-6420 FAX (228) 875-6423
www.micromethodslab.com

Chain of Custody Record

Lab ID# MS00021
LELAP ID # 01960
TNI ID # TNI01397

Print Form

M-M Lab WO # 2409298

Company Name:	EMS	Project Manager:	Ken Ruckstuhl
Address:	7350 US Hwy 98	Purchase Order #:	SOU2-24-001
City:	Hattiesburg State: MS Zip: 39402	Email Address :	kruckstuhl@env-mgt.com
Phone:	601 544 3674	Sampler Name Printed:	Alan Niven
Fax:	601 544 0504	Sampler Name Signed:	

Turn Around Time & Reporting

Our normal turn around time is 10 working days

x Normal
__ Next Day*
__ 2nd Day*
__ Other*_____

*All rush order requests must be prior approved.

__ Phone
__ Mail
__ Fax
__ Email

QC Level: Level 1 ☐ Level 2 ☐ Level 3 ☐

Project Name: Cooperative Energy CCR Semiannual
Project #: SOU2-23-001

List Analyses Requested

Sample Identification	Sampling Date/Time	Matrix Code	# of Containers	Grab (G) or Composite (C)	Metals (see below)	Chloride/sulfate	Total dissolved solids	Alkalinity, Total	Alkalinity, Bicarbonate	Alkalinity Carbonate	Fluoride	Radium 226/228
MW-2	9-16-24 11:40	W	5	G	X	X	X	X	X	X	X	X
MW-3	9-17-24 9:35	W	5	G	X	X	X	X	X	X	X	X
MW-4	9-17-24 11:20	W	10	G	X	X	X	X	X	X	X	X
MW-5	9-16-24 14:40	W	5	G	X	X	X	X	X	X	X	X
MW-6	9-16-24 13:20	W	5	G	X	X	X	X	X	X	X	X
MW-10	9-16-24 10:15	W	5	G	X	X	X	X	X	X	X	X
BD-1	9-17-24 8:45	W	5	G	X	X	X	X	X	X	X	X

Field Testing

ID# Field Test	ID# Field Test	ID# Field Test	ID# Field Test

Matrix:
W = Water
DW = Drinking Water
S = Solid
SO = Soil
SE = Sediment
L = Liquid
A = Air
O = Oil
SL = Sludge

Preservation:
1= H2SO4
2= H3PO4
3=NaOH
4=ZnC4H10O6
5=ZnC4H10O6 & NaOH
6=HNO3
7=Na2S2O3
8=HCl
9=NaHSO4

Received on Ice: Y N Thermometer# 5 Cooler #_____ **Receipt Temp Corrected(°C)**
Date & Time _____ By: _____ Sample_____ Blank X Cooler_____

All Temps are Corrected Values

	Printed Name	Signature	Company	Date	Time
Relinquished by	Alan Niven		EMS	9.17.24	14:07
Received by	Sarah Tomek		MM	9/17/24	1407
Relinquished by					
Received by					
Relinquished by					
Received by					

Notes: cooler #1134 -0.7°C
cooler #1126 0.4°C
See Attached Work Order:

Metals - antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, thallium, mercury, iron, magnesium, manganese, sodium, potassium

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

October 14, 2024

Tina Tomek
Micro-Methods Lab
6500 Sunplex Drive
Ocean Springs, MS 39564

RE: Project: 2409298
Pace Project No.: 30720214

Dear Tina Tomek:

Enclosed are the analytical results for sample(s) received by the laboratory on September 24, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:
- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Justin Horn

Justin P. Horn
justin.horn@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Accounts Payable, Micro-Methods Lab

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2409298
Pace Project No.: 30720214

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572023-03
New Hampshire/TNI Certification #: 297622
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2409298
Pace Project No.: 30720214

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30720214001	2409298-01	Water	09/16/24 11:40	09/24/24 09:20
30720214002	2409298-02	Water	09/17/24 09:35	09/24/24 09:20
30720214003	2409298-03	Water	09/17/24 11:20	09/24/24 09:20
30720214004	2409298-04	Water	09/16/24 14:40	09/24/24 09:20
30720214005	2409298-05	Water	09/16/24 13:20	09/24/24 09:20
30720214006	2409298-06	Water	09/16/24 10:15	09/24/24 09:20
30720214007	2409298-07	Water	09/17/24 08:45	09/24/24 09:20

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 2409298
Pace Project No.: 30720214

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30720214001	2409298-01	EPA 903.1	LL1	1
		EPA 904.0	JJS1	1
		Total Radium Calculation	JAL	1
30720214002	2409298-02	EPA 903.1	LL1	1
		EPA 904.0	JJS1	1
		Total Radium Calculation	JAL	1
30720214003	2409298-03	EPA 903.1	LL1	1
		EPA 904.0	JJS1	1
		Total Radium Calculation	JAL	1
30720214004	2409298-04	EPA 903.1	LL1	1
		EPA 904.0	JJS1	1
		Total Radium Calculation	JAL	1
30720214005	2409298-05	EPA 903.1	LL1	1
		EPA 904.0	JJS1	1
		Total Radium Calculation	JAL	1
30720214006	2409298-06	EPA 903.1	LL1	1
		EPA 904.0	JJS1	1
		Total Radium Calculation	JAL	1
30720214007	2409298-07	EPA 903.1	LL1	1
		EPA 904.0	JJS1	1
		Total Radium Calculation	JAL	1

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2409298
Pace Project No.: 30720214

Sample: 2409298-01 **Lab ID: 30720214001** Collected: 09/16/24 11:40 Received: 09/24/24 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.293 ± 0.385 (0.641) C:NA T:86%**	pCi/L	10/10/24 14:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.881 ± 0.509 (0.952) C:80% T:86%**	pCi/L	10/10/24 15:22	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.17 ± 0.894 (1.59)**	pCi/L	10/14/24 10:46	7440-14-4	

Sample: 2409298-02 **Lab ID: 30720214002** Collected: 09/17/24 09:35 Received: 09/24/24 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**-0.231 ± 0.609 (1.20) C:NA T:89%**	pCi/L	10/10/24 14:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.16 ± 0.587 (1.05) C:78% T:81%**	pCi/L	10/10/24 15:22	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.16 ± 1.20 (2.25)**	pCi/L	10/14/24 10:46	7440-14-4	

Sample: 2409298-03 **Lab ID: 30720214003** Collected: 09/17/24 11:20 Received: 09/24/24 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**-0.224 ± 0.563 (1.12) C:NA T:92%**	pCi/L	10/10/24 14:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.00 ± 0.577 (1.07) C:76% T:83%**	pCi/L	10/10/24 15:22	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.000 ± 1.14 (2.19)**	pCi/L	10/14/24 10:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2409298
Pace Project No.: 30720214

Sample: 2409298-04 **Lab ID: 30720214004** Collected: 09/16/24 14:40 Received: 09/24/24 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**-0.0938 ± 0.344 (0.744) C:NA T:87%**	pCi/L	10/10/24 15:01	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.469 ± 0.429 (0.875) C:76% T:82%**	pCi/L	10/10/24 15:22	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.469 ± 0.773 (1.62)**	pCi/L	10/14/24 10:46	7440-14-4	

Sample: 2409298-05 **Lab ID: 30720214005** Collected: 09/16/24 13:20 Received: 09/24/24 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0957 ± 0.608 (1.13) C:NA T:92%**	pCi/L	10/10/24 15:01	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.906 ± 0.456 (0.801) C:80% T:87%**	pCi/L	10/10/24 15:22	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.00 ± 1.06 (1.93)**	pCi/L	10/14/24 10:46	7440-14-4	

Sample: 2409298-06 **Lab ID: 30720214006** Collected: 09/16/24 10:15 Received: 09/24/24 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.500 (0.953) C:NA T:97%**	pCi/L	10/10/24 15:01	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.748 ± 0.442 (0.819) C:79% T:86%**	pCi/L	10/10/24 15:22	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.748 ± 0.942 (1.77)**	pCi/L	10/14/24 10:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2409298
Pace Project No.: 30720214

Sample: 2409298-07 **Lab ID: 30720214007** Collected: 09/17/24 08:45 Received: 09/24/24 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**-0.135 ± 0.553 (1.08) C:NA T:94%**	pCi/L	10/10/24 15:01	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.27 ± 0.526 (0.849) C:81% T:84%**	pCi/L	10/10/24 15:22	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.27 ± 1.08 (1.93)**	pCi/L	10/14/24 10:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2409298
Pace Project No.: 30720214

QC Batch: 698445 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30720214001, 30720214002, 30720214003, 30720214004, 30720214005, 30720214006, 30720214007

METHOD BLANK: 3401280 Matrix: Water
Associated Lab Samples: 30720214001, 30720214002, 30720214003, 30720214004, 30720214005, 30720214006, 30720214007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0392 ± 0.179 (0.364) C:NA T:91%	pCi/L	10/10/24 14:27	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2409298
Pace Project No.: 30720214

QC Batch: 698446
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30720214001, 30720214002, 30720214003, 30720214004, 30720214005, 30720214006, 30720214007

METHOD BLANK: 3401281 Matrix: Water
Associated Lab Samples: 30720214001, 30720214002, 30720214003, 30720214004, 30720214005, 30720214006, 30720214007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0715 ± 0.300 (0.683) C:85% T:85%	pCi/L	10/10/24 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2409298
Pace Project No.: 30720214

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2409298
Pace Project No.: 30720214

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30720214001	2409298-01	EPA 903.1	698445		
30720214002	2409298-02	EPA 903.1	698445		
30720214003	2409298-03	EPA 903.1	698445		
30720214004	2409298-04	EPA 903.1	698445		
30720214005	2409298-05	EPA 903.1	698445		
30720214006	2409298-06	EPA 903.1	698445		
30720214007	2409298-07	EPA 903.1	698445		
30720214001	2409298-01	EPA 904.0	698446		
30720214002	2409298-02	EPA 904.0	698446		
30720214003	2409298-03	EPA 904.0	698446		
30720214004	2409298-04	EPA 904.0	698446		
30720214005	2409298-05	EPA 904.0	698446		
30720214006	2409298-06	EPA 904.0	698446		
30720214007	2409298-07	EPA 904.0	698446		
30720214001	2409298-01	Total Radium Calculation	702658		
30720214002	2409298-02	Total Radium Calculation	702658		
30720214003	2409298-03	Total Radium Calculation	702658		
30720214004	2409298-04	Total Radium Calculation	702658		
30720214005	2409298-05	Total Radium Calculation	702658		
30720214006	2409298-06	Total Radium Calculation	702658		
30720214007	2409298-07	Total Radium Calculation	702658		

MICRO-METHOD LABORATORY, INC.

WO#: 30720214

30720214

Sending Laboratory:

Micro-Methods Laboratory, Inc.
6500 Sunplex Drive
Ocean Springs, MS 39564
Phone: 228.875.6420
Fax: 228.875.6423

Project Manager: Teresa Meins

Subcontracted Laboratory:

Pace Analytical-7
1638 Roseytown Rd. Suites 2, 3, 4
Greensburg, PA 15601
Phone: (724) 850-5600
Fax: -

*Standard TAT

Work Order: 2409298

Analysis	Due	Expires	Comments
Sample ID: 2409298-01 *Water* *Sampled: 09/16/2024 11:40* *Sample Name: MW-2*			001
Radium,Total 226 & 228 by EPA 903.1 & 9C	09/25/2024	10/14/2024 11:40	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			
Sample ID: 2409298-02 *Water* *Sampled: 09/17/2024 09:35* *Sample Name: MW-3*			002
Radium,Total 226 & 228 by EPA 903.1 & 9C	09/25/2024	10/15/2024 09:35	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			
Sample ID: 2409298-03 *Water* *Sampled: 09/17/2024 11:20* *Sample Name: MW-4*			003
Radium,Total 226 & 228 by EPA 903.1 & 9C	09/25/2024	10/15/2024 11:20	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C) 1000mL Plastic w/HNO3 (G) 1000mL Plastic w/HNO3 (H)			
Sample ID: 2409298-04 *Water* *Sampled: 09/16/2024 14:40* *Sample Name: MW-5*			004
Radium,Total 226 & 228 by EPA 903.1 & 9C	09/25/2024	10/14/2024 14:40	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			
Sample ID: 2409298-05 *Water* *Sampled: 09/16/2024 13:20* *Sample Name: MW-6*			005
Radium,Total 226 & 228 by EPA 903.1 & 9C	09/25/2024	10/14/2024 13:20	

Received by Pace Greensburg
Therm ID — Corr Factor +/- —
Receipt Temp —
Corrected Temp —
Correct Preservation (Y)/ N

Sarah Jarrett 9/19/24	1630	UPS 9/19/24	1630
Released By	Date	Received By	Date
UPS		B Bell 9.24.21	0920
Released By	Date	Received By	Date
Released By	Date	Received By	Date
Released By	Date	Received By	Date
Released By	Date	Received By	Date

MICRO-METHODS LABORATORY, INC.

SUBCONTRACT ORDER
(Continued)

Work Order: 2409298 (Continued)

Analysis	Due	Expires	Comments
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			
Sample ID: 2409298-06 ***Water Sampled: 09/16/2024 10:15 Sample Name: MW-10***			006
Radium,Total 226 & 228 by EPA 903.1 & 9C	09/25/2024	10/14/2024 10:15	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			
Sample ID: 2409298-07 ***Water Sampled: 09/17/2024 08:45 Sample Name: BD-1***			007
Radium,Total 226 & 228 by EPA 903.1 & 9C	09/25/2024	10/15/2024 08:45	
Containers Supplied: 1000mL Plastic w/HNO3 (B) 1000mL Plastic w/HNO3 (C)			

WO#: 30720214
PM: JPH Due Date: 10/15/24
CLIENT: MICROMETHOD

Released By	Date	Received By	Date
Sarah Jorneh	9/19/24 1630	UPS	9/19/24 1630
UPS		BTC11	9.24.24 0920

DC#_Title: ENV-FRM-GBUR-0088 v07_Sample Condition Upon Receipt-Greensburg	
Effective Date: 01/04/2024	

Client Name: Micro Methods **Project #:** 30720214

Initial / Date

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other

Tracking Number: 1Z 353 063 03 6823 7296

Examined By: VB 9.24.24
Labeled By: VB 9.24.24
Temped By: —

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No **Seals Intact:** ☐ Yes ☒ No

Thermometer Used: — **Type of Ice:** Wet Blue ~~None~~

Cooler Temperature: Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

pH paper Lot# 160104 | D.P.D. Residual Chlorine Lot #

Comments:	Yes	No	NA	
Chain of Custody Present	X			1.
Chain of Custody Filled Out:	X			2.
-Were client corrections present on COC		X		
Chain of Custody Relinquished	X			3.
Sampler Name & Signature on COC:		X		4.
Sample Labels match COC:	X			5.
-Includes date/time/ID				
Matrix: WT				
Samples Arrived within Hold Time:	X			6.
Short Hold Time Analysis (<72hr remaining):		X		7.
Rush Turn Around Time Requested:		X		8.
Sufficient Volume:	X			9.
Correct Containers Used:	X			10.
-Pace Containers Used		X		
Containers Intact:	X			11.
Orthophosphate field filtered:			X	12.
Hex Cr Aqueous samples field filtered:			X	13.
Organic Samples checked for dichlorination			X	14:
Filtered volume received for dissolved tests:			X	15:
All containers checked for preservation:	X			16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix				pH<2
All containers meet method preservation requirements:	X			Initial when completed: VB Date/Time of Preservation:
				Lot# of added Preservative:
8260C/D: Headspace in VOA Vials (> 6mm)			X	17.
624.1: Headspace in VOA Vials (0mm)			X	18.
Radon: Headspace in RAD Vials (0mm)			X	19.
Trip Blank Present:			X	Trip blank custody seal present? YES or NO
Rad Samples Screened <.05 mrem/hr.	✓			Initial when completed: BK Date: 9.24.24 Survey Meter SN: 2502380

Comments:

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office.
PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

Client _____

Site 24Q9298

Page 1 of 1

Profile/EZ Login Number 14460

Notes _____

		Amber Glass					Plastic								Vials					Other									
Sample Line Item	Matrix	AG1H	AG3S	AG3U	AG5U	AG5T	BP1N	BP1U	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	DG9S	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	GCUB	GJN	12GN	AG1U	BG1U	BP2N	
001	WT						2																						
002							2																						
003							4																						
004							2																						
005							2																						
006							2																						
007	↓						2																						

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unpreserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosulfate
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass NA Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar
AG3U	250mL amber glass unpreserved	GN	General

Plastic/Misc.

GCUB	1 gallon cubitainer
12GN	1/2 gallon cubitainer
SP5T	120mL coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
	50mL plastic HNO3
	0mL plastic unpreserved
	0mL plastic NAOH
	0mL plastic H2SO4
	0mL plastic unpreserved

EZI	5g Encore
VOAK	Kit Volatile Solid
I	Wipe/Swab
ZPLC	Siploc Bag

WT	Water
SL	Solid
OL	Non-Aq Liquid
WP	Wipe

WO#: 30720214
PM: JPH Due Date: 10/15/24
CLIENT: MICROMETHOD

Page 15 of 15

Qualtrax ID: 55678

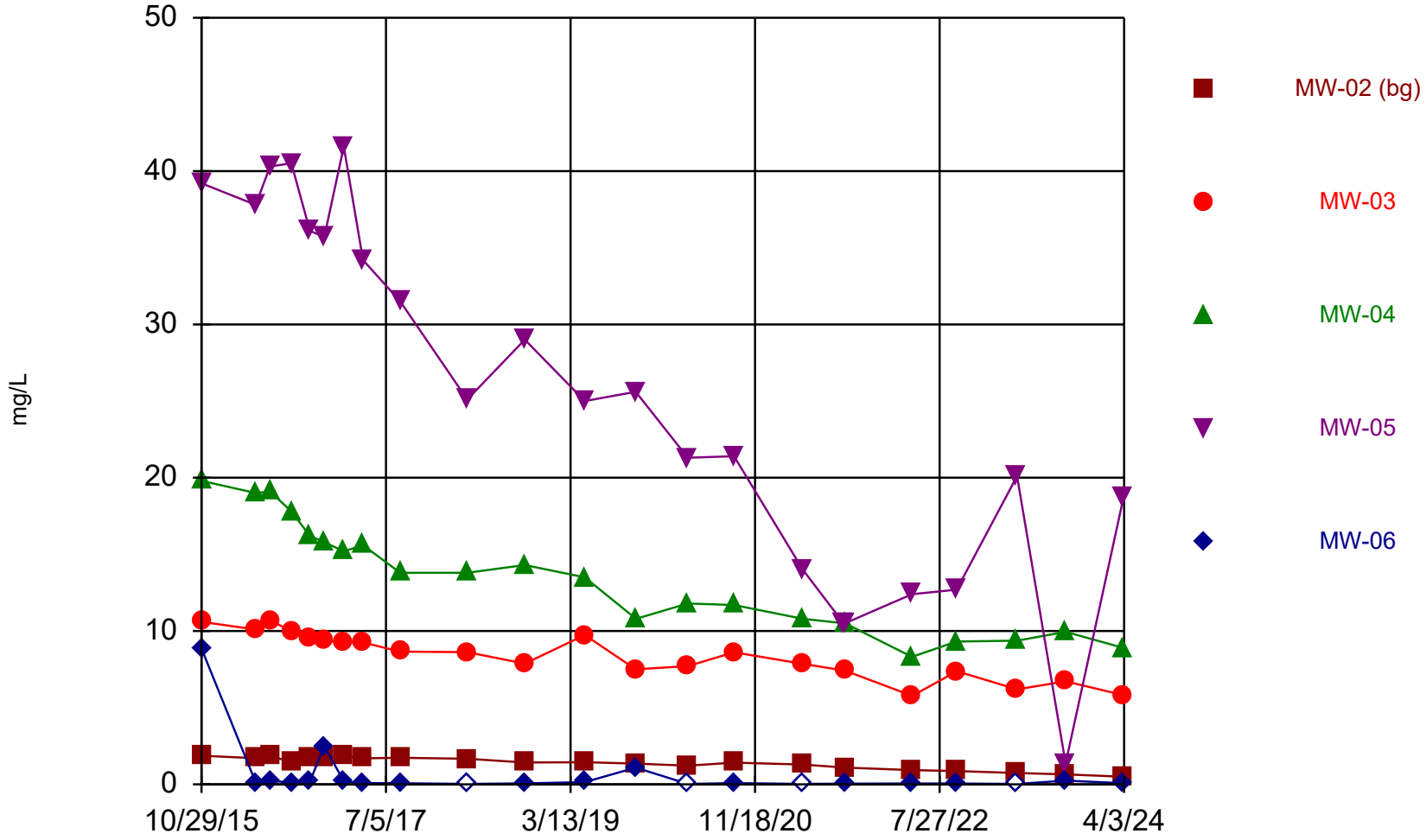
APPENDIX B

Statistical Analysis

April 2024

Hollow symbols indicate censored values.

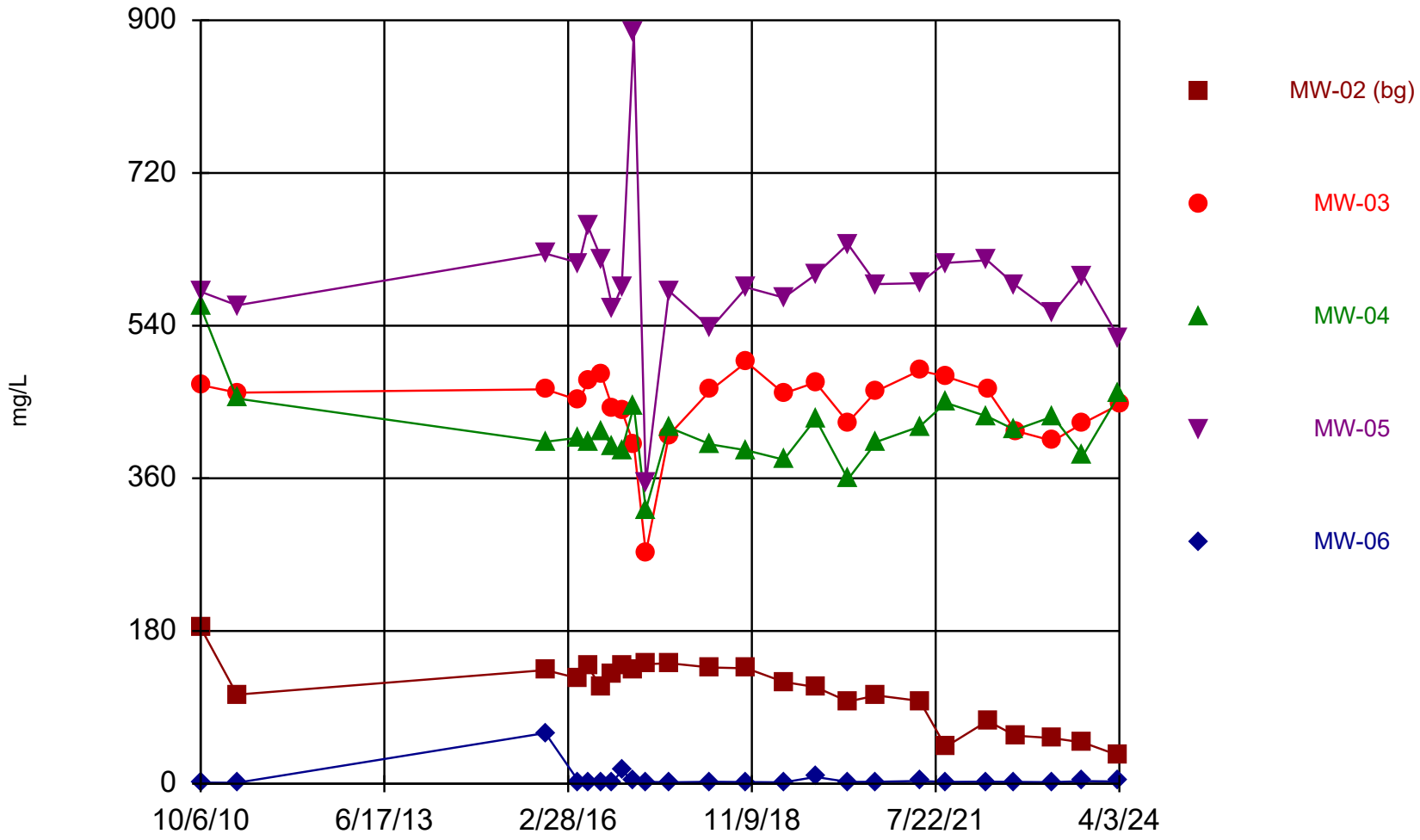
Time Series



Constituent: Boron Analysis Run 7/16/2024 12:15 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

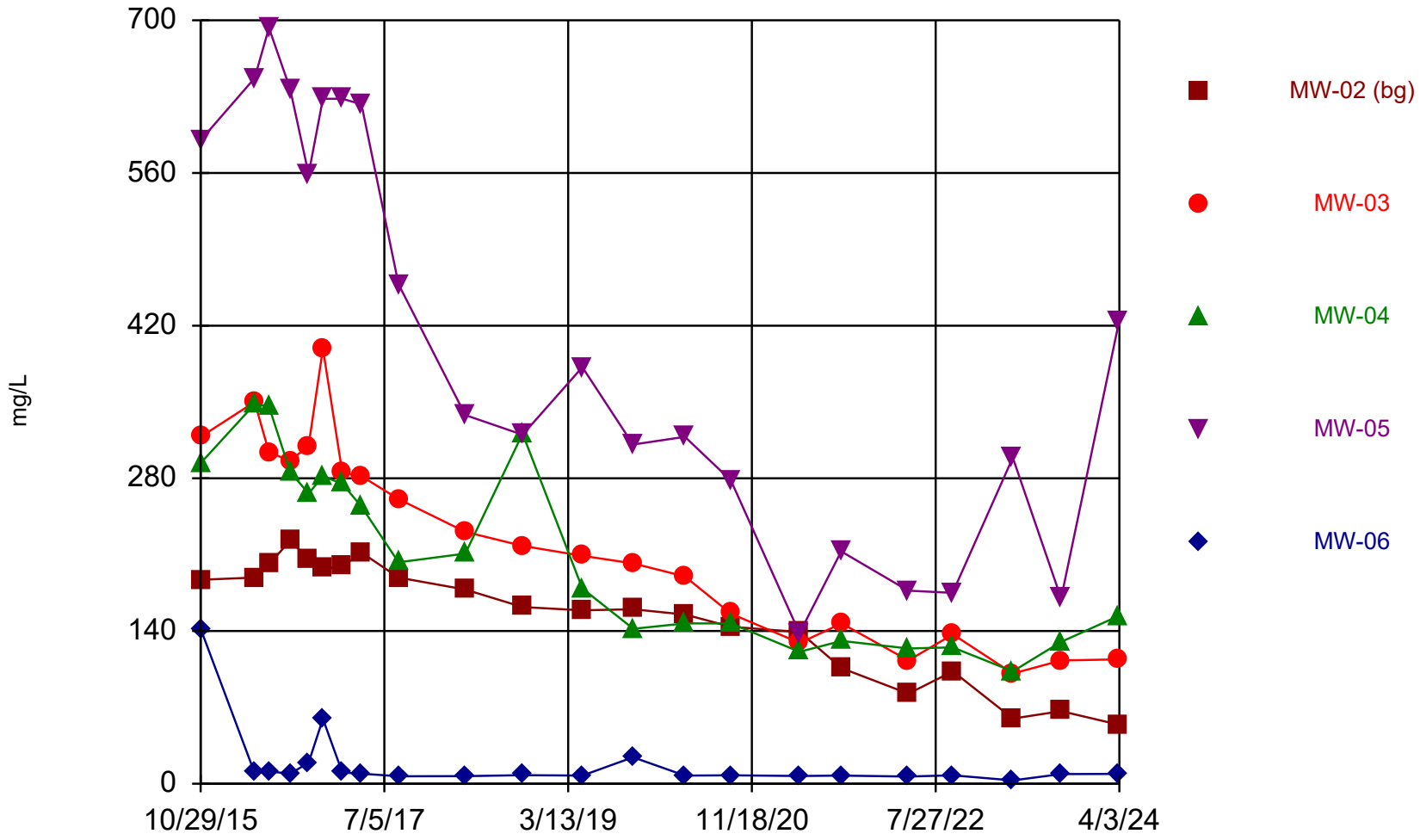
Time Series



Constituent: Calcium Analysis Run 7/16/2024 12:15 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Time Series

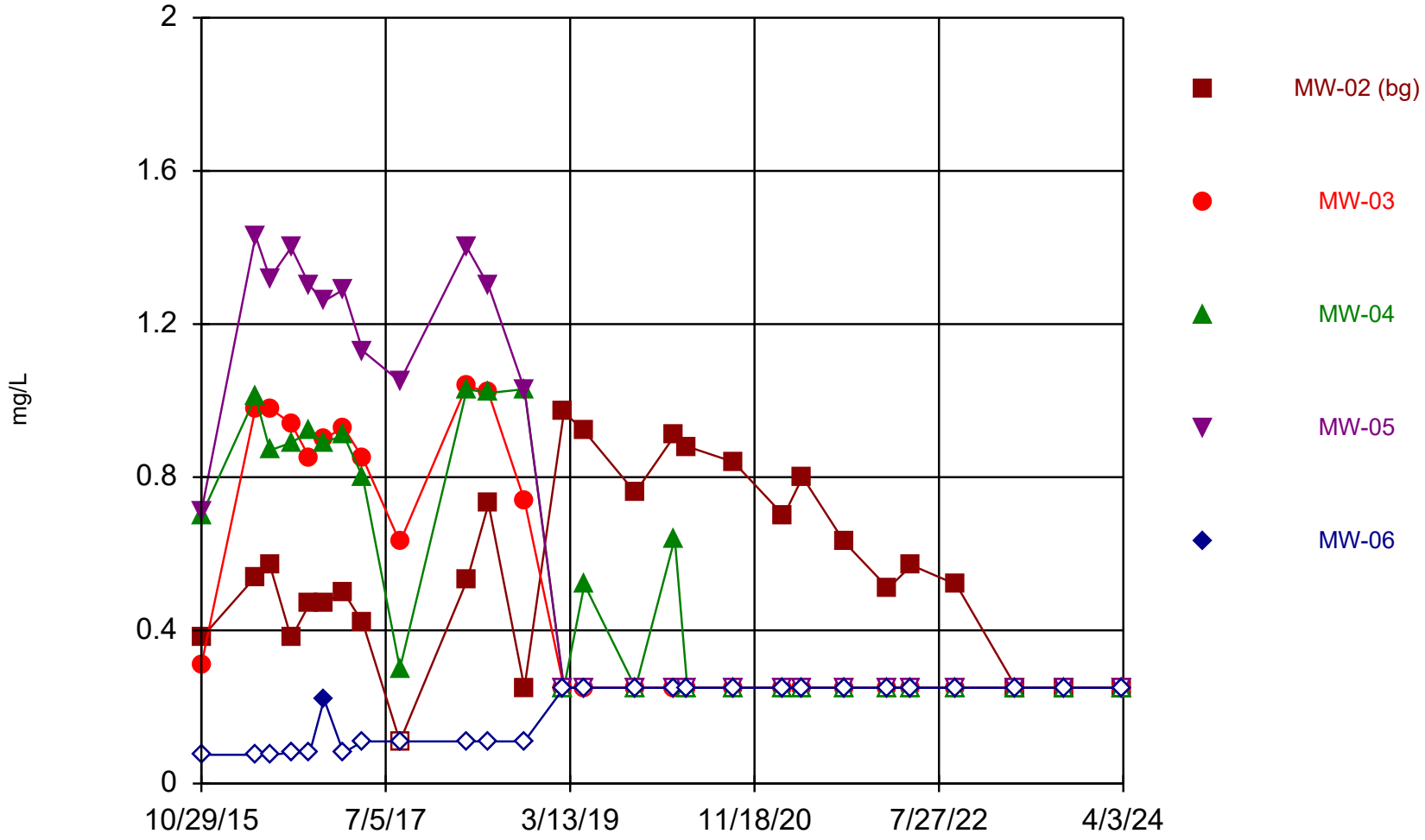


Constituent: Chloride Analysis Run 7/16/2024 12:15 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

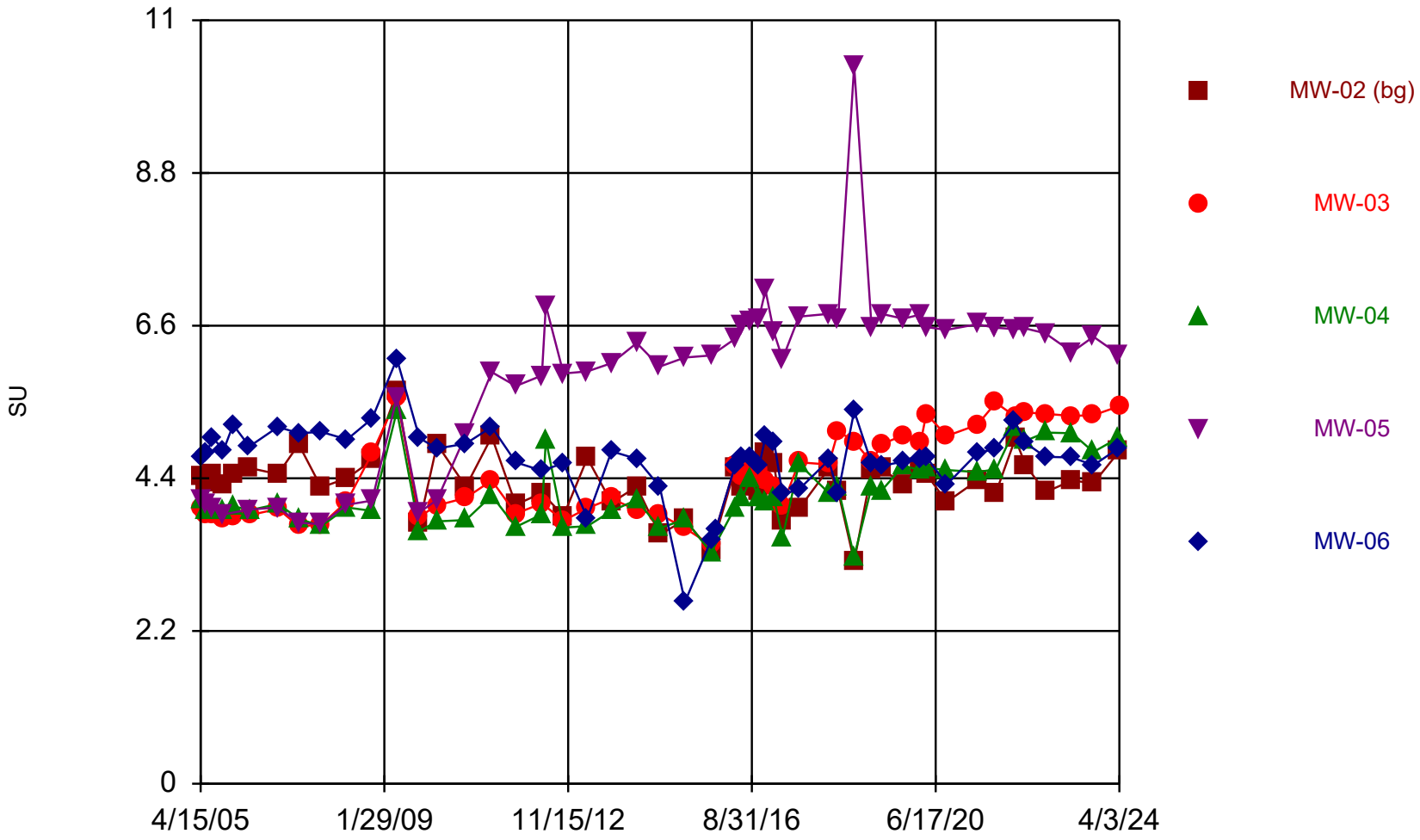
Time Series



Constituent: Fluoride Analysis Run 7/16/2024 12:15 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Time Series

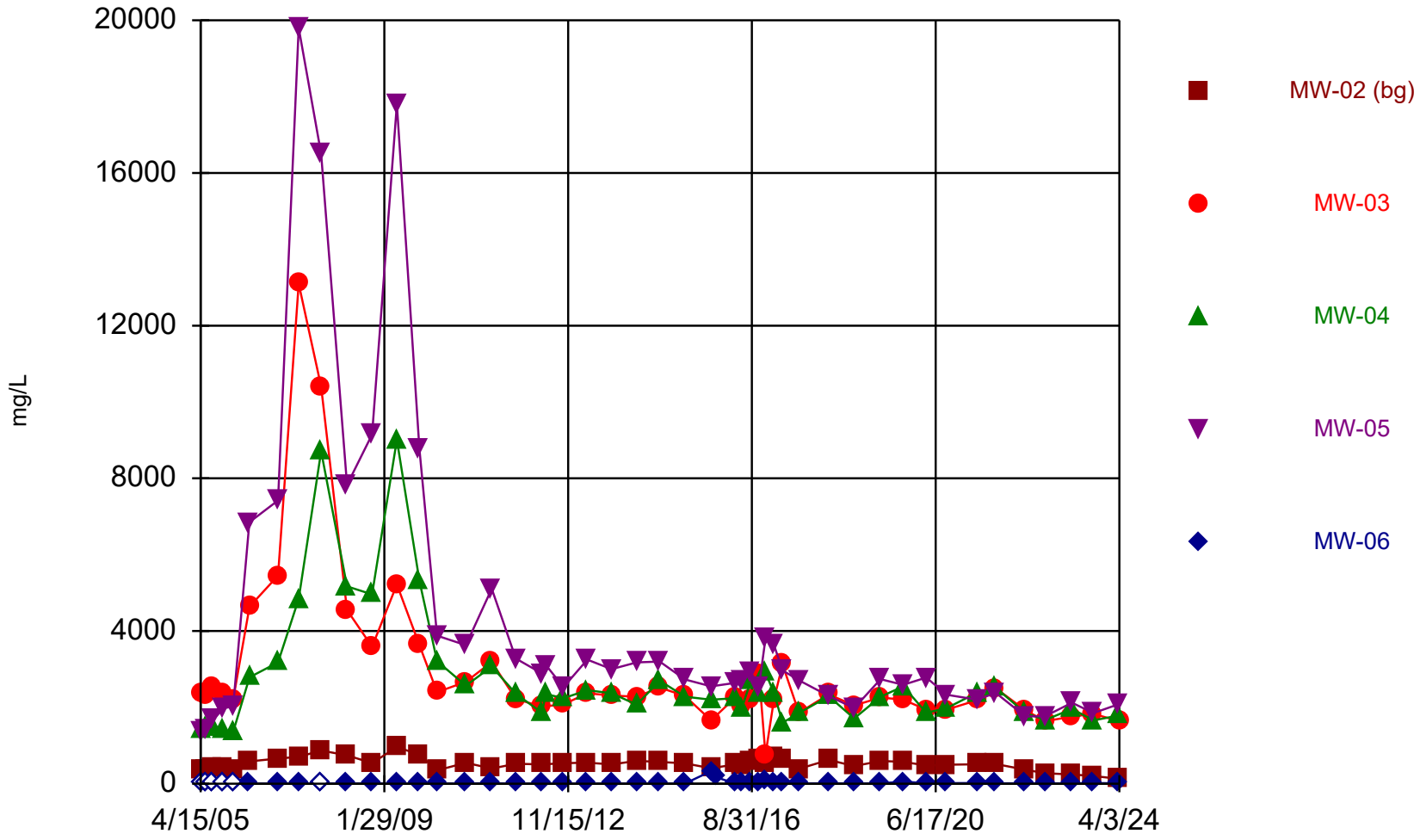


Constituent: pH Analysis Run 7/16/2024 12:15 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

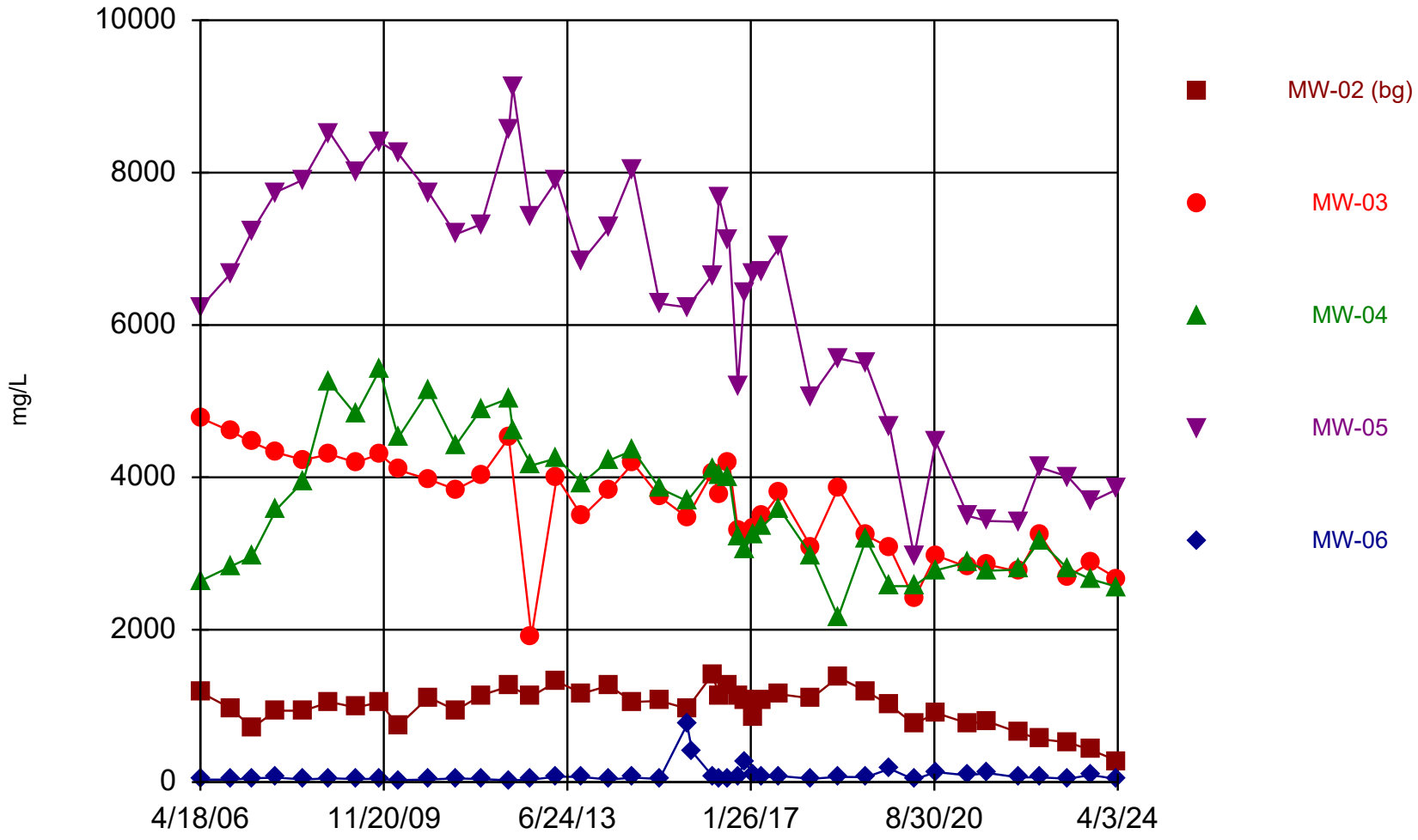
Time Series



Constituent: Sulfate Analysis Run 7/16/2024 12:15 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2024 12:15 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Prediction Limit

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen Printed 7/16/2024, 12:30 PM

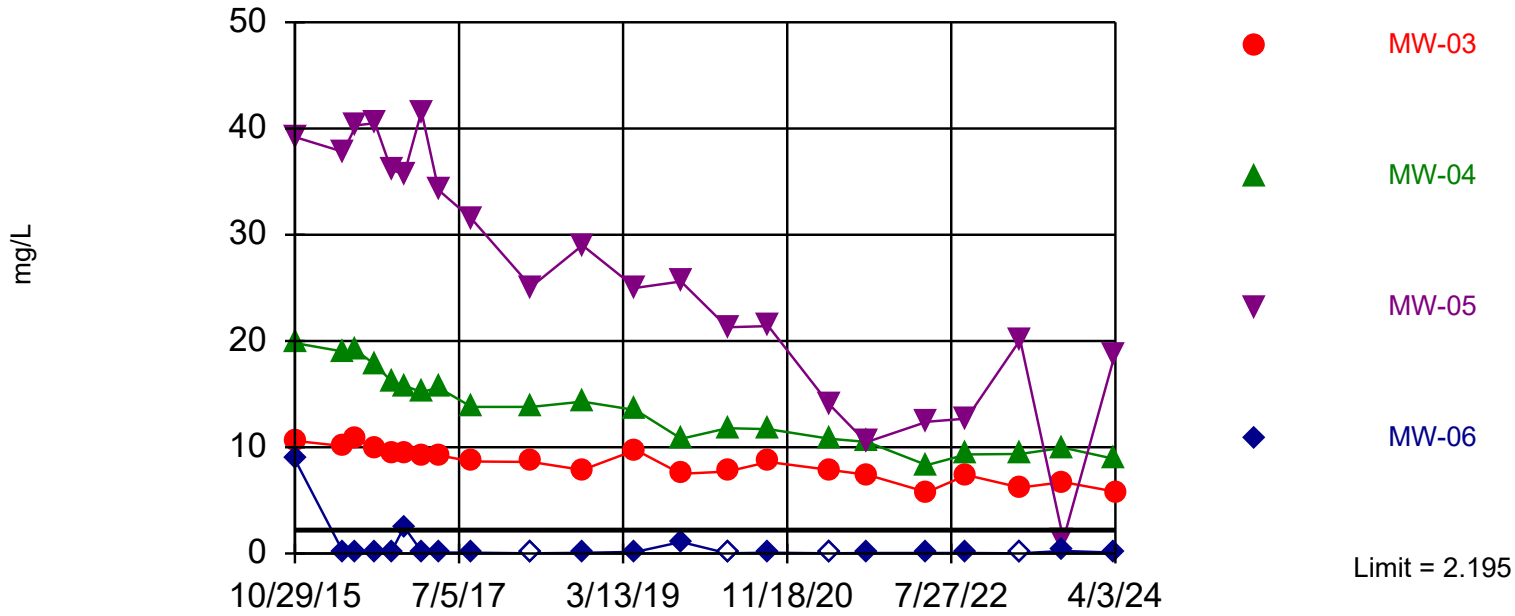
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	**MW-03**	**2.195**	**n/a**	**4/3/2024**	**5.81**	**Yes**	**22**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Boron (mg/L)	**MW-04**	**2.195**	**n/a**	**4/2/2024**	**8.89**	**Yes**	**22**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Boron (mg/L)	**MW-05**	**2.195**	**n/a**	**4/2/2024**	**18.8**	**Yes**	**22**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Boron (mg/L)	MW-06	2.195	n/a	4/2/2024	0.071	No	22	0	No	0.00188	Param Inter 1 of 2
Calcium (mg/L)	**MW-03**	**182.3**	**n/a**	**4/3/2024**	**447**	**Yes**	**24**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-04**	**182.3**	**n/a**	**4/2/2024**	**459**	**Yes**	**24**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-05**	**182.3**	**n/a**	**4/2/2024**	**525**	**Yes**	**24**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Calcium (mg/L)	MW-06	182.3	n/a	4/2/2024	2.69	No	24	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/L)	MW-03	255.9	n/a	4/3/2024	114	No	22	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/L)	MW-04	255.9	n/a	4/2/2024	154	No	22	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/L)	**MW-05**	**255.9**	**n/a**	**4/2/2024**	**424**	**Yes**	**22**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Chloride (mg/L)	MW-06	255.9	n/a	4/2/2024	8.94	No	22	0	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-03	1.008	n/a	4/3/2024	0.25ND	No	27	14.81	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-04	1.008	n/a	4/2/2024	0.25ND	No	27	14.81	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-05	1.008	n/a	4/2/2024	0.25ND	No	27	14.81	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-06	1.008	n/a	4/2/2024	0.25ND	No	27	14.81	No	0.00188	Param Inter 1 of 2
pH (SU)	**MW-03**	**5.105**	**3.585**	**4/3/2024**	**5.44**	**Yes**	**50**	**0**	**No**	**0.000...**	**Param Inter 1 of 2**
pH (SU)	MW-04	5.105	3.585	4/2/2024	4.99	No	50	0	No	0.000...	Param Inter 1 of 2
pH (SU)	**MW-05**	**5.105**	**3.585**	**4/2/2024**	**6.18**	**Yes**	**50**	**0**	**No**	**0.000...**	**Param Inter 1 of 2**
pH (SU)	MW-06	5.105	3.585	4/2/2024	4.84	No	50	0	No	0.000...	Param Inter 1 of 2
Sulfate (mg/L)	**MW-03**	**807.4**	**n/a**	**4/3/2024**	**1640**	**Yes**	**46**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Sulfate (mg/L)	**MW-04**	**807.4**	**n/a**	**4/2/2024**	**1790**	**Yes**	**46**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Sulfate (mg/L)	**MW-05**	**807.4**	**n/a**	**4/2/2024**	**2090**	**Yes**	**46**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-06	807.4	n/a	4/2/2024	10.6	No	46	0	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids [TDS] (m...	**MW-03**	**1449**	**n/a**	**4/3/2024**	**2668**	**Yes**	**41**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Total Dissolved Solids [TDS] (m...	**MW-04**	**1449**	**n/a**	**4/2/2024**	**2562**	**Yes**	**41**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Total Dissolved Solids [TDS] (m...	**MW-05**	**1449**	**n/a**	**4/2/2024**	**3848**	**Yes**	**41**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Total Dissolved Solids [TDS] (m...	MW-06	1449	n/a	4/2/2024	39	No	41	0	No	0.00188	Param Inter 1 of 2

Sanitas™ v.9.6.37 Software licensed to WSP USA Inc. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1.376, Std. Dev.=0.4193, n=22. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9109, critical = 0.878. Kappa = 1.952 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

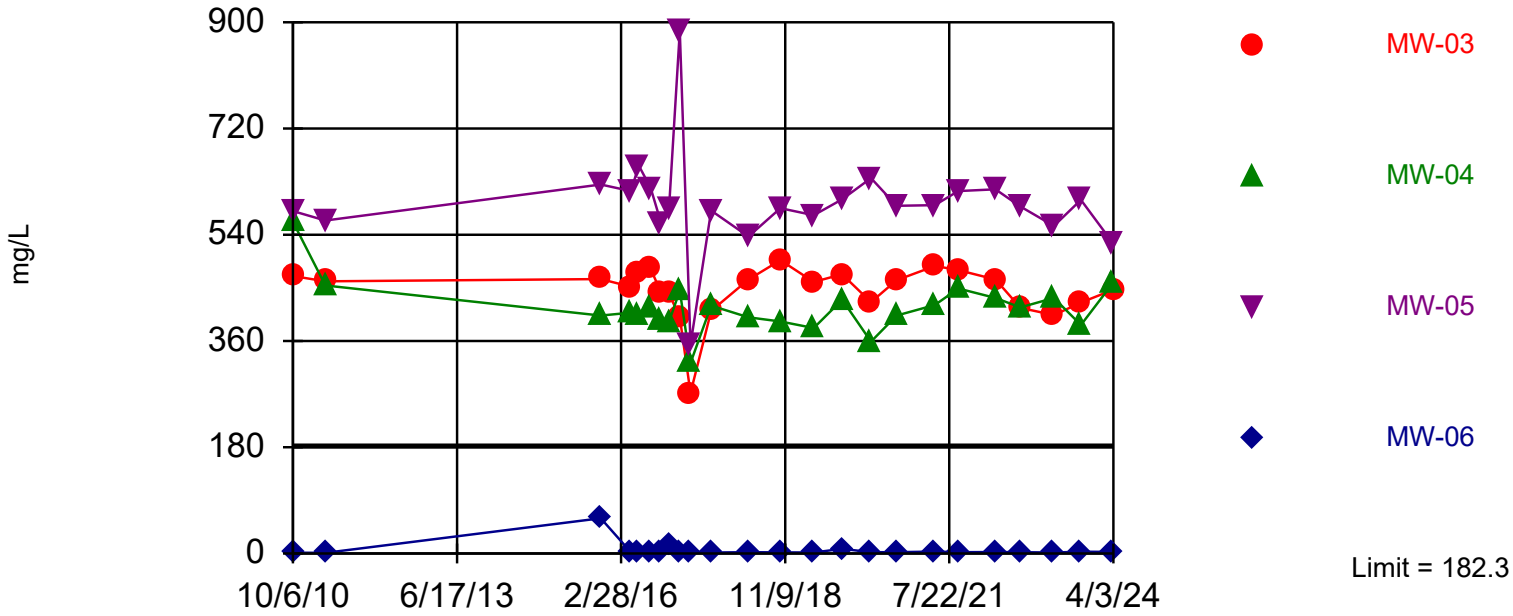
Constituent: Boron Analysis Run 7/16/2024 12:29 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=108.2, Std. Dev.=38.44, n=24. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9197, critical = 0.884. Kappa = 1.927 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

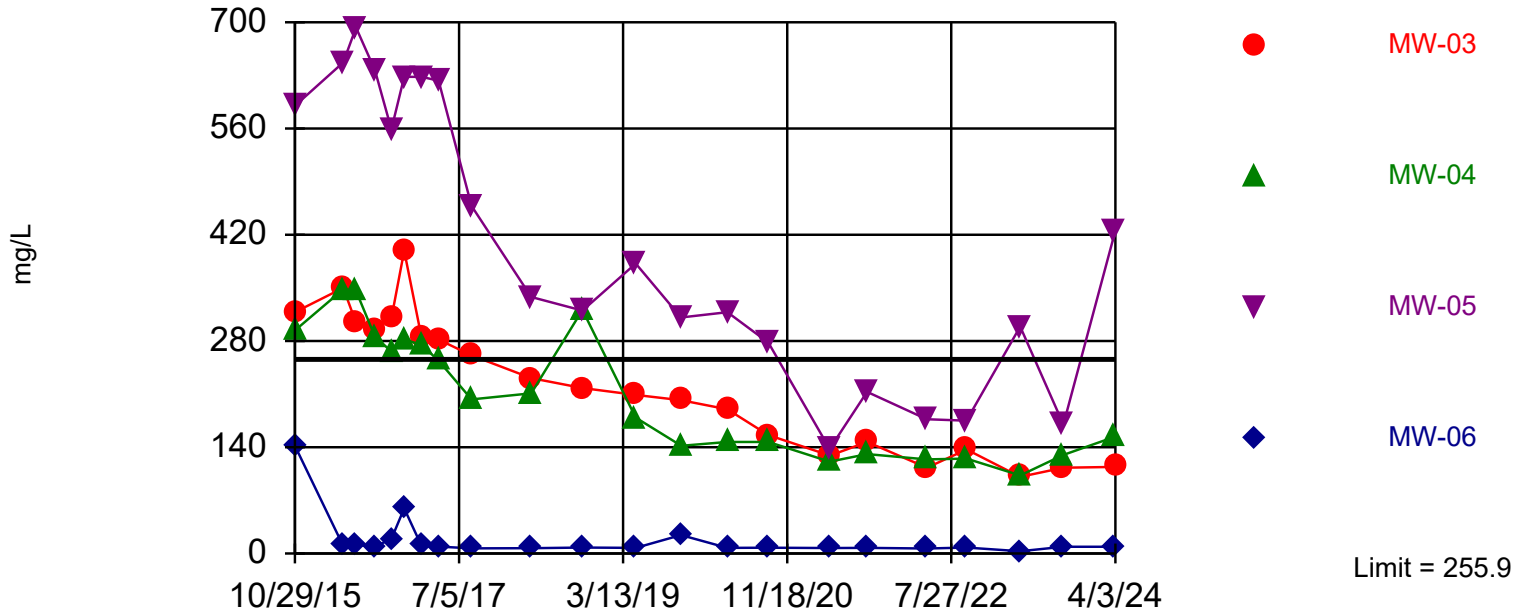
Constituent: Calcium Analysis Run 7/16/2024 12:29 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Exceeds Limit: MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=153.3, Std. Dev.=52.54, n=22. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9055, critical = 0.878. Kappa = 1.952 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Constituent: Chloride Analysis Run 7/16/2024 12:29 PM View: Landfill AppIII

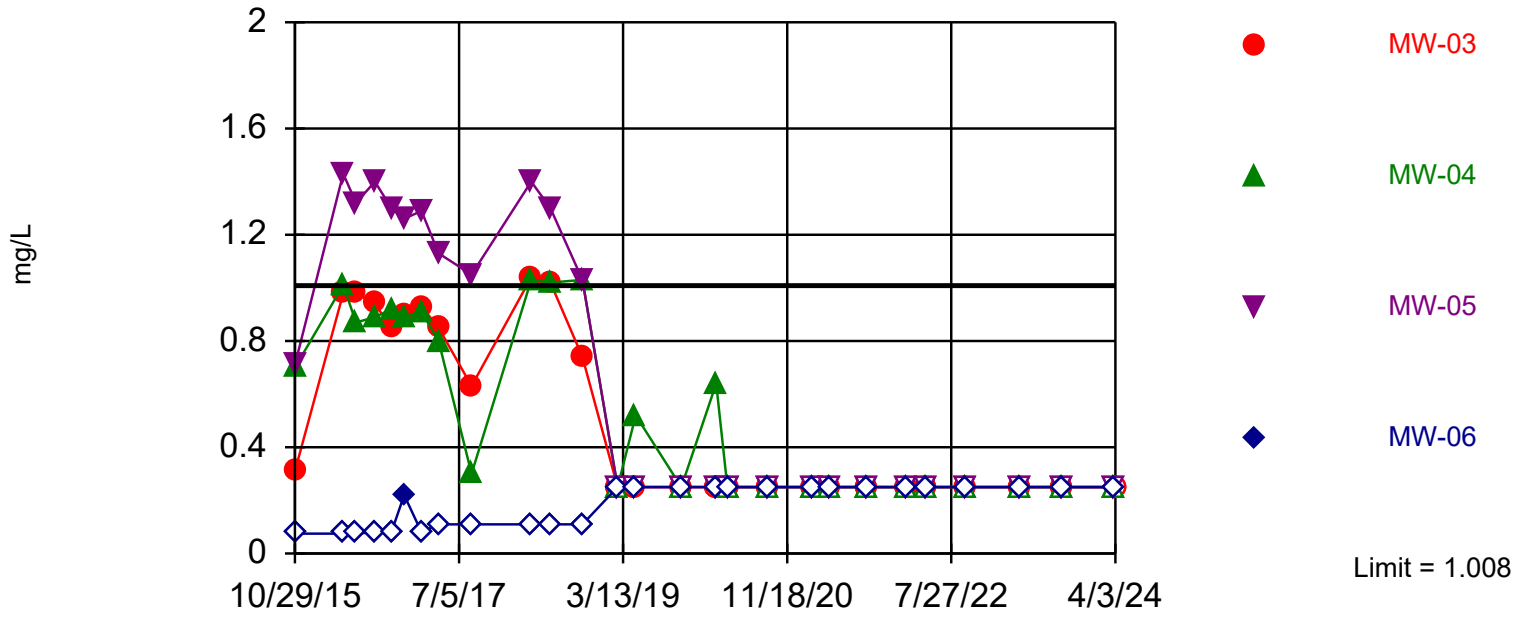
RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.5596, Std. Dev.=0.236, n=27, 14.81% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.962, critical = 0.894. Kappa = 1.9 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

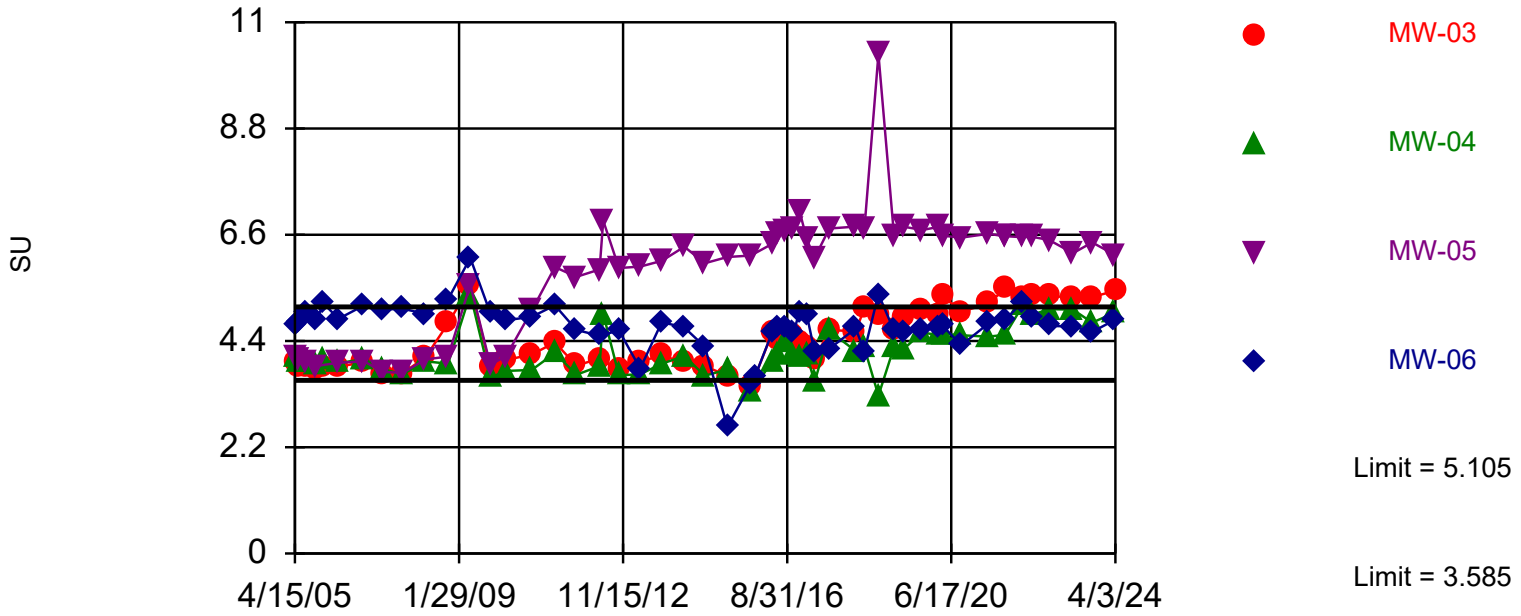
Constituent: Fluoride Analysis Run 7/16/2024 12:29 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Exceeds Limits: MW-03, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4.345, Std. Dev.=0.4216, n=50. Seasonality was not detected with 95% confidence. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9426, critical = 0.935. Kappa = 1.802 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009398. Comparing 4 points to limit.

Constituent: pH Analysis Run 7/16/2024 12:29 PM View: Landfill AppIII

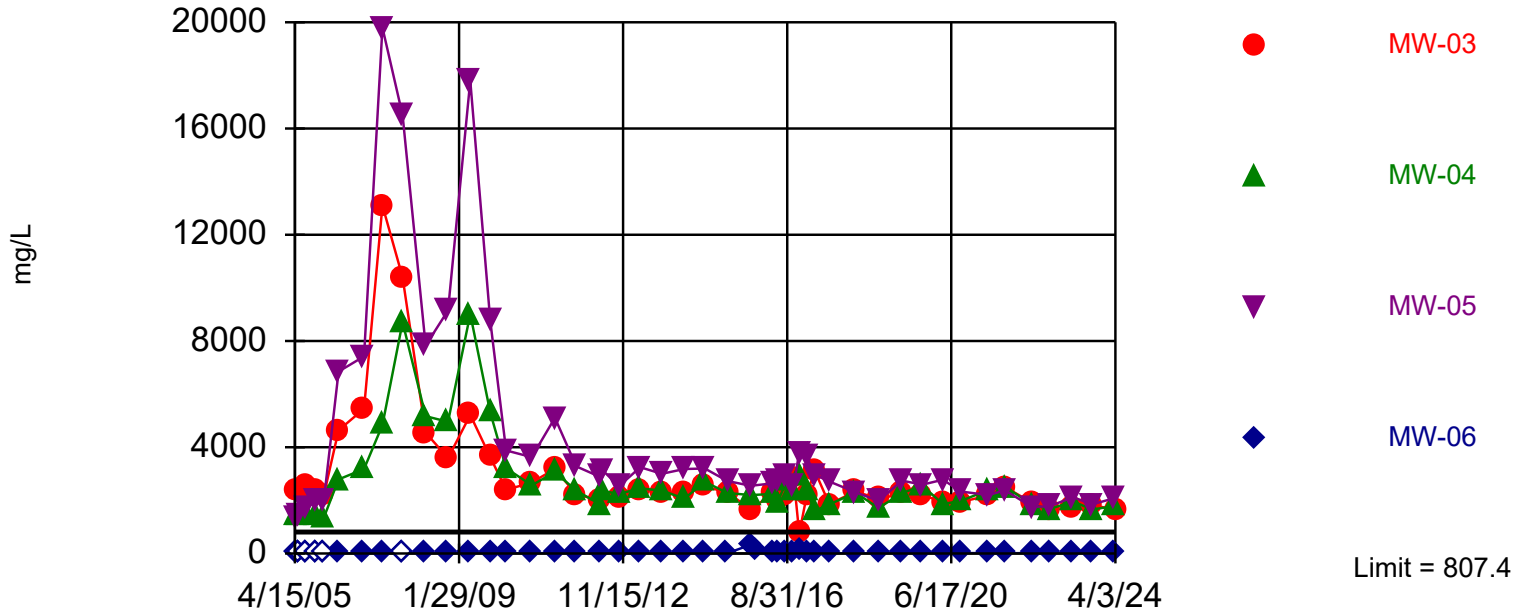
RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=514.9, Std. Dev.=161.3, n=46. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9817, critical = 0.927. Kappa = 1.813 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

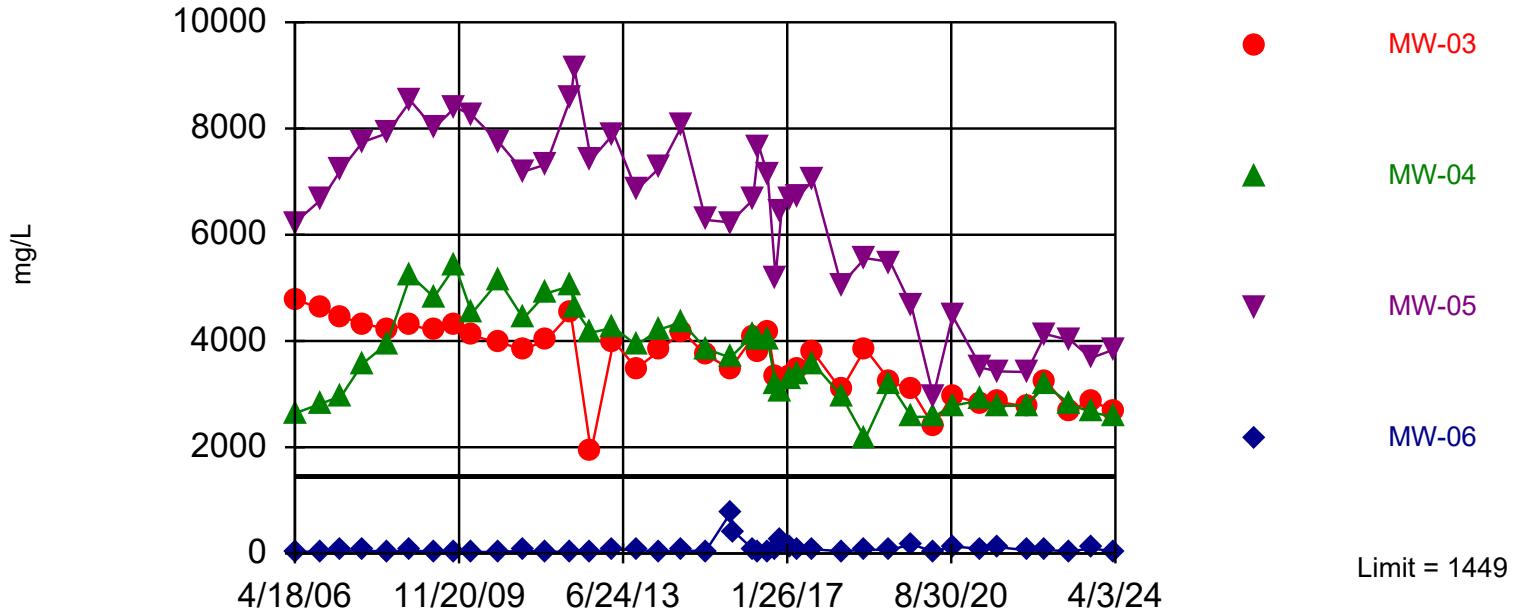
Constituent: Sulfate Analysis Run 7/16/2024 12:29 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=985.3, Std. Dev.=254.1, n=41. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9469, critical = 0.92. Kappa = 1.824 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2024 12:29 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

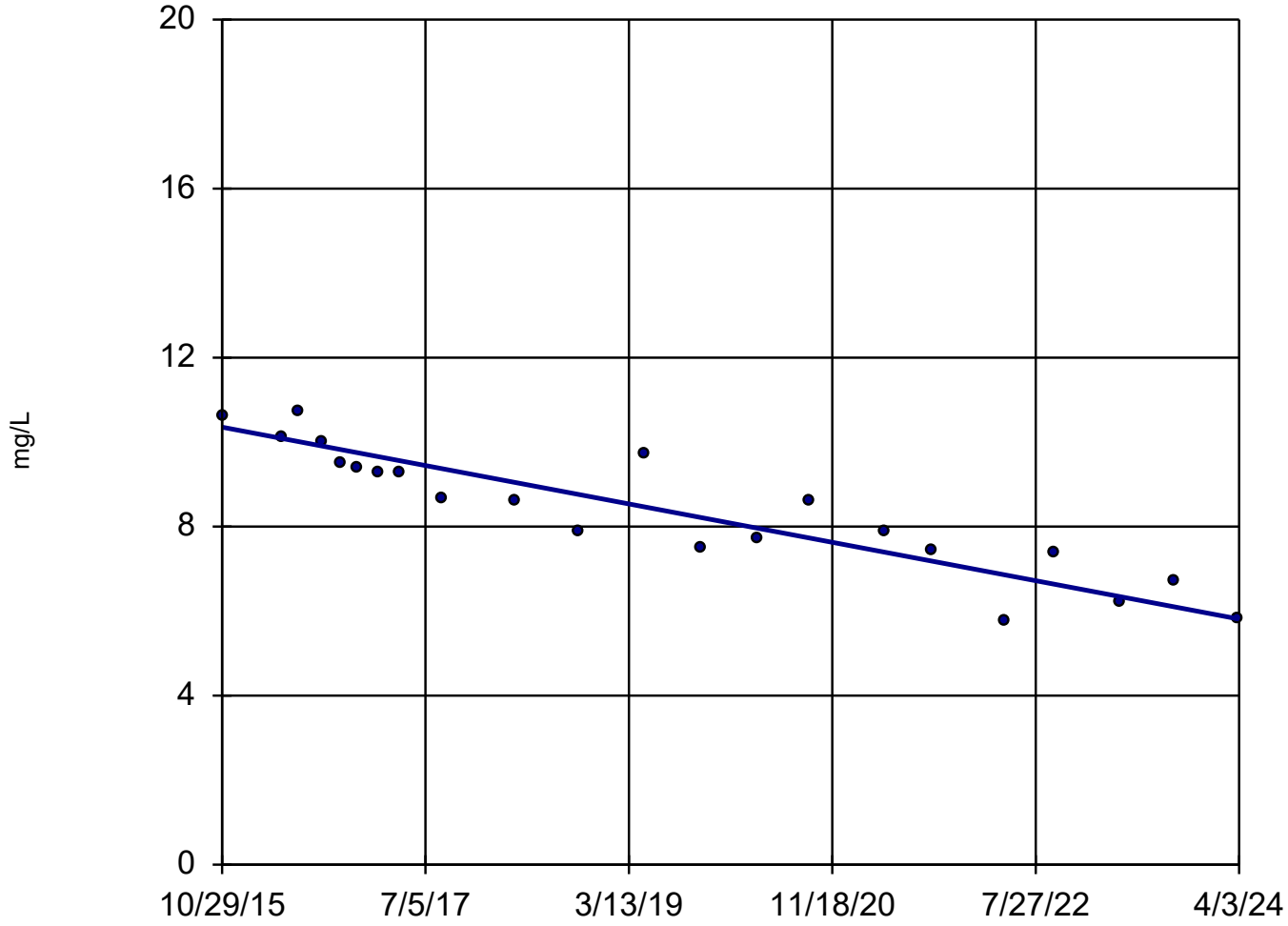
Trend Test

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen Printed 7/16/2024, 12:45 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	**MW-03**	**-0.5387**	**-191**	**-84**	**Yes**	**22**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	**MW-04**	**-1.247**	**-203**	**-84**	**Yes**	**22**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	**MW-05**	**-4.284**	**-190**	**-89**	**Yes**	**23**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Calcium (mg/L)	MW-03	-1.565	-35	-95	No	24	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-04	0.2001	5	95	No	24	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-05	-0.9025	-17	-95	No	24	0	n/a	n/a	0.02	NP
Chloride (mg/L)	**MW-05**	**-64.09**	**-162**	**-84**	**Yes**	**22**	**0**	**n/a**	**n/a**	**0.02**	**NP**
pH (SU)	**MW-03**	**0.08733**	**6.142**	**2.33**	**Yes**	**50**	**0**	**n/a**	**n/a**	**0.02**	**NP**
pH (SU)	**MW-05**	**0.1372**	**5.549**	**2.33**	**Yes**	**51**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Sulfate (mg/L)	**MW-03**	**-61.78**	**-4.906**	**-2.33**	**Yes**	**46**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Sulfate (mg/L)	MW-04	-54.83	-2.22	-2.33	No	47	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	**MW-05**	**-127.5**	**-3.558**	**-2.33**	**Yes**	**47**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids [TDS] (m...	**MW-03**	**-107.3**	**-6.391**	**-2.33**	**Yes**	**41**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids [TDS] (m...	**MW-04**	**-147.7**	**-4.736**	**-2.33**	**Yes**	**42**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids [TDS] (m...	**MW-05**	**-286.5**	**-5.549**	**-2.33**	**Yes**	**42**	**0**	**n/a**	**n/a**	**0.02**	**NP**

Sen's Slope Estimator

MW-03



n = 22

Slope = -0.5387 units per year.

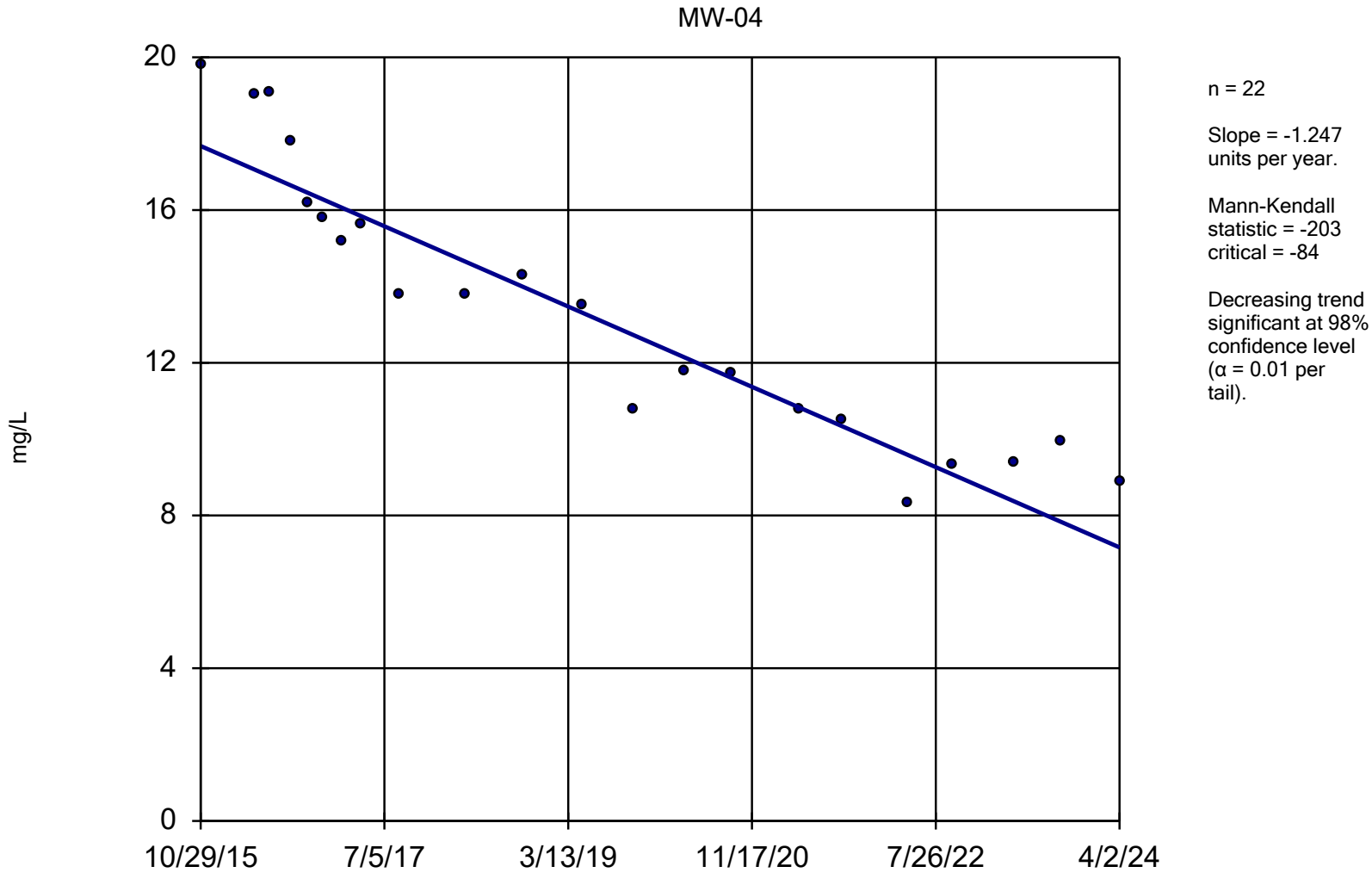
Mann-Kendall statistic = -191
critical = -84

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Boron Analysis Run 7/16/2024 12:43 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

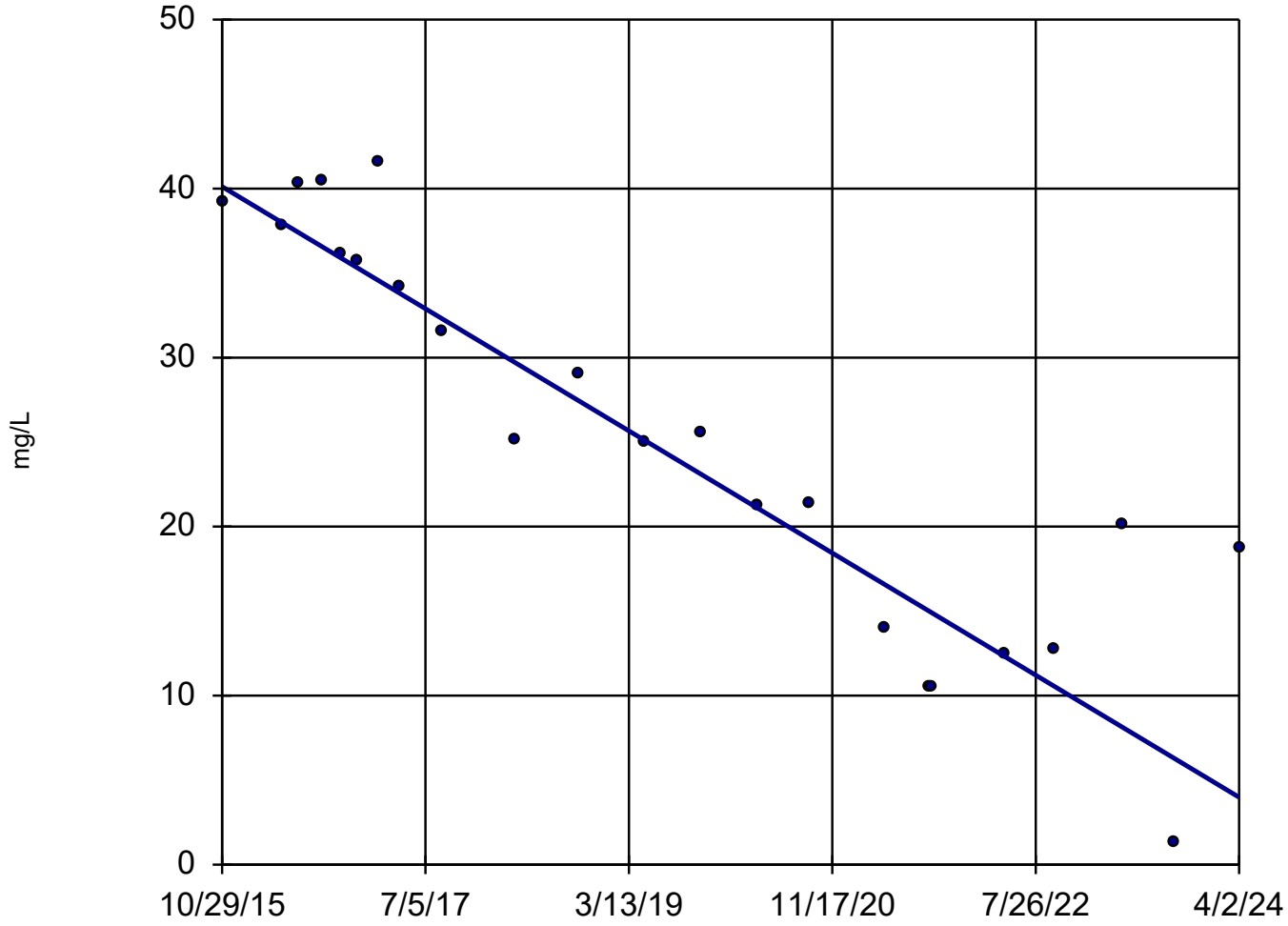


Constituent: Boron Analysis Run 7/16/2024 12:43 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-05



n = 23

Slope = -4.284 units per year.

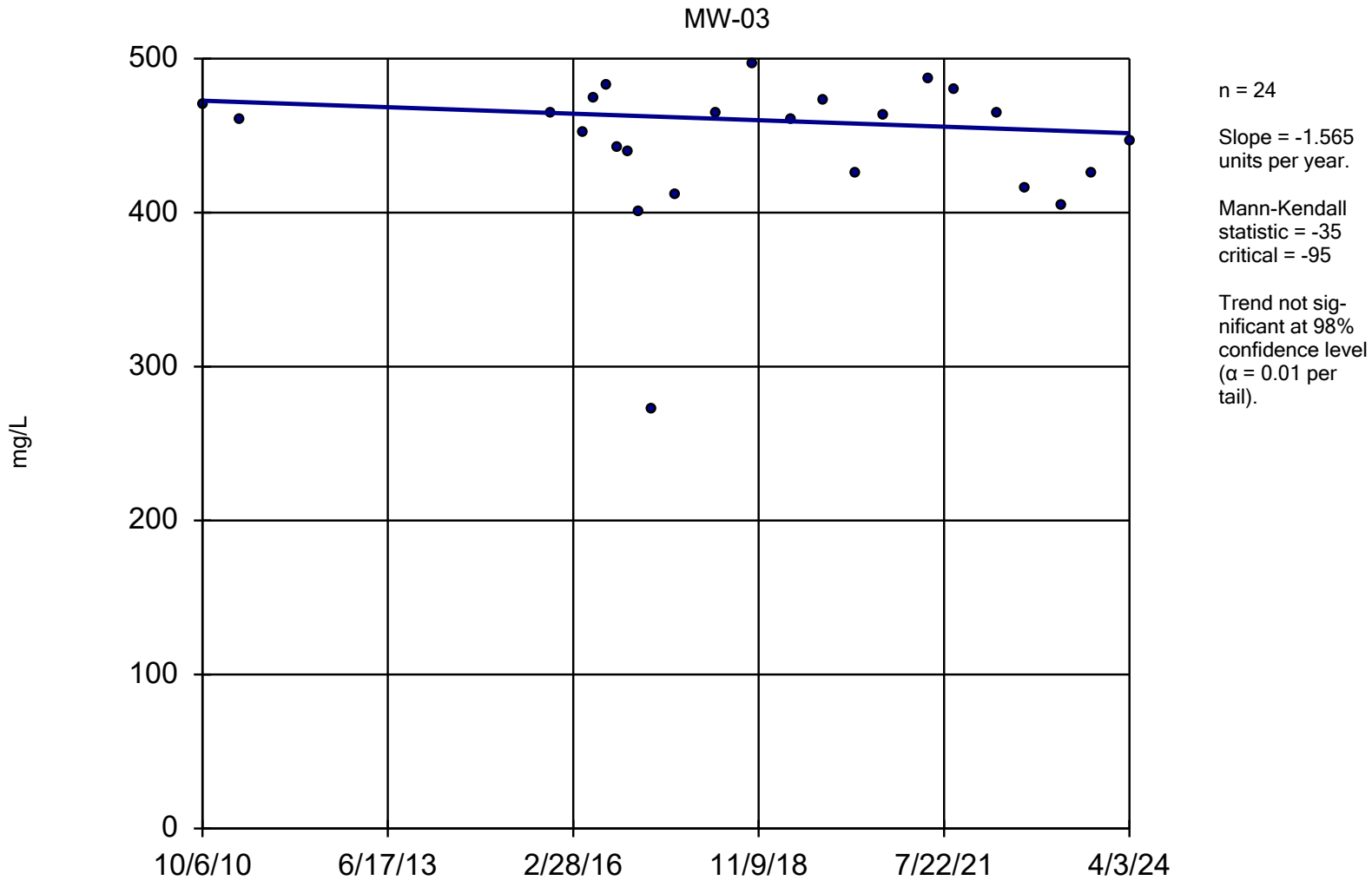
Mann-Kendall statistic = -190
critical = -89

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Boron Analysis Run 7/16/2024 12:43 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

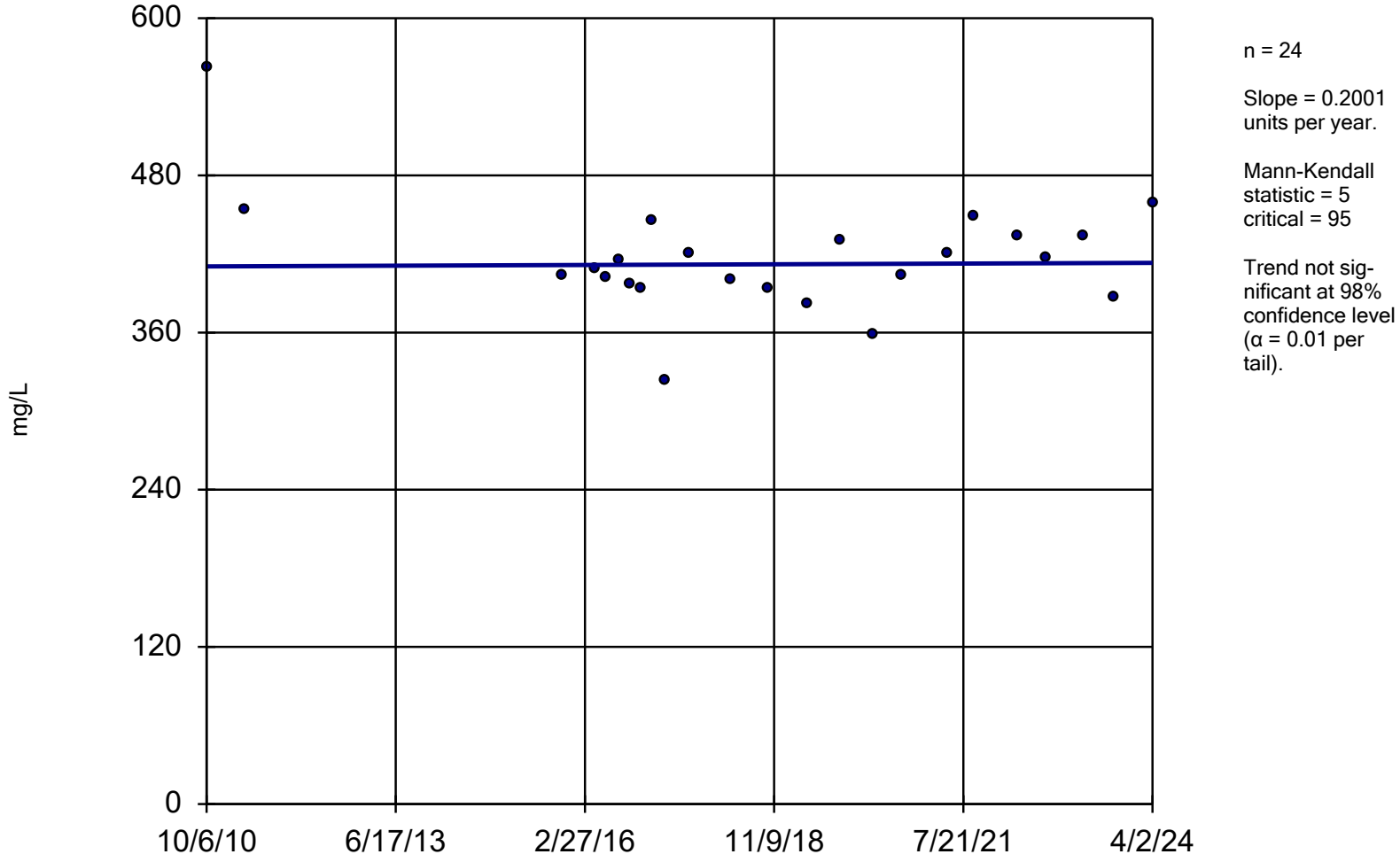


Constituent: Calcium Analysis Run 7/16/2024 12:43 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-04



n = 24

Slope = 0.2001 units per year.

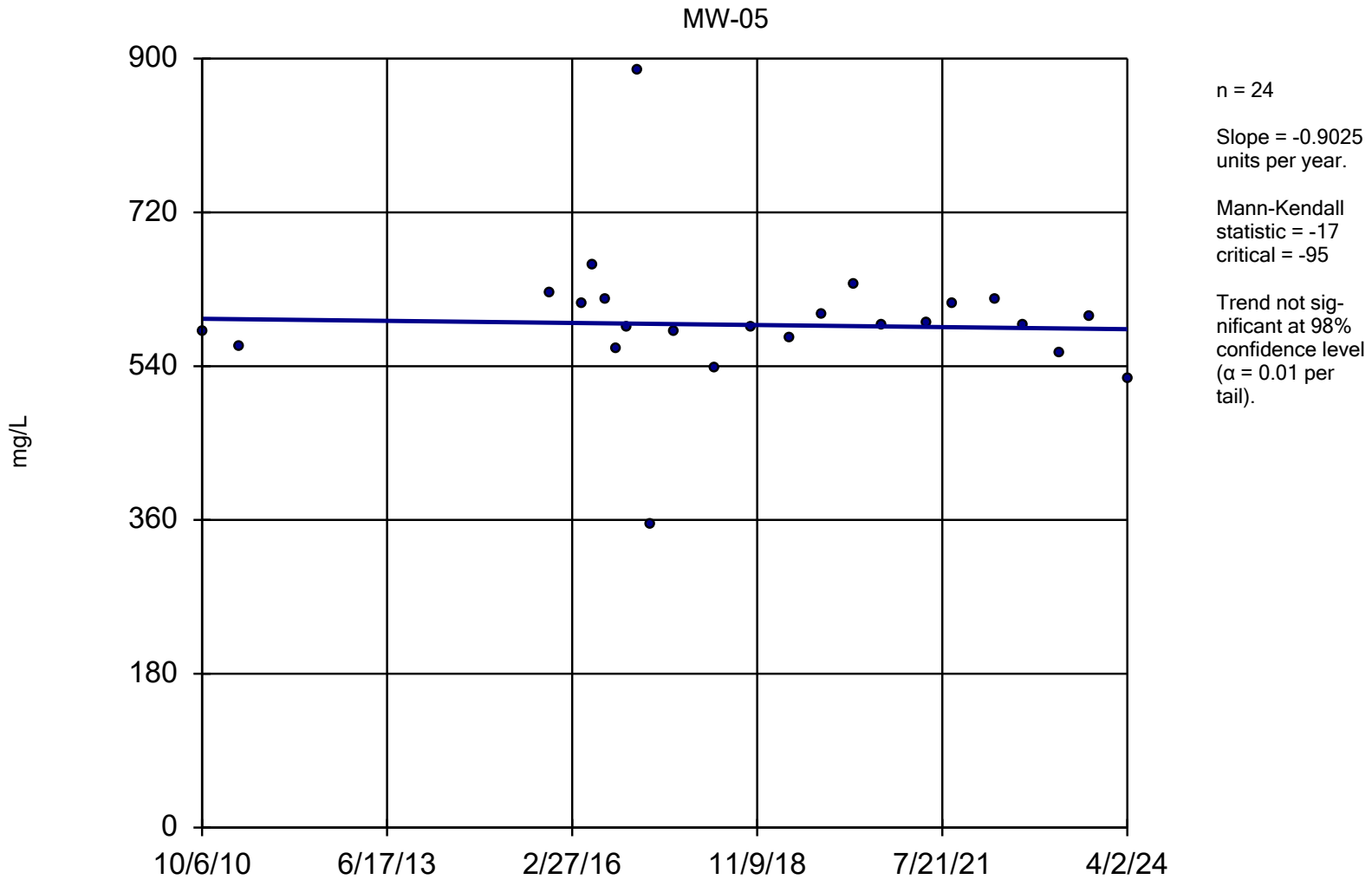
Mann-Kendall statistic = 5
critical = 95

Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: Calcium Analysis Run 7/16/2024 12:43 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

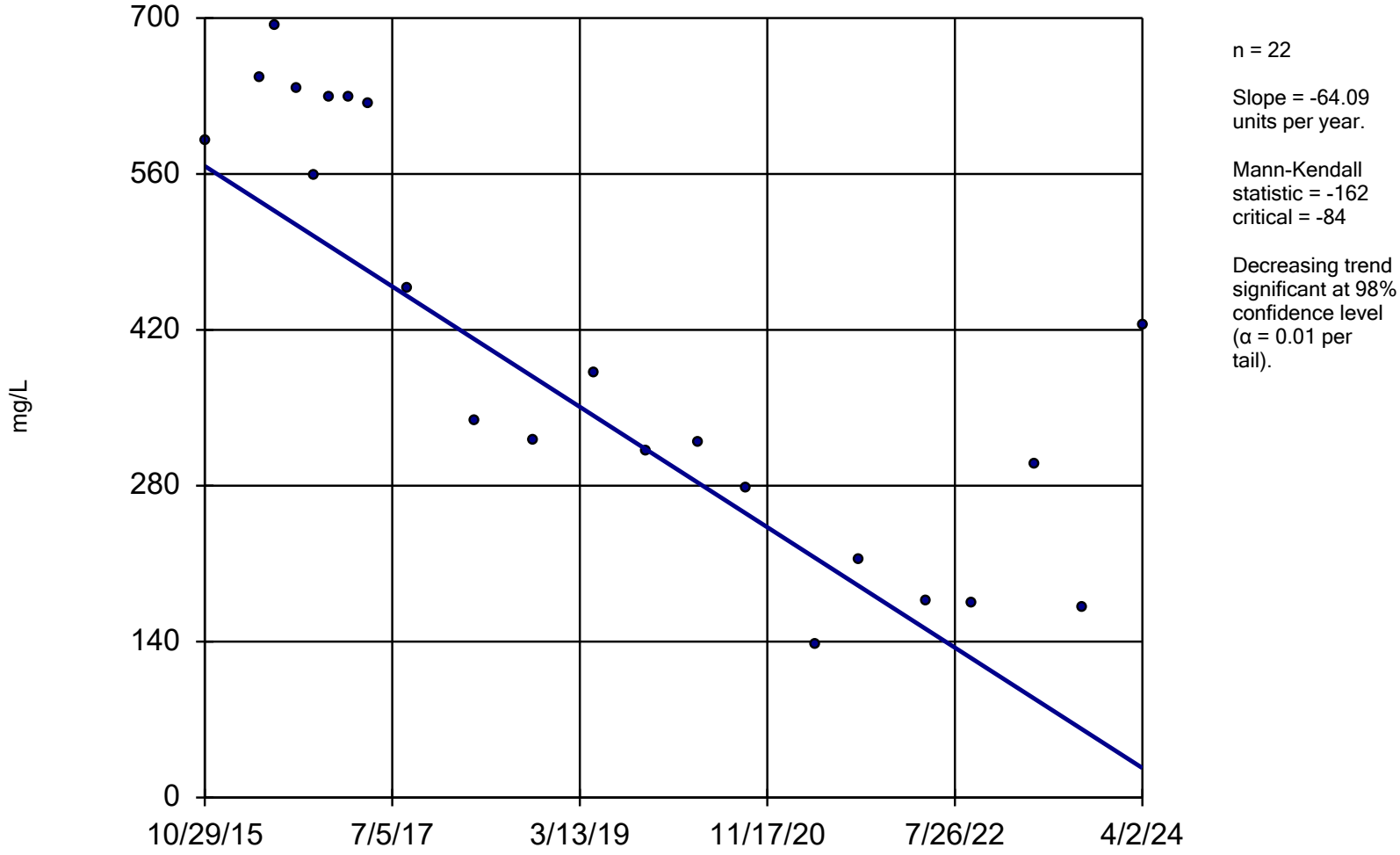


Constituent: Calcium Analysis Run 7/16/2024 12:43 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-05



n = 22

Slope = -64.09 units per year.

Mann-Kendall statistic = -162
critical = -84

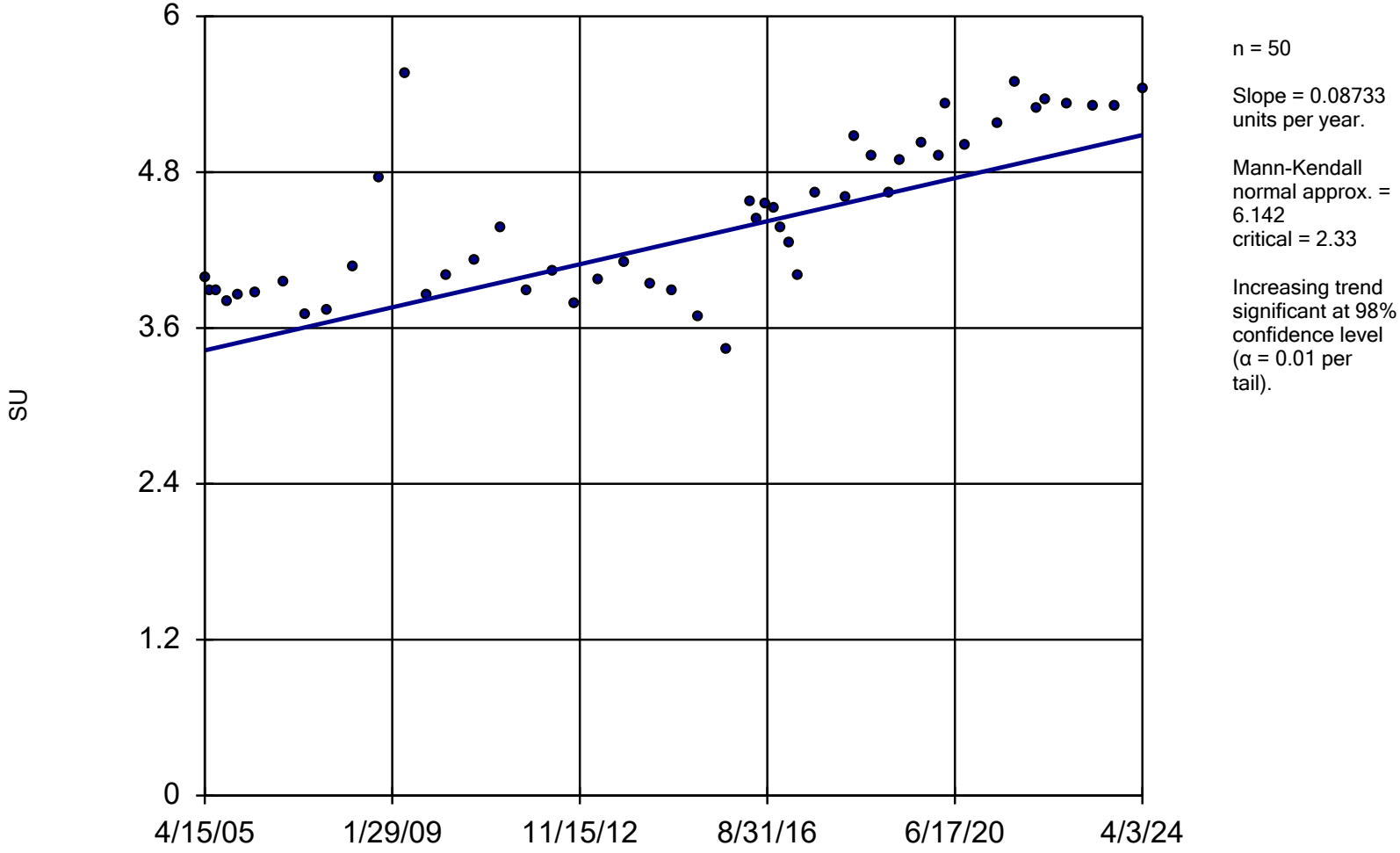
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Chloride Analysis Run 7/16/2024 12:43 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-03



n = 50

Slope = 0.08733 units per year.

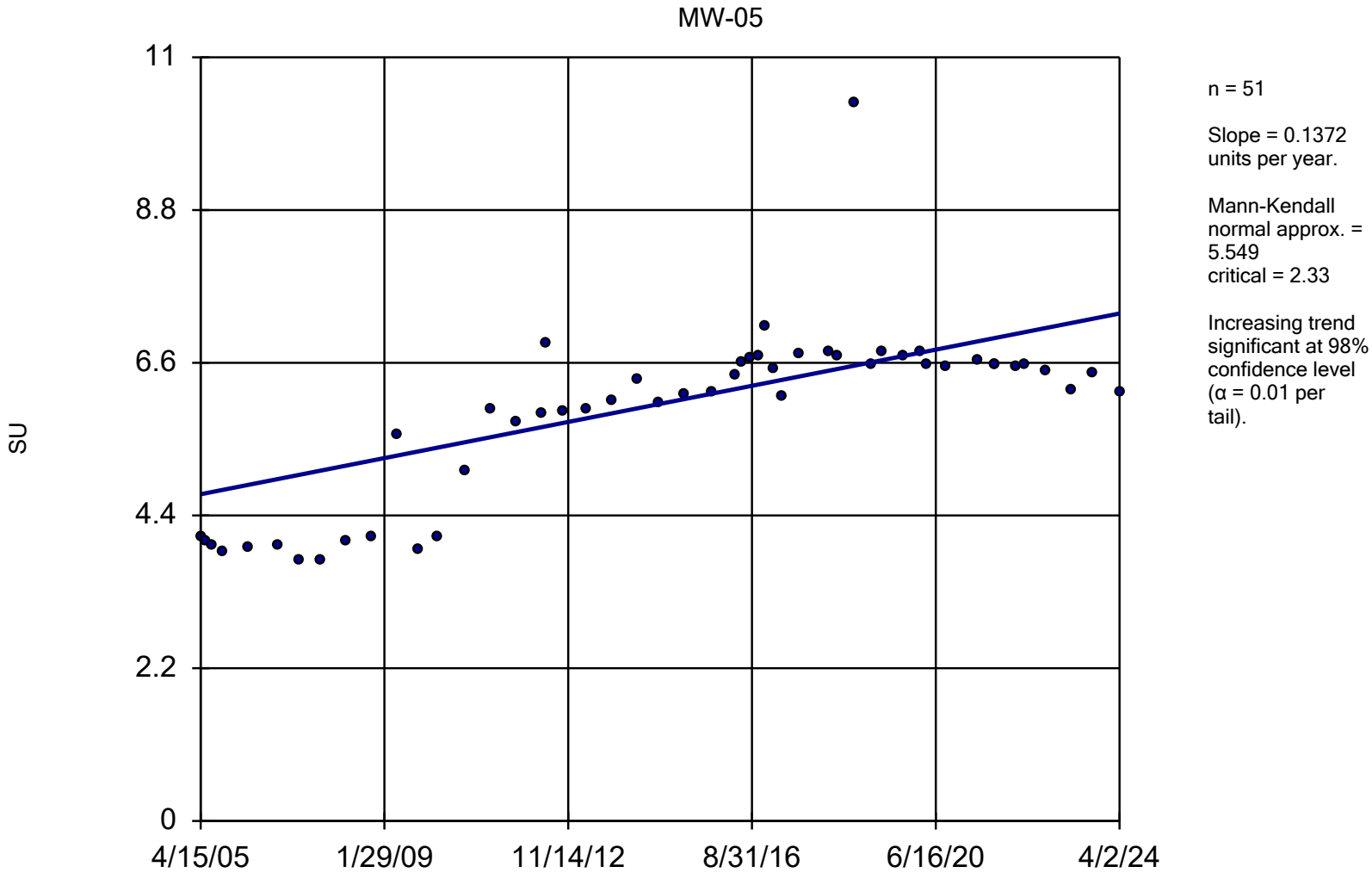
Mann-Kendall normal approx. = 6.142
critical = 2.33

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: pH Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

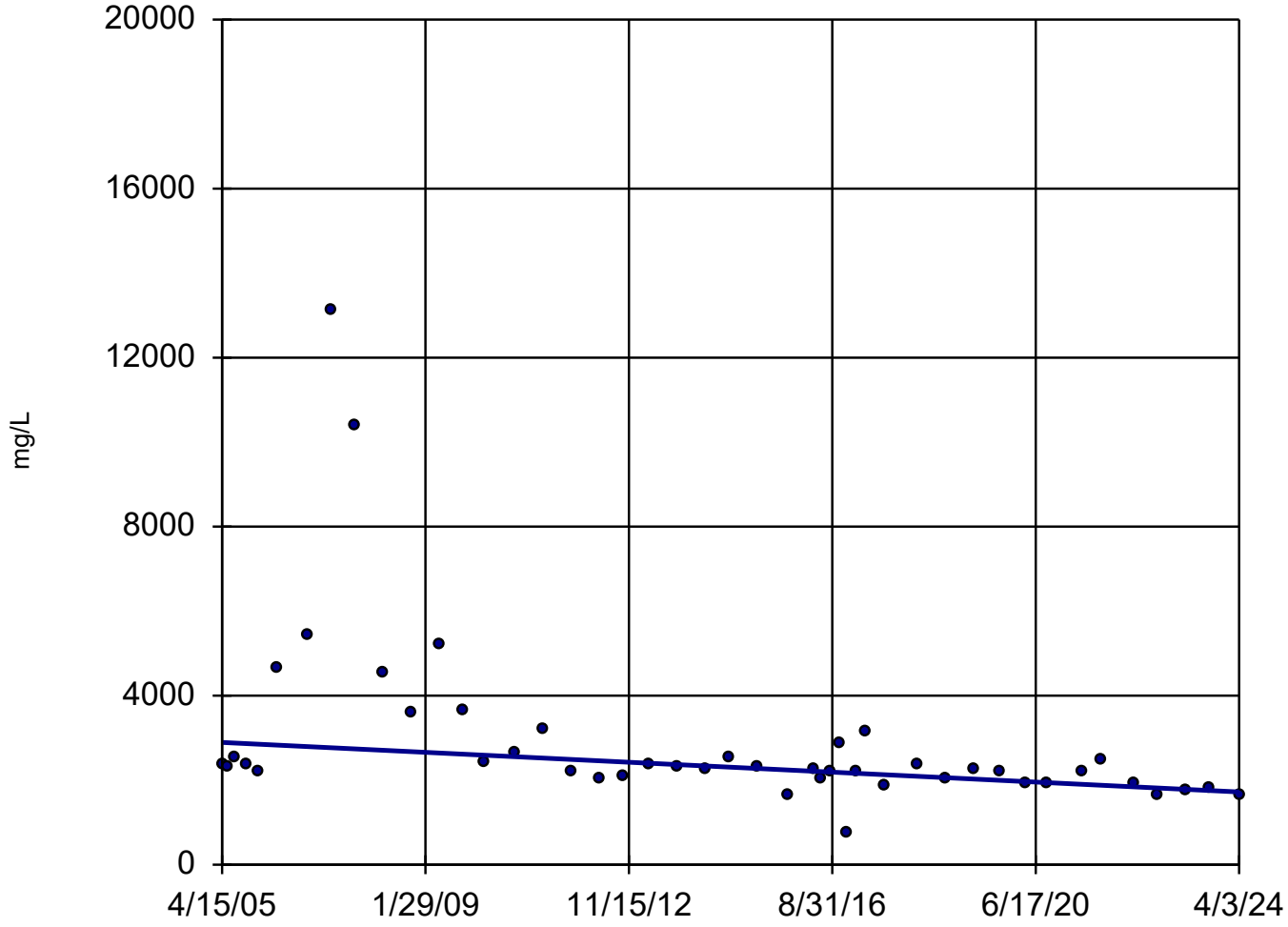


Constituent: pH Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-03



n = 46

Slope = -61.78 units per year.

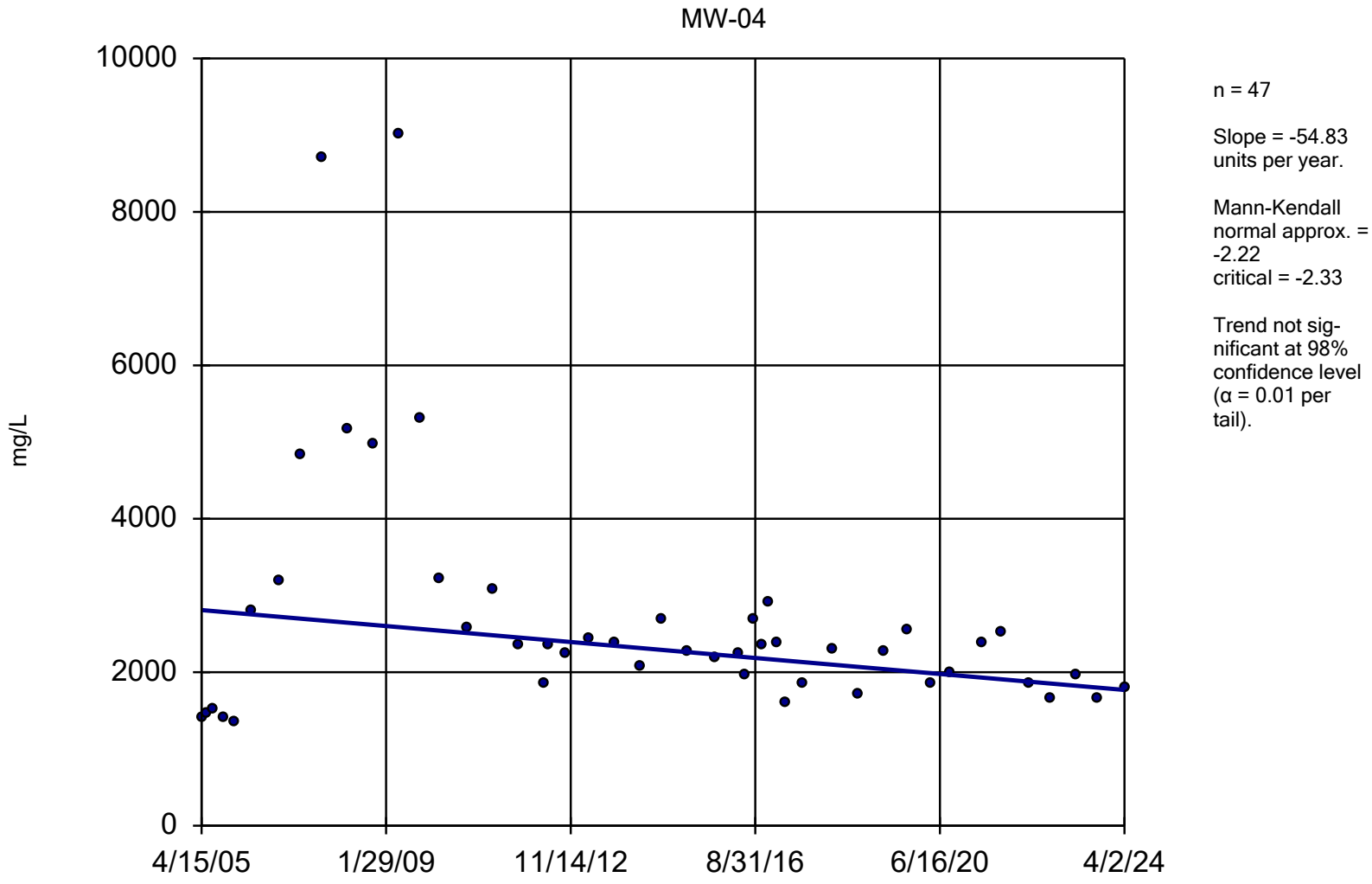
Mann-Kendall normal approx. = -4.906
critical = -2.33

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Sulfate Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

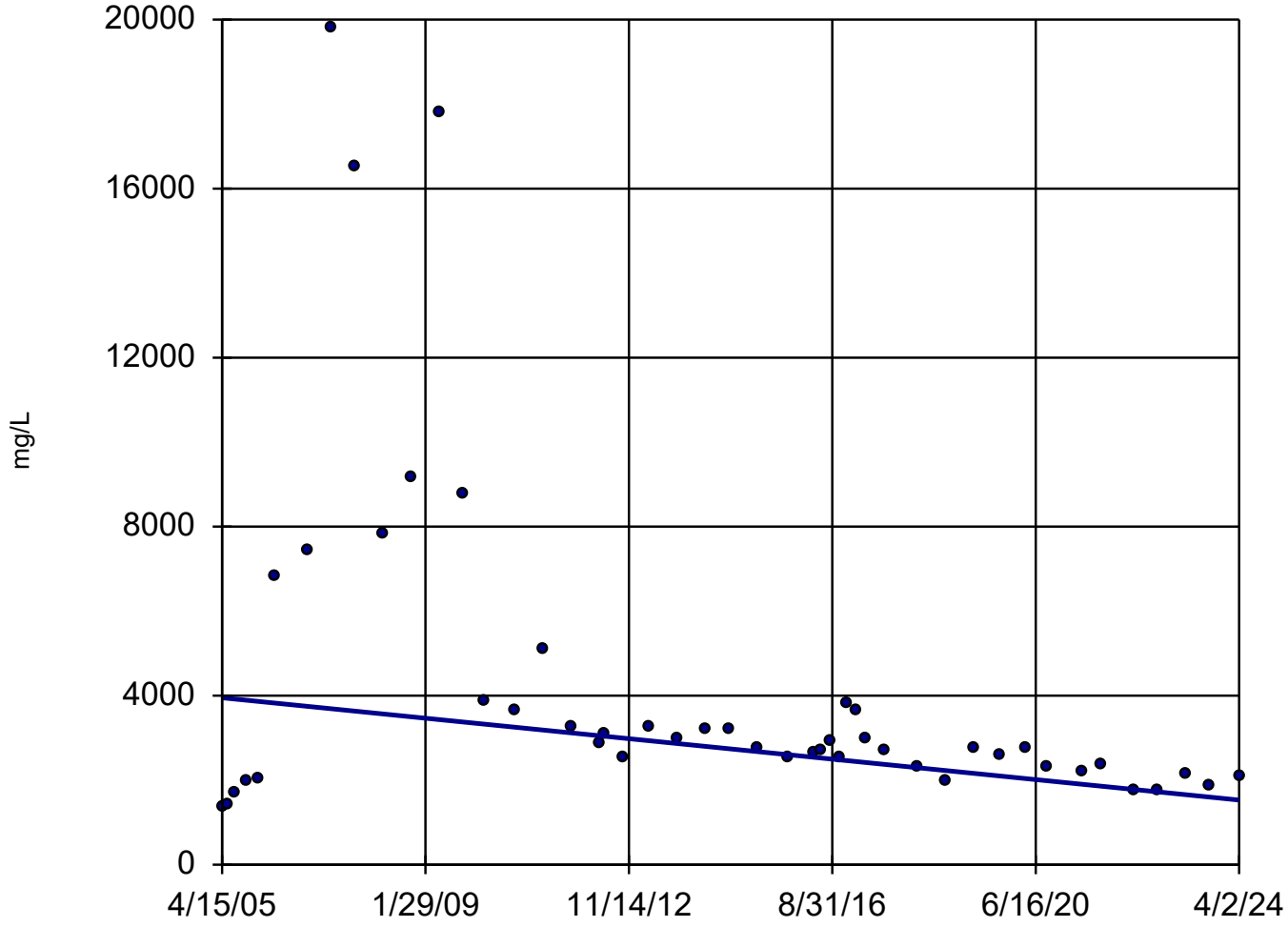


Constituent: Sulfate Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-05



n = 47

Slope = -127.5 units per year.

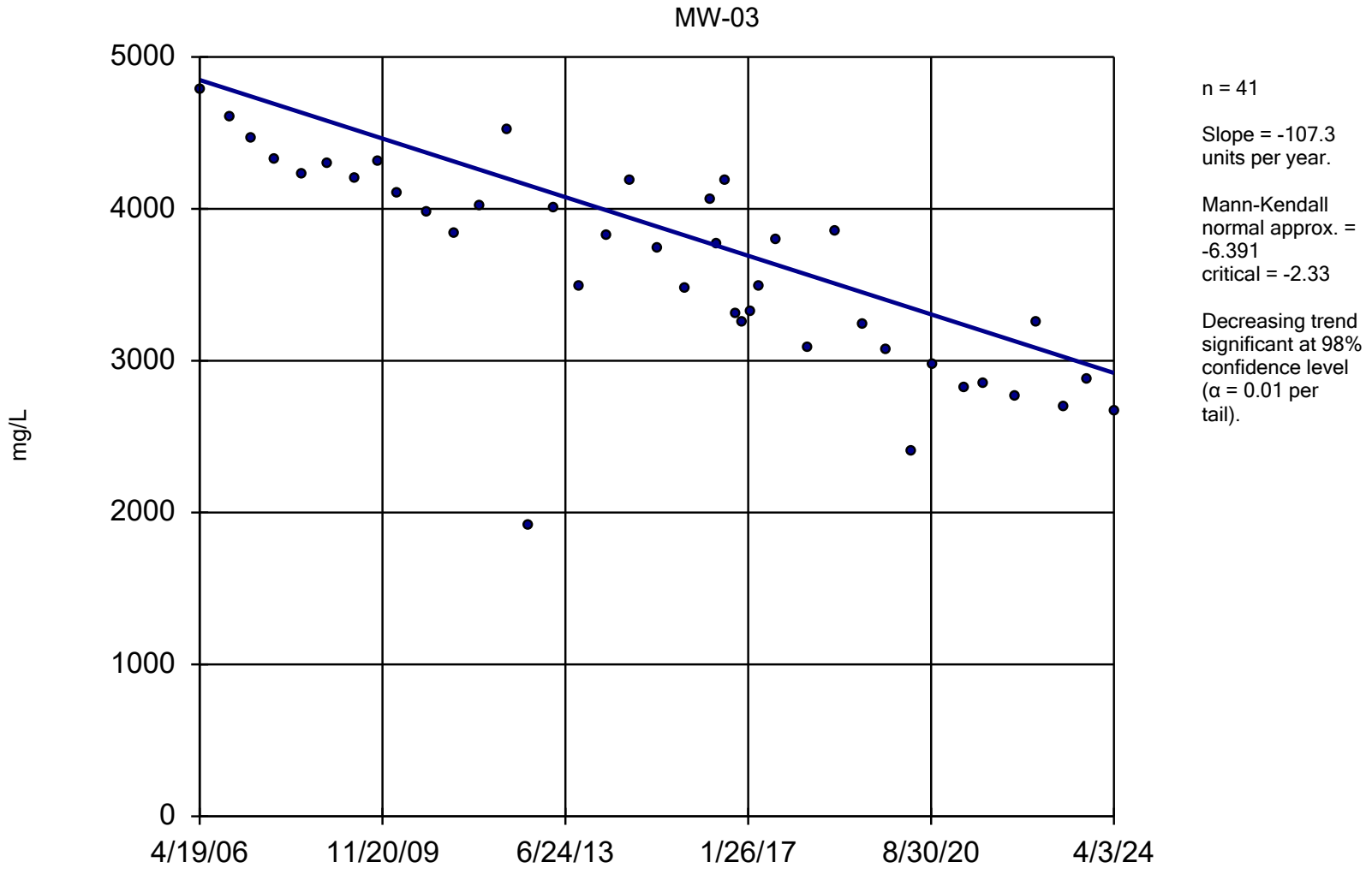
Mann-Kendall normal approx. = -3.558
critical = -2.33

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Sulfate Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

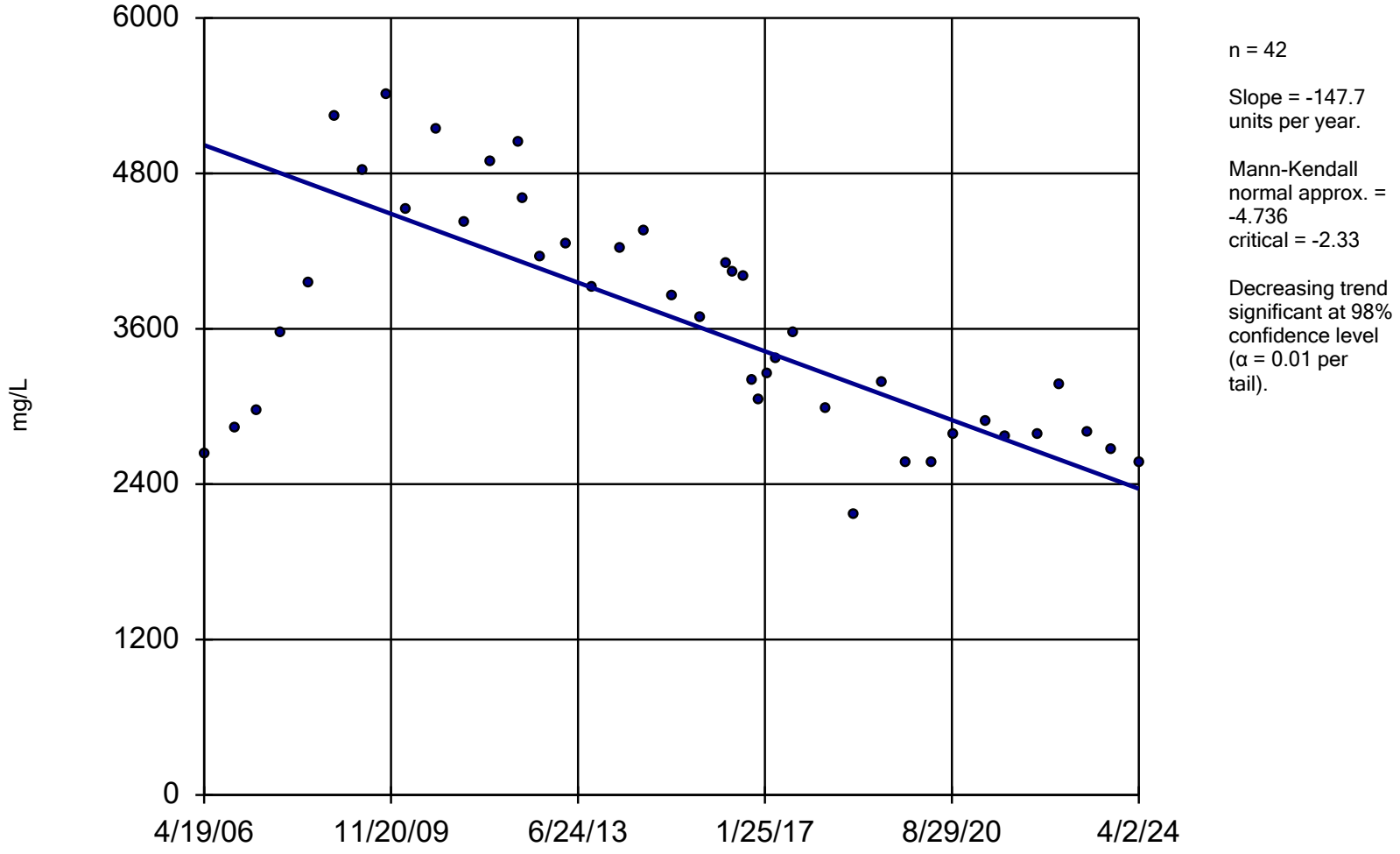


Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-04



n = 42

Slope = -147.7 units per year.

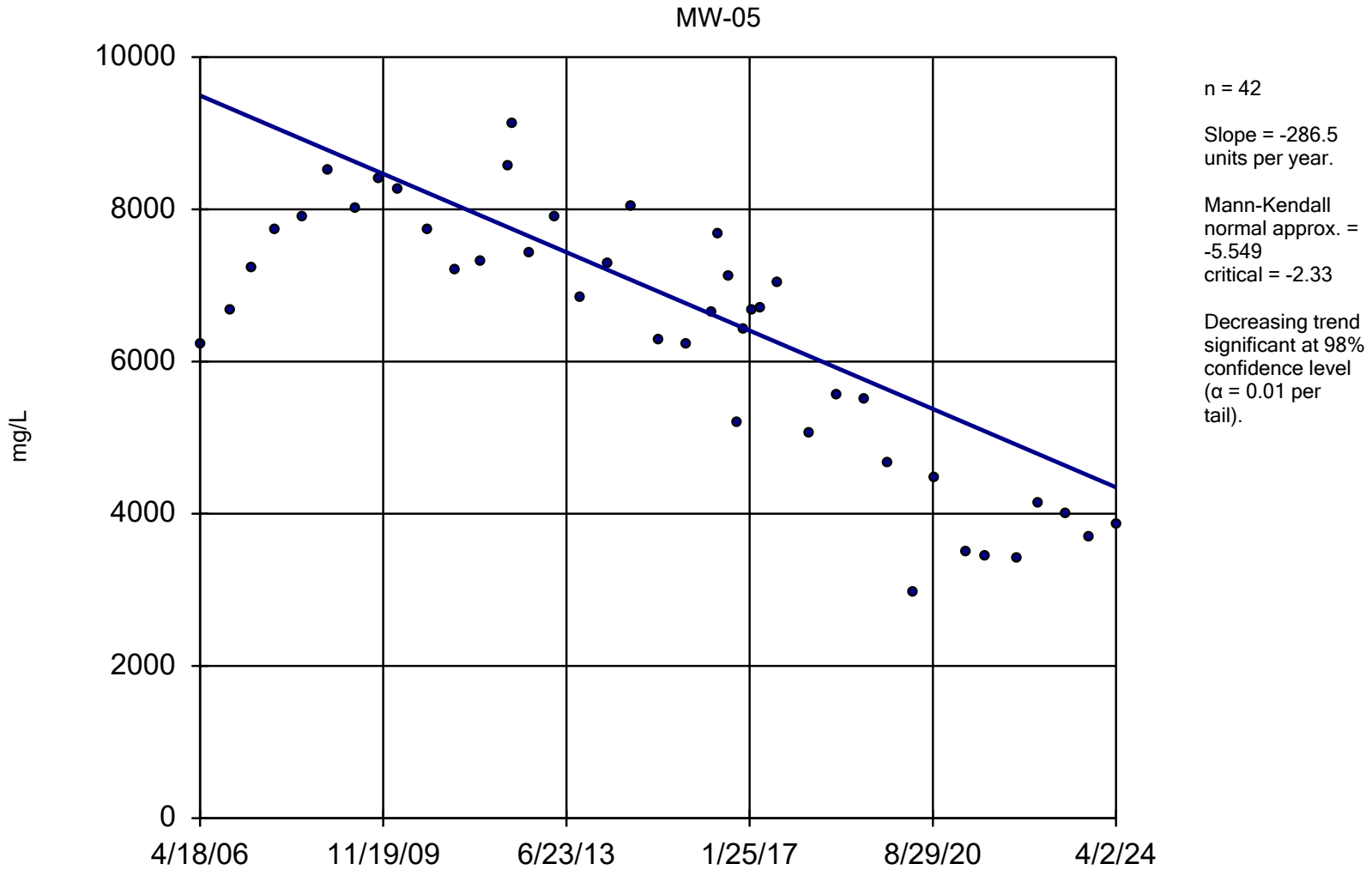
Mann-Kendall normal approx. = -4.736
critical = -2.33

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

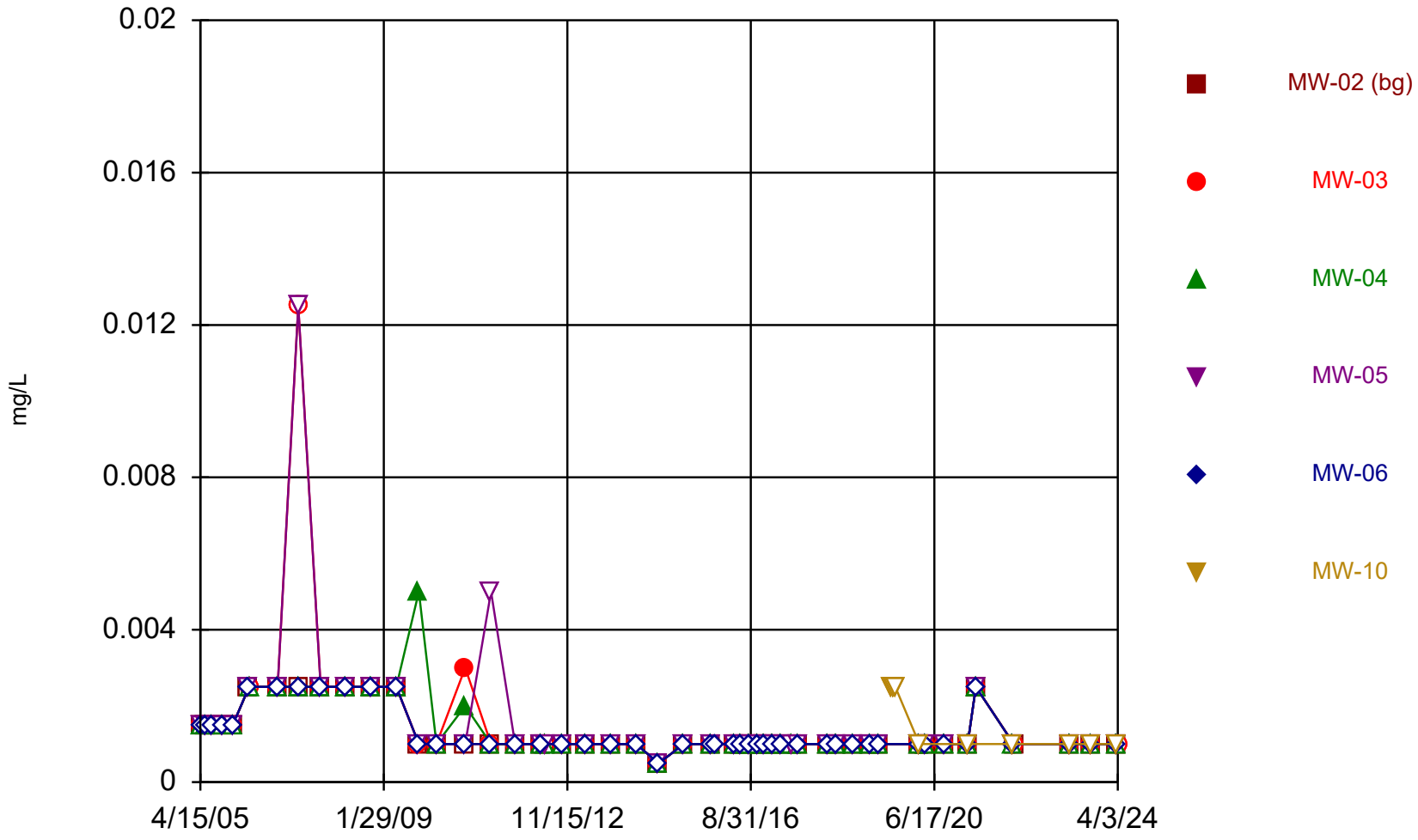


Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2024 12:44 PM View: Landfill AppIII

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

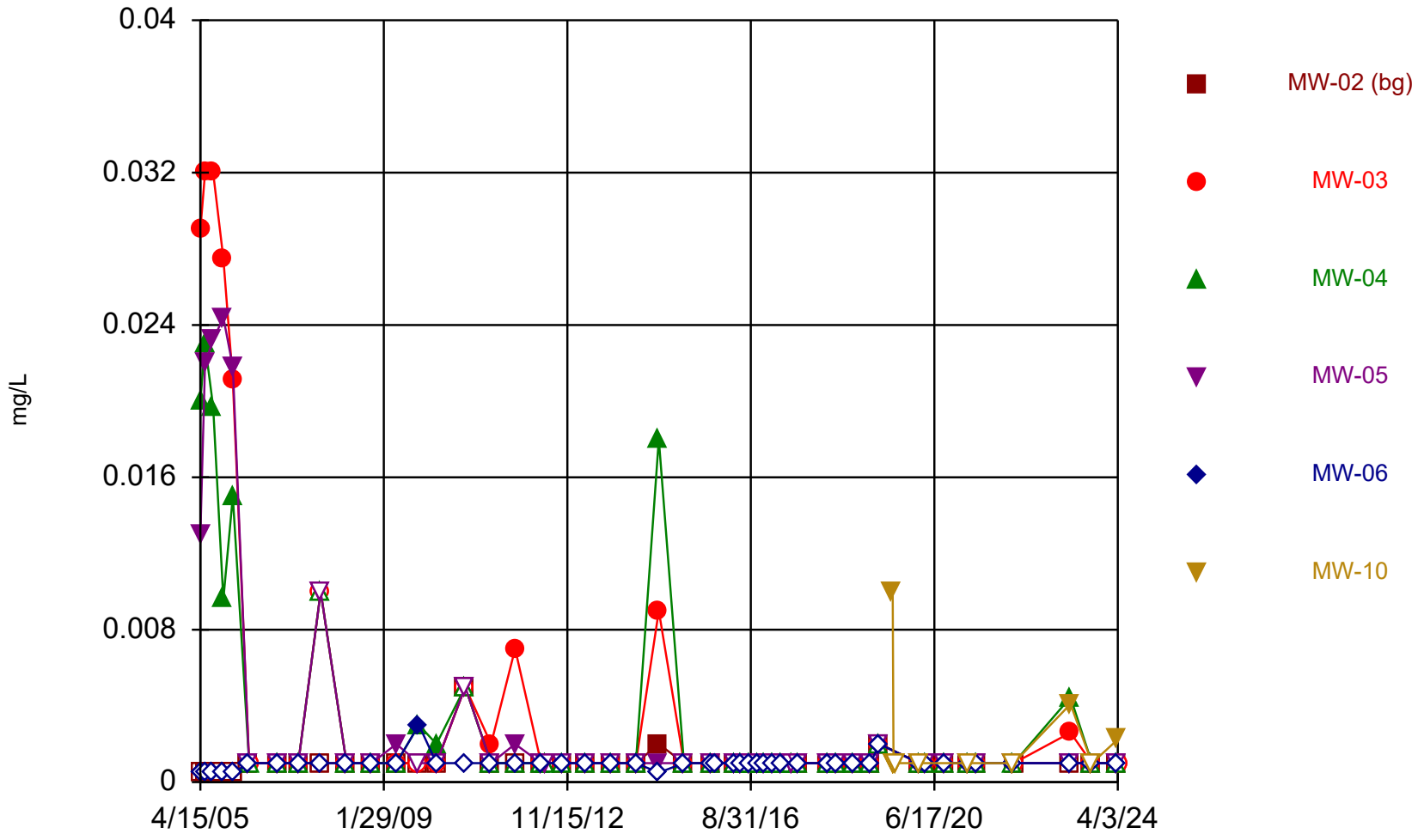


Constituent: Antimony Analysis Run 7/3/2024 5:57 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

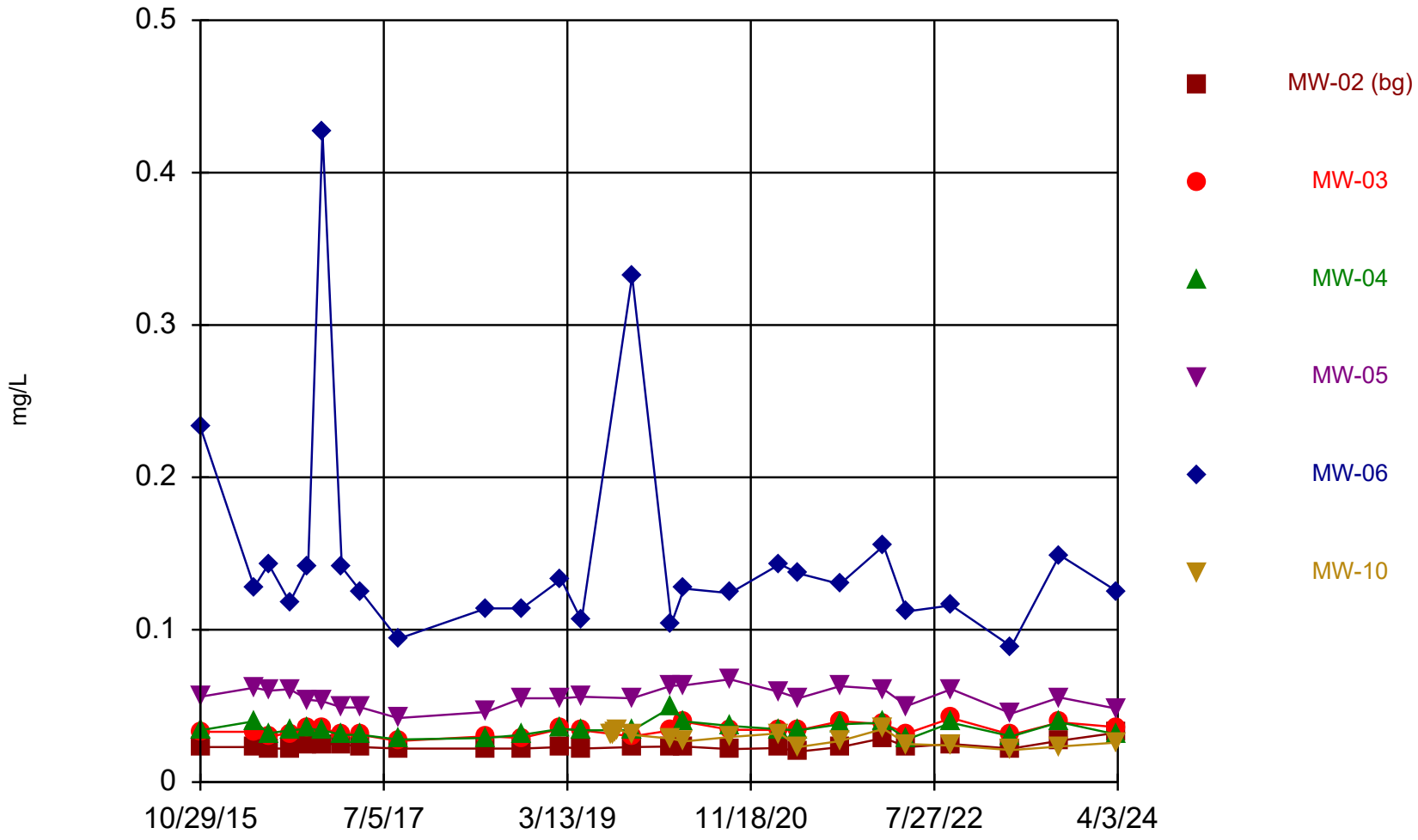
Time Series



Constituent: Arsenic Analysis Run 7/3/2024 5:57 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Time Series

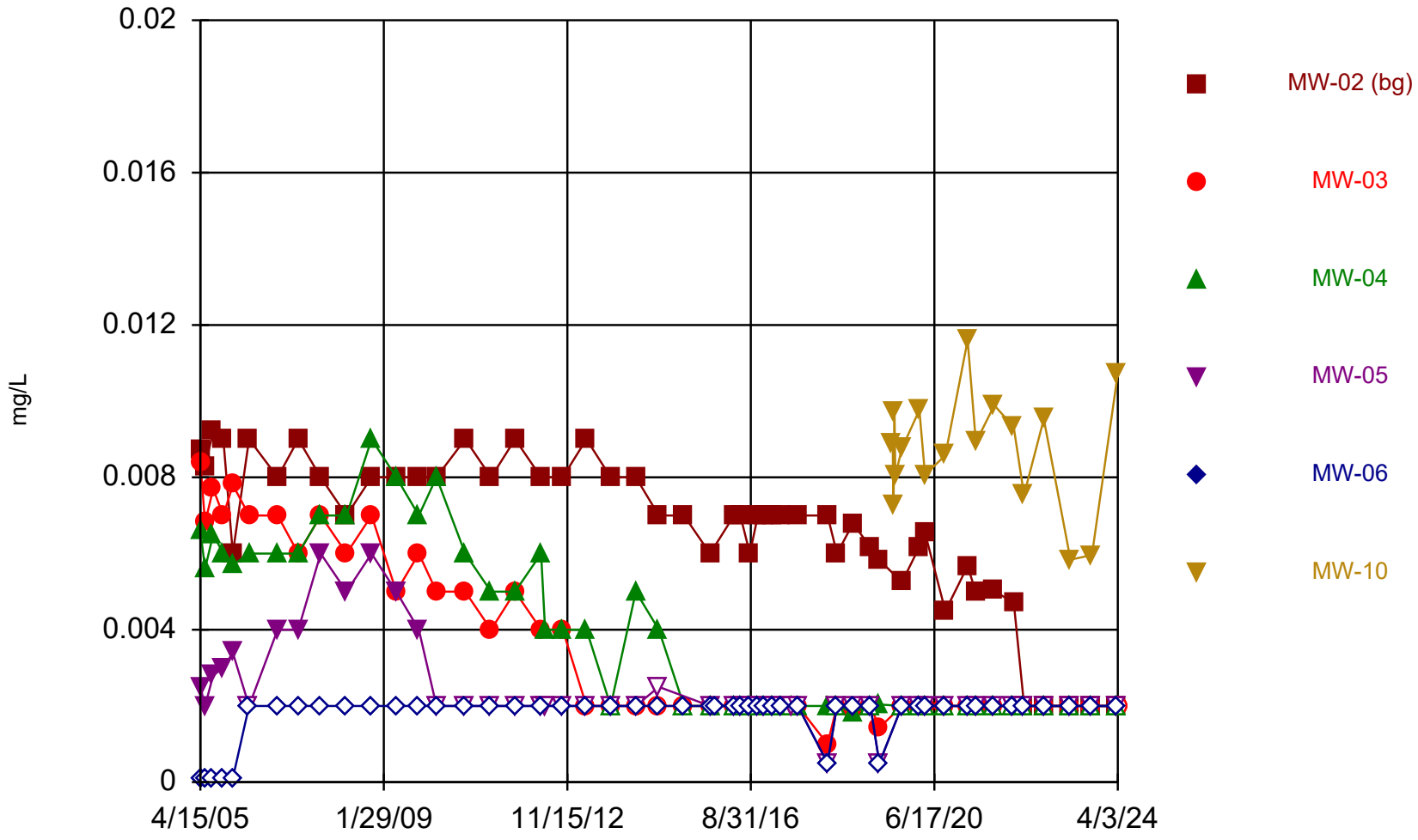


Constituent: Barium Analysis Run 7/3/2024 5:57 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

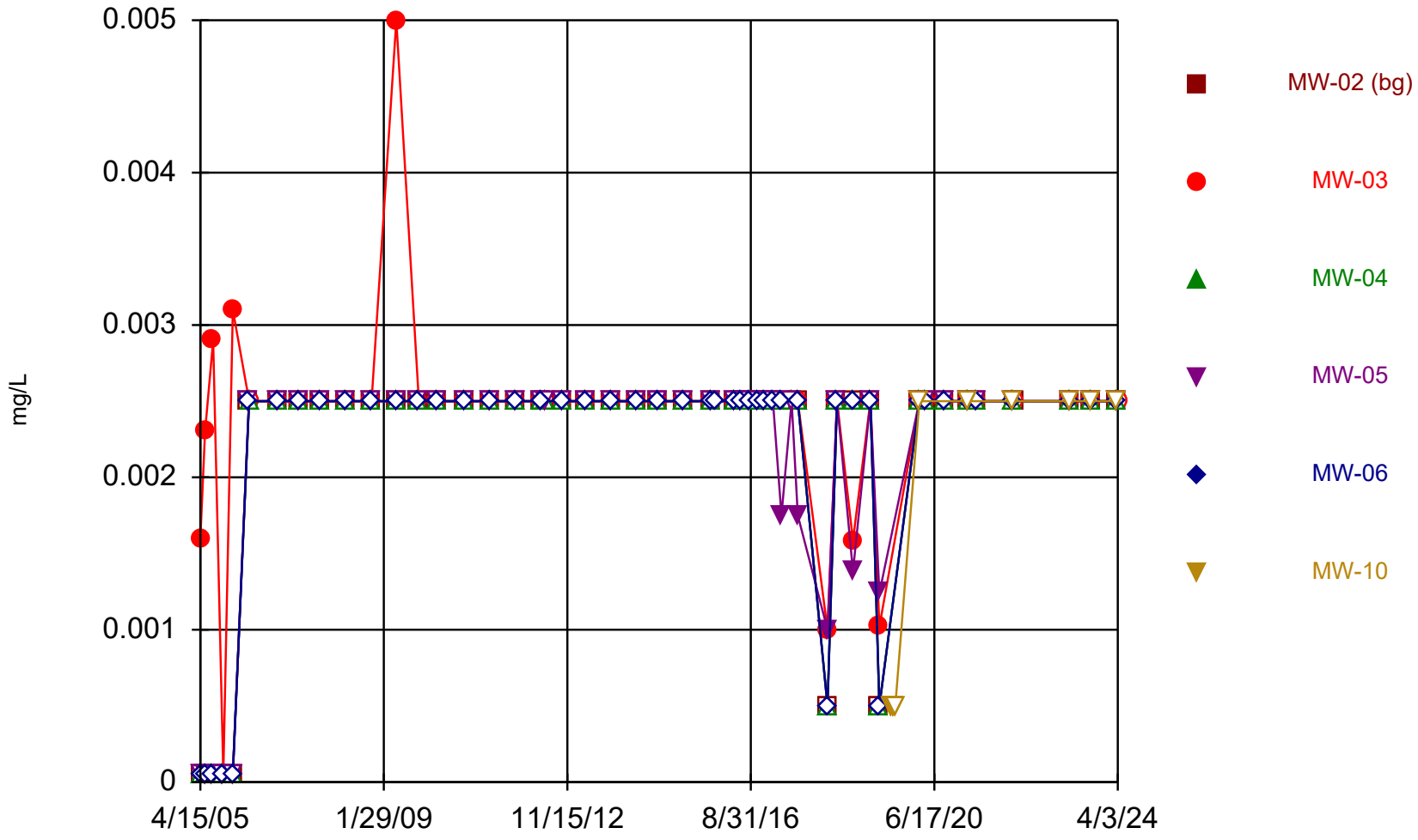


Constituent: Beryllium Analysis Run 7/3/2024 5:57 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

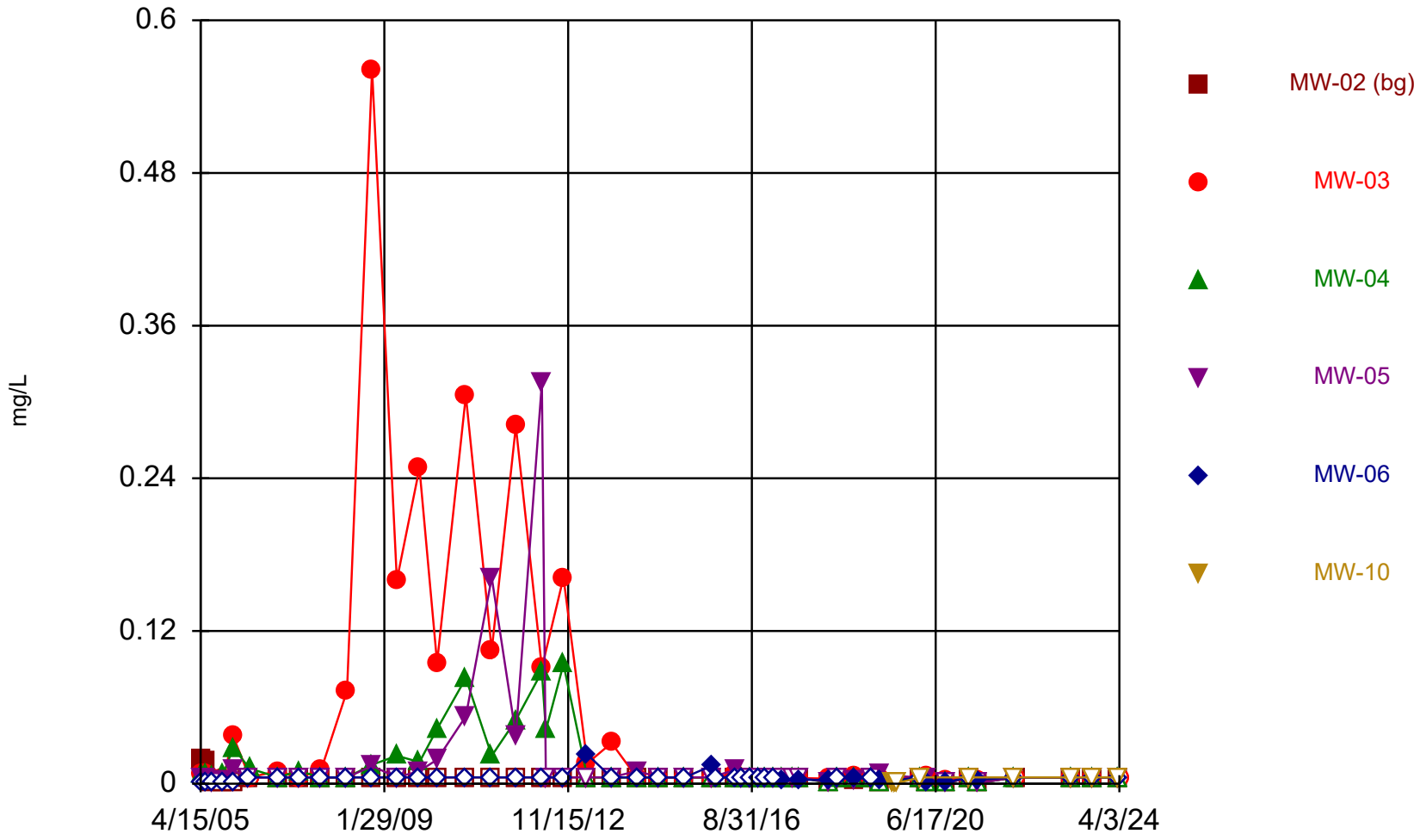


Constituent: Cadmium Analysis Run 7/3/2024 5:57 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

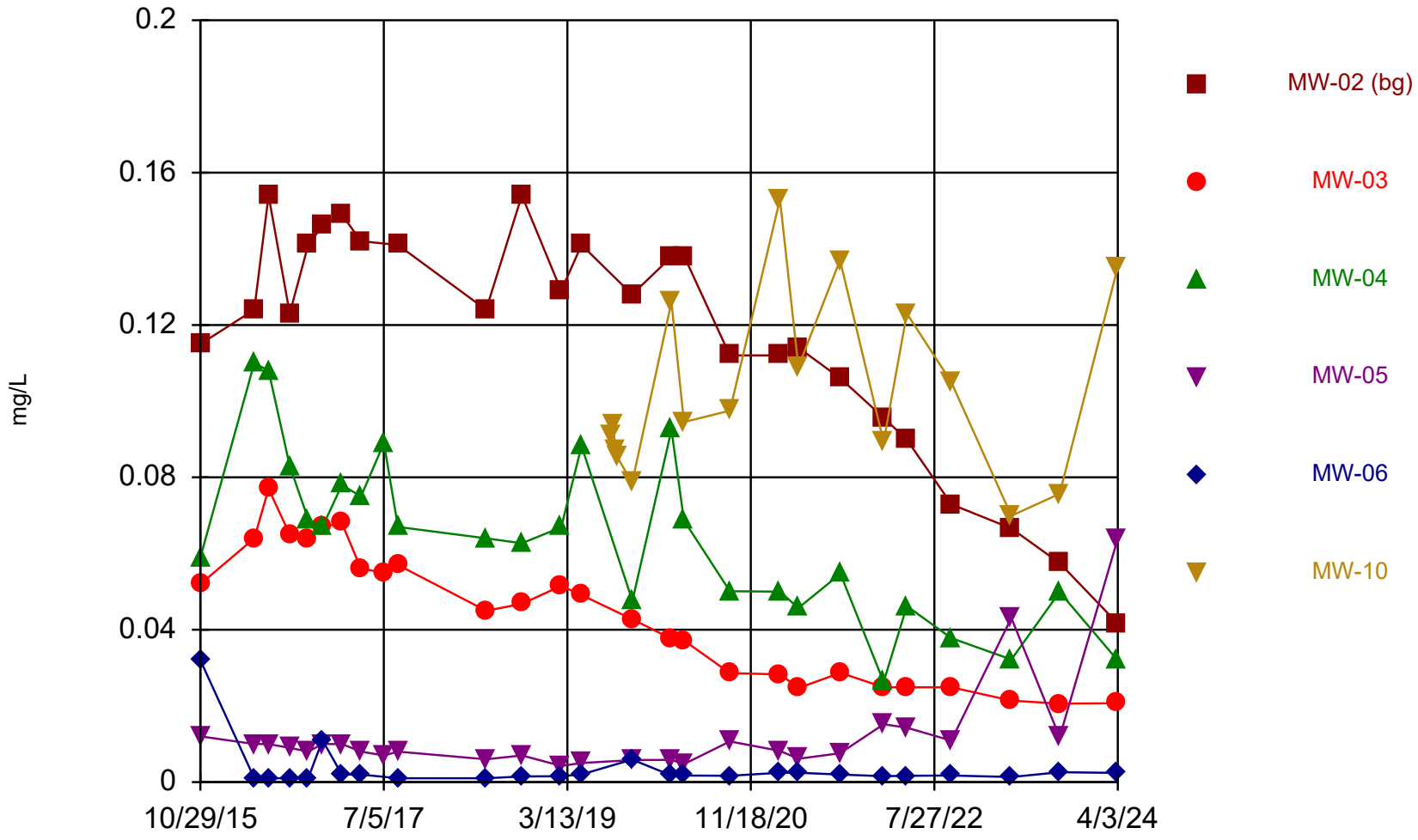
Time Series



Constituent: Chromium Analysis Run 7/3/2024 5:57 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Time Series

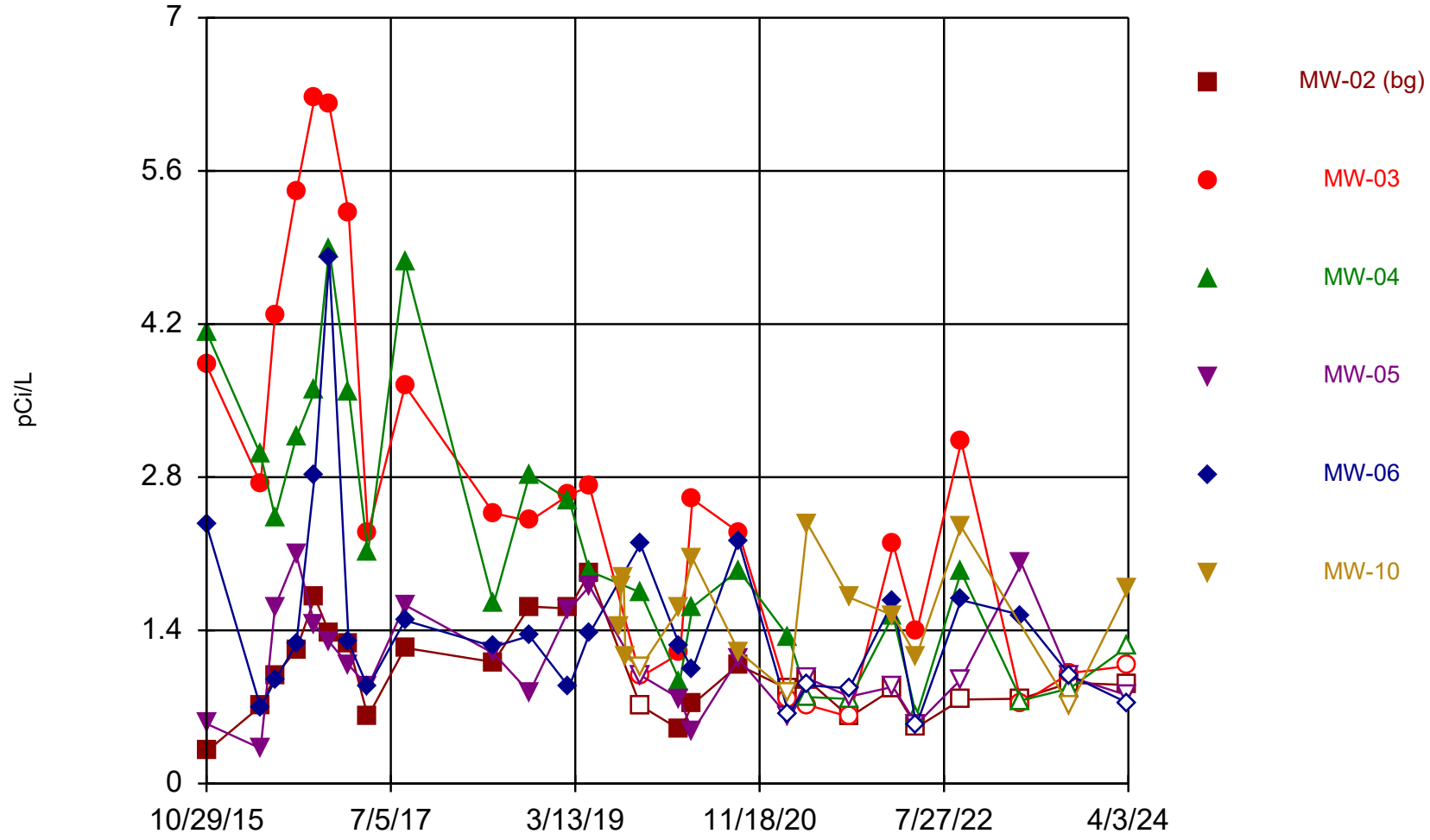


Constituent: Cobalt Analysis Run 7/3/2024 5:57 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

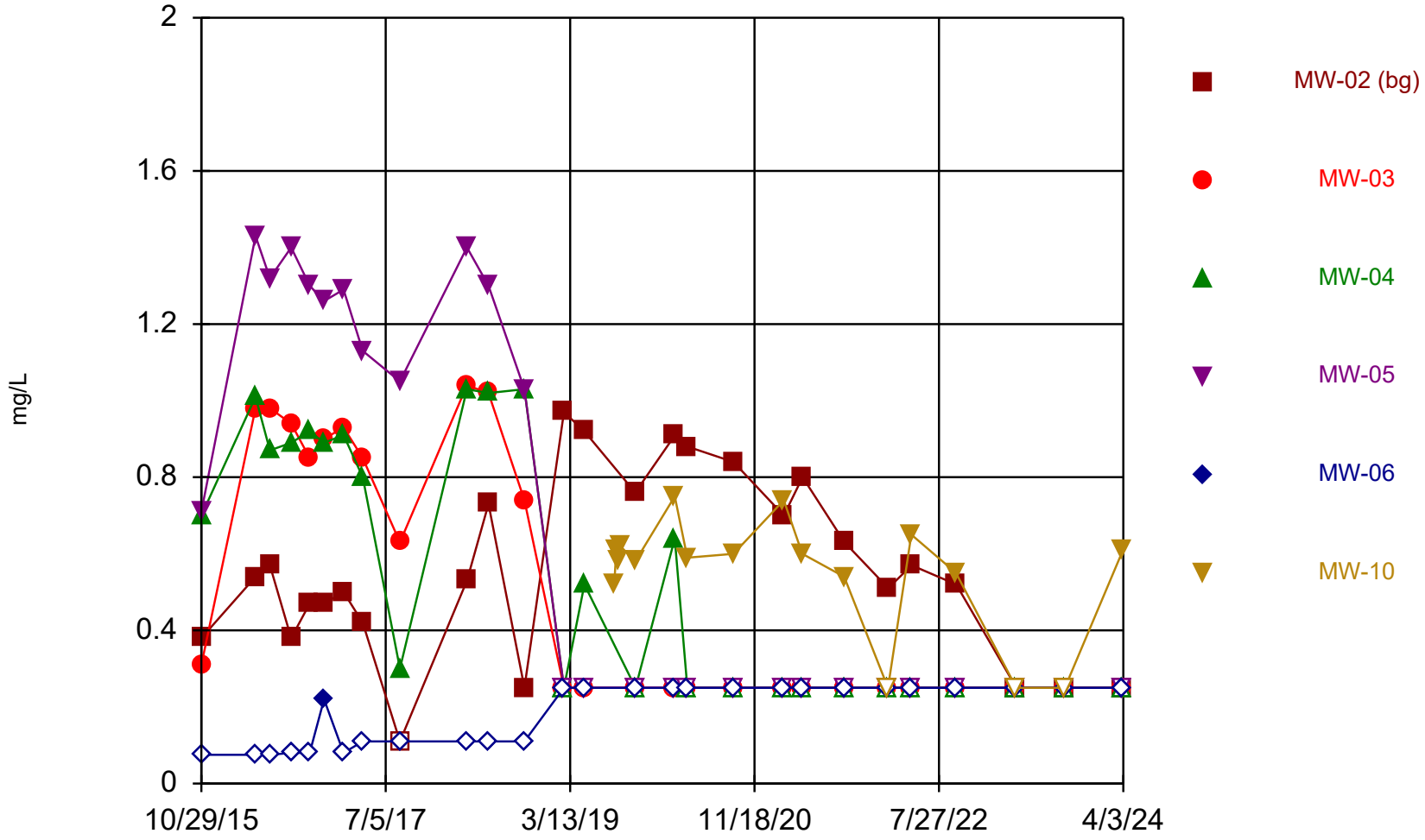


Constituent: Combined Radium Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

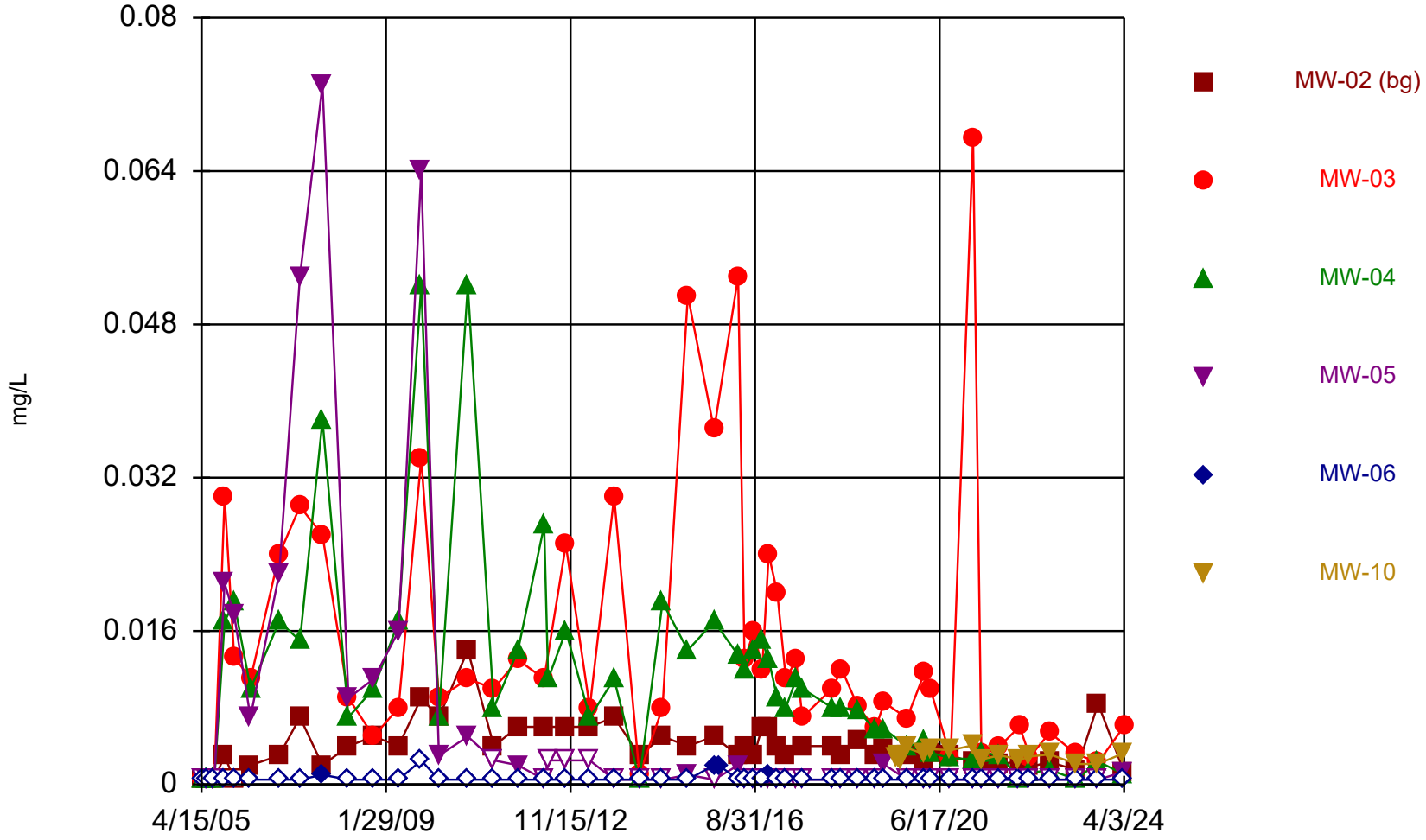


Constituent: Fluoride Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

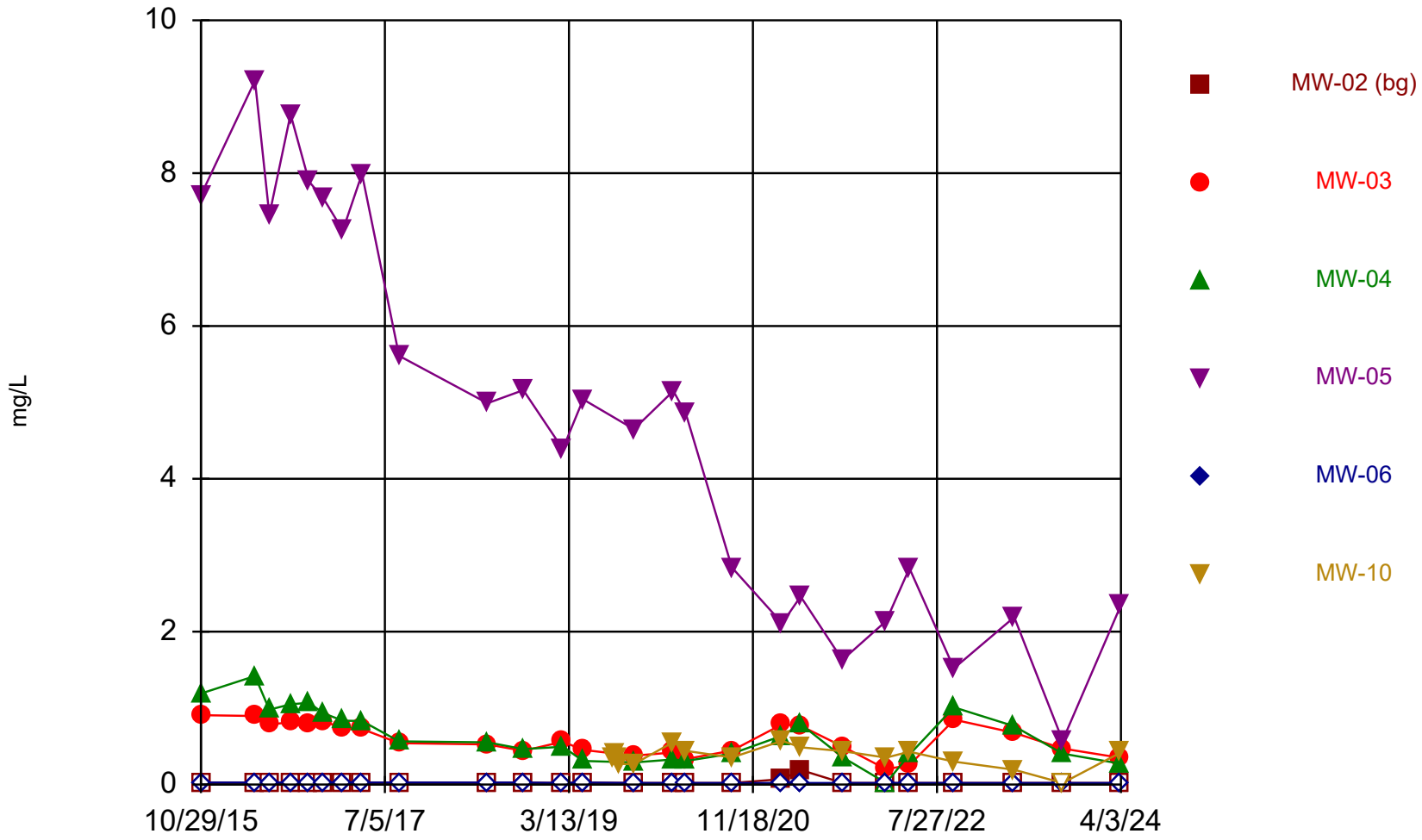


Constituent: Lead Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

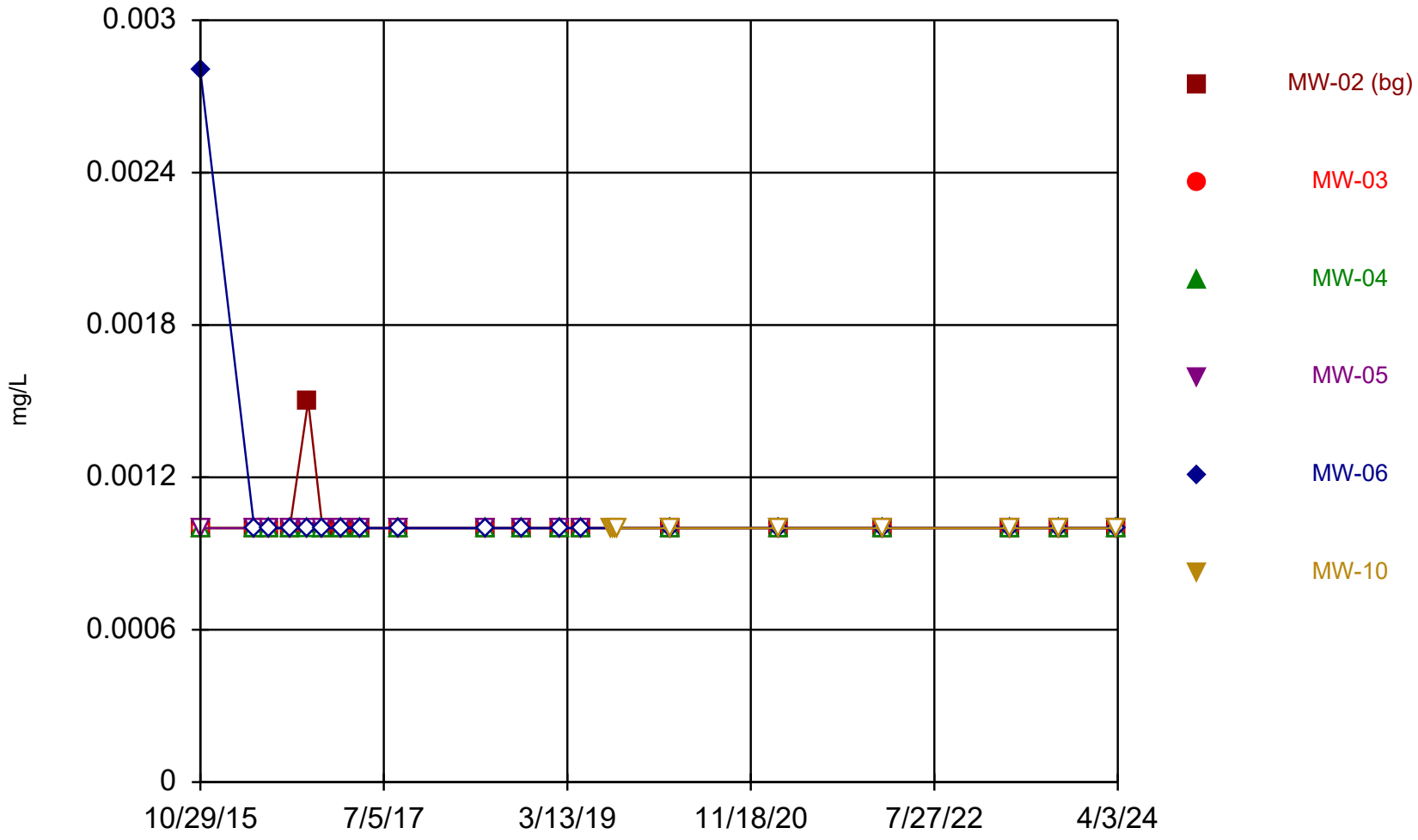


Constituent: Lithium Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

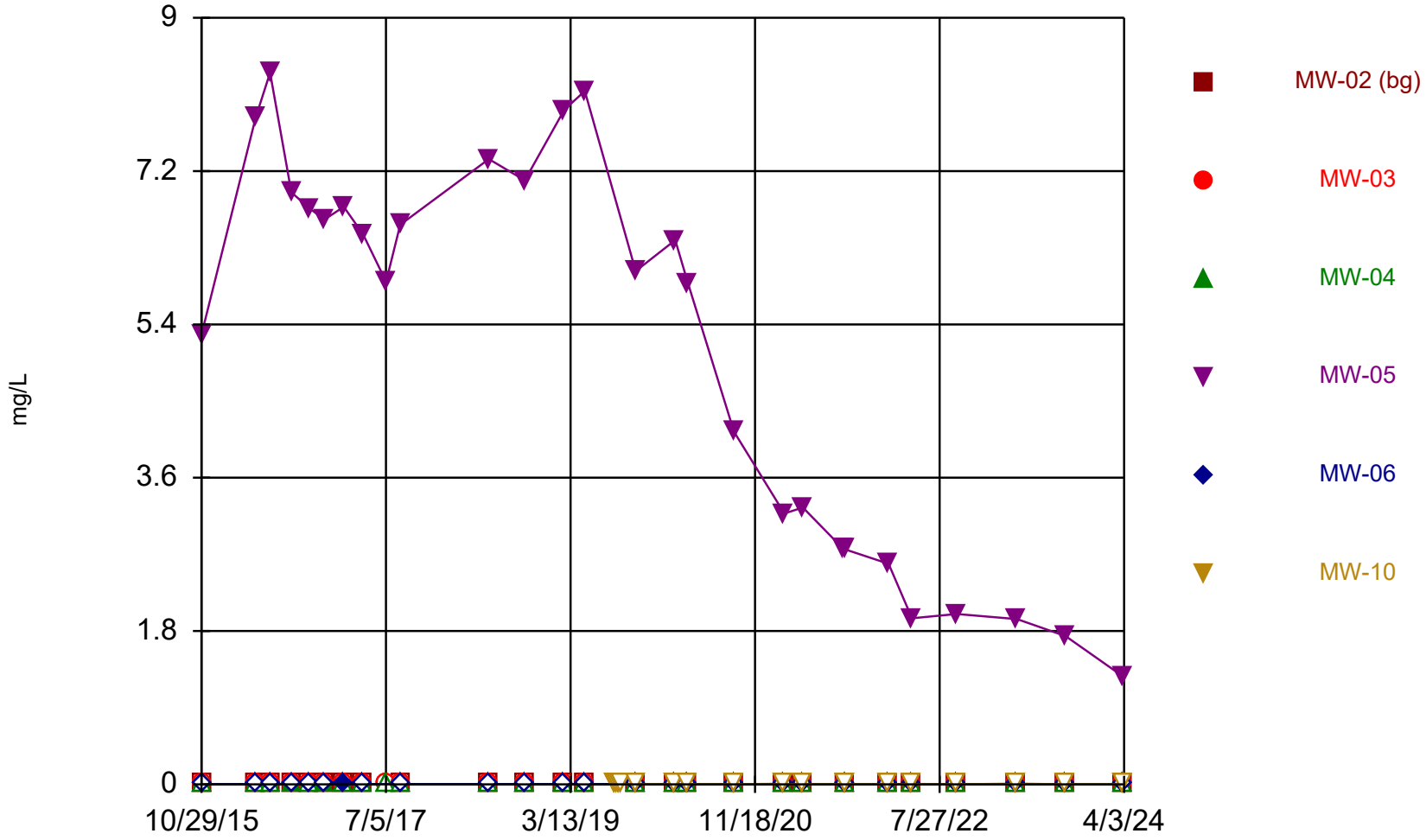


Constituent: Mercury Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

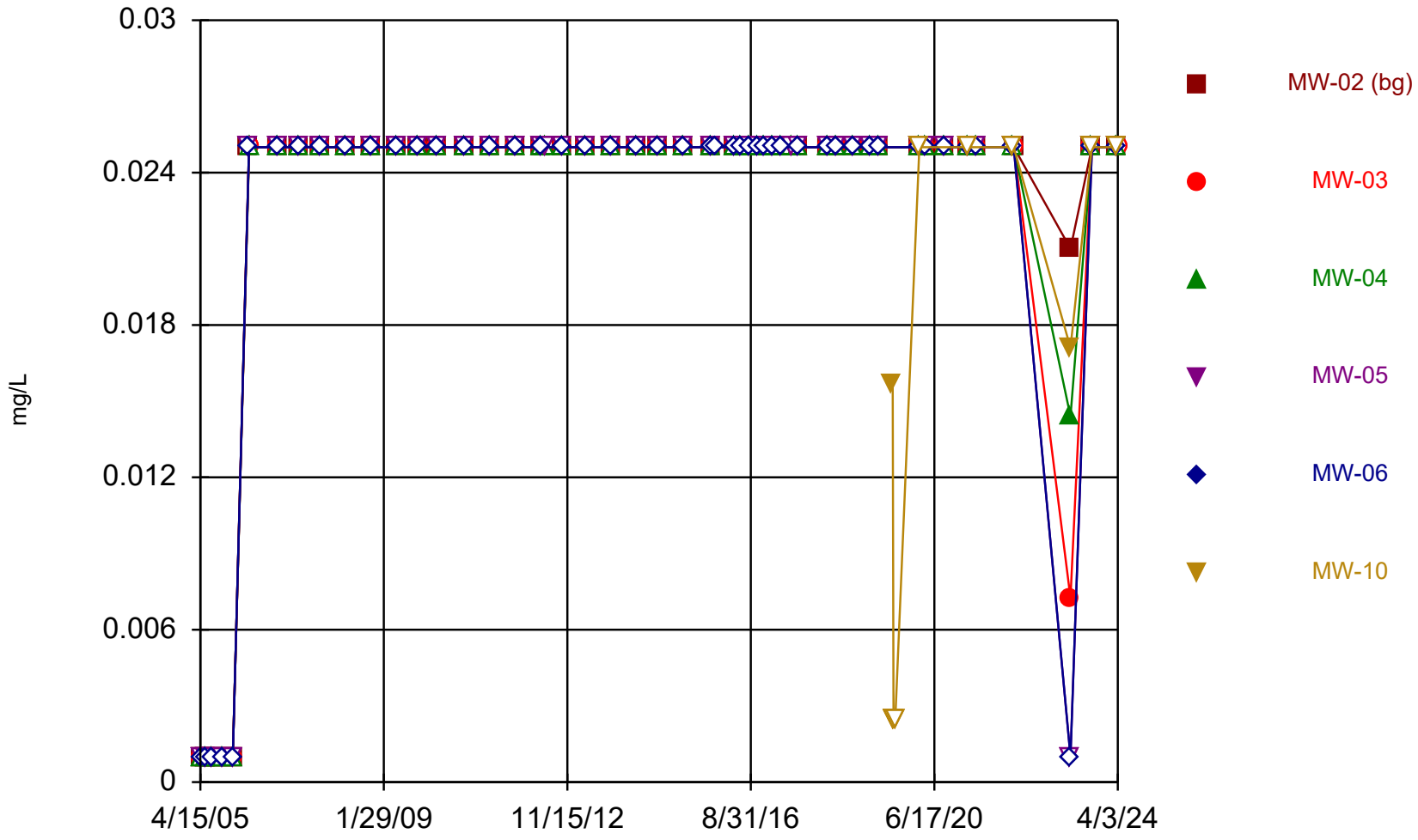


Constituent: Molybdenum Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series

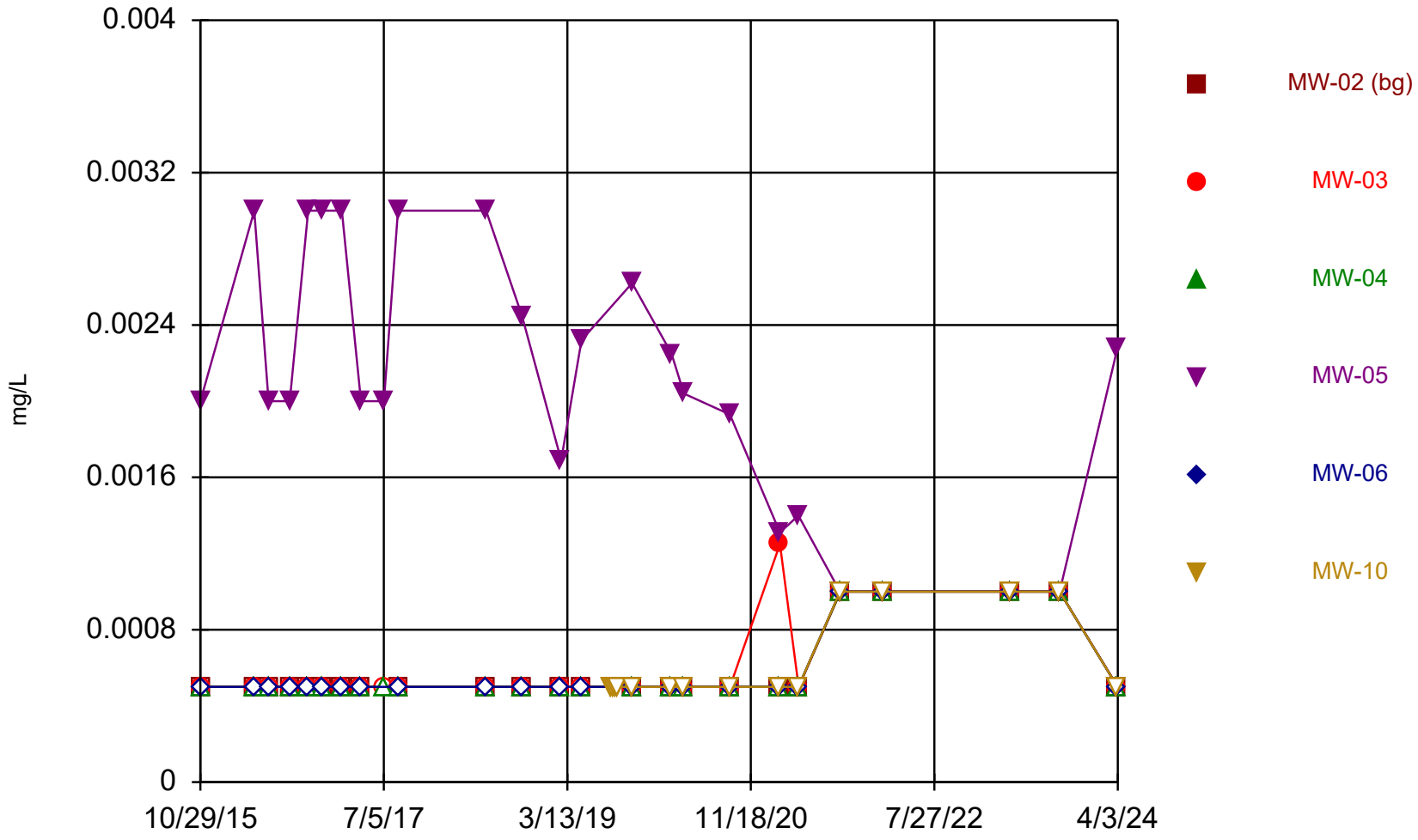


Constituent: Selenium Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Time Series



Constituent: Thallium Analysis Run 7/3/2024 5:58 PM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Tolerance Limit

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen Printed 7/3/2024, 6:15 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.001	n/a	n/a	n/a	47	100	n/a	0.08974	NP Inter(NDs)
Arsenic (mg/L)	n/a	0.005	n/a	n/a	n/a	47	97.87	n/a	0.08974	NP Inter(NDs)
Barium (mg/L)	n/a	0.0325	n/a	n/a	n/a	26	0	n/a	0.2635	NP Inter(normal...
Beryllium (mg/L)	n/a	0.009758	n/a	n/a	n/a	51	9.804	x^2	0.05	Inter
Cadmium (mg/L)	n/a	0.0025	n/a	n/a	n/a	47	100	n/a	0.08974	NP Inter(NDs)
Chromium (mg/L)	n/a	0.02	n/a	n/a	n/a	47	91.49	n/a	0.08974	NP Inter(NDs)
Cobalt (mg/L)	n/a	0.187	n/a	n/a	n/a	26	0	No	0.05	Inter
Combined Radium (pCi/L)	n/a	2.037	n/a	n/a	n/a	26	38.46	No	0.05	Inter
Fluoride (mg/L)	n/a	1.094	n/a	n/a	n/a	27	14.81	No	0.05	Inter
Lead (mg/L)	n/a	0.009856	n/a	n/a	n/a	51	7.843	sqrt(x)	0.05	Inter
Lithium (mg/L)	n/a	0.189	n/a	n/a	n/a	26	92.31	n/a	0.2635	NP Inter(NDs)
Mercury (mg/L)	n/a	0.0015	n/a	n/a	n/a	19	94.74	n/a	0.3774	NP Inter(NDs)
Molybdenum (mg/L)	n/a	0.0025	n/a	n/a	n/a	26	100	n/a	0.2635	NP Inter(NDs)
Selenium (mg/L)	n/a	0.025	n/a	n/a	n/a	47	97.87	n/a	0.08974	NP Inter(NDs)
Thallium (mg/L)	n/a	0.0005	n/a	n/a	n/a	24	100	n/a	0.292	NP Inter(NDs)

Confidence Interval

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen Printed 7/5/2024, 8:38 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (mg/L)	MW-02 (bg)	0.001	0.001	0.01	No	47	97.87	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-03	0.002	0.001	0.01	No	48	81.25	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-04	0.002	0.001	0.01	No	49	81.63	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-05	0.002	0.001	0.01	No	49	83.67	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-06	0.001	0.001	0.01	No	48	97.92	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-10	0.0041	0.001	0.01	No	10	70	No	0.011	NP (normality)
Barium (mg/L)	MW-02 (bg)	0.0234	0.022	2	No	26	0	No	0.01	NP (normality)
Barium (mg/L)	MW-03	0.03565	0.03208	2	No	26	0	No	0.01	Param.
Barium (mg/L)	MW-04	0.03694	0.03237	2	No	26	0	No	0.01	Param.
Barium (mg/L)	MW-05	0.05874	0.05242	2	No	26	0	No	0.01	Param.
Barium (mg/L)	MW-06	0.143	0.114	2	No	26	0	No	0.01	NP (normality)
Barium (mg/L)	MW-10	0.03101	0.02569	2	No	17	0	No	0.01	Param.
Beryllium (mg/L)	MW-02 (bg)	0.007492	0.006392	0.009758	No	51	9.804	x^2	0.01	Param.
Beryllium (mg/L)	MW-03	0.004	0.002	0.009758	No	52	53.85	No	0.01	NP (normality)
Beryllium (mg/L)	MW-04	0.005	0.002	0.009758	No	53	47.17	No	0.01	NP (normality)
Beryllium (mg/L)	MW-05	0.0025	0.002	0.009758	No	52	76.92	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-06	0.002	0.0005	0.009758	No	52	100	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-10	0.009685	0.007777	0.009758	No	17	0	No	0.01	Param.
Cobalt (mg/L)	MW-02 (bg)	0.1324	0.1026	0.187	No	26	0	No	0.01	Param.
Cobalt (mg/L)	MW-03	0.05212	0.03549	0.187	No	27	0	No	0.01	Param.
Cobalt (mg/L)	MW-04	0.07422	0.05323	0.187	No	27	0	No	0.01	Param.
Cobalt (mg/L)	MW-05	0.0109	0.00614	0.187	No	27	0	No	0.01	NP (normality)
Cobalt (mg/L)	MW-06	0.00244	0.00134	0.187	No	26	0	No	0.01	NP (normality)
Cobalt (mg/L)	MW-10	0.118	0.08797	0.187	No	17	0	No	0.01	Param.
Combined Radium (pCi/L)	MW-02 (bg)	1.253	0.8262	5	No	26	38.46	No	0.01	Param.
Combined Radium (pCi/L)	MW-03	3.514	1.995	5	No	26	26.92	No	0.01	Param.
Combined Radium (pCi/L)	MW-04	2.822	1.706	5	No	26	23.08	No	0.01	Param.
Combined Radium (pCi/L)	MW-05	1.365	0.8771	5	No	26	34.62	No	0.01	Param.
Combined Radium (pCi/L)	MW-06	1.794	1.122	5	No	26	23.08	sqrt(x)	0.01	Param.
Combined Radium (pCi/L)	MW-10	1.886	1.375	5	No	16	18.75	No	0.01	Param.
Fluoride (mg/L)	MW-02 (bg)	0.6722	0.447	4	No	27	14.81	No	0.01	Param.
Fluoride (mg/L)	MW-03	0.9	0.25	4	No	27	55.56	No	0.01	NP (normality)
Fluoride (mg/L)	MW-04	0.89	0.25	4	No	27	48.15	No	0.01	NP (normality)
Fluoride (mg/L)	MW-05	1.29	0.25	4	No	27	55.56	No	0.01	NP (normality)
Fluoride (mg/L)	MW-06	0.25	0.11	4	No	27	96.3	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-10	0.638	0.5304	4	No	17	17.65	x^3	0.01	Param.
Lead (mg/L)	MW-02 (bg)	0.004421	0.002881	0.015	No	51	7.843	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-03	0.0158	0.008199	0.015	No	52	5.769	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-04	0.01184	0.005953	0.015	No	53	11.32	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-05	0.002	0.0005	0.015	No	53	67.92	No	0.01	NP (normality)
Lead (mg/L)	MW-06	0.0005	0.0005	0.015	No	52	92.31	No	0.01	NP (NDs)
Lead (mg/L)	MW-10	0.003346	0.002648	0.015	No	17	0	No	0.01	Param.
Lithium (mg/L)	MW-02 (bg)	0.025	0.02	1.42	No	26	92.31	No	0.01	NP (NDs)
Lithium (mg/L)	MW-03	0.6971	0.4905	1.42	No	26	0	No	0.01	Param.
Lithium (mg/L)	MW-04	0.81	0.4726	1.42	No	26	3.846	No	0.01	Param.
Lithium (mg/L)	**MW-05**	**6.037**	**3.534**	**1.42**	**Yes**	**26**	**0**	**No**	**0.01**	**Param.**
Lithium (mg/L)	MW-06	0.025	0.02	1.42	No	26	100	No	0.01	NP (NDs)
Lithium (mg/L)	MW-10	0.4477	0.2803	1.42	No	17	5.882	No	0.01	Param.
Molybdenum (mg/L)	MW-02 (bg)	0.0025	0.0005	0.1	No	26	100	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-03	0.00727	0.0005	0.1	No	27	96.3	No	0.01	NP (NDs)

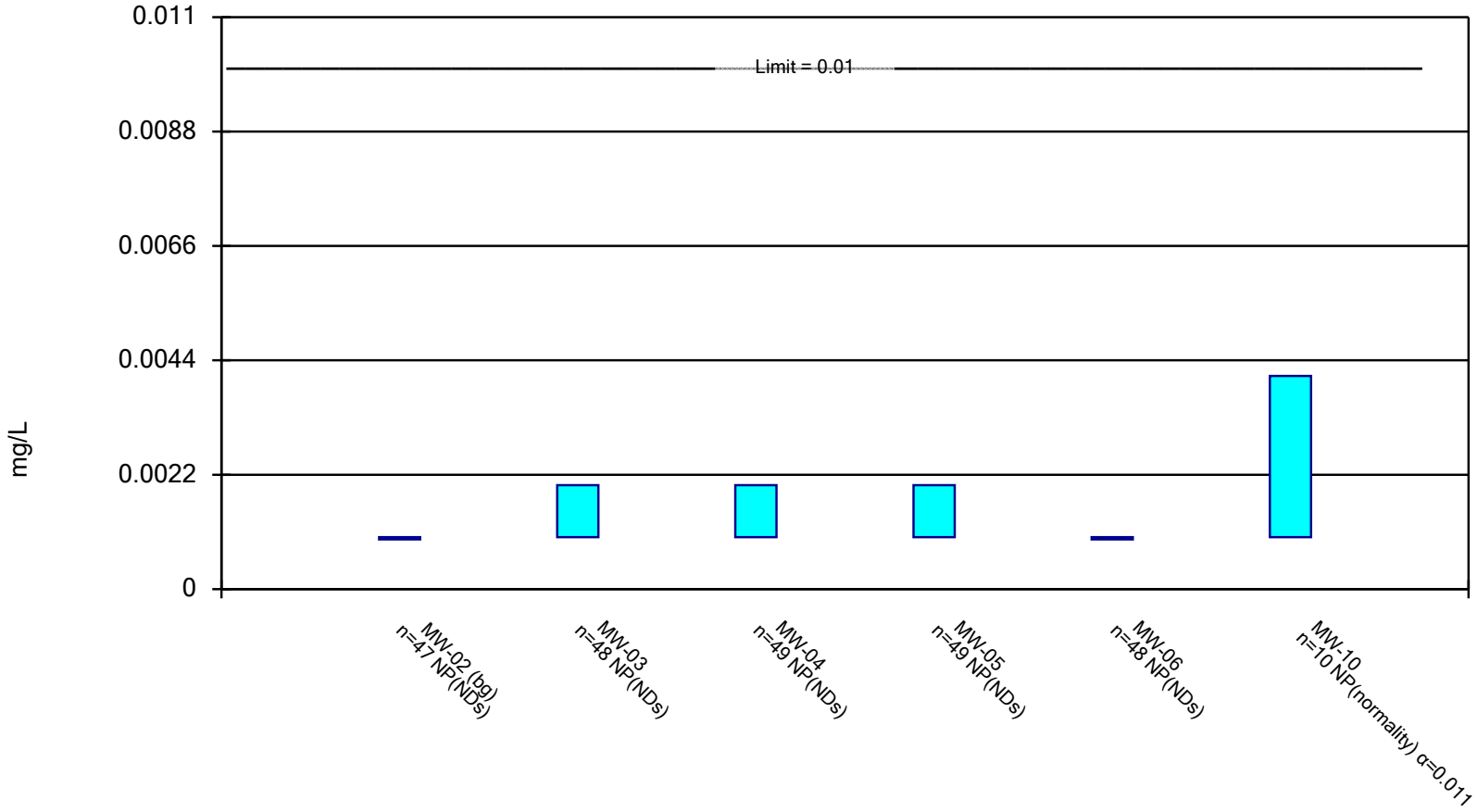
Confidence Interval

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen Printed 7/5/2024, 8:38 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Molybdenum (mg/L)	MW-04	0.006	0.0025	0.1	No	27	92.59	No	0.01	NP (NDs)
Molybdenum (mg/L)	**MW-05**	**6.48**	**4.595**	**0.1**	**Yes**	**28**	**0**	**x^2**	**0.01**	**Param.**
Molybdenum (mg/L)	MW-06	0.005	0.0025	0.1	No	26	88.46	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-10	0.0025	0.0005	0.1	No	17	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-02 (bg)	0.001	0.0005	0.002	No	24	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-03	0.001	0.0005	0.002	No	25	96	No	0.01	NP (NDs)
Thallium (mg/L)	MW-04	0.001	0.0005	0.002	No	25	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-05	0.002123	0.001668	0.002	No	25	16	No	0.01	Param.
Thallium (mg/L)	MW-06	0.001	0.0005	0.002	No	24	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-10	0.001	0.0005	0.002	No	15	100	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.

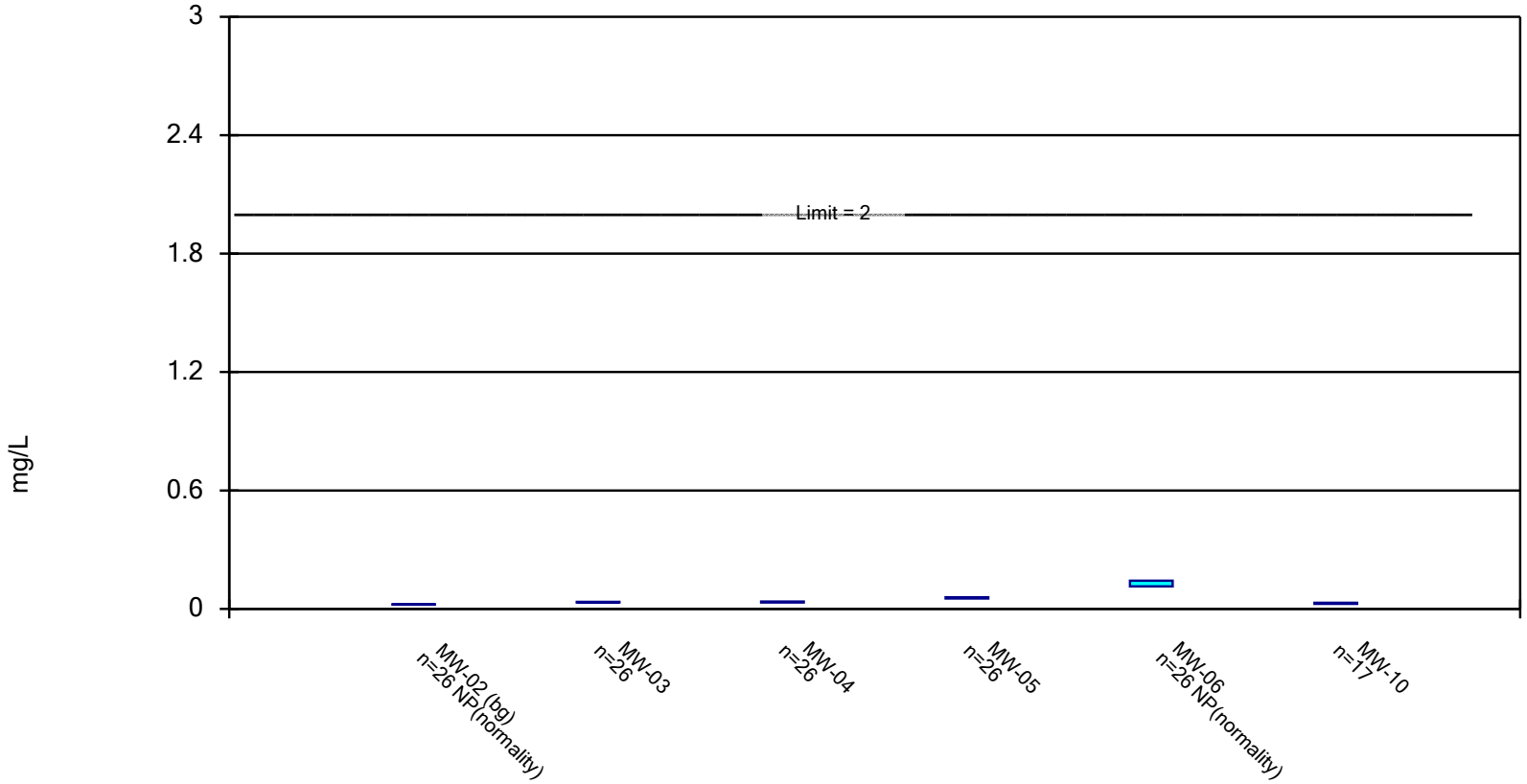


Constituent: Arsenic Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

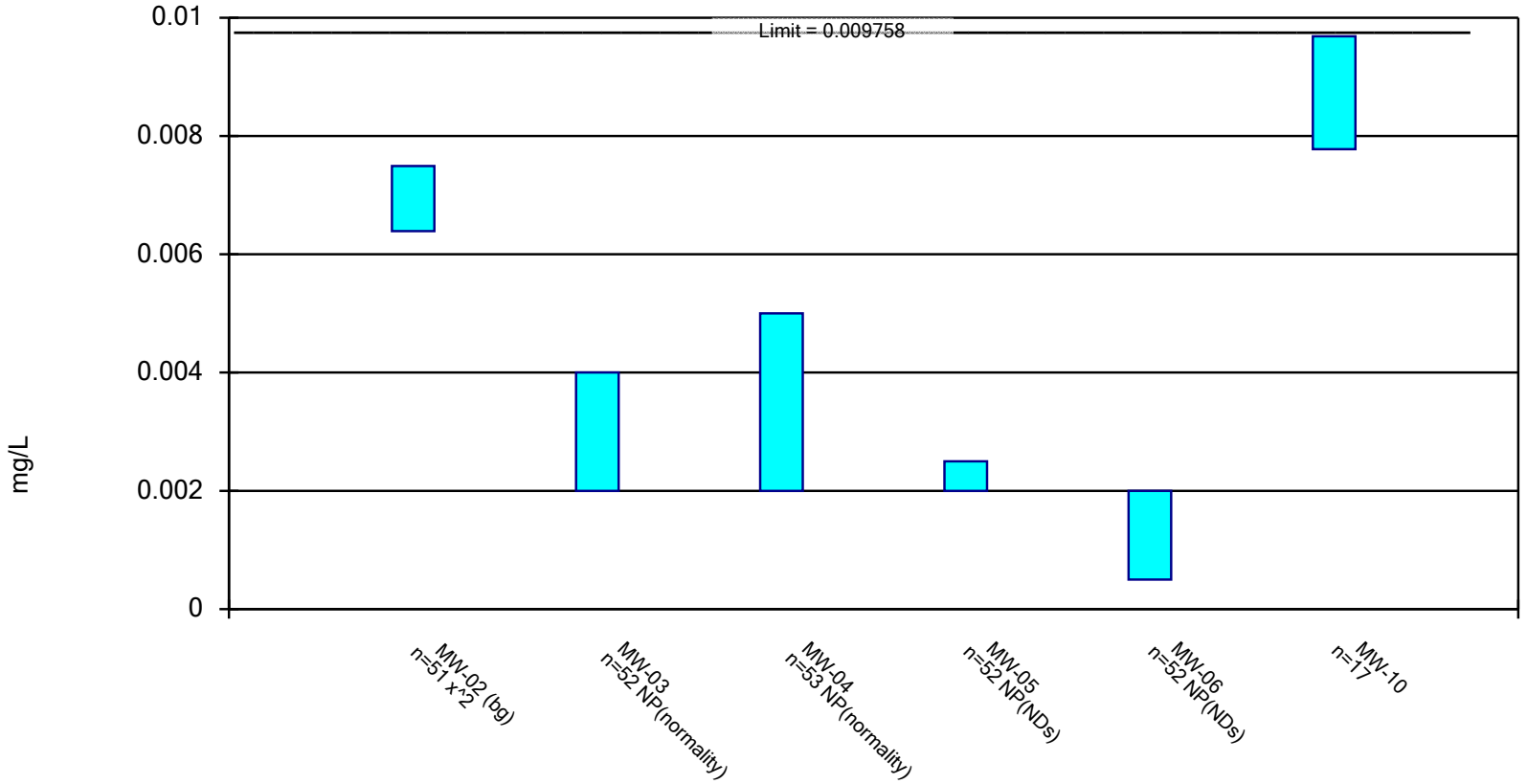


Constituent: Barium Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: multiple

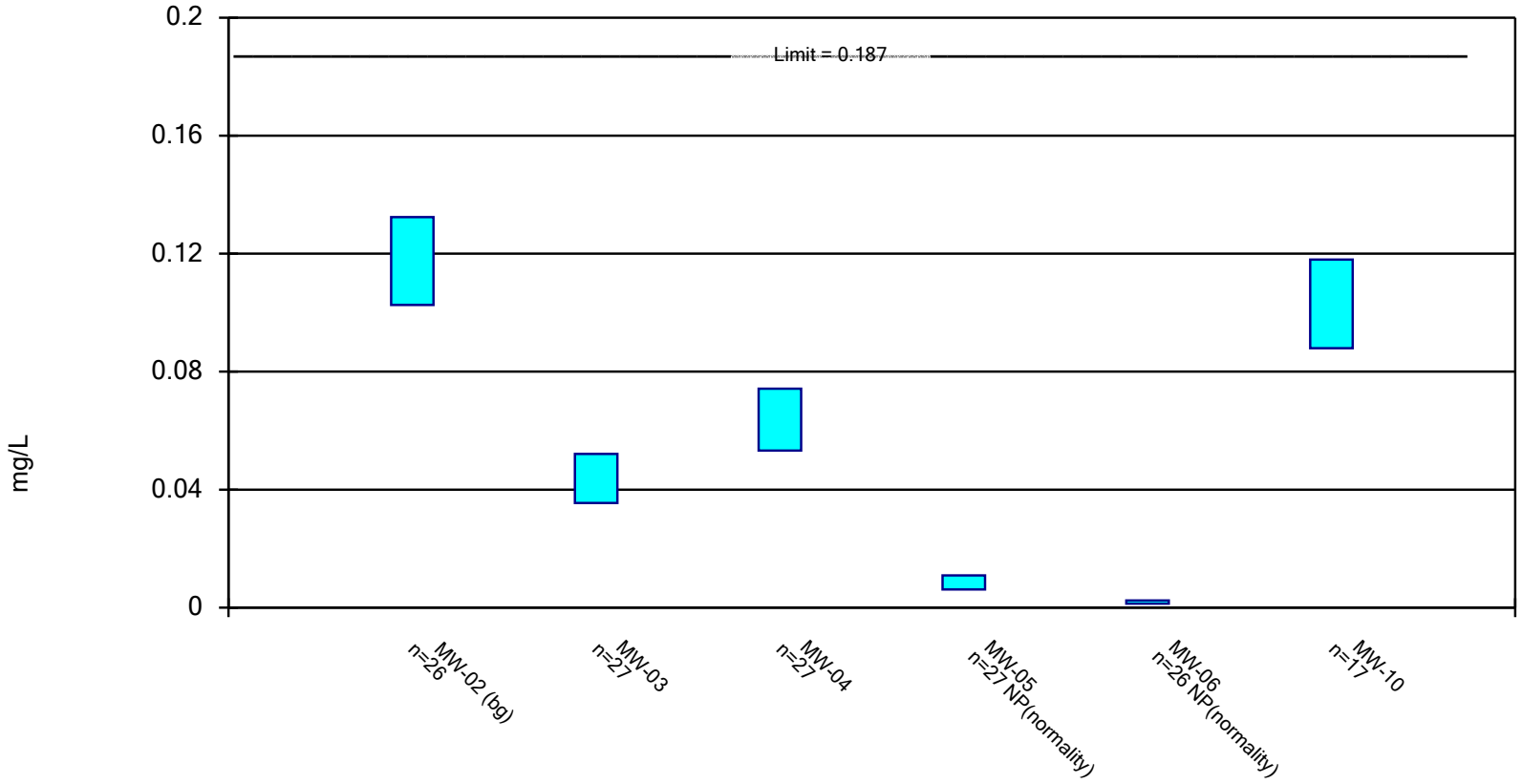


Constituent: Beryllium Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

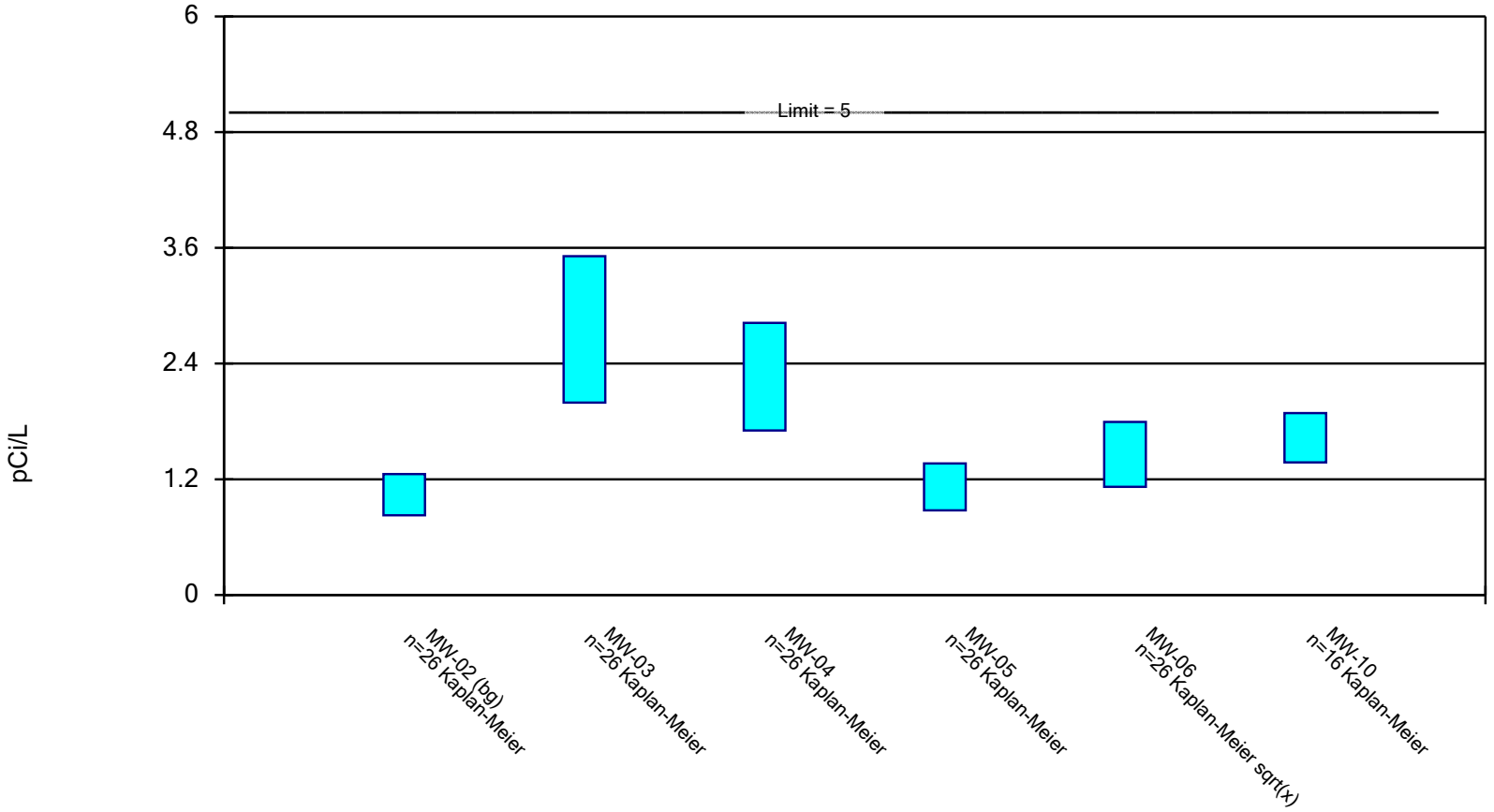


Constituent: Cobalt Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

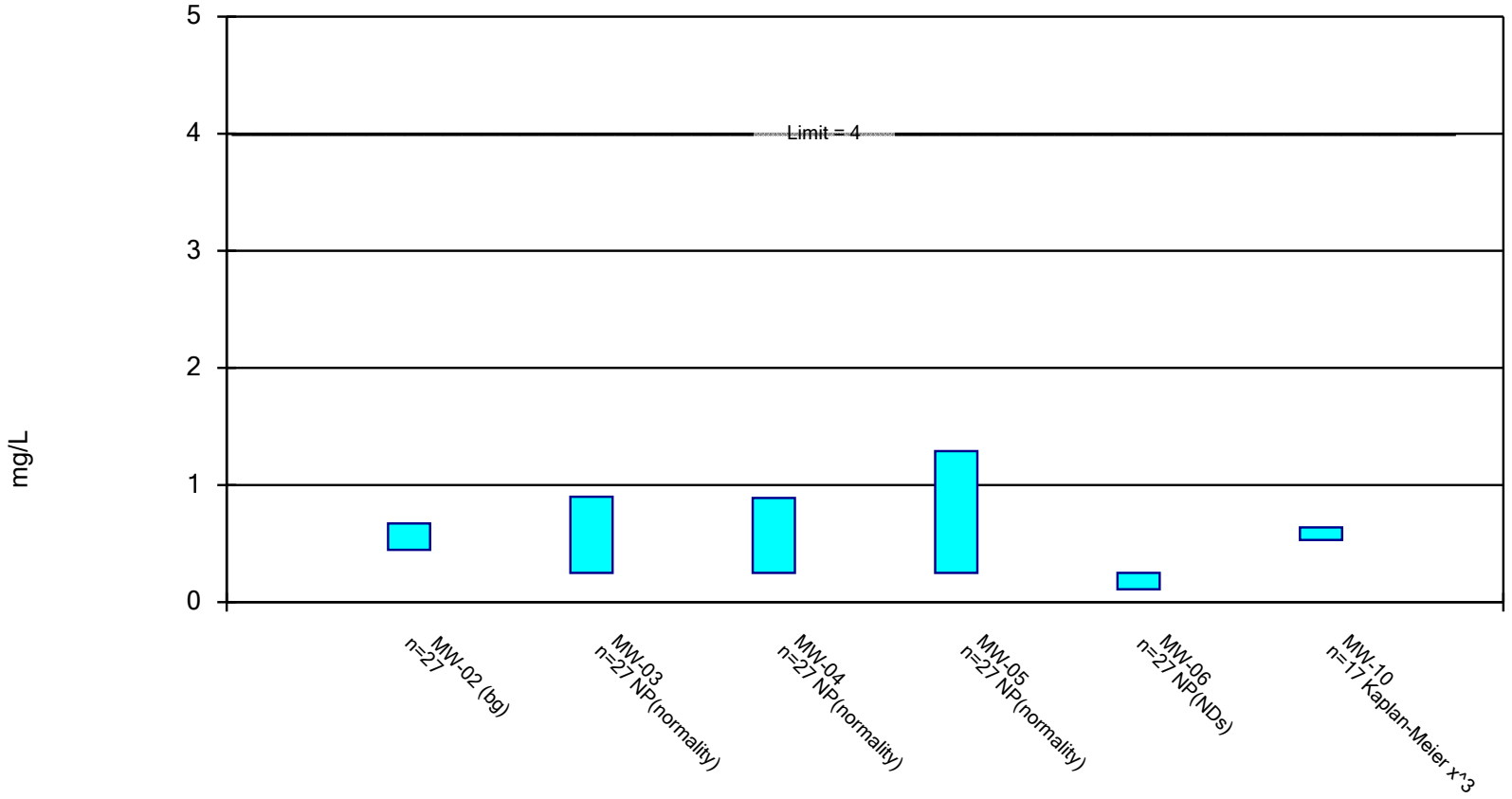


Constituent: Combined Radium Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

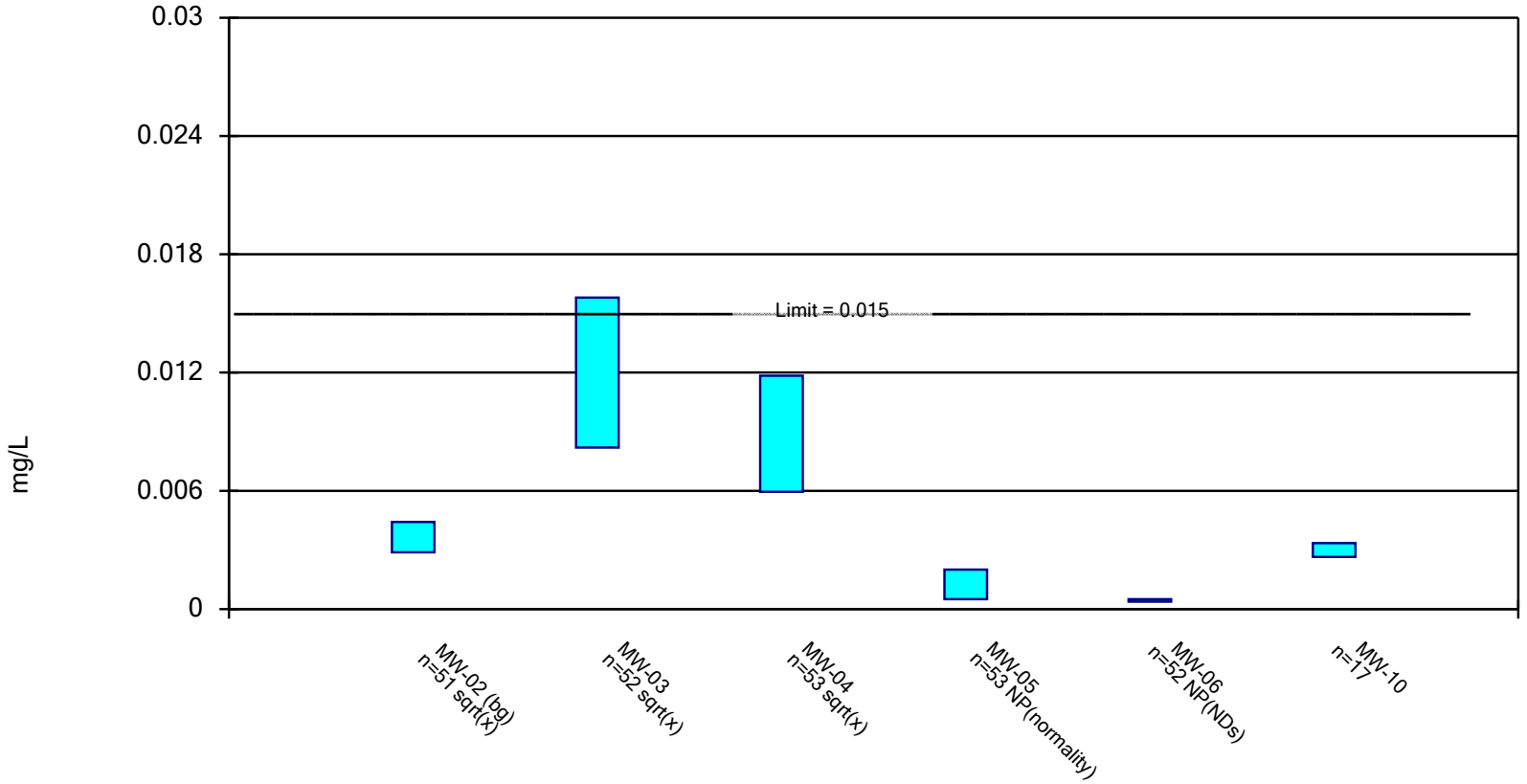


Constituent: Fluoride Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: multiple

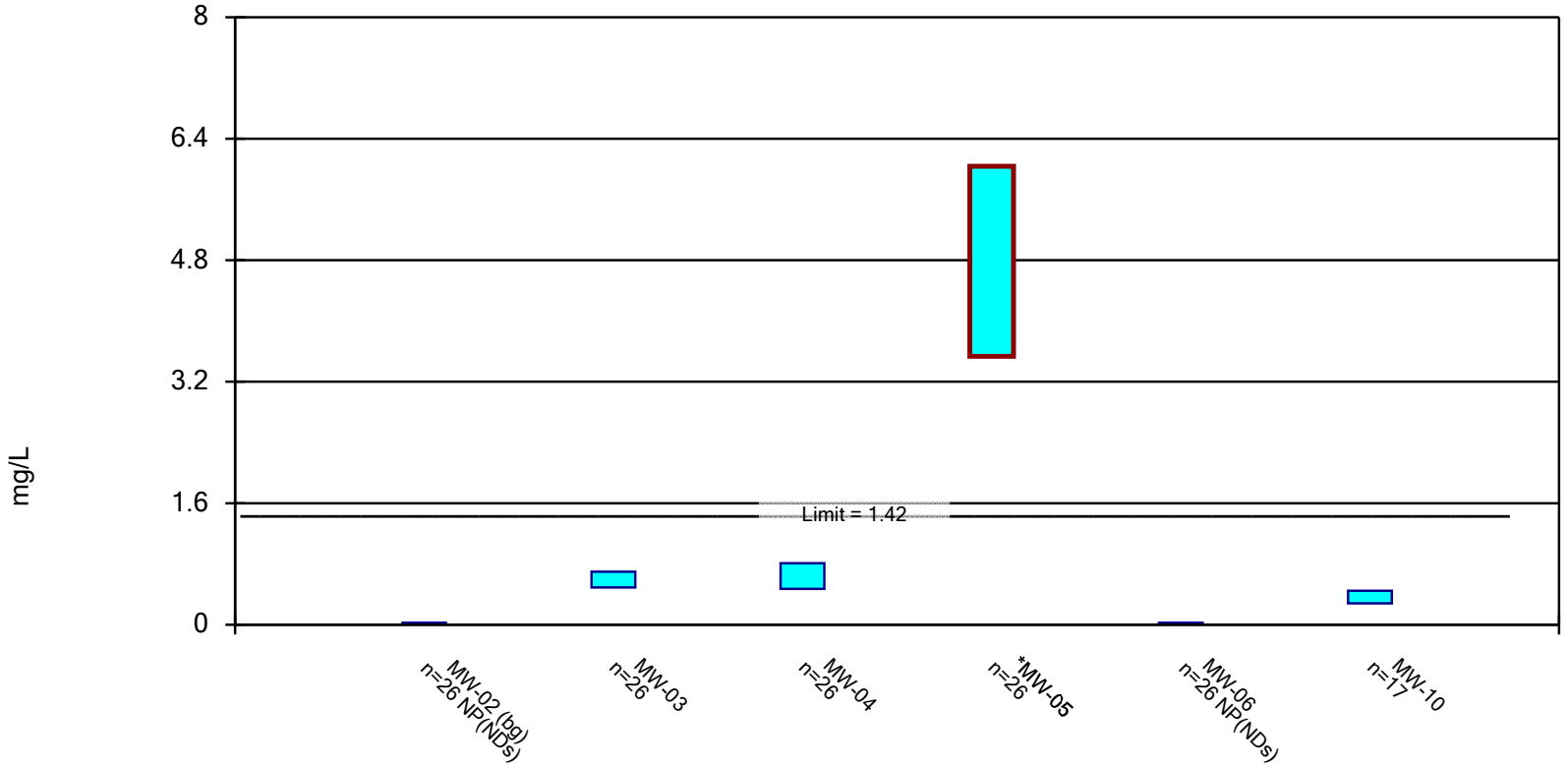


Constituent: Lead Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

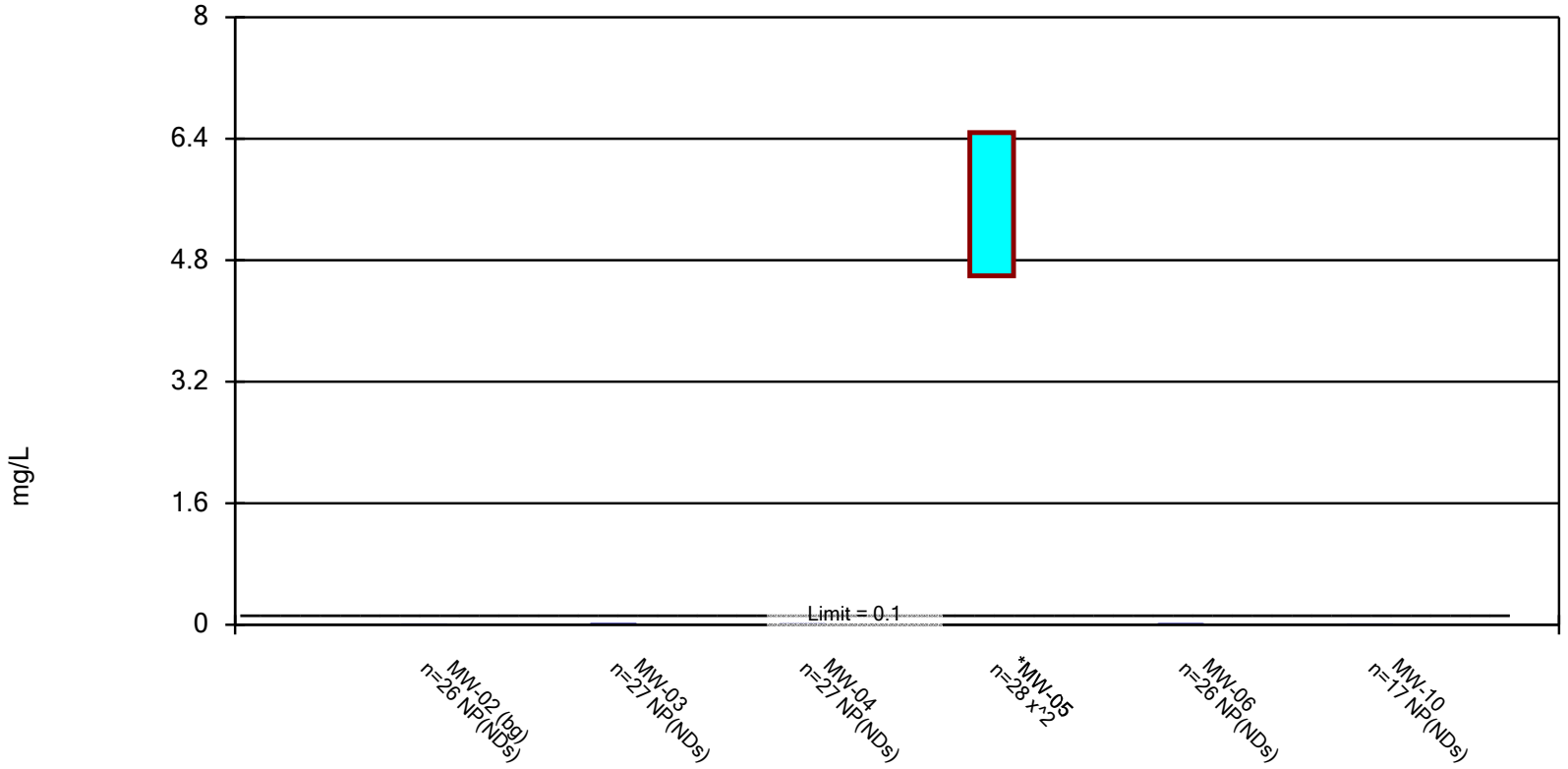


Constituent: Lithium Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

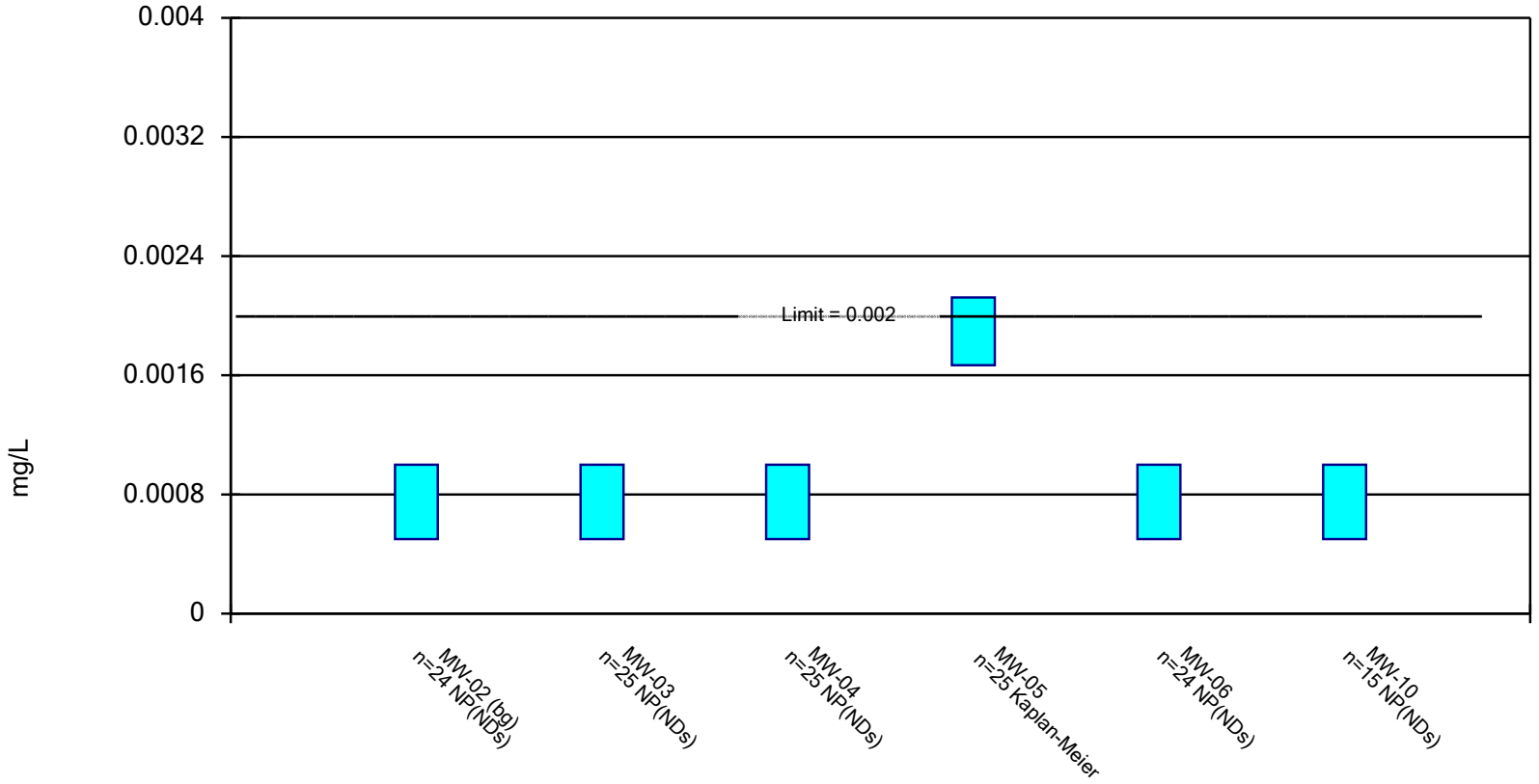


Constituent: Molybdenum Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Thallium Analysis Run 7/5/2024 8:37 AM View: Landfill App IV

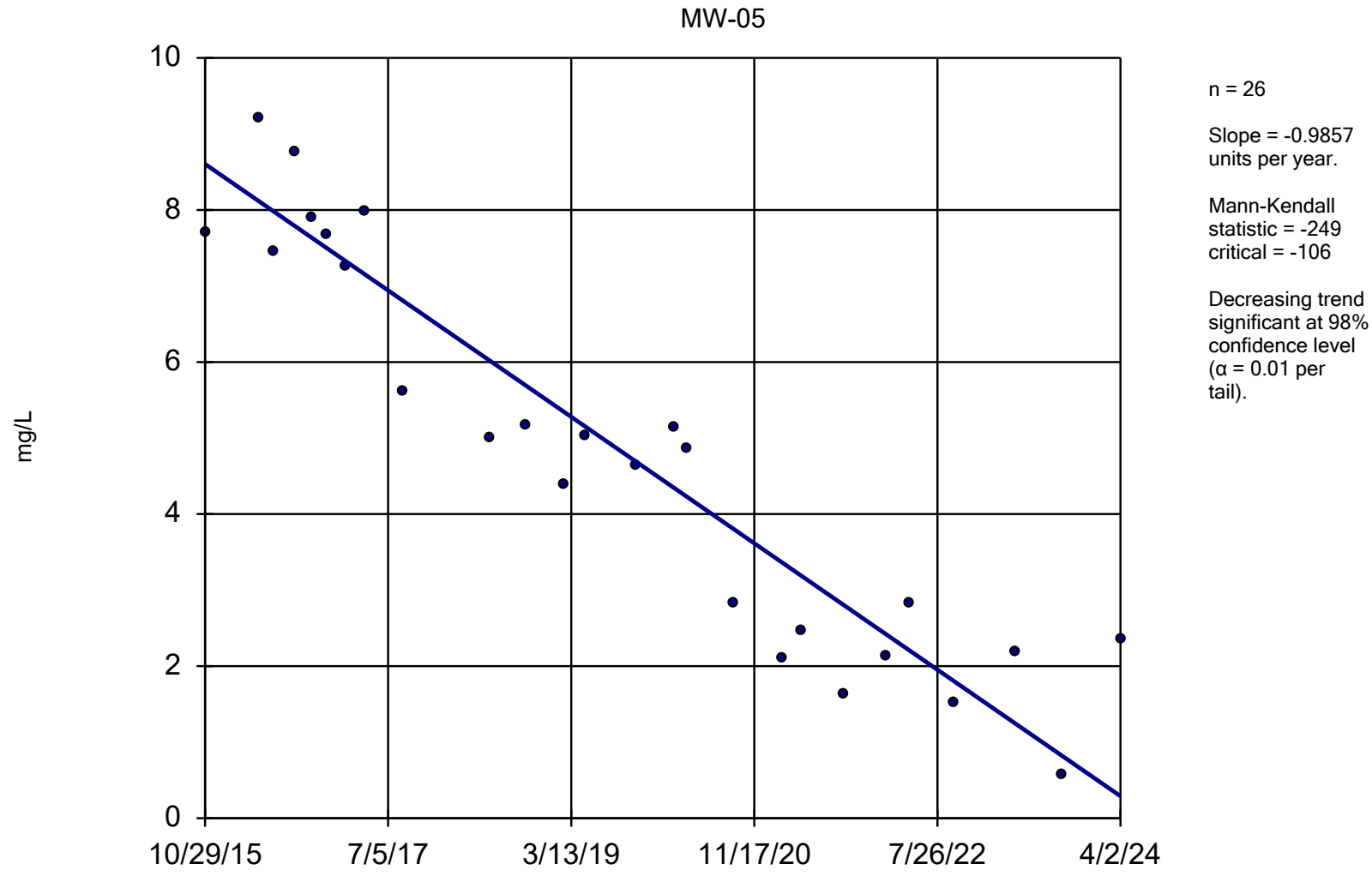
RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Trend Test

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen Printed 7/5/2024, 8:22 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Lithium (mg/L)	**MW-05**	**-0.9857**	**-249**	**-106**	**Yes**	**26**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Lithium (mg/L)	MW-10	-0.01742	-18	-58	No	17	5.882	n/a	n/a	0.02	NP
Molybdenum (mg/L)	**MW-05**	**-0.8017**	**-255**	**-119**	**Yes**	**28**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Molybdenum (mg/L)	MW-10	0	52	58	No	17	100	n/a	n/a	0.02	NP

Sen's Slope Estimator



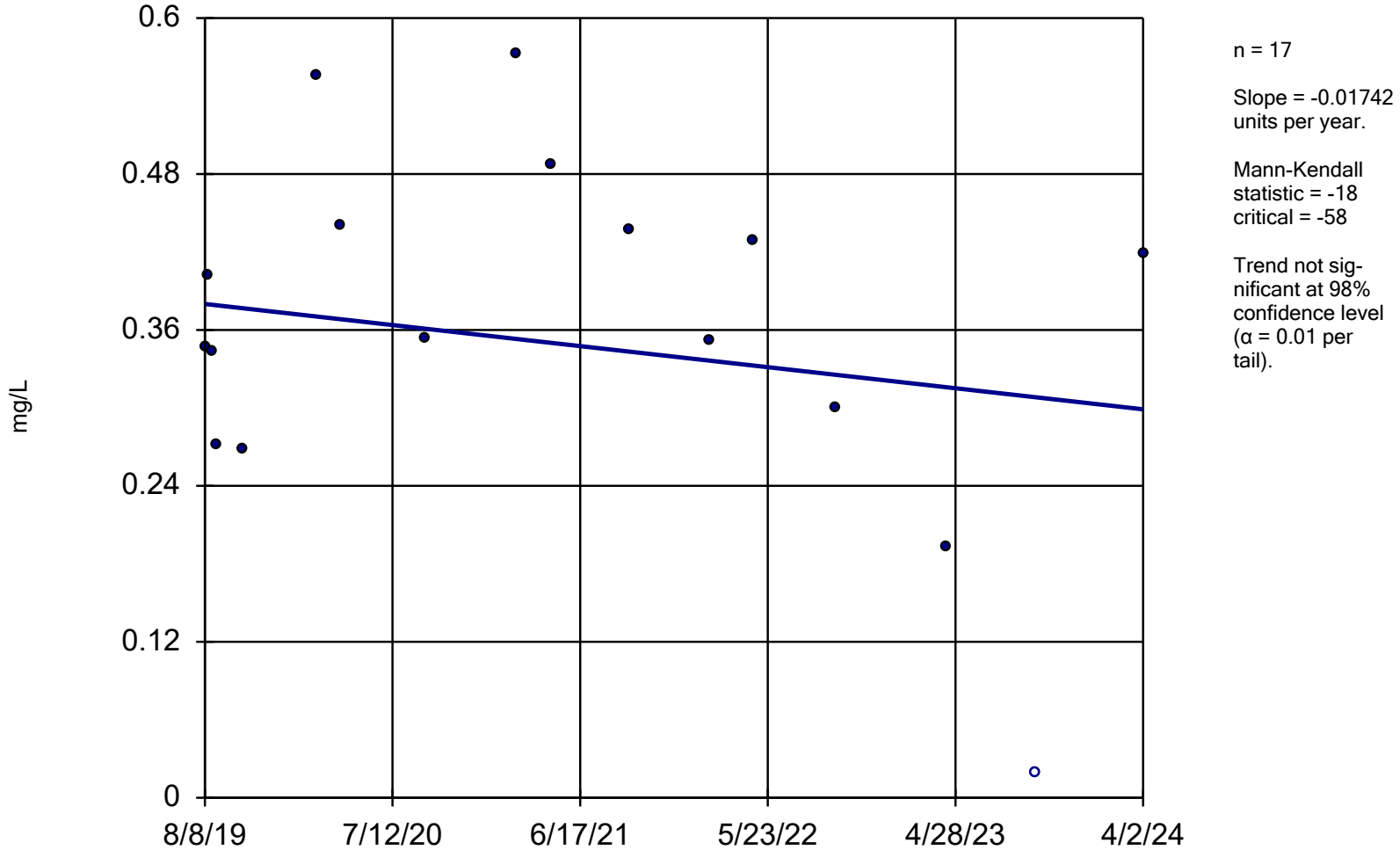
Constituent: Lithium Analysis Run 7/5/2024 8:21 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-10



n = 17

Slope = -0.01742 units per year.

Mann-Kendall statistic = -18
critical = -58

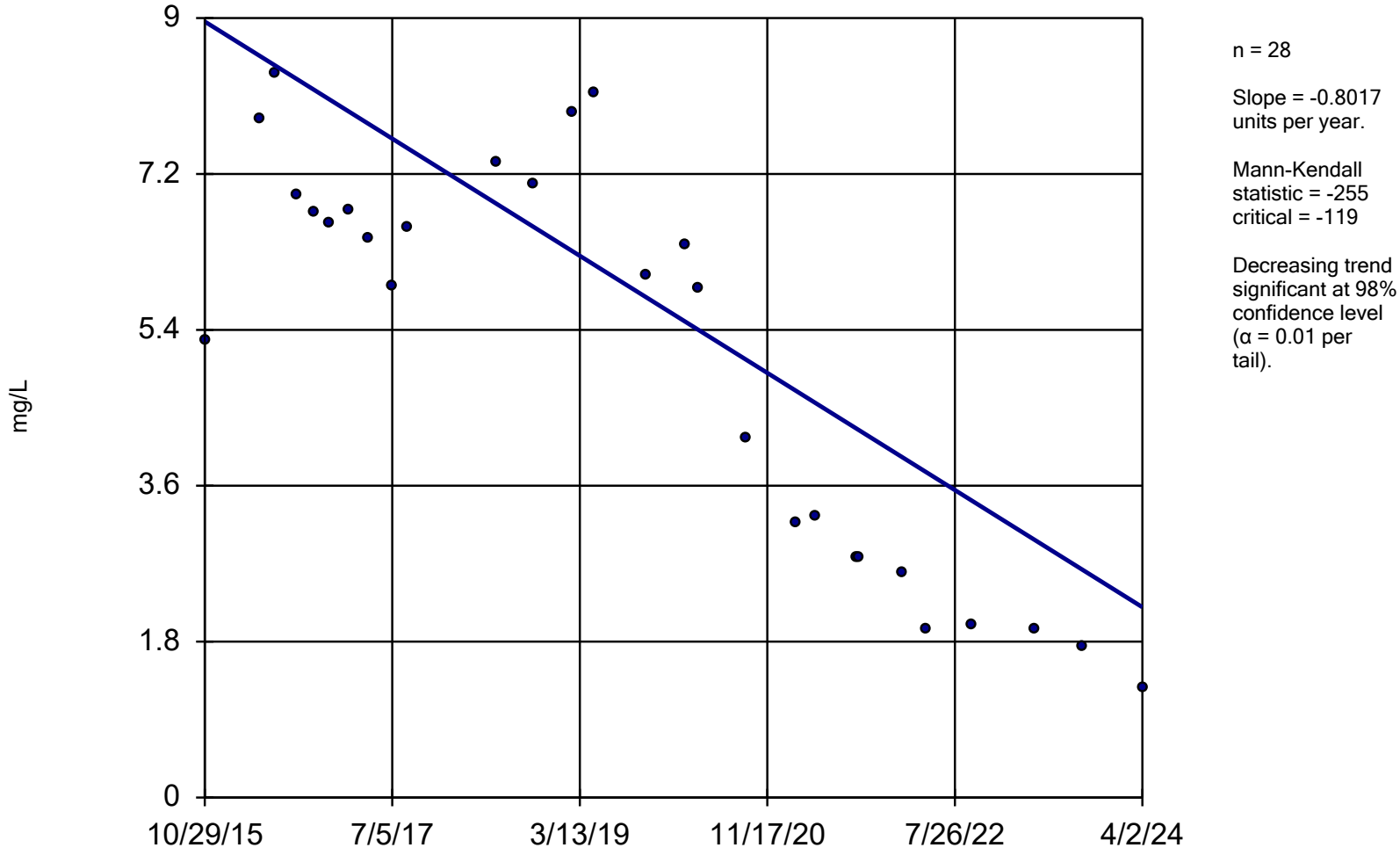
Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: Lithium Analysis Run 7/5/2024 8:21 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Sen's Slope Estimator

MW-05



n = 28

Slope = -0.8017 units per year.

Mann-Kendall statistic = -255
critical = -119

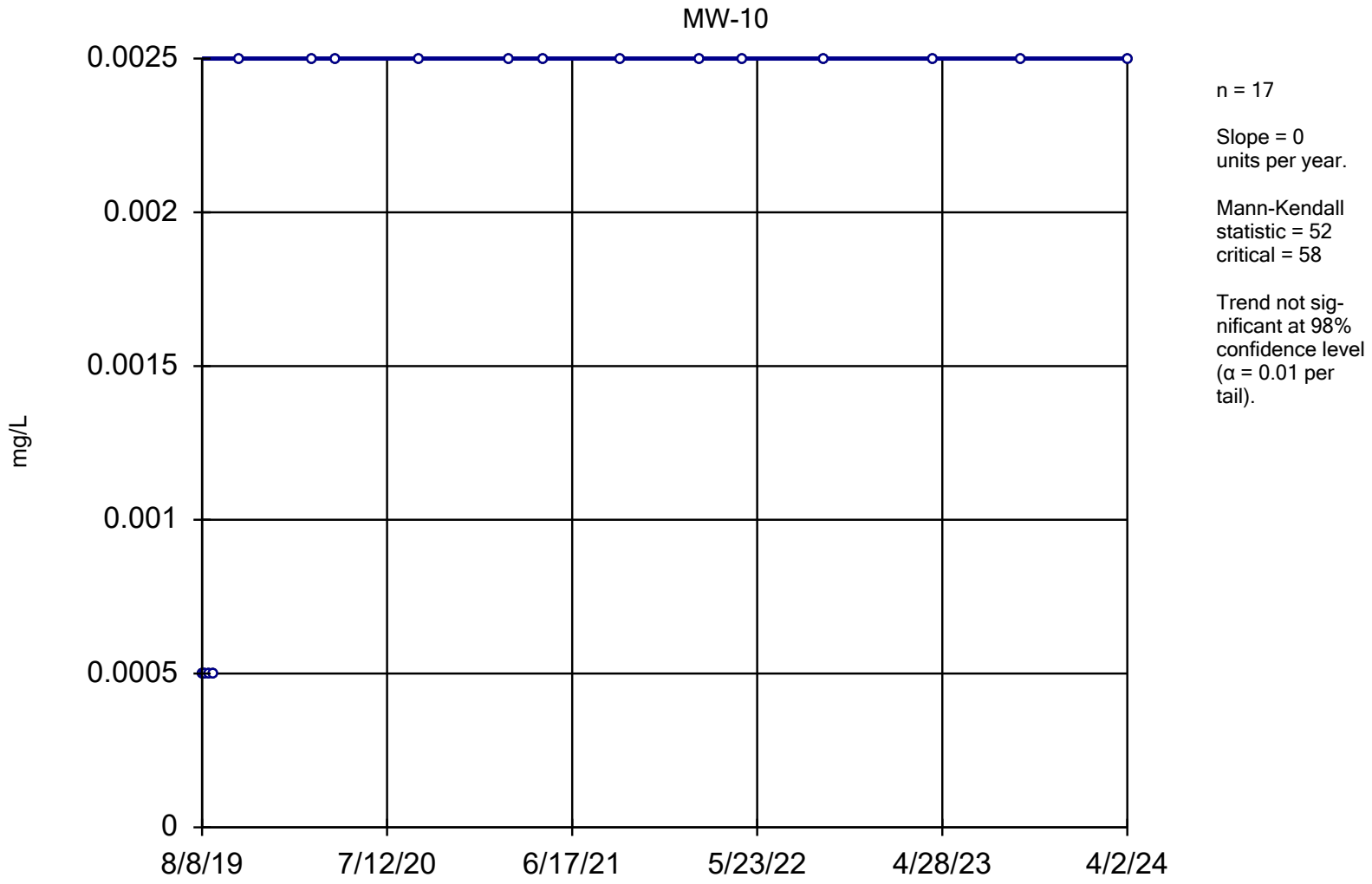
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Molybdenum Analysis Run 7/5/2024 8:21 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

Hollow symbols indicate censored values.

Sen's Slope Estimator



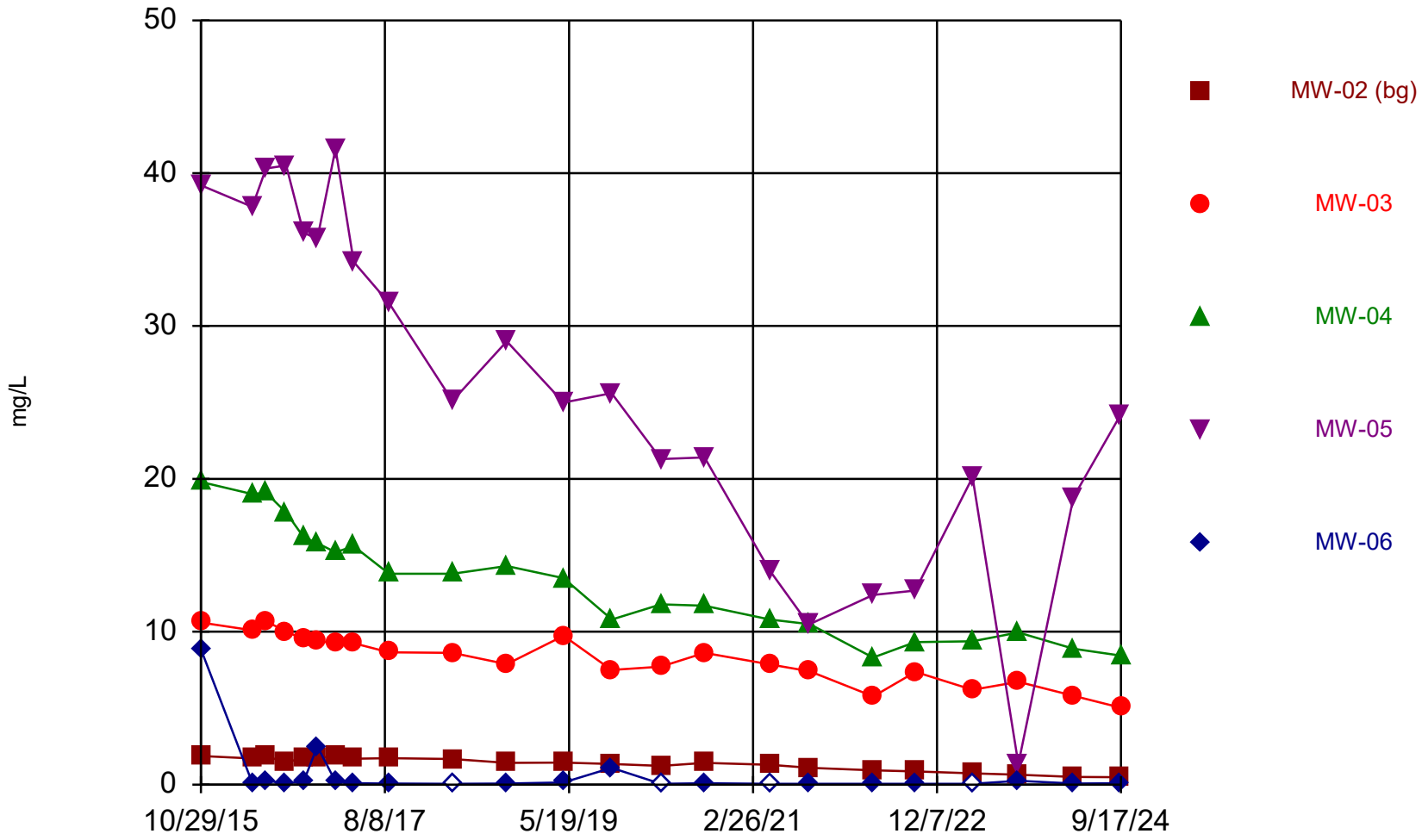
Constituent: Molybdenum Analysis Run 7/5/2024 8:21 AM View: Landfill App IV

RD Morrow Generating Facility Client: WSP Data: RD Morrow Gen

September 2024

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

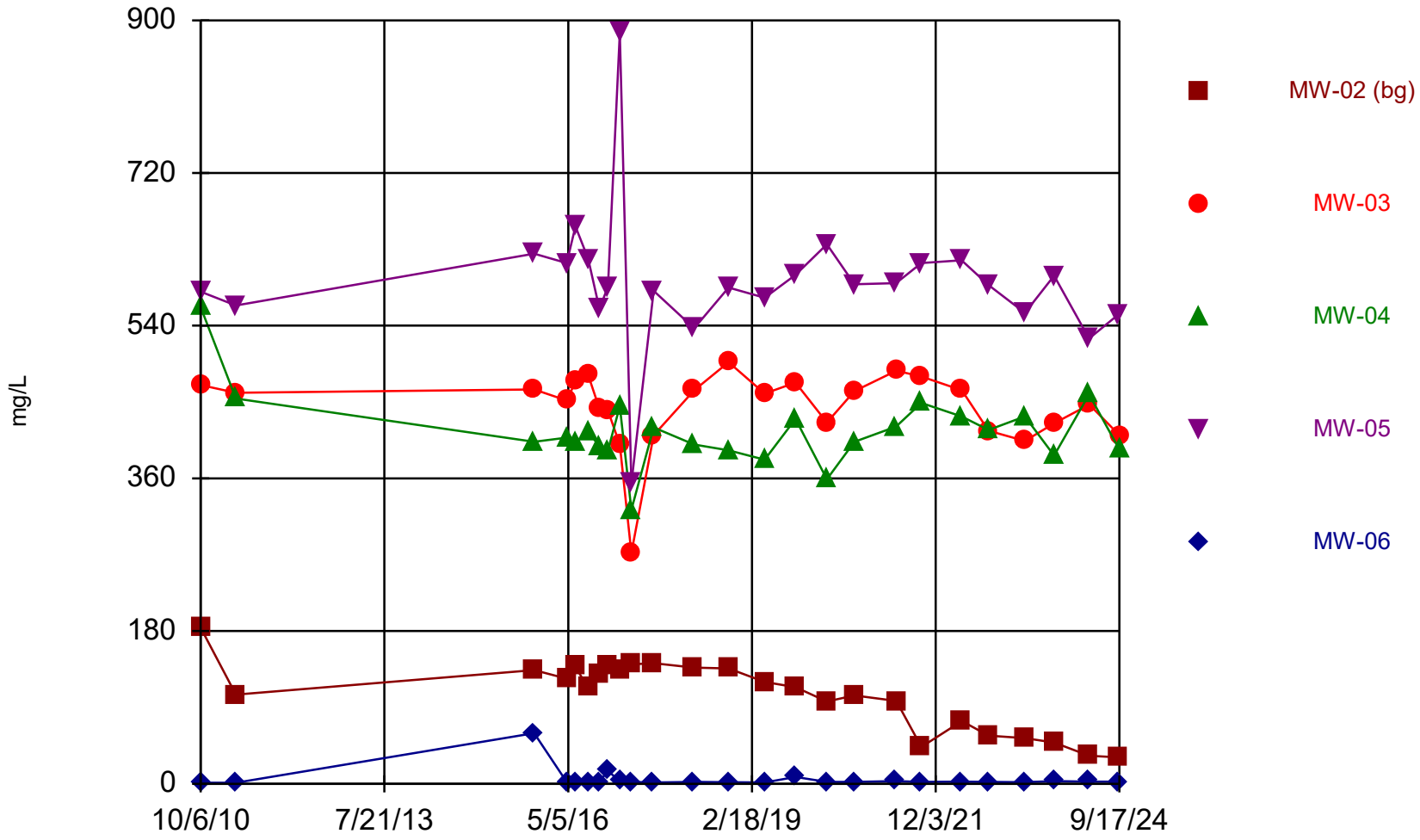
Time Series



Constituent: Boron Analysis Run 11/4/2024 7:41 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

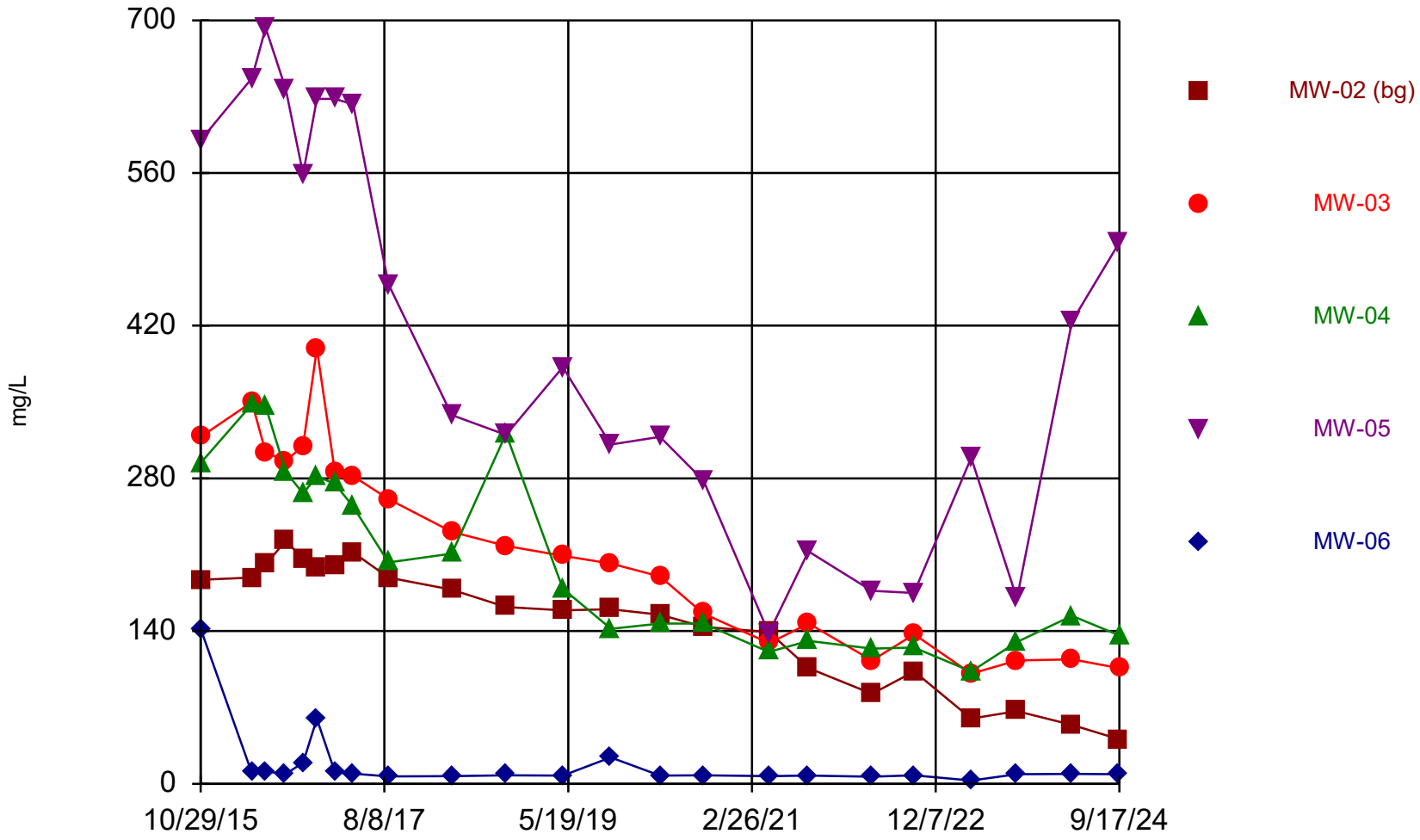
Time Series



Constituent: Calcium Analysis Run 11/4/2024 7:41 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Time Series

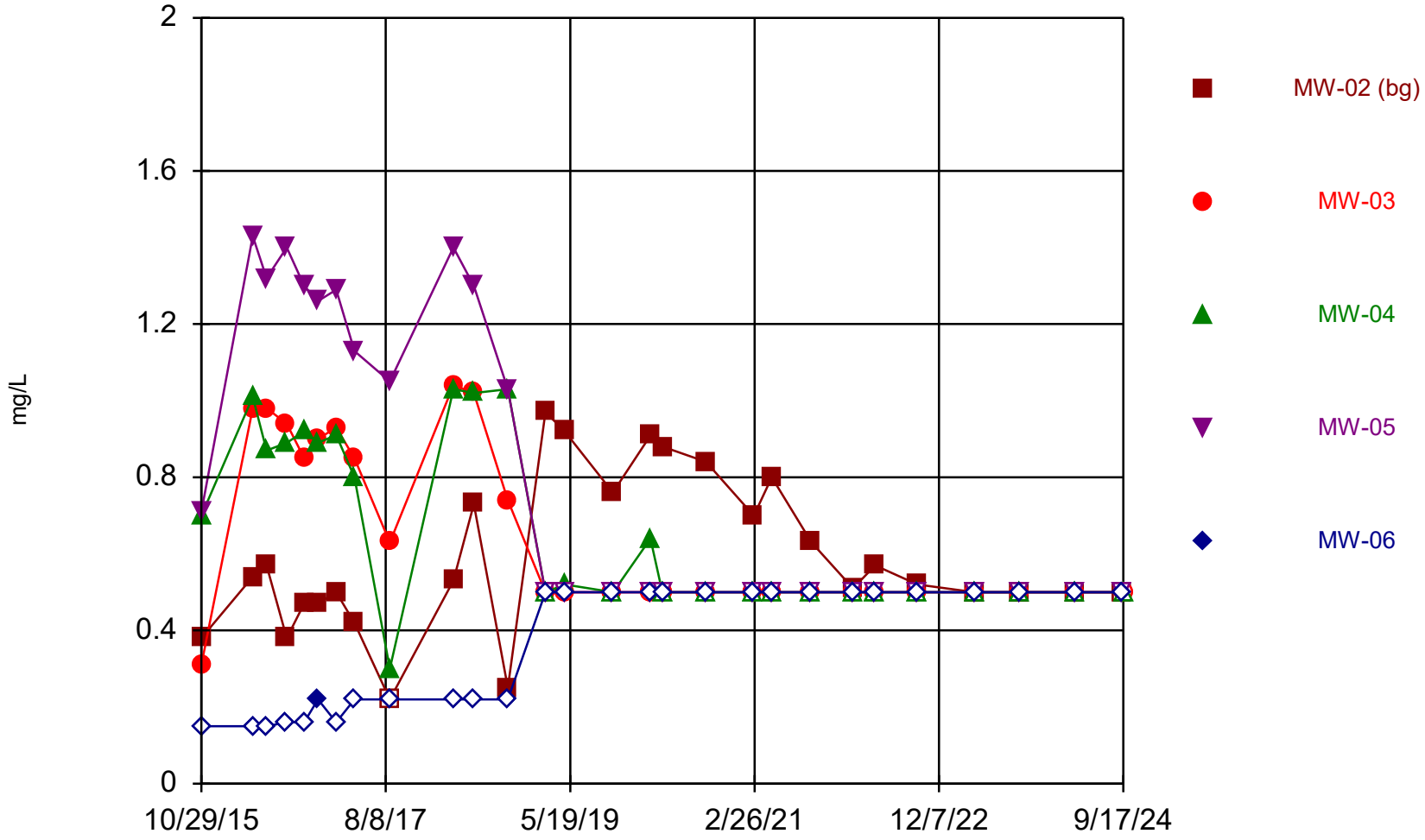


Constituent: Chloride Analysis Run 11/4/2024 7:41 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

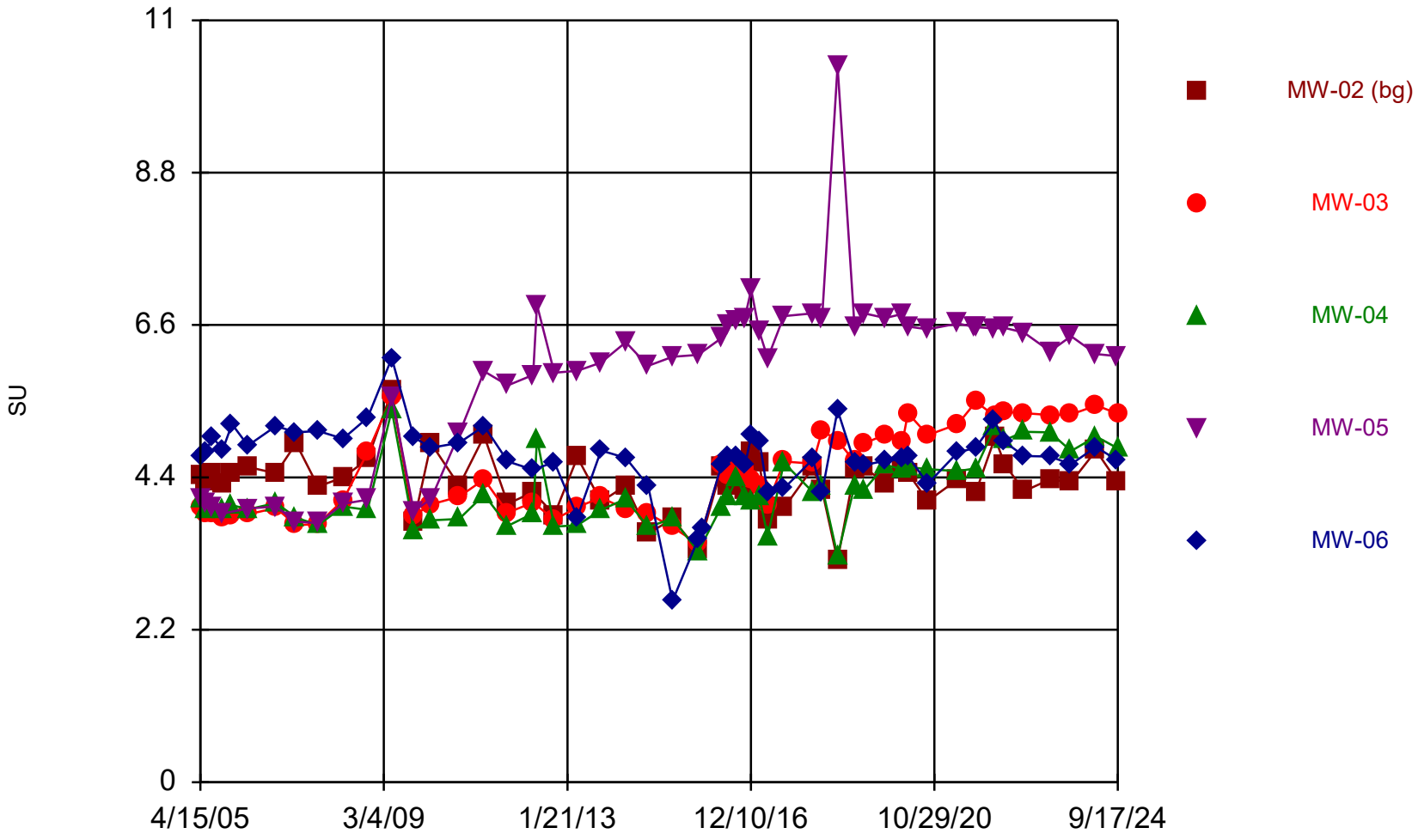
Time Series



Constituent: Fluoride Analysis Run 11/4/2024 7:41 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Time Series

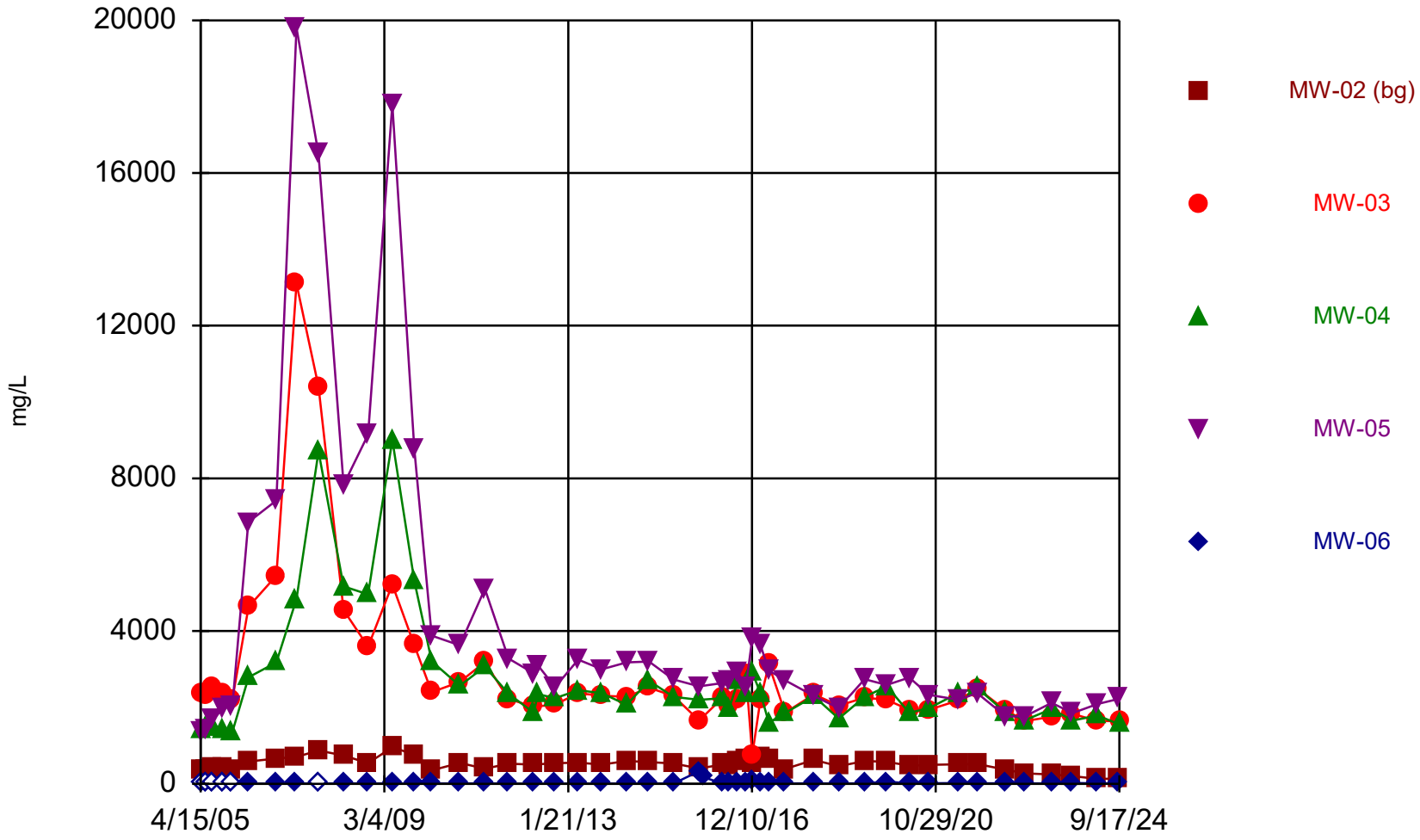


Constituent: pH Analysis Run 11/4/2024 7:41 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

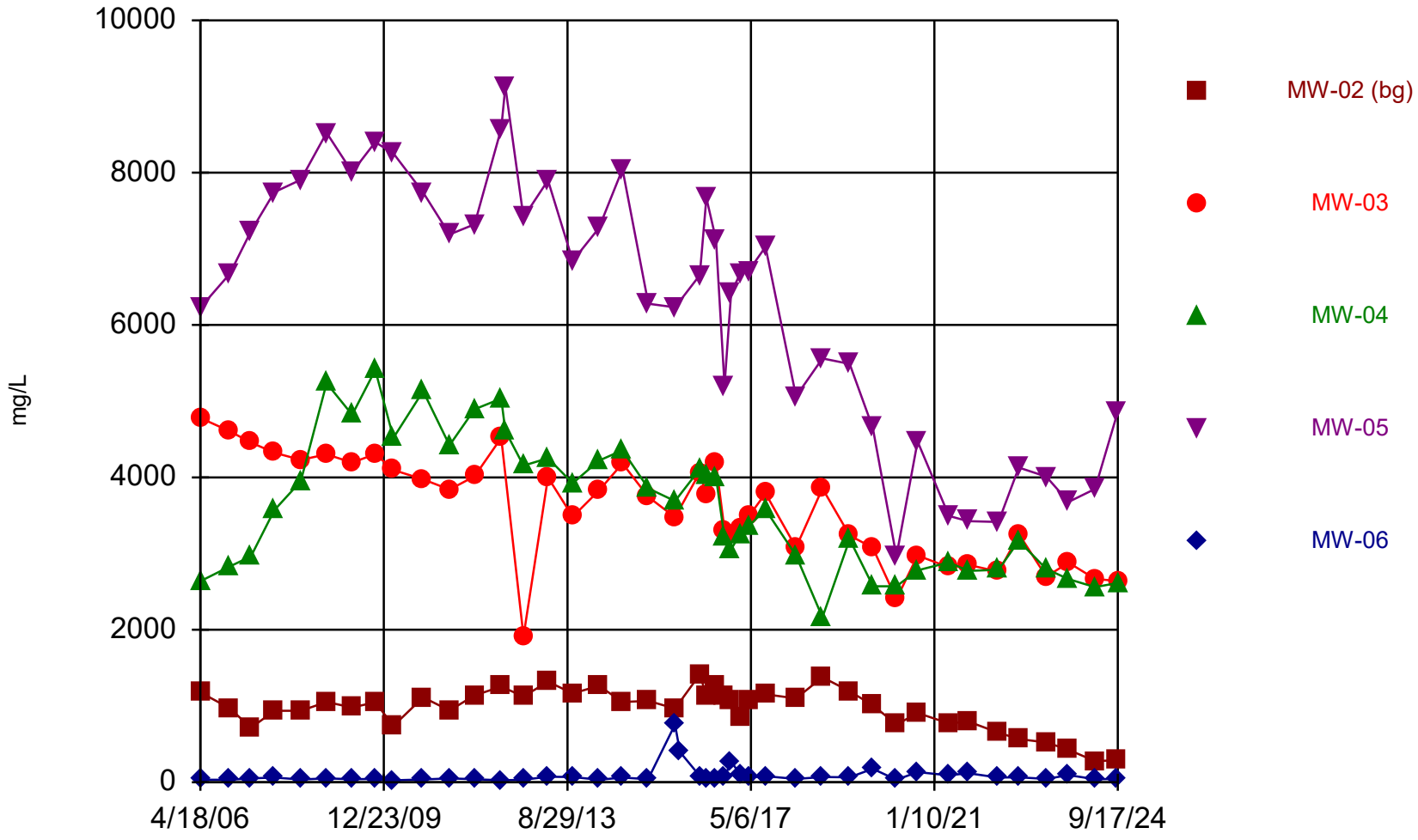
Time Series



Constituent: Sulfate Analysis Run 11/4/2024 7:41 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 11/4/2024 7:41 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Prediction Limit

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen Printed 11/4/2024, 7:47 AM

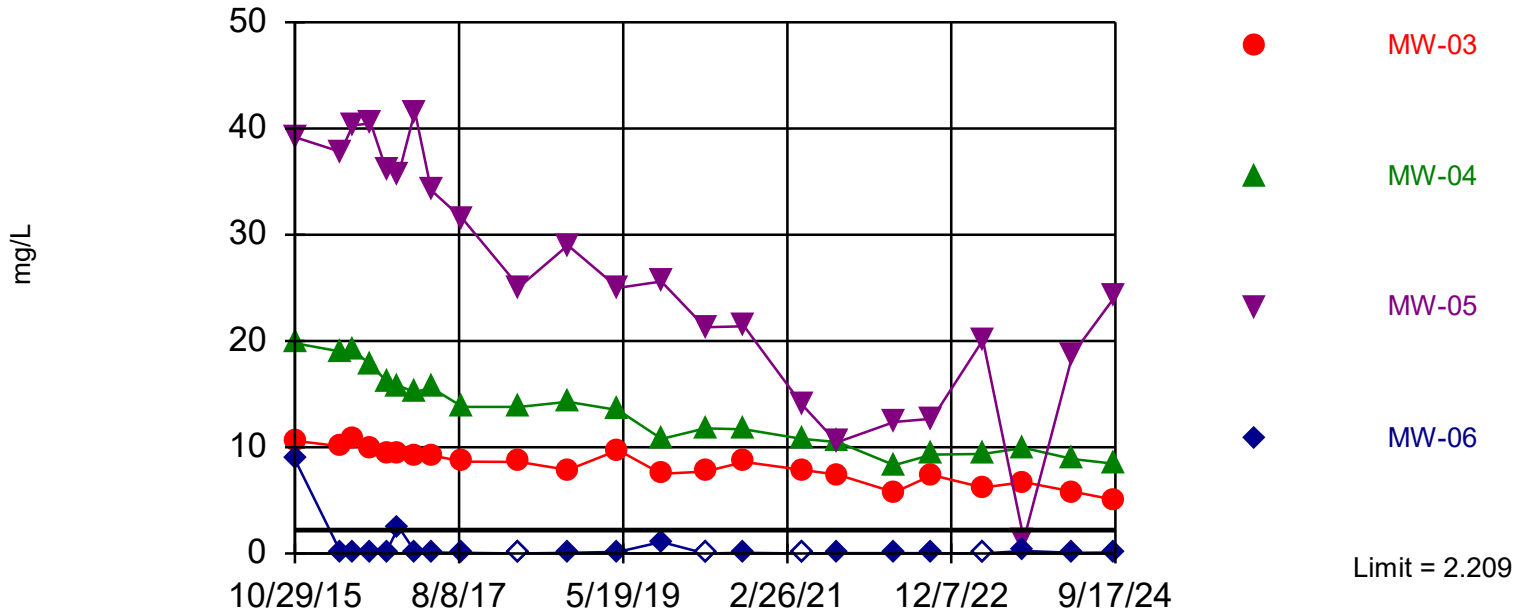
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	**MW-03**	**2.209**	**n/a**	**9/17/2024**	**5.03**	**Yes**	**23**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Boron (mg/L)	**MW-04**	**2.209**	**n/a**	**9/17/2024**	**8.44**	**Yes**	**23**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Boron (mg/L)	**MW-05**	**2.209**	**n/a**	**9/16/2024**	**24.2**	**Yes**	**23**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Boron (mg/L)	MW-06	2.209	n/a	9/16/2024	0.094	No	23	0	No	0.00188	Param Inter 1 of 2
Calcium (mg/L)	**MW-03**	**183**	**n/a**	**9/17/2024**	**411**	**Yes**	**25**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-04**	**183**	**n/a**	**9/17/2024**	**394**	**Yes**	**25**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-05**	**183**	**n/a**	**9/16/2024**	**554**	**Yes**	**25**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Calcium (mg/L)	MW-06	183	n/a	9/16/2024	2.46	No	25	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/L)	MW-03	257.8	n/a	9/17/2024	106	No	23	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/L)	MW-04	257.8	n/a	9/17/2024	136	No	23	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/L)	**MW-05**	**257.8**	**n/a**	**9/16/2024**	**496**	**Yes**	**23**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Chloride (mg/L)	MW-06	257.8	n/a	9/16/2024	8.77	No	23	0	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-03	0.9851	n/a	9/17/2024	0.5ND	No	28	17.86	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-04	0.9851	n/a	9/17/2024	0.5ND	No	28	17.86	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-05	0.9851	n/a	9/16/2024	0.5ND	No	28	17.86	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	MW-06	0.9851	n/a	9/16/2024	0.5ND	No	28	17.86	No	0.00188	Param Inter 1 of 2
pH (SU)	**MW-03**	**5.096**	**3.593**	**9/17/2024**	**5.32**	**Yes**	**51**	**0**	**No**	**0.000...**	**Param Inter 1 of 2**
pH (SU)	MW-04	5.096	3.593	9/17/2024	4.82	No	51	0	No	0.000...	Param Inter 1 of 2
pH (SU)	**MW-05**	**5.096**	**3.593**	**9/16/2024**	**6.15**	**Yes**	**51**	**0**	**No**	**0.000...**	**Param Inter 1 of 2**
pH (SU)	MW-06	5.096	3.593	9/16/2024	4.64	No	51	0	No	0.000...	Param Inter 1 of 2
Sulfate (mg/L)	**MW-03**	**812.5**	**n/a**	**9/17/2024**	**1640**	**Yes**	**47**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Sulfate (mg/L)	**MW-04**	**812.5**	**n/a**	**9/17/2024**	**1560**	**Yes**	**47**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Sulfate (mg/L)	**MW-05**	**812.5**	**n/a**	**9/16/2024**	**2230**	**Yes**	**47**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-06	812.5	n/a	9/16/2024	11.8	No	47	0	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids [TDS] (m...	**MW-03**	**1466**	**n/a**	**9/17/2024**	**2640**	**Yes**	**42**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Total Dissolved Solids [TDS] (m...	**MW-04**	**1466**	**n/a**	**9/17/2024**	**2613**	**Yes**	**42**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Total Dissolved Solids [TDS] (m...	**MW-05**	**1466**	**n/a**	**9/16/2024**	**4863**	**Yes**	**42**	**0**	**No**	**0.00188**	**Param Inter 1 of 2**
Total Dissolved Solids [TDS] (m...	MW-06	1466	n/a	9/16/2024	43	No	42	0	No	0.00188	Param Inter 1 of 2

Hollow symbols indicate censored values.

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1.337, Std. Dev.=0.4495, n=23. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9027, critical = 0.881. Kappa = 1.94 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

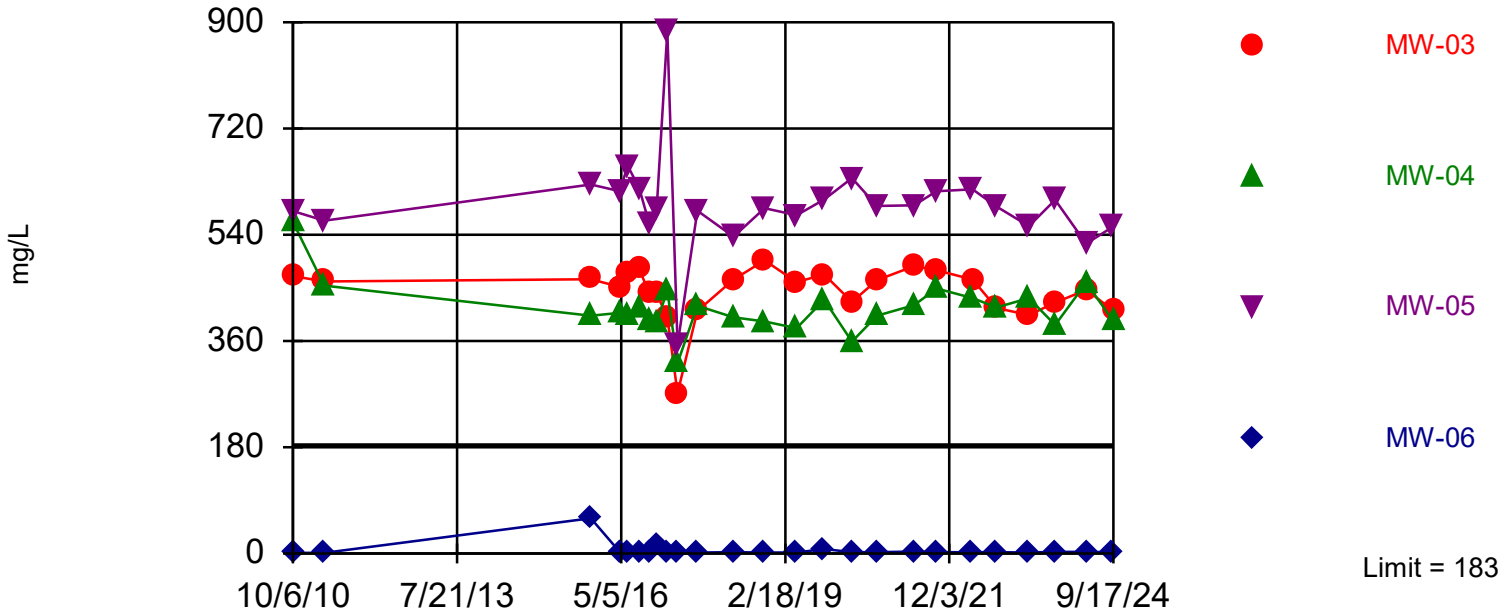
Constituent: Boron Analysis Run 11/4/2024 7:46 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=105.1, Std. Dev.=40.66, n=25. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9144, critical = 0.888. Kappa = 1.914 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

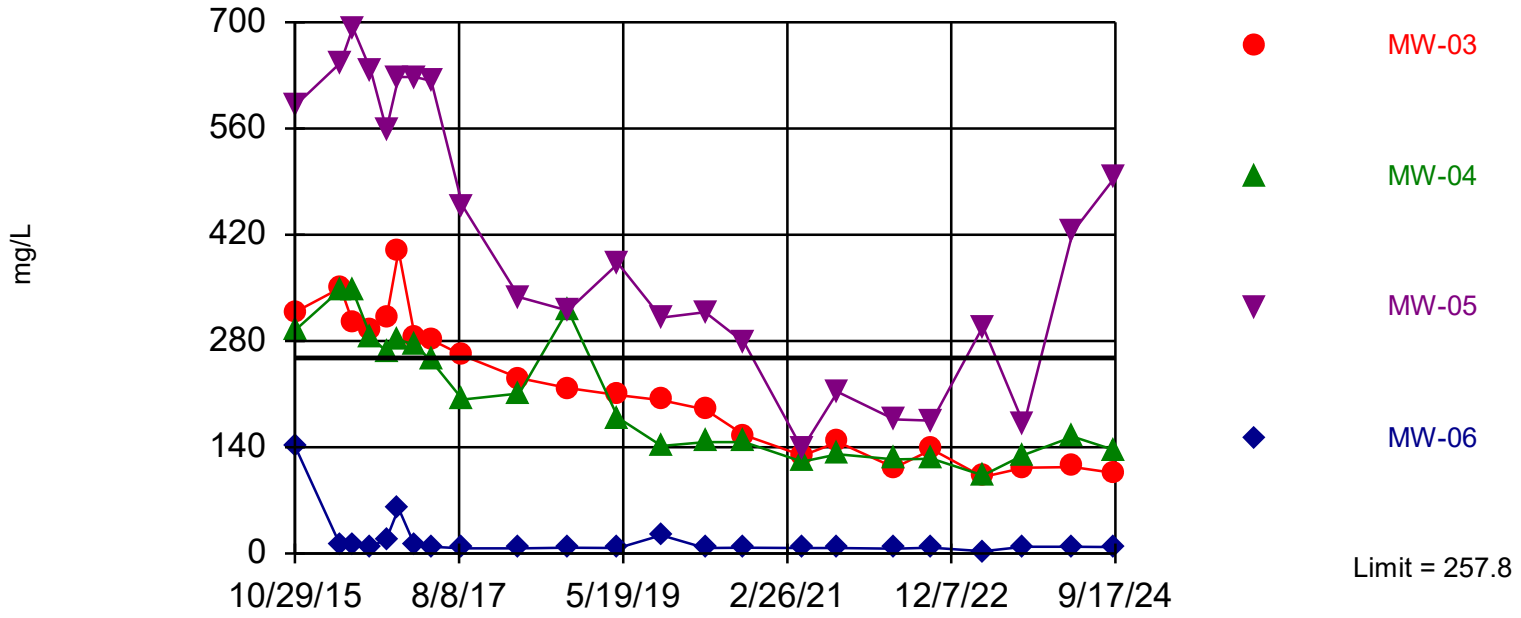
Constituent: Calcium Analysis Run 11/4/2024 7:46 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Exceeds Limit: MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=148.4, Std. Dev.=56.43, n=23. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9051, critical = 0.881. Kappa = 1.94 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Constituent: Chloride Analysis Run 11/4/2024 7:46 AM View: Landfill AppIII

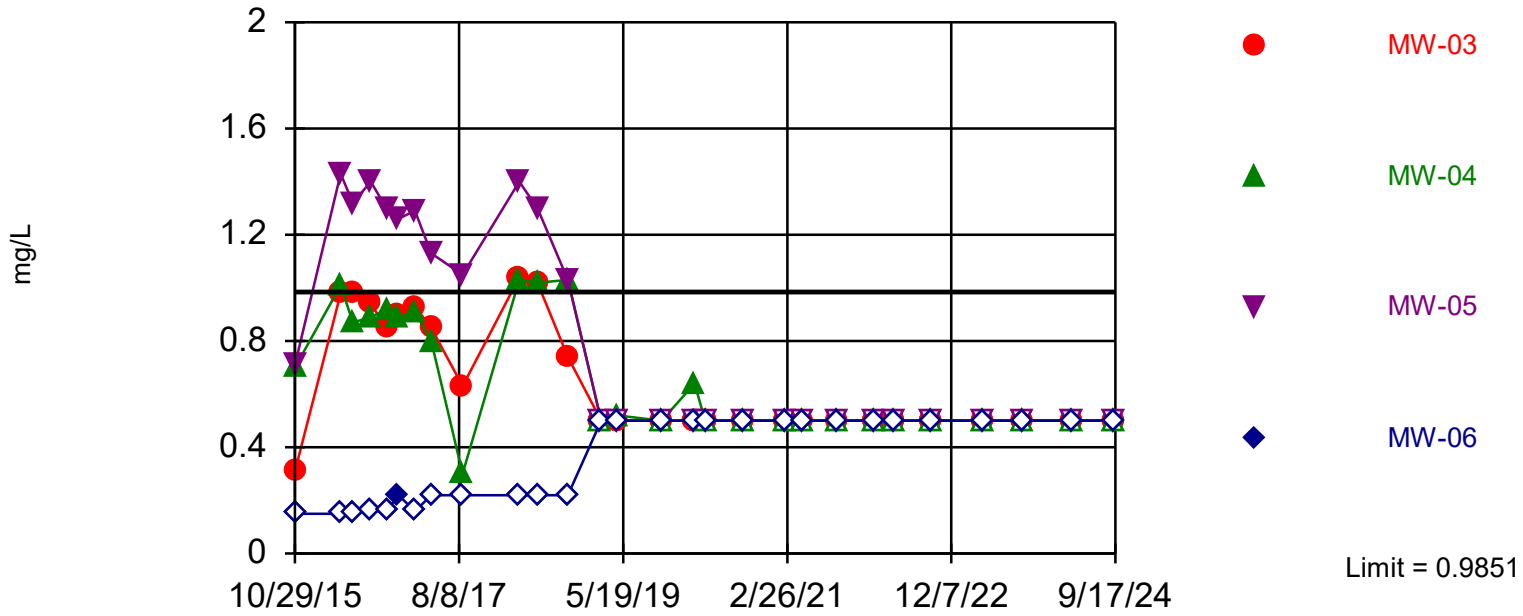
RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.5455, Std. Dev.=0.2322, n=28, 17.86% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9392, critical = 0.896. Kappa = 1.894 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

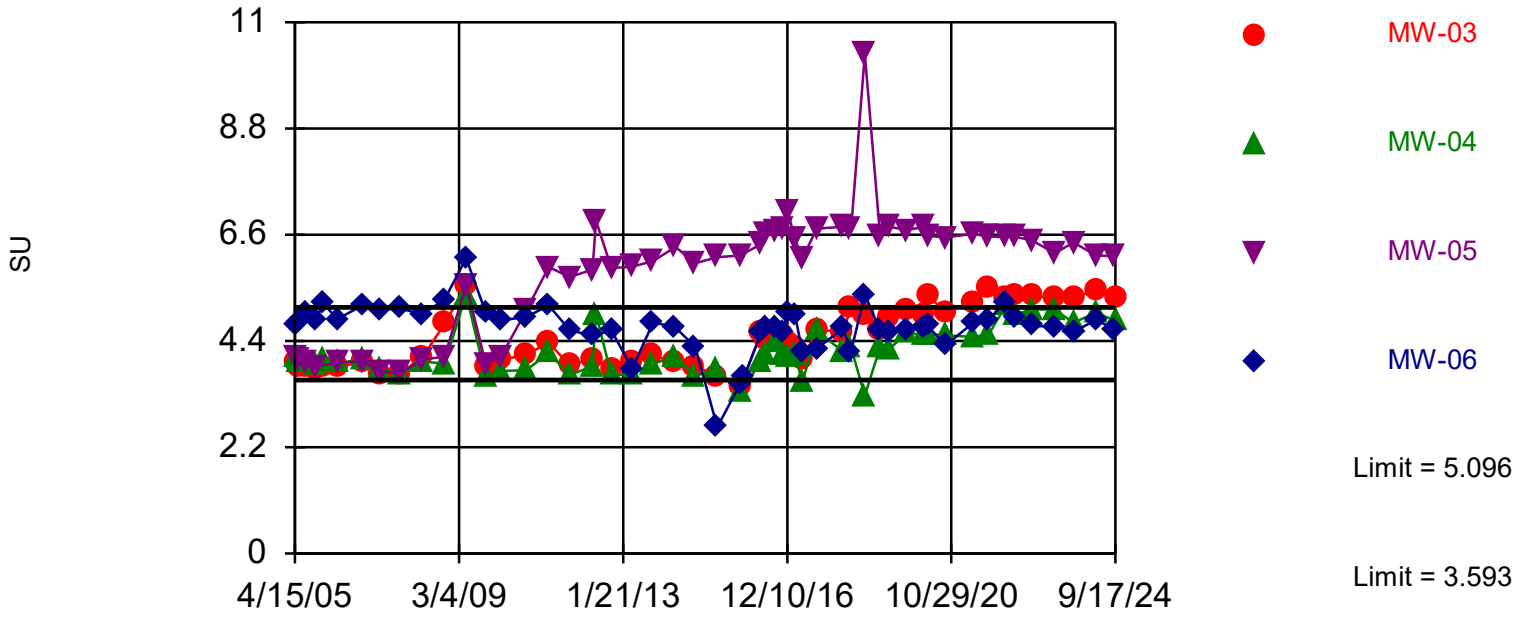
Constituent: Fluoride Analysis Run 11/4/2024 7:46 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Exceeds Limits: MW-03, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4.345, Std. Dev.=0.4174, n=51. Seasonality was not detected with 95% confidence. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9399, critical = 0.935. Kappa = 1.8 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009398. Comparing 4 points to limit.

Constituent: pH Analysis Run 11/4/2024 7:46 AM View: Landfill AppIII

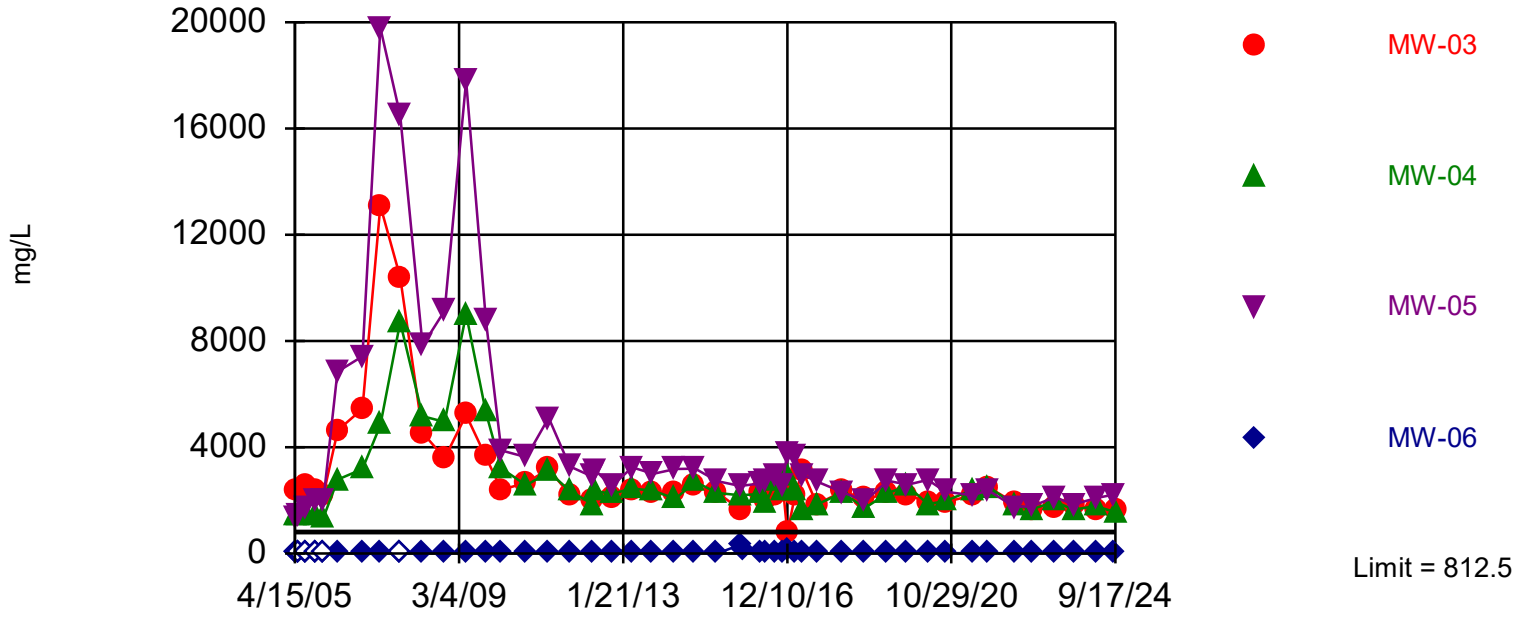
RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=506.8, Std. Dev.=168.8, n=47. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9768, critical = 0.928. Kappa = 1.81 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

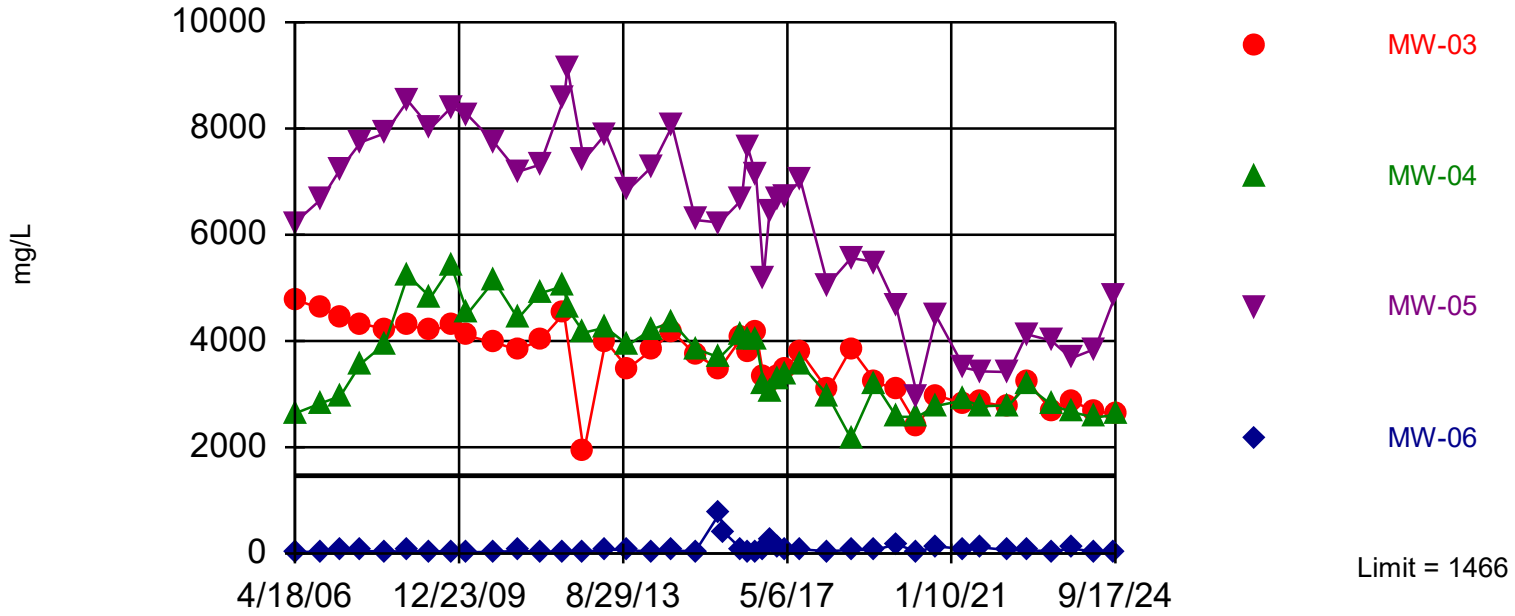
Constituent: Sulfate Analysis Run 11/4/2024 7:46 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Exceeds Limit: MW-03, MW-04, MW-05

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=968.8, Std. Dev.=273.1, n=42. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9295, critical = 0.922. Kappa = 1.822 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/4/2024 7:46 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

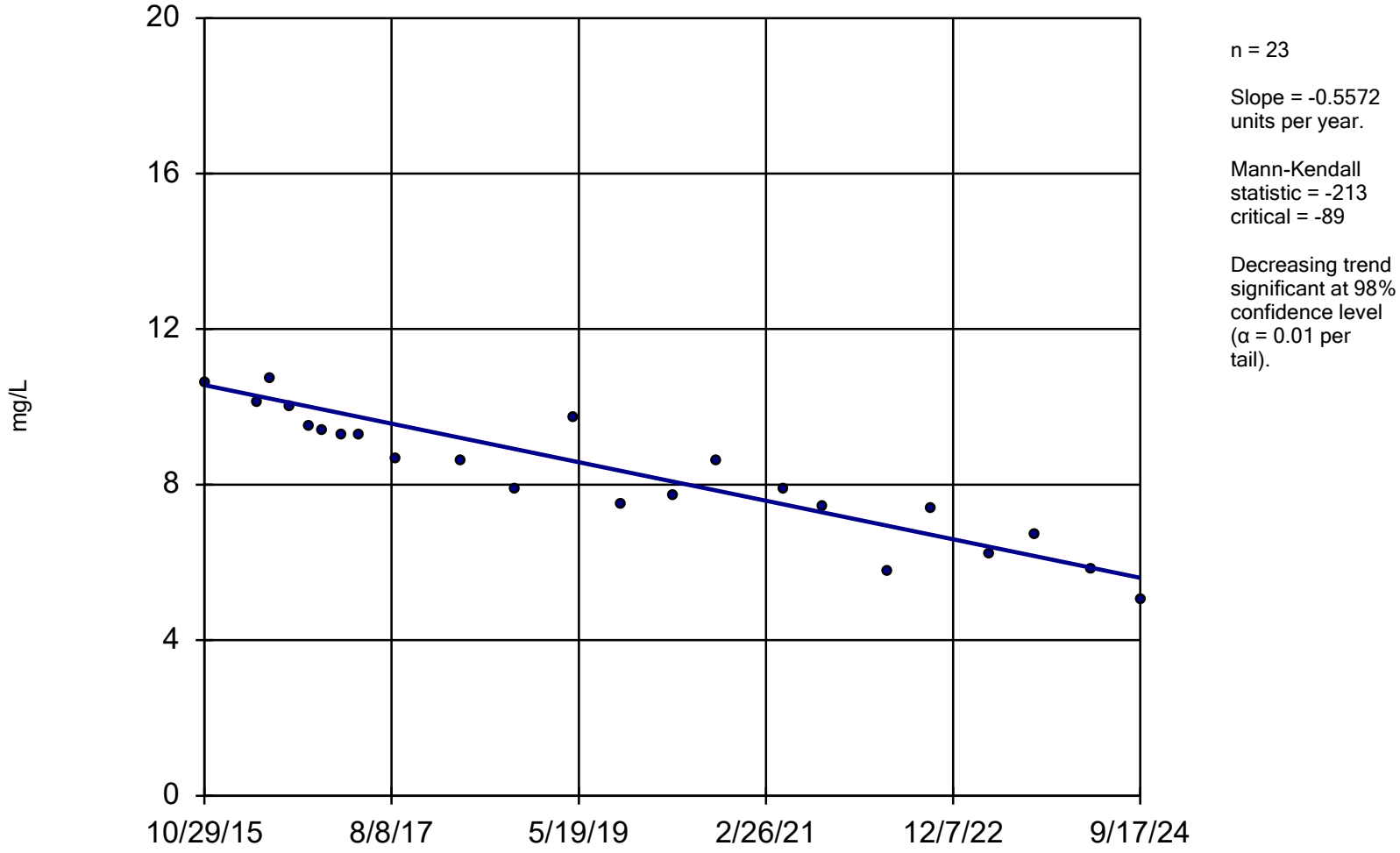
Trend Test

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen Printed 11/4/2024, 7:53 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	**MW-03**	**-0.5572**	**-213**	**-89**	**Yes**	**23**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	**MW-04**	**-1.193**	**-223**	**-89**	**Yes**	**23**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	**MW-05**	**-4.104**	**-193**	**-95**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Calcium (mg/L)	MW-03	-2.615	-52	-101	No	25	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-04	-0.5348	-7	-101	No	25	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-05	-1.998	-35	-101	No	25	0	n/a	n/a	0.02	NP
Chloride (mg/L)	**MW-05**	**-58.66**	**-156**	**-89**	**Yes**	**23**	**0**	**n/a**	**n/a**	**0.02**	**NP**
pH (SU)	**MW-03**	**0.08719**	**6.272**	**2.33**	**Yes**	**51**	**0**	**n/a**	**n/a**	**0.02**	**NP**
pH (SU)	**MW-05**	**0.131**	**5.351**	**2.33**	**Yes**	**52**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Sulfate (mg/L)	**MW-03**	**-64.42**	**-5.137**	**-2.33**	**Yes**	**47**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Sulfate (mg/L)	**MW-04**	**-57.53**	**-2.48**	**-2.33**	**Yes**	**48**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Sulfate (mg/L)	**MW-05**	**-121.4**	**-3.653**	**-2.33**	**Yes**	**48**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids [TDS] (m...	**MW-03**	**-106.9**	**-6.568**	**-2.33**	**Yes**	**42**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids [TDS] (m...	**MW-04**	**-144.8**	**-4.93**	**-2.33**	**Yes**	**43**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids [TDS] (m...	**MW-05**	**-274.3**	**-5.589**	**-2.33**	**Yes**	**43**	**0**	**n/a**	**n/a**	**0.02**	**NP**

Sen's Slope Estimator

MW-03



n = 23

Slope = -0.5572 units per year.

Mann-Kendall statistic = -213
critical = -89

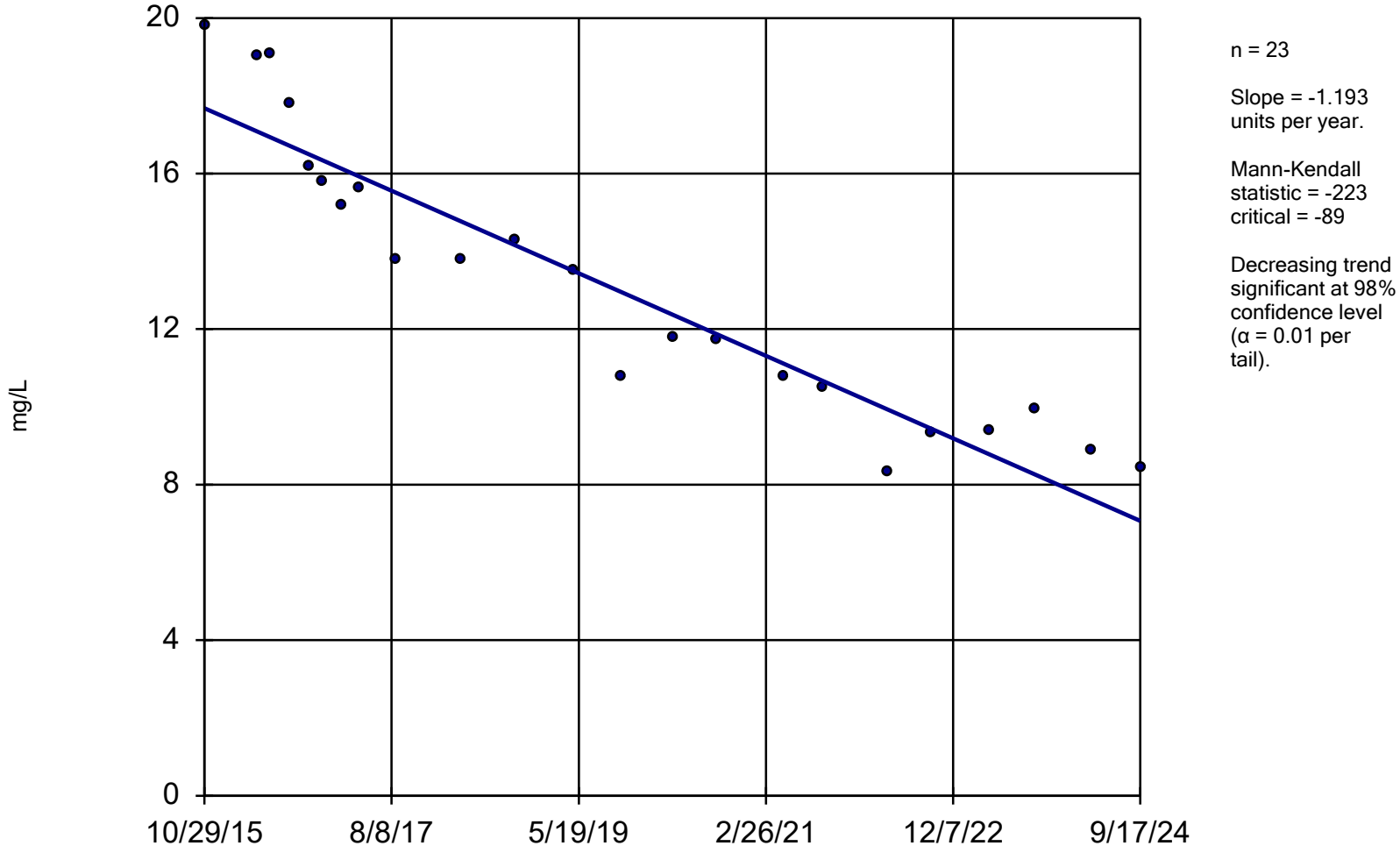
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Boron Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-04



n = 23

Slope = -1.193 units per year.

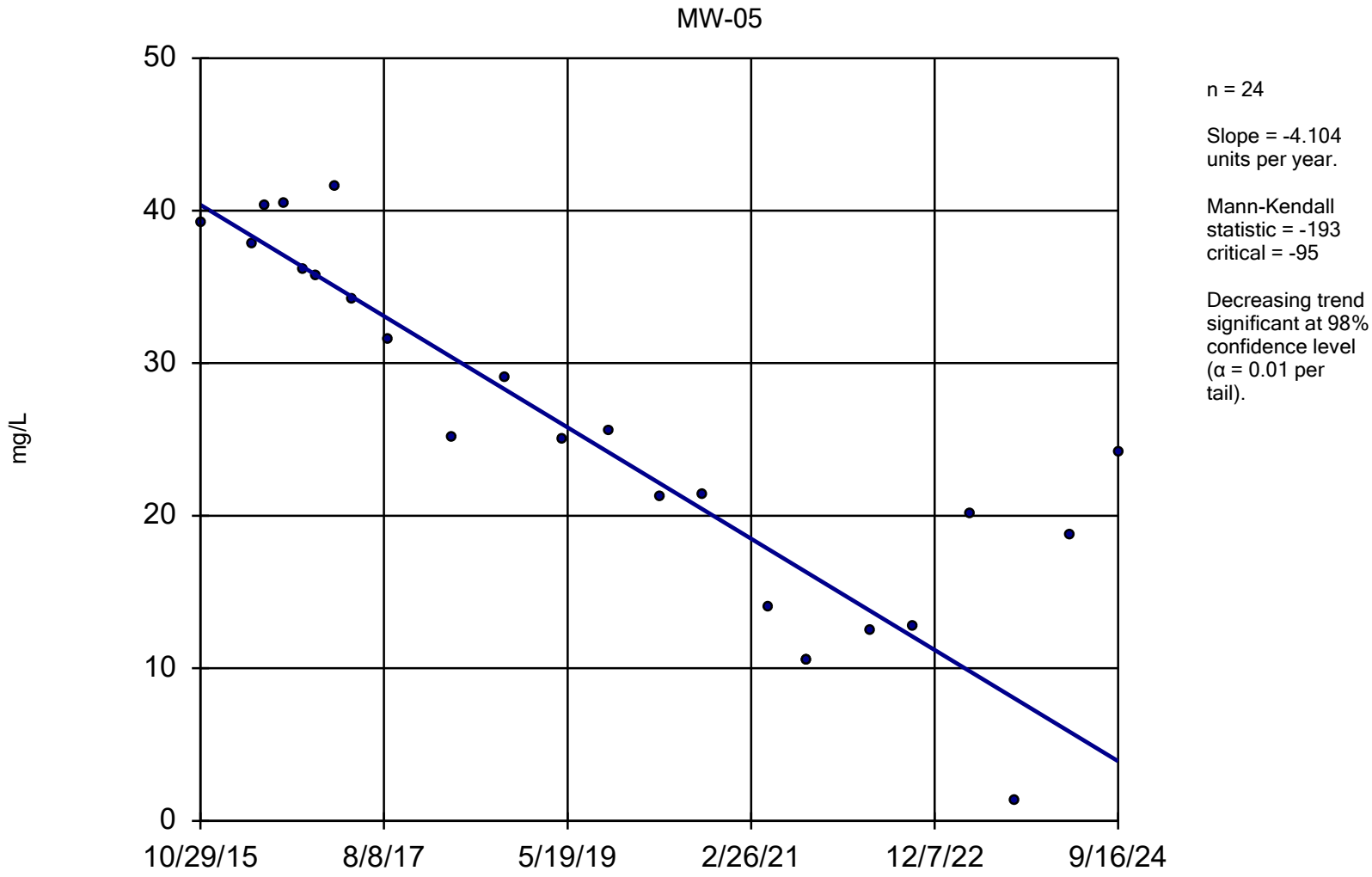
Mann-Kendall statistic = -223
critical = -89

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Boron Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

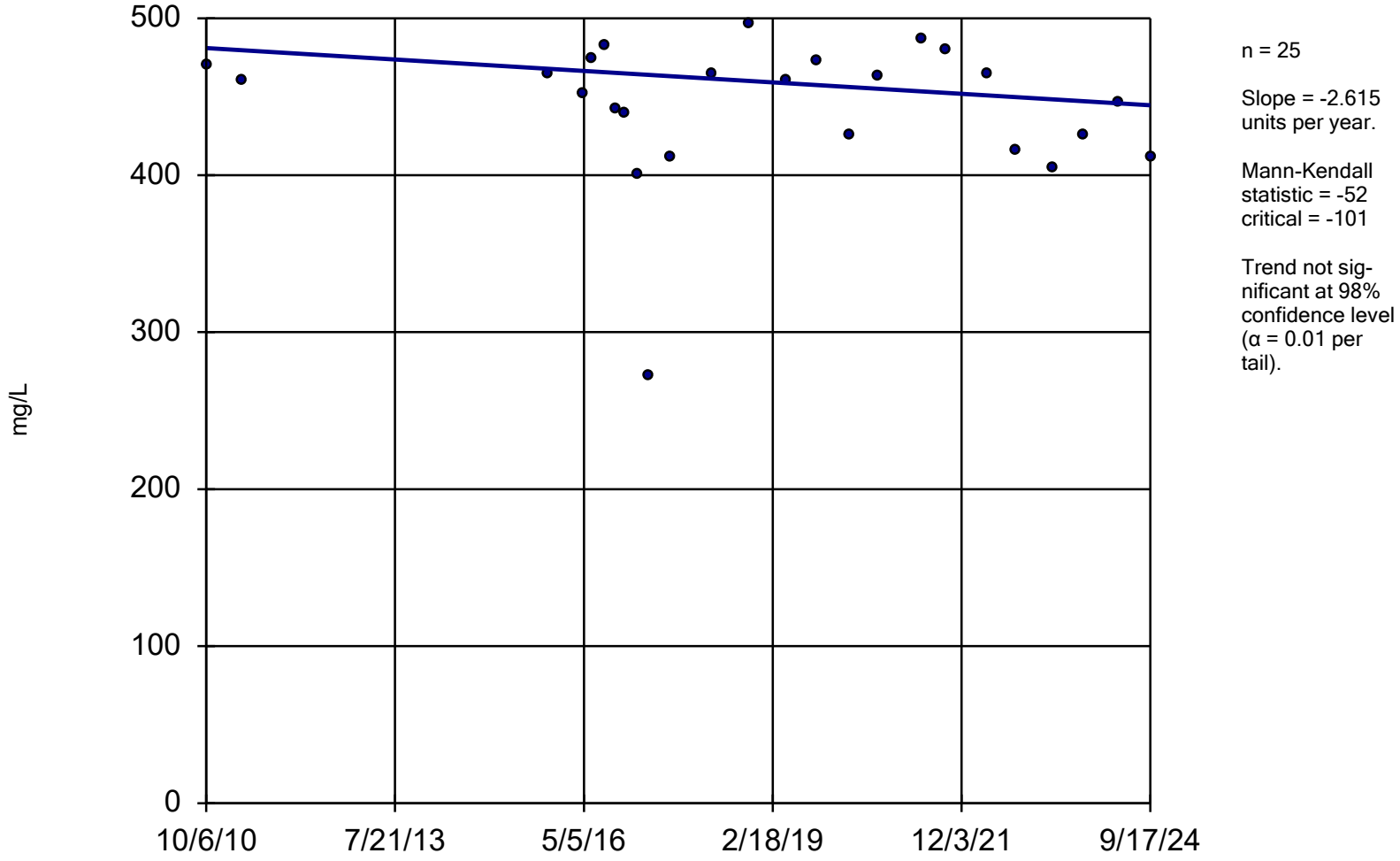


Constituent: Boron Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-03



n = 25

Slope = -2.615 units per year.

Mann-Kendall statistic = -52
critical = -101

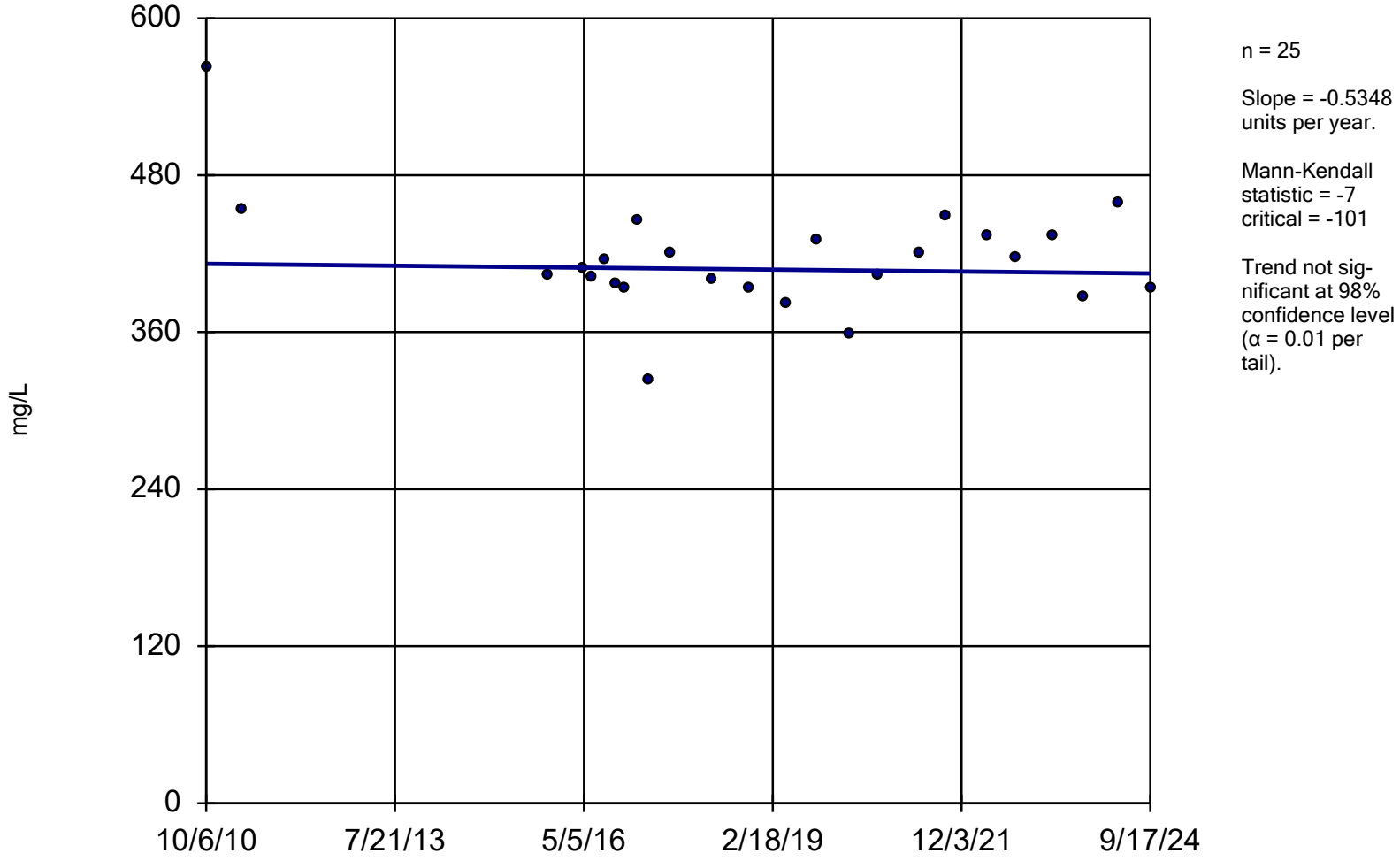
Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: Calcium Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-04



n = 25

Slope = -0.5348 units per year.

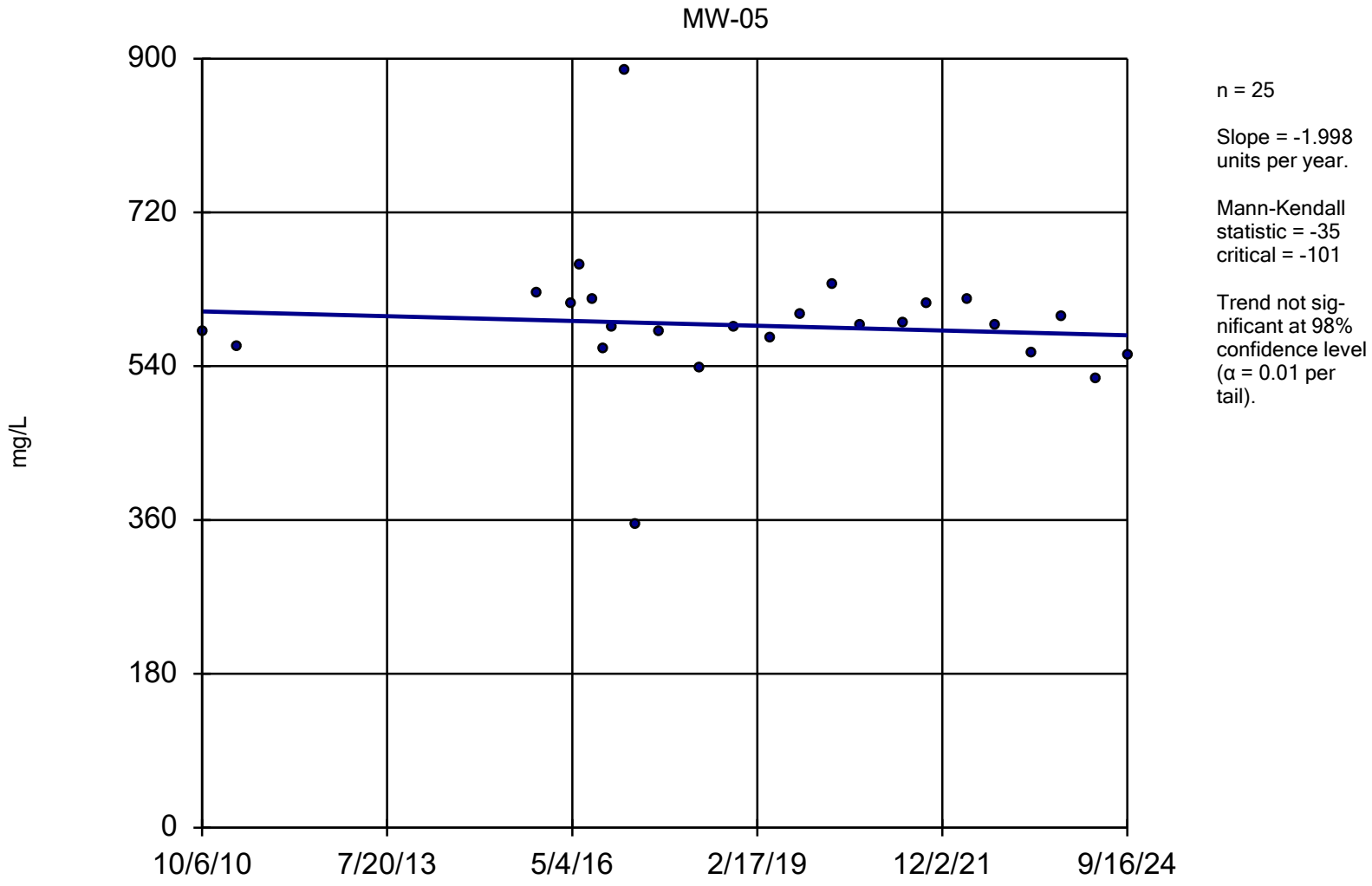
Mann-Kendall statistic = -7
critical = -101

Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: Calcium Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

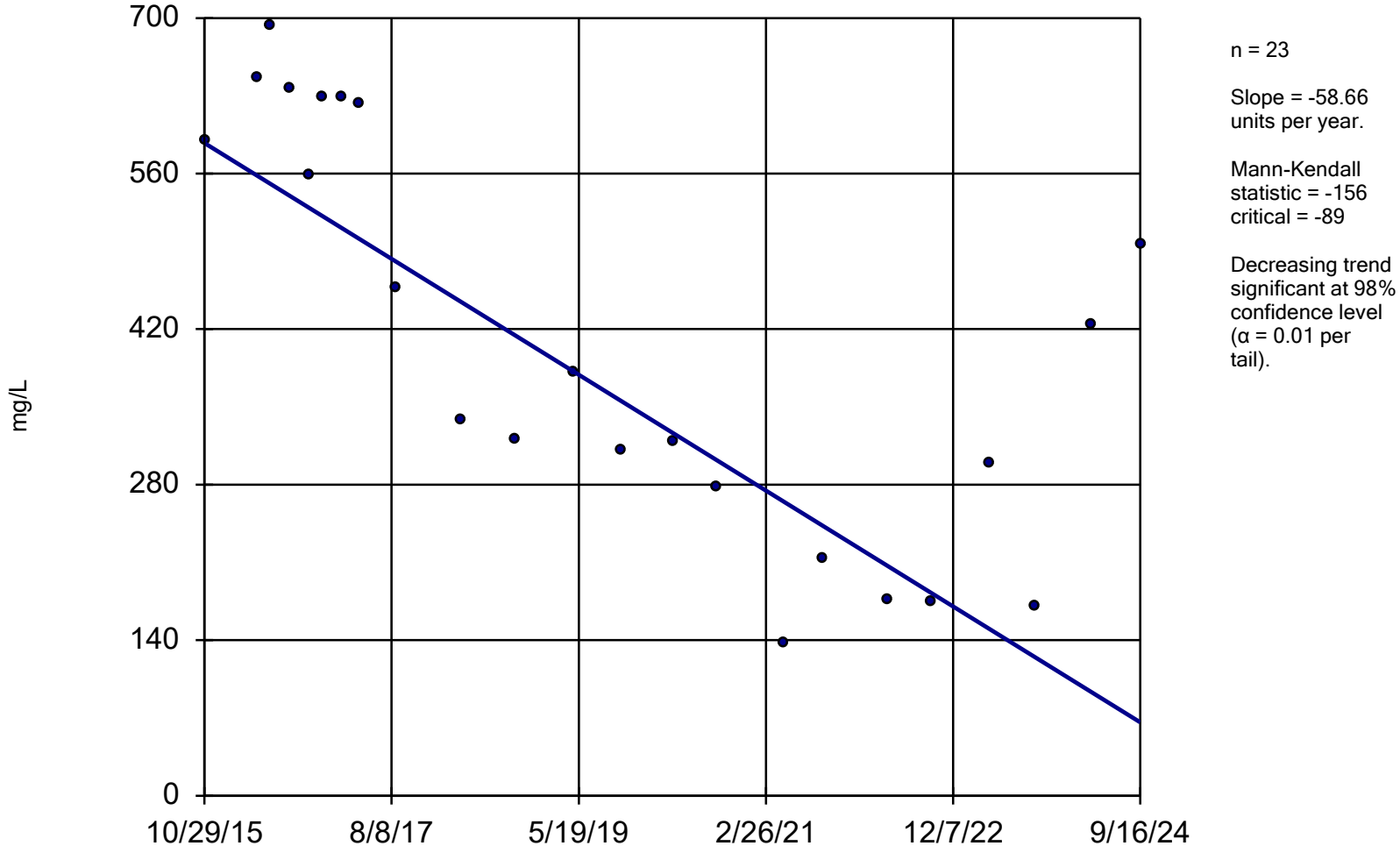


Constituent: Calcium Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-05



n = 23

Slope = -58.66 units per year.

Mann-Kendall statistic = -156
critical = -89

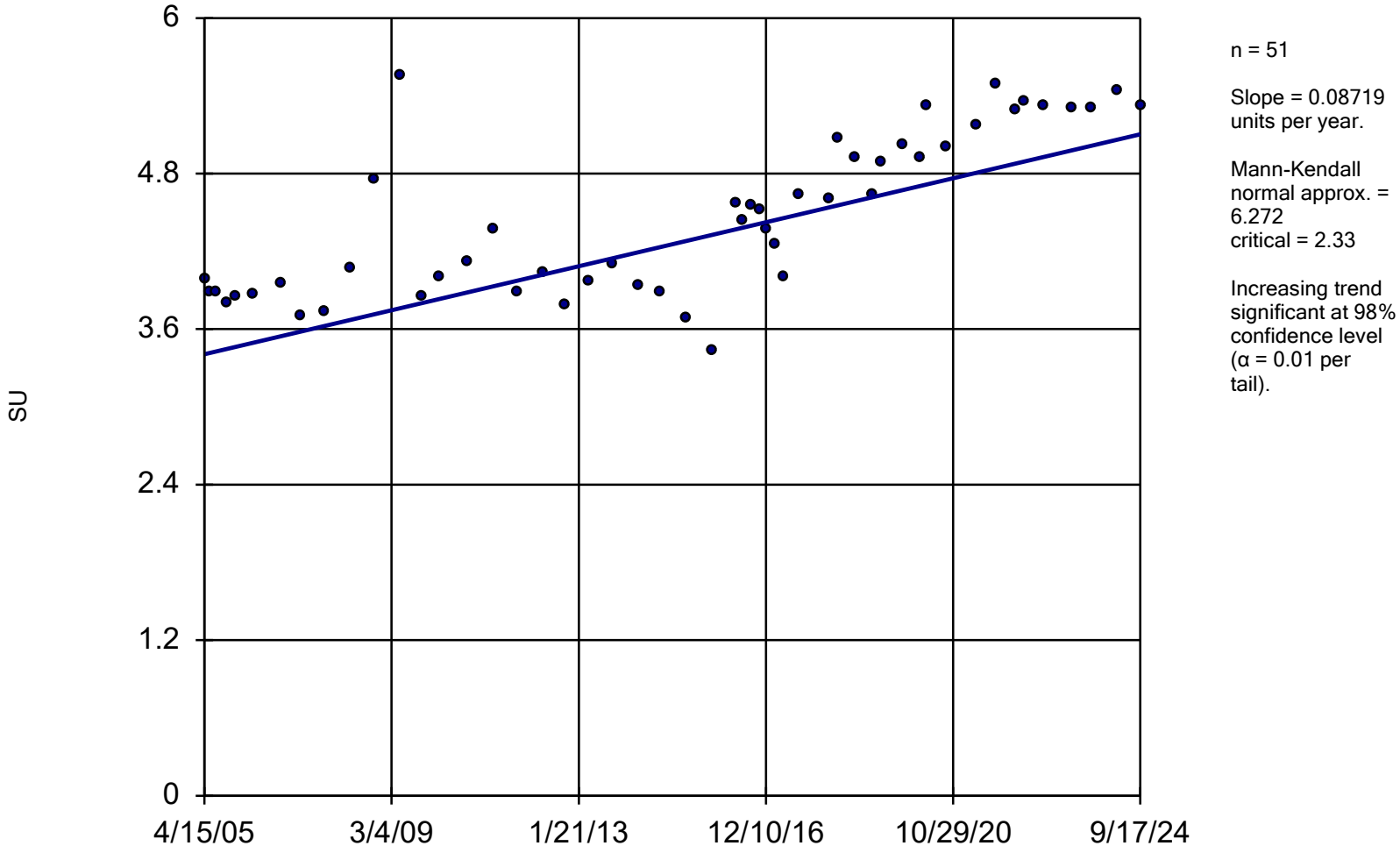
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Chloride Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-03



n = 51

Slope = 0.08719 units per year.

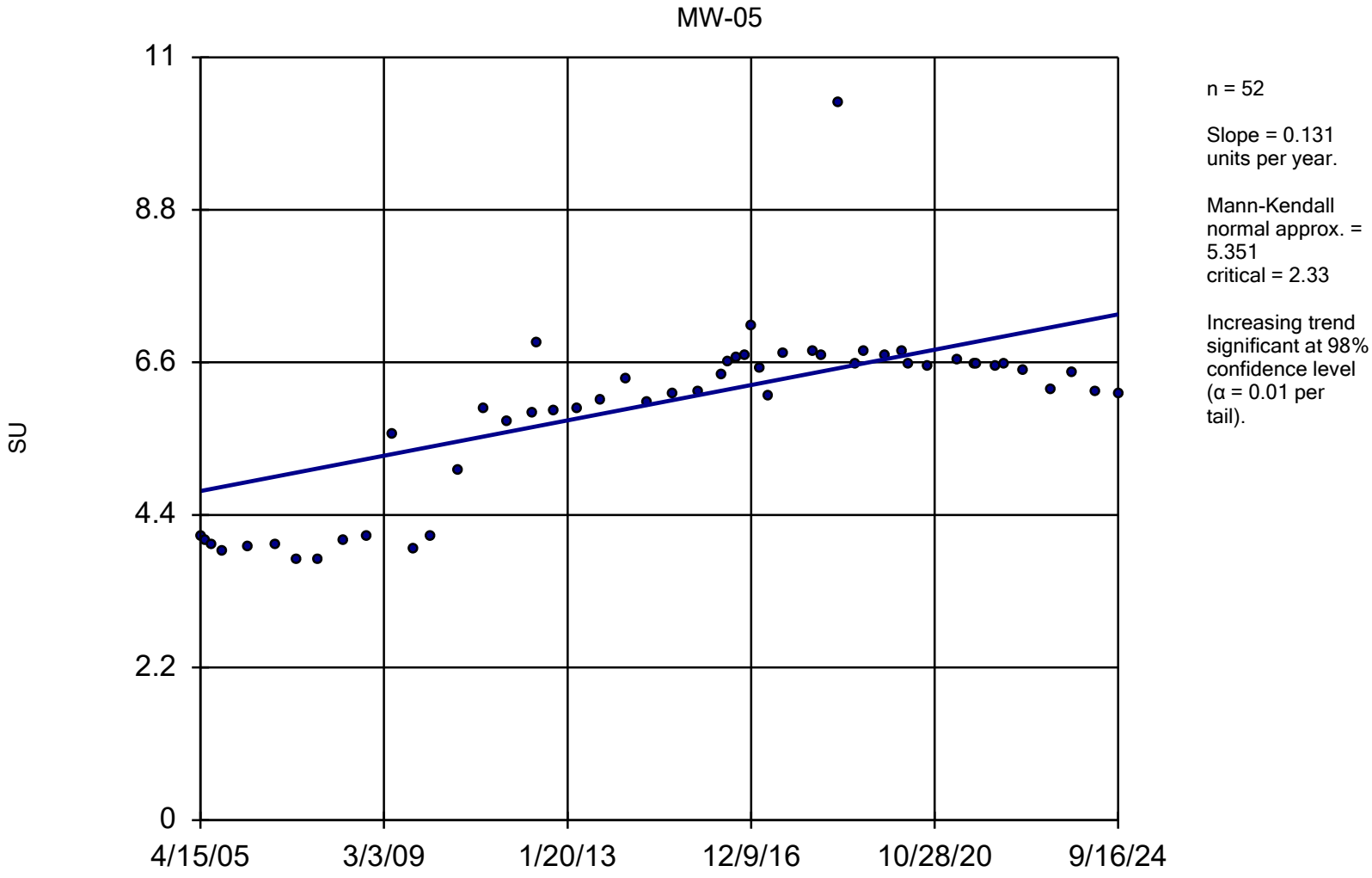
Mann-Kendall normal approx. = 6.272
critical = 2.33

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: pH Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

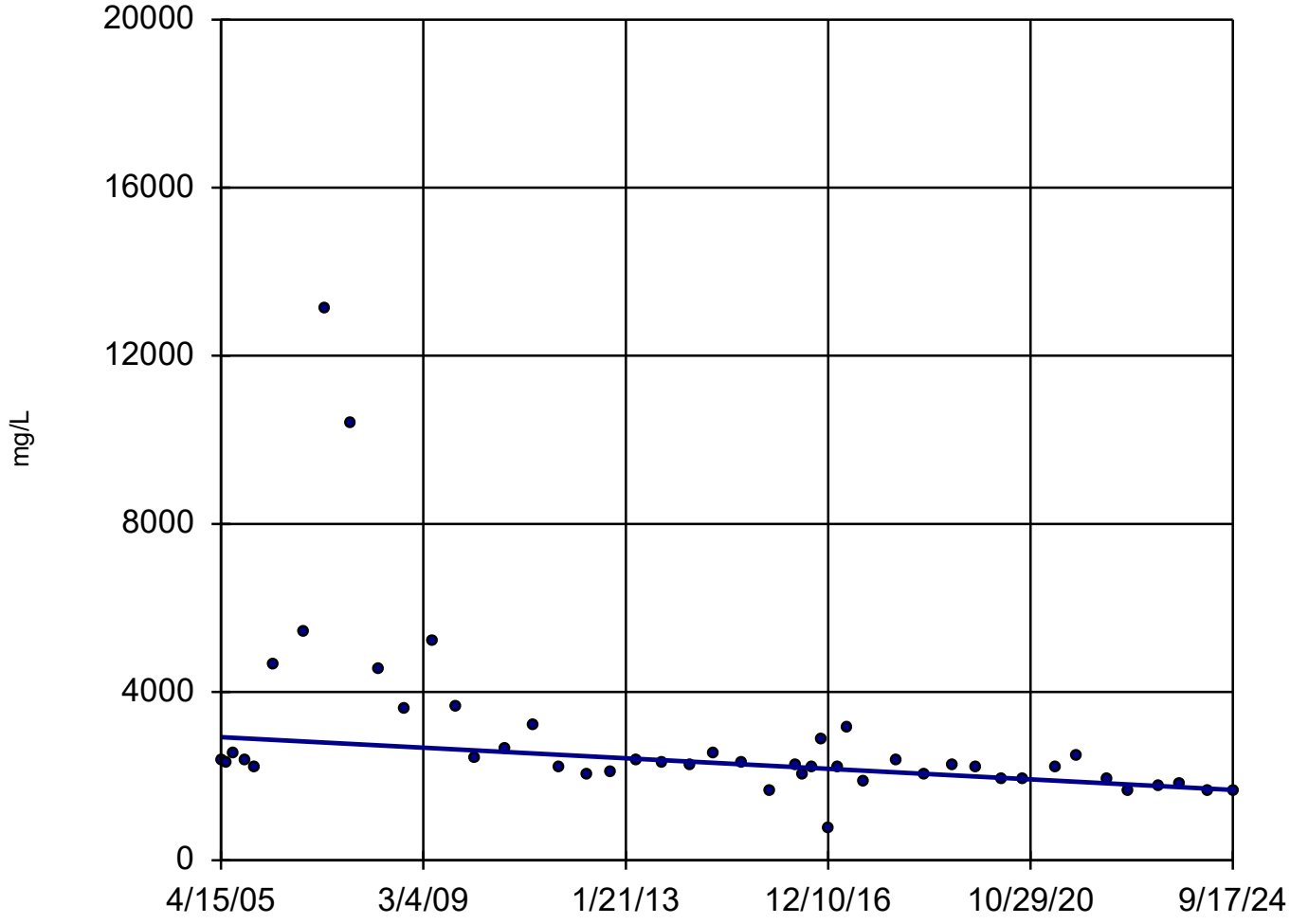


Constituent: pH Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-03



n = 47

Slope = -64.42 units per year.

Mann-Kendall normal approx. = -5.137
critical = -2.33

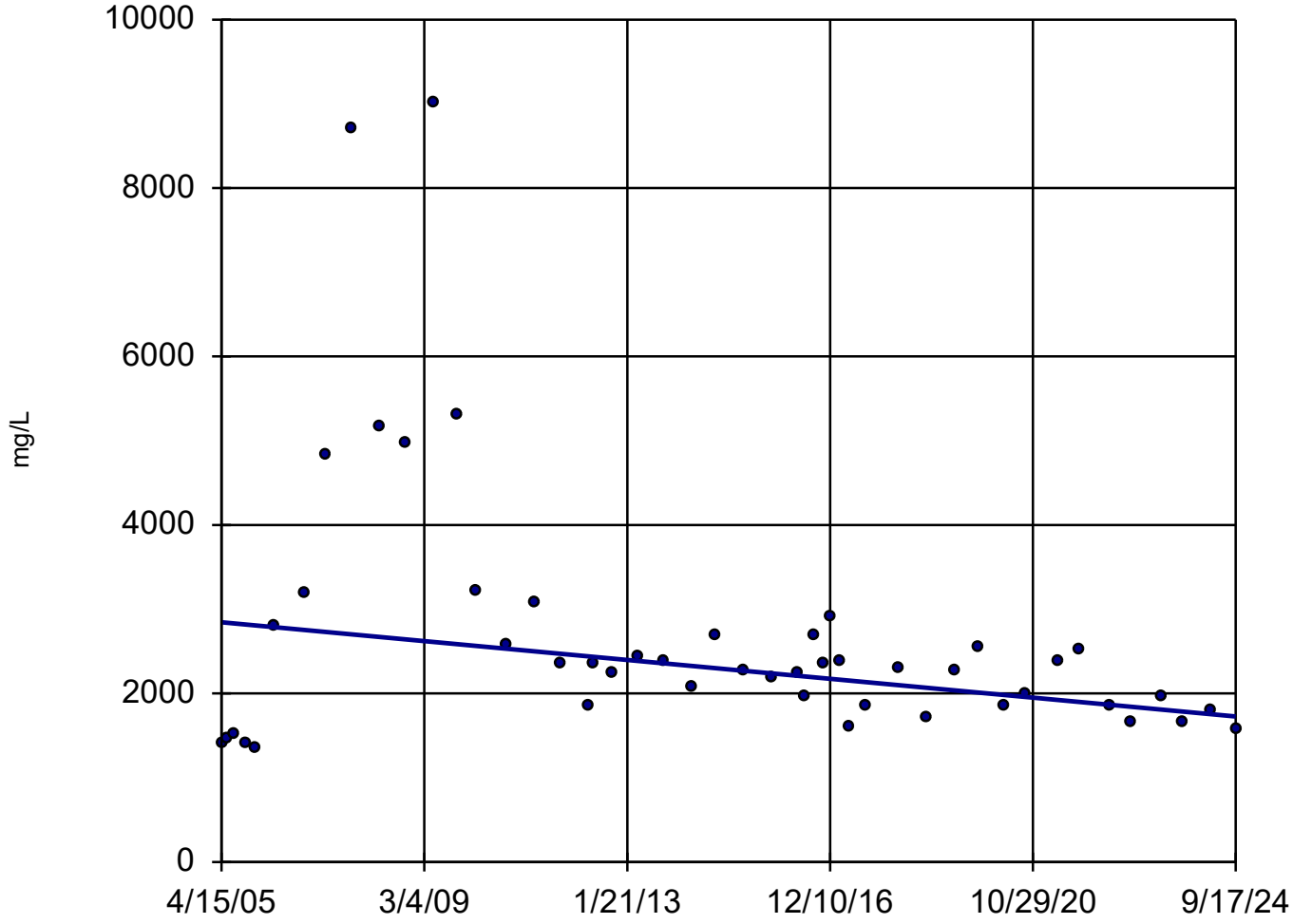
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Sulfate Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-04



n = 48

Slope = -57.53 units per year.

Mann-Kendall normal approx. = -2.48
critical = -2.33

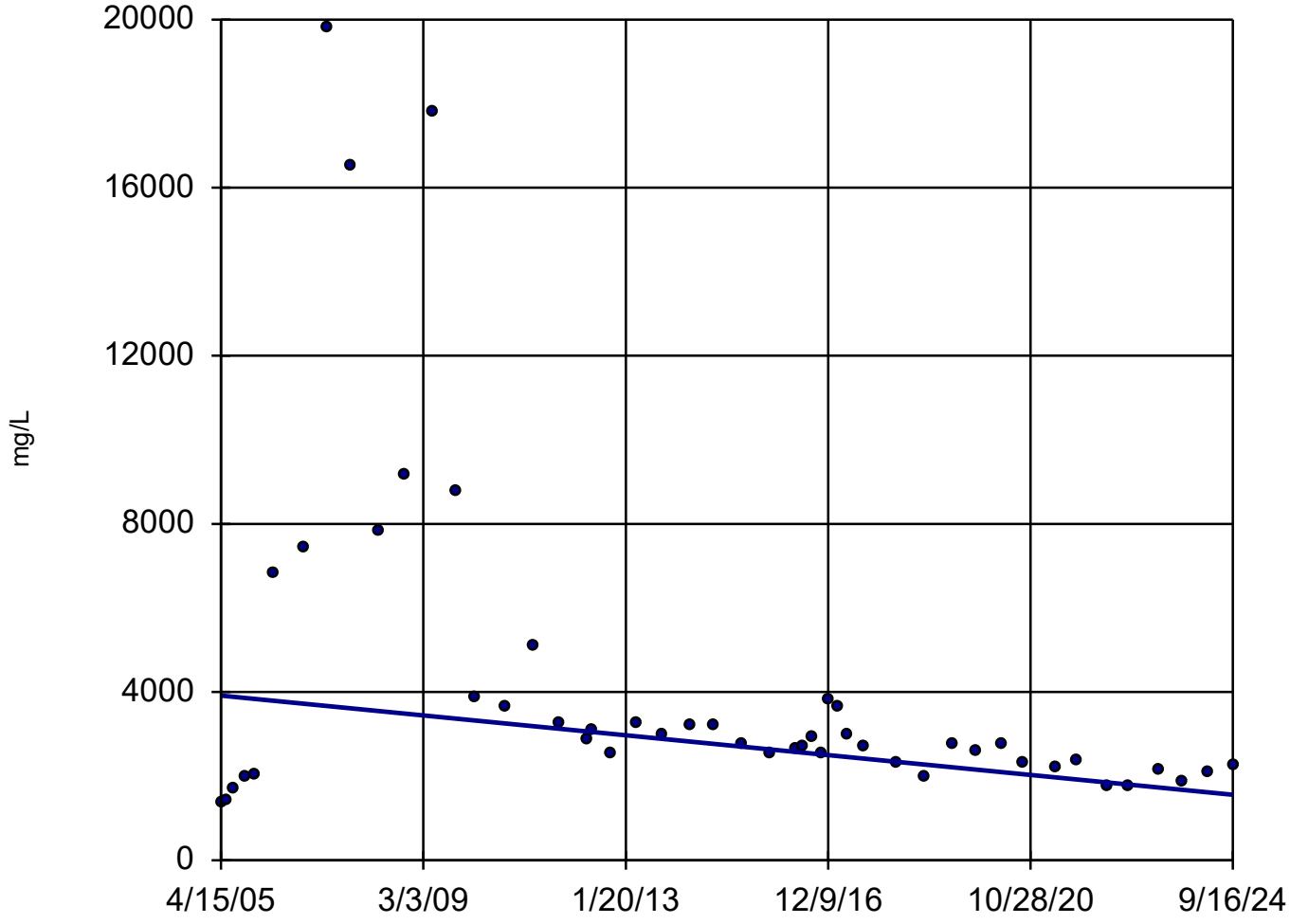
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Sulfate Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-05



n = 48

Slope = -121.4 units per year.

Mann-Kendall normal approx. = -3.653
critical = -2.33

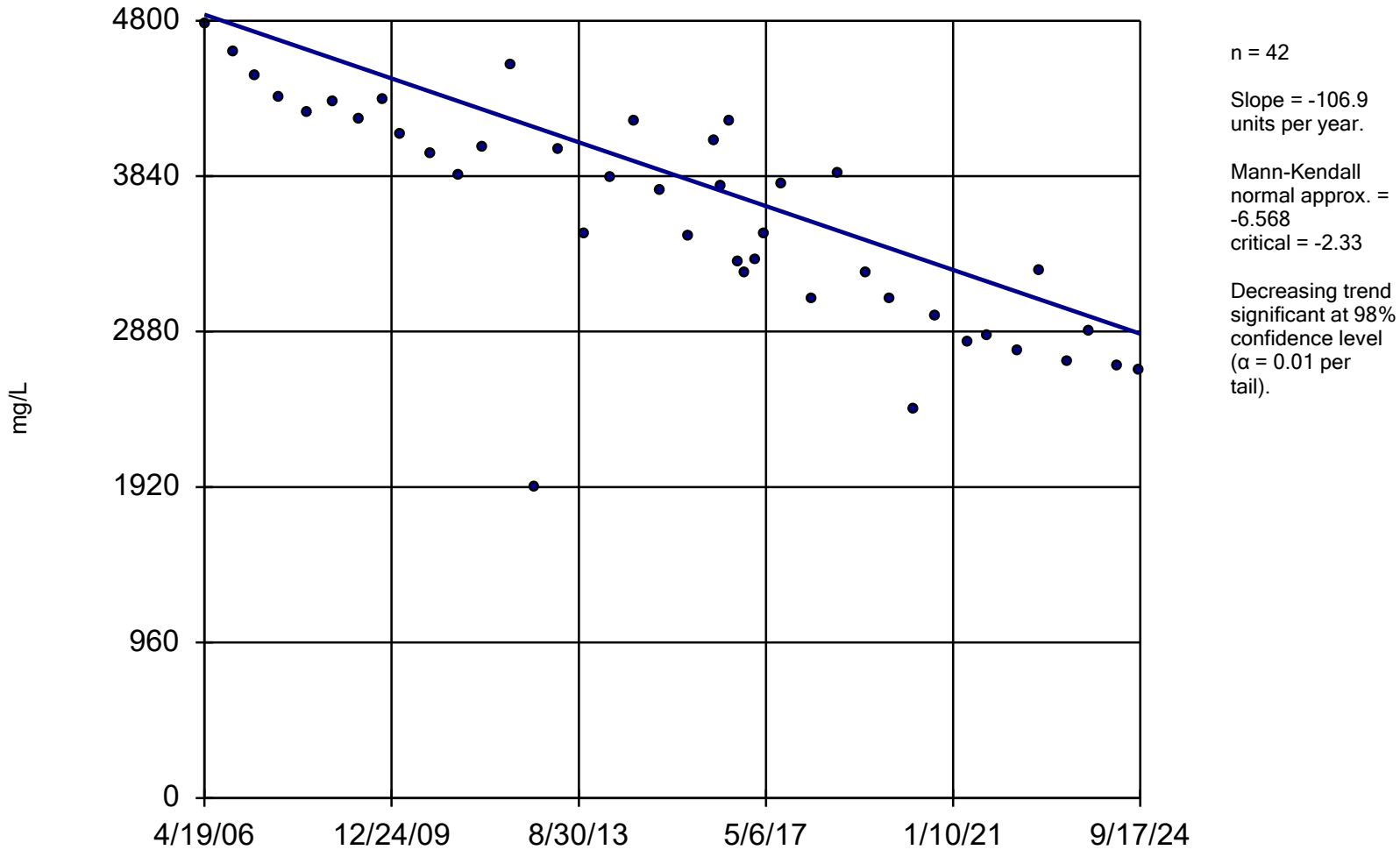
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Sulfate Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

MW-03



n = 42

Slope = -106.9 units per year.

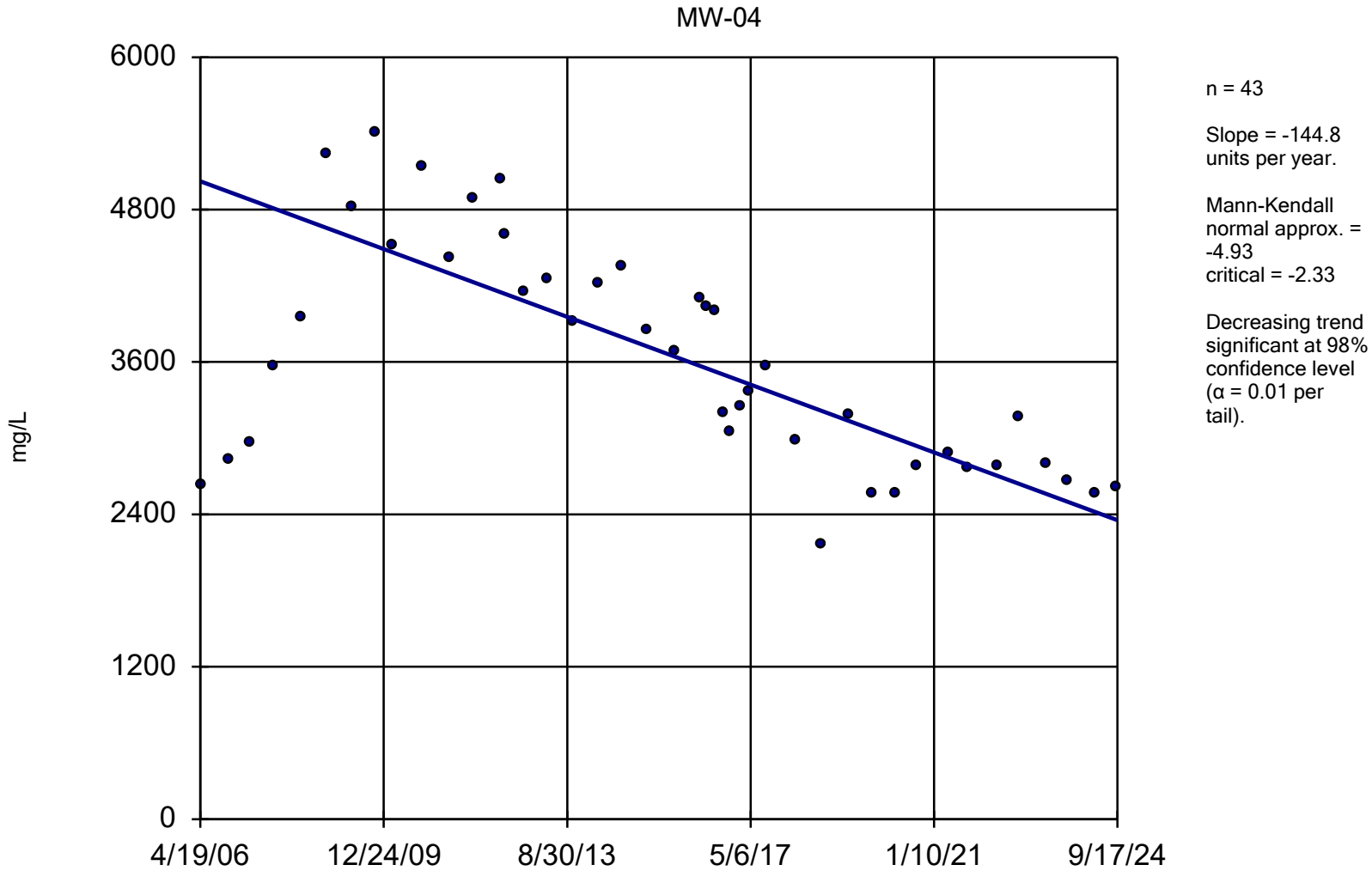
Mann-Kendall normal approx. = -6.568
critical = -2.33

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

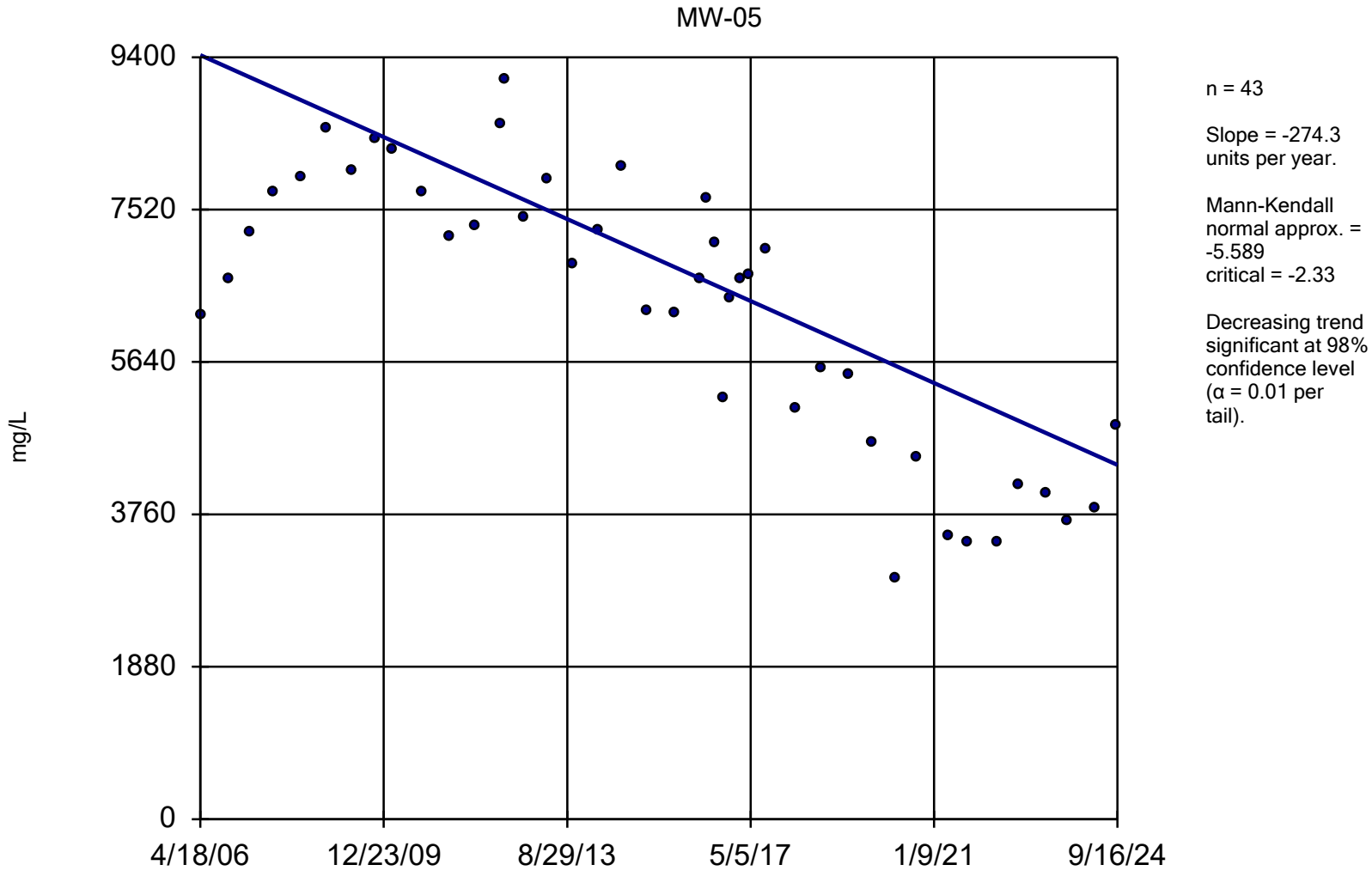
Sen's Slope Estimator



Constituent: Total Dissolved Solids [TDS] Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator

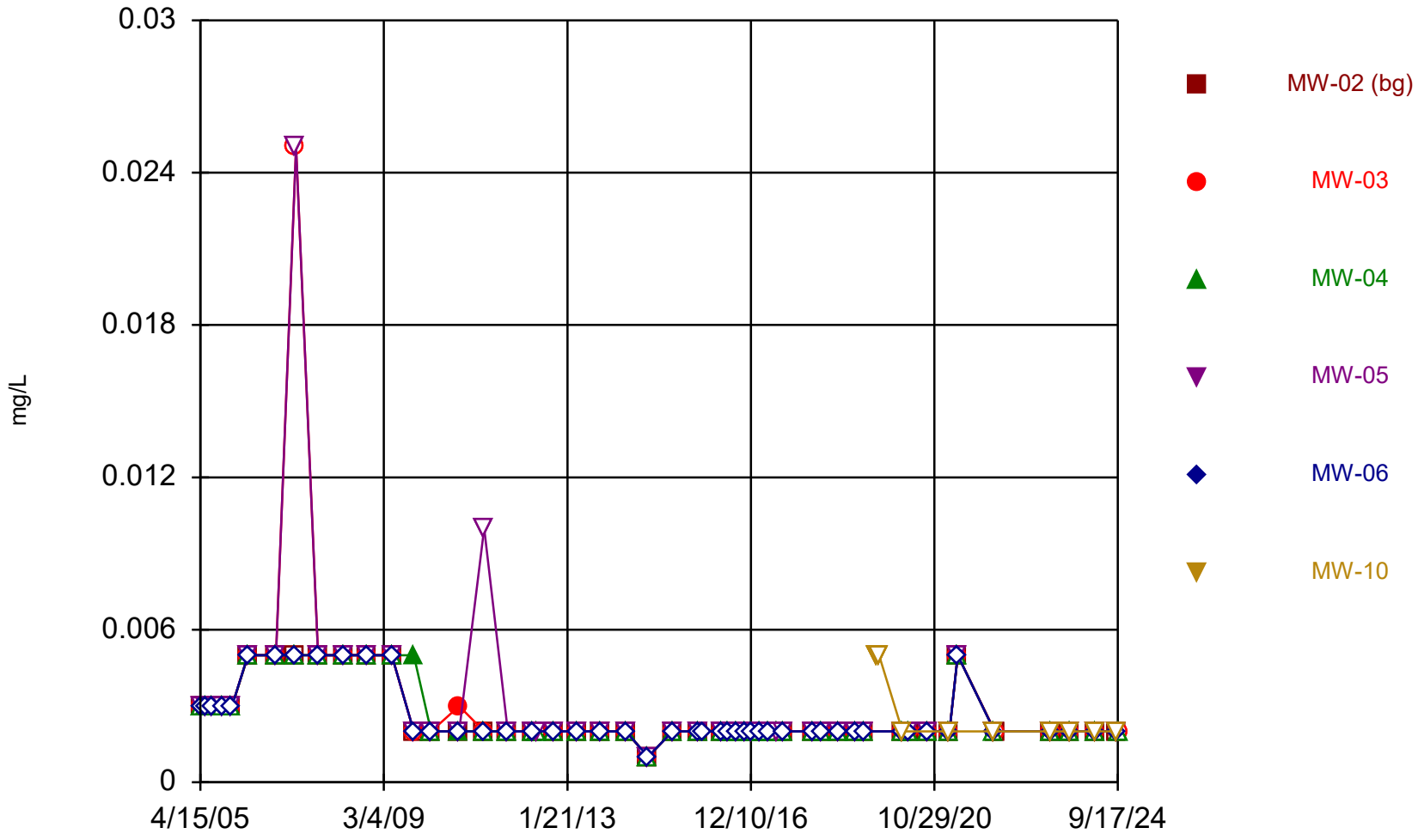


Constituent: Total Dissolved Solids [TDS] Analysis Run 11/4/2024 7:52 AM View: Landfill AppIII

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

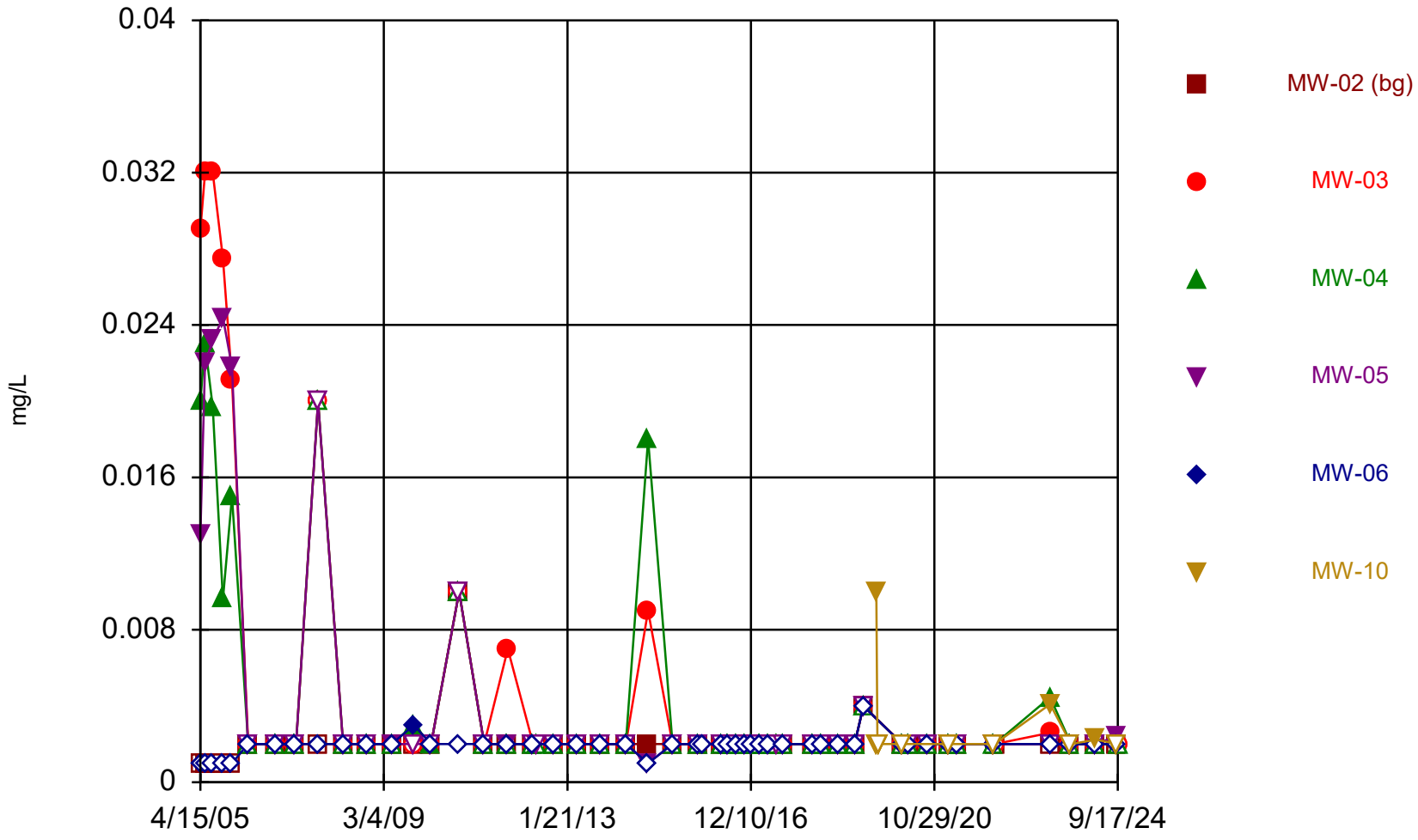


Constituent: Antimony Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

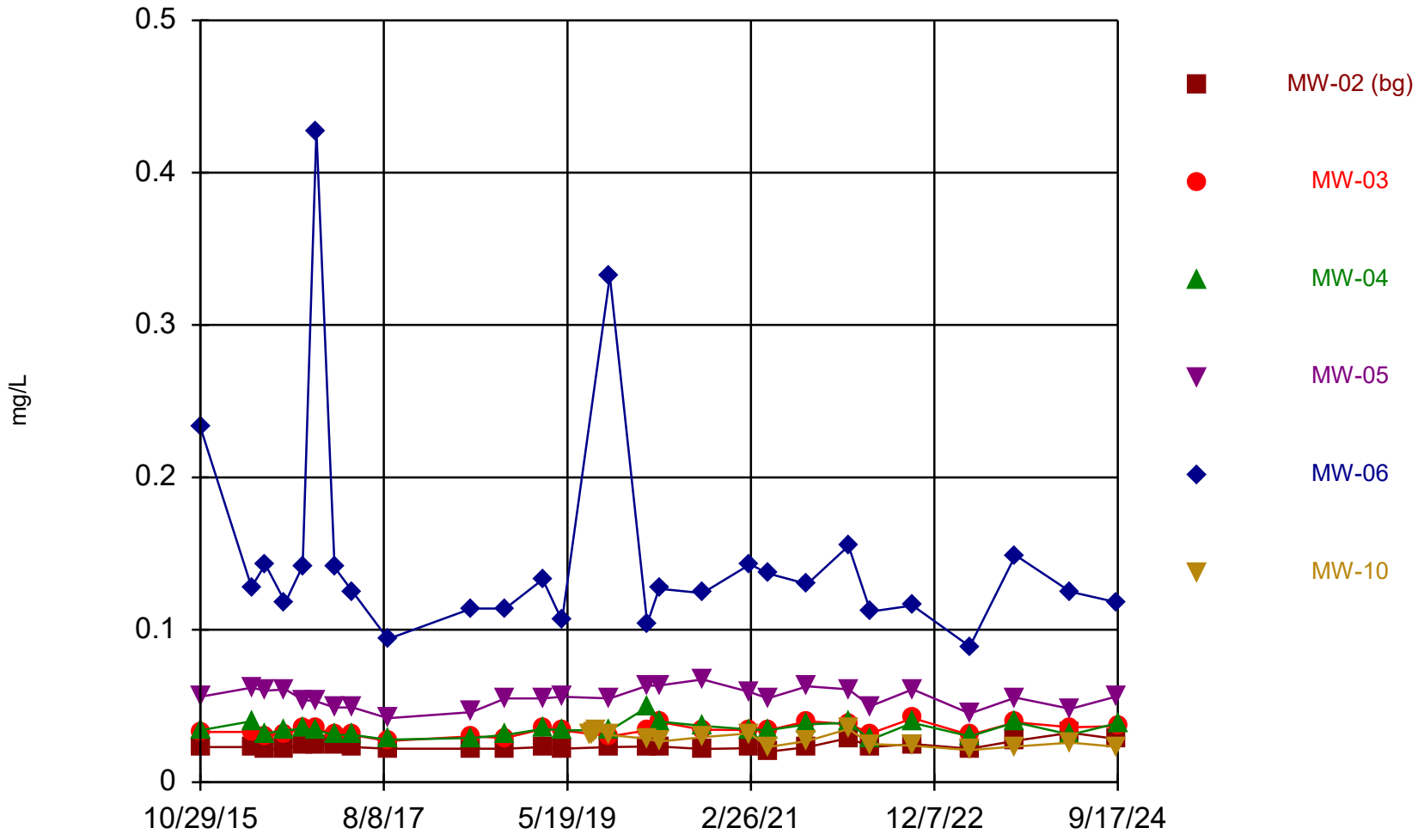
Time Series



Constituent: Arsenic Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Time Series

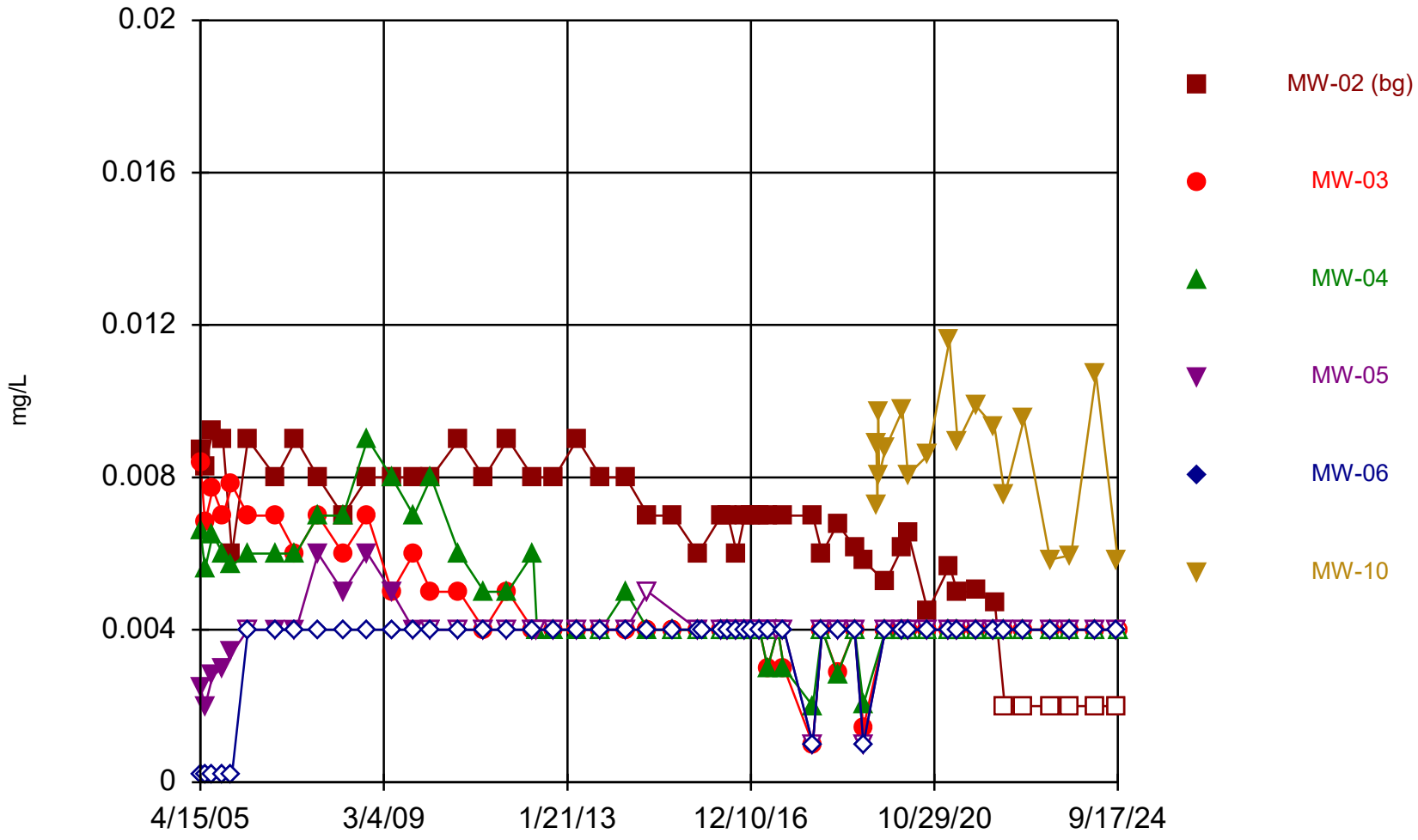


Constituent: Barium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

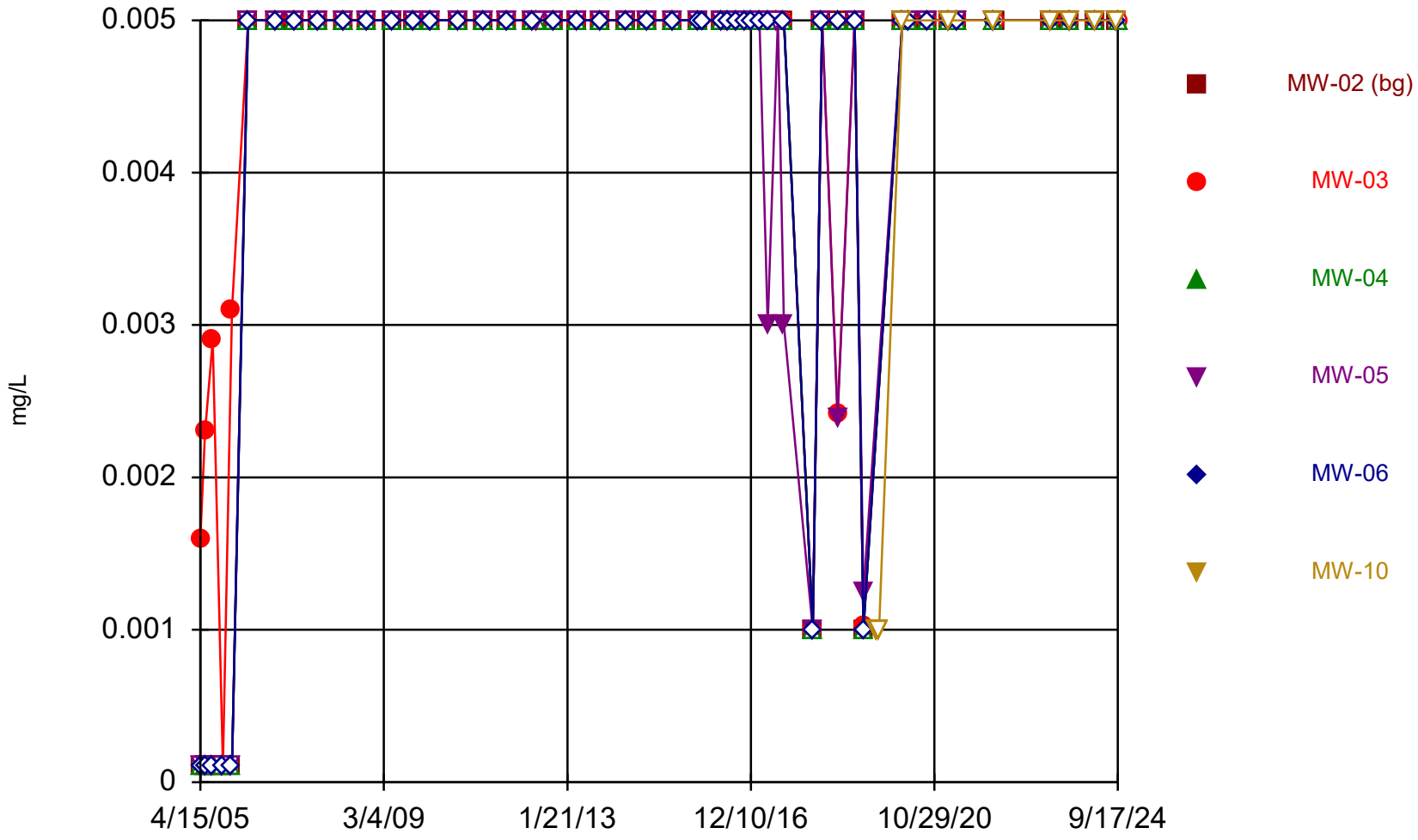


Constituent: Beryllium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

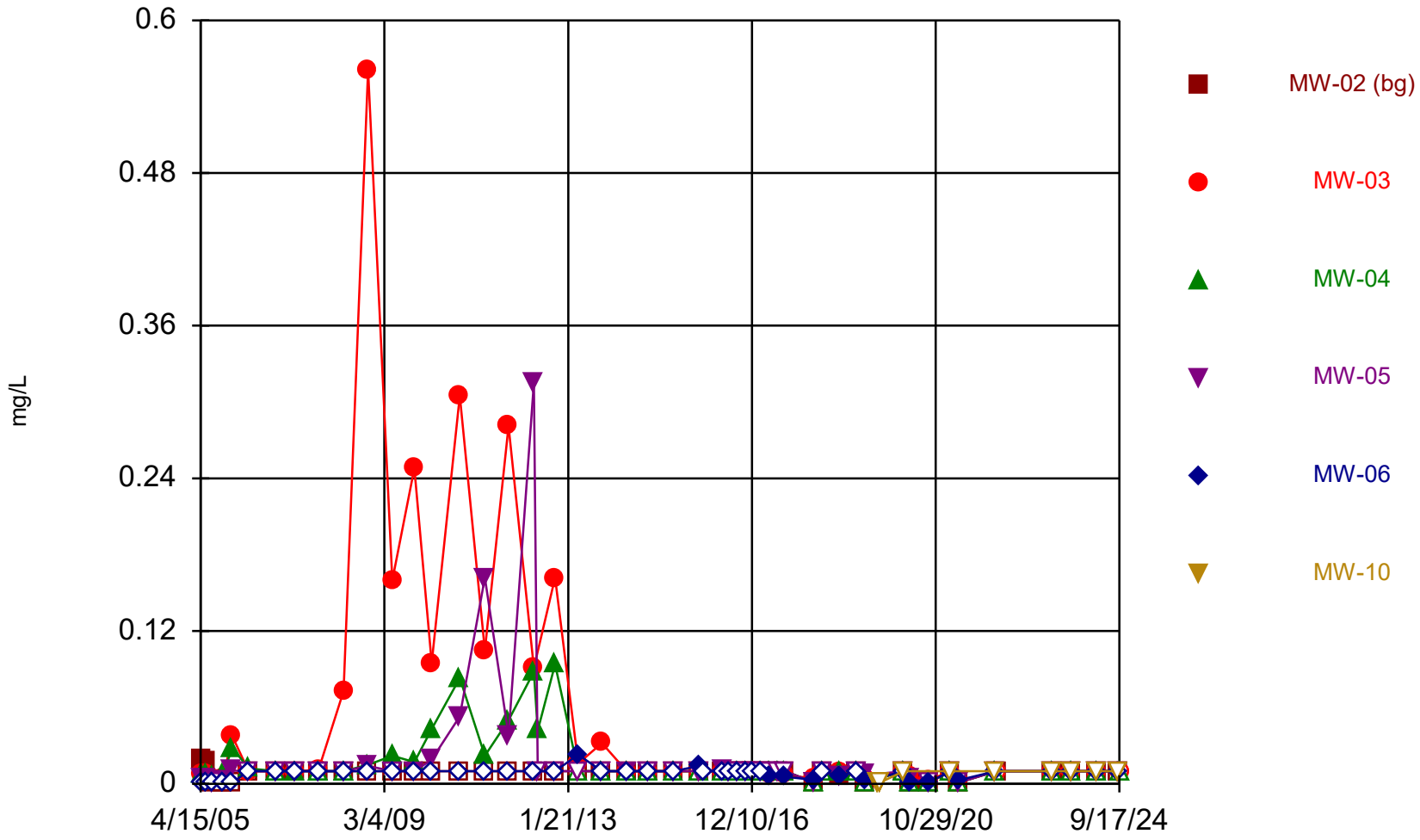


Constituent: Cadmium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

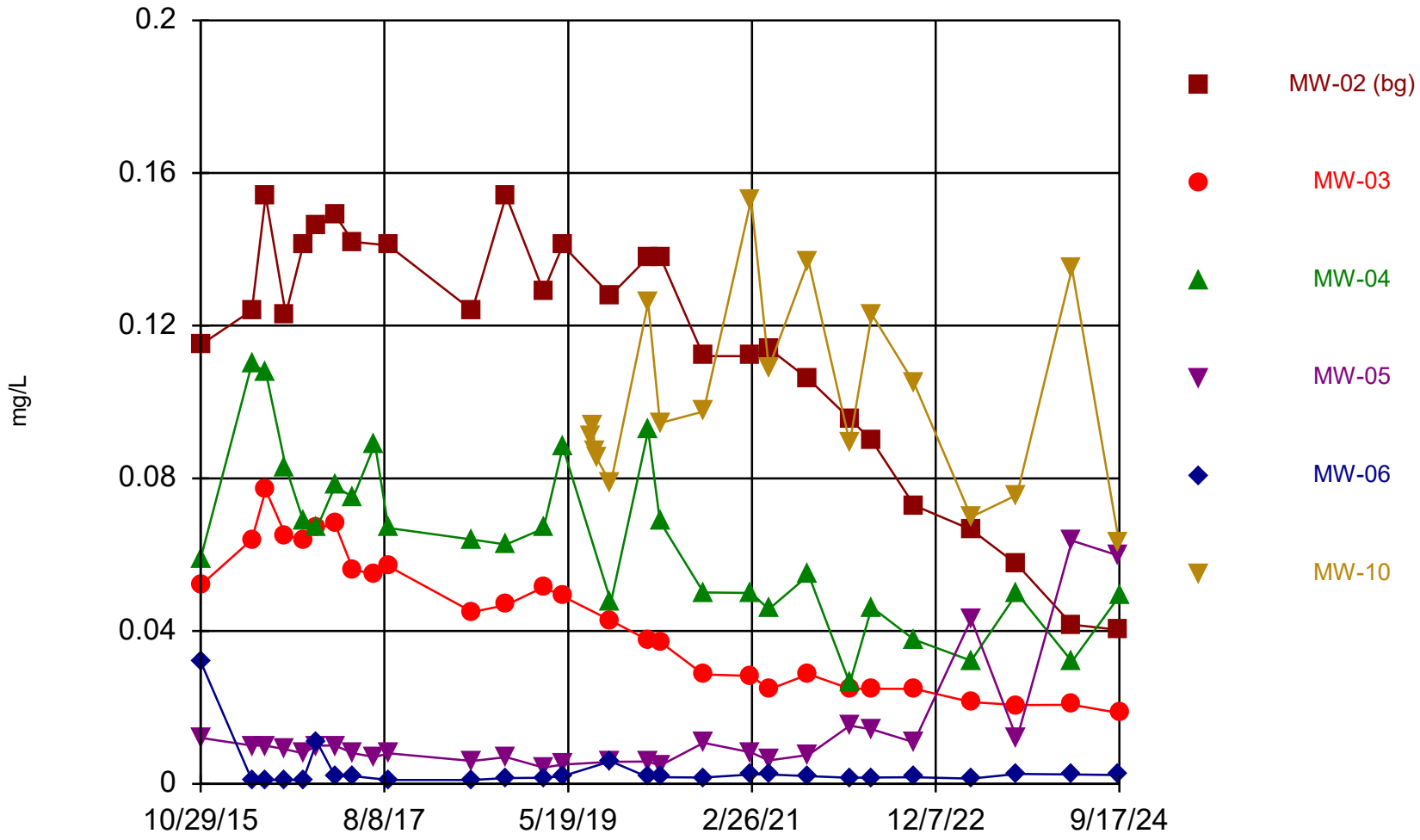
Time Series



Constituent: Chromium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Time Series

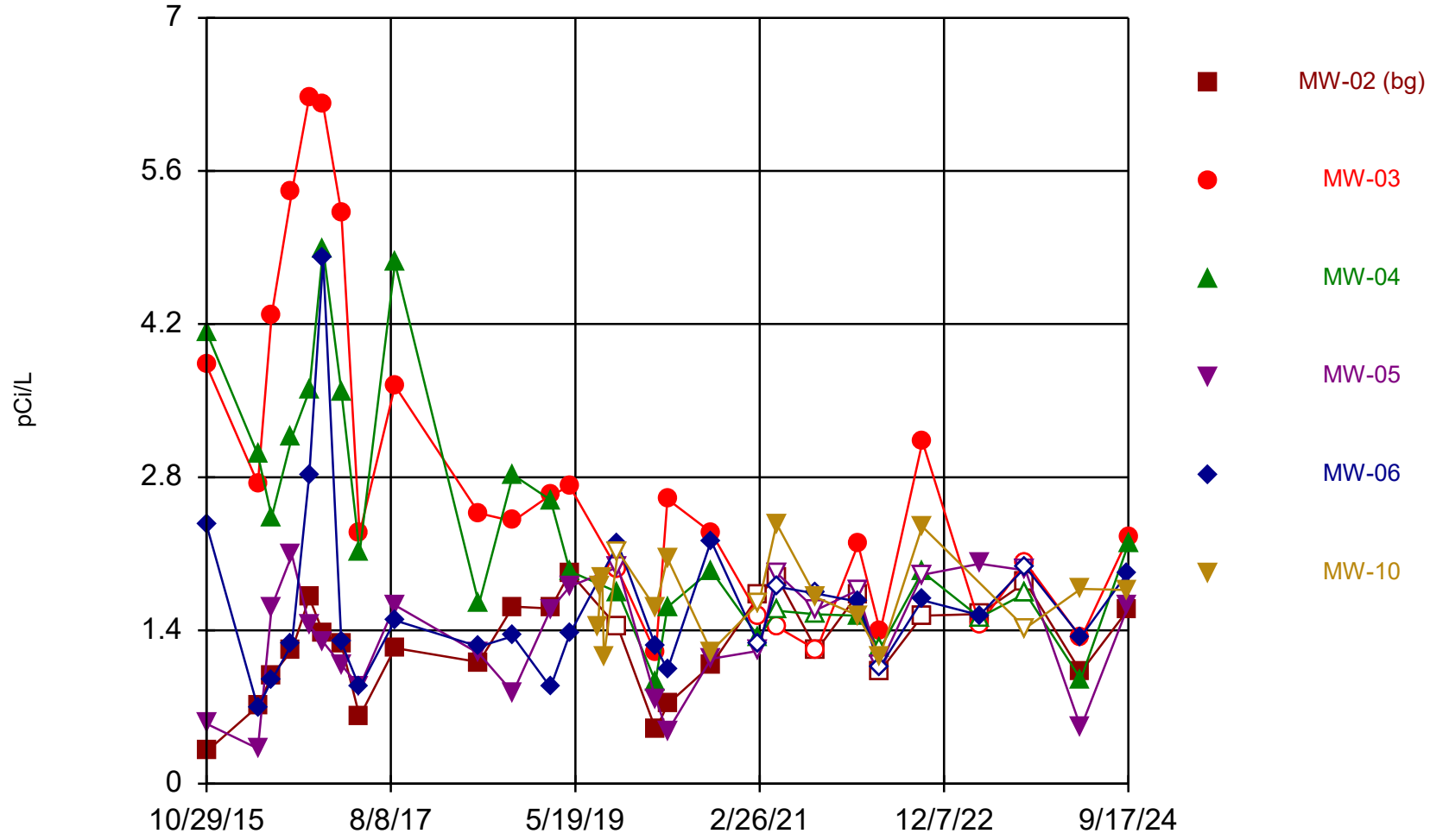


Constituent: Cobalt Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

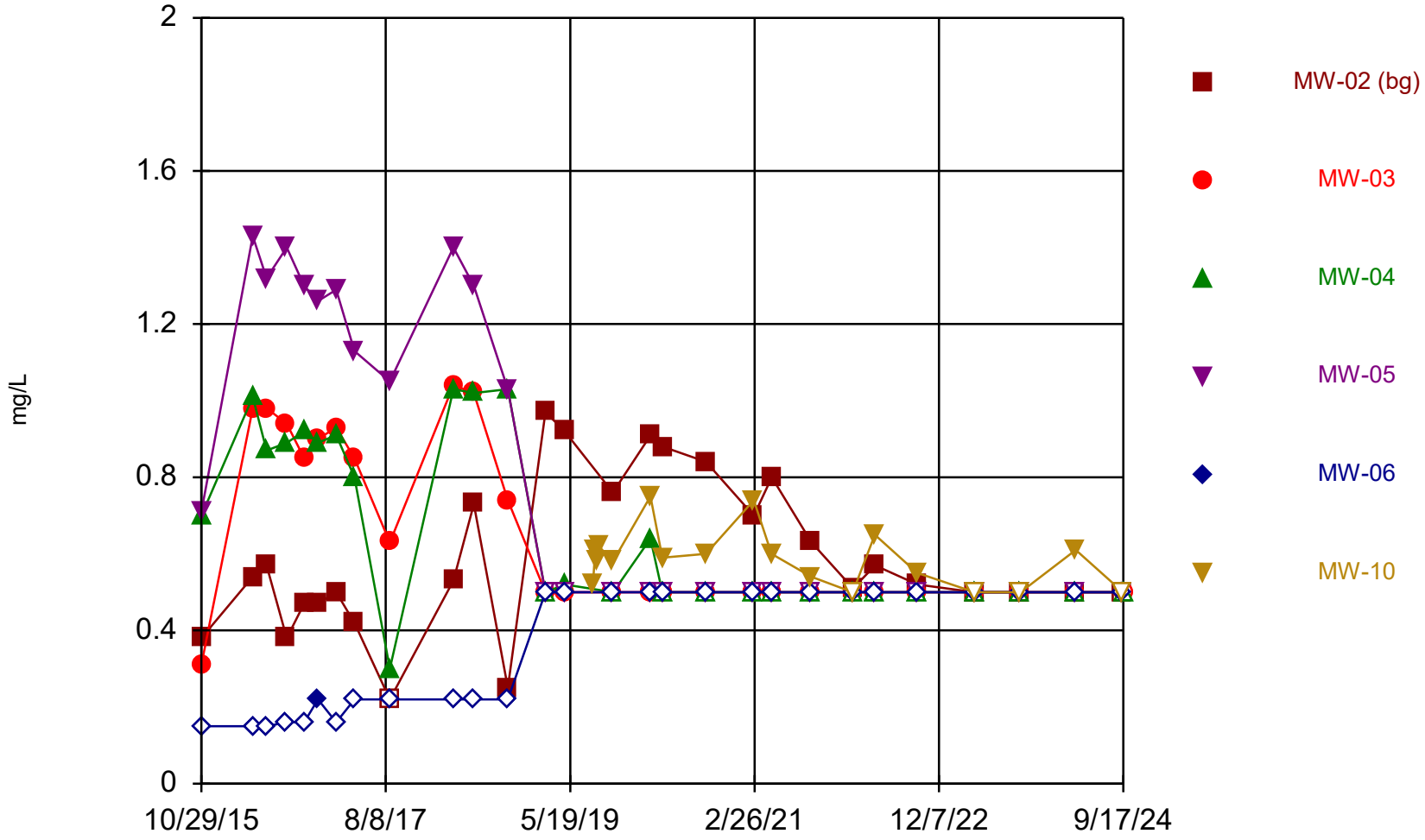


Constituent: Combined Radium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

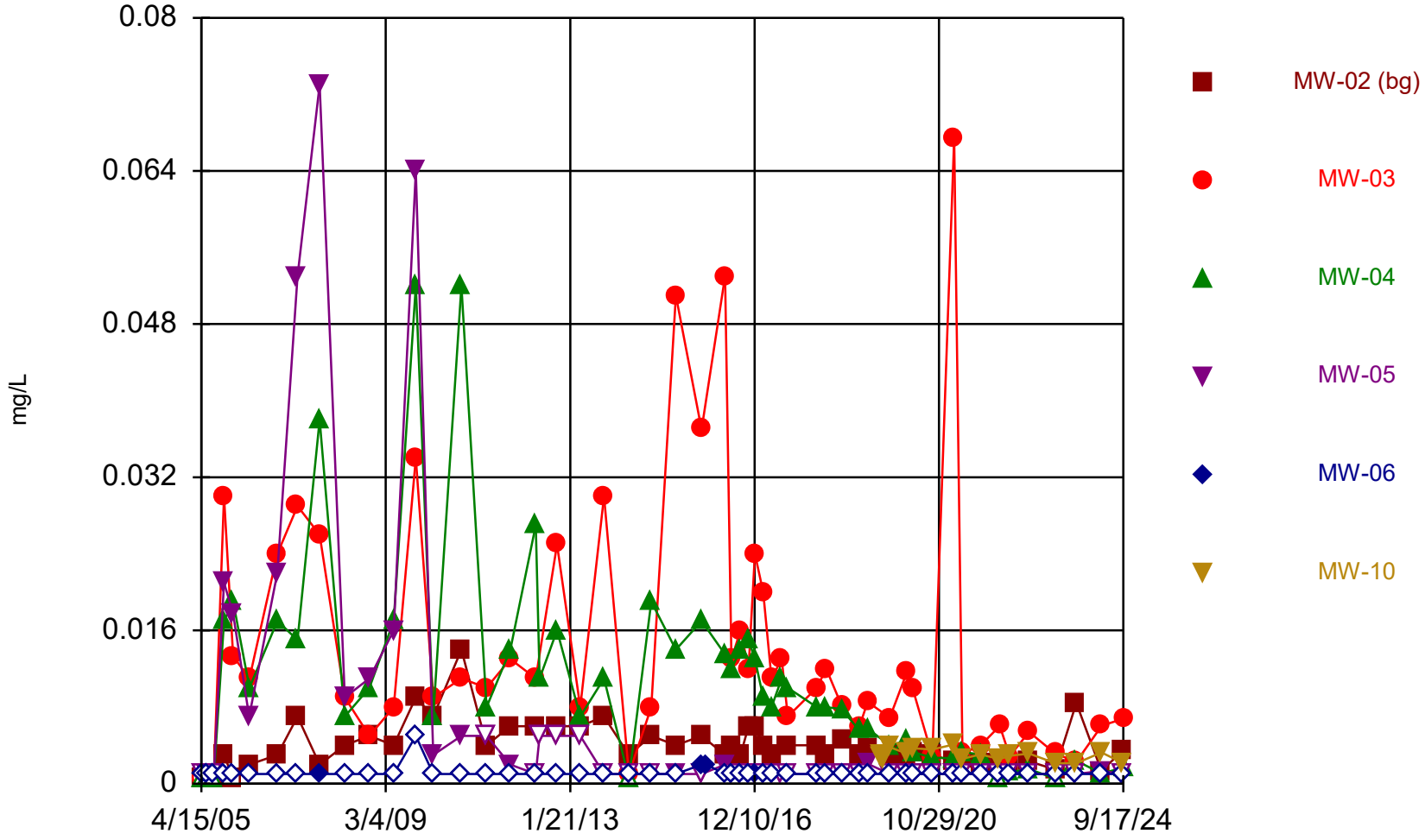


Constituent: Fluoride Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

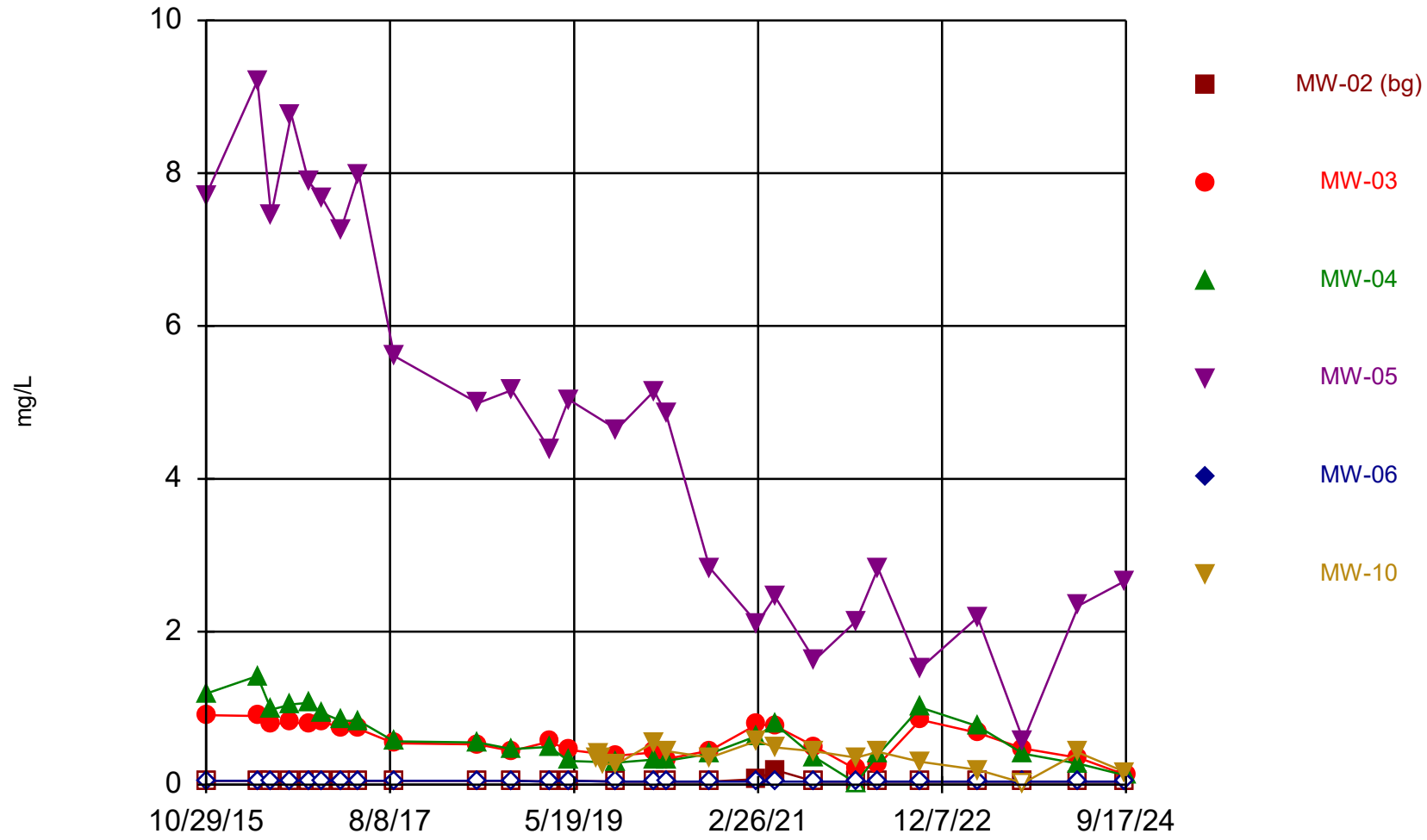


Constituent: Lead Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

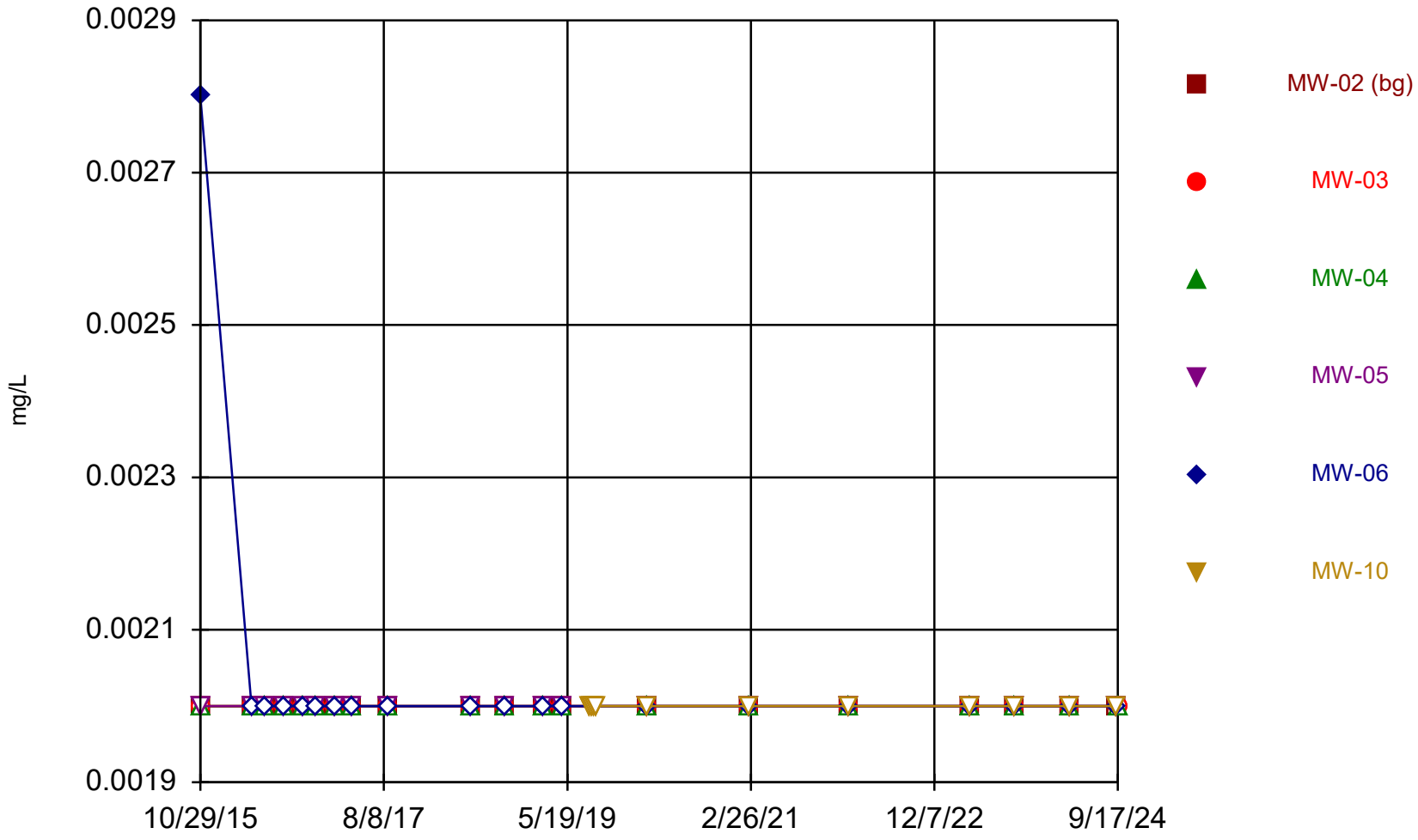


Constituent: Lithium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

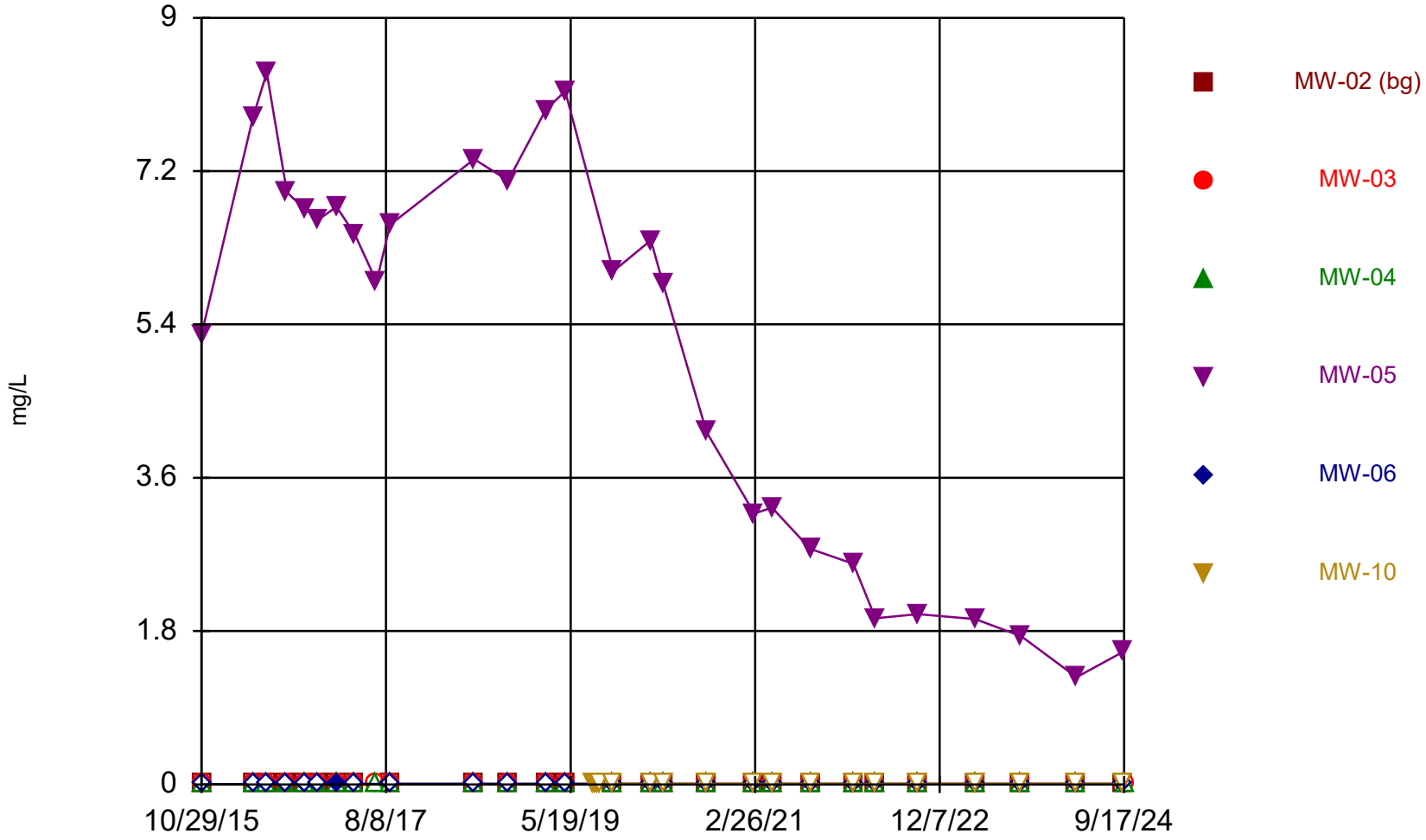


Constituent: Mercury Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

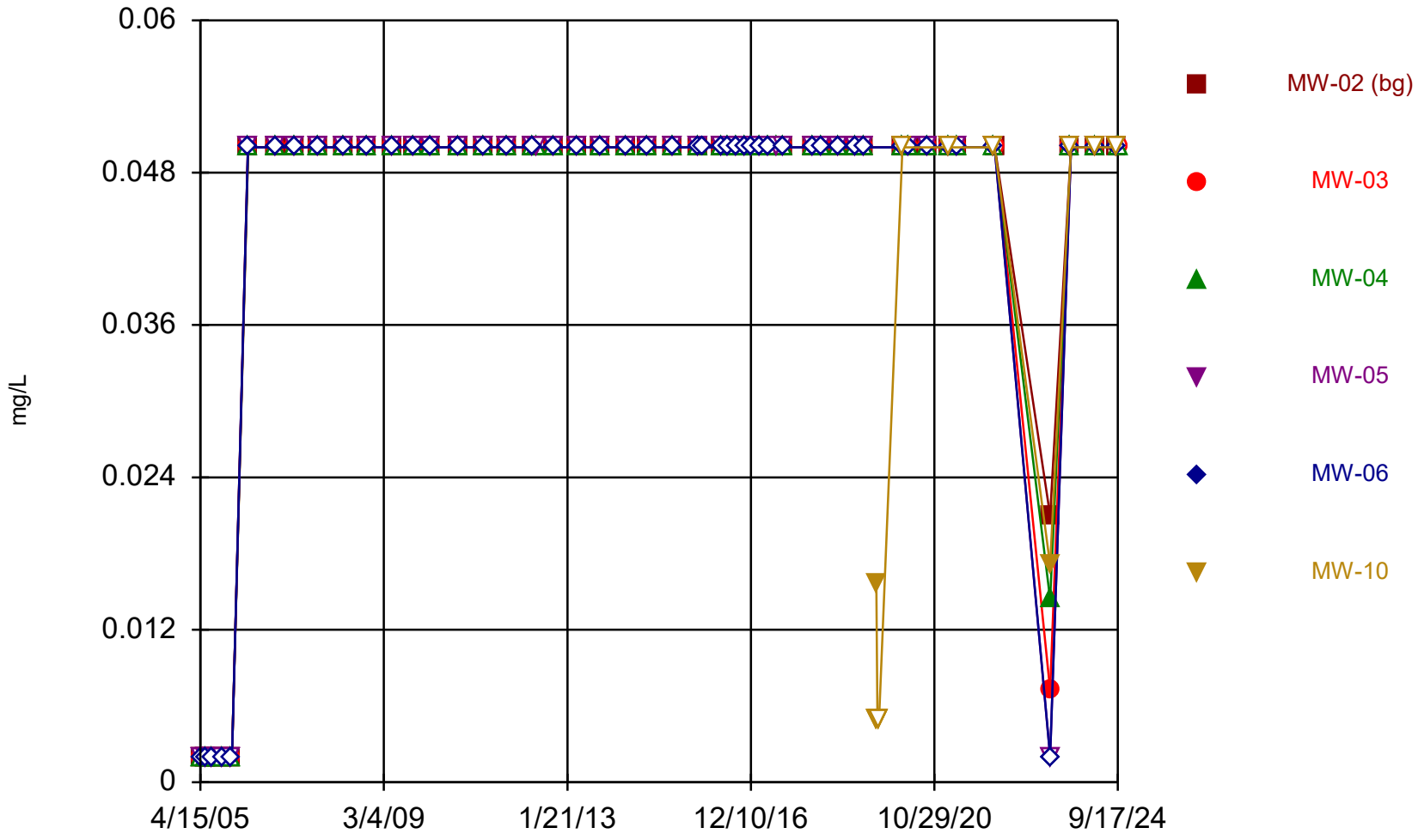


Constituent: Molybdenum Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series

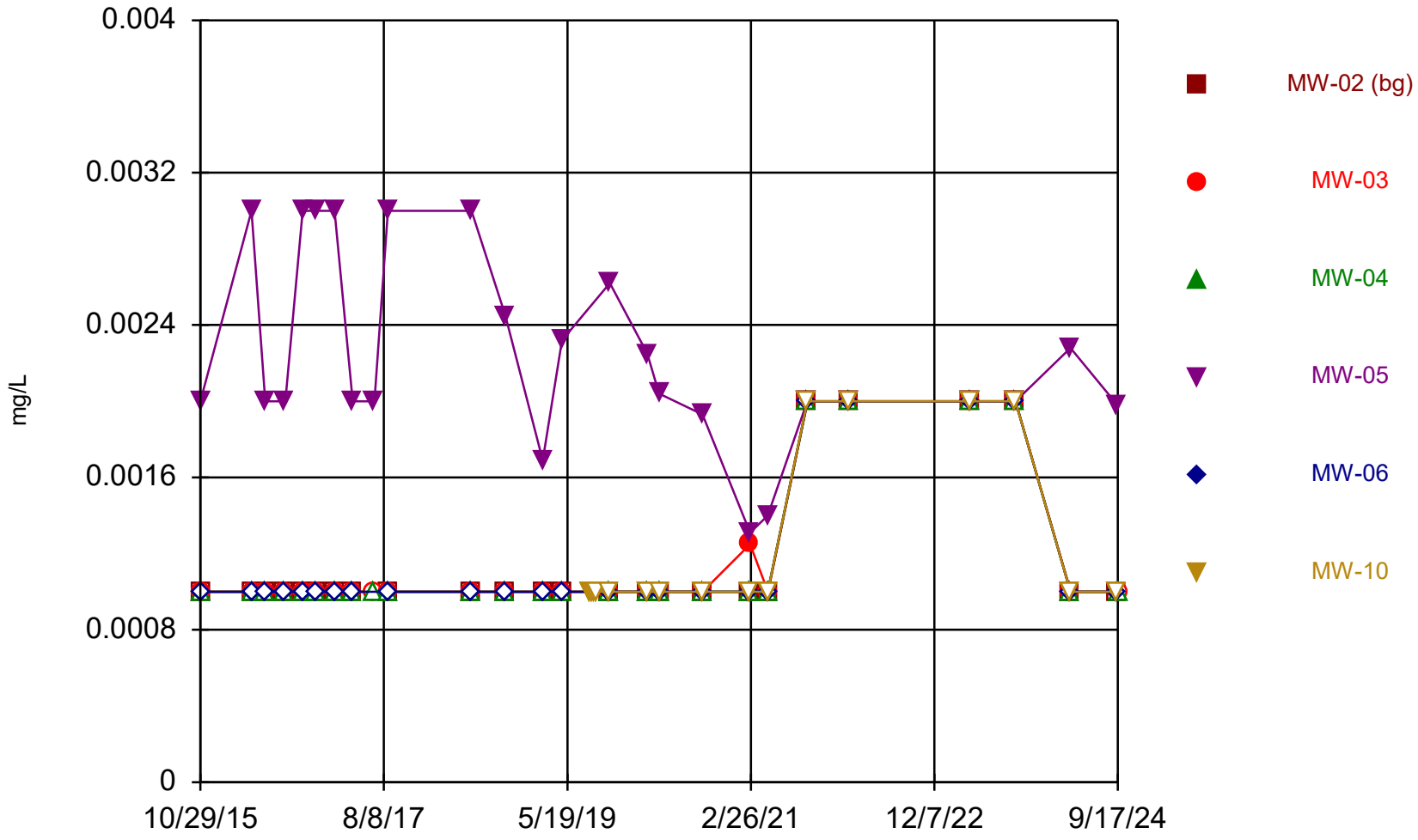


Constituent: Selenium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sanitas™ v.10.0.23 For the statistical analyses of ground water by Golder Associates only. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium Analysis Run 11/4/2024 8:19 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Tolerance Limit

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen Printed 11/4/2024, 8:22 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.002	n/a	n/a	n/a	48	100	n/a	0.08526	NP Inter(NDs)
Arsenic (mg/L)	n/a	0.01	n/a	n/a	n/a	48	97.92	n/a	0.08526	NP Inter(NDs)
Barium (mg/L)	n/a	0.0325	n/a	n/a	n/a	27	0	n/a	0.2503	NP Inter(normal...
Beryllium (mg/L)	n/a	0.009772	n/a	n/a	n/a	52	11.54	x^2	0.05	Inter
Cadmium (mg/L)	n/a	0.005	n/a	n/a	n/a	48	100	n/a	0.08526	NP Inter(NDs)
Chromium (mg/L)	n/a	0.02	n/a	n/a	n/a	48	91.67	n/a	0.08526	NP Inter(NDs)
Cobalt (mg/L)	n/a	0.1716	n/a	n/a	n/a	27	0	x^2	0.05	Inter
Combined Radium (pCi/L)	n/a	2.043	n/a	n/a	n/a	27	33.33	No	0.05	Inter
Fluoride (mg/L)	n/a	1.068	n/a	n/a	n/a	28	17.86	No	0.05	Inter
Lead (mg/L)	n/a	0.009754	n/a	n/a	n/a	52	7.692	sqrt(x)	0.05	Inter
Lithium (mg/L)	n/a	0.189	n/a	n/a	n/a	27	92.59	n/a	0.2503	NP Inter(NDs)
Mercury (mg/L)	n/a	0.002	n/a	n/a	n/a	20	95	n/a	0.3585	NP Inter(NDs)
Molybdenum (mg/L)	n/a	0.005	n/a	n/a	n/a	27	100	n/a	0.2503	NP Inter(NDs)
Selenium (mg/L)	n/a	0.05	n/a	n/a	n/a	48	97.92	n/a	0.08526	NP Inter(NDs)
Thallium (mg/L)	n/a	0.001	n/a	n/a	n/a	25	100	n/a	0.2774	NP Inter(NDs)

Confidence Interval

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen Printed 11/4/2024, 9:07 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Lithium (mg/L)	MW-05	5.924	3.49	1.42	Yes	27	0	No	0.01	Param.
Molybdenum (mg/L)	MW-05	6.78	2.76	0.1	Yes	29	0	No	0.01	NP (normality)

Confidence Interval

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen Printed 11/4/2024, 9:07 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (mg/L)	MW-02 (bg)	0.002	0.002	0.01	No	48	97.92	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-03	0.0026	0.002	0.01	No	49	81.63	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-04	0.003	0.002	0.01	No	50	82	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-05	0.00245	0.002	0.01	No	50	82	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-06	0.002	0.002	0.01	No	49	97.96	No	0.01	NP (NDs)
Arsenic (mg/L)	MW-10	0.0041	0.002	0.01	No	11	72.73	No	0.006	NP (normality)
Barium (mg/L)	MW-02 (bg)	0.025	0.022	2	No	27	0	No	0.01	NP (normality)
Barium (mg/L)	MW-03	0.03571	0.03224	2	No	27	0	No	0.01	Param.
Barium (mg/L)	MW-04	0.03702	0.03258	2	No	27	0	No	0.01	Param.
Barium (mg/L)	MW-05	0.05865	0.05258	2	No	27	0	No	0.01	Param.
Barium (mg/L)	MW-06	0.142	0.116	2	No	27	0	No	0.01	NP (normality)
Barium (mg/L)	MW-10	0.03067	0.02547	2	No	18	0	No	0.01	Param.
Beryllium (mg/L)	MW-02 (bg)	0.007443	0.006315	0.009772	No	52	11.54	x^2	0.01	Param.
Beryllium (mg/L)	MW-03	0.005	0.004	0.009772	No	53	54.72	No	0.01	NP (normality)
Beryllium (mg/L)	MW-04	0.005	0.004	0.009772	No	54	48.15	No	0.01	NP (normality)
Beryllium (mg/L)	MW-05	0.004	0.004	0.009772	No	53	77.36	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-06	0.004	0.001	0.009772	No	53	100	No	0.01	NP (NDs)
Beryllium (mg/L)	MW-10	0.009555	0.007586	0.009772	No	18	0	No	0.01	Param.
Cobalt (mg/L)	MW-02 (bg)	0.132	0.1049	0.1716	No	27	0	x^2	0.01	Param.
Cobalt (mg/L)	MW-03	0.0512	0.0346	0.1716	No	28	0	No	0.01	Param.
Cobalt (mg/L)	MW-04	0.07337	0.05303	0.1716	No	28	0	No	0.01	Param.
Cobalt (mg/L)	MW-05	0.0109	0.007	0.1716	No	28	0	No	0.01	NP (normality)
Cobalt (mg/L)	MW-06	0.00244	0.00134	0.1716	No	27	0	No	0.01	NP (normality)
Cobalt (mg/L)	MW-10	0.1159	0.0856	0.1716	No	18	0	No	0.01	Param.
Combined Radium (pCi/L)	MW-02 (bg)	1.276	0.8654	5	No	27	33.33	No	0.01	Param.
Combined Radium (pCi/L)	MW-03	3.26	1.93	5	No	27	22.22	sqrt(x)	0.01	Param.
Combined Radium (pCi/L)	MW-04	2.64	1.616	5	No	27	18.52	sqrt(x)	0.01	Param.
Combined Radium (pCi/L)	MW-05	1.366	0.8782	5	No	27	29.63	No	0.01	Param.
Combined Radium (pCi/L)	MW-06	1.813	1.162	5	No	27	18.52	sqrt(x)	0.01	Param.
Combined Radium (pCi/L)	MW-10	1.879	1.4	5	No	17	17.65	No	0.01	Param.
Fluoride (mg/L)	MW-02 (bg)	0.654	0.4369	4	No	28	17.86	No	0.01	Param.
Fluoride (mg/L)	MW-03	0.85	0.5	4	No	28	57.14	No	0.01	NP (normality)
Fluoride (mg/L)	MW-04	0.89	0.5	4	No	28	50	No	0.01	NP (normality)
Fluoride (mg/L)	MW-05	1.26	0.5	4	No	28	57.14	No	0.01	NP (normality)
Fluoride (mg/L)	MW-06	0.5	0.22	4	No	28	96.43	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-10	0.6173	0.5276	4	No	18	22.22	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-02 (bg)	0.004401	0.002893	0.015	No	52	7.692	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-03	0.0156	0.008167	0.015	No	53	5.66	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-04	0.01161	0.005825	0.015	No	54	11.11	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-05	0.002	0.001	0.015	No	54	68.52	No	0.01	NP (normality)
Lead (mg/L)	MW-06	0.001	0.001	0.015	No	53	92.45	No	0.01	NP (NDs)
Lead (mg/L)	MW-10	0.003298	0.002598	0.015	No	18	0	No	0.01	Param.
Lithium (mg/L)	MW-02 (bg)	0.05	0.04	1.42	No	27	92.59	No	0.01	NP (NDs)
Lithium (mg/L)	MW-03	0.6845	0.4684	1.42	No	27	0	No	0.01	Param.
Lithium (mg/L)	MW-04	0.7908	0.4531	1.42	No	27	3.704	No	0.01	Param.
Lithium (mg/L)	**MW-05**	**5.924**	**3.49**	**1.42**	**Yes**	**27**	**0**	**No**	**0.01**	**Param.**
Lithium (mg/L)	MW-06	0.05	0.04	1.42	No	27	100	No	0.01	NP (NDs)
Lithium (mg/L)	MW-10	0.4363	0.2692	1.42	No	18	5.556	No	0.01	Param.
Molybdenum (mg/L)	MW-02 (bg)	0.005	0.001	0.1	No	27	100	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-03	0.005	0.005	0.1	No	28	96.43	No	0.01	NP (NDs)

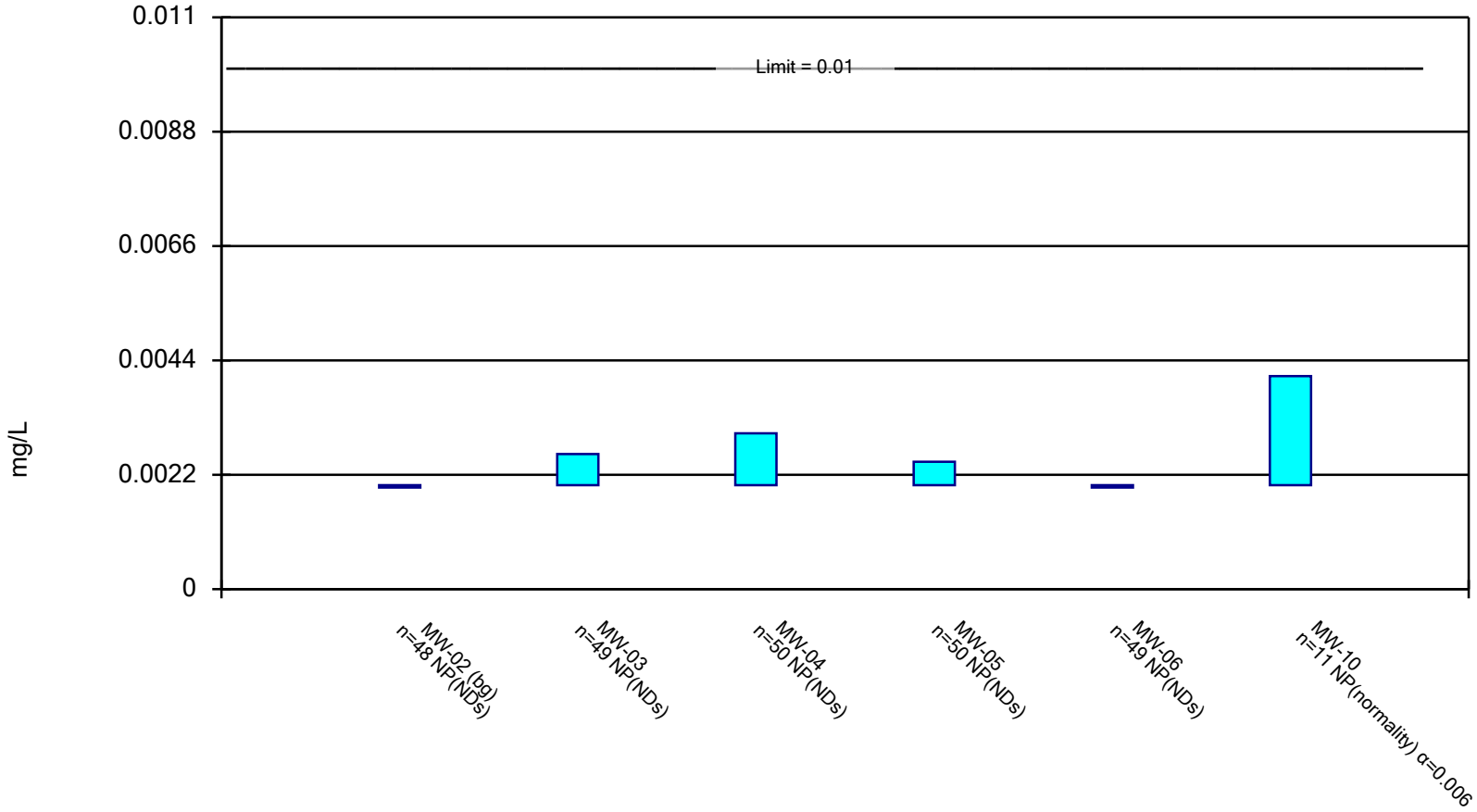
Confidence Interval

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen Printed 11/4/2024, 9:07 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Molybdenum (mg/L)	MW-04	0.006	0.005	0.1	No	28	92.86	No	0.01	NP (NDs)
Molybdenum (mg/L)	**MW-05**	**6.78**	**2.76**	**0.1**	**Yes**	**29**	**0**	**No**	**0.01**	**NP (normality)**
Molybdenum (mg/L)	MW-06	0.005	0.005	0.1	No	27	88.89	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-10	0.005	0.001	0.1	No	18	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-02 (bg)	0.002	0.001	0.002	No	25	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-03	0.00125	0.001	0.002	No	26	96.15	No	0.01	NP (NDs)
Thallium (mg/L)	MW-04	0.002	0.001	0.002	No	26	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-05	0.00262	0.002	0.002	No	26	15.38	No	0.01	NP (normality)
Thallium (mg/L)	MW-06	0.002	0.001	0.002	No	25	100	No	0.01	NP (NDs)
Thallium (mg/L)	MW-10	0.002	0.001	0.002	No	16	100	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.

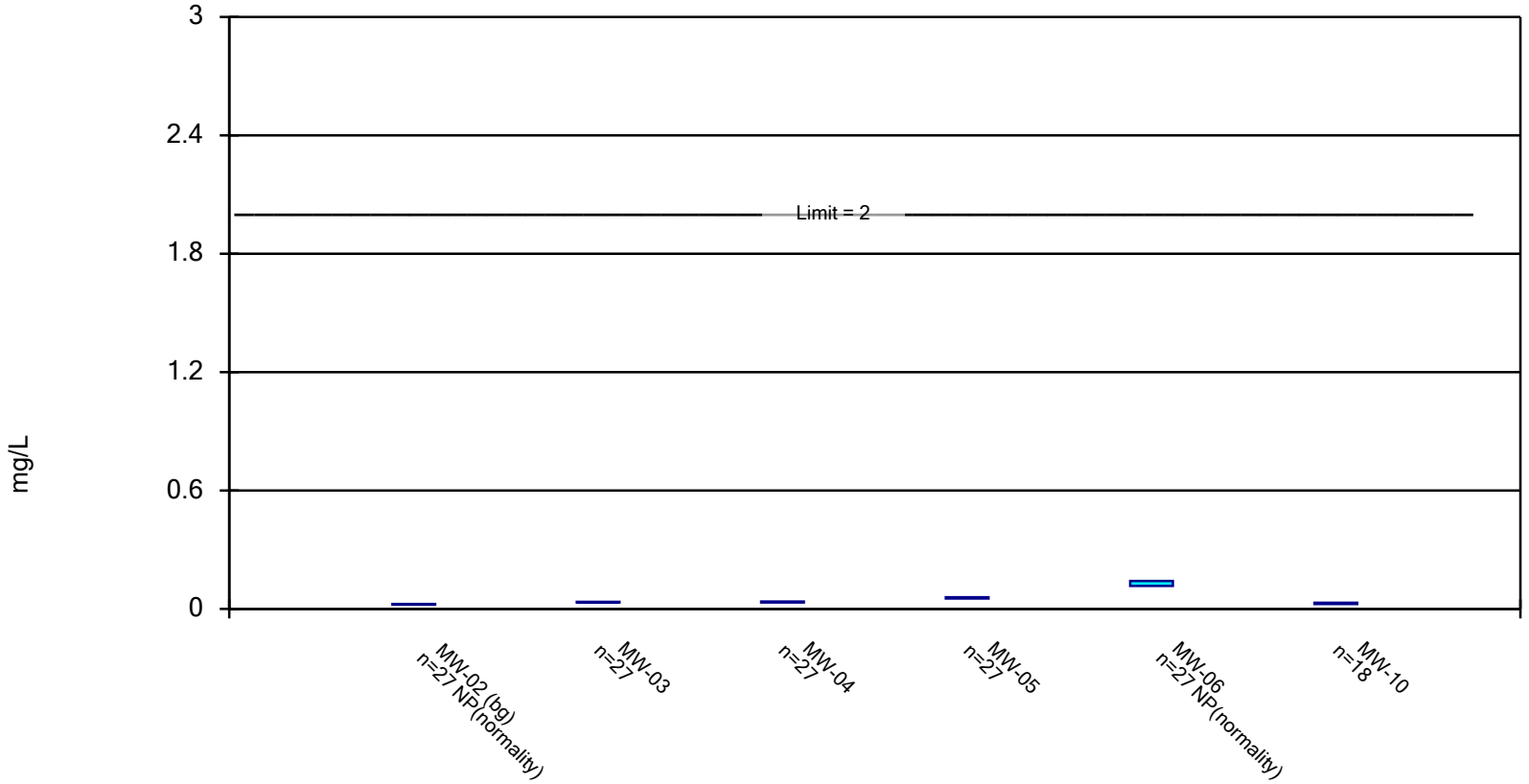


Constituent: Arsenic Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

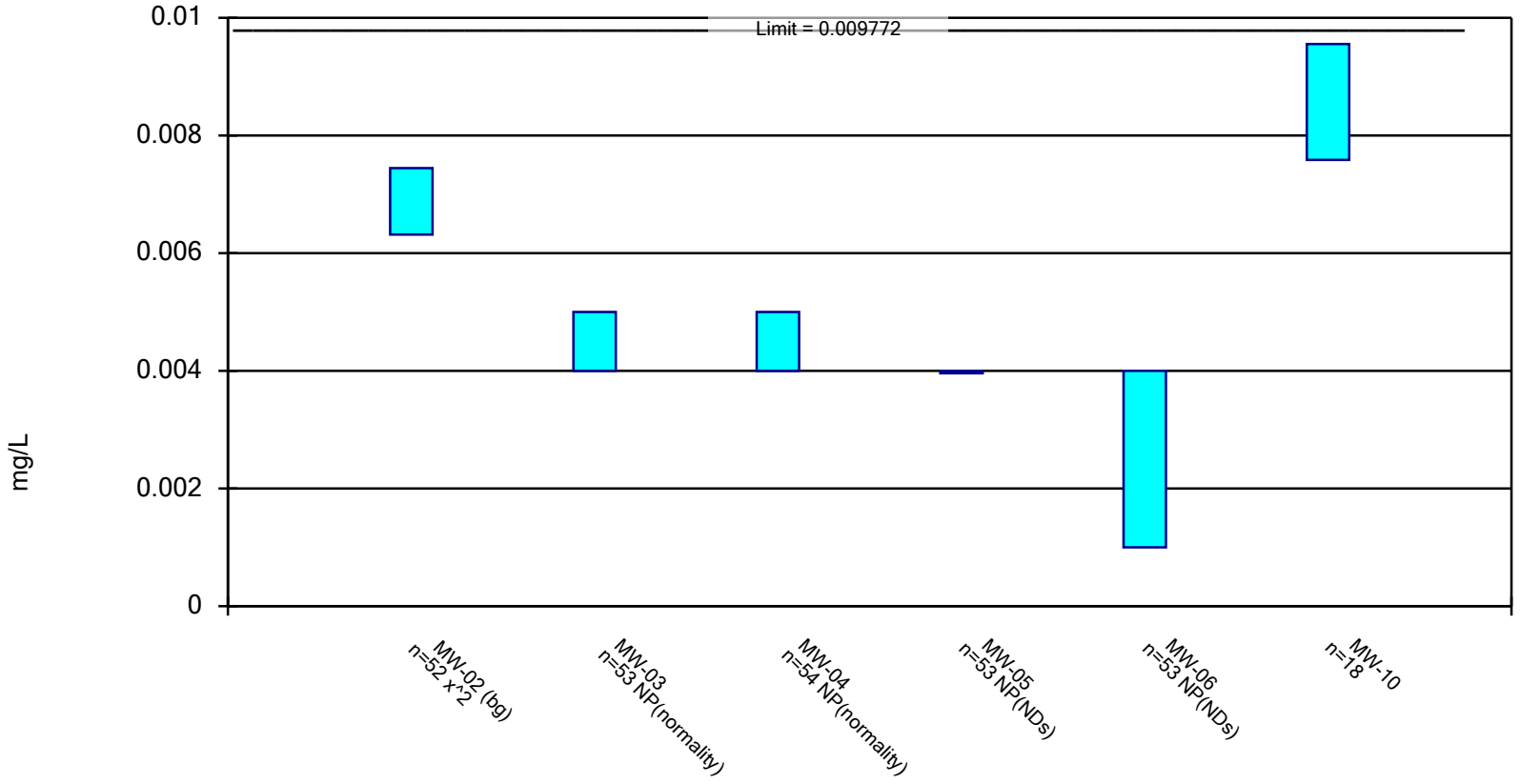


Constituent: Barium Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: multiple

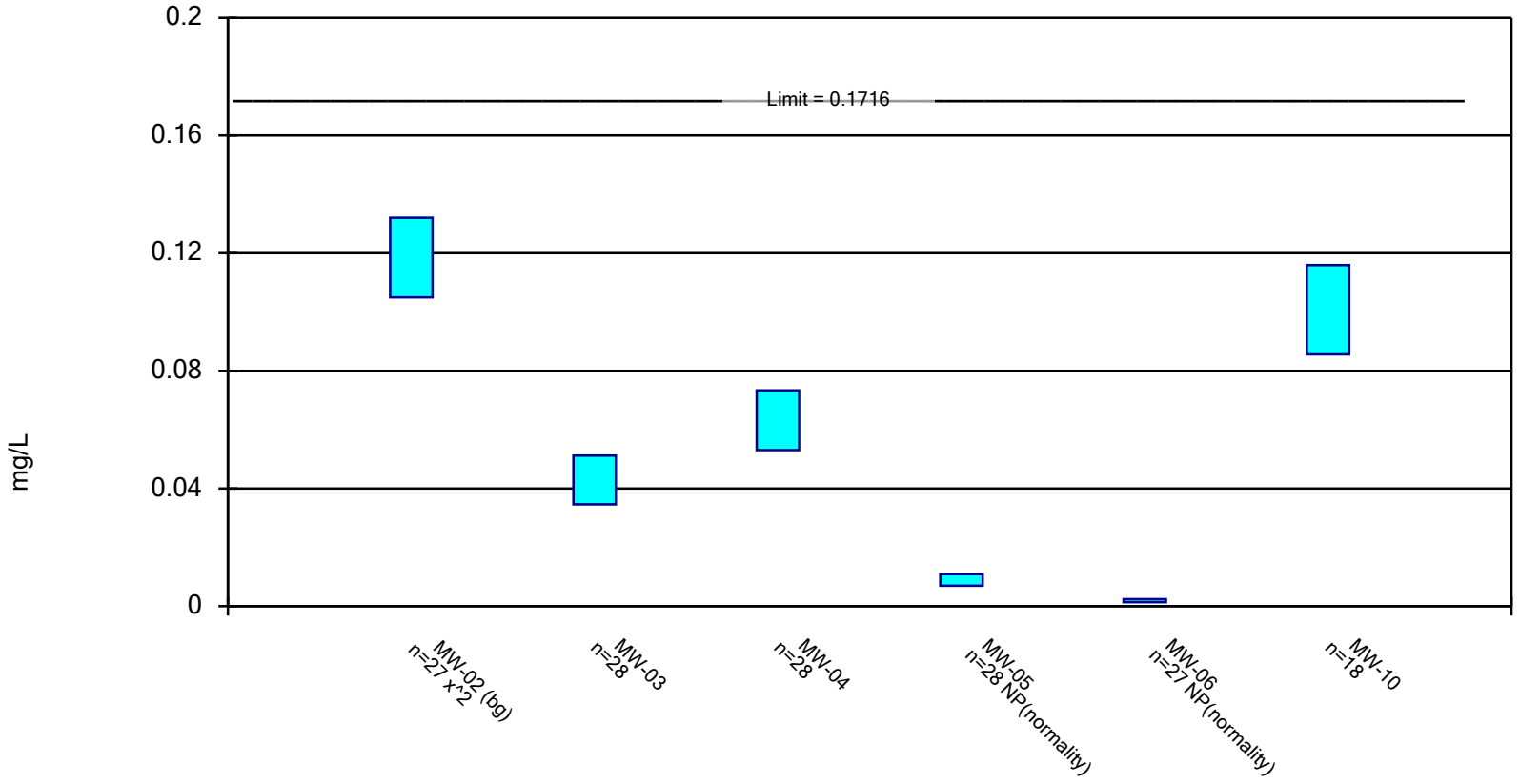


Constituent: Beryllium Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

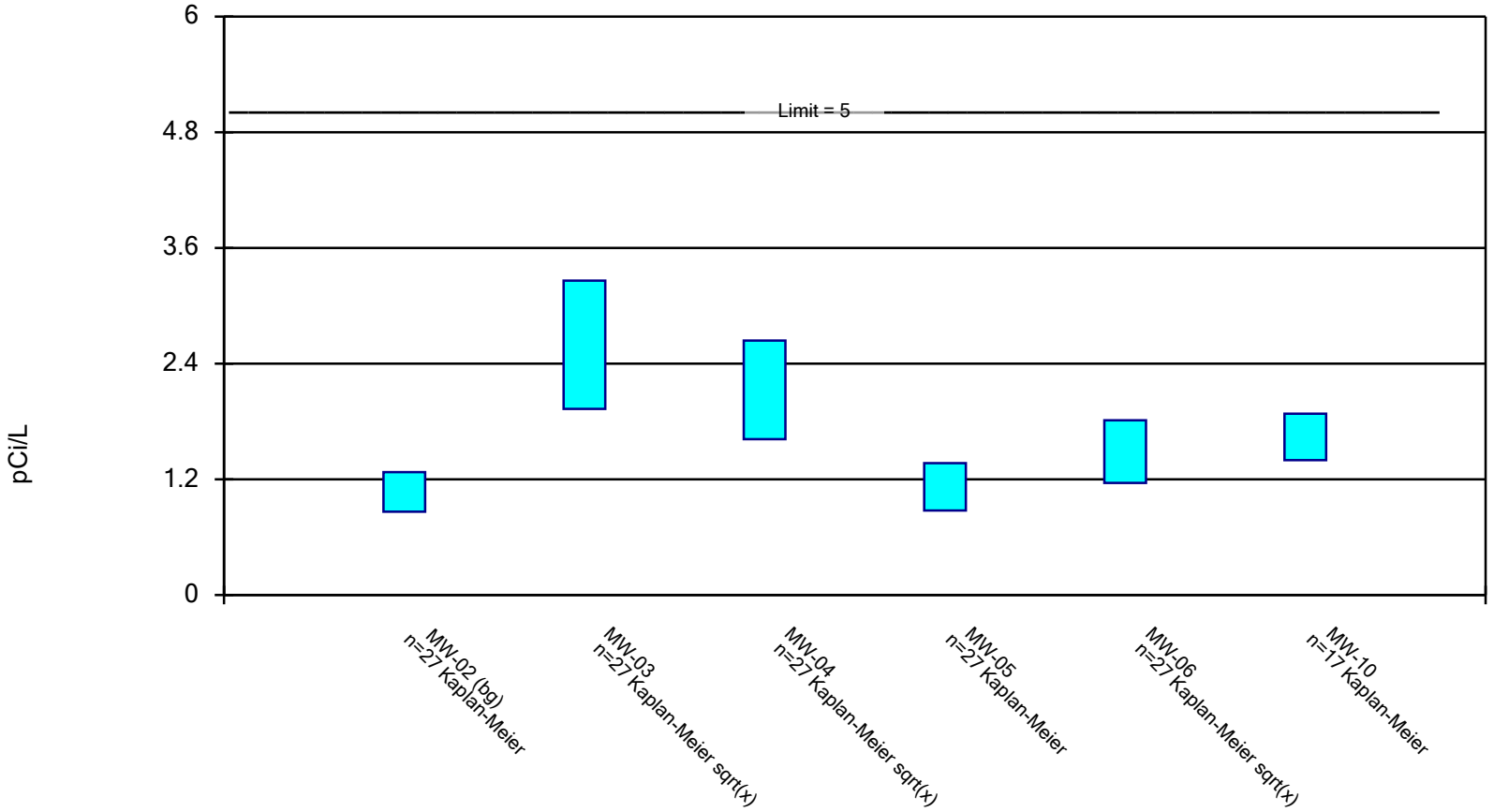


Constituent: Cobalt Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

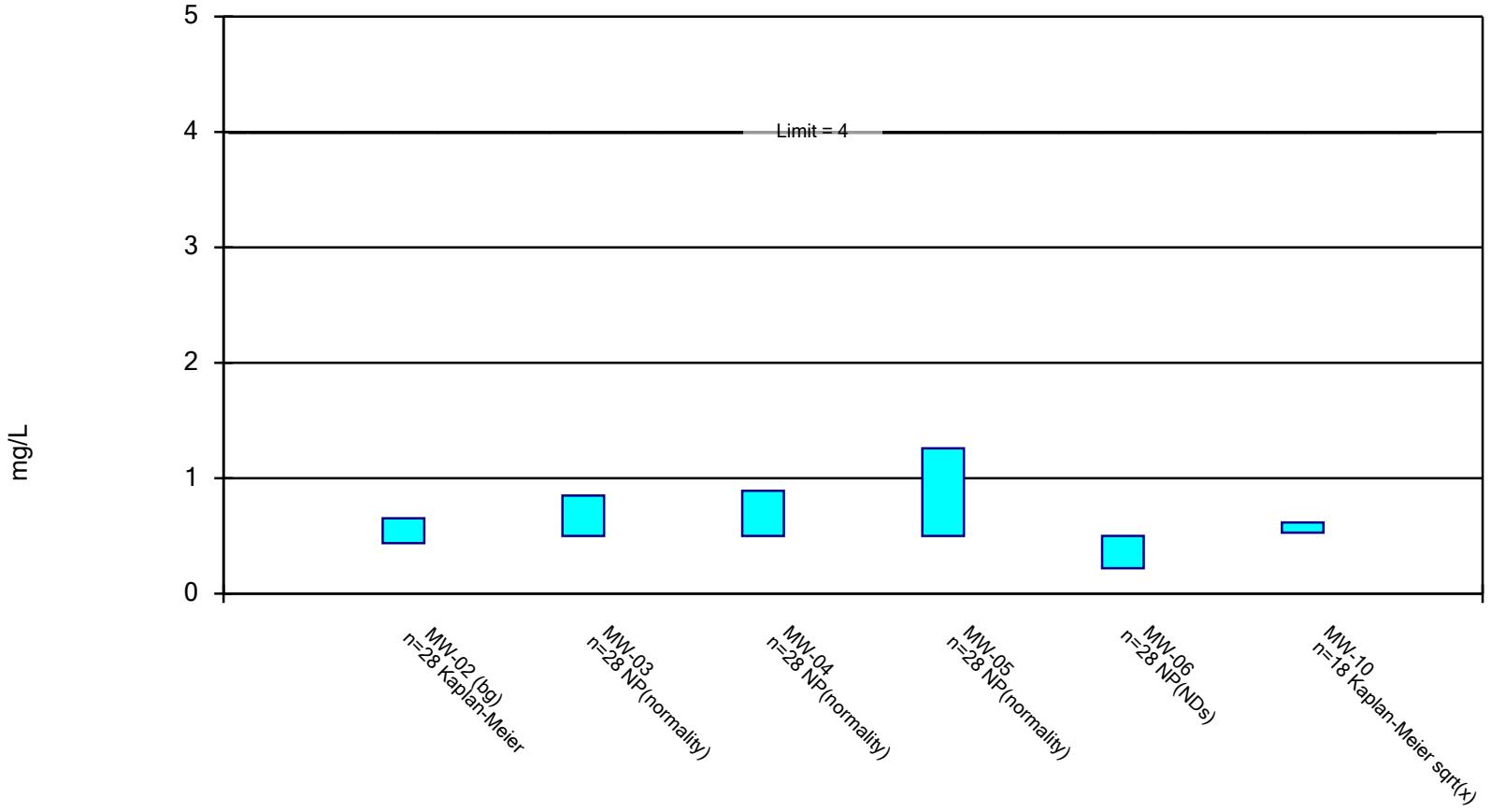


Constituent: Combined Radium Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

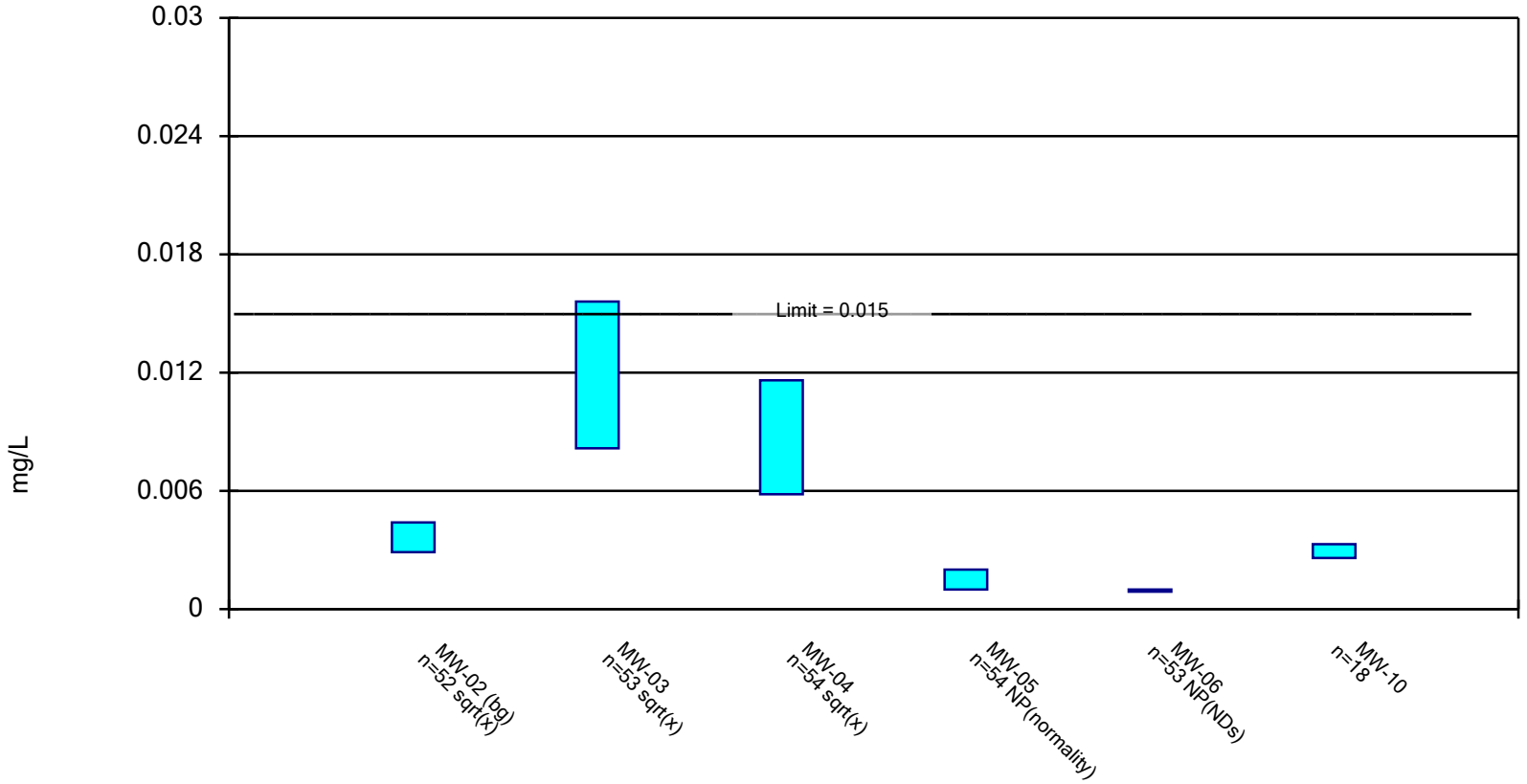


Constituent: Fluoride Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: multiple

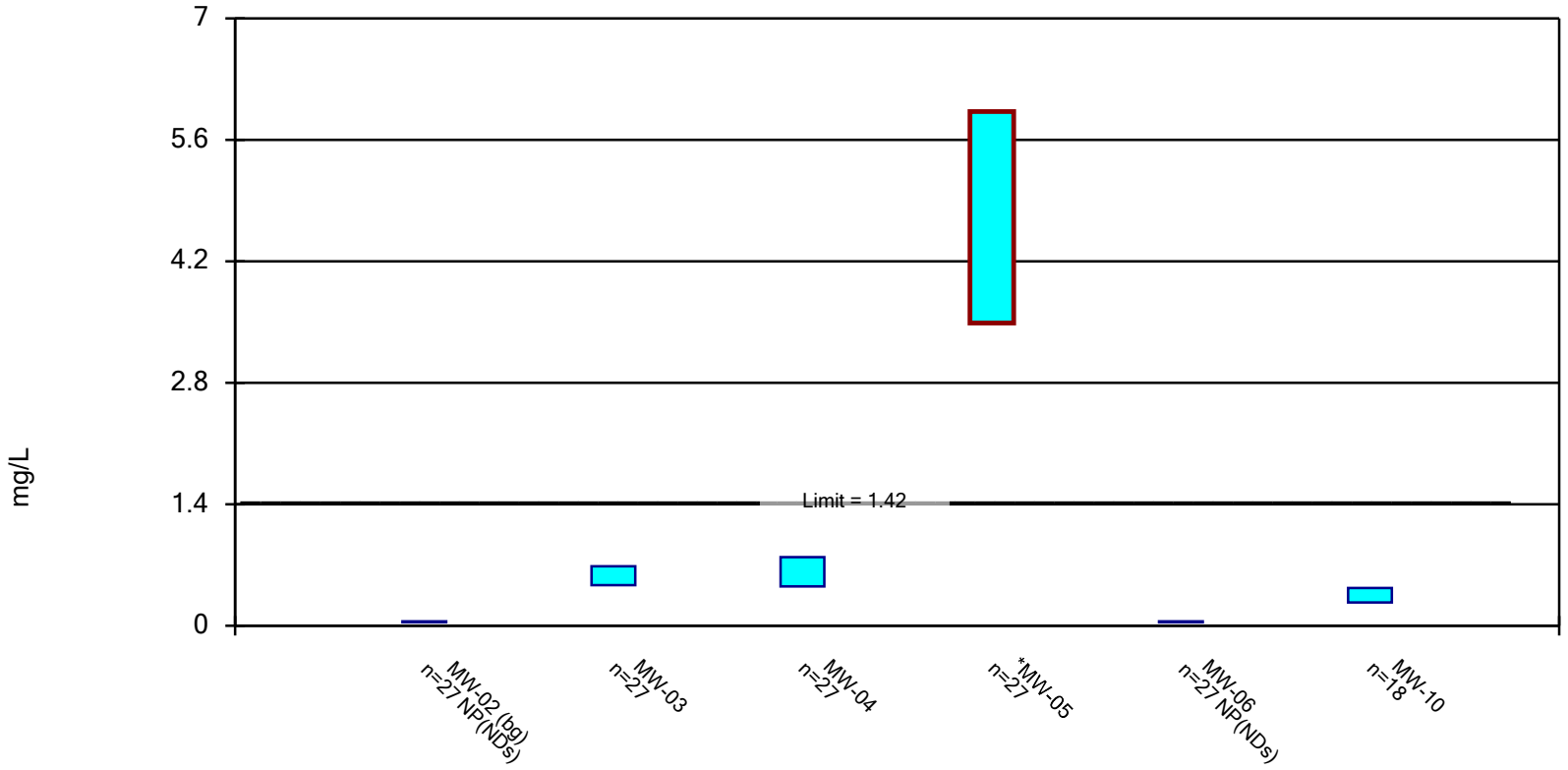


Constituent: Lead Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

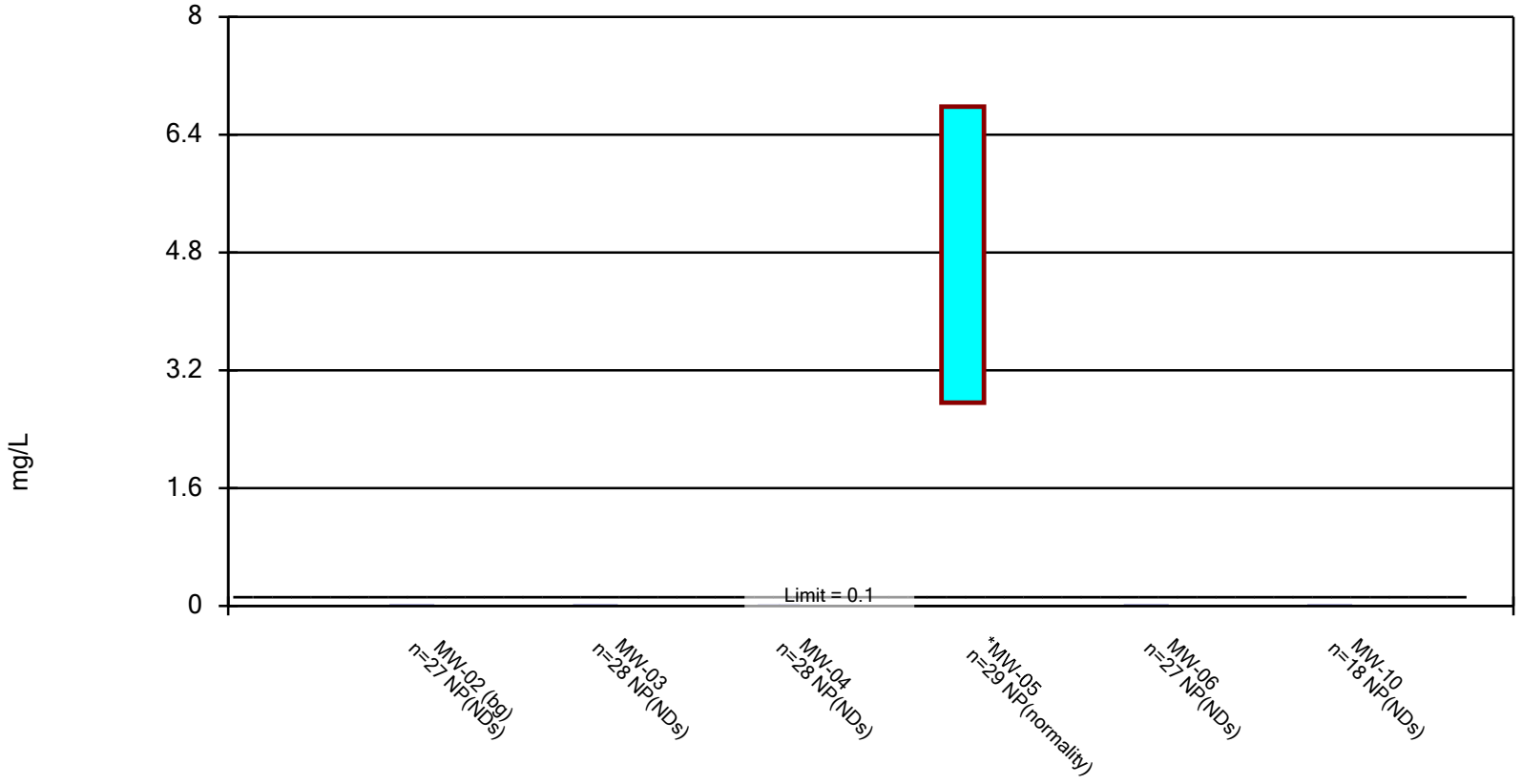


Constituent: Lithium Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Non-Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01.

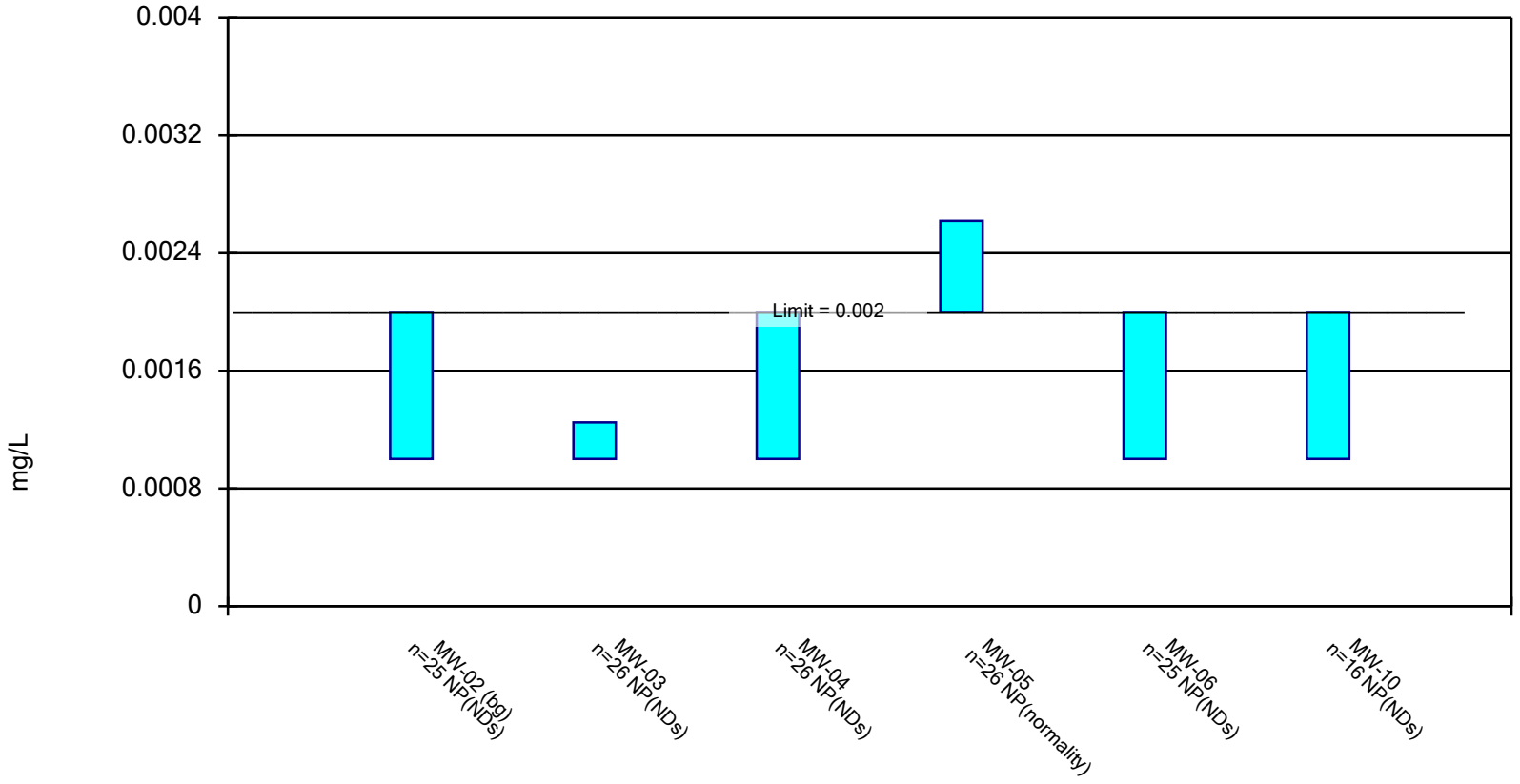


Constituent: Molybdenum Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium Analysis Run 11/4/2024 9:05 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

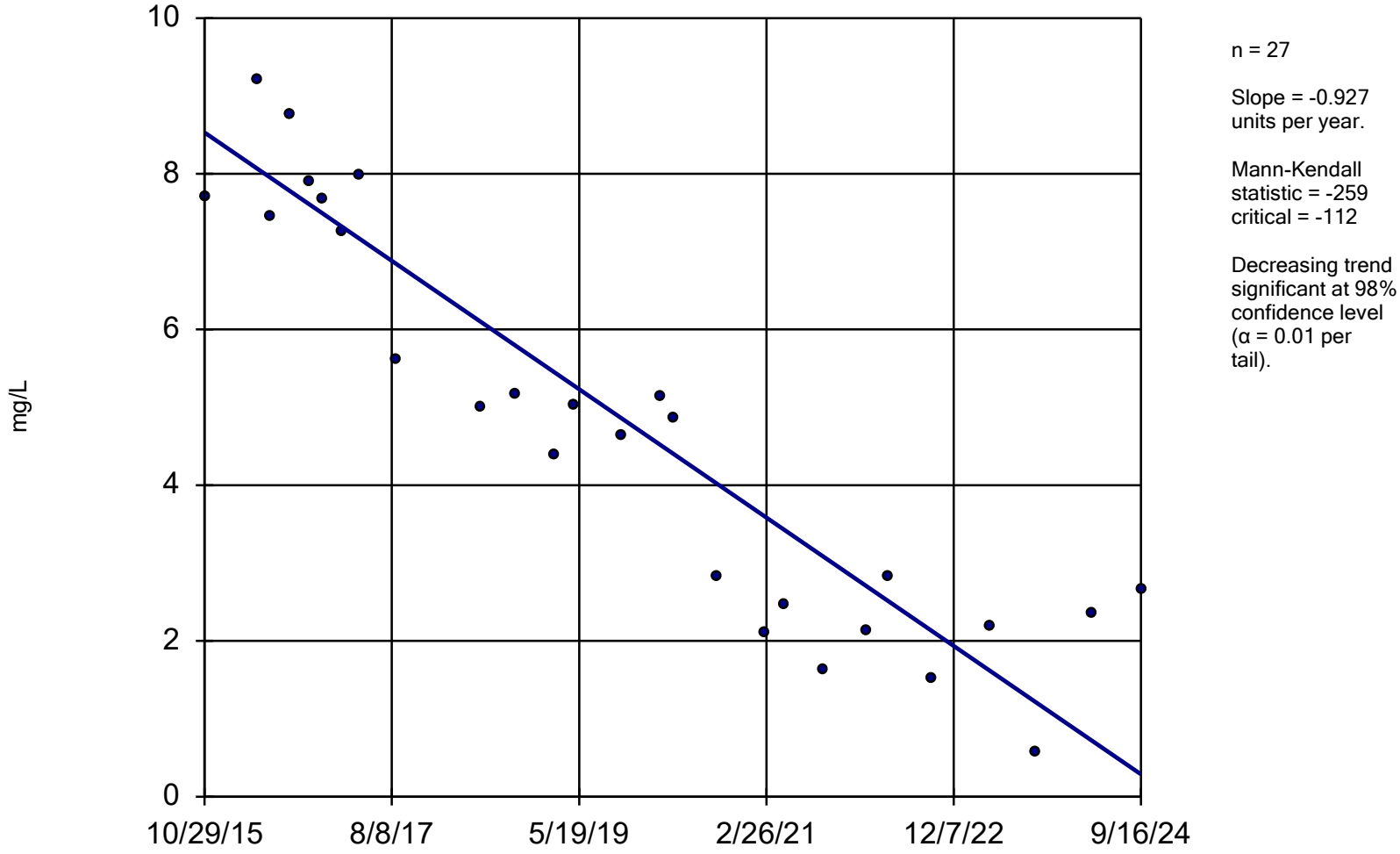
Trend Test

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen Printed 11/4/2024, 9:10 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Lithium (mg/L)	**MW-05**	**-0.927**	**-259**	**-112**	**Yes**	**27**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Molybdenum (mg/L)	**MW-05**	**-0.7925**	**-281**	**-125**	**Yes**	**29**	**0**	**n/a**	**n/a**	**0.02**	**NP**

Sen's Slope Estimator

MW-05



n = 27

Slope = -0.927 units per year.

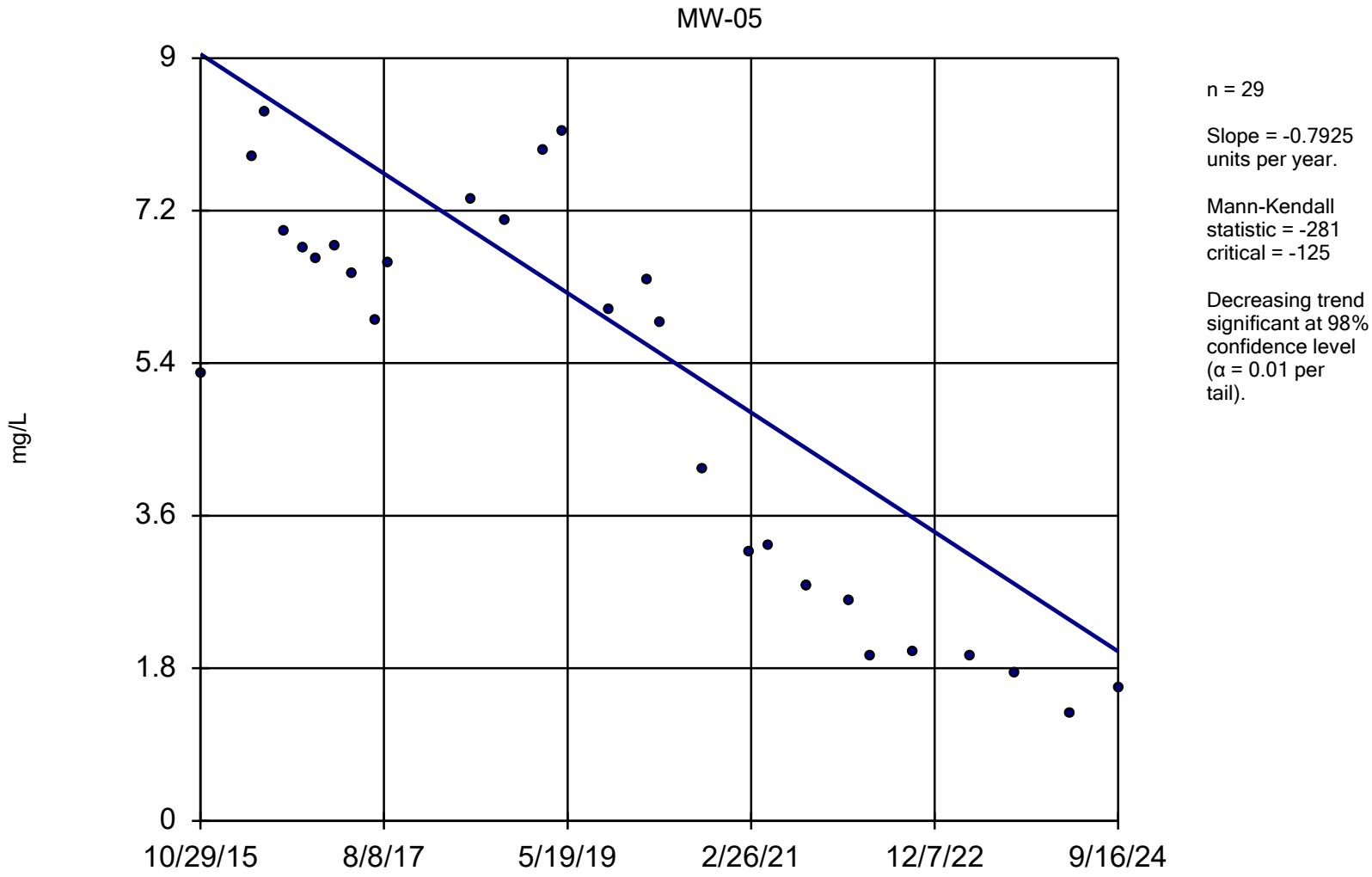
Mann-Kendall statistic = -259
critical = -112

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Lithium Analysis Run 11/4/2024 9:09 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

Sen's Slope Estimator



Constituent: Molybdenum Analysis Run 11/4/2024 9:09 AM View: Landfill App IV

RD Morrow Generating Facility Client: Cooperative Energy Data: RD Morrow Gen

APPENDIX C

Supplemental Alternate Source Demonstration

REPORT

Supplemental Alternate Source Demonstration

Cooperative Energy RD Morrow CCR Landfill

Submitted to:

304 Old Okahola School Road, Purvis Mississippi 39475

Submitted by:

WSP USA Inc.

5170 Peachtree Road, Suite 300 Building 100 Atlanta, Georgia 30341

+1 248 295 0135

January 31, 2024; Revision 1

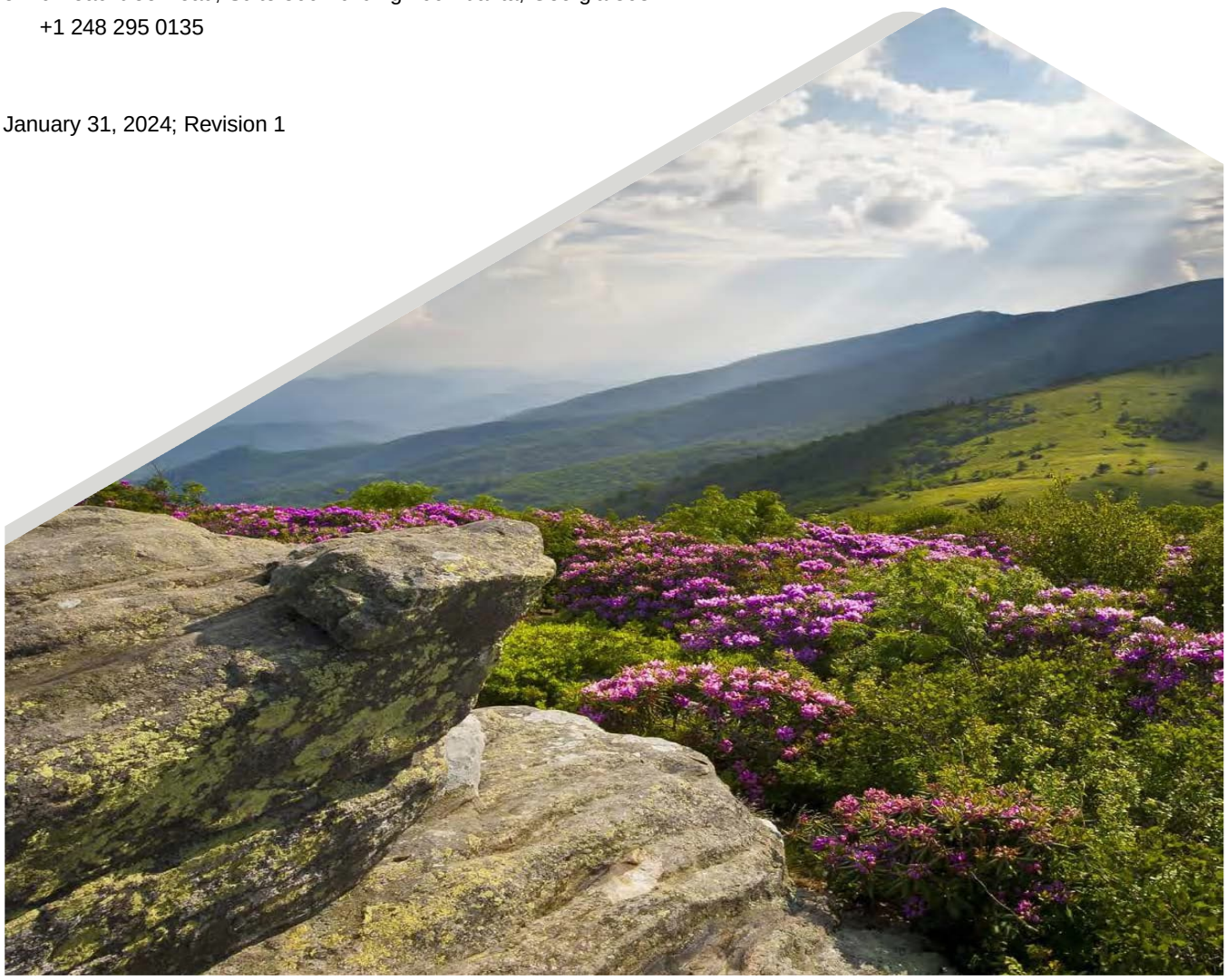


Table of Contents

Appendix

Certification

This *Supplemental Alternate Source Demonstration* for the Cooperative Energy, RD Morrow CCR Landfill in Purvis, Lamar County, Mississippi, has been prepared in compliance with 40 CFR Part 257, Subpart D; published in 80 Fed. Reg 21302 (April 17, 2015) under the direction of a licensed professional engineer with WSP USA Inc.

WSP USA Inc.

Cole Mayer
Project Geochemist

PJ Nolan, PhD
Technical Principal, Geochemist

I hereby certify that this *Supplemental Alternate Source Demonstration* for the Cooperative Energy RD Morrow CCR Landfill, located at 304 Old Okahola School Road Purvis, Mississippi, has been prepared to meet the requirements of 40 CFR § 257.95(g)(3)(ii).

Daniel Smith, PE
Senior Associate, Engineer-Civil
Mississippi PE No. 32180

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residuals (CCR) rule 40 CFR § 257.50 et seq., 80 Fed. Reg. 21302 (April 17, 2015) (the CCR Rule or the Rule), this Supplemental *Alternate Source Demonstration* for Cooperative Energy's RD Morrow (RD Morrow) CCR Landfill Unit (the CCR Landfill Unit) has been prepared to provide additional documentation demonstrating that an alternate source has caused Statistically Significant Levels (SSLs) of lithium at MW-03 and MW-04 at the RD Morrow CCR Landfill. This document further satisfies the requirements of Section § 257.95(g)(3)(ii), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSL and that it was the result of an alternate source or resulted from an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

As documented by this report and the previous *Alternate Source Demonstration* for RD Morrow Generating Station – Landfill CCR Unit, Purvis, Mississippi prepared by Golder for Cooperative Energy, Inc. dated September 11, 2020 (the 2020 ASD), the historical SSLs of lithium at monitoring wells MW-03 and MW-04 result from naturally-occurring lithium in subsurface aquifer materials due to the depositional environment and are not the result of a release from the CCR Unit.

2.0 ALTERNATE SOURCE DEMONSTRATION

As allowed under § 257.95(g)(3)(ii), this supplemental alternate source demonstration (ASD) summarizes the lines of evidence previously presented in *Alternate Source Demonstration* (Golder, 2020) and presents additional data to further support the conclusions of the 2020 ASD that the SSLs of lithium at MW-03 and MW-04 are the result of natural variability in site groundwater and not the result of a release from the CCR Landfill Unit.

2.1 Summary of 2020 ASD

As presented in the 2020 ASD, multiple lines of evidence were identified to support the conclusion that the SSLs of lithium at monitoring wells MW-03 and MW-04 are caused by an alternate source. Specifically, the lithium concentrations observed in groundwater at these two wells are due to naturally-occurring lithium in aquifer materials at the site. The following lines of evidence were presented to support the conclusion that the SSLs of lithium at MW-03 and MW-04 are not the result of a release from the CCR Landfill Unit:

- Porewater and Groundwater: Concentrations of some parameters, such as chloride, sulfate, and total dissolved solids (TDS), are higher in groundwater samples from downgradient wells MW-03 and MW-04 as compared to their upgradient CCR porewater equivalents (LF-P-6 and LF-P-7); concentrations of other CCR indicator parameters, such as calcium, are lower in downgradient samples. The pH of groundwater in downgradient wells MW-03, MW-04, MW-10, MW-11 and MW-12 (3.27 to 5.55 standard units) also shows a substantial difference from that of porewater (7.34 and 7.15 S.U.), while upgradient background groundwater pH is also acidic (4.54), indicating minimal impacts, if any, from the CCR Landfill Unit at MW-03 and MW-04. For these reasons, these parameters indicate that the groundwater at MW-03, MW-04, MW-10, MW-11 and MW-12 is not the result of a mixture of CCR leachate and ambient groundwater. Additionally, groundwater at MW-03, MW-04, MW-10, MW-11, MW-12, and P-B is nearly identical to that of groundwater at MW-02 (background monitoring well) based on major ion abundance. The relative major ion abundances in groundwater at downgradient and upgradient wells are different than those of CCR porewater samples (LF-P-6 and LF-P-7)

- Soil Sampling Results: Results of sequential extraction procedure (SEP) testing indicated the presence of naturally-occurring lithium in soils at RD Morrow in the acid/sulfide soluble and residual fractions at each of the three soil borings (SB-02, SB-106, and SB-107; Golder 2020). Lithium is reported in soils at concentrations ranging from 2.2 to 4.6 milligrams per kilogram (as a sum total from SEP) and is predominantly (85 to 100%) present in the residual and sulfide component of the soil, i.e. the non-environmentally-available fractions. The absence of lithium in the environmentally-available fractions (specifically exchangeable and carbonate fractions) indicates a general lack of lithium transport and attenuation in the aquifer (e.g., through sorption and/or co-precipitation).
- Regional Presence of Lithium: Naturally-occurring lithium is present in groundwater across the United States (US), ranging from non-detect to approximately 1.2 mg/L. Based on available data, Mississippi is one of fifteen states in the US with higher concentrations of lithium observed in groundwater (Ayotte 2011, Huber et al. 2014). Naturally-occurring lithium can be found in nearly all rock and soil types and is most commonly found to be associated with silicate minerals (Tomazscak 2015). Site-specific test results (i.e., SEP results) confirm this finding for the RD Morrow site and areas surrounding the CCR Landfill Unit. The weathering of silicate minerals is widely known to cause the release of naturally-occurring lithium into groundwater (Tomazscak 2015).

2.2 Supplemental Sampling Activities

In October 2022, additional soil samples were collected to further demonstrate an alternate source for the reported concentrations of lithium in groundwater at RD Morrow. Soil samples were collected from soil borings SB-02, (adjacent to MW-02), SB-04 (adjacent to MW-04), SB-05 (adjacent MW-5), and SB-10 (adjacent to MW-10). Samples were collected at depths corresponding to the elevation of the Stratum IV – Green Silty Clay present at each monitoring well location, as summarized below. Monitoring wells MW-03, MW-04, MW-05, and MW-10 are screened directly in contact with the Stratum IV clay; whereas, MW-02 (the background monitoring location) is set more than 3 feet above the Stratum IV clay. The boring locations were chosen to provide a comparison of the Stratum IV Clay both upgradient (SB-02) and downgradient (SB-04, SB-05, and SB-10) of the CCR Landfill Unit. Samples from the borings were analyzed by Electron Micro Probe Analysis (EMPA) and TESCAN Integrated Mineral Analysis (TIMA, an updated version of QEMSCAN) with Laser Ablation-Inductively Coupled Plasma Mass Spectrometry (LA-ICPMS) methods to evaluate if the subsurface material is a host for naturally occurring lithium in the aquifer. These methods have been widely used and accepted in the mining industry to determine the provenance of rare earth and trace metals and association with mineral deposits (Aylmore et al., 2018; Grammatikopoulos and Downing, 2020; Layton-Matthews and McClenaghan, 2021; Vermeesch et al., 2017).

October 2022 Soil Boring Locations and Depths

Borehole ID	Corresponding Monitoring Well	Boring Depth (FT BGS)	Sample Depth (FT BGS)	Sample Elevation (FT MSL)	Geologic Unit Sampled
SB-02	MW-02	28	24 – 28	211 – 215	Stratum IV – Green Silty Clay
SB-04	MW-04	20	16.5 – 20	212 – 215.5	Stratum IV – Green/Light Gray Clay

Borehole ID	Corresponding Monitoring Well	Boring Depth (FT BGS)	Sample Depth (FT BGS)	Sample Elevation (FT MSL)	Geologic Unit Sampled
SB-05	MW-05	24	19 – 24	208 – 213	Stratum IV – Green/Light Gray Clay
SB-10	MW-10	28	24 - 28	196 – 200	Stratum IV – Green Silty Clay

Notes:
1. FT BGS – Feet Below Ground Surface.
2. FT MSL – Feet Above Mean Sea Level.
3. Sample elevations are approximated based on original monitoring well installation ground elevation survey data. Sample intervals are rounded to nearest foot.

To further evaluate the mineralogy of subsurface materials in greater detail and the associated lithium content, select samples were evaluated as described below:

TESCAN Integrated Mineral Analyzer: TESCAN Integrated Mineral Analyzer (TIMA-X) is based on four Energy Dispersive X-Ray (EDX) silicon drift detectors (SDD) attached to a TESCAN MIRA (field-emission gun – FEG) platform which also includes backscattered electron (BSE) and secondary electron (SE) detectors. The TIMA system utilizes both the EDX and BSE signals to identify minerals at each measurement point (or each homogenous segment of a grain, depending upon the analysis mode). It is optimized to deal with rapidly acquired low-count spectra. These EDX (and BSE) spectra (and BSE data) are compared to entries in a mineral library on a first-match principle to identify the mineral phase. The mineral library is based on theoretical mineral/phase composition or created by the user based on BSE, X-ray spectral windows counts and ratios. TIMA-X has four X-ray analysis scanning modes to identify minerals/compounds: High-Resolution Mapping (THRM), Point Spectrometry (TPS), Line Mapping (TLM), and Dot Mapping (TDM). The preferred analysis mode for this compound is THRM which collects a BSE signal and an X-Ray spectrum at a set resolution (3 µm) to map the particles. It collects modal and textural information, such as liberation or exposure analysis of grains of interest.

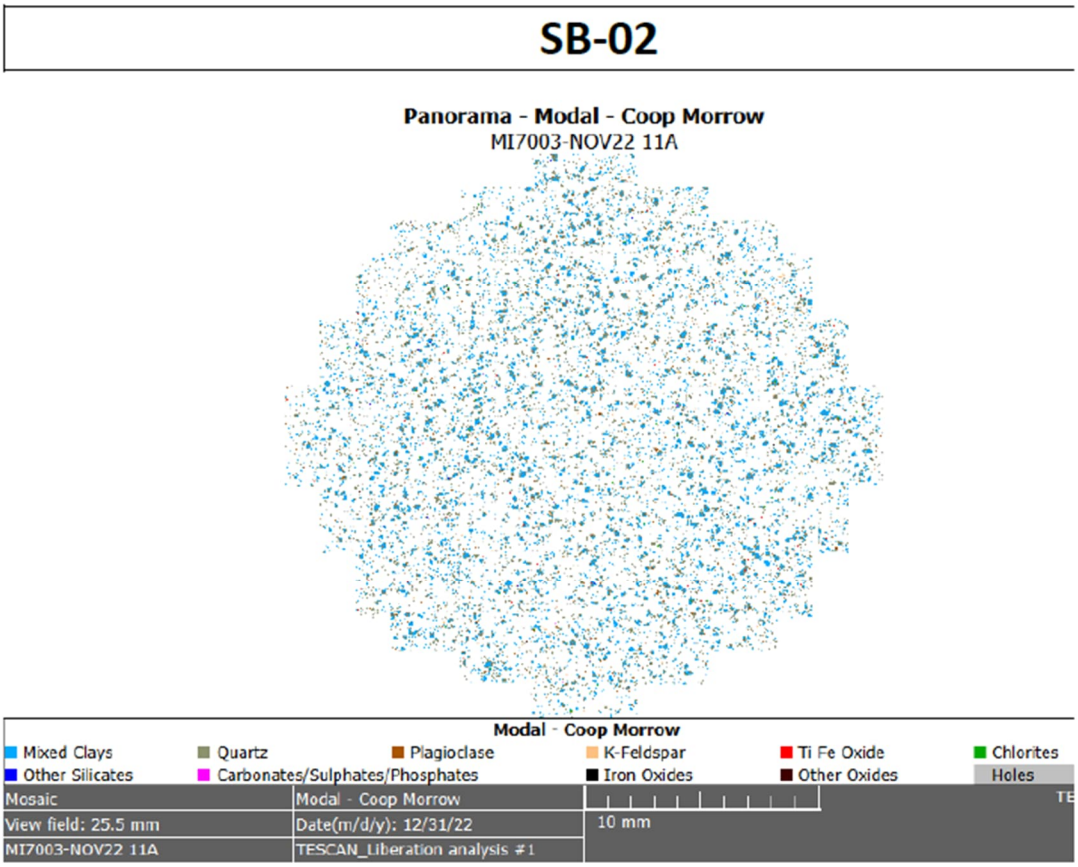
EMPA AND LA-ICP-MS: The polished sections for each sample were submitted for EMPA and LA-ICP-MS at the University of New Brunswick, Microscopy and Microanalysis Facility. Selected minerals of interest (clay; K-feldspar; mica etc.) were analyzed with EMPA to quantify the chemical composition of the major and minor elements. It is well known that many minerals display compositional variations. Therefore, EMPA is necessary to determine the chemistry of the minerals and identify the minerals correctly. LA-ICP-MS combined with the EMPA identifies the lithium content in the silicates and clay minerals; the clay phases were specifically targeted. The results, in conjunction with the TIMA-X data, indicate possible sources of deleterious elements.

Modal percentages of minerals quantified by EMPA are provided in Appendix A (EMPA and TIMA-X Modals Summary). The analysis indicates that the majority of the lithium is carried in the mixed-clay phases. Lithium was below detection in quartz and feldspars; however, only a minimal number of grains were analyzed. An example EMPA image is provided below (inset figure, Modal Image of SB-02 Mineralogy). The analytical report is presented in Appendix A. Based on these results, as summarized below, the highest concentration of lithium is observed at upgradient soil boring SB-02. These results further demonstrate that the lithium associated with the clay minerals is naturally occurring.

Concentrations of Lithium Associated with Illite/Mixed Clays by LA-ICPMS Analysis

Boring	Lithium Concentration (mg/kg)
SB-02 (upgradient)	50.99
SB-04	31.41
SB-05	39.68
SB-10	39.54

Note:
[1] Sample elevations are approximated based on original monitoring well installation ground elevation survey data. Sample intervals are rounded to nearest foot.
[2] The soil sample at SB-2 was collected in the clay materials at an elevation below the well screen of MW-02. MW-02 is screened considerably above (>3ft) the Stratum IV – Green Silty Clay; whereas all the other well screens sit directly in contact with the clay materials that were analyzed in October 2022. If MW-02 were completed with the well screen in contact with the clay materials similar to the other site monitoring wells, we expect the resulting groundwater quality would show higher concentrations of lithium similar to the downgradient monitoring wells.



INSET FIGURE: Modal image of sample from SB-02 showing the mineralogical analysis of the sample.

3.0 CONCLUSION

Based on the evaluation of the soil sampling data, the SSLs for lithium identified in the groundwater results at MW-03 and MW-04 are the result of naturally-occurring lithium present in soils and not due to a release from the CCR Landfill Unit. Wells MW-03 and MW-04 are screened on top of the clay material leading to naturally-occurring elevated lithium concentrations in groundwater. However, upgradient well MW-02 does not exhibit elevated lithium concentrations in groundwater as compared to other wells because it is screened considerably above the clay material in which the natural source of lithium is located, as confirmed by the soil sample at SB-02. The naturally-occurring lithium within the clays (silicate minerals) has likely been released into the aquifer due to weathering caused by low pH groundwater in areas across the site. The weathering of silicate minerals has been well documented to cause the release of naturally-occurring lithium into groundwater (Tomazscak 2015). The highest lithium measured in the Site soil materials was in soil boring SB-02 (adjacent to upgradient background well MW-02) confirming lithium is not from the CCR Unit. As such, based on available geochemical data, evidence supports the conclusion that naturally-occurring lithium in soils the source of lithium in groundwater at MW-03 and MW-04, not the CCR Landfill Unit.

In summary, this analysis of soil sampling data supports the conclusion that naturally-occurring lithium present in soils is the source of the SSLs of lithium in MW-03 and MW-04. This Supplemental Alternate Source Demonstration adds a new line of evidence as further support for the conclusions in the 2020 ASD prepared for RD Morrow in accordance with § 257.95(g)(3)(ii).

4.0 REFERENCES

Aylmore, M.G., Merigot, K., Quadir, Z., Rickard, W.D., Evans, N.J., McDonald, B.J., Catovic, E. and Spitalny, P., 2018. Applications of advanced analytical and mass spectrometry techniques to the characterisation of micaceous lithium-bearing ores. Minerals Engineering, 116, pp.182-195.

Ayotte, J.D., Gronberg, J.M. and Apodaca, L.E., 2011. Trace elements and radon in groundwater across the United States, 1992-2003 (p. 115). US Department of the Interior, US Geological Survey.

Golder Associates, Inc., 2020., Alternate Source Demonstration, Cooperative Energy, RD Morrow CCR Landfill. September 11, 2020.

Grammatikopoulos, T. and Downing, S., 2020. The disruptive role of process mineralogy in geology and mineral processing industry. Asp. Min. Miner. Sci, 5, pp.571-579.

Huber, R.S., Kim, N., Renshaw, C.E., Renshaw, P.F. and Kondo, D.G., 2014. Relationship between altitude and lithium in groundwater in the United States of America: results of a 1992–2003 study. Geospatial health, 9(1), p.231.

Layton-Matthews, D. and McClenaghan, M.B., 2021. Current Techniques and Applications of Mineral Chemistry to Mineral Exploration; Examples from Glaciated Terrain: A Review. Minerals, 12(1), p.59.

Tomascak, P.B., Magna, T. and Dohmen, R., 2016. The surficial realm: Low temperature geochemistry of lithium. In Advances in Lithium Isotope Geochemistry (pp. 157-189). Springer, Cham.

United States Environmental Protection Agency (US EPA). 2015. Federal Register. Volume 80. No. 74. Friday April 17, Part II. Environmental Protection Agency. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule/ [EPA-HQ-RCRA-2009-0640; FRL-9919-44-OSWER]

Vermeesch, P., Rittner, M., Petrou, E., Omma, J., Mattinson, C. and Garzanti, E., 2017. High throughput petrochronology and sedimentary provenance analysis by automated phase mapping and LAICPMS. Geochemistry, Geophysics, Geosystems, 18(11), pp.4096-4109.

APPENDIX A

Results of XRD, EMPA, TIMA-X, and LA-ICPMS Sample Analysis

Semi-Quantitative X-Ray Diffraction

Report Prepared for:	*WSP (Golder Associates Inc.)*
Project Number/ LIMS No.	*19465-04/MI7003-NOV22*
Sample Receipt:	*October 24, 2022*
Sample Analysis:	*November 29, 2022*
Reporting Date:	*January 13, 2023*

Instrument:	Panalytical X'pert Pro Diffractometer
Test Conditions:	Co radiation, 40 kV, 45 mA Regular Scanning: Step: 0.033°, Step time:0.15s, 2θ range: 6-70°
Interpretations :	PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva software.
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

Landon Kapusianyk, B.Sc.
Junior Mineralogist

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

Method Summary

Mineral Identification and Interpretation:

Mineral identification and interpretation involve matching the diffraction pattern of a test sample material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) and released on software as a database of Powder Diffraction Files (PDF).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds. Mineral proportions are based on relative peak heights and may be strongly influenced by crystallinity, structural group or preferred orientations. Interpretations and relative proportions should be accompanied by supporting petrographic and geochemical data (Whole Rock Analysis, Inductively Coupled Plasma - Optical Emission Spectroscopy, etc.).

Semi-Quantitative Analysis:

The Semi-Quantitative analysis (RIR method) is performed based on each mineral's relative peak heights and of their respective I/Icor values, which are available from the PDF database. Mineral abundances for the bulk sample (in weight %) are generated by Bruker-EVA Software. These data are reconciled with a bulk chemistry (e.g. whole rock analysis including SiO_2, Al_2O_3, Na_2O, K_2O, CaO, MgO, Fe_2O_3, Cr_2O_3, MnO, TiO_2, P_2O_5, V_2O_5 or other chemical data). A chemical balance table shows the difference between the assay results and elemental concentrations determined by XRD.

Summary of Semi-Quantitative X-Ray Diffraction Results

Crystalline Mineral Assemblage (relative proportions based on peak height)

Sample	Major (>30% Wt)	Moderate (10% -30% Wt)	Minor (2% -10% Wt)	Trace (<2% Wt)
(1) SB-02	quartz	muscovite, montmorillonite, illite	kaolinite, albite, epidote	*orthoclase, *magnetite, *rutile
(2) SB-04	quartz	montmorillonite, muscovite, illite	kaolinite, albite	*orthoclase, *magnetite, *epidote, *rutile, *clinochlore
(3) SB-05	quartz	montmorillonite, illite, kaolinite	albite, biotite	*muscovite, *orthoclase, *epidote, *magnetite, *rutile
(4) SB-10	quartz	illite	kaolinite, montmorillonite,, muscovite, albite	*biotite, *orthoclase, *rutile, *epidote

** tentative identification due to low concentrations, diffraction line overlap or poor crystallinity*

Mineral	Composition
Quartz	SiO_2
Albite	$NaAlSi_3O_8$
Orthoclase	$KAlSi_3O_8$
Magnetite	Fe_3O_4
Rutile	TiO_2
Epidote	$Ca_2(Al,Fe)Al_2O(SiO_4)(Si_2O_7)(OH)$
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Biotite	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$
Illite	$(K,H_3O)(Al,Mg,Fe)_2(Si,Al)_4O_{10}[(OH)_2,(H_2O)]$
Montmorillonite	$(Na,Ca)_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot 10H_2O$
Kaolinite	$Al_2Si_2O_5(OH)_4$
Clinochlore	$(Fe,Mg)_5Al(Si_3Al)O_{10}(OH)_8$

Semi-Quantitative X-ray Diffraction Results

Mineral	SB-02 (wt %)	SB-04 (wt %)	SB-05 (wt %)	SB-10 (wt %)
Quartz	44.3	49.1	48.3	58.8
Albite	3.0	3.1	2.9	4.8
Orthoclase	0.8	0.4	0.6	1.3
Magnetite	0.9	0.7	0.8	-
Rutile	0.9	0.9	0.8	0.9
Epidote	2.9	0.8	1.6	0.5
Muscovite	16.9	10.1	0.5	2.9
Biotite	-	-	2.2	1.1
Montmorillonite	11.7	15.1	13.2	7.5
Kaolinite	8.4	8.2	16.3	8.4
Illite	10.3	10.4	12.9	13.8
Clinochlore	-	1.1	-	-
TOTAL	100	100.0	100.0	100.0

Chemical Balance

SB-02

Name	Assay[1]	SQD[2]	Delta	Status
Oxygen	-	50.1	-	SQD
Silicon	32.3	33.2	-0.89	Both
Aluminum	6.83	9.28	-2.45	Both
Iron	3.39	3.16	0.23	Both
Potassium	1.62	2.55	-0.93	Both
Magnesium	0.70	-	-	Both
Titanium	0.46	0.55	-0.09	Both
Calcium	0.44	0.48	-0.04	Both
Sodium	0.24	0.21	0.03	Both
Manganese	0.06	-	-	XRF
Barium	0.04	-	-	XRF
Phosphorus	0.03	-	-	XRF
Hydrogen	-	0.29	-	SQD
Fluorine	-	0.21	-	SQD

1. Values measured by chemical assay. Reported in weight percent.

2. Values calculated based on mineral/compound formulas and quantites identified by semi-quantitative XRD.

SB-04

Name	Assay[1]	SQD[2]	Delta	Status
Oxygen	-	42.9	-	SQD
Silicon	32.7	29.9	2.83	Both
Aluminum	6.70	5.90	0.79	Both
Iron	3.41	2.88	0.53	Both
Potassium	0.97	1.88	-0.91	Both
Magnesium	0.57	0.20	0.37	Both
Titanium	0.57	0.55	0.02	Both
Calcium	0.36	0.14	0.22	Both
Sodium	0.09	0.21	-0.12	Both
Barium	0.03	-	-	XRF
Manganese	0.02	0.00	0.02	Both
Phosphorus	0.02	-	-	XRF
Vanadium	0.01	-	-	XRF
Hydrogen	-	0.27	-	SQD
Fluorine	-	0.13	-	SQD

Chemical Balance

SB-05

Name	Assay[1]	SQD[2]	Delta	Status
Oxygen	-	50.7	-	SQD
Silicon	31.7	34.4	-2.64	Both
Aluminum	7.62	8.21	-0.60	Both
Iron	3.28	3.77	-0.49	Both
Potassium	1.49	1.36	0.14	Both
Magnesium	0.56	0.24	0.32	Both
Titanium	0.50	0.47	0.03	Both
Calcium	0.36	0.26	0.10	Both
Sodium	0.14	0.20	-0.06	Both
Barium	0.04	-	-	XRF
Phosphorus	0.02	-	-	XRF
Manganese	0.01	-	-	XRF
Vanadium	0.01	-	-	XRF
Hydrogen	-	0.37	-	SQD
Fluorine	-	0.01	-	SQD

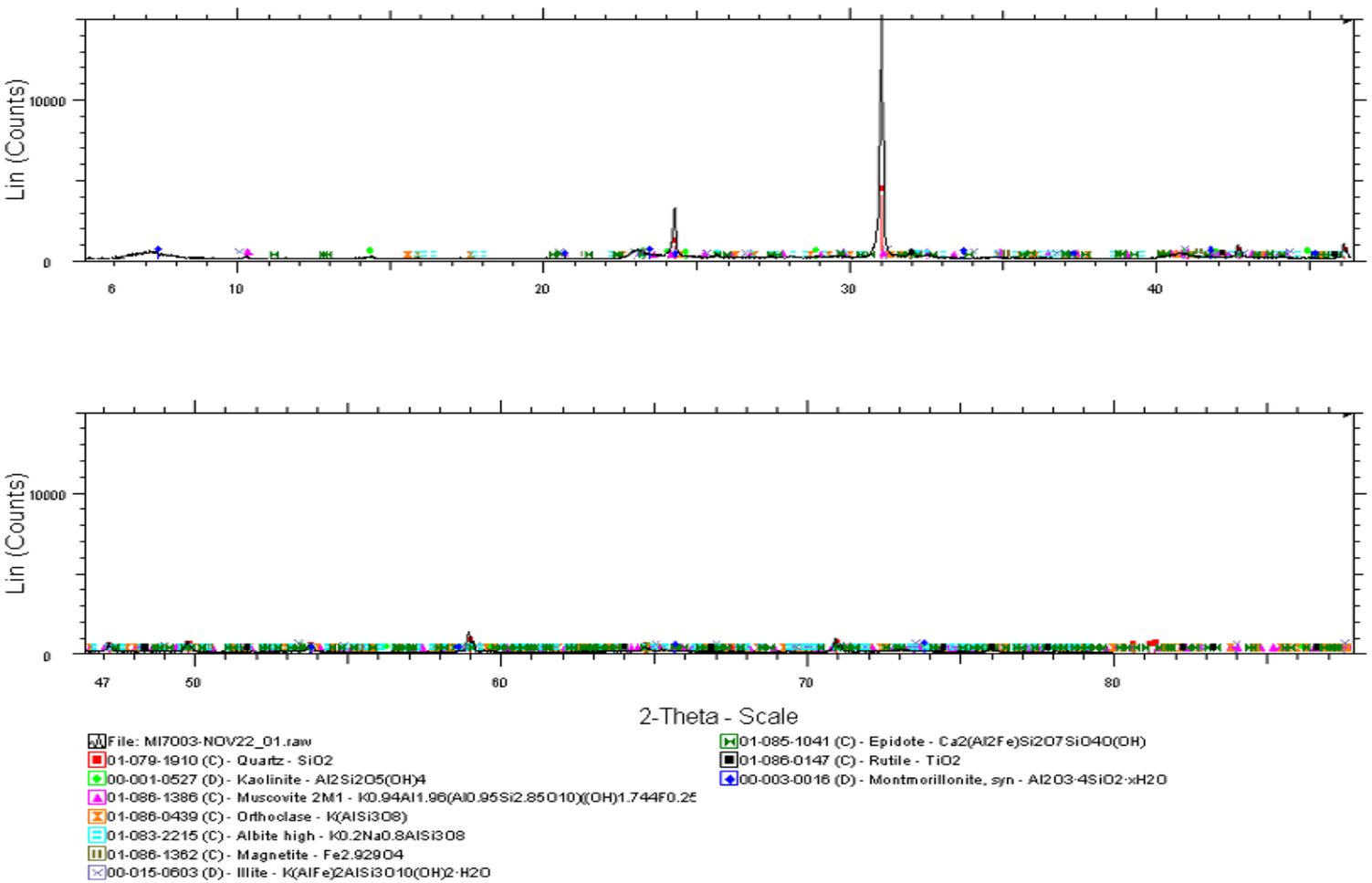
SB-10

Name	Assay[1]	SQD[2]	Delta	Status
Oxygen	-	50.6	-	SQD
Silicon	35.4	36.8	-1.33	Both
Aluminum	5.71	6.38	-0.67	Both
Iron	2.63	3.13	-0.50	Both
Potassium	1.34	1.73	-0.40	Both
Titanium	0.45	0.53	-0.08	Both
Magnesium	0.42	0.12	0.30	Both
Sodium	0.27	0.32	-0.05	Both
Calcium	0.26	0.09	0.17	Both
Barium	0.04	-	-	XRF
Phosphorus	0.02	-	-	XRF
Manganese	0.01	-	-	XRF
Vanadium	0.01	-	-	XRF
Hydrogen	-	0.26	-	SQD
Fluorine	-	0.04	-	SQD

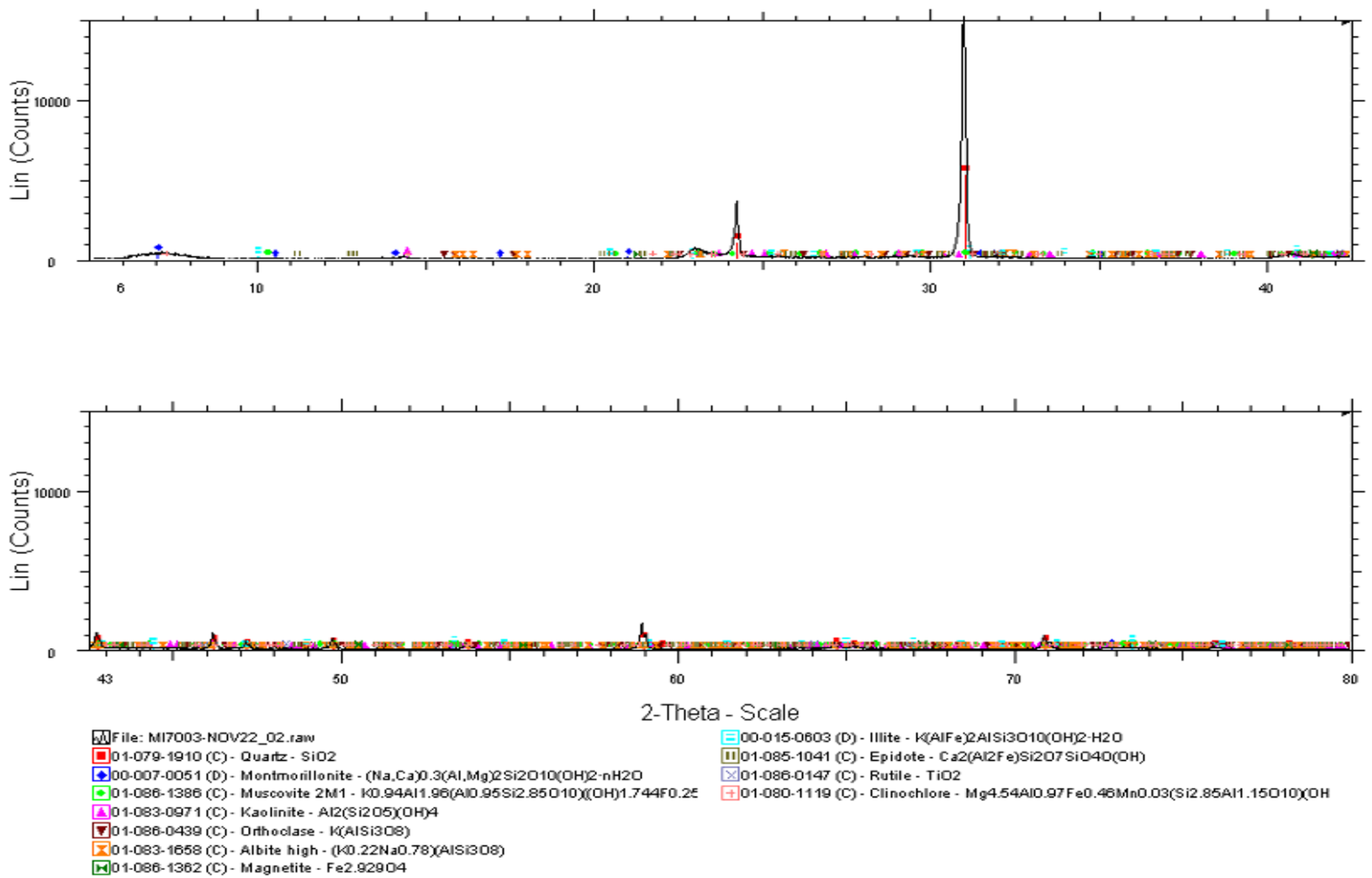
1. Values measured by chemical assay. Reported in weight percent.

2. Values calculated based on mineral/compound formulas and quantites identified by semi-quantitative XRD.

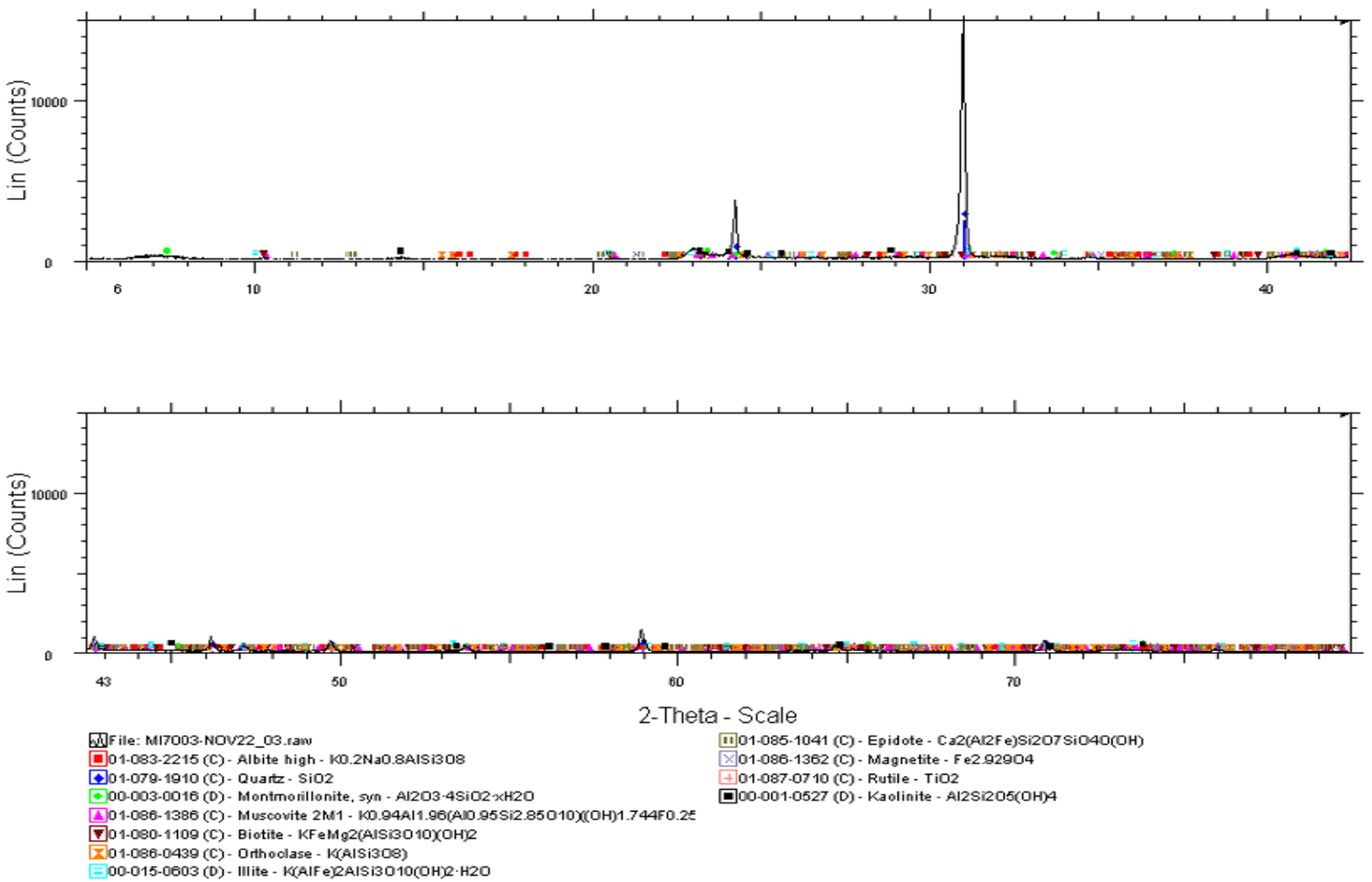
SB-02


Lin (Counts)
10000
0
6
10
20
30
40
Lin (Counts)
10000
0
47
50
60
70
80
2-Theta - Scale
File: MI7003-NOV22_01.raw
01-079-1910 (C) - Quartz - SiO2
00-001-0527 (D) - Kaolinite - Al2Si2O5(OH)4
01-086-1386 (C) - Muscovite 2M1 - K0.94Al1.96(Al0.95Si2.85O10)(OH)1.744F0.25
01-086-0439 (C) - Orthoclase - K(AlSi3O8)
01-083-2215 (C) - Albite high - K0.2Na0.8AlSi3O8
01-086-1362 (C) - Magnetite - Fe2.929O4
00-015-0603 (D) - Illite - K(AlFe)2AlSi3O10(OH)2·H2O
01-085-1041 (C) - Epidote - Ca2(Al2Fe)Si2O7SiO4O(OH)
01-086-0147 (C) - Rutile - TiO2
00-003-0016 (D) - Montmorillonite, syn - Al2O3·4SiO2·xH2O

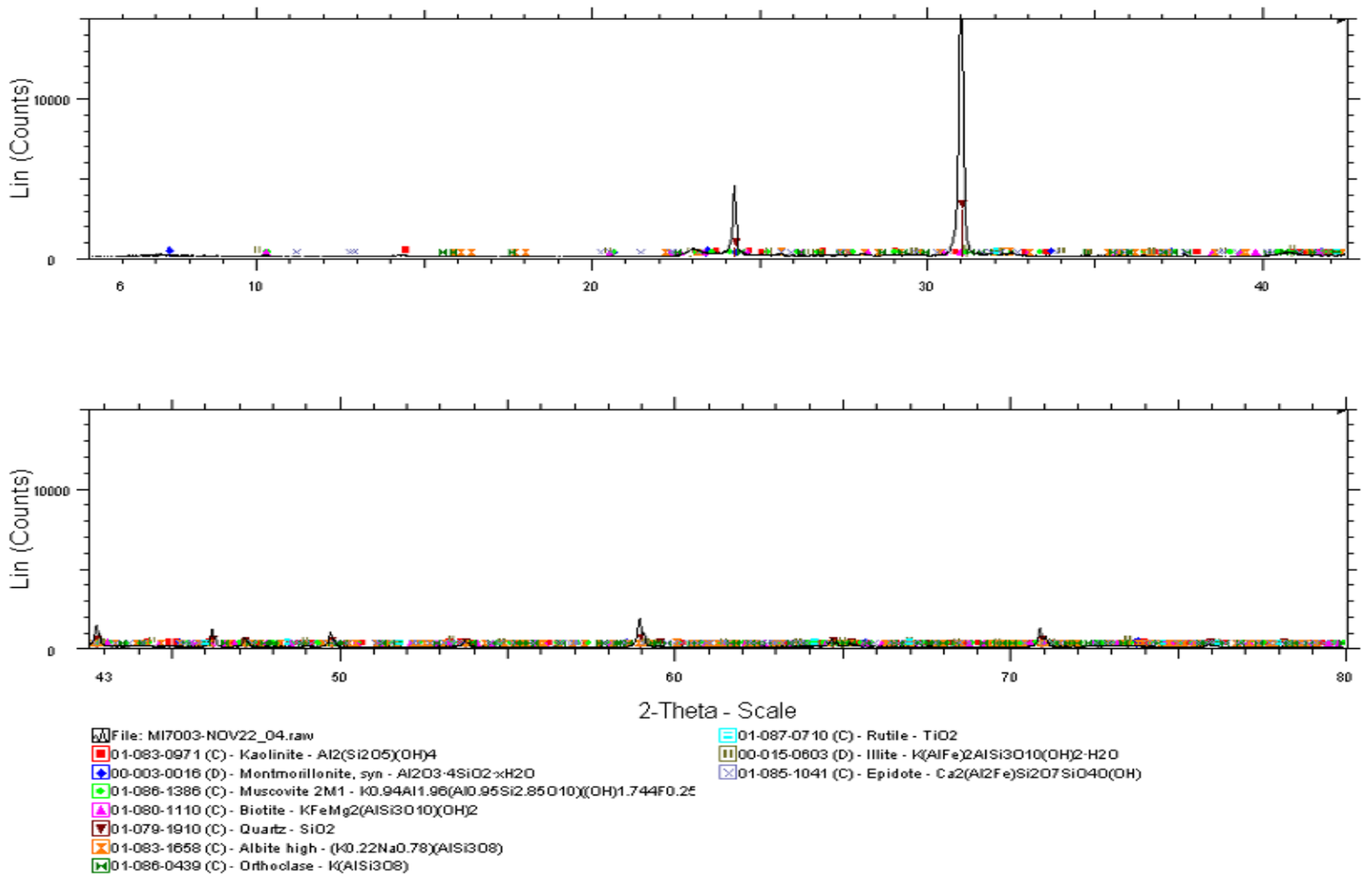
SB-04


Lin (Counts)
10000
0
6
10
20
30
40
Lin (Counts)
10000
0
43
50
60
70
80
2-Theta - Scale
File: MI7003-NOV22_02.raw
01-079-1910 (C) - Quartz - SiO2
00-007-0051 (D) - Montmorillonite - (Na,Ca)0.3(Al,Mg)2Si2O10(OH)2-nH2O
01-086-1386 (C) - Muscovite 2M1 - K0.94Al1.96(Al0.95Si2.85O10)((OH)1.744F0.25
01-083-0971 (C) - Kaolinite - Al2(Si2O5)(OH)4
01-086-0439 (C) - Orthoclase - K(AlSi3O8)
01-083-1658 (C) - Albite high - (K0.22Na0.78)(AlSi3O8)
01-086-1362 (C) - Magnetite - Fe2.929O4
00-015-0603 (D) - Illite - K(AlFe)2AlSi3O10(OH)2-H2O
01-085-1041 (C) - Epidote - Ca2(Al2Fe)Si2O7SiO4O(OH)
01-086-0147 (C) - Rutile - TiO2
01-080-1119 (C) - Clinochlore - Mg4.54Al0.97Fe0.46Mn0.03(Si2.85Al1.15O10)(OH

SB-05


Lin (Counts)
10000
0
6
10
20
30
40
Lin (Counts)
10000
0
43
50
60
70
2-Theta - Scale
File: MI7003-NOV22_03.raw
01-083-2215 (C) - Albite high - K0.2Na0.8AlSi3O8
01-079-1910 (C) - Quartz - SiO2
00-003-0016 (D) - Montmorillonite, syn - Al2O3·4SiO2·xH2O
01-086-1386 (C) - Muscovite 2M1 - K0.94Al1.96(Al0.95Si2.85O10)((OH)1.744F0.25
01-080-1109 (C) - Biotite - KFeMg2(AlSi3O10)(OH)2
01-086-0439 (C) - Orthoclase - K(AlSi3O8)
00-015-0603 (D) - Illite - K(AlFe)2AlSi3O10(OH)2·H2O
01-085-1041 (C) - Epidote - Ca2(Al2Fe)Si2O7SiO4O(OH)
01-086-1362 (C) - Magnetite - Fe2.929O4
01-087-0710 (C) - Rutile - TiO2
00-001-0527 (D) - Kaolinite - Al2Si2O5(OH)4

SB-10


Lin (Counts)
10000
0
6
10
20
30
40
Lin (Counts)
10000
0
43
50
60
70
80
2-Theta - Scale
File: MI7003-NOV22_04.raw
01-083-0971 (C) - Kaolinite - Al2(Si2O5)(OH)4
00-003-0016 (D) - Montmorillonite, syn - Al2O3·4SiO2·xH2O
01-086-1386 (C) - Muscovite 2M1 - K0.94Al1.96(Al0.95Si2.85O10)(OH)1.744F0.25
01-080-1110 (C) - Biotite - KFeMg2(AlSi3O10)(OH)2
01-079-1910 (C) - Quartz - SiO2
01-083-1658 (C) - Albite high - (K0.22Na0.78)(AlSi3O8)
01-086-0439 (C) - Orthoclase - K(AlSi3O8)
01-087-0710 (C) - Rutile - TiO2
00-015-0603 (D) - Illite - K(AlFe)2AlSi3O10(OH)2·H2O
01-085-1041 (C) - Epidote - Ca2(Al2Fe)Si2O7SiO4O(OH)

MINERALOGY DATA

prepared for:

WSP - Cooperative Engergy

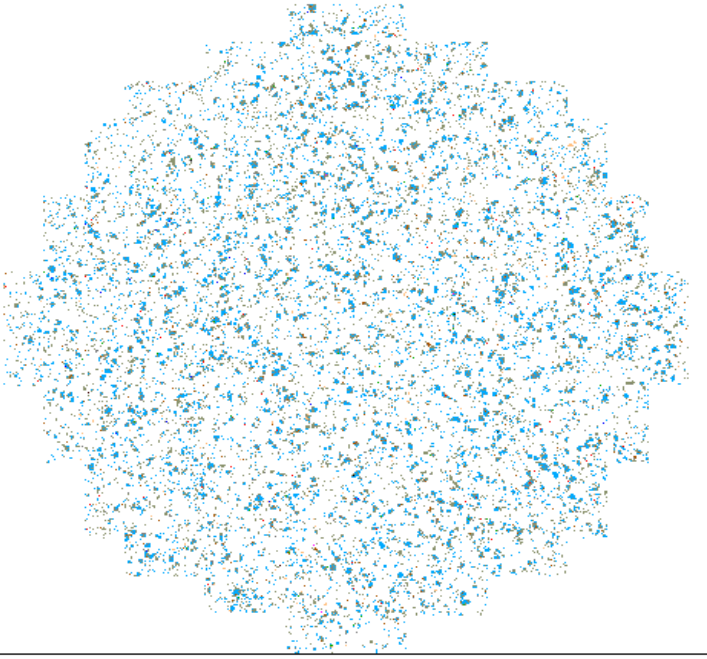
19465-004
MI7003-NOV22
March 8, 2023

Prepared by:

Michelle Kelvin/Lain Glossop
Senior Mineralogist/Senior Mineralogist

SB-02

Panorama - Modal - Coop Morrow
MI7003-NOV22 11A



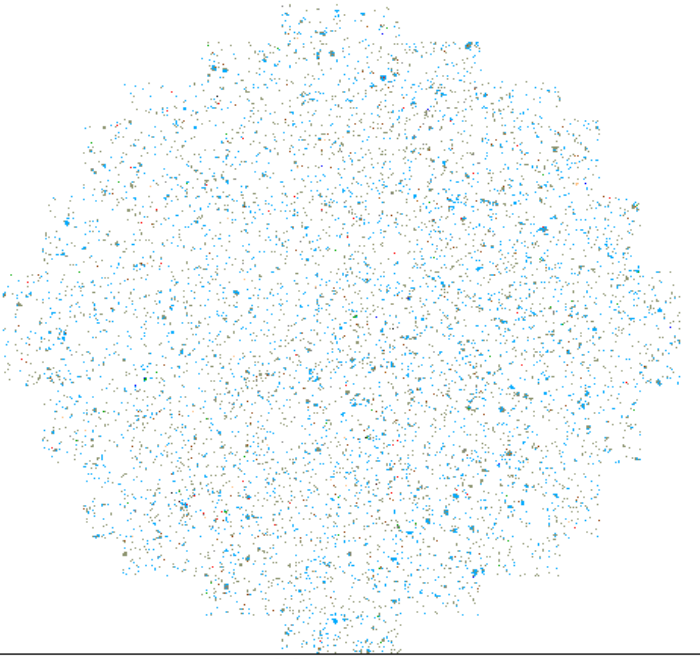
Modal - Coop Morrow

Mixed Clays	Quartz	Plagioclase	K-Feldspar	Ti Fe Oxide	Chlorites
Other Silicates	Carbonates/Sulphates/Phosphates		Iron Oxides	Other Oxides	Holes

Mosaic	Modal - Coop Morrow		TESCAN TIMA
View field: 25.5 mm	Date(m/d/y): 12/31/22	10 mm	
MI7003-NOV22 11A	TESCAN_Liberation analysis #1		

SB-04

Panorama - Modal - Coop Morrow
MI7003-NOV22 21A

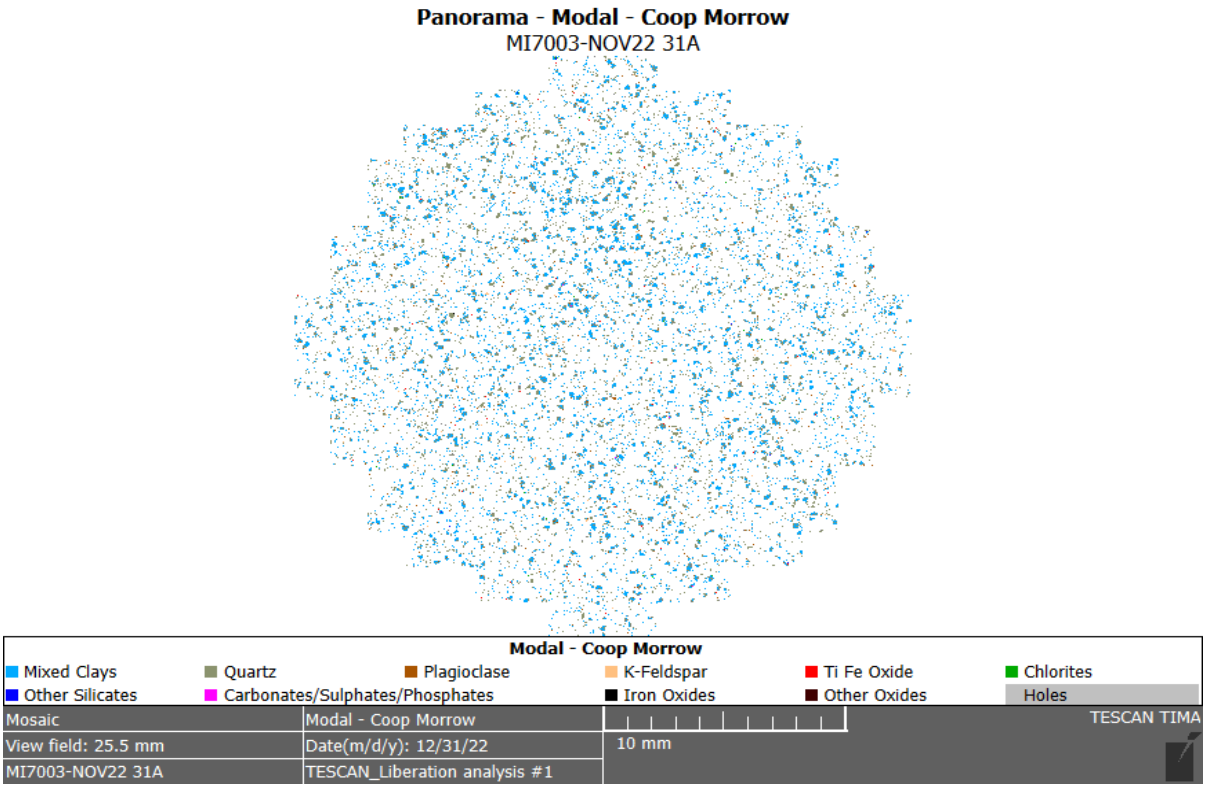


Modal - Coop Morrow

Quartz	Mixed Clays	Plagioclase	Chlorites	Ti Fe Oxide	K-Feldspar
Other Silicates	Iron Oxides	Carbonates/Sulphates/Phosphates		Holes	

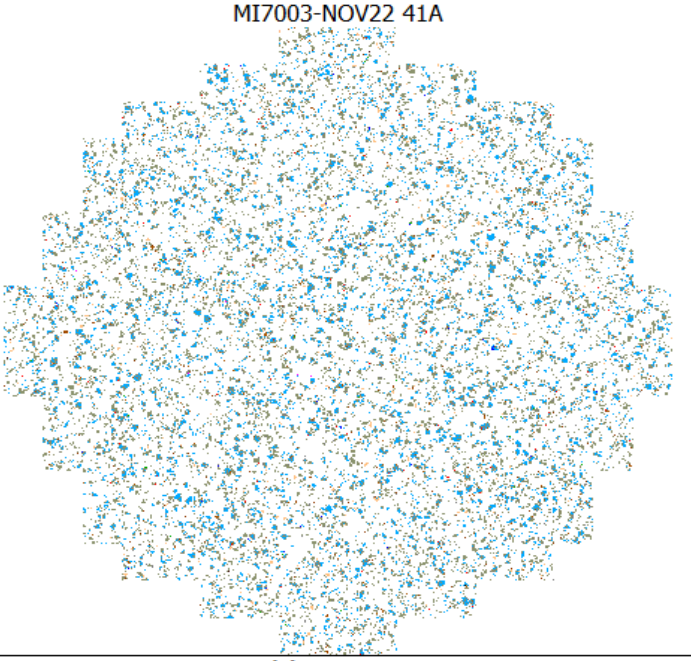
Mosaic	Modal - Coop Morrow		TESCAN TIMA
View field: 25.5 mm	Date(m/d/y): 12/31/22	10 mm	
MI7003-NOV22 21A	TESCAN_Liberation analysis #1		

SB-05


Panorama - Modal - Coop Morrow
MI7003-NOV22 31A
Modal - Coop Morrow
Mixed Clays
Quartz
Plagioclase
K-Feldspar
Ti Fe Oxide
Chlorites
Other Silicates
Carbonates/Sulphates/Phosphates
Iron Oxides
Other Oxides
Holes
Mosaic
Modal - Coop Morrow
TESCAN TIMA
View field: 25.5 mm
Date(m/d/y): 12/31/22
10 mm
MI7003-NOV22 31A
TESCAN_Liberation analysis #1

SB-10

Panorama - Modal - Coop Morrow
MI7003-NOV22 41A



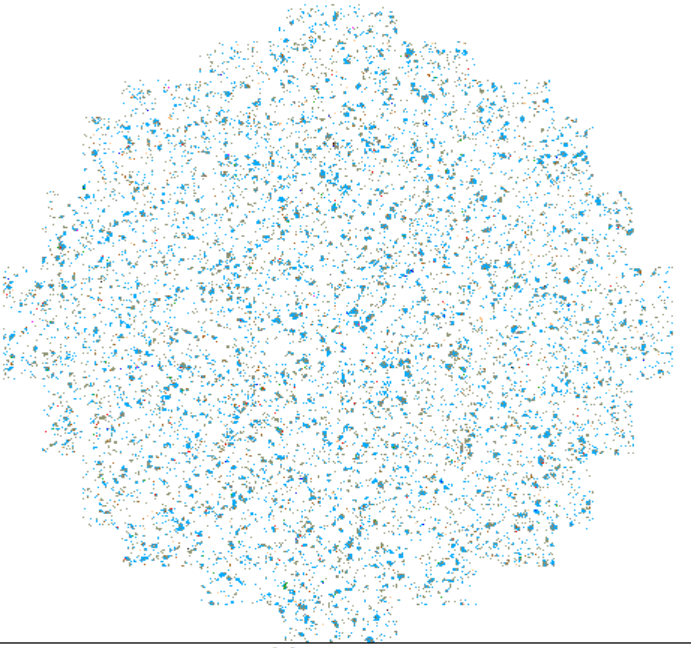
Modal - Coop Morrow

Quartz	Mixed Clays	Plagioclase	K-Feldspar	Ti Fe Oxide	Chlorites
Other Silicates	Other	Iron Oxides	Carbonates/Sulphates/Phosphates		Holes

Mosaic	Modal - Coop Morrow		TESCAN TIMA
View field: 25.5 mm	Date(m/d/y): 12/31/22	10 mm	
MI7003-NOV22 41A	TESCAN_Liberation analysis #1		

SB-02

Panorama - Modal - Coop Morrow
MI7003-NOV22 11B



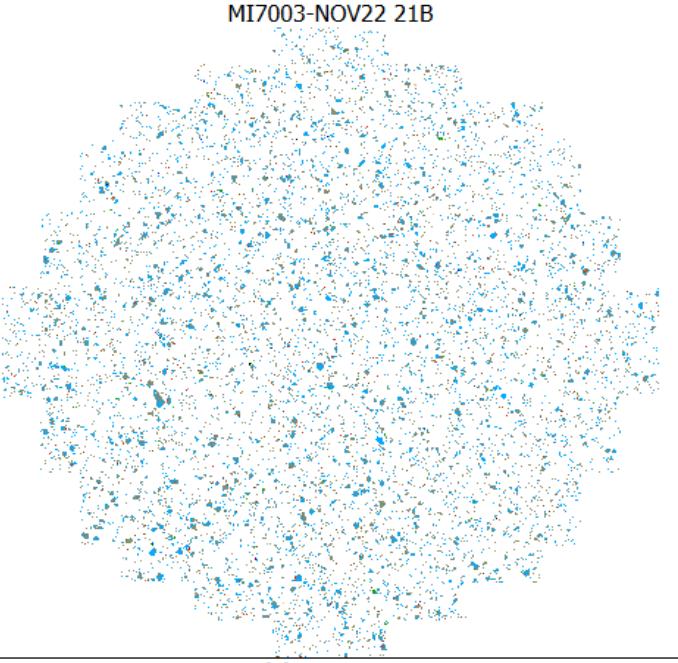
Modal - Coop Morrow

Mixed Clays	Quartz	Plagioclase	K-Feldspar	Ti Fe Oxide	Chlorites
Other Silicates	Iron Oxides	Carbonates/Sulphates/Phosphates		Holes	

Mosaic	Modal - Coop Morrow		TESCAN TIMA
View field: 25.5 mm	Date(m/d/y): 12/31/22	10 mm	
MI7003-NOV22 11B	TESCAN_Liberation analysis #1		

SB-04

Panorama - Modal - Coop Morrow
MI7003-NOV22 21B



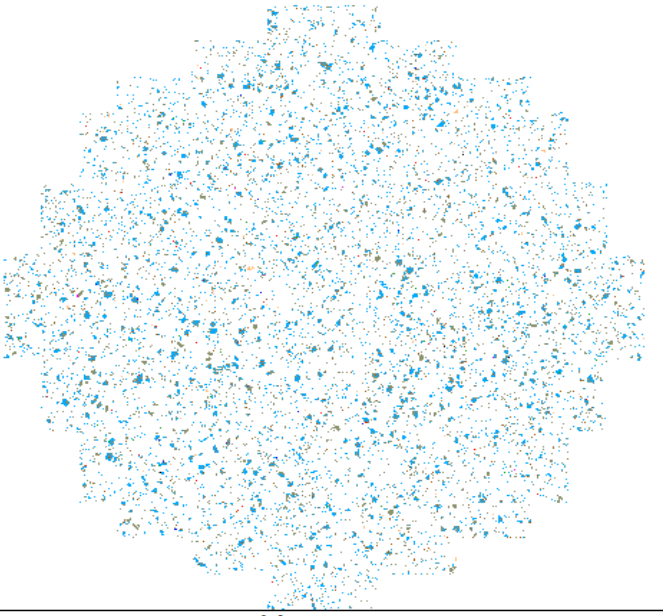
Modal - Coop Morrow

Quartz	Mixed Clays	Plagioclase	Chlorites	Ti Fe Oxide	K-Feldspar
Other Silicates	Iron Oxides	Carbonates/Sulphates/Phosphates		Other Oxides	Holes

Mosaic	Modal - Coop Morrow	10 mm	TESCAN TIMA
View field: 25.5 mm	Date(m/d/y): 12/31/22		
MI7003-NOV22 21B	TESCAN_Liberation analysis #1		

SB-05

Panorama - Modal - Coop Morrow
MI7003-NOV22 31B

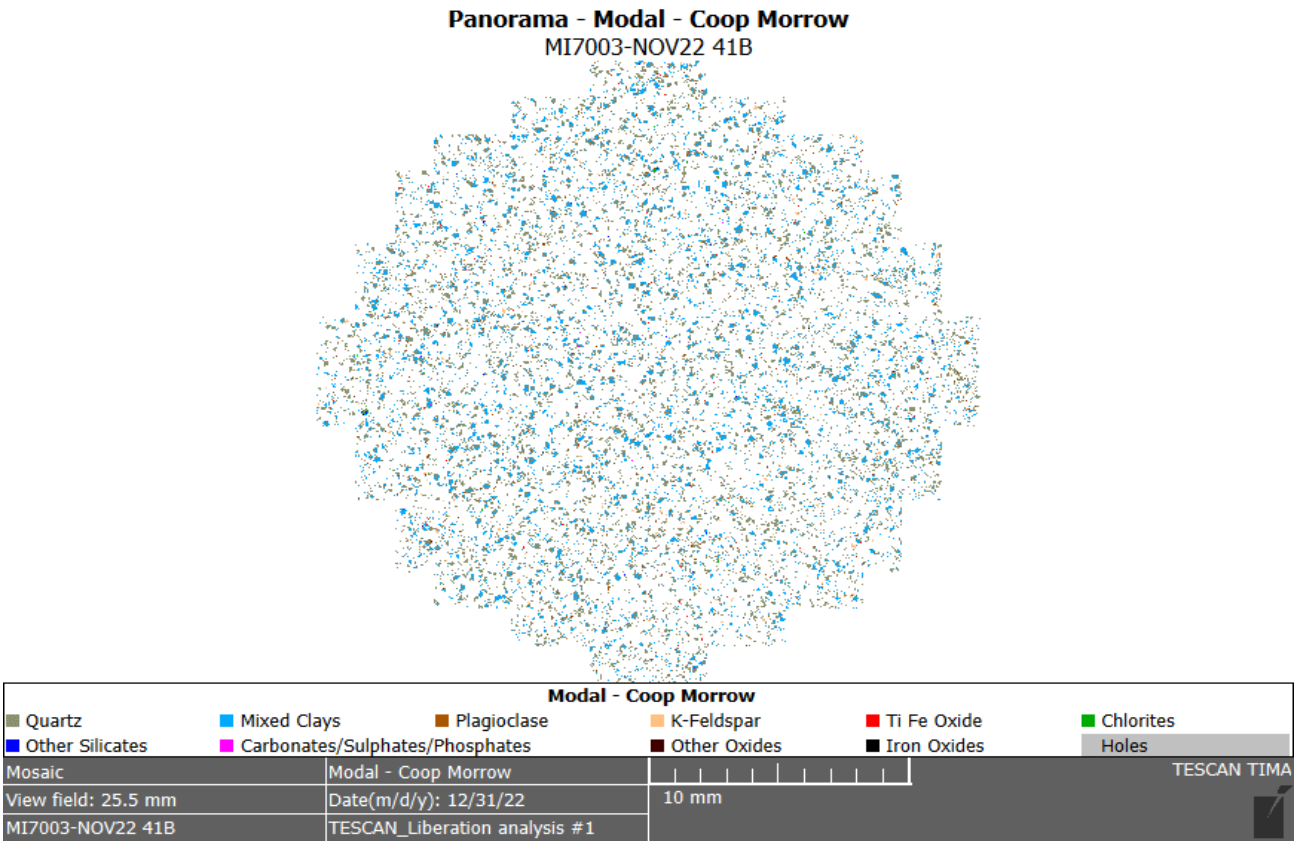


Modal - Coop Morrow

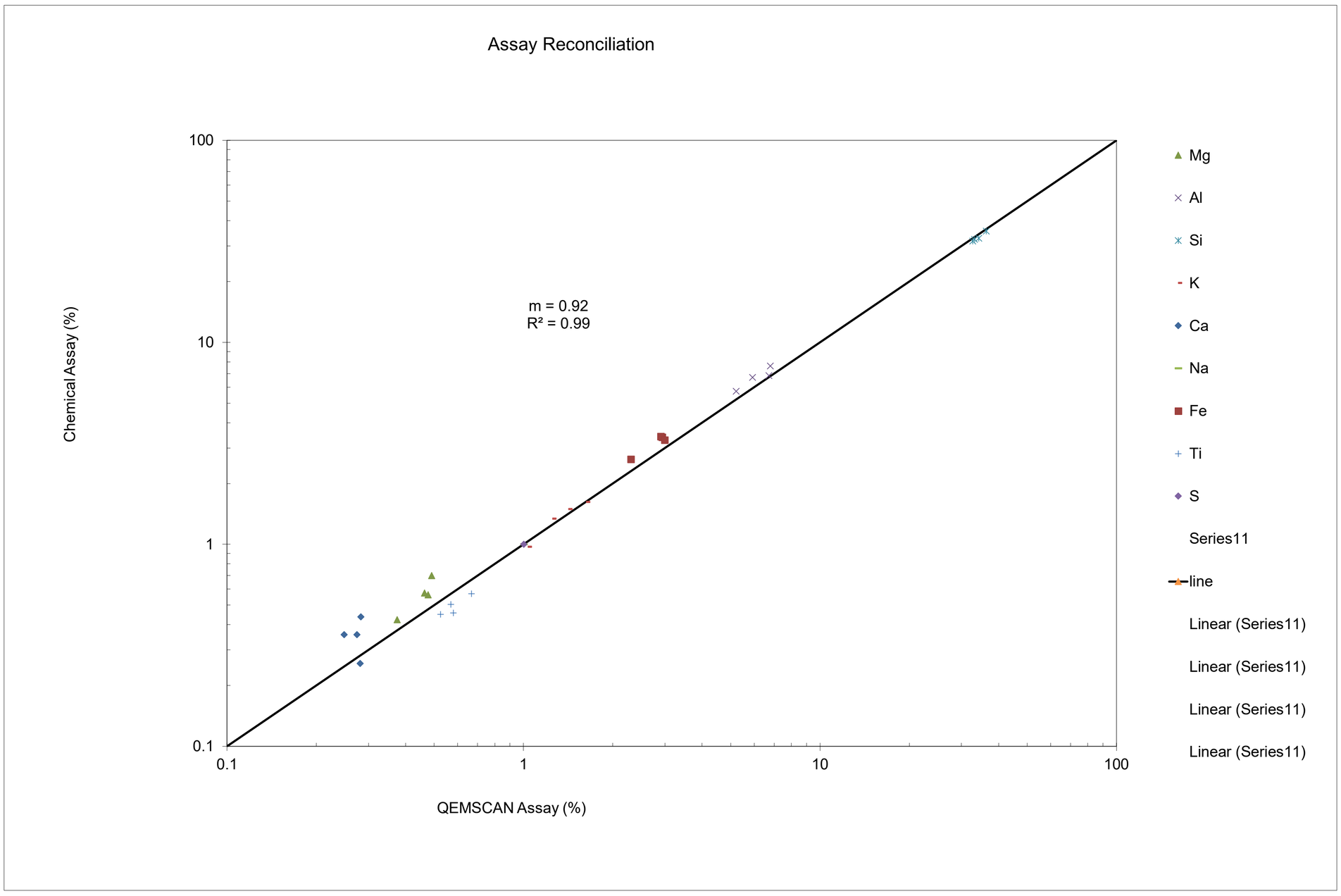
Mixed Clays	Quartz	Plagioclase	K-Feldspar	Ti Fe Oxide	Chlorites
Other Silicates	Carbonates/Sulphates/	Iron Oxides	Other	Other Oxides	Holes

Mosaic	Modal - Coop Morrow	TESCAN TIMA
View field: 25.5 mm	Date(m/d/y): 12/31/22	10 mm
MI7003-NOV22 31B	TESCAN_Liberation analysis #1	

SB-10


Panorama - Modal - Coop Morrow
MI7003-NOV22 41B
Modal - Coop Morrow
Quartz
Mixed Clays
Plagioclase
K-Feldspar
Ti Fe Oxide
Chlorites
Other Silicates
Carbonates/Sulphates/Phosphates
Other Oxides
Iron Oxides
Holes
Mosaic
Modal - Coop Morrow
TESCAN TIMA
View field: 25.5 mm
Date(m/d/y): 12/31/22
10 mm
MI7003-NOV22 41B
TESCAN_Liberation analysis #1

Elemental Mass (%)



Elemental Mass (%) Absolute

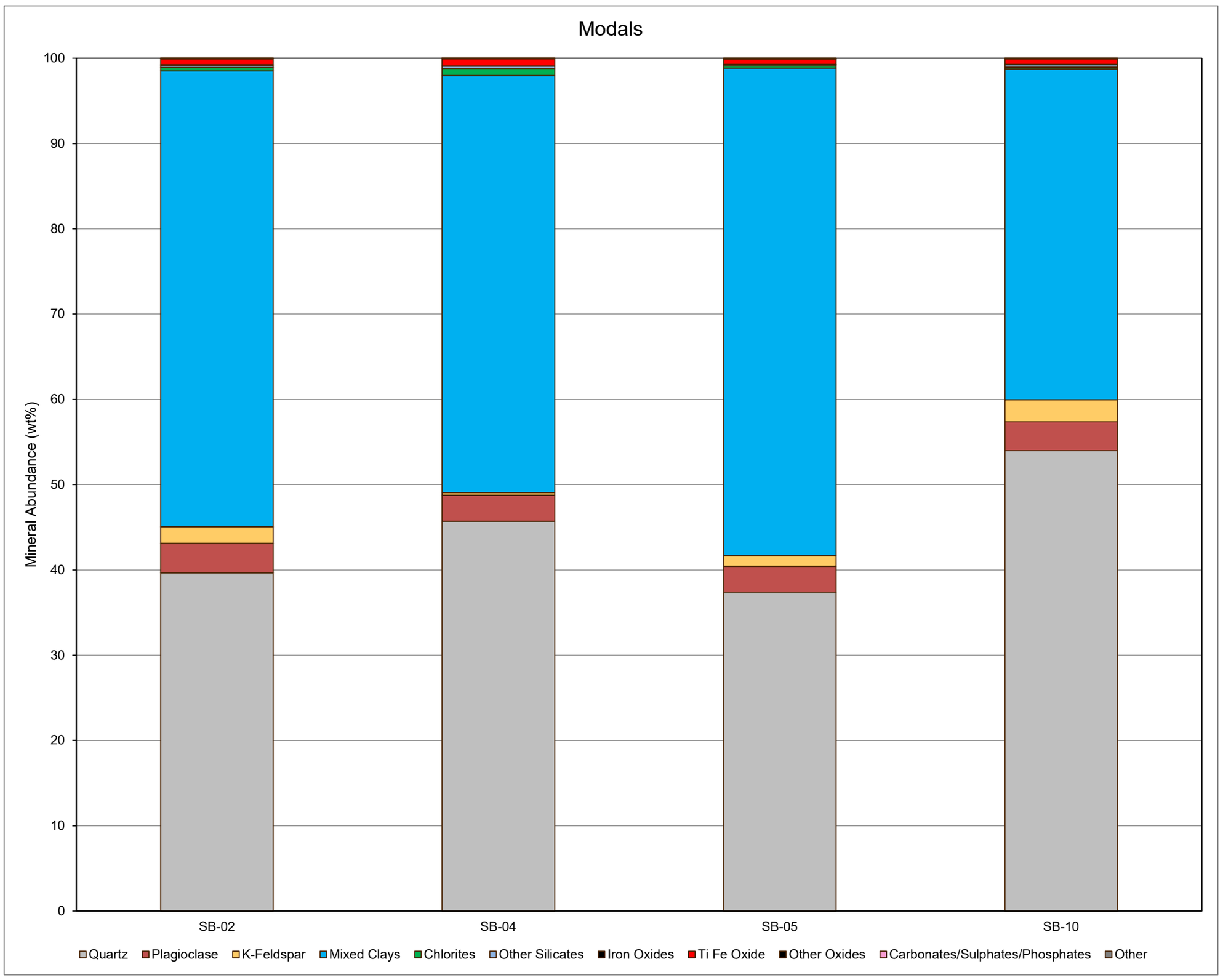
	Magnesium		Aluminum		Silicon		Potassium	
Mineral Name	Mg (Calculated)	Mg (Assay)	Al (Calculated)	Al (Assay)	Si (Calculated)	Si (Assay)	K (Calculated)	K (Assay)
SB-02	0.49	0.70	6.71	6.83	33.1	32.3	1.63	1.62
SB-04	0.46	0.57	5.92	6.70	34.3	32.7	1.04	0.97
SB-05	0.48	0.56	6.80	7.62	32.7	31.7	1.42	1.49
SB-10	0.38	0.42	5.20	5.71	36.3	35.4	1.25	1.34

	Calcium		Iron		Titanium	
Mineral Name	Ca (Calculated)	Ca (Assay)	Fe (Calculated)	Fe (Assay)	Ti (Calculated)	Ti (Assay)
SB-02	0.28	0.44	2.94	3.39	0.58	0.46
SB-04	0.25	0.36	2.90	3.41	0.67	0.57
SB-05	0.27	0.36	2.99	3.28	0.57	0.50
SB-10	0.28	0.26	2.30	2.63	0.52	0.45

WSP - Cooperative Energy
19465-04
MI7003-NOV22

Modals

Mineral (%)	SB-02	SB-04	SB-05	SB-10
Quartz	39.7	45.7	37.4	54.0
Plagioclase	3.47	3.06	3.04	3.41
K-Feldspar	1.93	0.28	1.22	2.58
Mixed Clays	53.5	48.9	57.2	38.8
Chlorites	0.42	0.81	0.23	0.23
Other Silicates	0.27	0.25	0.15	0.27
Iron Oxides	0.05	0.07	0.05	0.03
Ti Fe Oxide	0.69	0.84	0.63	0.65
Other Oxides	0.02	0.02	0.03	0.03
Carbonates/Sulphates/F	0.04	0.02	0.04	0.03
Other	0.01	0.01	0.01	0.02
Total	100	100	100	100



WSP - Cooperative Energy
19465-04
MI7003-NOV22

Summary Major and Trace Element Compositions Determined by EPMA (element wt%)

	Na	Mg	Al	Si	K	Ca	Ti	Mn	Fe	Rb	Cs	Ba	Cl	F
Mean DL	***0.013***	***0.010***	***0.008***	***0.009***	***0.008***	***0.010***	***0.035***	***0.035***	***0.048***	***0.029***	***0.042***	***0.174***	***0.033***	***0.041***
Illite/Clays - SB-02	0.11	0.87	9.15	24.25	1.78	0.34	0.37	0.04	5.45	0.03	0.00	0.06	0.15	0.09
Illite/Clays - SB-04	0.07	0.72	8.82	26.40	1.33	0.31	0.33	0.03	4.88	0.04	0.00	0.04	0.10	0.09
Illite/Clays - SB-05	0.11	0.69	10.19	25.91	1.75	0.24	0.38	0.02	4.43	0.04	0.00	0.04	0.11	0.11
Illite/Clays - SB-10	0.11	0.65	9.78	24.14	1.67	0.24	0.34	0.02	5.08	0.03	0.00	0.05	0.17	0.10
Ortholcase	0.37	0.00	9.66	30.53	13.24	0.00	0.03	0.00	0.03	0.04	0.00	0.21	0.02	0.00
Quartz/Fine Textures	0.06	0.13	1.17	43.91	0.20	0.22	0.04	0.03	0.41	0.06	0.00	0.04	0.05	0.12

Summary Major and Trace Element Compositions Determined by EPMA (element wt%)

	O	Total	*n*
Mean DL			
Illite/Clays - SB-02	38.64	81.33	*36*
Illite/Clays - SB-04	40.40	83.57	*37*
Illite/Clays - SB-05	41.01	85.04	*36*
Illite/Clays - SB-10	38.73	81.13	*37*
Ortholcase	46.28	100.4	*1*
Quartz/Fine Textures	51.41	97.87	*1*

Summary Trace Element Compositions Determined by LA-ICP-MS (ppm)

	Li	Be	B	Al	Ca	Sc	Ti	V	Cr	Rb	Sr	Cs	Ba	*n*
Mean DL	***1.82***	***0.57***	***17.75***	***2.70***	***521.31***	***0.47***	***2.41***	***0.32***	***6.72***	***0.41***	***0.03***	***0.15***	***0.06***	
Illite/Clays - SB-02	50.99	3.63	51.49	92274	3892	12.83	3615	126	92.76	155.3	94.94	9.52	456.6	*36*
Illite/Clays - SB-04	31.41	2.35	48.19	87543	3418	11.95	4292	115	72.38	124.3	62.04	8.58	299.9	*37*
Illite/Clays - SB-05	39.68	2.77	59.32	100412	2773	13.41	3743	129	77.41	156.9	65.32	9.66	335.3	*36*
Illite/Clays - SB-10	39.54	3.23	58.31	92703	3041	12.91	3409	141	75.29	150.8	70.77	9.45	364.1	*37*
Ortholcase	BD	BD	46.08	106077	BD	0.81	25.67	1.01	BD	311.6	190.8	0.95	3053	*1*

Major and Trace Element Compositions by EPMA and LA-ICP-MS (wt%)																	
Sample	**Mineral**	**EPMA**															**LA-ICP-MS**
		Na	**Mg**	**Al**	**Si**	**K**	**Ca**	**Ti**	**Mn**	**Fe**	**Rb**	**Cs**	**Ba**	**Cl**	**F**	**O**	**Total**	**Li**
	Mean DL	***0.01***	***0.01***	***0.01***	***0.01***	***0.01***	***0.01***	***0.03***	***0.03***	***0.05***	***0.03***	***0.04***	***0.17***	***0.03***	***0.04***			***0.0002***
SB-02	**Illite/Clays**	0.06	1.12	9.90	25.61	1.60	0.45	0.19	0.05	8.90	0.03	0.00	0.11	0.04	0.13	41.9	90.09	0.004
	Illite/Clays	0.06	1.02	12.32	22.73	2.42	0.24	0.46	0.00	4.72	0.03	0.02	0.16	0.08	0.10	39.8	84.13	0.004
	Illite/Clays	0.09	1.00	9.96	22.11	1.45	0.24	0.21	0.03	5.00	0.03	0.00	0.00	0.13	0.12	36.5	76.87	0.004
	Illite/Clays	0.10	0.97	9.11	26.02	1.68	0.32	0.23	0.04	5.03	0.03	0.00	0.03	0.12	0.10	40.5	84.24	0.006
	Illite/Clays	0.07	0.87	7.68	28.84	1.28	0.27	0.26	0.03	4.89	0.04	0.01	0.06	0.17	0.12	42.2	86.77	0.005
	Illite/Clays	0.08	0.59	6.81	29.17	1.59	0.42	0.35	0.03	4.98	0.04	0.00	0.08	0.19	0.06	41.8	86.21	0.006
	Illite/Clays	0.06	0.73	8.20	23.90	1.69	0.15	0.33	0.04	4.97	0.03	0.00	0.08	0.32	0.08	37.0	77.62	0.006
	Illite/Clays	0.06	0.96	7.76	24.12	1.28	0.71	0.33	0.06	7.33	0.03	0.00	0.00	0.16	0.09	37.9	80.74	0.005
	Illite/Clays	0.07	0.90	7.77	23.76	1.19	0.31	0.20	0.03	6.67	0.04	0.00	0.12	0.26	0.11	37.0	78.39	0.004
	Illite/Clays	0.05	0.77	8.10	29.52	1.70	0.20	0.28	0.02	2.86	0.04	0.00	0.07	0.13	0.10	42.8	86.59	0.006
	Illite/Clays	0.08	0.92	9.57	21.06	1.37	0.58	0.21	0.00	6.14	0.02	0.00	0.06	0.23	0.09	35.5	75.83	0.005
	Illite/Clays	0.06	0.92	10.59	21.32	1.64	0.37	0.48	0.05	6.98	0.02	0.00	0.12	0.13	0.11	37.1	79.91	0.005
	Illite/Clays	0.07	0.61	7.43	28.65	1.85	0.25	0.12	0.02	4.14	0.04	0.00	0.06	0.11	0.09	41.4	84.84	0.005
	Illite/Clays	0.09	1.04	10.10	21.82	1.93	0.38	0.27	0.04	4.44	0.04	0.00	0.05	0.14	0.06	36.5	76.95	0.004
	Illite/Clays	0.07	0.93	9.39	23.88	1.72	0.46	0.29	0.01	4.99	0.04	0.00	0.00	0.12	0.05	38.3	80.28	0.005
	Illite/Clays	0.10	0.82	9.43	22.33	1.76	0.49	0.20	0.06	6.40	0.03	0.00	0.00	0.11	0.10	36.9	78.75	0.004
	Illite/Clays	0.13	0.62	7.86	27.80	1.97	0.23	0.39	0.07	5.48	0.04	0.00	0.04	0.15	0.08	41.4	86.26	0.007
	Illite/Clays	0.04	0.63	6.91	29.84	1.10	0.29	0.47	0.04	2.92	0.03	0.00	0.00	0.08	0.06	42.0	84.47	0.007
	Illite/Clays	0.05	1.01	8.97	29.31	1.38	0.23	0.18	0.04	5.95	0.04	0.00	0.03	0.05	0.15	44.2	91.62	0.011
	Illite/Clays	0.72	0.80	8.51	23.21	1.38	0.45	0.16	0.03	5.14	0.05	0.00	0.00	0.15	0.05	36.8	77.44	0.004
	Illite/Clays	0.08	0.74	7.61	24.96	1.41	0.26	0.27	0.02	5.12	0.03	0.00	0.09	0.18	0.05	37.7	78.53	0.006
	Illite/Clays	0.05	0.75	7.04	21.89	1.19	0.44	0.27	0.25	13.43	0.02	0.00	0.06	0.19	0.15	36.1	81.88	0.004
	Illite/Clays	0.88	0.02	8.31	26.08	9.72	0.10	0.01	0.00	0.10	0.01	0.02	0.26	0.16	0.00	39.5	85.17	0.001
	Illite/Clays	0.08	0.92	8.79	23.10	1.52	0.26	0.60	0.04	5.28	0.03	0.00	0.10	0.24	0.08	37.1	78.09	0.006
	Illite/Clays	0.06	1.02	9.59	21.51	1.31	0.44	0.57	0.02	4.41	0.03	0.01	0.03	0.06	0.14	35.8	74.96	0.004
	Illite/Clays	0.09	0.93	8.65	22.37	1.76	0.40	0.44	0.10	9.85	0.03	0.00	0.00	0.17	0.12	37.4	82.33	0.006
	Illite/Clays	0.09	0.99	8.53	24.87	1.81	0.35	0.27	0.03	5.07	0.03	0.00	0.07	0.17	0.11	38.7	81.09	0.005
	Illite/Clays	0.08	1.00	8.75	26.26	1.49	0.32	0.18	0.04	5.32	0.06	0.00	0.00	0.14	0.09	40.4	84.16	0.005
	Illite/Clays	0.07	0.95	9.89	20.94	1.93	0.27	0.19	0.06	4.80	0.04	0.01	0.04	0.28	0.15	35.2	74.85	0.005
	Illite/Clays	0.09	1.90	10.21	22.79	1.38	0.26	0.23	0.07	3.99	0.05	0.00	0.06	0.11	0.13	38.0	79.25	0.006
	Illite/Clays	0.07	0.78	8.14	23.50	1.56	0.37	0.32	0.02	4.76	0.06	0.00	0.00	0.18	0.06	36.6	76.37	0.005
	Illite/Clays	0.07	0.94	8.98	19.93	1.93	0.50	2.92	0.03	5.72	0.03	0.00	0.00	0.10	0.14	35.5	76.77	0.003
	Illite/Clays	0.08	1.21	12.02	24.69	1.70	0.40	0.34	0.02	6.55	0.02	0.00	0.06	0.05	0.14	42.2	89.51	0.005
	Illite/Clays	0.02	0.13	19.32	21.55	0.10	0.07	0.05	0.00	0.54	0.01	0.00	0.01	0.03	0.05	42.0	83.92	0.000
	Illite/Clays	0.08	0.90	8.18	19.19	1.45	0.35	0.61	0.05	7.82	0.03	0.00	0.04	0.31	0.05	32.8	71.82	0.003
	Average	0.114	0.869	9.154	24.246	1.779	0.338	0.369	0.042	5.448	0.034	0.002	0.055	0.150	0.095	38.6	81.334	0.005
	Orthoclase	0.373	0.000	9.665	30.532	13.239	0.004	0.028	0.001	0.034	0.040	0.000	0.213	0.019	0.000	46.3	100.43	BD

Sample	Mineral	EPMA															LA-ICP-MS
		Na	Mg	Al	Si	K	Ca	Ti	Mn	Fe	Rb	Cs	Ba	Cl	F	O	Total	Li
		0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.03*	*0.03*	*0.05*	*0.03*	*0.04*	*0.17*	*0.03*	*0.04*			*0.0002*
SB-04	Illite/Clays	0.04	0.61	9.90	27.71	0.93	0.32	0.37	0.01	5.31	0.05	0.00	0.02	0.00	0.08	42.87	88.22	0.004
	Illite/Clays	0.05	0.89	10.20	23.51	1.30	0.39	0.25	0.04	6.05	0.03	0.01	0.06	0.10	0.06	38.77	81.72	0.003
	Illite/Clays	0.10	1.30	12.58	27.30	1.89	0.40	0.26	0.02	6.07	0.04	0.00	0.02	0.05	0.15	45.61	95.80	0.003
	Illite/Clays	0.10	1.31	11.73	24.26	2.31	0.31	0.38	0.05	5.91	0.03	0.02	0.10	0.08	0.13	41.49	88.19	0.003
	Illite/Clays	0.08	1.14	11.63	25.39	2.66	0.38	0.43	0.03	5.61	0.03	0.01	0.16	0.05	0.15	42.60	90.34	0.004
	Illite/Clays	0.11	0.89	11.06	24.91	2.08	0.46	0.34	0.02	5.98	0.06	0.00	0.00	0.03	0.11	41.36	87.40	0.003
	Illite/Clays	0.05	0.69	9.37	24.34	1.45	0.32	0.40	0.03	5.17	0.04	0.02	0.09	0.17	0.12	38.66	80.93	0.003
	Illite/Clays	0.06	0.51	6.63	27.06	0.88	0.25	0.37	0.04	4.16	0.04	0.00	0.02	0.12	0.12	38.75	79.02	0.004
	Illite/Clays	0.05	0.55	7.81	28.93	0.99	0.33	0.41	0.03	3.67	0.04	0.00	0.00	0.04	0.03	41.95	84.83	0.003
	Illite/Clays	0.06	0.97	10.42	26.47	1.50	0.30	0.30	0.03	6.22	0.05	0.01	0.15	0.07	0.09	42.50	89.13	0.003
	Illite/Clays	0.09	0.57	11.36	26.88	1.34	0.19	0.24	0.00	4.09	0.04	0.00	0.02	0.06	0.04	42.81	87.72	0.003
	Illite/Clays	0.06	0.52	6.38	20.44	1.16	0.32	0.25	0.03	3.09	0.04	0.00	0.12	0.17	0.06	30.71	63.35	0.002
	Illite/Clays	0.05	0.58	7.94	28.22	0.87	0.24	0.42	0.03	4.80	0.04	0.00	0.05	0.11	0.09	41.51	84.95	0.004
	Illite/Clays	0.05	0.44	7.13	29.04	0.66	0.20	0.26	0.01	4.04	0.04	0.00	0.02	0.13	0.11	41.22	83.36	0.003
	Illite/Clays	0.05	0.37	5.37	28.35	0.65	0.41	0.27	0.03	5.68	0.04	0.00	0.00	0.12	0.15	39.37	80.87	0.003
	Illite/Clays	0.04	0.70	6.68	24.64	1.05	0.32	0.21	0.03	4.20	0.04	0.00	0.10	0.27	0.12	36.09	74.47	0.003
	Illite/Clays	0.06	1.03	11.87	25.11	1.79	0.35	0.52	0.02	5.53	0.04	0.00	0.01	0.03	0.08	42.30	88.74	0.003
	Illite/Clays	0.06	0.96	9.58	21.93	1.59	0.40	0.33	0.05	4.41	0.04	0.00	0.00	0.12	0.08	36.09	75.64	0.003
	Illite/Clays	0.05	0.69	6.39	29.76	0.92	0.28	0.60	0.02	4.23	0.03	0.00	0.00	0.14	0.09	41.92	85.11	0.000
	Illite/Clays	0.11	0.74	10.51	25.32	1.84	0.27	0.42	0.03	4.67	0.04	0.00	0.12	0.06	0.02	40.83	84.97	0.003
	Illite/Clays	0.11	0.71	8.45	25.31	2.11	0.24	0.27	0.04	3.82	0.04	0.00	0.01	0.14	0.03	38.64	79.90	0.003
	Illite/Clays	0.05	0.45	5.78	34.95	0.62	0.29	0.16	0.01	2.14	0.06	0.01	0.00	0.17	0.05	46.19	90.94	0.000
	Illite/Clays	0.08	0.64	9.58	26.75	0.99	0.45	0.49	0.02	4.16	0.04	0.00	0.04	0.09	0.05	41.34	84.71	0.003
	Illite/Clays	0.06	0.44	6.33	27.07	1.04	0.25	0.41	0.02	3.45	0.02	0.00	0.03	0.05	0.04	38.33	77.53	0.003
	Illite/Clays	0.05	0.45	6.36	30.53	0.60	0.32	0.28	0.03	2.77	0.04	0.01	0.00	0.12	0.00	41.98	83.55	0.003
	Illite/Clays	0.06	0.50	7.22	24.51	0.81	0.27	0.42	0.00	5.03	0.04	0.00	0.00	0.18	0.06	36.63	75.72	0.003
	Illite/Clays	0.07	0.59	7.97	30.36	0.97	0.28	0.24	0.03	4.65	0.05	0.00	0.04	0.14	0.08	43.86	89.33	0.004
	Illite/Clays	0.08	0.62	8.38	25.70	0.99	0.39	0.21	0.03	4.27	0.03	0.03	0.00	0.13	0.05	38.88	79.79	0.003
	Illite/Clays	0.08	1.01	9.90	26.69	1.72	0.16	0.44	0.04	5.86	0.04	0.00	0.03	0.10	0.07	42.28	88.42	0.003
	Illite/Clays	0.07	0.68	8.27	23.33	1.16	0.26	0.20	0.06	11.15	0.04	0.00	0.04	0.15	0.15	38.01	83.58	0.002
	Illite/Clays	0.06	0.78	9.51	24.85	1.11	0.18	0.37	0.02	6.05	0.03	0.00	0.09	0.07	0.09	39.56	82.77	0.003
	Illite/Clays	0.09	0.58	7.94	21.72	1.86	0.30	0.41	0.03	6.01	0.03	0.00	0.01	0.06	0.07	34.68	73.78	0.002
	Illite/Clays	0.15	0.90	12.28	24.33	2.84	0.38	0.28	0.04	4.84	0.05	0.00	0.11	0.07	0.15	41.56	87.96	0.003
	Illite/Clays	0.06	0.67	8.06	29.45	0.94	0.35	0.24	0.03	3.78	0.06	0.00	0.08	0.10	0.08	42.73	86.63	0.003
	Illite/Clays	0.06	0.71	9.88	27.59	1.15	0.36	0.22	0.02	4.44	0.03	0.00	0.02	0.08	0.19	42.43	87.18	0.003
	Illite/Clays	0.04	0.73	7.16	27.52	0.99	0.42	0.23	0.05	4.47	0.03	0.01	0.01	0.17	0.15	39.95	81.94	0.004
	Average	0.07	0.72	8.82	26.40	1.33	0.31	0.33	0.03	4.88	0.04	0.00	0.04	0.10	0.09	40.40	83.57	0.003

Sample	Mineral	EPMA															LA-ICP-MS
		Na	Mg	Al	Si	K	Ca	Ti	Mn	Fe	Rb	Cs	Ba	Cl	F	O	Total	Li
		0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.03*	*0.03*	*0.05*	*0.03*	*0.04*	*0.17*	*0.03*	*0.04*			*0.0002*
SB-05	Quartz (fine?)	0.06	0.13	1.17	43.91	0.20	0.22	0.04	0.03	0.41	0.06	0.00	0.04	0.05	0.12	51.41	97.87	0.000
	Illite/Clays	0.09	0.58	10.81	22.29	1.33	0.18	2.54	0.00	4.41	0.04	0.00	0.05	0.03	0.05	38.71	81.10	0.003
	Illite/Clays	0.10	0.76	11.84	25.67	1.47	0.37	0.35	0.00	4.92	0.05	0.00	0.03	0.09	0.08	42.37	88.10	0.004
	Illite/Clays	0.05	0.56	7.95	24.00	1.13	0.41	0.21	0.04	3.64	0.04	0.00	0.02	0.22	0.08	36.32	74.66	0.004
	Illite/Clays	0.07	0.51	9.08	22.87	1.49	0.30	0.27	0.02	4.76	0.02	0.00	0.02	0.09	0.07	36.44	76.02	0.004
	Illite/Clays	0.09	0.69	9.74	27.45	1.58	0.23	0.21	0.01	4.71	0.05	0.00	0.07	0.08	0.16	42.27	87.35	0.004
	Illite/Clays	0.10	0.81	9.88	25.37	1.62	0.28	0.31	0.02	4.65	0.05	0.00	0.00	0.08	0.09	40.20	83.46	0.004
	Illite/Clays	0.10	0.77	10.80	23.60	1.87	0.18	0.30	0.03	4.76	0.03	0.00	0.06	0.06	0.28	38.96	81.81	0.006
	Illite/Clays	0.06	0.62	8.01	27.98	1.35	0.35	0.25	0.02	3.33	0.05	0.00	0.02	0.26	0.10	40.89	83.31	0.005
	Illite/Clays	0.07	0.65	9.27	26.79	1.27	0.30	0.19	0.02	4.02	0.04	0.00	0.04	0.11	0.09	40.85	83.70	0.004
	Illite/Clays	0.09	0.64	8.92	25.53	1.41	0.41	0.18	0.00	3.95	0.04	0.00	0.00	0.15	0.10	39.12	80.53	0.004
	Illite/Clays	0.11	0.63	9.80	24.31	2.25	0.34	0.59	0.02	3.85	0.02	0.00	0.00	0.08	0.11	38.92	81.02	0.004
	Illite/Clays	0.11	0.64	10.78	25.08	1.38	0.40	0.52	0.02	4.35	0.06	0.00	0.10	0.13	0.09	40.61	84.27	0.005
	Illite/Clays	0.13	0.66	11.14	27.88	2.00	0.26	0.29	0.01	4.46	0.03	0.00	0.00	0.07	0.11	44.08	91.12	0.004
	Illite/Clays	0.13	0.90	12.56	26.92	2.14	0.21	0.33	0.06	4.93	0.04	0.00	0.01	0.01	0.07	44.64	92.95	0.003
	Illite/Clays	0.10	0.57	9.81	24.66	1.55	0.23	0.25	0.03	4.31	0.05	0.00	0.13	0.06	0.10	39.02	80.88	0.004
	Illite/Clays	0.10	0.81	11.11	23.73	1.99	0.13	0.26	0.04	5.16	0.05	0.00	0.00	0.11	0.10	39.57	83.16	0.003
	Illite/Clays	0.09	0.64	9.72	23.62	1.78	0.20	0.60	0.04	4.41	0.05	0.00	0.00	0.09	0.11	38.07	79.41	0.003
	Illite/Clays	0.11	0.88	11.88	25.07	2.18	0.14	0.41	0.07	4.83	0.02	0.00	0.02	0.07	0.18	41.87	87.72	0.003
	Illite/Clays	0.08	0.64	10.60	27.88	1.87	0.34	0.29	0.02	4.28	0.05	0.00	0.07	0.07	0.09	43.55	89.83	0.004
	Illite/Clays	0.09	0.50	10.06	23.86	2.42	0.18	0.23	0.02	4.20	0.04	0.00	0.12	0.10	0.09	38.38	80.28	0.004
	Illite/Clays	0.08	0.66	8.83	26.94	1.72	0.15	0.19	0.07	6.85	0.03	0.00	0.05	0.11	0.12	41.47	87.28	0.003
	Illite/Clays	0.12	1.31	13.39	27.99	2.02	0.21	0.49	0.05	5.73	0.04	0.00	0.07	0.04	0.15	47.14	98.74	0.005
	Illite/Clays	0.07	0.68	11.01	22.64	1.70	0.32	0.40	0.03	4.37	0.03	0.00	0.00	0.16	0.08	38.01	79.47	0.004
	Illite/Clays	0.06	0.57	9.34	27.30	1.82	0.19	0.27	0.02	3.65	0.03	0.00	0.00	0.06	0.14	41.43	84.87	0.004
	Illite/Clays	0.05	0.47	9.82	28.83	2.80	0.20	0.30	0.00	3.49	0.04	0.00	0.00	0.10	0.10	43.71	89.90	0.004
	Illite/Clays	0.07	0.52	7.68	33.43	1.07	0.21	0.21	0.01	3.78	0.05	0.00	0.07	0.07	0.10	46.78	94.05	0.004
	Illite/Clays	0.14	0.62	9.15	26.47	1.55	0.33	0.35	0.03	4.13	0.03	0.00	0.07	0.11	0.17	40.56	83.71	0.004
	Illite/Clays	0.14	0.80	10.51	23.45	1.86	0.11	0.26	0.05	4.65	0.03	0.00	0.09	0.13	0.13	38.51	80.71	0.005
	Illite/Clays	0.12	0.61	9.59	25.19	1.63	0.15	0.23	0.01	4.05	0.03	0.00	0.06	0.20	0.06	39.32	81.26	0.004
	Illite/Clays	0.23	0.61	11.35	24.63	2.09	0.15	0.44	0.02	3.96	0.03	0.00	0.20	0.28	0.12	40.50	84.62	0.004
	Illite/Clays	0.10	0.64	8.75	31.29	1.48	0.11	0.34	0.01	4.08	0.05	0.00	0.00	0.05	0.16	45.58	92.64	0.004
	Illite/Clays	0.09	1.08	10.34	32.15	1.78	0.41	0.33	0.02	4.13	0.03	0.00	0.00	0.04	0.16	48.46	99.03	0.005
	Illite/Clays	0.08	0.83	12.35	25.34	1.89	0.19	0.22	0.01	3.95	0.02	0.00	0.01	0.10	0.12	42.13	87.26	0.004
	Illite/Clays	0.39	0.72	10.34	22.26	1.84	0.15	0.49	0.03	5.55	0.04	0.00	0.02	0.17	0.07	37.47	79.54	0.004
	Illite/Clays	0.20	0.64	10.35	24.40	1.90	0.11	0.23	0.02	4.93	0.05	0.00	0.11	0.16	0.11	39.45	82.65	0.004
	Average	0.11	0.69	10.19	25.91	1.75	0.24	0.38	0.02	4.43	0.04	0.00	0.04	0.11	0.11	41.01	85.04	0.004

Sample	Mineral	EPMA																LA-ICP-MS
		Na	Mg	Al	Si	K	Ca	Ti	Mn	Fe	Rb	Cs	Ba	Cl	F	O	Total	Li
		0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.03*	*0.03*	*0.05*	*0.03*	*0.04*	*0.17*	*0.03*	*0.04*			*0.0002*
SB-10	Illite/Clays	0.12	0.78	9.58	22.51	1.80	0.32	0.56	0.03	7.76	0.04	0.00	0.13	0.17	0.08	37.78	81.66	0.004
	Illite/Clays	0.05	0.65	8.96	26.87	1.23	0.26	0.32	0.04	4.81	0.04	0.00	0.09	0.19	0.04	40.96	84.50	0.004
	Illite/Clays	0.09	0.81	11.10	22.71	1.60	0.18	0.20	0.02	7.07	0.03	0.00	0.00	0.16	0.08	38.83	82.89	0.004
	Illite/Clays	0.05	0.73	8.80	19.14	1.62	0.26	0.49	0.03	5.59	0.02	0.00	0.00	0.08	0.01	32.50	69.33	0.003
	Illite/Clays	0.14	0.63	11.07	24.80	2.29	0.17	0.21	0.02	3.89	0.04	0.00	0.05	0.16	0.10	40.30	83.86	0.003
	Illite/Clays	0.10	0.48	9.63	26.33	1.71	0.25	0.27	0.00	4.04	0.03	0.00	0.10	0.13	0.08	40.67	83.83	0.004
	Illite/Clays	0.10	0.73	11.96	25.60	1.79	0.21	0.42	0.00	4.73	0.04	0.00	0.06	0.12	0.15	42.34	88.24	0.004
	Illite/Clays	0.08	0.55	10.21	23.95	1.35	0.19	0.21	0.01	4.56	0.02	0.00	0.00	0.15	0.15	38.47	79.90	0.003
	Illite/Clays	0.14	0.78	11.48	22.76	2.81	0.33	0.35	0.02	3.40	0.02	0.00	0.07	0.18	0.06	38.60	81.00	0.004
	Illite/Clays	0.11	0.69	10.45	25.72	1.50	0.23	0.27	0.04	3.99	0.05	0.01	0.09	0.25	0.14	40.74	84.28	0.004
	Illite/Clays	0.05	0.65	8.11	23.75	1.21	0.38	0.48	0.04	4.60	0.03	0.00	0.05	0.25	0.08	36.70	76.39	0.004
	Illite/Clays	0.38	0.52	9.97	26.60	2.06	0.24	0.16	0.02	5.67	0.04	0.00	0.00	0.14	0.04	41.87	87.70	0.004
	Illite/Clays	0.09	0.66	9.01	27.19	1.31	0.25	0.17	0.04	4.86	0.04	0.00	0.02	0.14	0.15	41.27	85.22	0.004
	Illite/Clays	0.08	0.44	7.13	27.74	1.23	0.23	1.17	0.01	2.94	0.04	0.01	0.01	0.14	0.02	40.21	81.42	0.004
	Illite/Clays	0.09	0.66	10.36	21.23	1.54	0.22	0.21	0.00	5.40	0.02	0.00	0.01	0.26	0.18	35.84	76.03	0.004
	Illite/Clays	0.08	0.55	8.23	18.96	3.05	0.22	0.35	0.01	5.74	0.02	0.01	0.07	0.21	0.03	31.86	69.39	0.004
	Illite/Clays	0.10	0.78	9.91	20.32	1.45	0.28	0.32	0.02	9.29	0.03	0.00	0.08	0.24	0.11	35.72	78.65	0.003
	Illite/Clays	0.11	0.51	5.66	31.01	1.14	0.27	0.22	0.04	3.68	0.04	0.00	0.00	0.14	0.12	42.23	85.19	0.004
	Illite/Clays	0.11	0.64	9.35	27.02	1.41	0.25	0.46	0.03	5.14	0.02	0.00	0.00	0.12	0.26	41.62	86.43	0.004
	Illite/Clays	0.21	0.62	12.37	22.20	3.22	0.17	0.60	0.01	3.73	0.04	0.00	0.02	0.17	0.11	38.90	82.36	0.004
	Illite/Clays	0.06	0.64	9.44	23.21	1.35	0.25	0.51	0.01	5.45	0.03	0.01	0.02	0.20	0.09	37.50	78.79	0.004
	Illite/Clays	0.06	0.61	7.24	29.40	1.20	0.21	0.15	0.03	4.11	0.05	0.00	0.09	0.13	0.14	41.92	85.33	0.005
	Illite/Clays	0.05	0.42	5.32	27.21	0.84	0.12	0.08	0.04	2.96	0.03	0.01	0.01	0.24	0.10	37.07	74.52	0.004
	Illite/Clays	0.11	0.83	11.07	24.99	1.86	0.25	0.34	0.01	4.99	0.06	0.00	0.11	0.10	0.19	40.97	85.86	0.004
	Illite/Clays	0.06	0.79	10.28	25.11	1.49	0.23	0.34	0.02	3.99	0.07	0.00	0.01	0.15	0.09	40.01	82.64	0.005
	Illite/Clays	0.44	0.70	12.01	24.46	2.28	0.30	0.31	0.03	5.36	0.04	0.00	0.02	0.12	0.07	41.47	87.63	0.004
	Illite/Clays	0.06	0.60	10.18	20.58	1.71	0.31	0.33	0.00	5.57	0.02	0.00	0.00	0.18	0.10	35.15	74.82	0.004
	Illite/Clays	0.07	0.74	8.68	19.39	1.93	0.20	0.35	0.06	6.79	0.01	0.00	0.01	0.08	0.16	32.92	71.39	0.003
	Illite/Clays	0.09	0.81	11.80	22.17	1.61	0.29	0.37	0.03	4.72	0.03	0.00	0.13	0.31	0.10	38.31	80.77	0.004
	Illite/Clays	0.08	0.82	11.01	21.07	1.51	0.36	0.35	0.03	8.81	0.02	0.00	0.00	0.19	0.05	37.53	81.83	0.003
	Illite/Clays	0.08	0.68	10.61	20.81	1.76	0.22	0.21	0.07	6.49	0.03	0.00	0.11	0.31	0.08	36.02	77.47	0.004
	Illite/Clays	0.11	0.62	10.27	25.46	1.64	0.23	0.40	0.00	4.49	0.04	0.00	0.00	0.20	0.08	40.50	84.05	0.005
	Illite/Clays	0.09	0.75	10.82	22.97	1.64	0.28	0.52	0.06	7.00	0.03	0.01	0.07	0.14	0.16	39.06	83.59	0.003
	Illite/Clays	0.05	0.56	8.16	26.60	1.60	0.17	0.18	0.00	3.06	0.02	0.00	0.06	0.18	0.16	39.25	80.05	0.004
	Illite/Clays	0.08	0.54	8.55	26.11	1.51	0.20	0.30	0.03	4.93	0.04	0.01	0.07	0.13	0.08	39.70	82.28	0.005
	Illite/Clays	0.06	0.51	13.27	22.96	0.91	0.24	0.19	0.00	3.26	0.01	0.01	0.10	0.23	0.03	39.62	81.40	0.004
	Average	0.11	0.65	9.78	24.14	1.67	0.24	0.34	0.02	5.08	0.03	0.00	0.05	0.17	0.10	38.73	81.13	0.004

wsp.com

wsp.com