

Annual Groundwater Monitoring Report

Appalachian Power Company
Mountaineer Plant
Bottom Ash Pond CCR Management Unit
Letart, WV

January 31, 2024

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An **AEP** Company

BOUNDLESS ENERGYSM

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Appendix 1 – Groundwater Quality Data, Flow Directions, Flow Rates

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Abbreviations:

- ASD – Alternate Source Demonstration
- CCR – Coal Combustion Residual
- GWPS – Groundwater Protection Standard
- SSI – Statistically Significant Increase
- SSL – Statistically Significant Level
- MTBAP – Mountaineer Bottom Ash Pond

I. Overview

This *Annual Groundwater Monitoring and Corrective Action Report* (Report) has been prepared to report the status of activities for the preceding year for the bottom ash pond CCR unit at Appalachian Power Company's, a wholly-owned subsidiary of American Electric Power Company (AEP), Mountaineer Power Plant. The USEPA's CCR rules require that the Annual Groundwater Monitoring and Corrective Action Report be posted to the operating record for the preceding year no later than January 31.

In general, the following activities were completed:

- An assessment monitoring program for Mountaineer Bottom Ash Pond (MT BAP) was established on April 13, 2018.
- Statistically significant level (SSL) of lithium concentrations above groundwater protection standards (GWPSs) were observed on January 8, 2019. An Assessment of Corrective Measures (ACM) was initiated on March 26, 2019. The ACM was completed on June 24, 2019 and the public meeting to discuss the proposed remedies was held on August 22, 2019. The ACM was revised on November 30, 2020 per federal EPA comments received via conference call discussions.
- The BAP selected a final design and remedy for the groundwater corrective action on December 22, 2021. The BAP established and implemented the Corrective Action Monitoring Plan (CAMP) within 90 days of selecting a remedy.
- Ash and impacted soil removal activities as outlined in the most recent closure plan were completed in 2023.
- Mountaineer BAP started 2023 in corrective measures. The BAP ended the year in the corrective action program.
- Groundwater samples were collected in March, May, and October 2023 and analyzed for all Appendix III and Appendix IV constituents, as specified in the CAMP and AEP's *Groundwater Sampling and Analysis Plan (2016)*.
- Analytical results for groundwater monitoring data received during this reporting period are summarized in **Appendix 1** along with groundwater flow rates and direction.
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units.
- The November 2022 sampling event statistical analysis was completed in March 2023 and is included in **Appendix 2**. The statistical analysis identified the following:
 - Under Corrective Measures Monitoring: the upper confidence level (UCL) for Lithium exceeded the GWPS at the certified monitoring well network wells: MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S; and in

the nature and extent wells: MW-1921, MW-1922S, MW-1923, MW-1924, and MW-1925.

- SSL for Arsenic, where the Lower Confidence Limit (LCL) exceeded the GWPS, was noted at primary nature and extent wells MW-1805 and MW-1922D.
- SSL for Molybdenum was noted at secondary nature and extent well MW-1921.
- Statistically Significant Increase (SSI) for Boron above the upper prediction limit (UPL) was observed at MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
- SSI for Calcium above the UPL was observed at MW-1604S, MW-1605D, and MW-1607D.
- SSI for Chloride above the UPL was observed at MW-1604S, MW-1604D, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
- SSI for Fluoride above the UPL was observed at MW-1606S and MW-1607D.
- SSI for Sulfate above the UPL was observed at MW-1604S, MW-1605D, MW-1606D, and MW-1607D.
- SSI for TDS above the UPL was observed at MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
- Notification of constituent(s) above GWPS was completed.
- The statistical analysis for the May 2023 corrective action monitoring event was completed in September 2023 and is included in **Appendix 2**. The statistical analysis identified the following:
 - Under Corrective Measures Monitoring: the UCL for Lithium exceeded the GWPS at the certified monitoring well network wells: MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S; and in the nature and extent wells: MW-1922S, MW-1923, MW-1924, and MW-1925.
 - SSL for Arsenic was noted at the primary nature and extent wells MW-1805 and MW-1922D.
 - SSI for Boron above the UPL was observed at MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
 - SSI for Calcium above the UPL was observed at MW-1604S.
 - SSI for Chloride above the UPL was observed at MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
 - SSI for Fluoride above the UPL was observed at MW-1606S and MW-1607D.

- SSI for Sulfate above the UPL was observed at MW-1604S, MW-1605D, MW-1605S, MW-1606D, and MW-1607D.
- SSI for TDS above the UPL was observed at MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
- Notification of constituent(s) for potential SSL was completed.
- Alternate source demonstrations (ASDs) were completed for the potential SSLs not included in the corrective measures and are included in **Appendix 3**.
- The October 2023 sampling event data are still undergoing statistical analysis.

The major components of this annual report, to the extent applicable at this time, are presented in sections that follow:

- A map, aerial photograph or a drawing showing the CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers.
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened.
- All the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of detection monitoring or assessment monitoring programs (Attached as **Appendix 1**).
- Statistical comparison of monitoring data to determine if there have been SSI's or SSL's (Attached as **Appendix 2**, where applicable).
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as **Appendix 3**).
- A summary of any transition between monitoring programs or an alternate monitoring frequency, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring, in addition to identifying the constituents detected at a statistically significant increase over background concentrations (**Appendix 4**).
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened (Attached as Appendix 5, where applicable). This is not applicable.
- Corrective Action evaluation and other information required to be included in the annual report, if applicable.

In addition, this report summarizes key actions completed, and where applicable, describes any problems encountered and actions taken to resolve those problems. The report includes a projection of key activities for the upcoming year.

II. Groundwater Monitoring Well Locations and Identification Numbers

Figure 1 that follows depicts the PE-certified groundwater monitoring network, the monitoring well locations, and their corresponding identification numbers. The total groundwater monitoring network includes 4 background wells and 8 down-gradient wells. The monitoring well distribution adequately cover down-gradient and background areas as detailed in the *Ground Water Monitoring Well Network Evaluation* report that was placed in the AEP CCR public internet site on March 9, 2017. Additional wells are shown in the figure that were installed as part of the Nature and Extent Characterization study.

III. Monitoring Wells Installed or Decommissioned

No monitoring wells were installed or decommissioned in 2023.

IV. Groundwater Quality Data and Static Water Elevation Data and Flow Rate

Appendix 1 contains tables showing the groundwater quality data collected during the establishment of background quality, detection monitoring, assessment monitoring, and corrective action monitoring. Static water elevation data from each monitoring event also are shown in **Appendix 1**, along with the groundwater velocity calculations, groundwater flow direction and potentiometric maps developed after each sampling event. It is important to note that MW-1928 although installed, was unable to be sampled due to very low groundwater yield the first attempt and the monitoring well being dry and not recovering on the following attempts. Additionally, MW-112 also has low recovery and was not sampled during 2023.

V. Groundwater Quality Data Statistical Analysis

- Statistical analysis of the November 2022, 257.95(d)(1) sampling event resulted in a SSL above the GWPS for arsenic, lithium and molybdenum in March 2023. A notice of this SSL was placed in the facility electronic operating record and on the publicly available internet site. The full statistical analysis report for this event is included in **Appendix 2**. The statistical analysis identified the following:
 - Under Corrective Measures Monitoring: the upper confidence level (UCL) for Lithium exceeded the GWPS at the certified monitoring well network wells: MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S; and in the nature and extent wells: MW-1921, MW-1922S, MW-1923, MW-1924, and MW-1925.
 - SSL for Arsenic, where the Lower Confidence Limit (LCL) exceeded the GWPS, was noted at primary nature and extent wells MW-1805 and MW-1922D.
 - SSL for Molybdenum, where the LCL exceeded the GWPS, was noted at secondary nature and extent well MW-1921.
 - Statistically Significant Increase (SSI) for Boron above the upper prediction limit (UPL) was observed at MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
 - SSI for Calcium above the UPL was observed at MW-1604S, MW-1605D, and MW-1607D.
 - SSI for Chloride above the UPL was observed at MW-1604S, MW-1604D, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
 - SSI for Fluoride above the UPL was observed at MW-1606S and MW-1607D.

- SSI for Sulfate above the UPL was observed at MW-1604S, MW-1605D, MW-1606D, and MW-1607D.
- SSI for TDS above the UPL was observed at MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
- Groundwater sampling to address the requirements of 40 CFR 257.85(b) were conducted February 10, 2023
- Statistical analysis of the May 2023 corrective action (40 CFR 257.98(a)(1)) sampling was completed in September 2023 and resulted in a SSL above GWPS for arsenic and lithium. A notice of these SSLs was placed in the facility electronic operating record and on the publicly available internet site. The full statistical analysis report for this event is included in **Appendix 2**. The statistical analysis identified the following:
 - Under Corrective Measures Monitoring: the UCL for Lithium exceeded the GWPS at the certified monitoring well network wells: MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S; and in the nature and extent wells: MW-1922S, MW-1923, MW-1924, and MW-1925.
 - SSL for Arsenic, where the LCL exceeded the GWPS, was noted at the primary nature and extent wells MW-1805 and MW-1922D.
 - SSI for Boron above the UPL was observed at MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
 - SSI for Calcium above the UPL was observed at MW-1604S.
 - SSI for Chloride above the UPL was observed at MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.
 - SSI for Fluoride above the UPL was observed at MW-1606S and MW-1607D.
 - SSI for Sulfate above the UPL was observed at MW-1604S, MW-1605D, MW-1605S, MW-1606D, and MW-1607D.
 - SSI for TDS above the UPL was observed at MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S.

Appendix 2 also contains a memorandum that explains the reissuance of select analytical laboratory reports to correct laboratory equipment data quality assurance/quality control issues.

VI. Alternative Source Demonstrations

Successful ASDs were completed for arsenic and molybdenum GWPS exceedances and are included in **Appendix 3**.

VII. Discussion About Transition Between Monitoring Requirements or Alternate Monitoring Frequency

The Mountaineer Bottom Ash Pond CCR Unit transitioned from the Assessment Monitoring program to the Assessment of Corrective Measures program on March 26, 2019 due to the SSL above a GWPS for Lithium on January 8, 2019. An Assessment of Corrective Measures Report was completed on June 24, 2019. A public meeting was held on August 22, 2019 to present the assessment of corrective measure options. Two semi-annual reports describing the progress in selecting and designing the remedy were completed in March and September of 2020 and 2021. The selection of remedy was completed on December 22, 2021. The remedy was initiated within 90 days of selection. The corrective action monitoring program was established and implemented within 90 days of selecting the remedy. The notice for initiating assessment of corrective measures was posted on the publicly available internet site (4-25-2019). The selection of remedy report can also be found on the publicly available internet site.

Regarding defining an alternate monitoring frequency, the groundwater velocity and monitoring well production is high enough at this facility that no modification to the monitoring frequency is needed.

VIII. Corrective Action and Other Required Information

SSLs of lithium above the groundwater protection standard (GWPS, 40 ug/L) in some of the compliance monitoring wells were observed on January 8, 2019. 40 CFR §257.96(a) requires that an owner or operator initiate an assessment of corrective measures to prevent further release, to remediate any releases, and to restore impacted areas to original conditions if any Appendix IV constituent has been detected at a SSL exceeding a GWPS. An Assessment of Corrective Measures (ACM) was initiated on March 26, 2019. The ACM was completed on June 24, 2019, and the public meeting to discuss the proposed remedies was held on August 22, 2019. The ACM was revised on November 30, 2020, per federal EPA comments received via conference call discussions.

As discussed in the ACM, the nature and extent of lithium contamination in groundwater relative to GWPS (40 ug/L) has been defined per the 40 CFR 257 requirements based on the site-specific hydrogeology. The presence of nearby surface water body as well as the unimpacted background monitoring wells provide the boundaries for the extent of the GWPS exceedance.

The selected final design and remedy for the groundwater corrective action was completed on December 22, 2021. The selected remedy was source removal (closure by removal) and utilization of a hydraulic containment system (HCS). The Corrective Action Monitoring Plan (CAMP) for the BAP was established and implemented the within 90 days of selecting a remedy.

Source Removal and Disposal:

Ash and impacted soil removal activities as outlined in the most recent closure plan were completed in 2023, eliminating future mass flux of lithium to groundwater.

Hydraulic Containment System:

The hydraulic control system (HCS) for the Site is designed to maintain hydraulic capture of impacted groundwater. The table below provides a summary of groundwater extracted during this reporting period.

Extraction Well	Gallons of GW extracted in 2023
Well #4	19,184,392
Well #5	57,900,000
Well#6	17,216,100
East Well	174,445,203
West Well	167,857,055

The potentiometric maps depict the hydraulic capture of potential contaminated groundwater. Note: The plant was in an outage during the May 2023 gauging and sampling event.

Graphs and trend analysis of the lithium concentration over time are presented within the statistical analyses’ reports located in the appendix. Based on a review of the time series graphs, Certified monitoring well network wells pairs MWs 1605S/D and 1606S/D show decreasing trends for lithium while monitoring well pairs MWs-1607S/D appear to be stable.

IX. Description of Any Problems Encountered and Actions Taken

No significant problems were encountered. The low flow sampling effort went smoothly, and the schedule was met to support this annual groundwater report preparation.

X. A Projection of Key Activities for the Upcoming Year

Key activities for 2024 include:

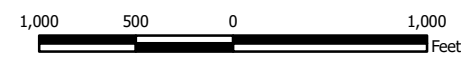
- Continue the HCS remedy for groundwater corrective actions;
- Continue to implement the most recent corrective action monitoring program (CAMP);
- Respond to any new data received considering what the CCR rule requires; and
- Preparation of the next annual groundwater report.



- Monitoring Well Network**
- Compliance Sampling Location
 - Background Sampling Location
 - Nature and Extent Wells
 - Bottom Ash Ponds

Notes

- Monitoring well coordinates provided by AEP.
- Site features based on information available in Ash Pond System-CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016) provided by AEP.



Site Layout
CCR Bottom Ash Ponds
 AEP Mountaineer Generating Plant
 Letart, West Virginia

Geosyntec
 consultants

Figure
1

Columbus, Ohio 2020/01/24

APPENDIX 1

Tables and figures follow that show the groundwater monitoring data collected and rate and direction of groundwater flow. The dates that the samples were collected are also shown.

**Table 1. Groundwater Data Summary: JTMN-1
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
3/31/2021	Assessment	0.295	149	42.3	0.31	7.2	255	716
5/20/2021	Assessment	0.249	142	37.6	0.26	6.7	217	670
10/27/2021	Assessment	0.335	164	50.4	0.34	7.0	342	840
3/3/2022	Corrective Action	0.266	172	47.2	0.29	7.2	294	740
5/24/2022	Corrective Action	0.302	188	46.9	0.29	7.3	304	780 L1
11/3/2022	Corrective Action	0.332	219 M1, P3	62.3	0.26	6.9	453	1,010
2/14/2023	Corrective Action	0.292	179	52.2	0.25	7.0	354	840
5/24/2023	Corrective Action	0.257	150	48.0	0.21	7.0	325	820
10/31/2023	Corrective Action	0.332	219	58.3	0.26	7.0	442	1,000

**Table 1. Groundwater Data Summary: JTMN-1
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
3/31/2021	Assessment	0.1 J1	2.16	89.1	0.07 J1	0.03 J1	2.82	2.07	0.686	0.31	2.13	0.00594	0.003 J1	6.59	0.7	< 0.04 U1
5/20/2021	Assessment	0.14	1.46	84.6	0.032 J1	0.114	1.36	1.31	0.65	0.26	1.28	0.00370	< 0.002 U1	3.2	1.19	< 0.04 U1
10/27/2021	Assessment	0.08 J1	2.52	85.9	0.063	0.029	1.72	2.77	0.84	0.34	2.36	0.0127	0.003 J1	17.1	0.50	0.04 J1
3/3/2022	Corrective Action	0.04 J1	0.88	67.1	0.015 J1	0.021	0.88	0.674	1.25	0.29	0.59	0.00948	< 0.002 U1	13.0	0.89	< 0.04 U1
5/24/2022	Corrective Action	0.07 J1	2.02	94.7	0.041 J1	0.028	1.48	1.95	0.68	0.29	1.78	0.0113	0.003 J1	15.0	1.33	< 0.04 U1
11/3/2022	Corrective Action	0.09 J1	2.38	102 P3	0.065	0.038	2.45	2.44	2.04	0.26	2.46	0.0118	0.005	11.7	0.54	< 0.04 U1
2/14/2023	Corrective Action	0.03 J1	0.59	66.6	0.011 J1	0.018 J1	0.67	0.449	0.35	0.25	0.48	0.00787	< 0.002 U1	8.0	0.54	< 0.04 U1
5/24/2023	Corrective Action	0.045 J1	0.58	57.5	0.01 J1	0.017 J1	0.61	0.367	0.31	0.21	0.41	0.00620	< 0.002 U1	5.9	0.65	< 0.02 U1
10/31/2023	Corrective Action	0.045 J1	0.97	67.6	0.026 J1	0.023	1.01	0.953	1.03	0.26	0.90	0.0108	< 0.002 U1	12.4	0.48 J1	0.04 J1

**Table 1. Groundwater Data Summary: JTMN-2
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
3/31/2021	Assessment	0.378	178	54.0	0.36	7.2	392	862
5/20/2021	Assessment	0.289	142	35.0	0.26	6.6	186	690
10/27/2021	Assessment	0.407	185	59.3	0.41	--	420	940
10/28/2021	Assessment	--	--	--	--	7.2	--	--
3/3/2022	Corrective Action	0.230	165	43.2	0.22	7.1	262	700
5/24/2022	Corrective Action	0.364	182	48.2	0.41	7.5	304	770 L1
11/3/2022	Corrective Action	0.372	214	61.4	0.31	6.9	456	1,060
2/14/2023	Corrective Action	0.262	153	45.7	0.25	6.8	294	750
5/25/2023	Corrective Action	0.372	195	63.6	0.38	7.3	484	1,000
11/1/2023	Corrective Action	0.319	190	55.6	0.27	6.9	410	930 S7

**Table 1. Groundwater Data Summary: JTMN-2
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
3/31/2021	Assessment	0.06 J1	1.09	87.1	0.03 J1	0.04 J1	1.27	1.24	0.27	0.36	0.775	0.0151	< 0.002 U1	20.0	0.6	< 0.04 U1
5/20/2021	Assessment	0.14	0.83	90.6	0.019 J1	0.052	0.67	0.826	0.42	0.26	0.66	0.00934	< 0.002 U1	10.7	1.05	< 0.04 U1
10/27/2021	Assessment	0.05 J1	0.79	68.3	0.021 J1	0.036	0.86	0.928	3.42	0.41	0.58	0.0225	< 0.002 U1	30.8	0.36 J1	< 0.04 U1
3/3/2022	Corrective Action	0.05 J1	1.08	91.5	0.029 J1	0.031	1.52	0.938	1.12	0.22	0.79	0.00586	0.002 J1	5.5	0.96	< 0.04 U1
5/24/2022	Corrective Action	0.06 J1	0.94	71.3	0.019 J1	0.014 J1	0.89	0.688	0.37	0.41	0.58	0.0208	0.004 J1	33.2	0.81	< 0.04 U1
11/3/2022	Corrective Action	0.07 J1	1.33	85.7	0.045 J1	0.034	1.78	1.47	1.64	0.31	1.13	0.0198	0.008	22.7	0.54	< 0.04 U1
2/14/2023	Corrective Action	0.03 J1	0.51	89.4	0.011 J1	0.038	0.65	0.299	0.78	0.25	0.24	0.00748	< 0.002 U1	7.5	0.56	< 0.04 U1
5/25/2023	Corrective Action	0.043 J1	0.55	61.6	0.012 J1	0.022	0.64	0.578	1.14	0.38	0.33	0.0224	< 0.002 U1	29.4	0.24 J1	< 0.02 U1
11/1/2023	Corrective Action	0.042 J1	0.86	83.0	0.025 J1	0.038	1.26	0.737	1.29	0.27	0.63	0.0134	< 0.002 U1	14.3	0.39 J1	0.03 J1

**Table 1. Groundwater Data Summary: MW-016
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/11/2019	Assessment	1.87	230	64.4	0.21	7.3	545	1,240
3/11/2020	Assessment	--	--	--	0.23	7.2	--	--
5/13/2020	Assessment	2.28	204	64.2	0.26	7.2	530	1,210
10/9/2020	Assessment	1.79	228	56.7	0.23	7.1	542	1,220
3/24/2021	Assessment	1.79	224	67.0	0.27	7.5	521	1,050
5/19/2021	Assessment	1.65	195	73	0.26	7.3	495	1,090
10/28/2021	Assessment	1.54	203	64.0	0.27	7.3	470	1,060
3/2/2022	Corrective Action	1.43 P3	221 M1	72.0	0.25	7.4	476	1,010
5/17/2022	Corrective Action	1.45	197	77.8	0.24	7.3	458	1,010 L1
11/7/2022	Corrective Action	1.32	213	70.8	0.25	7.3	454	1,060
2/16/2023	Corrective Action	1.25	205	73.9	0.23	7.3	481	1,040
5/25/2023	Corrective Action	1.09	189	80.0	0.24	7.3	485	1,040
10/30/2023	Corrective Action	1.13	200	73.8	0.25	7.3	472	920

**Table 1. Groundwater Data Summary: MW-016
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/11/2019	Assessment	0.04 J1	4.55	48.7	0.04 J1	0.04 J1	1.47	1.90	2.17	0.21	1.28	0.0348	< 0.002 U1	36.8	0.2	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	8.51	39.1	< 0.02 U1	0.02 J1	0.728	1.64	2.23	0.23	0.459	0.0345	< 0.002 U1	40.5	0.1 J1	< 0.1 U1
5/13/2020	Assessment	0.04 J1	4.02	28.7	--	0.03 J1	0.423	1.42	0.577	0.26	0.260	0.0338	--	39.0	0.2 J1	< 0.1 U1
10/9/2020	Assessment	0.04 J1	4.10	22.6	--	< 0.01 U1	0.363	1.12	0.548	0.23	0.1 J1	0.0305	< 0.002 U1	37.3	0.09 J1	< 0.1 U1
3/24/2021	Assessment	0.02 J1	4.11	23.2	< 0.007 U1	0.02 J1	0.2 J1	1.07	0.951	0.27	< 0.05 U1	0.0289	< 0.002 U1	36.3	0.2 J1	< 0.04 U1
5/19/2021	Assessment	0.09 J1	3.07	23.9	< 0.007 U1	0.021	0.26	0.92	1.41	0.26	0.17 J1	0.0284	< 0.002 U1	32.1	0.14 J1	< 0.04 U1
10/28/2021	Assessment	< 0.02 U1	3.55	23.9	< 0.007 U1	0.018 J1	0.33	1.17	0.44	0.27	0.17 J1	0.0293	< 0.002 U1	40.2	< 0.09 U1	< 0.04 U1
3/2/2022	Corrective Action	< 0.02 U1	3.47	24.2	< 0.007 U1	0.019 J1	0.47	1.06	0.89	0.25	0.05 J1	0.0252	< 0.002 U1	35.5	0.19 J1	< 0.04 U1
5/17/2022	Corrective Action	0.04 J1	2.45	24.2	< 0.007 U1	0.022	0.27	1.05	1.42	0.24	0.06 J1	0.0304	< 0.002 U1	36.3	0.13 J1	< 0.04 U1
11/7/2022	Corrective Action	0.05 J1	4.31	24.6	< 0.007 U1	0.012 J1	0.45	1.88	1.35	0.25	0.07 J1	0.0291	< 0.002 U1	36.3	0.10 J1	< 0.04 U1
2/16/2023	Corrective Action	< 0.02 U1	2.89	25.1	< 0.007 U1	0.022	0.41	1.03	0.98 P1	0.23	0.09 J1	0.0249	< 0.002 U1	36.0	0.12 J1	< 0.04 U1
5/25/2023	Corrective Action	0.028 J1	2.58	22.1	< 0.007 U1	0.011 J1	0.23 J1	1.02	2.00	0.24	0.06 J1	0.0262	< 0.002 U1	35.7	0.1 J1	< 0.02 U1
10/30/2023	Corrective Action	0.014 J1	2.60	25.2	< 0.007 U1	0.019 J1	0.41	1.04	1.01	0.25	0.12 J1	0.0244	< 0.002 U1	34.0	0.14 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-107
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/18/2018	Assessment	--	--	--	--	6.8	--	--
4/10/2019	Assessment	0.614	270	71.4	0.21	6.8	518	1,270
6/18/2019	Assessment	0.592	245	71.7	0.22	--	545	1,250
9/10/2019	Assessment	0.696	316	79.7	0.19	7.1	631	1,410
3/10/2020	Assessment	--	--	--	0.25	--	--	--
5/13/2020	Assessment	0.579	239	66.5	0.26	6.7	555	1,240
10/6/2020	Assessment	0.560	179	46.1	0.25	6.6	301	845
3/23/2021	Assessment	0.757	225	48.5	0.25	7.1	454	1,060
5/18/2021	Assessment	0.684	204	51.8	0.25	6.8	418	1,020
10/27/2021	Assessment	0.491	185	48.6	0.21	6.8	273	850
3/1/2022	Corrective Action	0.872	300	76.4	0.22	7.0	683	1,440
5/17/2022	Corrective Action	0.952	338	74.3	0.22	6.9	666	1,460 L1
11/1/2022	Corrective Action	0.508	151	32.5	0.20	6.8	245	730
2/13/2023	Corrective Action	0.786	169	36.0	0.21	7.0	316	860
5/23/2023	Corrective Action	0.632	171	46.5	0.21	6.9	426	1,040
10/26/2023	Corrective Action	0.583	196	40.1	0.22	6.8	299	870

**Table 1. Groundwater Data Summary: MW-107
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	< 0.1 U1	1.08	68.3	< 0.1 U1	0.05 J1	0.4 J1	1.03	1.854	0.21	0.4 J1	0.02 J1	< 0.002 U1	< 2 U1	0.7 J1	< 0.5 U1
6/18/2019	Assessment	0.03 J1	0.44	69.4	< 0.02 U1	0.05	0.08 J1	1.45	0.2284	0.22	0.04 J1	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.6	< 0.1 U1
9/10/2019	Assessment	0.02 J1	0.44	67.8	< 0.02 U1	0.04 J1	0.07 J1	1.08	3.5	0.19	< 0.05 U1	0.00358	< 0.002 U1	< 0.4 U1	0.8	< 0.1 U1
3/10/2020	Assessment	< 0.02 U1	0.42	48.2	< 0.02 U1	0.03 J1	0.1 J1	0.741	0.161	0.25	< 0.05 U1	0.00410	< 0.002 U1	< 0.4 U1	0.7	< 0.1 U1
5/13/2020	Assessment	0.03 J1	0.59	48.1	--	0.07	0.2 J1	1.90	0.524	0.26	< 0.05 U1	0.00336	--	0.7 J1	0.5	< 0.1 U1
10/6/2020	Assessment	< 0.02 U1	0.34	35.4	--	0.02 J1	0.548	0.219	1.111	0.25	< 0.05 U1	0.00308	< 0.002 U1	< 0.4 U1	1.0	< 0.1 U1
3/23/2021	Assessment	0.03 J1	0.33	42.4	< 0.007 U1	0.03 J1	0.355	0.154	0.1427	0.25	< 0.05 U1	0.00370	< 0.002 U1	0.7 J1	0.4	< 0.04 U1
5/18/2021	Assessment	0.06 J1	0.25	39.0	< 0.007 U1	0.031	0.20	0.169	0.41	0.25	< 0.05 U1	0.00350	< 0.002 U1	0.2 J1	0.47 J1	< 0.04 U1
10/27/2021	Assessment	< 0.02 U1	0.30	37.1	< 0.007 U1	0.024	0.58	0.269	0.81	0.21	< 0.05 U1	0.00357	< 0.002 U1	0.6	0.97	< 0.04 U1
3/1/2022	Corrective Action	0.02 J1	0.42	52.1	< 0.007 U1	0.031	0.35	0.821	0.77	0.22	< 0.05 U1	0.00451	< 0.002 U1	0.2 J1	0.48 J1	< 0.04 U1
5/17/2022	Corrective Action	0.02 J1	0.37	50.9	< 0.007 U1	0.035	0.64	0.734	1.22	0.22	< 0.05 U1	0.00486	< 0.002 U1	1.7	0.48 J1	< 0.04 U1
11/1/2022	Corrective Action	0.02 J1	0.29	32.4	< 0.007 U1	0.015 J1	0.33	0.080	0.33	0.20	< 0.05 U1	0.00331	< 0.002 U1	0.1 J1	0.49 J1	< 0.04 U1
2/13/2023	Corrective Action	0.02 J1	0.29	33.6	< 0.007 U1	0.022	0.27	0.209	0.35	0.21	< 0.05 U1	0.00389	< 0.002 U1	0.2 J1	0.43 J1	< 0.04 U1
5/23/2023	Corrective Action	0.024 J1	0.27	33.5	< 0.007 U1	0.024	0.25 J1	0.331	0.78	0.21	< 0.05 U1	0.00340	< 0.002 U1	0.3 J1	0.24 J1	< 0.02 U1
10/26/2023	Corrective Action	0.019 J1	0.28	41.1	< 0.007 U1	0.028	0.22 J1	0.495	0.46	0.22	< 0.05 U1	0.00334	< 0.002 U1	0.3 J1	0.39 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-112
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/19/2019	Assessment	0.283	142	37.2	0.24	7.2	255	668
5/13/2020	Assessment	0.246	108	33.3	0.29	6.8	205	533
3/24/2021	Assessment	0.315	170	45.6	0.32	7.1	333	753
5/19/2021	Assessment	0.324	159	45.6	0.3	7.0	347	800
3/1/2022	Corrective Action	0.229	117	34.9	0.22	6.8	199	520

**Table 1. Groundwater Data Summary: MW-112
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/19/2019	Assessment	< 0.02 U1	0.40	76.9	< 0.02 U1	< 0.01 U1	0.2 J1	0.02 J1	0.0507	0.24	0.02 J1	< 0.009 U1	< 0.002 U1	11.2	1.5	< 0.1 U1
5/13/2020	Assessment	< 0.02 U1	0.33	59.7	--	< 0.01 U1	0.236	0.02 J1	0.08899	0.29	< 0.05 U1	0.00151	--	5.62	0.9	< 0.1 U1
3/24/2021	Assessment	0.03 J1	0.41	73.7	< 0.007 U1	0.007 J1	0.419	0.03 J1	0.13538	0.32	< 0.05 U1	0.00180	< 0.002 U1	9.18	0.7	< 0.04 U1
5/19/2021	Assessment	0.06 J1	0.38	72.7	< 0.007 U1	0.005 J1	0.34	0.023	0.78	0.3	< 0.05 U1	0.00186	< 0.002 U1	8.3	0.85	< 0.04 U1
3/1/2022	Corrective Action	0.03 J1	0.33	54.0	< 0.007 U1	0.007 J1	0.46	0.027	0.38	0.22	< 0.05 U1	0.00127	< 0.002 U1	5.2	0.69	< 0.04 U1

**Table 1. Groundwater Data Summary: MW-203
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/18/2019	Assessment	0.1 J1	115	31.4	0.22	7.2	86.8	472
9/11/2019	Assessment	0.104	106	10.1	0.22	7.1	65.5	435
3/11/2020	Assessment	--	--	--	0.25	7.0	--	--
5/13/2020	Assessment	0.094	103	12.6	0.28	7.0	77.1	434
10/6/2020	Assessment	0.085	92.3	12.5	0.32	6.8	60.0	423
3/23/2021	Assessment	0.090	98.1	15.6	0.32	7.3	56.2	353
5/18/2021	Assessment	0.077	101	60.8	0.29	7.1	54.8	470
10/27/2021	Assessment	0.085	95.0	27.2	0.28	7.2	64.1	380
3/2/2022	Corrective Action	0.089	114	42.0	0.28	7.3	70.9	420
5/17/2022	Corrective Action	0.093	114 M1, P3	28.8	0.28	7.1	65.9	390 L1
10/31/2022	Corrective Action	0.067	102	71.7	0.24	7.0	83.8	470
2/13/2023	Corrective Action	0.071	87.7	22.3	0.29	7.2	61.3	360
5/25/2023	Corrective Action	0.074	84.4	27.8	0.28	7.2	61.8	360
10/31/2023	Corrective Action	0.083	85.3	21.7	0.28	7.1	69.0	350

**Table 1. Groundwater Data Summary: MW-203
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/18/2019	Assessment	< 0.02 U1	0.30	34.7	< 0.02 U1	< 0.01 U1	0.2 J1	0.054	0.1139	0.22	0.113	< 0.009 U1	< 0.002 U1	2 J1	1.4	< 0.1 U1
9/11/2019	Assessment	0.02 J1	0.33	31.6	< 0.02 U1	< 0.01 U1	0.2 J1	0.139	0.381	0.22	0.2 J1	0.00230	< 0.002 U1	1 J1	1.1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.25	33.4	< 0.02 U1	< 0.01 U1	0.217	0.05 J1	0.824	0.25	0.1 J1	0.00237	< 0.002 U1	1 J1	1.4	< 0.1 U1
5/13/2020	Assessment	< 0.02 U1	0.29	31.0	--	< 0.01 U1	0.204	0.03 J1	0.4071	0.28	< 0.05 U1	0.00227	--	1 J1	1.1	< 0.1 U1
10/6/2020	Assessment	0.03 J1	0.28	24.6	--	< 0.01 U1	0.360	0.107	1.568	0.32	0.226	0.00205	< 0.002 U1	0.9 J1	0.8	< 0.1 U1
3/23/2021	Assessment	0.03 J1	0.29	26.7	< 0.007 U1	0.007 J1	0.211	0.04 J1	0.501	0.32	< 0.05 U1	0.00194	< 0.002 U1	1 J1	1.3	< 0.04 U1
5/18/2021	Assessment	0.06 J1	0.27	28.2	< 0.007 U1	0.005 J1	0.19 J1	0.027	3.67	0.29	< 0.05 U1	0.00199	< 0.002 U1	1	1.08	< 0.04 U1
10/27/2021	Assessment	< 0.02 U1	0.25	26.5	< 0.007 U1	0.005 J1	0.44	0.015 J1	0.46	0.28	< 0.05 U1	0.00224	< 0.002 U1	1.1	1.05	< 0.04 U1
3/2/2022	Corrective Action	< 0.02 U1	0.21	32.8	< 0.007 U1	0.006 J1	0.44	0.024	0.55	0.28	< 0.05 U1	0.00224	< 0.002 U1	1.1	0.85	< 0.04 U1
5/17/2022	Corrective Action	< 0.02 U1	0.26	29.3	< 0.007 U1	0.004 J1	0.39	0.030	0.28	0.28	< 0.05 U1	0.00199	< 0.002 U1	1.3	0.91	< 0.04 U1
10/31/2022	Corrective Action	< 0.02 U1	0.22	30.6	< 0.007 U1	0.005 J1	0.38	0.017 J1	0.68	0.24	< 0.05 U1	0.00238	< 0.002 U1	0.8	2.29	< 0.04 U1
2/13/2023	Corrective Action	< 0.02 U1	0.24	24.6	< 0.007 U1	0.004 J1	0.37	0.017 J1	0.08	0.29	< 0.05 U1	0.00203	< 0.002 U1	1.1	0.82	< 0.04 U1
5/25/2023	Corrective Action	0.018 J1	0.22	24.4	< 0.007 U1	0.006 J1	0.39	0.016 J1	1.46	0.28	< 0.05 U1	0.00201	< 0.002 U1	1.3	0.63	< 0.02 U1
10/31/2023	Corrective Action	0.024 J1	0.23	25.7	< 0.007 U1	0.005 J1	0.33	0.026	0.51 B1	0.28	< 0.05 U1	0.00201	< 0.002 U1	1.2	0.78	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1601A
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/28/2016	Background	0.211	141	21.8	0.17	7.6	130	538
11/1/2016	Background	0.170	122	17.3	0.19	7.2	136	534
12/19/2016	Background	0.196	130	20.4	0.18	7.2	141	544
2/20/2017	Background	0.253	117	31.0	0.20	7.2	135	568
3/27/2017	Background	0.515	119	42.1	0.19	7.1	148	530
4/18/2017	Background	0.259	130	55.3	0.19	7.1	169	580
5/15/2017	Background	0.224	159	74.4	0.18	7.7	197	676
6/12/2017	Background	0.285	138	57.7	0.18	6.9	170	586
10/31/2017	Detection	0.224	137	49.4	0.19	7.1	169	564
5/10/2018	Assessment	--	--	--	0.16	7.3	--	--
9/20/2018	Assessment	0.251	148	51.0	0.19	7.1	189	638
4/9/2019	Assessment	0.224	155	44.4	0.1 J1	7.1	176	692
6/20/2019	Assessment	0.160	165	48.6	0.16	7.3	207	730
9/11/2019	Assessment	0.153	164	45.8	0.14	7.0	221	749
3/11/2020	Assessment	--	--	--	0.14	6.7	--	--
5/15/2020	Assessment	0.136	185	22.7	0.16	6.7	274	814
10/8/2020	Assessment	0.114	178	18.4	0.13	6.8	252	748
3/22/2021	Assessment	0.128	179	16.0	0.15	7.0	241	738
5/20/2021	Assessment	0.122	173	16.1	0.13	6.6	241	750
10/28/2021	Assessment	0.121	173	13.0	0.12	6.9	222	700
3/7/2022	Corrective Action	0.144	164	13.8	0.11	7.0	242	700
5/20/2022	Corrective Action	0.146	178	13.9	0.12	6.7	239	720 L1
11/3/2022	Corrective Action	0.165	166	16.7	0.10	6.7	239	680
2/13/2023	Corrective Action	0.144	156	17.0	0.11	6.6	240	650
5/22/2023	Corrective Action	0.143	148	13.5	0.1	7.0	263	710
10/25/2023	Corrective Action	0.133	166	27.8	0.11	6.8	269	720

**Table 1. Groundwater Data Summary: MW-1601A
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/28/2016	Background	0.05	0.62	46.6	< 0.005 U1	0.01 J1	0.3	0.116	0.43758	0.17	0.132	0.002	< 0.002 U1	2.61	1.3	0.053
11/1/2016	Background	0.05 J1	0.61	45.2	< 0.005 U1	0.02 J1	1.3	0.086	2.011	0.19	0.108	0.001	< 0.002 U1	2.36	1.1	0.058
12/19/2016	Background	0.05 J1	0.65	47.0	< 0.005 U1	0.02 J1	0.806	0.282	1.544	0.18	0.383	< 0.0002 U1	< 0.002 U1	0.93	1.1	0.04 J1
2/20/2017	Background	0.03 J1	0.55	41.4	< 0.005 U1	0.02 J1	0.198	0.132	0.313	0.20	0.139	0.005	< 0.002 U1	1.42	1.4	0.070
3/27/2017	Background	0.03 J1	0.49	40.2	< 0.005 U1	0.01 J1	0.225	0.097	0.495	0.19	0.069	0.006	< 0.002 U1	2.85	1.0	0.03 J1
4/18/2017	Background	0.03 J1	0.59	47.5	< 0.004 U1	0.01 J1	0.170	0.093	0.814	0.19	0.052	0.007	0.003 J1	1.53	1.5	0.04 J1
5/15/2017	Background	0.04 J1	0.79	56.9	< 0.004 U1	0.02 J1	0.166	0.154	1.279	0.18	0.141	< 0.0002 U1	< 0.002 U1	2.04	1.3	0.04 J1
6/12/2017	Background	0.04 J1	0.61	49.0	< 0.004 U1	0.02 J1	0.152	0.098	0.599	0.18	0.063	0.004	< 0.002 U1	1.13	1.5	0.04 J1
5/10/2018	Assessment	0.03 J1	0.55	63.9	< 0.004 U1	0.02 J1	0.153	0.083	0.767	0.16	0.034	0.004	< 0.002 U1	0.99	1.5	0.03 J1
9/20/2018	Assessment	0.03 J1	0.58	55.3	< 0.004 U1	0.02 J1	0.131	0.059	0.696	0.19	0.005 J1	0.004	< 0.002 U1	0.76	1.1	0.04 J1
4/9/2019	Assessment	< 0.1 U1	0.61	52.0	< 0.1 U1	< 0.05 U1	0.2 J1	0.2 J1	1.168	0.1 J1	< 0.1 U1	0.02 J1	< 0.002 U1	< 2 U1	1.1	< 0.5 U1
6/20/2019	Assessment	0.03 J1	0.63	63.1	< 0.02 U1	0.02 J1	0.314	0.03 J1	0.45	0.16	0.07 J1	< 0.009 U1	< 0.002 U1	0.9 J1	1.3	< 0.1 U1
9/11/2019	Assessment	0.03 J1	0.62	65.3	< 0.02 U1	0.02 J1	0.370	0.03 J1	1.168	0.14	< 0.05 U1	0.00184	< 0.002 U1	0.9 J1	1.1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.58	64.9	< 0.02 U1	0.01 J1	0.205	0.02 J1	1.685	0.14	< 0.05 U1	0.00183	< 0.002 U1	1 J1	1.4	< 0.1 U1
5/15/2020	Assessment	0.03 J1	0.57	67.8	--	0.02 J1	0.1 J1	< 0.02 U1	0.553	0.16	< 0.05 U1	0.00190	--	0.7 J1	0.9	< 0.1 U1
10/8/2020	Assessment	0.03 J1	0.59	61.0	--	0.02 J1	0.328	0.04 J1	0.0868	0.13	< 0.05 U1	0.00168	< 0.002 U1	0.7 J1	0.9	< 0.1 U1
3/22/2021	Assessment	0.03 J1	0.55	65.4	< 0.007 U1	0.02 J1	0.456	0.02 J1	1.17	0.15	< 0.05 U1	0.00198	< 0.002 U1	3.96	0.9	< 0.04 U1
5/20/2021	Assessment	0.08 J1	0.54	67.7	< 0.007 U1	0.016 J1	0.23	0.012 J1	0.78	0.13	< 0.05 U1	0.00194	< 0.002 U1	0.5	0.94	< 0.04 U1
10/28/2021	Assessment	0.03 J1	0.55	64.4	< 0.007 U1	0.016 J1	0.28	0.012 J1	1.43	0.12	< 0.05 U1	0.00226	< 0.002 U1	0.5	0.85	< 0.04 U1
3/7/2022	Corrective Action	0.02 J1	0.50	62.5	< 0.007 U1	0.014 J1	0.33	0.013 J1	1.67	0.11	< 0.05 U1	0.00202	< 0.002 U1	1.7	0.89	< 0.04 U1
5/20/2022	Corrective Action	0.02 J1	0.47	64.3	< 0.007 U1	0.015 J1	0.25	0.024	1.36	0.12	< 0.05 U1	0.00201	< 0.002 U1	0.4 J1	1.09	< 0.04 U1
11/3/2022	Corrective Action	0.03 J1	0.49	66.5	< 0.007 U1	0.015 J1	0.30	0.014 J1	1.52	0.10	< 0.05 U1	0.00377	< 0.002 U1	0.5	0.58	< 0.04 U1
2/13/2023	Corrective Action	0.02 J1	0.45	60.6	< 0.007 U1	0.013 J1	0.26	0.013 J1	0.37	0.11	< 0.05 U1	0.00390	< 0.002 U1	0.5	0.57	< 0.04 U1
5/22/2023	Corrective Action	0.027 J1	0.44	58.5	< 0.007 U1	0.013 J1	0.21 J1	0.013 J1	1.02	0.1	< 0.05 U1	0.00291	< 0.002 U1	0.5	0.53	< 0.02 U1
10/25/2023	Corrective Action	0.028 J1	0.42	61.7	< 0.007 U1	0.018 J1	0.29 J1	0.014 J1	10.52 M1	0.11	< 0.05 U1	0.00419	< 0.002 U1	0.4 J1	0.47 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1602
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/28/2016	Background	0.141	74.9	7.95	0.17	7.3	167	412
11/1/2016	Background	0.115	71.1	8.70	0.18	6.6	178	424
12/19/2016	Background	0.120	74.7	9.91	0.18	6.9	188	470
2/20/2017	Background	0.093	69.6	9.76	0.19	6.5	193	494
3/27/2017	Background	0.240	86.6	12.0	0.19	6.3	231	504
4/17/2017	Background	0.107	91.1	12.1	0.20	6.7	248	520
5/15/2017	Background	0.115	105	12.6	0.19	7.0	273	598
6/12/2017	Background	0.153	94.0	11.8	0.20	6.8	269	588
10/31/2017	Detection	0.093	78.1	8.41	0.23	6.7	184	468
5/10/2018	Assessment	--	--	--	0.23	7.0	--	--
9/20/2018	Assessment	0.109	81.6	10.5	0.25	7.1	195	502
4/9/2019	Assessment	0.09 J1	99.8	11.4	0.20	6.6	221	595
6/20/2019	Assessment	0.1 J1	91.2	10.7	0.23	7.0	267	606
9/11/2019	Assessment	0.111	95.1	10.4	0.21	6.7	259	603
3/11/2020	Assessment	--	--	--	0.23	6.4	--	--
5/15/2020	Assessment	0.118	99.2	9.67	0.25	6.4	264	595
10/8/2020	Assessment	0.108	96.7	8.61	0.23	6.5	253	575
3/22/2021	Assessment	0.110	96.9	8.58	0.29	6.8	238	550
5/20/2021	Assessment	0.117	87.7	7.54	0.27	6.5	238	580
10/28/2021	Assessment	0.127	91.3 M1, P3	7.49	0.26	6.9	222	530
3/7/2022	Corrective Action	0.099	74.5	7.23	0.26	6.9	175	460
5/20/2022	Corrective Action	0.115	104	7.63	0.25	6.5	220	560 L1
11/2/2022	Corrective Action	0.098	77.0	7.89	0.26	6.6	178	480
2/13/2023	Corrective Action	0.100	86.3	8.75	0.24	6.4	226	540
5/22/2023	Corrective Action	0.107	78.7	8.29	0.23	6.7	227	530
10/25/2023	Corrective Action	0.104	79.0	8.69	0.19	6.4	236	520

Table 1. Groundwater Data Summary: MW-1602

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/28/2016	Background	0.02 J1	0.40	27.1	< 0.005 U1	0.02 J1	0.2	0.217	0.275	0.17	0.255	0.013	< 0.002 U1	0.90	0.08 J1	0.092
11/1/2016	Background	0.02 J1	0.35	28.7	< 0.005 U1	0.02 J1	0.6	0.108	2.086	0.18	0.070	0.014	< 0.002 U1	1.48	0.1	0.116
12/19/2016	Background	0.02 J1	0.43	28.9	< 0.005 U1	0.01 J1	1.65	0.225	0.7053	0.18	0.272	0.008	< 0.002 U1	0.56	0.08 J1	0.02 J1
2/20/2017	Background	< 0.01 U1	0.35	26.9	< 0.005 U1	0.01 J1	0.194	0.052	0.75	0.19	0.052	0.013	< 0.002 U1	0.63	0.1	0.02 J1
3/27/2017	Background	0.01 J1	0.34	29.9	< 0.005 U1	0.02 J1	0.456	0.059	0.679	0.19	0.063	0.019	< 0.002 U1	1.49	0.2	0.01 J1
4/17/2017	Background	0.02 J1	0.36	32.1	< 0.004 U1	0.01 J1	0.240	0.049	0.337	0.20	0.087	0.017	0.002 J1	0.66	0.1	0.01 J1
5/15/2017	Background	0.02 J1	0.42	33.2	< 0.004 U1	0.02 J1	0.136	0.072	1.9116	0.19	0.078	0.009	< 0.002 U1	1.28	0.1	0.04 J1
6/12/2017	Background	0.03 J1	0.36	33.1	< 0.004 U1	0.01 J1	0.408	0.066	0.2898	0.20	0.061	0.018	< 0.002 U1	0.53	0.1	0.02 J1
5/10/2018	Assessment	0.02 J1	0.34	31.2	0.005 J1	0.01 J1	0.121	0.036	0.342	0.23	0.038	0.015	< 0.002 U1	0.71	0.1	0.03 J1
9/20/2018	Assessment	0.01 J1	0.32	26.7	< 0.004 U1	0.01 J1	0.210	0.02 J1	0.683	0.25	0.01 J1	0.012	< 0.002 U1	0.84	0.07 J1	0.02 J1
4/9/2019	Assessment	< 0.1 U1	0.4 J1	29.0	< 0.1 U1	< 0.05 U1	< 0.2 U1	< 0.1 U1	1.0509	0.20	< 0.1 U1	0.02 J1	< 0.002 U1	3 J1	0.2 J1	< 0.5 U1
6/20/2019	Assessment	0.02 J1	0.33	29.5	< 0.02 U1	0.01 J1	0.2 J1	0.03 J1	0.1531	0.23	0.07 J1	0.01 J1	< 0.002 U1	0.9 J1	0.1 J1	< 0.1 U1
9/11/2019	Assessment	< 0.02 U1	0.31	27.3	< 0.02 U1	0.01 J1	0.2 J1	< 0.02 U1	0.451	0.21	< 0.05 U1	0.00979	< 0.002 U1	1 J1	0.1 J1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.31	28.9	< 0.02 U1	< 0.01 U1	0.261	< 0.02 U1	0.4389	0.23	0.05 J1	0.0117	< 0.002 U1	1 J1	0.2 J1	< 0.1 U1
5/15/2020	Assessment	0.02 J1	0.31	30.0	--	0.01 J1	0.2 J1	0.04 J1	0.5819	0.25	< 0.05 U1	0.0126	--	0.9 J1	0.09 J1	< 0.1 U1
10/8/2020	Assessment	0.04 J1	0.33	25.7	--	0.01 J1	0.311	0.04 J1	0.194	0.23	< 0.05 U1	0.0104	< 0.002 U1	0.9 J1	0.08 J1	< 0.1 U1
3/22/2021	Assessment	0.02 J1	0.31	26.2	< 0.007 U1	0.02 J1	0.531	0.03 J1	0.8182	0.29	0.06 J1	0.0109	< 0.002 U1	1 J1	0.1 J1	< 0.04 U1
5/20/2021	Assessment	0.07 J1	0.30	25.9	< 0.007 U1	0.012 J1	0.65	0.018 J1	0.58	0.27	< 0.05 U1	0.0118	< 0.002 U1	1.1	0.10 J1	< 0.04 U1
10/28/2021	Assessment	< 0.02 U1	0.31	24.5	< 0.007 U1	0.011 J1	0.47	0.013 J1	0.86	0.26	< 0.05 U1	0.0129	< 0.002 U1	1.1	0.11 J1	< 0.04 U1
3/7/2022	Corrective Action	0.52	0.32	21.8	< 0.007 U1	0.038	0.62	0.044	0.72	0.26	0.20	0.0114	< 0.002 U1	1.2	0.12 J1	< 0.04 U1
5/20/2022	Corrective Action	0.02 J1	0.36	28.2	< 0.007 U1	0.017 J1	0.32	0.027	0.57	0.25	0.20	0.0125	< 0.002 U1	1.0	< 0.09 U1	< 0.04 U1
11/2/2022	Corrective Action	< 0.02 U1	0.29	23.6	< 0.007 U1	0.011 J1	0.42	0.015 J1	0.96	0.26	< 0.05 U1	0.0137	< 0.002 U1	1.1	< 0.09 U1	< 0.04 U1
2/13/2023	Corrective Action	< 0.02 U1	0.27	25.1	< 0.007 U1	0.012 J1	0.66	0.012 J1	0.78	0.24	< 0.05 U1	0.0133	< 0.002 U1	1.0	0.11 J1	< 0.04 U1
5/22/2023	Corrective Action	0.022 J1	0.26	24.0	< 0.007 U1	0.01 J1	0.35	0.016 J1	0.24	0.23	< 0.05 U1	0.0131	< 0.002 U1	1.1	0.40 J1	< 0.02 U1
10/25/2023	Corrective Action	0.020 J1	0.25	26.7	< 0.007 U1	0.013 J1	0.44	0.019 J1	1.58	0.19	< 0.05 U1	0.0152	< 0.002 U1	0.6	0.52	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1603
Mountaineer - BAP
Appendix III Constituents**

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/28/2016	Background	0.327	124	15.7	0.07 J1	7.3	388	618
11/2/2016	Background	0.334	146	22.8	0.08 J1	6.6	483	814
12/19/2016	Background	0.495	164	30.1	0.1 J1	7.4	504	908
2/20/2017	Background	0.543	169	27.4	0.1 J1	6.8	485	962
3/28/2017	Background	0.781	181	25.2	0.1 J1	6.6	476	918
4/17/2017	Background	0.519	170	22.9	0.1 J1	6.9	474	910
5/15/2017	Background	0.546	187	24.7	0.1 J1	7.4	470	910
6/12/2017	Background	0.535	176	20.5	0.1 J1	7.0	482	878
10/31/2017	Detection	0.360	171	13.1	0.1 J1	6.6	553	872
5/10/2018	Assessment	--	--	--	0.09 J1	6.6	--	--
9/20/2018	Assessment	0.324	167	14.0	0.09	6.6	524	920
4/9/2019	Assessment	0.408	182	15.8	0.11	6.8	429	918
6/20/2019	Assessment	0.299	162	10.9	0.09	7.0	434	878
9/11/2019	Assessment	0.308	156	10.0	0.09	6.7	421	853
3/11/2020	Assessment	--	--	--	0.06	6.4	--	--
5/15/2020	Assessment	0.275	161	10.7	0.09	6.5	387	809
10/8/2020	Assessment	0.221	139	8.86	0.07	6.3	332	692
3/22/2021	Assessment	0.218	177	9.93	0.09	6.7	364	840
5/20/2021	Assessment	0.232	162	10.3	0.08	6.3	390	820
10/28/2021	Assessment	0.328	176	18.7	0.09	6.9	372	860
3/8/2022	Corrective Action	0.300	187	16.2	0.08	6.9	395	910
5/19/2022	Corrective Action	0.344	202	17.3	0.09	6.6	379	880 L1
11/7/2022	Corrective Action	0.239	166	14.1	0.07	6.7	424	880
2/13/2023	Corrective Action	0.190	150	12.7	0.06	6.4	450	830
5/22/2023	Corrective Action	0.203	128	11.3	0.05 J1	6.5	433	800
10/25/2023	Corrective Action	0.206	114	10.9	0.06	6.2	392	720

Table 1. Groundwater Data Summary: MW-1603

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/28/2016	Background	0.02 J1	0.36	29.5	< 0.005 U1	0.02 J1	0.3	0.317	0.0927	0.07 J1	0.253	0.021	< 0.002 U1	1.21	0.1	0.02 J1
11/2/2016	Background	0.02 J1	0.36	34.1	< 0.005 U1	0.01 J1	0.4	0.166	2.593	0.08 J1	0.131	0.022	< 0.002 U1	2.47	0.4	0.04 J1
12/19/2016	Background	0.03 J1	0.40	33.1	< 0.005 U1	0.01 J1	2.37	0.134	0.966	0.1 J1	0.084	0.010	< 0.002 U1	0.36	0.3	0.063
2/20/2017	Background	0.01 J1	0.37	31.7	< 0.005 U1	0.01 J1	0.229	0.105	0.384	0.1 J1	0.077	0.012	< 0.002 U1	0.37	0.4	0.02 J1
3/28/2017	Background	0.02 J1	0.36	32.9	< 0.005 U1	0.01 J1	0.545	0.093	0.2071	0.1 J1	0.080	0.020	< 0.002 U1	0.72	0.2	< 0.01 U1
4/17/2017	Background	0.03 J1	0.52	33.7	0.005 J1	0.01 J1	0.304	0.377	0.6154	0.1 J1	0.308	0.018	0.003 J1	0.27	0.2	0.01 J1
5/15/2017	Background	0.03 J1	0.43	33.0	< 0.004 U1	0.01 J1	0.415	0.101	1.6052	0.1 J1	0.079	0.012	< 0.002 U1	0.71	0.1	0.02 J1
6/12/2017	Background	0.03 J1	0.35	32.0	< 0.004 U1	0.01 J1	0.963	0.085	0.776	0.1 J1	0.059	0.021	< 0.002 U1	0.29	0.1	0.01 J1
5/10/2018	Assessment	0.02 J1	0.31	41.3	0.007 J1	0.01 J1	0.099	0.054	0.363	0.09 J1	0.042	0.021	< 0.002 U1	0.14	0.2	0.02 J1
9/20/2018	Assessment	0.02 J1	0.26	35.9	< 0.004 U1	0.01 J1	0.102	0.032	0.881	0.09	0.02 J1	0.022	< 0.002 U1	0.07 J1	0.4	0.01 J1
4/9/2019	Assessment	< 0.1 U1	0.56	32.4	< 0.1 U1	< 0.05 U1	0.4 J1	0.622	2.389	0.11	0.5 J1	0.030	< 0.002 U1	< 2 U1	0.4 J1	< 0.5 U1
6/20/2019	Assessment	0.03 J1	0.41	30.7	< 0.02 U1	0.01 J1	0.249	0.204	0.2974	0.09	0.176	< 0.009 U1	< 0.002 U1	0.9 J1	0.3	< 0.1 U1
9/11/2019	Assessment	0.03 J1	0.35	30.9	< 0.02 U1	0.01 J1	0.205	0.112	1.07	0.09	0.1 J1	0.0150	< 0.002 U1	0.5 J1	0.2	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.29	30.4	< 0.02 U1	0.01 J1	0.224	0.061	2.036	0.06	0.08 J1	0.0175	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
5/15/2020	Assessment	< 0.02 U1	0.27	30.0	--	0.01 J1	0.210	0.094	0.701	0.09	0.07 J1	0.0182	--	< 0.4 U1	0.2 J1	< 0.1 U1
10/8/2020	Assessment	0.15	0.41	26.8	--	0.01 J1	0.552	0.392	0.0948	0.07	0.310	0.0142	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
3/22/2021	Assessment	0.03 J1	0.32	31.2	< 0.007 U1	0.01 J1	0.341	0.110	1.916	0.09	0.1 J1	0.0153	< 0.002 U1	0.1 J1	0.1 J1	< 0.04 U1
5/20/2021	Assessment	0.08 J1	0.29	30.9	< 0.007 U1	0.012 J1	0.74	0.152	0.49	0.08	0.16 J1	0.0154	< 0.002 U1	0.1 J1	0.13 J1	< 0.04 U1
10/28/2021	Assessment	0.02 J1	0.23	29.5	< 0.007 U1	0.010 J1	0.45	0.033	1.59	0.09	< 0.05 U1	0.0158	< 0.002 U1	0.1 J1	0.14 J1	< 0.04 U1
3/8/2022	Corrective Action	0.02 J1	0.27	29.3	< 0.007 U1	0.012 J1	0.40	0.037	0.65	0.08	< 0.05 U1	0.0145	< 0.002 U1	0.2 J1	0.19 J1	< 0.04 U1
5/19/2022	Corrective Action	0.02 J1	0.28	31.6	< 0.007 U1	0.011 J1	0.32	0.039	0.40	0.09	< 0.05 U1	0.0158	< 0.002 U1	0.2 J1	0.1 J1	< 0.04 U1
11/7/2022	Corrective Action	< 0.02 U1	0.22	29.3	< 0.007 U1	0.010 J1	0.57	0.031	4.44	0.07	< 0.05 U1	0.0174	< 0.002 U1	0.3 J1	0.16 J1	< 0.04 U1
2/13/2023	Corrective Action	0.02 J1	0.18	28.1	< 0.007 U1	0.012 J1	0.35	0.034	0.49	0.06	< 0.05 U1	0.0167	< 0.002 U1	0.1 J1	0.38 J1	< 0.04 U1
5/22/2023	Corrective Action	0.069 J1	0.27	29.5	< 0.007 U1	0.020	0.42	0.226	0.77	0.05 J1	0.21	0.0165	< 0.002 U1	< 0.1 U1	0.24 J1	< 0.02 U1
10/25/2023	Corrective Action	0.027 J1	0.21	28.5	< 0.007 U1	0.011 J1	0.37	0.112	1.34	0.06	0.11 J1	0.0141	< 0.002 U1	0.1 J1	0.14 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1604D
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/26/2016	Background	3.54	306	111	0.18	7.3	865	1,650
11/1/2016	Background	2.98	277	116	0.19	7.3	866	1,580
12/20/2016	Background	3.07	289	118	0.17	7.4	863	1,630
2/21/2017	Background	3.01	260	111	0.21	7.2	823	1,640
3/28/2017	Background	4.18	293	112	0.19	7.2	814	1,660
4/19/2017	Background	2.97	269	109	0.20	7.2	797	1,570
5/16/2017	Background	2.95	300	112	0.18	7.9	828	1,610
6/13/2017	Background	2.98	283	118	0.18	7.5	856	1,620
10/30/2017	Detection	2.60	295	116	0.20	7.2	833	1,570
1/22/2018	Detection	3.07	291	118	--	7.2	862	1,620
5/9/2018	Assessment	--	--	--	0.21	7.1	--	--
9/19/2018	Assessment	1.33	144	41.3	0.19	7.2	313	838
4/9/2019	Assessment	2.82	236	100	0.15	6.9	539	1,300
6/19/2019	Assessment	1.66	196	93.0	0.14	7.2	461	1,110
9/9/2019	Assessment	2.18	217	82.2	0.17	7.0	551	1,210
3/10/2020	Assessment	--	--	--	0.22	6.4	--	--
5/14/2020	Assessment	4.65	205	113	0.25	6.7	667	1,390
10/9/2020	Assessment	3.58	188	57.9	0.20	6.7	483	1,080
3/24/2021	Assessment	3.68	175	70.4	0.24	7.2	489	1,080
5/20/2021	Assessment	4.02	174	80.5	0.24	7.0	508	1,160
10/27/2021	Assessment	3.32	186	48.7	0.15	6.9	314	250
3/2/2022	Corrective Action	3.17	185	64.0	0.22	7.1	496	1,110
5/23/2022	Corrective Action	2.73	192	31.9	0.07	6.8	5.20	260 L1
11/3/2022	Corrective Action	3.59	160	60.9	0.21	6.9	440	1,060
2/15/2023	Corrective Action	3.20	163 M1	78.1	0.21	6.8	462	1,070
5/24/2023	Corrective Action	0.566	105	3.75	0.24	7.1	249	650
10/25/2023	Corrective Action	0.130	105	20.7	0.25	7.1	203	600

**Table 1. Groundwater Data Summary: MW-1604D
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/26/2016	Background	0.14	0.48	29.1	< 0.005 U1	0.14	0.4	1.76	1.38	0.18	0.106	0.059	< 0.002 U1	19.8	0.9	0.235
11/1/2016	Background	0.15	0.59	28.4	< 0.005 U1	0.17	0.5	1.78	1.056	0.19	0.039	0.057	0.036	20.0	1.0	0.261
12/20/2016	Background	0.14	0.57	30.3	< 0.005 U1	0.17	0.798	1.92	1.45	0.17	0.02 J1	0.045	< 0.002 U1	20.8	1.0	0.283
2/21/2017	Background	0.11	0.45	26.2	< 0.005 U1	0.13	0.297	1.85	0.824	0.21	0.02 J1	0.050	< 0.002 U1	17.4	0.7	0.264
3/28/2017	Background	0.13	0.41	28.9	< 0.005 U1	0.13	0.416	1.74	0.806	0.19	0.022	0.064	< 0.002 U1	18.2	0.7	0.336
4/19/2017	Background	0.12	0.49	27.9	< 0.004 U1	0.09	0.323	1.60	1.537	0.20	0.584	0.051	0.003 J1	17.4	0.7	0.217
5/16/2017	Background	0.13	0.54	27.5	< 0.004 U1	0.10	0.079	1.60	3.489	0.18	0.027	0.052	< 0.002 U1	18.1	0.5	0.231
6/13/2017	Background	0.15	0.46	27.9	< 0.008 U1	0.15	0.180	1.95	1.058	0.18	0.03 J1	0.058	< 0.002 U1	18.3	0.8	0.256
5/9/2018	Assessment	0.04 J1	0.34	32.0	< 0.004 U1	0.04	0.195	0.314	0.687	0.21	0.035	0.024	< 0.002 U1	2.05	1.4	0.02 J1
9/19/2018	Assessment	0.04 J1	0.29	37.0	< 0.004 U1	0.03	0.169	0.203	0.316	0.19	0.303	0.016	< 0.002 U1	1.57	3.8	0.02 J1
4/9/2019	Assessment	< 0.1 U1	0.4 J1	42.5	< 0.1 U1	0.05 J1	0.2 J1	0.345	0.957	0.15	< 0.1 U1	0.038	< 0.002 U1	< 2 U1	2.0	< 0.5 U1
6/19/2019	Assessment	0.04 J1	0.28	52.9	< 0.02 U1	0.04 J1	0.212	0.242	0.1922	0.14	0.07 J1	< 0.009 U1	< 0.002 U1	1 J1	3.1	< 0.1 U1
9/9/2019	Assessment	0.03 J1	0.30	55.6	< 0.02 U1	0.03 J1	0.345	0.181	0.464	0.17	< 0.05 U1	0.0188	< 0.002 U1	2 J1	3.4	< 0.1 U1
3/10/2020	Assessment	0.02 J1	0.31	34.2	< 0.02 U1	0.03 J1	0.311	0.138	0.834	0.22	< 0.05 U1	0.0235	< 0.002 U1	1 J1	0.8	< 0.1 U1
5/14/2020	Assessment	0.03 J1	0.28	34.1	--	0.03 J1	0.729	0.117	0.1393	0.25	< 0.05 U1	0.0218	--	1 J1	0.7	< 0.1 U1
10/9/2020	Assessment	0.03 J1	0.29	27.3	--	0.02 J1	1.02	0.140	0.123	0.20	0.06 J1	0.0190	< 0.002 U1	1 J1	3.0	< 0.1 U1
3/24/2021	Assessment	0.04 J1	0.28	26.5	< 0.007 U1	0.02 J1	0.219	0.105	0.677	0.24	< 0.05 U1	0.0217	< 0.002 U1	2 J1	1.2	< 0.04 U1
5/20/2021	Assessment	0.08 J1	0.25	24.4	< 0.007 U1	0.022	0.26	0.091	0.32	0.24	< 0.05 U1	0.0213	< 0.002 U1	1.4	1.39	< 0.04 U1
10/27/2021	Assessment	0.03 J1	0.29	24.1	< 0.007 U1	0.027	0.28	0.134	0.61	0.15	< 0.05 U1	0.0213	< 0.002 U1	1.5	1.49	< 0.04 U1
3/2/2022	Corrective Action	0.03 J1	0.26	23.2	< 0.007 U1	0.022	0.49	0.092	0.79	0.22	< 0.05 U1	0.0197	< 0.002 U1	1.5	0.51	< 0.04 U1
5/23/2022	Corrective Action	0.04 J1	0.40	35.3	< 0.007 U1	0.022	0.24	0.126	0.85	0.07	< 0.05 U1	0.0199	< 0.002 U1	1.9	0.74	< 0.04 U1
11/3/2022	Corrective Action	0.06 J1	0.24	26.8	< 0.007 U1	0.017 J1	0.26	0.112	2.13	0.21	0.08 J1	0.0190	< 0.002 U1	1.6	2.11	< 0.04 U1
2/15/2023	Corrective Action	0.03 J1	0.23	24.1	< 0.007 U1	0.018 J1	0.27	0.116	0.70	0.21	< 0.05 U1	0.0186	< 0.002 U1	1.6	1.19	< 0.04 U1
5/24/2023	Corrective Action	0.041 J1	0.24	25.6	< 0.007 U1	0.014 J1	0.30	0.079	0.54	0.24	< 0.05 U1	0.0140	< 0.002 U1	1.8	3.46	< 0.02 U1
10/25/2023	Corrective Action	0.040 J1	0.26	34.5	< 0.007 U1	0.022	0.44	0.607	2.25	0.25	0.32	0.0128	< 0.002 U1	1.3	1.52	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1604S
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/26/2016	Background	2.12	178	83.9	0.20	7.0	602	1,280
11/1/2016	Background	1.90	167	99.4	0.21	7.1	626	1,310
12/20/2016	Background	2.35	165	99.9	0.19	7.2	618	1,300
2/21/2017	Background	3.08	168	112	0.21	7.0	634	1,430
3/28/2017	Background	4.04	180	116	0.20	6.9	663	1,420
4/19/2017	Background	3.68	191	130	0.21	7.0	716	1,500
5/16/2017	Background	3.63	202	122	0.19	7.7	708	1,510
6/13/2017	Background	3.48	182	112	0.20	7.5	685	1,400
10/30/2017	Detection	2.17	167	85.3	0.21	7.1	544	1,150
1/22/2018	Detection	2.36	--	105	--	6.9	602	1,312
5/9/2018	Assessment	--	--	--	0.22	7.4	--	--
9/19/2018	Assessment	2.49	262	109	0.22	7.3	742	1,500
4/9/2019	Assessment	3.50	301	132	0.19	7.1	703	1,650
6/19/2019	Assessment	3.15	278	127	0.16	7.3	741	1,580
9/9/2019	Assessment	3.23	267	128	0.20	7.3	770	1,520
3/10/2020	Assessment	--	--	--	0.24	6.7	--	--
5/14/2020	Assessment	3.68	250	116	0.25	6.9	715	1,520
10/9/2020	Assessment	2.59	265	107	0.21	7.0	635	1,360
3/25/2021	Assessment	2.48	220	95.3	0.29	7.3	577	1,210
5/20/2021	Assessment	2.72	223	100	0.27	7.1	602	1,300
10/27/2021	Assessment	2.94	221	93.5	0.26	7.1	532	1,210
3/2/2022	Corrective Action	2.25	237 M1, P3	100	0.25	7.4	609	1,250
5/23/2022	Corrective Action	2.59	270	98.0	0.26	6.9	634	1,300 L1
11/3/2022	Corrective Action	2.37	246	96.1	0.24	7.0	622	1,340
2/15/2023	Corrective Action	2.11	240	112	0.23	6.9	702	1,360
5/24/2023	Corrective Action	1.90	204	112	0.22	7.1	692	1,350
10/25/2023	Corrective Action	2.01	227	105	0.25	7.1	588	1,280

Table 1. Groundwater Data Summary: MW-1604S

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/26/2016	Background	0.04 J1	0.39	29.4	< 0.005 U1	0.03	0.2	0.358	0.136	0.20	0.114	0.034	< 0.002 U1	3.20	3.1	0.03 J1
11/1/2016	Background	0.04 J1	0.46	27.2	< 0.005 U1	0.04	0.3	0.307	0.769	0.21	0.065	0.035	< 0.002 U1	2.47	2.5	0.02 J1
12/20/2016	Background	0.04 J1	0.42	26.6	< 0.005 U1	0.04	1.97	0.390	0.5256	0.19	0.093	0.023	< 0.002 U1	2.71	2.7	0.03 J1
2/21/2017	Background	0.03 J1	0.42	26.7	< 0.005 U1	0.04	0.379	0.501	0.92	0.21	0.140	0.033	< 0.002 U1	2.52	2.2	0.03 J1
3/28/2017	Background	0.03 J1	0.37	31.6	< 0.005 U1	0.03	0.692	0.308	0.585	0.20	0.055	0.042	< 0.002 U1	2.53	2.2	0.119
4/19/2017	Background	0.03 J1	0.44	28.9	< 0.004 U1	0.04	0.158	0.317	0.722	0.21	0.051	0.041	0.003 J1	2.53	1.7	0.02 J1
5/16/2017	Background	0.04 J1	0.51	32.2	< 0.004 U1	0.04	0.098	0.317	2.577	0.19	0.100	0.033	< 0.002 U1	2.54	2.0	0.04 J1
6/13/2017	Background	0.03 J1	0.41	28.7	< 0.004 U1	0.04	0.149	0.308	0.598	0.20	0.033	0.038	< 0.002 U1	2.41	2.5	0.02 J1
5/9/2018	Assessment	0.13	0.33	28.7	0.024	0.15	0.107	1.83	1.173	0.22	0.034	0.051	< 0.002 U1	16.2	1.0	0.220
9/19/2018	Assessment	0.13	0.32	26.6	< 0.004 U1	0.15	0.093	1.88	1.159	0.22	0.02 J1	0.052	< 0.002 U1	15.6	0.8	0.251
4/9/2019	Assessment	0.2 J1	0.54	29.1	< 0.1 U1	0.27	0.3 J1	2.41	1.472	0.19	< 0.1 U1	0.061	< 0.002 U1	17.8	1.2	< 0.5 U1
6/19/2019	Assessment	0.15	0.33	29.0	< 0.02 U1	0.21	0.09 J1	2.16	1.256	0.16	< 0.02 U1	0.032	< 0.002 U1	16.6	1.0	0.3 J1
9/9/2019	Assessment	0.14	0.34	29.0	< 0.02 U1	0.21	0.1 J1	2.14	1.15	0.20	< 0.05 U1	0.0476	< 0.002 U1	16.3	1.0	0.3 J1
3/10/2020	Assessment	0.14	0.29	28.9	< 0.02 U1	0.12	0.323	1.72	1.662	0.24	< 0.05 U1	0.0390	< 0.002 U1	13.7	1.2	0.2 J1
5/14/2020	Assessment	0.15	0.30	29.1	--	0.19	0.1 J1	1.93	1.038	0.25	< 0.05 U1	0.0419	--	14.9	1.1	0.2 J1
10/9/2020	Assessment	0.16	0.32	28.2	--	0.21	0.798	2.08	9.989	0.21	< 0.05 U1	0.0384	< 0.002 U1	15.0	0.9	0.3 J1
3/25/2021	Assessment	0.25	0.35	28.2	< 0.007 U1	0.20	0.506	4.70	2.14	0.29	0.245	0.0368	< 0.002 U1	13.7	1.1	0.2 J1
5/20/2021	Assessment	0.16	0.25	25.3	< 0.007 U1	0.174	0.21	1.77	1.38	0.27	< 0.05 U1	0.0374	< 0.002 U1	14.5	0.96	0.24
10/27/2021	Assessment	0.15	0.35	24.9	< 0.007 U1	0.171	0.41	2.36	1.48	0.26	< 0.05 U1	0.0380	< 0.002 U1	13.9	0.76	0.23
3/2/2022	Corrective Action	0.15	0.24	27.8	< 0.007 U1	0.172	0.45	1.99	1.99	0.25	< 0.05 U1	0.0340	< 0.002 U1	13.4	0.77	0.21
5/23/2022	Corrective Action	0.16	0.26	34.0	< 0.007 U1	0.128	0.23	1.79	1.29	0.26	< 0.05 U1	0.0351	< 0.002 U1	14.4	0.73	0.21
11/3/2022	Corrective Action	0.16	0.22	29.4	< 0.007 U1	0.167	0.50	1.89	2.63	0.24	0.07 J1	0.0358	< 0.002 U1	13.5	0.60	0.22
2/15/2023	Corrective Action	0.15	0.22	29.9	< 0.007 U1	0.181	0.34	2.20	1.83	0.23	< 0.05 U1	0.0356	< 0.002 U1	12.1	0.53	0.21
5/24/2023	Corrective Action	0.117	0.20	25.5	< 0.007 U1	0.169	0.20 J1	1.49	0.99	0.22	0.08 J1	0.0306	< 0.002 U1	11.4	0.55	0.19 J1
10/25/2023	Corrective Action	0.186	0.23	29.1	< 0.007 U1	0.302	0.43	4.11	1.43	0.25	< 0.05 U1	0.0309	< 0.002 U1	13.1	0.70	0.22

**Table 1. Groundwater Data Summary: MW-1605D
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/27/2016	Background	12.2	462	195	0.18	7.6	1,480	2,650
11/2/2016	Background	9.96	381	195	0.19	7.4	1,500	2,510
12/20/2016	Background	9.35	341	168	0.18	7.4	1,290	2,300
2/21/2017	Background	9.16	318	163	0.20	7.3	1,190	2,290
3/28/2017	Background	11.6	344	169	0.20	7.2	1,200	2,350
4/18/2017	Background	9.06	360	172	0.20	7.5	1,180	2,280
5/16/2017	Background	8.77	374	187	0.20	7.9	1,130	2,240
6/13/2017	Background	9.09	351	196	0.17	--	1,190	2,260
10/31/2017	Detection	7.83	324	198	0.21	7.3	1,170	2,170
1/22/2018	Detection	9.33	321	197	--	7.2	1,070	2,060
5/9/2018	Assessment	--	--	--	0.23	7.5	--	--
9/19/2018	Assessment	9.11	278	188	0.22	7.6	972	1,960
4/9/2019	Assessment	6.90	247	169	0.22	7.3	791	1,710
6/19/2019	Assessment	6.57	265	165	0.19	7.5	877	1,890
9/10/2019	Assessment	8.57	283	168	0.17	7.2	974	2,050
3/10/2020	Assessment	--	--	--	0.19	6.9	--	--
5/19/2020	Assessment	6.92	265	169	0.17	7.0	848	1,670
10/9/2020	Assessment	4.81	247	109	0.20	7.2	682	1,490
3/25/2021	Assessment	4.32	233	121	0.22	7.5	772	1,540
5/19/2021	Assessment	4.90	224	128	0.21	7.2	785	1,590
10/26/2021	Assessment	3.70	183	103	0.21	7.2	526	1,230
3/9/2022	Corrective Action	3.35	189	102	0.20	7.4	532	1,220
5/24/2022	Corrective Action	3.98	220	104	0.20	7.0	615	2,610 L1
11/4/2022	Corrective Action	2.69	212 M1, P3	99.3	0.20	7.3	566	1,270
2/15/2023	Corrective Action	2.96	214	110	0.20	7.1	584	1,250
5/24/2023	Corrective Action	3.15 M1	202 M1	111	0.19	7.2	697	1,410
10/26/2023	Corrective Action	2.58	222 M1	105	0.22	7.2	577	1,250

**Table 1. Groundwater Data Summary: MW-1605D
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.03 J1	2.29	31.5	< 0.01 U1	0.04	0.1	1.91	1.06	0.18	0.080	0.085	< 0.002 U1	54.6	0.2	0.06 J1
11/2/2016	Background	0.03 J1	2.48	30.6	< 0.01 U1	0.04	0.2	1.79	1.925	0.19	0.044	0.078	< 0.002 U1	52.4	0.2	0.05 J1
12/20/2016	Background	0.03 J1	2.26	28.2	< 0.01 U1	0.04 J1	2.29	1.75	2.662	0.18	0.03 J1	0.063	< 0.002 U1	54.7	0.3	0.05 J1
2/21/2017	Background	0.04 J1	2.23	25.9	< 0.005 U1	0.03	0.282	1.84	1.033	0.20	0.021	0.071	< 0.002 U1	46.8	0.2	0.138
3/28/2017	Background	0.04 J1	2.01	27.9	< 0.005 U1	0.03	0.556	1.69	0.578	0.20	0.02 J1	0.086	< 0.002 U1	44.6	0.2	0.090
4/18/2017	Background	0.03 J1	2.25	25.8	< 0.008 U1	0.02 J1	0.127	1.69	0.821	0.20	0.02 J1	0.077	0.002 J1	43.2	0.2 J1	0.04 J1
5/16/2017	Background	0.03 J1	2.45	26.3	< 0.004 U1	0.02 J1	0.099	1.63	3.433	0.20	0.01 J1	0.075	< 0.002 U1	48.1	0.2	0.04 J1
6/13/2017	Background	0.04 J1	1.99	27.2	< 0.008 U1	0.04	0.120	1.86	0.668	0.17	0.02 J1	0.081	< 0.002 U1	45.5	0.4	0.05 J1
5/9/2018	Assessment	0.03 J1	2.22	21.6	< 0.004 U1	0.01 J1	0.067	1.51	0.523	0.23	0.02 J1	0.062	< 0.002 U1	46.4	0.2	0.04 J1
9/19/2018	Assessment	0.04 J1	2.51	25.9	< 0.004 U1	0.02 J1	0.229	1.80	0.759	0.22	0.01 J1	0.060	< 0.002 U1	47.9	0.3	0.05 J1
4/9/2019	Assessment	0.04 J1	2.81	26.4	< 0.02 U1	0.01 J1	0.06 J1	1.56	0.543	0.22	0.03 J1	0.075	< 0.002 U1	40.6	0.2	< 0.1 U1
6/19/2019	Assessment	< 0.04 U1	2.67	28.6	< 0.04 U1	0.02 J1	0.2 J1	1.65	0.831	0.19	< 0.04 U1	0.02 J1	< 0.002 U1	40.0	0.2 J1	< 0.2 U1
9/10/2019	Assessment	0.03 J1	2.78	33.1	< 0.02 U1	0.03 J1	0.04 J1	1.69	1.641	0.17	< 0.05 U1	0.0561	< 0.002 U1	39.7	0.3	< 0.1 U1
3/10/2020	Assessment	0.03 J1	3.01	29.6	< 0.02 U1	0.02 J1	0.08 J1	1.67	0.3851	0.19	< 0.05 U1	0.0502	< 0.002 U1	32.7	0.2 J1	< 0.1 U1
5/19/2020	Assessment	0.04 J1	2.73	25.7	--	0.01 J1	0.1 J1	1.45	0.425	0.17	< 0.05 U1	0.0495	--	32.8	0.2 J1	< 0.1 U1
10/9/2020	Assessment	< 0.02 U1	3.09	23.0	--	< 0.01 U1	0.208	1.43	0.8083	0.20	0.05 J1	0.0439	< 0.002 U1	35.7	0.09 J1	< 0.1 U1
3/25/2021	Assessment	0.03 J1	2.98	27.3	< 0.007 U1	0.01 J1	0.1 J1	1.55	3.315	0.22	< 0.05 U1	0.0447	< 0.002 U1	30.1	0.2 J1	< 0.04 U1
5/19/2021	Assessment	0.06 J1	2.83	26.6	< 0.007 U1	0.014 J1	0.17 J1	1.54	1.28	0.21	< 0.05 U1	0.0455	< 0.002 U1	29.3	0.14 J1	< 0.04 U1
10/26/2021	Assessment	0.04 J1	2.90	24.3	< 0.007 U1	0.011 J1	0.19 J1	1.23	0.62	0.21	< 0.05 U1	0.0413	< 0.002 U1	33.0	0.11 J1	0.05 J1
3/9/2022	Corrective Action	0.02 J1	3.33	26.6	< 0.007 U1	0.015 J1	0.50	1.41	2.11	0.20	< 0.05 U1	0.0352	< 0.002 U1	33.7	< 0.09 U1	< 0.04 U1
5/24/2022	Corrective Action	0.04 J1	3.27	33.5	< 0.007 U1	0.016 J1	0.18 J1	1.49	1.33	0.20	< 0.05 U1	0.0416	< 0.002 U1	35.5	0.13 J1	< 0.04 U1
11/4/2022	Corrective Action	0.03 J1	3.42	29.5	< 0.007 U1	0.008 J1	0.25	1.24	2.06	0.20	< 0.05 U1	0.0430	< 0.002 U1	32.0	< 0.09 U1	< 0.04 U1
2/15/2023	Corrective Action	0.03 J1	2.97	30.0	< 0.007 U1	0.008 J1	0.23	1.24	0.59 P1	0.20	< 0.05 U1	0.0417	< 0.002 U1	30.2	0.11 J1	< 0.04 U1
5/24/2023	Corrective Action	0.031 J1	2.72	28.4	< 0.007 M1, U1	0.008 J1	0.32	1.25	1.33	0.19	< 0.05 U1	0.0365 M1	< 0.002 U1	27.5	0.11 J1	0.02 J1
10/26/2023	Corrective Action	0.024 J1	2.85	28.8	< 0.007 U1	0.008 J1	0.22 J1	1.14	1.21	0.22	< 0.05 U1	0.0400	< 0.002 U1	27.4	0.09 J1	0.03 J1

**Table 1. Groundwater Data Summary: MW-1605S
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/27/2016	Background	8.30	224	150	0.24	7.5	965	1,910
11/1/2016	Background	6.55	220	159	0.25	7.3	1,010	1,930
12/20/2016	Background	7.30	279	173	0.22	7.4	1,180	2,160
2/21/2017	Background	9.04	249	179	0.25	7.2	1,110	2,220
3/28/2017	Background	10.8	261	212	0.25	7.1	1,110	2,250
4/18/2017	Background	8.69	244	180	0.23	7.4	1,100	2,120
5/16/2017	Background	8.75	251	217	0.26	7.7	1,060	2,160
6/13/2017	Background	8.80	218	191	0.24	7.8	1,000	1,980
10/31/2017	Detection	5.88	212	222	0.25	7.2	1,040	2,000
1/22/2018	Detection	10.1	231	220	--	7.1	976	1,970
5/9/2018	Assessment	--	--	--	0.30	7.2	--	--
9/19/2018	Assessment	7.75	182	171	0.32	7.4	793	1,650
4/9/2019	Assessment	9.39	164	140	0.33	7.2	599	1,450
6/19/2019	Assessment	7.02	156	140	0.23	7.4	649	1,510
9/10/2019	Assessment	8.05	174	149	0.26	7.2	694	1,470
3/10/2020	Assessment	--	--	--	0.30	6.9	--	--
5/19/2020	Assessment	4.83	154	93.5	0.28	6.9	543	1,160
10/9/2020	Assessment	3.99	163	85.4	0.28	7.0	492	1,150
3/24/2021	Assessment	4.63	160	85.8	0.33	7.4	512	1,120
5/19/2021	Assessment	4.74	154	93.2	0.30	7.1	528	1,180
10/26/2021	Assessment	3.95	167	81.9	0.29	7.3	568	1,220
3/9/2022	Corrective Action	4.16	180	80.2	0.24	7.3	607	1,250
5/24/2022	Corrective Action	4.17	178	66.0	0.27	6.9	547	1,130 L1
11/4/2022	Corrective Action	3.63	156	81.4	0.26	7.2	513	1,180
2/15/2023	Corrective Action	3.49	162	78.3	0.25	6.9	574	1,170
5/22/2023	Corrective Action	3.28	153	85.5	0.23	7.2	623	1,240
10/26/2023	Corrective Action	3.16	160	94.9	0.27	7.2	562	1,220

Table 1. Groundwater Data Summary: MW-1605S

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.16	1.38	49.6	0.02 J1	0.13	0.6	3.16	0.777	0.24	2.18	0.086	< 0.002 U1	25.8	1.1	0.174
11/1/2016	Background	0.07	0.93	38.2	0.009 J1	0.08	0.7	1.26	2.692	0.25	0.793	0.084	< 0.002 U1	23.9	0.9	0.055
12/20/2016	Background	0.07 J1	0.88	37.0	< 0.01 U1	0.08	2.85	0.861	0.337	0.22	0.410	0.076	< 0.002 U1	22.9	0.7	0.05 J1
2/21/2017	Background	0.04 J1	0.86	36.0	0.007 J1	0.08	0.390	1.10	0.785	0.25	0.636	0.068	< 0.002 U1	17.5	1.1	0.055
3/28/2017	Background	0.03 J1	0.63	32.5	< 0.005 U1	0.06	0.349	0.448	0.466	0.25	0.181	0.076	< 0.002 U1	15.4	1.0	0.102
4/18/2017	Background	0.06 J1	0.74	31.9	< 0.008 U1	0.08	0.245	0.715	0.827	0.23	0.285	0.067	0.003 J1	20.8	3.0	0.04 J1
5/16/2017	Background	0.06 J1	0.88	33.3	< 0.008 U1	0.08	0.585	0.647	2.733	0.26	0.382	0.076	< 0.002 U1	18.6	1.7	0.06 J1
6/13/2017	Background	0.05 J1	0.75	30.8	< 0.008 U1	0.08	0.387	0.708	0.611	0.24	0.541	0.071	< 0.002 U1	17.8	1.7	0.05 J1
5/9/2018	Assessment	0.04 J1	0.50	23.5	< 0.004 U1	0.06	0.083	0.518	0.3045	0.30	0.056	0.051	< 0.002 U1	15.6	2.0	0.04 J1
9/19/2018	Assessment	0.04 J1	0.49	23.1	< 0.004 U1	0.05	0.644	0.360	0.347	0.32	0.093	0.049	< 0.002 U1	15.1	1.0	0.04 J1
4/9/2019	Assessment	0.05 J1	0.64	25.2	< 0.02 U1	0.05	0.293	0.631	0.369	0.33	0.331	0.079	< 0.002 U1	15.9	0.7	< 0.1 U1
6/19/2019	Assessment	0.04 J1	0.47	23.6	< 0.02 U1	0.05 J1	0.1 J1	0.279	0.424	0.23	0.08 J1	0.040	< 0.002 U1	13.6	0.6	< 0.1 U1
9/10/2019	Assessment	0.04 J1	0.59	29.6	< 0.02 U1	0.05 J1	0.237	0.379	0.542	0.26	0.202	0.0524	< 0.002 U1	14.2	0.4	< 0.1 U1
3/10/2020	Assessment	0.08 J1	0.62	26.5	< 0.02 U1	0.04 J1	0.305	0.723	0.842	0.30	0.497	0.0558	< 0.002 U1	12.8	0.8	< 0.1 U1
5/19/2020	Assessment	0.04 J1	0.47	21.1	--	0.03 J1	0.1 J1	0.208	0.639	0.28	< 0.05 U1	0.0523	--	12.3	0.7	< 0.1 U1
10/9/2020	Assessment	0.04 J1	0.47	24.6	--	0.03 J1	0.266	0.195	1.4891	0.28	0.05 J1	0.0470	< 0.002 U1	11.2	0.5	< 0.1 U1
3/24/2021	Assessment	0.04 J1	0.42	25.7	< 0.007 U1	0.05 J1	0.2 J1	0.208	0.919	0.33	0.06 J1	0.0509	< 0.002 U1	13.4	0.4 J1	< 0.04 U1
5/19/2021	Assessment	0.09 J1	0.43	26.9	< 0.007 U1	0.047	0.34	0.603	0.77	0.30	0.14 J1	0.0516	< 0.002 U1	12.4	0.39 J1	< 0.04 U1
10/26/2021	Assessment	0.04 J1	0.39	28.2	< 0.007 U1	0.050	0.07 J1	0.324	0.69	0.29	< 0.05 U1	0.0542 M1	< 0.002 U1	11.9	0.96	< 0.04 U1
3/9/2022	Corrective Action	0.05 J1	0.43	28.3	< 0.007 U1	0.057	0.46	0.547	2.40	0.24	0.08 J1	0.0522	< 0.002 U1	14.3	0.88	< 0.04 U1
5/24/2022	Corrective Action	0.09 J1	0.43	29.0	< 0.007 U1	0.040	0.25	0.377	0.34	0.27	0.08 J1	0.0481	< 0.002 U1	13.4	0.92	< 0.04 U1
11/4/2022	Corrective Action	0.06 J1	0.45	27.3	< 0.007 U1	0.045	0.44	0.547	1.04	0.26	0.17 J1	0.0444	< 0.002 U1	13.0	0.59	< 0.04 U1
2/15/2023	Corrective Action	0.04 J1	0.39	27.5	< 0.007 U1	0.046	0.26	0.306	0.63	0.25	0.05 J1	0.0456	< 0.002 U1	12.8	0.45 J1	< 0.04 U1
5/22/2023	Corrective Action	0.043 J1	0.34	25.3	< 0.007 U1	0.049	0.18 J1	0.344	0.67	0.23	0.06 J1	0.0415	< 0.002 U1	13.6	1.38	0.03 J1
10/26/2023	Corrective Action	0.037 J1	0.41	27.6	< 0.007 U1	0.044	0.44	0.439	0.52	0.27	0.18 J1	0.0384	< 0.002 U1	12.5	1.53	0.03 J1

**Table 1. Groundwater Data Summary: MW-1606D
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/27/2016	Background	4.29	278	190	0.25	7.2	813	1,710
11/2/2016	Background	3.97	252	201	0.28	7.4	796	1,720
12/20/2016	Background	4.96	260	206	0.24	7.5	796	1,690
2/21/2017	Background	5.48	242	190	0.26	7.3	759	1,670
3/28/2017	Background	6.90	247	187	0.26	7.2	739	1,700
4/18/2017	Background	5.46	274	104	0.26	7.4	385	1,690
5/16/2017	Background	5.26	278	218	0.26	8.0	764	1,730
6/13/2017	Background	5.90	262	219	0.24	7.5	752	1,680
10/31/2017	Detection	7.03	287	213	0.24	7.3	770	1,590
1/23/2018	Detection	9.59	322	237	--	7.4	760	1,730
5/9/2018	Assessment	--	--	--	0.26	7.4	--	--
9/19/2018	Assessment	7.27	260	201	0.26	7.2	722	1,610
4/8/2019	Assessment	7.32	265	214	0.26	7.2	682	1,600
6/19/2019	Assessment	7.79	281	231	0.1 J1	7.4	693	1,690
9/10/2019	Assessment	6.38	281	244	0.49	7.4	588	1,700
3/10/2020	Assessment	--	--	--	0.27	7.0	--	--
5/19/2020	Assessment	5.92	270	178	0.24	7.0	756	1,600
10/8/2020	Assessment	6.85	273	208	0.23	7.1	694	1,650
3/25/2021	Assessment	7.50	239	170	0.27	7.4	703	1,580
5/18/2021	Assessment	7.99	230	180	0.26	7.1	682	1,620
10/26/2021	Assessment	7.25	216	226	0.26	7.0	652	1,650
3/9/2022	Corrective Action	7.44	235	229	0.22	7.3	657	1,530
5/24/2022	Corrective Action	4.90	207	131	0.26	6.9	581	1,280 L1
11/7/2022	Corrective Action	6.37	199	191	0.24	7.2	585	1,380
2/15/2023	Corrective Action	5.52 M1	189 M1	164	0.24	7.2	601	1,320
5/24/2023	Corrective Action	4.07	194	172	0.23	7.2	585	1,330
10/27/2023	Corrective Action	4.23	212	159	0.26	7.2	563	1,320

**Table 1. Groundwater Data Summary: MW-1606D
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.19	0.71	64.0	0.005 J1	0.07	0.3	2.20	8.459	0.25	0.522	0.129	< 0.002 U1	81.4	1.8	0.123
11/2/2016	Background	0.19	0.84	62.6	< 0.005 U1	0.07	0.9	1.92	3.659	0.28	0.491	0.120	< 0.002 U1	81.2	4.7	0.092
12/20/2016	Background	0.16	0.63	58.4	< 0.005 U1	0.06	0.736	1.52	1.179	0.24	0.164	0.110	< 0.002 U1	83.2	3.6	0.094
2/21/2017	Background	0.16	0.51	52.6	< 0.005 U1	0.07	0.300	1.33	1.71	0.26	0.082	0.109	< 0.002 U1	76.6	4.1	0.119
3/28/2017	Background	0.15	0.44	53.6	< 0.005 U1	0.05	0.541	1.17	1.459	0.26	0.087	0.130	< 0.002 U1	73.3	3.6	0.113
4/18/2017	Background	0.25	1.38	64.2	0.01 J1	0.08	0.853	4.26	1.212	0.26	2.04	0.119	0.004 J1	71.5	4.1	0.097
5/16/2017	Background	0.19	0.63	56.7	0.031	0.07	0.163	1.39	3.18	0.26	0.162	0.124	< 0.002 U1	79.1	5.9	0.095
6/13/2017	Background	0.16	0.52	52.0	< 0.008 U1	0.08	0.153	1.46	1.026	0.24	0.084	0.132	< 0.002 U1	77.8	8.1	0.09 J1
5/9/2018	Assessment	0.16	0.44	53.0	< 0.004 U1	0.07	0.198	1.40	0.972	0.26	0.115	0.112	< 0.002 U1	70.3	2.6	0.086
9/19/2018	Assessment	0.15	0.38	48.9	0.004 J1	0.07	0.151	1.17	0.4378	0.26	0.01 J1	0.107	< 0.002 U1	65.3	3.3	0.108
4/8/2019	Assessment	0.15	0.35	47.3	< 0.02 U1	0.07	0.1 J1	1.25	0.94	0.26	0.03 J1	0.124	< 0.002 U1	71.8	8.1	< 0.1 U1
6/19/2019	Assessment	0.14	0.37	49.4	< 0.02 U1	0.09	0.07 J1	1.36	0.933	0.1 J1	< 0.02 U1	0.058	< 0.002 U1	68.3	9.6	0.1 J1
9/10/2019	Assessment	0.15	0.40	51.4	< 0.02 U1	0.08	0.1 J1	1.09	2.2714	0.49	< 0.05 U1	0.0835	< 0.002 U1	68.5	1.0	< 0.1 U1
3/10/2020	Assessment	0.14	0.35	45.3	< 0.02 U1	0.05	0.2 J1	1.11	0.946	0.27	< 0.05 U1	0.0700	< 0.002 U1	62.5	0.5	< 0.1 U1
5/19/2020	Assessment	0.15	0.32	45.6	--	0.06	0.1 J1	1.10	0.975	0.24	< 0.05 U1	0.0681	--	67.0	0.5	< 0.1 U1
10/8/2020	Assessment	0.14	0.36	45.6	--	0.08	0.247	1.54	0.908	0.23	< 0.05 U1	0.0633	< 0.002 U1	63.6	4.2	< 0.1 U1
3/25/2021	Assessment	0.15	0.35	47.3	< 0.007 U1	0.08	0.202	1.56	0.444	0.27	< 0.05 U1	0.0658	< 0.002 U1	66.9	3.2	0.07 J1
5/18/2021	Assessment	0.20	0.33	46.1	< 0.007 U1	0.082	0.46	1.60	1.24	0.26	< 0.05 U1	0.0666	< 0.002 U1	66.9	3.62	0.07 J1
10/26/2021	Assessment	0.14	0.28	46.1	< 0.007 U1	0.075	0.30	1.60	0.89	0.26	< 0.05 U1	0.0594	< 0.002 U1	61.2	1.92	0.07 J1
3/9/2022	Corrective Action	0.17	0.30	48.1	< 0.007 U1	0.083	0.64	1.77	2.43	0.22	0.07 J1	0.0603	< 0.002 U1	66.5	1.64	0.07 J1
5/24/2022	Corrective Action	0.21	0.27	39.4	< 0.007 U1	0.052	0.43	1.01	1.89	0.26	< 0.05 U1	0.0540	< 0.002 U1	62.0	0.85	0.06 J1
11/7/2022	Corrective Action	0.14	0.30	41.9	< 0.007 U1	0.064	0.28	1.41	2.35	0.24	< 0.05 U1	0.0591	< 0.002 U1	62.5	2.18	0.06 J1
2/15/2023	Corrective Action	0.15	0.27	39.6	< 0.007 U1	0.061	0.52	1.31	1.85	0.24	< 0.05 M1, P3, U1	0.0545 M1	< 0.002 U1	65.3	1.41	0.07 J1
5/24/2023	Corrective Action	0.140	0.26	37.3	< 0.007 U1	0.057	0.48	1.23	0.78	0.23	< 0.05 U1	0.0519	< 0.002 U1	59.3	2.29	0.06 J1
10/27/2023	Corrective Action	0.143	0.28	40.7	< 0.007 U1	0.060	0.45	1.18	1.38	0.26	< 0.05 U1	0.0520	< 0.002 U1	56.3	2.35	0.09 J1

**Table 1. Groundwater Data Summary: MW-1606S
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/27/2016	Background	5.25	219	182	0.50	6.0	621	1,470
11/2/2016	Background	4.57	183	183	0.57	7.2	638	1,470
12/20/2016	Background	5.35	200	170	0.46	7.3	621	1,420
2/21/2017	Background	5.03	211	231	0.46	7.1	578	1,500
3/28/2017	Background	6.67	217	226	0.45	7.0	589	1,500
4/18/2017	Background	5.80	228	217	0.43	7.2	615	1,540
5/16/2017	Background	5.72	228	227	0.45	7.7	635	3,230
6/13/2017	Background	6.12	230	230	0.45	7.4	643	1,540
10/31/2017	Detection	9.54	226	187	0.46	7.1	644	1,410
1/23/2018	Detection	6.62	218	184	0.43	7.2	660	1,450
5/9/2018	Assessment	--	--	--	0.44	6.9	--	--
9/19/2018	Assessment	5.87	199	219	0.46	7.1	571	1,370
4/8/2019	Assessment	7.68	229	223	0.54	6.8	592	1,480
6/19/2019	Assessment	6.08	223	232	0.25	7.2	581	1,490
9/10/2019	Assessment	6.19	229	221	0.28	7.3	705	1,460
3/10/2020	Assessment	--	--	--	0.40	6.8	--	--
5/19/2020	Assessment	5.94	207	181	0.38	6.7	646	1,400
10/8/2020	Assessment	6.35	206	172	0.38	6.9	572	1,460
3/25/2021	Assessment	6.09	172	137	0.45	7.2	516	1,280
5/18/2021	Assessment	4.92	158	141	0.45	7.0	505	1,290
10/26/2021	Assessment	5.49	181	152	0.38	6.9	497	1,300
3/9/2022	Corrective Action	5.01	200	145	0.38	7.1	495	1,280
5/24/2022	Corrective Action	3.61	156 M1, P3	124	0.39	6.9	485	1,150 L1
11/8/2022	Corrective Action	4.94	201	169	0.36	7.1	529	1,300
2/15/2023	Corrective Action	5.06	196	166	0.34	7.0	553	1,280
5/23/2023	Corrective Action	3.33	127	106	0.34	7.1	477	1,100
10/27/2023	Corrective Action	3.03	160	98.3	0.37	7.0	458	1,100

**Table 1. Groundwater Data Summary: MW-1606S
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.16	0.88	76.7	< 0.005 U1	0.08	0.2	0.466	0.592	0.50	0.234	0.116	< 0.002 U1	112	1.2	0.074
11/2/2016	Background	0.17	0.94	69.7	< 0.005 U1	0.07	0.4	0.432	1.55	0.57	0.207	0.103	< 0.002 U1	112	1.0	0.060
12/20/2016	Background	0.16	0.83	71.6	< 0.005 U1	0.07	1.26	0.280	1.656	0.46	0.084	0.102	< 0.002 U1	101	0.9	0.063
2/21/2017	Background	0.15	0.88	77.2	< 0.005 U1	0.08	0.384	0.372	0.993	0.46	0.158	0.108	< 0.002 U1	93.1	0.7	0.086
3/28/2017	Background	0.14	0.78	75.7	< 0.005 U1	0.06	0.742	0.258	0.945	0.45	0.096	0.126	< 0.002 U1	90.1	0.7	0.100
4/18/2017	Background	0.16	0.86	74.2	< 0.004 U1	0.07	0.134	0.234	1.303	0.43	0.070	0.117	0.002 J1	92.4	0.8	0.062
5/16/2017	Background	0.16	0.90	74.1	< 0.004 U1	0.07	0.093	0.241	2.167	0.45	0.062	0.110	< 0.002 U1	90.2	0.9	0.069
6/13/2017	Background	0.16	0.81	77.1	< 0.008 U1	0.09	0.178	0.281	1.28	0.45	0.090	0.118	< 0.002 U1	95.7	0.9	0.07 J1
5/9/2018	Assessment	0.14	0.72	73.2	< 0.004 U1	0.08	0.056	0.318	0.3443	0.44	0.040	0.107	< 0.002 U1	70.2	2.0	0.076
9/19/2018	Assessment	0.13	0.69	64.8	0.005 J1	0.06	0.297	0.260	0.439	0.46	0.02 J1	0.096	< 0.002 U1	70.6	2.8	0.112
4/8/2019	Assessment	0.15	0.70	63.1	< 0.02 U1	0.07	0.08 J1	0.320	0.595	0.54	0.107	0.117	< 0.002 U1	67.7	1.4	< 0.1 U1
6/19/2019	Assessment	0.15	0.63	67.2	< 0.02 U1	0.08	0.08 J1	0.171	1.0123	0.25	0.111	0.056	< 0.002 U1	58.9	1.3	0.1 J1
9/10/2019	Assessment	0.13	0.67	70.4	< 0.02 U1	0.07	0.08 J1	0.312	2.682	0.28	< 0.05 U1	0.0877	< 0.002 U1	54.9	2.7	< 0.1 U1
3/10/2020	Assessment	0.13	0.62	60.9	< 0.02 U1	0.07	0.1 J1	0.322	0.434	0.40	0.05 J1	0.0721	< 0.002 U1	51.7	4.4	< 0.1 U1
5/19/2020	Assessment	0.14	0.65	59.8	--	0.06	0.1 J1	0.435	0.3814	0.38	< 0.05 U1	0.0730	--	56.0	5.3	< 0.1 U1
10/8/2020	Assessment	0.14	0.68	57.4	--	0.07	0.492	0.148	0.682	0.38	< 0.05 U1	0.0701	< 0.002 U1	56.4	1.9	< 0.1 U1
3/25/2021	Assessment	0.16	0.70	54.1	< 0.007 U1	0.05	0.232	0.153	0.745	0.45	< 0.05 U1	0.0604	< 0.002 U1	62.5	3.0	0.06 J1
5/18/2021	Assessment	0.17	0.63	52.1	< 0.007 U1	0.067	0.19 J1	0.192	0.79	0.45	< 0.05 U1	0.0652	< 0.002 M1, P3, U1	52.8	3.49	0.06 J1
10/26/2021	Assessment	0.15	0.61	55.6	< 0.007 U1	0.061	0.21	0.142	0.67	0.38	0.08 J1	0.0644	< 0.002 U1	50.6	1.87	0.06 J1
3/9/2022	Corrective Action	0.15	0.70	54.6	< 0.007 U1	0.068	0.70	0.139	1.21	0.38	< 0.05 U1	0.0543	< 0.002 U1	58.3	2.04	0.06 J1
5/24/2022	Corrective Action	0.14	0.61	44.8	< 0.007 U1	0.055	0.30	0.280	3.53	0.39	< 0.05 U1	0.0582	< 0.002 U1	56.6	5.90	0.06 J1
11/8/2022	Corrective Action	0.14	0.62	56.0	< 0.007 U1	0.059	0.25	0.145	0.52	0.36	< 0.05 U1	0.0571	< 0.002 U1	51.8	1.43	0.06 J1
2/15/2023	Corrective Action	0.14	0.64	54.1	< 0.007 U1	0.061	0.26	0.195	0.93	0.34	< 0.05 U1	0.0545	< 0.002 U1	52.8	1.55	0.06 J1
5/23/2023	Corrective Action	0.130	0.51	36.3	< 0.007 U1	0.043	0.22 J1	0.136	0.47 M1	0.34	0.06 J1	0.0391	< 0.002 U1	44.4	3.28	0.04 J1
10/27/2023	Corrective Action	0.147	0.58	44.7	< 0.007 U1	0.048	0.29 J1	0.154	0.92	0.37	0.05 J1	0.0473	< 0.002 U1	48.7	2.26	0.06 J1

**Table 1. Groundwater Data Summary: MW-1607D
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/27/2016	Background	1.64	141	88.3	0.54	6.9	285	744
11/2/2016	Background	1.42	155	103	0.61	7.8	376	856
12/20/2016	Background	1.46	187	118	0.50	7.7	474	1,050
1/23/2017	Background	--	--	--	--	7.5	--	--
2/21/2017	Background	1.54	165	107	0.51	7.6	415	1,010
3/29/2017	Background	1.89	162	106	0.52	7.6	393	938
4/18/2017	Background	1.58	168	104	0.52	7.6	383	904
5/16/2017	Background	1.54	156	102	0.52	8.4	347	876
6/14/2017	Background	1.50	159	104	0.49	7.6	365	872
10/31/2017	Detection	1.76	214	138	0.47	7.6	626	1,290
1/23/2018	Detection	2.34	244	150	0.44	7.5	668	1,380
5/10/2018	Assessment	--	--	--	0.54	7.5	--	--
9/20/2018	Assessment	2.44	222	163	0.52	7.7	662	1,450
4/8/2019	Assessment	3.10	232	162	0.52	7.4	656	1,480
6/19/2019	Assessment	3.14	234	167	0.40	7.8	710	1,600
9/10/2019	Assessment	3.65	233	174	0.56	7.7	699	1,610
3/11/2020	Assessment	--	--	--	0.41	7.1	--	--
5/20/2020	Assessment	3.89	228	181	0.51	7.2	722	1,620
10/8/2020	Assessment	4.16	232	170	0.49	7.3	703	1,650
3/25/2021	Assessment	4.43	212	170	0.57	7.6	668	1,550
5/18/2021	Assessment	4.46	197	170	0.53	7.3	652	1,590
10/26/2021	Assessment	4.46	201	164	0.52	7.3	612	1,530
3/8/2022	Corrective Action	4.51	225	166	0.50	7.5	622	1,530
5/25/2022	Corrective Action	5.04	201	158	0.49	7.6	604	1,480 L1
11/8/2022	Corrective Action	4.56	222 M1	165	0.47	7.4	641	1,560
2/15/2023	Corrective Action	4.40	218	177	0.46	7.4	719	1,600
5/23/2023	Corrective Action	4.16	175	159	0.46	7.4	629	1,530
10/31/2023	Corrective Action	4.65	211	157	0.48	7.3	624	1,510

**Table 1. Groundwater Data Summary: MW-1607D
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.04 J1	0.91	117	< 0.005 U1	0.02 J1	0.3	0.439	0.86	0.54	0.179	0.068	< 0.002 U1	96.2	0.1	0.05 J1
11/2/2016	Background	0.03 J1	1.02	155	< 0.005 U1	0.02 J1	0.7	0.396	3.997	0.61	0.058	0.069	< 0.002 U1	91.1	0.07 J1	0.04 J1
12/20/2016	Background	0.03 J1	1.02	168	< 0.005 U1	0.005 J1	2.07	0.526	1.689	0.50	0.038	0.075	< 0.002 U1	89.6	0.03 J1	0.04 J1
2/21/2017	Background	0.03 J1	1.14	133	< 0.005 U1	< 0.004 U1	0.090	0.481	0.883	0.51	0.041	0.072	< 0.002 U1	87.7	0.03 J1	0.04 J1
3/29/2017	Background	0.05	1.24	140	0.008 J1	0.03	0.602	0.805	1.872	0.52	0.628	0.087	0.002 J1	85.9	0.5	0.062
4/18/2017	Background	0.03 J1	1.00	126	< 0.004 U1	< 0.005 U1	0.133	0.414	1.535	0.52	0.070	0.079	0.002 J1	81.8	0.05 J1	0.02 J1
5/16/2017	Background	0.03 J1	1.11	129	< 0.004 U1	< 0.005 U1	0.078	0.399	1.265	0.52	0.041	0.087	< 0.002 U1	91.2	0.04 J1	0.02 J1
6/14/2017	Background	0.03 J1	0.98	131	< 0.004 U1	< 0.005 U1	0.141	0.439	1.764	0.49	0.124	0.088	< 0.002 U1	90.8	0.03 J1	0.04 J1
5/10/2018	Assessment	0.03 J1	1.15	73.5	< 0.004 U1	< 0.005 U1	0.051	0.521	1.254	0.54	0.043	0.089	< 0.002 U1	80.9	< 0.03 U1	0.02 J1
9/20/2018	Assessment	0.03 J1	1.34	92.3	< 0.004 U1	< 0.005 U1	0.158	0.769	0.926	0.52	0.044	0.104	< 0.002 U1	83.4	< 0.03 U1	0.04 J1
4/8/2019	Assessment	0.03 J1	1.31	75.7	< 0.02 U1	< 0.01 U1	0.07 J1	0.778	1.3269	0.52	0.05 J1	0.127	< 0.002 U1	79.8	0.05 J1	< 0.1 U1
6/19/2019	Assessment	0.03 J1	1.61	82.3	< 0.02 U1	< 0.01 U1	0.1 J1	0.799	1.31	0.40	0.07 J1	0.072	< 0.002 U1	81.8	0.06 J1	< 0.1 U1
9/10/2019	Assessment	0.03 J1	1.53	79.3	< 0.02 U1	0.01 J1	0.05 J1	0.848	1.855	0.56	< 0.05 U1	0.110	< 0.002 U1	82.1	0.09 J1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	1.56	68.3	< 0.02 U1	< 0.01 U1	0.08 J1	0.846	2.552	0.41	< 0.05 U1	0.108	< 0.002 U1	79.6	0.04 J1	< 0.1 U1
5/20/2020	Assessment	0.03 J1	1.42	65.6	--	< 0.01 U1	0.2 J1	0.913	0.815	0.51	0.05 J1	0.104	--	83.5	0.08 J1	< 0.1 U1
10/8/2020	Assessment	0.03 J1	1.80	75.8	--	< 0.01 U1	0.244	1.01	1.304	0.49	< 0.05 U1	0.0966	< 0.002 U1	83.8	0.06 J1	< 0.1 U1
3/25/2021	Assessment	0.03 J1	1.86	75.3	< 0.007 U1	0.004 J1	0.1 J1	0.874	1.002	0.57	< 0.05 U1	0.0770	< 0.002 U1	75.9	< 0.09 U1	< 0.04 U1
5/18/2021	Assessment	0.07 J1	1.86	71.7	< 0.007 U1	0.01 J1	0.26	0.843	1.34	0.53	< 0.05 U1	0.103	< 0.002 U1	75.0	< 0.09 U1	< 0.04 U1
10/26/2021	Assessment	0.03 J1	1.87	70.3	< 0.007 U1	0.008 J1	0.44	0.853	1.55	0.52	< 0.05 U1	0.0968	< 0.002 U1	72.3	< 0.09 U1	< 0.04 U1
3/8/2022	Corrective Action	0.03 J1	2.07	70.5	< 0.007 U1	0.011 J1	0.34	0.902	4.44	0.50	< 0.05 U1	0.0919	< 0.002 U1	71.9	< 0.09 U1	< 0.04 U1
5/25/2022	Corrective Action	0.03 J1	1.93	67.0	< 0.007 U1	0.01 J1	0.32	0.923	3.21	0.49	< 0.05 U1	0.0998	< 0.002 U1	75.0	< 0.09 U1	< 0.04 U1
11/8/2022	Corrective Action	0.03 J1	1.95	74.0	< 0.007 U1	< 0.004 U1	0.29	0.897	1.54	0.47	< 0.05 U1	0.0988	< 0.002 U1	64.3	< 0.09 U1	< 0.04 U1
2/15/2023	Corrective Action	0.04 J1	2.51	68.7	< 0.007 U1	< 0.004 U1	0.51	0.989	1.68	0.46	0.06 J1	0.0997	< 0.002 U1	63.2	< 0.09 U1	< 0.04 U1
5/23/2023	Corrective Action	0.030 J1	1.97	58.1	< 0.007 U1	< 0.004 U1	0.21 J1	0.839	1.81	0.46	< 0.05 U1	0.0811	< 0.002 U1	60.0	< 0.04 U1	< 0.02 U1
10/31/2023	Corrective Action	0.033 J1	1.97	63.5	< 0.007 U1	0.004 J1	0.47	0.859	1.70 B1	0.48	< 0.05 U1	0.0892	< 0.002 U1	58.5	0.07 J1	0.02 J1

**Table 1. Groundwater Data Summary: MW-1607S
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/31/2016	Background	1.38	126	90.8	0.31	7.6	213	670
11/2/2016	Background	1.35	126	90.6	0.32	7.6	214	698
12/21/2016	Background	1.02	129	92.7	0.33	7.7	246	716
2/21/2017	Background	1.27	131	91.9	0.29	7.5	244	746
3/28/2017	Background	1.70	131	93.1	0.28	7.4	233	706
4/18/2017	Background	1.65	135	92.6	0.30	7.6	225	678
5/16/2017	Background	1.64	133	97.5	0.29	8.2	221	746
6/14/2017	Background	1.74	136	96.3	0.27	7.5	229	708
10/31/2017	Detection	1.32	165	100	0.28	7.5	343	860
1/23/2018	Detection	1.49	--	111	--	7.4	--	--
5/10/2018	Assessment	--	--	--	0.29	7.4	--	--
9/20/2018	Assessment	1.71	220	151	0.28	7.6	478	1,160
4/8/2019	Assessment	2.35	226	153	0.26	7.2	504	1,310
6/19/2019	Assessment	2.46	233	154	0.19	7.5	524	1,370
9/10/2019	Assessment	3.21	198	167	0.27	7.7	465	1,350
3/10/2020	Assessment	--	--	--	0.24	6.9	--	--
5/20/2020	Assessment	3.55	190	172	0.23	7.0	407	1,230
10/8/2020	Assessment	3.26	187	148	0.24	7.0	371	1,180
3/25/2021	Assessment	3.37	187	166	0.26	7.4	373	1,160
5/18/2021	Assessment	3.40 P3	177	163	0.25	7.1	375	1,230
10/26/2021	Assessment	3.07	156	141	0.24	7.1	312	1,120
3/8/2022	Corrective Action	3.09	185	156	0.23	7.3	341	1,170
5/25/2022	Corrective Action	3.37	169	143	0.21	7.1	339	1,130 L1
11/8/2022	Corrective Action	2.76	170	126	0.21	7.2	290	1,060
2/15/2023	Corrective Action	2.58	181	161	0.21	7.2	349	1,160
5/23/2023	Corrective Action	3.18 M1	146 M1	138	0.22	7.1	311	1,140
10/31/2023	Corrective Action	2.87	134	116	0.24	7.1	244	940

Table 1. Groundwater Data Summary: MW-1607S

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/31/2016	Background	0.46	1.86	56.7	0.01 J1	0.06	0.8	2.59	2.504	0.31	1.40	0.098	0.003 J1	48.4	7.1	0.060
11/2/2016	Background	0.45	1.30	55.5	< 0.005 U1	0.04	0.4	0.752	1.338	0.32	0.264	0.092	< 0.002 U1	50.4	7.0	0.05 J1
12/21/2016	Background	0.84	11.2	114	0.123	0.22	3.10	20.1	2.81	0.33	11.0	0.088	0.012	45.7	9.4	0.150
2/21/2017	Background	0.42	1.19	63.9	0.007 J1	0.03	0.325	1.21	1.974	0.29	0.267	0.091	< 0.002 U1	41.3	9.0	0.069
3/28/2017	Background	0.43	1.17	66.8	< 0.005 U1	0.02	0.390	0.942	1.153	0.28	0.134	0.110	< 0.002 U1	39.2	9.2	0.052
4/18/2017	Background	0.55	1.62	67.6	0.01 J1	0.06	0.514	2.60	1.632	0.30	1.25	0.102	0.003 J1	45.1	8.9	0.058
5/16/2017	Background	0.50	1.17	63.7	< 0.004 U1	0.03	0.226	0.851	2.408	0.29	0.159	0.094	< 0.002 U1	48.1	9.1	0.05 J1
6/14/2017	Background	0.48	1.10	62.9	< 0.004 U1	0.03	0.200	0.936	1.017	0.27	0.138	0.106	< 0.002 U1	46.1	9.4	0.05 J1
5/10/2018	Assessment	0.44	0.93	71.1	< 0.004 U1	0.04	0.121	1.18	1.29	0.29	0.128	0.103	< 0.002 U1	43.2	11.4	0.064
9/20/2018	Assessment	0.42	0.90	80.6	< 0.004 U1	0.04	0.086	0.840	0.584	0.28	0.094	0.118	< 0.002 U1	41.5	8.8	0.089
4/8/2019	Assessment	0.40	0.94	72.7	< 0.02 U1	0.04 J1	0.376	1.21	0.723	0.26	0.09 J1	0.141	< 0.002 U1	37.9	7.0	< 0.1 U1
6/19/2019	Assessment	0.44	0.96	81.0	< 0.02 U1	0.04 J1	0.428	0.990	1.121	0.19	0.108	0.075	< 0.002 U1	34.6	5.6	< 0.1 U1
9/10/2019	Assessment	0.41	0.87	67.7	< 0.02 U1	0.05 J1	0.357	0.971	2.765	0.27	0.09 J1	0.0990	< 0.002 U1	35.0	4.3	< 0.1 U1
3/10/2020	Assessment	0.41	0.92	69.2	< 0.02 U1	0.04 J1	0.321	1.23	1.171	0.24	0.06 J1	0.110	< 0.002 U1	35.5	4.5	< 0.1 U1
5/20/2020	Assessment	0.45	0.93	66.8	--	0.04 J1	0.249	1.42	0.3123	0.23	0.06 J1	0.105	--	35.8	5.7	< 0.1 U1
10/8/2020	Assessment	0.48	0.89	64.0	--	0.03 J1	0.509	1.27	1.553	0.24	0.2 J1	0.0937	< 0.002 U1	35.9	3.3	< 0.1 U1
3/25/2021	Assessment	0.43	0.93	70.7	< 0.007 U1	0.04 J1	0.329	1.28	0.963	0.26	0.08 J1	0.0796	< 0.002 U1	30.4	4.1	0.07 J1
5/18/2021	Assessment	0.49	0.91	68.0 P3	< 0.007 U1	0.108	0.23	1.45	0.39	0.25	0.19 J1	0.103	< 0.002 U1	30.5	4.05	0.07 J1
10/26/2021	Assessment	0.40	0.92	65.0	< 0.007 U1	0.036	0.31	1.27	0.52	0.24	0.08 J1	0.0974	< 0.002 U1	30.1	2.71	0.07 J1
3/8/2022	Corrective Action	0.43	0.85	68.6	< 0.007 U1	0.042	0.43	1.53	1.42	0.23	0.05 J1	0.0967	< 0.002 U1	29.4	3.38	0.06 J1
5/25/2022	Corrective Action	0.41	0.84	60.8	< 0.007 U1	0.043	0.26	1.78	1.01	0.21	0.09 J1	0.104	< 0.002 U1	30.5	4.53	0.06 J1
11/8/2022	Corrective Action	0.44	0.91	64.0	< 0.04 U1	0.034	0.31	1.37	1.42	0.21	0.07 J1	0.105	< 0.002 U1	31.8	2.25	0.06 J1
2/15/2023	Corrective Action	0.40	0.84	67.4	< 0.007 U1	0.038	0.27	1.57	1.39	0.21	0.06 J1	0.102	< 0.002 U1	28.4	3.06	0.06 J1
5/23/2023	Corrective Action	0.399	0.80	57.2 M1	< 0.007 M1, U1	0.032	0.26 J1	1.39	1.12	0.22	0.07 J1	0.0890 M1	< 0.002 U1	30.5	3.27	0.05 J1
10/31/2023	Corrective Action	0.405	0.83	52.6	< 0.007 U1	0.024	0.34	1.26	1.13 B1	0.24	< 0.05 U1	0.0827	< 0.002 U1	29.9	3.16	0.04 J1

**Table 1. Groundwater Data Summary: MW-1608
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
9/27/2016	Background	0.150	93.8	6.55	0.27	7.4	70.6	368
11/1/2016	Background	0.113	86.2	6.43	0.30	7.3	64.3	352
12/19/2016	Background	0.118	83.0	4.25	0.26	7.3	58.3	338
2/22/2017	Background	0.156	83.3	4.37	0.25	7.1	94.4	398
3/27/2017	Background	0.238	80.3	5.27	0.24	6.8	112	350
4/17/2017	Background	0.233	101	7.08	0.23	7.0	168	424
5/15/2017	Background	0.200	102	8.62	0.23	7.8	208	475
6/12/2017	Background	0.169	110	8.23	0.21	6.7	204	486
10/31/2017	Detection	0.140	94.7	5.13	0.22	7.1	131	430
5/10/2018	Assessment	--	--	--	0.18	6.8	--	--
9/20/2018	Assessment	0.169	128	6.59	0.21	7.2	256	572
4/9/2019	Assessment	0.156	102	6.82	0.20	6.9	179	451
6/18/2019	Assessment	0.116	86.5	5.06	0.16	6.2	144	416
9/10/2019	Assessment	0.124	92.0	4.01	0.20	7.1	109	369
3/10/2020	Assessment	--	--	--	0.21	6.7	--	--
5/13/2020	Assessment	0.108	92.7	5.22	0.22	6.8	158	440
10/6/2020	Assessment	0.074	83.9	1.57	0.27	6.7	56.4	440
3/23/2021	Assessment	0.059	81.8	2.82	0.29	6.9	76.5	325
5/18/2021	Assessment	0.085	80.3	2.58	0.27	6.9	78.3	360
10/27/2021	Assessment	0.069	78.2	1.45	0.29	7.0	50.3	300
3/1/2022	Corrective Action	0.075	94.7 M1, P3	2.30	0.25	7.0	85.1	370
5/17/2022	Corrective Action	0.099	90.5 M1, P3	2.10	0.26	7.1	78.9	340 L1
11/1/2022	Corrective Action	0.065	84.5	2.07	0.25	7.0	83.3	370
2/14/2023	Corrective Action	0.058	78.5 M1	1.57	0.26	6.9	64.7	320 S7
5/23/2023	Corrective Action	0.089	91.5	4.78	0.23	6.9	140	440
10/26/2023	Corrective Action	0.075	75.9	1.28	0.27	6.9	60.8	320

Table 1. Groundwater Data Summary: MW-1608

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.10	0.82	42.0	0.02 J1	0.03	0.9	1.21	0.454	0.27	0.881	0.003	< 0.002 U1	2.35	1.2	0.03 J1
11/1/2016	Background	0.04 J1	0.53	33.4	< 0.005 U1	0.02 J1	0.6	0.254	2.282	0.30	0.232	0.004	< 0.002 U1	2.16	1.3	0.081
12/19/2016	Background	0.04 J1	0.68	32.2	0.009 J1	0.02	2.78	0.588	0.379	0.26	0.405	< 0.0002 U1	< 0.002 U1	1.94	1.1	0.03 J1
2/22/2017	Background	0.03 J1	0.52	32.4	< 0.005 U1	0.01 J1	0.364	0.240	1.235	0.25	0.205	0.003	< 0.002 U1	1.40	1.5	0.053
3/27/2017	Background	0.03 J1	0.56	31.4	< 0.005 U1	0.01 J1	0.335	0.330	0.417	0.24	0.274	0.006	< 0.002 U1	2.49	1.3	0.04 J1
4/17/2017	Background	0.04 J1	0.50	35.3	< 0.004 U1	0.01 J1	0.223	0.196	0.1298	0.23	0.173	0.006	0.002 J1	1.89	1.3	0.01 J1
5/15/2017	Background	0.04 J1	0.49	35.1	< 0.004 U1	0.008 J1	0.151	0.098	0.857	0.23	0.073	0.006	< 0.002 U1	2.08	1.0	0.01 J1
6/12/2017	Background	0.03 J1	0.49	36.4	< 0.004 U1	0.006 J1	0.277	0.040	0.146	0.21	0.024	0.016	< 0.002 U1	1.57	1.1	0.02 J1
5/10/2018	Assessment	0.02 J1	0.37	46.6	0.009 J1	0.01 J1	0.126	0.095	0.565	0.18	0.079	0.0003 J1	< 0.002 U1	0.53	0.9	0.02 J1
9/20/2018	Assessment	0.03 J1	0.42	42.6	< 0.004 U1	0.008 J1	0.264	0.052	0.55	0.21	0.037	0.004	< 0.002 U1	1.18	1.2	0.02 J1
4/9/2019	Assessment	0.04 J1	0.56	41.2	< 0.02 U1	0.02 J1	0.372	0.597	0.2435	0.20	0.454	0.01 J1	< 0.002 U1	1 J1	1.2	< 0.1 U1
6/18/2019	Assessment	0.03 J1	0.40	32.0	< 0.02 U1	0.01 J1	0.306	0.05 J1	0.104	0.16	0.06 J1	< 0.009 U1	< 0.002 U1	0.8 J1	0.8	< 0.1 U1
9/10/2019	Assessment	0.03 J1	0.52	26.8	0.05 J1	< 0.01 U1	0.327	0.056	1.348	0.20	0.06 J1	0.00286	< 0.002 U1	1 J1	1.0	< 0.1 U1
3/10/2020	Assessment	< 0.02 U1	0.37	30.5	< 0.02 U1	< 0.01 U1	0.264	0.070	0.67	0.21	0.06 J1	0.00229	< 0.002 U1	0.6 J1	4.3	< 0.1 U1
5/13/2020	Assessment	0.04 J1	0.36	31.3	--	0.02 J1	0.2 J1	0.092	0.569	0.22	0.275	0.00241	--	0.7 J1	2.1	< 0.1 U1
10/6/2020	Assessment	0.09 J1	0.66	30.5	--	0.05	0.707	0.659	0.0286	0.27	0.476	0.00241	< 0.002 U1	2 J1	1.7	< 0.1 U1
3/23/2021	Assessment	0.04 J1	0.55	31.9	< 0.007 U1	0.02 J1	0.429	0.399	0.9785	0.29	0.334	0.00187	< 0.002 U1	0.6 J1	1.4	< 0.04 U1
5/18/2021	Assessment	0.09 J1	0.45	25.0	< 0.007 U1	0.009 J1	0.25	0.125	0.56	0.27	0.10 J1	0.00209	< 0.002 U1	1	2.06	< 0.04 U1
10/27/2021	Assessment	0.04 J1	0.49	23.0	< 0.007 U1	0.01 J1	0.43	0.113	1.09	0.29	0.10 J1	0.00226	< 0.002 U1	1.9	1.32	< 0.04 U1
3/1/2022	Corrective Action	0.04 J1	0.45	25.2	< 0.007 U1	0.006 J1	0.48	0.070	0.80	0.25	0.05 J1	0.00206	< 0.002 U1	0.8	1.58	< 0.04 U1
5/17/2022	Corrective Action	0.03 J1	0.40	24.0	< 0.007 U1	0.008 J1	0.60	0.092	0.53	0.26	0.06 J1	0.00223	< 0.002 U1	0.9	2.38	< 0.04 U1
11/1/2022	Corrective Action	0.03 J1	0.43	25.1	< 0.007 U1	0.005 J1	0.44	0.024	1.19	0.25	0.22	0.00231	< 0.002 U1	0.9	2.07	< 0.04 U1
2/14/2023	Corrective Action	0.03 J1	0.38	23.4	< 0.007 U1	0.006 J1	0.28	0.052	0.29	0.26	< 0.05 U1	0.00226	< 0.002 U1	0.7	1.58	< 0.04 U1
5/23/2023	Corrective Action	0.033 J1	0.33	26.8	< 0.007 U1	0.007 J1	0.31	0.049	0.54	0.23	< 0.05 U1	0.00228	< 0.002 U1	0.8	3.27	< 0.02 U1
10/26/2023	Corrective Action	0.032 J1	0.41	22.7	< 0.007 U1	0.006 J1	0.41	0.080	1.43	0.27	0.06 J1	0.00216	< 0.002 U1	0.9	1.03	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1805
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	4.24	147	146	0.36	7.8	639	1,500
6/19/2019	Assessment	6.38	280	156	0.1 J1	7.5	894	1,860
9/10/2019	Assessment	6.00	273	--	--	7.4	--	--
9/11/2019	Assessment	--	--	167	0.24	--	908	1,880
3/10/2020	Assessment	--	--	--	0.27	7.2	--	--
5/14/2020	Assessment	5.74	254	169	0.24	7.2	923	1,800
10/9/2020	Assessment	5.11	265	131	0.19	7.2	789	1,660
3/25/2021	Assessment	4.67	225	127	0.24	7.6	762	1,530
5/19/2021	Assessment	4.46	204	124	0.29	7.2	735	1,480
10/26/2021	Assessment	3.43	111	140	0.29	7.3	473	1,250
3/2/2022	Corrective Action	2.96	86.9	151	0.38	7.8	368	1,100
5/20/2022	Corrective Action	3.13	65.6	152	0.41	7.7	288	1,050 L1
11/4/2022	Corrective Action	2.84	147	119	0.31	7.5	408	1,140
2/14/2023	Corrective Action	2.03	39.5 M1	156	0.63	8.0	128	840
5/22/2023	Corrective Action	1.98	36.3	149	0.60	8.0	143	840
10/25/2023	Corrective Action	1.75	63.4	133	0.64	8.0	180	800

**Table 1. Groundwater Data Summary: MW-1805
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	2.14	20.3	54.3	< 0.1 U1	< 0.05 U1	1.00	3.31	3.12	0.36	1.21	0.043	< 0.002 U1	80.1	< 0.3 U1	< 0.5 U1
6/19/2019	Assessment	< 0.04 U1	66.3	42.4	< 0.04 U1	< 0.02 U1	0.2 J1	4.91	1.412	0.1 J1	< 0.04 U1	0.032	< 0.002 U1	96.2	0.1 J1	< 0.2 U1
9/10/2019	Assessment	0.07 J1	70.4	41.9	< 0.02 U1	< 0.01 U1	0.415	3.39	2.7353	--	0.1 J1	0.0426	< 0.002 U1	78.0	0.1 J1	< 0.1 U1
9/11/2019	Assessment	--	--	--	--	--	--	--	--	0.24	--	--	--	--	--	--
3/10/2020	Assessment	0.02 J1	11.4	24.3	< 0.02 U1	< 0.01 U1	0.2 J1	0.091	1.409	0.27	< 0.05 U1	0.0316	< 0.002 U1	10.7	< 0.03 U1	< 0.1 U1
5/14/2020	Assessment	0.03 J1	56.0	41.3	--	< 0.01 U1	0.1 J1	0.384	0.641	0.24	< 0.05 U1	0.0422	--	42.7	0.1 J1	< 0.1 U1
10/9/2020	Assessment	< 0.02 U1	80.9	32.2	--	< 0.01 U1	0.326	1.01	1.50	0.19	< 0.05 U1	0.0432	< 0.002 U1	50.0	0.05 J1	< 0.1 U1
3/25/2021	Assessment	0.03 J1	74.2	28.8	< 0.007 U1	< 0.004 U1	0.2 J1	0.417	0.755	0.24	< 0.05 U1	0.0426	< 0.002 U1	43.9	< 0.09 U1	< 0.04 U1
5/19/2021	Assessment	0.05 J1	69.5	27.7	< 0.007 U1	< 0.004 U1	0.32	0.358	0.98	0.29	< 0.05 U1	0.0409	< 0.002 U1	41.0	< 0.09 U1	< 0.04 U1
10/26/2021	Assessment	0.04 J1	37.3	25.2	< 0.007 U1	< 0.004 U1	0.24	0.066	0.58	0.29	< 0.05 U1	0.0347	< 0.002 U1	10.6	< 0.09 M1, U1	< 0.04 U1
3/2/2022	Corrective Action	0.09 J1	19.4	32.3	< 0.007 U1	< 0.004 U1	0.40	0.037	1.70	0.38	< 0.05 U1	0.0248	< 0.002 U1	5.3	< 0.09 U1	< 0.04 U1
5/20/2022	Corrective Action	0.09 J1	10.9	44.5	< 0.007 U1	< 0.004 U1	0.26	0.098	2.07	0.41	< 0.05 U1	0.0260	< 0.002 U1	3.8	< 0.09 U1	< 0.04 U1
11/4/2022	Corrective Action	< 0.02 U1	40.2	40.3	< 0.007 U1	< 0.004 U1	0.31	0.130	3.14	0.31	< 0.05 U1	0.0306	< 0.002 U1	21.2	< 0.09 U1	< 0.04 U1
2/14/2023	Corrective Action	0.03 J1	15.2	56.7	< 0.007 U1	< 0.004 U1	0.24	0.039	0.56	0.63	< 0.05 U1	0.0178	< 0.002 U1	7.7	< 0.09 M1, U1	< 0.04 U1
5/22/2023	Corrective Action	0.037 J1	8.77	77.9	< 0.007 U1	< 0.004 U1	0.24 J1	0.033	2.00	0.60	< 0.05 U1	0.0180	< 0.002 U1	2.2	< 0.04 U1	< 0.02 U1
10/25/2023	Corrective Action	0.022 J1	27.4	96.3	< 0.007 U1	< 0.004 U1	0.32	0.037	1.03	0.64	< 0.05 U1	0.0187	< 0.002 U1	8.7	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1921
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	0.571	55.9	34.7	0.77	7.6	106	452
6/19/2019	Assessment	0.644	77.7	33.3	0.87	8.2	128	435
9/11/2019	Assessment	0.647	79.6	--	--	7.6	--	--
9/13/2019	Assessment	--	--	33.2	0.79	--	131	438
3/12/2020	Assessment	--	--	--	0.94	7.4	--	--
5/18/2020	Assessment	0.751	88.3	35.8	0.98	7.4	153	469
10/6/2020	Assessment	0.577	77.2	38.7	0.98	7.2	127	603
3/22/2021	Assessment	0.654	86.8	51.3	1.05	7.8	130	448
5/20/2021	Assessment	0.585	83.8	53.6	1.0	7.7	137	470
10/29/2021	Assessment	0.563	85.3	56.9	0.96	7.6	152	500
3/2/2022	Corrective Action	0.647	95.2	57.0	1.15	7.8	163	510
5/18/2022	Corrective Action	0.727	109	53.2	1.13	7.8	148	470 L1
11/1/2022	Corrective Action	0.603	93.7	60.7	1.01	7.5	163	520
2/14/2023	Corrective Action	0.692	99.9	62.4	1.09	7.5	166	520
5/25/2023	Corrective Action	0.655	93.2	57.3	1.09	7.7	167	520
10/27/2023	Corrective Action	0.478	95.4	71.6	1.11	7.6	162	510

**Table 1. Groundwater Data Summary: MW-1921
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	0.1 J1	3.36	68.0	< 0.1 U1	< 0.05 U1	1.13	2.64	1.678	0.77	0.944	0.075	0.002 J1	478	0.4 J1	< 0.5 U1
6/19/2019	Assessment	0.10	1.19	51.2	< 0.02 U1	< 0.01 U1	0.07 J1	0.860	0.276	0.87	0.06 J1	0.074	< 0.002 U1	502	0.2 J1	< 0.1 U1
9/11/2019	Assessment	0.1 J1	1.25	50.8	< 0.02 U1	0.03 J1	0.1 J1	0.692	1.228	--	0.08 J1	0.0926	< 0.002 U1	500	0.1 J1	< 0.1 U1
9/13/2019	Assessment	--	--	--	--	--	--	--	--	0.79	--	--	--	--	--	--
3/12/2020	Assessment	0.08 J1	1.21	58.5	< 0.02 U1	< 0.01 U1	0.230	0.879	3.441	0.94	0.217	0.0995	< 0.002 U1	461	0.1 J1	< 0.1 U1
5/18/2020	Assessment	0.11	1.12	54.1	--	< 0.01 U1	0.2 J1	0.795	1.053	0.98	0.385	0.0990	--	472	0.1 J1	< 0.1 U1
10/6/2020	Assessment	0.11	1.18	47.4	--	< 0.01 U1	0.524	0.604	0.451	0.98	0.2 J1	0.0870	< 0.002 U1	472	0.1 J1	< 0.1 U1
3/22/2021	Assessment	0.14	1.61	54.7	0.02 J1	0.06	0.748	0.951	0.925	1.05	0.572	0.0672	< 0.002 U1	364	0.2	0.06 J1
5/20/2021	Assessment	0.16	1.59	55.5	0.009 J1	0.043	0.46	0.707	0.62	1.0	0.30	0.0942	< 0.002 U1	489	0.19 J1	0.07 J1
10/29/2021	Assessment	0.09 J1	1.22	56.9	< 0.007 U1	0.023	0.48	0.574	1.04	0.96	0.1 J1	0.0862	< 0.002 U1	417	0.13 J1	0.05 J1
3/2/2022	Corrective Action	0.10	1.14	60.3	< 0.007 U1	0.040	0.52	0.630	0.82	1.15	< 0.05 U1	0.0892	< 0.002 U1	445	0.19 J1	0.06 J1
5/18/2022	Corrective Action	0.11	1.25	60.6	< 0.04 U1	0.047	0.26	0.657	1.37	1.13	0.07 J1	0.0998	< 0.002 U1	468	0.26 J1	0.07 J1
11/1/2022	Corrective Action	0.10	1.14	63.0	< 0.007 U1	0.01 J1	0.28	0.588	1.27	1.01	0.06 J1	0.0981	< 0.002 U1	386	< 0.09 U1	0.05 J1
2/14/2023	Corrective Action	0.10	1.14	62.2	< 0.007 U1	< 0.004 U1	0.31	0.655	0.30	1.09	< 0.05 U1	0.0992	< 0.002 U1	408	0.18 J1	0.06 J1
5/25/2023	Corrective Action	0.095 J1	1.11	58.1	< 0.007 U1	0.007 J1	0.15 J1	0.675	1.53	1.09	< 0.05 U1	0.0903	< 0.002 U1	415	0.32 J1	0.07 J1
10/27/2023	Corrective Action	0.094 J1	1.18	63.3	< 0.007 U1	0.012 J1	0.39	0.562	0.51	1.11	0.1 J1	0.0913	< 0.002 U1	350	0.34 J1	0.06 J1

**Table 1. Groundwater Data Summary: MW-1922D
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/9/2019	Assessment	1.00	145	53.5	0.29	7.5	333	908
6/19/2019	Assessment	0.725	121	44.1	0.31	7.6	269	724
9/10/2019	Assessment	0.440	96.5	--	--	7.6	--	--
9/11/2019	Assessment	--	--	32.7	0.33	--	167	566
3/11/2020	Assessment	--	--	--	0.29	6.9	--	--
5/19/2020	Assessment	0.310	80.0	28.3	0.32	7.0	118	484
10/8/2020	Assessment	0.131	64.5	19.5	0.30	7.1	47.3	389
3/25/2021	Assessment	0.098	59.8	18.8	0.34	7.6	34.6	362
5/20/2021	Assessment	0.085	58.7	18.1	0.32	7.4	25.2	370
10/27/2021	Assessment	0.071	59.5	17.6	0.31	7.4	22.1	340
3/3/2022	Corrective Action	0.082	62.4	17.9	0.30	7.5	22.3	340
5/23/2022	Corrective Action	0.131	65.0	20.3	0.31	7.2	40.7	10,300 L1
11/4/2022	Corrective Action	0.063	58.3 M1, P3	17.2	0.28	7.2	16.0	330
2/15/2023	Corrective Action	0.073	58.8	17.4	0.29	7.2	16.1	340
5/22/2023	Corrective Action	0.079	51.9	18.2	0.29	7.3	21.5	340
10/25/2023	Corrective Action	0.054	52.5	16.0	0.29	7.4	8.6	320

**Table 1. Groundwater Data Summary: MW-1922D
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/9/2019	Assessment	0.88	323	69.3	< 0.1 U1	< 0.05 U1	0.4 J1	1.02	2.64	0.29	0.1 J1	0.02 J1	< 0.002 U1	488	< 0.2 U1	< 0.5 U1
6/19/2019	Assessment	0.29	716	54.7	< 0.02 U1	< 0.01 U1	< 0.04 U1	0.530	3.332	0.31	< 0.02 U1	< 0.009 U1	< 0.002 U1	515	0.04 J1	< 0.1 U1
9/10/2019	Assessment	1.04	839	51.0	< 0.02 U1	0.01 J1	0.08 J1	0.492	3.089	--	< 0.05 U1	0.0126	< 0.002 U1	478	0.06 J1	< 0.1 U1
9/11/2019	Assessment	--	--	--	--	--	--	--	--	0.33	--	--	--	--	--	--
3/11/2020	Assessment	0.63	1,240	72.3	< 0.02 U1	< 0.01 U1	0.335	0.267	3.28	0.29	0.07 J1	0.0117	< 0.002 U1	314	0.05 J1	< 0.1 U1
5/19/2020	Assessment	0.31	522	66.3	--	< 0.01 U1	0.2 J1	0.218	1.816	0.32	< 0.05 U1	0.0110	--	289	< 0.03 U1	< 0.1 U1
10/8/2020	Assessment	4.91	1,040	144	--	< 0.01 U1	0.351	0.326	2.815	0.30	0.07 J1	0.00747	< 0.002 U1	109	< 0.03 U1	< 0.1 U1
3/25/2021	Assessment	1.61	546	227	< 0.007 U1	< 0.004 U1	0.248	0.215	3.232	0.34	< 0.05 U1	0.00796	< 0.002 U1	77.6	< 0.09 U1	< 0.04 U1
5/20/2021	Assessment	0.65	494	262	< 0.007 U1	< 0.004 U1	0.18 J1	0.104	4.45	0.32	< 0.05 U1	0.00755	< 0.002 U1	40.5	< 0.09 U1	< 0.04 U1
10/27/2021	Assessment	0.60	456	331	< 0.007 U1	< 0.004 U1	< 0.04 U1	0.124	5.33	0.31	< 0.05 U1	0.00779	< 0.002 U1	47.7	< 0.09 U1	< 0.04 U1
3/3/2022	Corrective Action	0.90	478	353	< 0.007 U1	0.005 J1	0.39	0.138	6.28	0.30	< 0.05 U1	0.00712	< 0.002 U1	57.4	< 0.09 U1	< 0.04 U1
5/23/2022	Corrective Action	0.94	562	300	< 0.007 U1	0.009 J1	0.25	0.161	5.55	0.31	< 0.05 U1	0.00848	< 0.002 U1	105	< 0.09 U1	< 0.04 U1
11/4/2022	Corrective Action	0.80	384 M1, P3	406 M1, P3	< 0.007 U1	< 0.004 U1	0.24	0.134	8.17	0.28	< 0.05 U1	0.00738	< 0.002 U1	36.6	< 0.09 U1	< 0.04 U1
2/15/2023	Corrective Action	0.85	443	402	< 0.007 U1	< 0.004 U1	0.28	0.178	5.54	0.29	0.10 J1	0.00770	< 0.002 U1	41.6	< 0.09 U1	< 0.04 U1
5/22/2023	Corrective Action	0.530	408	327	< 0.007 U1	< 0.004 U1	0.18 J1	0.129	5.72	0.29	< 0.05 U1	0.00682	< 0.002 U1	56.4	< 0.04 U1	< 0.02 U1
10/25/2023	Corrective Action	0.474	323	405	< 0.007 U1	< 0.004 U1	0.37	0.089	6.33	0.29	< 0.05 U1	0.00675	0.002 J1	23.8	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1922S
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/9/2019	Assessment	7.66	359	171	0.16	7.2	978	2,090
6/20/2019	Assessment	6.95	335	169	0.17	7.4	1,020	2,090
9/10/2019	Assessment	6.34	342	--	--	7.3	--	--
9/11/2019	Assessment	--	--	179	0.19	--	1,070	2,060
3/11/2020	Assessment	--	--	--	0.1 J1	6.9	--	--
5/18/2020	Assessment	6.92	345	160	0.19	6.9	1,060	1,920
10/8/2020	Assessment	4.09	293	126	0.16	7.1	842	1,750
3/25/2021	Assessment	4.22	284	120	0.20	7.4	832	1,630
5/20/2021	Assessment	3.60	265	117	0.19	7.2	828	1,660
10/26/2021	Assessment	2.99	250	102	0.17	7.2	721	1,460
3/2/2022	Corrective Action	2.99	283	103	0.17	7.3	752	1,430
5/23/2022	Corrective Action	3.49	282	97.2	0.16	7.0	723	1,450 L1
11/4/2022	Corrective Action	3.01	276	103	0.15	7.0	735	1,460
2/15/2023	Corrective Action	2.87	264	113	0.15	7.2	704	1,420
5/22/2023	Corrective Action	2.21	244	110	0.14 J1	7.2	813	1,550
10/26/2023	Corrective Action	2.32	303	113	0.15	7.1	955	1,730

Table 1. Groundwater Data Summary: MW-1922S

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/9/2019	Assessment	< 0.1 U1	1.95	30.7	< 0.1 U1	< 0.05 U1	0.3 J1	1.83	2.124	0.16	0.3 J1	0.082	< 0.002 U1	43.5	< 0.2 U1	< 0.5 U1
6/20/2019	Assessment	< 0.04 U1	1.89	26.9	< 0.04 U1	< 0.02 U1	0.2 J1	1.37	1.156	0.17	0.08 J1	0.03 J1	< 0.002 U1	36.4	0.07 J1	< 0.2 U1
9/10/2019	Assessment	0.02 J1	1.75	26.5	< 0.02 U1	< 0.01 U1	0.2 J1	1.23	2.945	--	0.1 J1	0.0556	< 0.002 U1	33.9	0.08 J1	< 0.1 U1
9/11/2019	Assessment	--	--	--	--	--	--	--	--	0.19	--	--	--	--	--	--
3/11/2020	Assessment	< 0.02 U1	2.92	28.0	< 0.04 U1	< 0.01 U1	0.220	1.31	2.028	0.1 J1	0.2 J1	0.0615	< 0.002 U1	32.4	0.09 J1	< 0.1 U1
5/18/2020	Assessment	< 0.02 U1	1.79	27.4	--	< 0.01 U1	0.2 J1	1.52	0.821	0.19	0.06 J1	0.0611	--	34.3	0.1 J1	< 0.1 U1
10/8/2020	Assessment	0.09 J1	3.25	37.7	--	0.11	1.48	2.88	1.844	0.16	1.57	0.0551	0.002 J1	30.7	0.3	< 0.1 U1
3/25/2021	Assessment	0.02 J1	2.12	24.3	< 0.007 U1	0.006 J1	0.222	1.12	0.372	0.20	0.06 J1	0.0484	< 0.002 U1	29.4	< 0.09 U1	< 0.04 U1
5/20/2021	Assessment	0.05 J1	2.04	25.8	< 0.007 U1	0.012 J1	0.25	1.14	0.45	0.19	0.22	0.0520	< 0.002 U1	31.1	0.11 J1	0.05 J1
10/26/2021	Assessment	< 0.02 U1	2.07	25.4	< 0.007 U1	0.010 J1	0.22	1.02	1.30	0.17	0.14 J1	0.0477	< 0.002 U1	27.4	< 0.09 U1	< 0.04 U1
3/2/2022	Corrective Action	0.06 J1	4.08	30.7	0.018 J1	0.076	0.88	1.63	1.46	0.17	0.88	0.0409	< 0.002 U1	31.8	0.14 J1	0.04 J1
5/23/2022	Corrective Action	0.02 J1	1.99	29.2	< 0.007 U1	0.013 J1	0.26	1.00	1.74	0.16	0.09 J1	0.0455	< 0.002 U1	31.0	0.1 J1	< 0.04 U1
11/4/2022	Corrective Action	0.04 J1	1.89	27.6	< 0.007 U1	0.005 J1	0.22	0.840	1.72	0.15	< 0.05 U1	0.0467	< 0.002 U1	26.6	< 0.09 U1	< 0.04 U1
2/15/2023	Corrective Action	0.03 J1	3.64	28.1	< 0.007 U1	0.007 J1	0.22	0.934	0.62	0.15	0.08 J1	0.0426	< 0.002 U1	29.0	< 0.09 U1	< 0.04 U1
5/22/2023	Corrective Action	0.023 J1	1.56	26.1	< 0.007 U1	0.007 J1	0.16 J1	0.933	1.31	0.14 J1	0.06 J1	0.0370	< 0.002 U1	24.2	< 0.04 U1	0.03 J1
10/26/2023	Corrective Action	0.018 J1	1.89	34.0	< 0.007 U1	0.005 J1	0.54	1.15	0.95	0.15	0.17 J1	0.0432	< 0.002 U1	25.2	0.06 J1	0.04 J1

**Table 1. Groundwater Data Summary: MW-1923
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	1.09	113	38.0	0.16	7.6	181	584
6/18/2019	Assessment	0.804	91.4	35.9	0.16	7.3	147	526
9/11/2019	Assessment	0.756	105	38.3	0.13	6.8	159	545
3/12/2020	Assessment	--	--	--	0.18	--	--	--
5/14/2020	Assessment	0.770	103	33.1	0.21	7.3	150	525
10/6/2020	Assessment	1.19	117	34.2	0.27	7.2	253	329
3/24/2021	Assessment	1.17	123	33.1	0.23	7.6	260	610
5/20/2021	Assessment	1.27	119	32.8	0.23	7.4	220	630
10/28/2021	Assessment	1.30	117	32.4	0.26	7.4	224	610
3/3/2022	Corrective Action	1.23	131	34.3	0.25	7.5	251	600
5/19/2022	Corrective Action	1.34	128 M1, P3	31.4	0.24	7.2	239	600 L1
11/1/2022	Corrective Action	1.17	120 M1, P3	34.2	0.22	7.3	263	630
2/16/2023	Corrective Action	1.15	115	30.2	0.26	7.2	256	620
5/25/2023	Corrective Action	1.21	113	29.6	0.28	7.5	254	620
10/30/2023	Corrective Action	1.31	109	32.3	0.29	7.5	222	580

**Table 1. Groundwater Data Summary: MW-1923
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	0.2 J1	0.55	77.6	< 0.1 U1	< 0.05 U1	0.3 J1	0.317	0.706	0.16	0.1 J1	0.223	< 0.002 U1	160	23.8	< 0.5 U1
6/18/2019	Assessment	0.21	0.56	72.9	< 0.02 U1	0.01 J1	0.353	0.657	0.836	0.16	0.255	0.135	< 0.002 U1	101	14.4	< 0.1 U1
9/11/2019	Assessment	0.24	0.75	86.6	< 0.02 U1	0.03 J1	0.541	1.01	2.099	0.13	0.543	0.137	< 0.002 U1	84.2	14.0	< 0.1 U1
3/12/2020	Assessment	0.15	0.58	73.3	< 0.02 U1	0.02 J1	0.903	0.622	0.935	0.18	0.302	0.115	< 0.002 U1	70.1	5.2	< 0.1 U1
5/14/2020	Assessment	0.23	0.69	79.8	--	0.02 J1	0.484	0.814	0.48	0.21	0.354	0.109	--	70.9	4.1	< 0.1 U1
10/6/2020	Assessment	0.18	0.62	86.4	--	0.01 J1	2.13	0.747	1.241	0.27	0.434	0.177	< 0.002 U1	98.0	17.8	< 0.1 U1
3/24/2021	Assessment	0.21	0.52	95.1	< 0.007 U1	0.01 J1	0.715	0.370	0.778	0.23	0.09 J1	0.135	< 0.002 U1	308	38.7	< 0.04 U1
5/20/2021	Assessment	0.23	1.14	98.1	0.041 J1	0.033	1.12	1.84	1.36	0.23	1.16	0.207	< 0.002 U1	344	14.1	< 0.04 U1
10/28/2021	Assessment	0.23	1.66	103 M1, P3	0.064	0.053	2.26	2.65	0.90	0.26	1.98	0.182	0.002 J1	319 M1, P3	7.59	< 0.04 U1
3/3/2022	Corrective Action	0.16	0.78	99.9	0.017 J1	0.036	0.68	0.780	0.76	0.25	0.50	0.197	< 0.002 U1	353	9.47	< 0.04 U1
5/19/2022	Corrective Action	0.21	0.85	95.5	0.015 J1	0.049	0.64	0.865	0.91	0.24	0.58	0.187 M1	< 0.002 U1	334 P3	28.0	< 0.04 U1
11/1/2022	Corrective Action	0.18	0.79	101	0.022 J1	0.012 J1	0.83	0.799	1.49	0.22	0.66	0.194	< 0.002 U1	315 M1, P3	47.6	< 0.04 U1
2/16/2023	Corrective Action	0.36	0.80	93.4	0.021 J1	0.012 J1	0.99	0.726	1.44	0.26	0.70	0.215	< 0.002 U1	293	17.8	< 0.04 U1
5/25/2023	Corrective Action	0.192	1.25	96.5	0.051	0.019 J1	1.19	1.99	1.40	0.28	1.49	0.202	< 0.002 U1	284	4.39	0.03 J1
10/30/2023	Corrective Action	0.156	0.90	89.9	0.030 J1	0.024	0.99	1.11	1.49	0.29	0.83	0.184	< 0.002 U1	303	12.6	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1924
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	7.49	286	136	0.42	6.9	766	1,700
6/18/2019	Assessment	6.22	243	122	0.38	7.3	721	1,570
9/11/2019	Assessment	4.89	238	109	0.44	7.1	662	1,500
3/12/2020	Assessment	--	--	--	0.44	7.1	--	--
5/14/2020	Assessment	5.28	314	145	0.47	7.0	817	1,730
10/5/2020	Assessment	5.27	301	159	0.40	7.1	851	1,840
3/24/2021	Assessment	5.07	288	131	0.53	7.6	800	1,660
5/20/2021	Assessment	6.17	264	146	0.51	7.3	830	1,720
10/28/2021	Assessment	5.78 M1	214	144	0.52	7.3	663	1,490
3/7/2022	Corrective Action	2.29	173	74.8	0.57	7.5	483	1,120
5/19/2022	Corrective Action	1.39	158	39.1	0.55	7.2	291	790 L1
11/2/2022	Corrective Action	5.20	191	133	0.49	7.2	626	1,380
2/16/2023	Corrective Action	2.49	180 M1	79.8	0.51	6.9	453	1,070
5/25/2023	Corrective Action	3.28	166	88.4	0.53	7.3	501	1,120
10/30/2023	Corrective Action	3.11	168 M1	84.5	0.51	7.2	424	1,040

**Table 1. Groundwater Data Summary: MW-1924
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	0.2 J1	0.91	59.8	< 0.1 U1	0.2 J1	0.3 J1	2.29	0.921	0.42	0.3 J1	0.133	< 0.002 U1	89.5	1.3	< 0.5 U1
6/18/2019	Assessment	0.06 J1	0.55	69.5	< 0.02 U1	0.05	0.1 J1	2.74	1.417	0.38	0.07 J1	0.087	< 0.002 U1	69.0	3.6	< 0.1 U1
9/11/2019	Assessment	0.07 J1	0.61	54.5	< 0.02 U1	0.06	0.2 J1	4.10	1.719	0.44	0.218	0.102	< 0.002 U1	76.7	3.5	< 0.1 U1
3/12/2020	Assessment	0.09 J1	0.72	46.7	< 0.1 U1	0.06	0.324	6.80	0.974	0.44	0.394	0.130	< 0.002 U1	92.0	1.1	< 0.1 U1
5/14/2020	Assessment	0.06 J1	0.66	54.5	--	0.06	0.784	3.10	1.785	0.47	0.229	0.104	--	77.6	1.1	< 0.1 U1
10/5/2020	Assessment	0.09 J1	1.30	55.3	--	0.09	1.64	10.3	1.013	0.40	1.14	0.113	0.003 J1	82.7	0.9	< 0.1 U1
3/24/2021	Assessment	0.07 J1	1.18	44.7	0.03 J1	0.07	1.04	3.26	0.956	0.53	0.905	0.0668	< 0.002 U1	87.1	2.5	< 0.04 U1
5/20/2021	Assessment	0.06 J1	0.56	42.9	0.009 J1	0.068	0.59	2.15	1.30	0.51	0.13 J1	0.0964	< 0.002 U1	112	0.74	< 0.04 U1
10/28/2021	Assessment	0.07 J1	0.57	37.7	< 0.007 U1	0.065	0.37	2.93	1.23	0.52	0.1 J1	0.0877 M1	< 0.002 U1	134	0.50	< 0.04 U1
3/7/2022	Corrective Action	0.05 J1	0.64	37.6	0.008 J1	0.056	0.32	2.86	1.22	0.57	0.22	0.0645	< 0.002 U1	113	0.48 J1	< 0.04 U1
5/19/2022	Corrective Action	0.11	0.54	34.3	< 0.01 U1	0.051	0.39	1.74	0.71	0.55	0.05 J1	0.0594	< 0.002 U1	100	1.26	< 0.04 U1
11/2/2022	Corrective Action	0.06 J1	0.43	48.1	< 0.007 U1	0.054	0.38	2.32	1.15	0.49	0.06 J1	0.0850	< 0.002 U1	113	0.76	< 0.04 U1
2/16/2023	Corrective Action	0.07 J1	0.37	46.3	< 0.007 U1	0.035	0.37	1.99	0.58	0.51	0.05 J1	0.0734	< 0.002 U1	72.9	1.35	< 0.04 U1
5/25/2023	Corrective Action	0.067 J1	0.43	41.3	< 0.007 U1	0.035	0.31	3.31	1.18	0.53	0.11 J1	0.0640	< 0.002 U1	119	0.41 J1	< 0.02 U1
10/30/2023	Corrective Action	0.055 J1	0.40	48.6	< 0.007 U1	0.040	0.40	2.39	1.65 B1	0.51	0.08 J1	0.0603	< 0.002 U1	105	0.37 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1925
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	4.17	172	128	0.33	7.2	624	1,460
6/19/2019	Assessment	5.21	242	147	0.25	7.6	686	1,520
9/10/2019	Assessment	5.86	249	147	0.26	7.2	683	1,500
3/11/2020	Assessment	--	--	--	0.24	7.0	--	--
5/14/2020	Assessment	4.91	205	119	0.34	7.0	565	1,250
10/6/2020	Assessment	4.31	211	122	0.29	6.8	548	372
3/23/2021	Assessment	3.13	223	106	0.33	7.3	521	1,180
5/19/2021	Assessment	4.26	183	90.2	0.31	7.1	495	1,130
10/28/2021	Assessment	4.28	166 M1	88.3	0.31	7.1	421	1,040
3/2/2022	Corrective Action	3.33	177	80.0	0.29	7.2	453	1,040
5/18/2022	Corrective Action	2.90	188	125	0.26	7.2	446	1,090 L1
11/1/2022	Corrective Action	3.35	174	109	0.27	6.9	474	1,130
2/14/2023	Corrective Action	3.35	190 M1	98.1	0.26	6.9	466	1,090
5/24/2023	Corrective Action	3.02 M1	172 M1	116	0.25	7.1	534	1,190
10/26/2023	Corrective Action	3.42	165	64.7	0.29	7.0	462	1,030

**Table 1. Groundwater Data Summary: MW-1925
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	0.2 J1	0.88	46.6	< 0.1 U1	0.06 J1	0.4 J1	1.65	2.726	0.33	0.4 J1	0.094	< 0.002 U1	76.0	6.2	< 0.5 U1
6/19/2019	Assessment	0.18	0.35	48.0	< 0.02 U1	0.04 J1	0.1 J1	1.28	1.245	0.25	0.04 J1	0.095	< 0.002 U1	63.5	6.3	< 0.1 U1
9/10/2019	Assessment	0.20	0.41	45.0	< 0.02 U1	0.06	0.1 J1	1.27	1.041	0.26	0.2 J1	0.0947	< 0.002 U1	54.6	4.1	< 0.1 U1
3/11/2020	Assessment	0.16	0.37	40.4	< 0.02 U1	0.05 J1	0.1 J1	1.21	1.59	0.24	< 0.05 U1	0.0926	< 0.002 U1	56.2	2.9	< 0.1 U1
5/14/2020	Assessment	0.19	0.32	36.8	--	0.04 J1	0.08 J1	1.07	0.91	0.34	< 0.05 U1	0.0853	--	57.9	4.8	< 0.1 U1
10/6/2020	Assessment	0.20	0.56	39.5	--	0.04 J1	0.428	1.07	0.2096	0.29	0.09 J1	0.0776	< 0.002 U1	45.8	5.4	< 0.1 U1
3/23/2021	Assessment	0.21	0.53	39.7	< 0.007 U1	0.05 J1	0.311	1.03	2.076	0.33	0.06 J1	0.0517	< 0.002 U1	47.8	4.4	< 0.04 U1
5/19/2021	Assessment	0.27	0.52	38.3	0.008 J1	0.067	0.47	1.18	1.07	0.31	0.17 J1	0.0714	< 0.002 U1	46.1	4.41	< 0.04 U1
10/28/2021	Assessment	0.20	0.28	33.9	< 0.007 U1	0.037	0.40	0.996	1.96	0.31	< 0.05 U1	0.0621	< 0.002 U1	52.3	2.96	< 0.04 U1
3/2/2022	Corrective Action	0.20	0.28	38.5	< 0.007 U1	0.047	0.37	1.06	0.77	0.29	< 0.05 U1	0.0662	< 0.002 U1	48.2	3.26	< 0.04 U1
5/18/2022	Corrective Action	0.21	0.39	42.1	< 0.007 U1	0.057	0.29	1.48	1.28	0.26	0.08 J1	0.0761	< 0.002 U1	43.4	2.51	< 0.04 U1
11/1/2022	Corrective Action	0.20	0.24	39.7	< 0.007 U1	0.040	0.28	0.920	0.95	0.27	< 0.05 U1	0.0680	< 0.002 U1	41.2	5.10	< 0.04 U1
2/14/2023	Corrective Action	0.20	0.24	39.6	< 0.007 U1	0.045	0.29	1.03	1.19	0.26	< 0.05 U1	0.0629	< 0.002 U1	43.3	6.44	< 0.04 U1
5/24/2023	Corrective Action	0.195	0.23	37.4	< 0.007 M1, U1	0.041	0.23 J1	1.03	1.72	0.25	< 0.05 U1	0.0601 M1	< 0.002 U1	39.5	2.56	< 0.02 U1
10/26/2023	Corrective Action	0.184	0.27	34.1	< 0.007 U1	0.036	0.43	0.954	1.80	0.29	0.09 J1	0.0529	< 0.002 U1	43.1	2.64	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1926
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	0.263	95.4	57.8	0.25	7.2	67.4	506
6/20/2019	Assessment	0.165	82.1	23.2	0.28	7.3	47.8	416
9/11/2019	Assessment	0.145	87.6	--	--	7.3	--	--
9/13/2019	Assessment	--	--	8.57	0.24	--	26.4	396
3/11/2020	Assessment	--	--	--	0.28	7.0	--	--
5/18/2020	Assessment	0.146	95.3	7.86	0.29	7.0	28.5	354
10/8/2020	Assessment	0.121	87.2	3.49	0.26	7.0	30.0	351
3/22/2021	Assessment	0.121	89.1	4.15	0.30	7.4	32.2	357
5/20/2021	Assessment	0.132	78.0	3.86	0.28	7.0	29.6	360
10/28/2021	Assessment	0.110	103	3.17	0.25	7.0	35.1	410
3/8/2022	Corrective Action	0.116	90.9	3.11	0.24	7.4	40.4	380
5/19/2022	Corrective Action	0.127	91.7	3.58	0.24	7.2	29.5	340 L1
11/2/2022	Corrective Action	0.108	82.7	3.00	0.26	7.2	28.2	350
2/13/2023	Corrective Action	0.106	88.3 M1	2.61	0.24	7.1	29.1	360
5/22/2023	Corrective Action	0.099	82.4	3.49	0.22	7.3	29.5	380
10/25/2023	Corrective Action	0.114	83.5	4.53	0.24	7.1	21.1	340

**Table 1. Groundwater Data Summary: MW-1926
Mountaineer - BAP
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	0.1 J1	0.95	28.8	< 0.1 U1	0.06 J1	0.4 J1	5.05	1.327	0.25	0.981	0.01 J1	< 0.002 U1	9 J1	0.3 J1	< 0.5 U1
6/20/2019	Assessment	0.08 J1	0.38	22.9	< 0.02 U1	0.05	0.06 J1	1.81	0.524	0.28	0.05 J1	< 0.009 U1	< 0.002 U1	7.05	0.3	< 0.1 U1
9/11/2019	Assessment	0.07 J1	0.37	23.9	< 0.02 U1	0.06	0.09 J1	1.17	0.4608	--	0.07 J1	0.00624	< 0.002 U1	5.38	0.4	< 0.1 U1
9/13/2019	Assessment	--	--	--	--	--	--	--	--	0.24	--	--	--	--	--	--
3/11/2020	Assessment	0.03 J1	0.33	20.3	< 0.02 U1	0.04 J1	0.206	1.08	1.316	0.28	< 0.05 U1	0.00675	< 0.002 U1	6.16	0.2	< 0.1 U1
5/18/2020	Assessment	0.08 J1	0.36	23.7	--	0.05	0.2 J1	1.42	0.3552	0.29	< 0.05 U1	0.00744	--	5.72	0.3	< 0.1 U1
10/8/2020	Assessment	0.05 J1	0.32	20.0	--	0.05 J1	0.323	1.03	0.379	0.26	< 0.05 U1	0.00575	< 0.002 U1	5.04	1.0	< 0.1 U1
3/22/2021	Assessment	0.06 J1	0.33	20.8	< 0.007 U1	0.04 J1	0.294	0.953	0.9312	0.30	< 0.05 U1	0.00585	< 0.002 U1	4.52	0.7	< 0.04 U1
5/20/2021	Assessment	0.1	0.31	19.1	< 0.007 U1	0.035	0.62	0.925	0.35	0.28	< 0.05 U1	0.00586	< 0.002 U1	4.7	0.59	0.09 J1
10/28/2021	Assessment	0.05 J1	0.31	22.0	< 0.007 U1	0.039	0.37	0.475	0.46	0.25	0.06 J1	0.00673	< 0.002 U1	4.1	0.73	< 0.04 U1
3/8/2022	Corrective Action	0.05 J1	0.30	20.2	< 0.007 U1	0.035	0.38	0.889	0.82	0.24	< 0.05 U1	0.00667	< 0.002 U1	4.4	0.60	< 0.04 U1
5/19/2022	Corrective Action	0.07 J1	0.34	20.0	< 0.007 U1	0.033	0.55	1.14	0.57	0.24	< 0.05 U1	0.00658	< 0.002 U1	4.9	0.46 J1	< 0.04 U1
11/2/2022	Corrective Action	0.06 J1	0.28	18.9	< 0.007 U1	0.032	0.50	0.875	0.53	0.26	< 0.05 U1	0.00661	< 0.002 U1	4.3	2.22	< 0.04 U1
2/13/2023	Corrective Action	0.06 J1	0.31	19.4	< 0.007 U1	0.036	0.47	0.788	0.78	0.24	0.10 J1	0.00683	< 0.002 U1	4.4	0.99	< 0.04 U1
5/22/2023	Corrective Action	0.063 J1	0.37	18.1	< 0.007 U1	0.032	0.48	0.728	0.71	0.22	0.24	0.00602	< 0.002 U1	4.1	0.60	0.02 J1
10/25/2023	Corrective Action	0.053 J1	0.34	18.4	< 0.007 U1	0.033	0.54	0.729	0.55 P1	0.24	0.18 J1	0.00629	< 0.002 U1	4.1	0.90	0.03 J1

**Table 1. Groundwater Data Summary: MW-1927
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	0.654	151	20.3	0.18	7.3	327	898
6/20/2019	Assessment	0.513	159	15.6	0.13	7.8	335	849
9/11/2019	Assessment	0.498	143	--	--	7.0	--	--
9/13/2019	Assessment	--	--	15.2	0.14	--	306	839
3/11/2020	Assessment	--	--	--	0.14	6.9	--	--
5/14/2020	Assessment	0.501	143	12.9	0.17	6.8	290	807
10/9/2020	Assessment	0.429	155	11.8	0.14	6.9	277	741
3/24/2021	Assessment	0.431	154	12.2	0.18	7.3	294	762
5/20/2021	Assessment	0.420	155	11.6	0.17	7.0	284	770
10/27/2021	Assessment	0.416	151	11.4	0.16	7.0	264	770
3/2/2022	Corrective Action	0.390	170	13.2	0.15	7.2	322	830
5/20/2022	Corrective Action	0.443	171	13.0	0.15	6.9	293	800 L1
11/3/2022	Corrective Action	0.421	157	11.8	0.14	6.9	287	790
2/14/2023	Corrective Action	0.416	157	11.2	0.14	6.9	267	750
5/24/2023	Corrective Action	0.341	138	13.5	0.13	7.1	281	750
10/31/2023	Corrective Action	0.358	152	12.1	0.14	7.0	279	660

Table 1. Groundwater Data Summary: MW-1927

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	0.3 J1	0.4 J1	63.4	< 0.1 U1	< 0.05 U1	< 0.2 U1	0.319	1.533	0.18	0.1 J1	0.03 J1	< 0.002 U1	7 J1	0.8 J1	< 0.5 U1
6/20/2019	Assessment	0.15	0.28	61.5	< 0.02 U1	0.05 J1	0.1 J1	0.251	0.866	0.13	0.03 J1	< 0.009 U1	< 0.002 U1	2.82	0.3	< 0.1 U1
9/11/2019	Assessment	0.12	0.27	58.7	< 0.02 U1	0.05	0.08 J1	0.225	1.415	--	< 0.05 U1	0.00638	< 0.002 U1	2 J1	0.4	< 0.1 U1
9/13/2019	Assessment	--	--	--	--	--	--	--	--	0.14	--	--	--	--	--	--
3/11/2020	Assessment	0.09 J1	0.29	56.2	< 0.02 U1	0.06	0.1 J1	0.319	0.765	0.14	< 0.05 U1	0.00723	< 0.002 U1	2 J1	0.2 J1	< 0.1 U1
5/14/2020	Assessment	0.14	0.29	54.4	--	0.06	0.1 J1	0.434	1.19	0.17	0.08 J1	0.00725	--	2 J1	0.1 J1	< 0.1 U1
10/9/2020	Assessment	0.12	0.44	51.3	--	0.07	0.763	0.602	1.371	0.14	0.441	0.00598	< 0.002 U1	2 J1	0.3	< 0.1 U1
3/24/2021	Assessment	0.09 J1	0.25	57.1	< 0.007 U1	0.07	0.256	0.255	0.918	0.18	< 0.05 U1	0.00612	< 0.002 U1	1 J1	0.9	< 0.04 U1
5/20/2021	Assessment	0.15	0.22	56.5	< 0.007 U1	0.055	0.25	0.264	1.00	0.17	< 0.05 U1	0.00594	< 0.002 U1	1.1	1.39	< 0.04 U1
10/27/2021	Assessment	0.07 J1	0.23	53.4	< 0.007 U1	0.067	0.1 J1	0.331	1.2	0.16	< 0.05 U1	0.00631	< 0.002 U1	1.1	0.98	< 0.04 U1
3/2/2022	Corrective Action	0.11	0.28	55.5	< 0.007 U1	0.098	0.36	0.791	1.6	0.15	0.18 J1	0.00594	< 0.002 U1	1.1	1.70	< 0.04 U1
5/20/2022	Corrective Action	0.1	0.28	59.6	< 0.007 U1	0.072	0.35	0.522	1.58	0.15	0.17 J1	0.00603	< 0.002 U1	1.2	1.36	< 0.04 U1
11/3/2022	Corrective Action	0.07 J1	0.20	57.0	< 0.007 U1	0.068	0.30	0.442	2.17	0.14	< 0.05 U1	0.00619	< 0.002 U1	0.9	0.94	< 0.04 U1
2/14/2023	Corrective Action	0.07 J1	0.21	56.1	< 0.007 U1	0.068	0.34	0.442	1.38	0.14	< 0.05 U1	0.00593	< 0.002 U1	1.0	0.79	< 0.04 U1
5/24/2023	Corrective Action	0.079 J1	0.17	49.5	< 0.007 U1	0.067	0.31	0.434	2.73	0.13	< 0.05 U1	0.00559	< 0.002 U1	0.9	0.33 J1	< 0.02 U1
10/31/2023	Corrective Action	0.066 J1	0.21	56.0	< 0.007 U1	0.066	0.51	0.475	1.30 B1	0.14	0.08 J1	0.00544	< 0.002 U1	0.8	0.60	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1929
Mountaineer - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/10/2019	Assessment	0.243	115	11.7	0.19	7.5	214	574
6/18/2019	Assessment	0.219	97.8	13.6	0.20	7.5	237	541
9/10/2019	Assessment	0.236	113	15.1	0.19	7.6	234	528
3/10/2020	Assessment	--	--	--	0.23	7.2	--	--
5/13/2020	Assessment	0.189	98.0	10.7	0.23	7.2	176	461
10/9/2020	Assessment	0.218	104	10.7	0.22	7.2	198	508
3/23/2021	Assessment	0.183	103	9.16	0.27	7.6	179	484
5/18/2021	Assessment	0.182	111	8.60	0.23	7.2	163	510
10/27/2021	Assessment	0.248	112	8.13	0.25	7.3	202	520
3/1/2022	Corrective Action	0.155	116	18.9	0.20	7.3	191	480
5/17/2022	Corrective Action	0.179	122	14.3	0.20	7.3	185	480 L1
11/1/2022	Corrective Action	0.210	98.7	6.81	0.23	7.4	211	490
2/13/2023	Corrective Action	0.200	106	6.15	0.21	7.3	193	500
5/23/2023	Corrective Action	0.208	101	6.52	0.23	7.4	211	510
10/26/2023	Corrective Action	0.223	102	5.69	0.25	7.3	196	500

Table 1. Groundwater Data Summary: MW-1929

Mountaineer - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/10/2019	Assessment	< 0.1 U1	0.80	56.9	< 0.1 U1	< 0.05 U1	0.5 J1	3.03	0.823	0.19	1.15	0.01 J1	< 0.002 U1	< 2 U1	1.3	< 0.5 U1
6/18/2019	Assessment	0.02 J1	0.37	47.6	< 0.02 U1	0.02 J1	0.2 J1	0.157	0.398	0.20	0.08 J1	< 0.009 U1	< 0.002 U1	0.7 J1	1.3	< 0.1 U1
9/10/2019	Assessment	0.03 J1	0.47	52.1	< 0.02 U1	0.01 J1	0.280	0.606	2.994	0.19	0.274	0.00480	< 0.002 U1	0.7 J1	1.7	< 0.1 U1
3/10/2020	Assessment	< 0.02 U1	0.41	43.8	< 0.02 U1	< 0.01 U1	0.529	0.214	0.478	0.23	0.1 J1	0.00382	< 0.002 U1	0.5 J1	0.9	< 0.1 U1
5/13/2020	Assessment	0.04 J1	0.79	52.1	--	0.04 J1	0.584	1.81	0.88	0.23	0.870	0.00416	--	0.6 J1	1.1	< 0.1 U1
10/9/2020	Assessment	0.02 J1	0.41	44.6	--	0.01 J1	0.416	0.363	0.988	0.22	0.2 J1	0.00430	< 0.002 U1	0.6 J1	1.8	< 0.1 U1
3/23/2021	Assessment	0.04 J1	0.46	45.9	< 0.007 U1	0.02 J1	0.639	0.638	1.373	0.27	0.355	0.00352	< 0.002 U1	0.6 J1	1.6	< 0.04 U1
5/18/2021	Assessment	0.05 J1	0.47	51.9	< 0.007 U1	0.017 J1	0.40	0.437	1.17	0.23	0.21	0.00363	< 0.002 U1	0.5	0.89	< 0.04 U1
10/27/2021	Assessment	0.02 J1	0.33	45.4	< 0.007 U1	0.005 J1	0.51	0.182	3.24	0.25	0.1 J1	0.00463	< 0.002 U1	0.8	2.08	< 0.04 U1
3/1/2022	Corrective Action	0.03 J1	0.32	48.3	< 0.007 U1	0.009 J1	0.40	0.160	0.80	0.20	0.08 J1	0.00331	< 0.002 U1	0.3 J1	0.92	< 0.04 U1
5/17/2022	Corrective Action	0.02 J1	0.35	47.8	< 0.007 U1	0.01 J1	0.43	0.133	1.00	0.20	0.06 J1	0.00368	< 0.002 U1	0.3 J1	1.07	< 0.04 U1
11/1/2022	Corrective Action	0.03 J1	0.28	44.3	< 0.007 U1	0.007 J1	0.43	0.101	0.78	0.23	0.07 J1	0.00435	< 0.002 U1	0.6	2.23	< 0.04 U1
2/13/2023	Corrective Action	0.02 J1	0.32	46.3	< 0.007 U1	0.008 J1	0.32	0.144	0.53	0.21	0.10 J1	0.00445	< 0.002 U1	0.4 J1	1.72	< 0.04 U1
5/23/2023	Corrective Action	0.033 J1	0.36	43.7	< 0.007 U1	0.01 J1	0.92	0.257	0.34	0.23	0.20	0.00391	< 0.002 U1	0.6	1.91	< 0.02 U1
10/26/2023	Corrective Action	0.029 J1	0.35	44.6	< 0.007 U1	0.009 J1	0.45	0.200	0.73	0.25	0.18 J1	0.00422	< 0.002 U1	1.2	1.98	< 0.02 U1

**Table 1. Groundwater Data Summary
Mountaineer – Bottom Ash Pond**

Geosyntec Consultants, Inc.

Notes:

--: Not analyzed

<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag.

In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.

B1: Analyte detected in method blank (MB) at or above the method criteria.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

In analytical data prior to 5/18/2021, J1 flags were reported as J in the analytical report.

L1: The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

mg/L: milligrams per liter

P1: The precision between duplicate results was above acceptance limits.

P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.

pCi/L: picocuries per liter

S7: Sample did not achieve constant weight.

SU: standard unit

µg/L: micrograms per liter

Table 2: Residence Time Calculation Summary *Geosyntec Consultants, Inc.*
Mountaineer Bottom Ash Pond

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2023-02		2023-05		2023-10	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Bottom Ash Pond	MW-1601A ^[1]	2.0	96	0.636	77	0.793	112	0.545
	MW-1602 ^[1]	2.0	101	0.600	79	0.770	101	0.601
	MW-1603 ^[1]	2.0	204	0.298	142	0.428	200	0.304
	MW-1608 ^[1]	2.0	115	0.530	97	0.630	121	0.503
	MW-1604D ^[2]	2.0	182	0.335	108	0.561	NC	NC
	MW-1604S ^[2]	2.0	275	0.221	164	0.371	236	0.258
	MW-1605D ^[2]	2.0	332	0.183	114	0.533	171	0.355
	MW-1605S ^[2]	2.0	327	0.186	157	0.388	215	0.283
	MW-1606D ^[2]	2.0	334	0.182	172	0.354	268	0.227
	MW-1606S ^[2]	2.0	390	0.156	188	0.323	203	0.299
	MW-1607D ^[2]	2.0	126	0.484	168	0.363	249	0.244
	MW-1607S ^[2]	2.0	167	0.363	56	1.090	192	0.318
	JTMN-1 ^[3]	2.0	168	0.362	235	0.258	25	2.457
	JTMN-2 ^[3]	2.0	714	0.085	269	0.226	151	0.402
	MW-016 ^[3]	2.0	465	0.131	94	0.647	161	0.377
	MW-107 ^[3]	2.0	253	0.240	308	0.197	174	0.349
	MW-1921 ^[3]	2.0	373	0.163	127	0.479	235	0.258
	MW-1922S ^[3]	2.0	353	0.172	141	0.431	NC	NC
	MW-1923 ^[3]	2.0	1,680	0.036	170	0.359	137	0.442
	MW-1924 ^[3]	2.0	1,350	0.045	145	0.419	162	0.376
MW-1925 ^[3]	2.0	308	0.198	172	0.353	333	0.183	
MW-1926 ^[3]	2.0	247	0.246	100	0.605	206	0.295	
MW-1927 ^[3]	2.0	50	1.224	57	1.070	161	0.378	
MW-203 ^[3]	2.0	278	0.219	160	0.380	102	0.597	
MW-1929 ^[4]	2.0	139	0.438	117	0.521	84	0.720	

Notes:

- [1] - Background Well
- [2] - Downgradient Well
- [3] - Nature and Extent Well
- [4] Sentinel Well
- NC - Not Calculated



- Legend**
- ◆ CCR Network Monitoring Wells
 - ◆ Nature and Extent Monitoring Wells
 - ⊕ Piezometer
 - ▲ AEP-Owned Pumping Well
 - Groundwater Elevation Contour
 - Approximate Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on February 10, 2023) provided by AEP.
 2. Site features based on information available in Ash Pond System-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
 3. Groundwater elevation units are feet above mean sea level.
 4. Only monitoring wells were used to generate groundwater contours. Water elevations were not collected for the pumping wells.
 5. No groundwater was present at MW-1928 and MW-112 during the February 2023 sampling event.
 6. Normal lower pool elevation of the Ohio River at Racine Lock and Dam is 539.5 ft amsl (USACE).
 7. Intermittent use of AEP-owned pumping wells for plant activities impact water levels in the vicinity. In general, shallow groundwater beneath the plant flows northeast toward the Ohio River.
 8. The plant was in a 5 day outage during April 2023.
- CCR: Coal combustion residuals
USACE: United States Army Core of Engineers



**Potentiometric Surface Map - Uppermost Aquifer
February 2023**

Mountaineer Bottom Ash Ponds

Geosyntec
consultants

Columbus, Ohio

March 2023

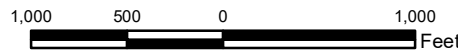
Figure
2

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Mountaineer\2023\AEP-Mountaineer_BAP_GW_2023-02.mxd, ASoltero, 11/29/2023, CHA8423/07/08.



- Legend**
- ◆ CCR Network Monitoring Wells
 - ⊕ Nature and Extent Monitoring Wells
 - ⊕ Piezometer
 - ▲ AEP-Owned Pumping Well
 - Groundwater Elevation Contour
 - - - Groundwater Elevation Contour (Inferred)
 - ➔ Approximate Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on May 19, 2023) provided by AEP.
 2. Site features based on information available in Ash Pond System-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
 3. Groundwater elevation units are feet above mean sea level.
 4. Only monitoring wells were used to generate groundwater contours. Water elevations were not collected for the pumping wells.
 5. No groundwater was present at MW-1928 and MW-112 during the May 2023 sampling event.
 6. Normal lower pool elevation of the Ohio River at Racine Lock and Dam is 539.5 ft amsl (USACE).
 7. Intermittent use of AEP-owned pumping wells for plant activities impact water levels in the vicinity. In general, shallow groundwater beneath the plant flows northeast toward the Ohio River.
 8. Plant was in a outage during this gauging event (April 2023 - June 2023)
- CCR: Coal combustion residuals
 USACE: United States Army Core of Engineers



**Potentiometric Surface Map - Uppermost Aquifer
 May 2023**

Mountaineer Bottom Ash Ponds

Geosyntec
 consultants

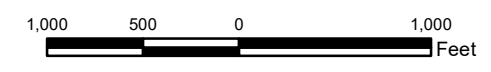
Columbus, Ohio May 2023

**Figure
 3**



- Legend**
- ◆ CCR Network Monitoring Wells
 - ◆ Nature and Extent Monitoring Wells
 - ▲ AEP-Owned Pumping Well
 - Groundwater Elevation Contour
 - Approximate Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on October 23 and 24, 2023) provided by AEP.
 2. Wells MW-005 (543.75 ft MSL), MW-1604D (541.04 ft MSL), and MW-1922S (547.52 ft MSL) were not used for contouring due to anomalous readings.
 3. Site features based on information available in Ash Pond System-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
 4. Groundwater elevation units are feet above mean sea level.
 5. Only monitoring wells were used to generate groundwater contours. Water elevations were not collected for the pumping wells.
 6. No groundwater was present at MW-1928 and MW-112 during the October 2023 sampling event.
 7. Normal lower pool elevation of the Ohio River at Racine Lock and Dam is 539.5 ft amsl (USACE).
 8. Intermittent use of AEP-owned pumping wells for plant activities impact water levels in the vicinity. In general, shallow groundwater beneath the plant flows northeast toward the Ohio River.
 9. The plant was in a 15 day outage in October
- CCR: Coal combustion residuals
 USACE: United States Army Core of Engineers



Potentiometric Surface Map - Uppermost Aquifer October 2023	
Mountaineer Bottom Ash Ponds	
Columbus, Ohio	May 2023
Figure 4	

Appendix 2

The groundwater data statistical analyses completed in this reporting period follow.

Memorandum

Date: January 16, 2024

To: Jill Parker-Witt (AEP)

Copies to: Brian Newton (AEP)

From: Allison Kreinberg (Geosyntec)

Subject: Evaluation of 2023 Reissued Analytical Laboratory Data for
Mountaineer Plant's Bottom Ash Ponds

In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (CCR Rule; Code of Federal Regulations Title 40, Part 257, Subpart D) groundwater sampling was completed in 2023 to support assessment monitoring at the Bottom Ash Ponds, an existing CCR unit at the Mountaineer Plant in New Haven, West Virginia. After the statistical evaluation was completed using data from the first semiannual assessment monitoring event,¹ select analytical laboratory reports were reissued to correct an inconsistent number of significant figures in electronic data deliverables and the published laboratory reports.

A review of the reissued analytical laboratory reports identified reported lithium results that had the number of significant figures changed (Table 1). The site-specific background value for lithium was not updated as part of the first semiannual assessment monitoring event; therefore, the lithium results at background locations were not used in the statistical evaluation before the reissued analytical laboratory reports were reviewed. Both the initial reported lithium value and the revised lithium value at nature and extent and sentinel locations were below the site-specific groundwater protection standard of 0.0400 milligrams per liter (mg/L), and statistically significant levels of lithium were not identified at these locations during the first semiannual assessment monitoring event.¹ Therefore, no changes to the statistical outcome of the first semiannual assessment monitoring event would occur.

The revised lithium values in the reissued laboratory analytical reports will be used in future reporting and statistical evaluations.

¹ Geosyntec. 2023. *Statistical Analysis Summary – Bottom Ash Ponds. Mountaineer Plant, New Haven, West Virginia.* Geosyntec Consultants, Inc. September.

**Table 1. 2023 Revised Analytical Results
Mountaineer - Bottom Ash Pond**

Geosyntec Consultants, Inc.

Sample Date	Well ID	CCR Unit	Well Location	Constituent	Units	Initial Reported Value	Revised Value
5/22/2023	MW-1601A	BAP	Upgradient	Lithium	mg/L	0.0029	0.00291
5/23/2023	MW-1608	BAP	Upgradient	Lithium	mg/L	0.0023	0.00228
5/25/2023	MW-203	BAP	Nature and Extent	Lithium	mg/L	0.002	0.00202
5/22/2023	MW-1922D	BAP	Nature and Extent	Lithium	mg/L	0.0068	0.00682
5/22/2023	MW-1926	BAP	Nature and Extent	Lithium	mg/L	0.006	0.00602
5/24/2023	MW-1927	BAP	Nature and Extent	Lithium	mg/L	0.0055	0.00553
5/23/2023	MW-1929	BAP	Sentinel	Lithium	mg/L	0.0039	0.00391

Notes:

1. All results are shown in milligrams per liter (mg/L).

STATISTICAL ANALYSIS SUMMARY

BOTTOM ASH POND

Mountaineer Plant

New Haven, West Virginia

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

Geosyntec Consultants, Inc.
500 West Wilson Bridge Road, Suite 250
Worthington, Ohio 43085

Project Number: CHA8500B

March 1, 2023

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LIST OF ATTACHMENTS

Attachment A:	Certification by Qualified Professional Engineer
Attachment B:	Statistical Analysis Output

ACRONYMS AND ABBREVIATIONS

BAP	Bottom Ash Pond
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LPL	Lower Prediction Limit
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
SU	Standard Units
TDS	Total Dissolved Solids
UCL	Upper Confidence Limit
UPL	Upper Prediction Limit
UTL	Upper Tolerance Limit
USEPA	United States Environmental Protection Agency

SECTION 1 EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257 Subpart D, "CCR rule"), groundwater monitoring has been conducted at the Bottom Ash Pond (BAP), an existing CCR unit at the Mountaineer Power Plant located in New Haven, West Virginia. Recent groundwater monitoring results were compared to site-specific groundwater protection standards (GWPS) to identify potential exceedances and evaluate progress towards completion of the selected corrective action.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, calcium, chloride, total dissolved solids (TDS), and sulfate at the BAP. An alternative source was not identified at the time, so the BAP initiated assessment monitoring in April 2018. GWPS were set in accordance with 40 CFR 257.95(d)(2) and a statistical evaluation of the assessment monitoring data was conducted in January 2019. Statistically significant levels (SSLs) were observed for lithium (Geosyntec, 2019).

An alternative source was not identified, so the BAP initiated an assessment of corrective measures in accordance with 40 CFR 257.96. Source Removal and Hydraulic Containment was selected as the remedial approach for lithium exceedances at the BAP (Sanborn Head, 2021). Corrective action monitoring was initiated in 2022, with corrective action monitoring events conducted at the BAP in March 2022, May 2022, and November 2022 in accordance with 40 CFR 257.98(a)(1) and the Corrective Action Monitoring Plan (Sanborn Head, 2022). The results of the November 2022 corrective action monitoring event are documented in this report.

Groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. GWPSs were re-established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance, nature and extent, and sentinel wells to assess whether Appendix IV parameters were present at SSLs above the GWPS. SSLs were identified for arsenic, lithium, and molybdenum. Corrective action statistics identified concentrations of lithium above the GWPS. Thus, the unit will continue corrective action monitoring as required by 40 CFR 257.98(a)(1). Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

SECTION 2 BOTTOM ASH POND EVALUATION

2.1 Data Validation & QA/QC

During the assessment monitoring program, one set of samples was collected for analysis from the upgradient and downgradient wells to meet the requirements of 257.95(d)(1) in November 2022. The samples from November 2022 were analyzed for all Appendix III and IV parameters. A summary of data collected during this assessment monitoring event may be found in Table 1.

Chemical analysis was completed by an analytical laboratory certified by the National Environmental Laboratory Accreditation Program (NELAP). Quality assurance and quality control (QA/QC) samples completed by the analytical laboratory included the use of laboratory reagent blanks (LRBs), continuing calibration verification (CCV) samples, and laboratory fortified blanks (LFBs).

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.35 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Statistical analyses for the BAP were conducted in accordance with the January 2021 *Statistical Analysis Plan* (Geosyntec, 2021). Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in November 2022 for the background and compliance wells was screened for potential outliers. No outliers were identified for the data collected from these monitoring locations.

2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with 40 CFR 257.95(h) and the *Statistical Analysis Plan* (Geosyntec, 2021). The established GWPS was determined to be the greater value of the background concentration and the maximum contaminant level (MCL) or risk-based level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events. Tolerance limits were calculated parametrically with 95% coverage and 95% confidence for arsenic, chromium, cobalt, combined radium, and molybdenum. Non-parametric tolerance limits were calculated for antimony, barium, cadmium, fluoride, lead, lithium, and selenium due to apparent non-normal distributions and for beryllium, mercury, and thallium due to a high non-detect frequency. Upper tolerance limits and the final GWPSs are summarized in Table 2.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well, except where previous lithium exceedances merited corrective action (see Section 2.2.3). Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B.

The following SSLs were identified at the Mountaineer BAP for assessment monitoring:

- The LCL for arsenic exceeded the GWPS of 0.0100 mg/L at MW-1805 (0.0258 mg/L) and MW-1922D (0.416 mg/L).
- The LCL for molybdenum exceeded the GWPS of 0.100 mg/L at MW-1921 (0.420 mg/L).

As a result, either an alternative source demonstration for arsenic and/or molybdenum will be prepared in accordance with 40 CFR 257.95(g)(3)(ii) or an assessment of corrective measures will be initiated for these constituents. Additionally, the Mountaineer BAP will continue to monitor the groundwater monitoring network in accordance with the assessment monitoring program per 40 CFR 257.96(b).

2.2.3 Evaluation of Corrective Action Monitoring

The selected remedy of Source Removal with Hydraulic Containment is considered complete when it meets the requirements of 40 CFR 257.98(c), including the requirement to achieve compliance with the GWPS at all points within the plume of contamination (40 CFR 257.98(c)(1)). For previously identified lithium exceedances, which are the subject of the current corrective measures, the upper confidence limit (UCL) of the confidence intervals constructed as described in Section 2.2.2 were compared to the GWPS provided in Table 2. If the UCL is above the GWPS, compliance with the GWPS has not been achieved. The following corrective action exceedances were identified:

- The UCL for lithium exceeded the GWPS of 0.0400 mg/L at MW-1605D (0.0682 mg/L), MW-1605S (0.0681 mg/L), MW-1606D (0.120 mg/L), MW-1606S (0.102 mg/L), MW-1607D (0.0993 mg/L), MW-1607S (0.108 mg/L), MW-1921 (0.0972 mg/L), MW-1922S (0.0623 mg/L), MW-1923 (0.1965 mg/L), MW-1924 (0.1129 mg/L), and MW-1925 (0.0893 mg/L).

For lithium exceedances, which are the subject of corrective measures, concentrations remain above the GWPS and implementation of the selected remedy will continue.

2.2.4 Establishment of Appendix III Prediction Limits

Upper prediction limits (UPL) for Appendix III parameters were established in January 2018 following the background monitoring period (Geosyntec, 2018). Intrawell tests were used to evaluate potential SSIs for pH, whereas interwell tests were used to evaluate potential SSIs for

boron, calcium, chloride, fluoride, sulfate, and TDS. Intrawell and interwell prediction limits have been updated periodically during the assessment monitoring period as sufficient data became available.

Mann-Whitney (Wilcoxon rank-sum) tests were performed to determine whether the newer data are affected by a release from the WBAP. Because the interwell Appendix III limits and the Appendix IV GWPSs are based on data from upgradient wells which we would not expect to have been impacted by a release, these tests were used for intrawell Appendix III tests only. Mann-Whitney tests were used to compare the medians of historical data (September 2016 – May 2020) to the new compliance samples (October 2020 – November 2022) for pH. Results were evaluated to determine if the medians of the two groups were similar at the 99% confidence level. Where no significant difference was found, the new compliance data were added to the background dataset. Where a statistically significant difference was found between the medians of the two groups, the data were reviewed to evaluate the cause of the difference and to determine if adding newer data to the background dataset, replacing the background dataset with the newer data, or continuing to use the existing background dataset was most appropriate. If the differences appeared to have been caused by a release, then the previous background dataset would have continued to be used. The complete Mann-Whitney test results and a summary of the significant findings can be found in Attachment B.

Prediction limits for the interwell tests were recalculated using data collected during the 2022 assessment monitoring events. New upgradient well data were tested for outliers prior to being added to the background dataset. Upgradient well data were also evaluated for statistically significant trends using the Sen's Slope/Mann-Kendall trend test, and the results are included in Attachment B. The updated prediction limits were calculated using a one-of-two retesting procedure, as during detection monitoring.

After the revised background set was established, a parametric or non-parametric analysis was selected based on the distribution of the data and the frequency of non-detect data. Estimated results less than the reporting limit (practical quantitation limit [PQL]) but above the method detection limit (MDL) – i.e., “J-flagged” data – were considered detections and the estimated results were used in the statistical analyses. Non-parametric analyses were selected for datasets with at least 50% non-detect data or datasets that could not be normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk / Shapiro-Francia test for normality. The Kaplan-Meier non-detect adjustment was applied to datasets with between 15% and 50% non-detect data. For datasets with fewer than 15% non-detect data, non-detect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or non-parametric) and transformation (where applicable) for each background dataset are shown in Attachment B.

Interwell UPLs were updated for boron, calcium, chloride, fluoride, sulfate, and TDS using historical data through November 2022, and intrawell UPLs and lower prediction limits (LPLs) were previously calculated for pH using the historical data through May 2022 to represent background values. The updated prediction limits are summarized in Table 3. The prediction limits were calculated for a one-of-two retesting procedure; i.e., if at least one sample in a series of two does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, then it can be concluded that an SSI has not occurred. In practice, where the initial result

does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, a second sample will not be collected.

2.2.5 Evaluation of Potential Appendix III SSIs

The Appendix III results were analyzed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations. Data collected during the November 2022 assessment monitoring event from each compliance well were compared to previously established prediction limits to assess whether the results are above background values. The results from these events and the prediction limits are summarized in Table 3. The following exceedances of the upper prediction limits (UPLs) were noted:

- Boron concentrations exceeded the interwell UPL of 0.491 mg/L at MW-1604D (3.59 mg/L), MW-1604S (2.37 mg/L), MW-1605D (2.69 mg/L), MW-1605S (3.63 mg/L), MW-1606D (6.37 mg/L), MW-1606S (4.94 mg/L), MW-1607D (4.56 mg/L), and MW-1607S (2.76 mg/L).
- Calcium concentrations exceeded the interwell UPL of 202 mg/L at MW-1604S (246 mg/L), MW-1605D (212 mg/L), and MW-1607D (222 mg/L).
- Chloride concentrations exceeded the interwell UPL of 57.8 mg/L at MW-1604D (60.9 mg/L), MW-1604S (96.1 mg/L), MW-1605D (99.3 mg/L), MW-1605S (81.4 mg/L), MW-1606D (191 mg/L), MW-1606S (169 mg/L), MW-1607D (165 mg/L), and MW-1607S (126 mg/L).
- Fluoride concentrations exceeded the interwell UPL of 0.300 mg/L at MW-1606S (0.36 mg/L), and MW-1607D (0.47 mg/L).
- Sulfate concentrations exceeded the interwell UPL of 530 mg/L at MW-1604S (622 mg/L), MW-1605D (566 mg/L), MW-1606D (585 mg/L), and MW-1607D (641 mg/L).
- TDS concentrations exceeded the interwell UPL of 1,010 mg/L at MW-1604D (1,060 mg/L), MW-1604S (1,340 mg/L), MW-1605D (1,270 mg/L), MW-1605S (1,180 mg/L), MW-1606D (1,380 mg/L), MW-1606S (1,300 mg/L), MW-1607D (1,560 mg/L), and MW-1607S (1,060 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the November 2022 sample was above the UPL or below the LPL. Based on these results, concentrations of Appendix III constituents appear to be above background levels at the compliance wells.

2.3 Conclusions

A semiannual corrective action monitoring event were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers

in the November 2022 data. GWPSs were established for the Appendix IV parameters. A confidence interval was constructed at each compliance, nature and extent, and sentinel well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. SSLs were identified for arsenic and molybdenum. For previous lithium exceedances which are the subject of corrective measures, concentrations remain above the GWPS and implementation of the selected remedy will continue. Appendix III parameters were compared to previously calculated prediction limits, with exceedances identified for boron, calcium, chloride, fluoride, sulfate, and TDS.

Based on this evaluation, the Mountaineer BAP CCR unit will continue corrective action monitoring as required by 40 CFR 275.98(a)(1).

SECTION 3 REFERENCES

Geosyntec Consultants (Geosyntec). 2018. Statistical Analysis Summary – Bottom Ash Pond, Mountaineer Plant. January 2018.

Geosyntec. 2019. Statistical Analysis Summary – Bottom Ash Pond, Mountaineer Plant. January 8, 2019.

Geosyntec. 2021. Statistical Analysis Plan. January.

Sanborn, Head & Associates, Inc (Sanborn Head). 2021. Remedy Selection Report – AEP Mountaineer Plant, Bottom Ash Ponds. December 22, 2021.

Sanborn Head. 2022. Corrective Action Monitoring Plan – AEP Mountaineer Plant, Bottom Ash Ponds. March 2022.

TABLES

**Table 1 - Groundwater Data Summary
Mountaineer Plant - Bottom Ash Pond**

Parameter	Unit	MW-016	MW-107	MW-203	MW-1601A	MW-1602	MW-1603	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S	MW-1607D
		11/7/2022	11/1/2022	10/31/2022	11/3/2022	11/2/2022	11/7/2022	11/3/2022	11/3/2022	11/3/2022	11/4/2022	11/4/2022	11/7/2022	11/8/2022
Antimony	µg/L	0.05 J1	0.02 J1	0.1 U1	0.03 J1	0.1 U1	0.1 U1	0.06 J1	0.16	0.03 J1	0.06 J1	0.14	0.14	0.03 J1
Arsenic	µg/L	4.31	0.29	0.22	0.49	0.29	0.22	0.24	0.22	3.42	0.45	0.30	0.62	1.95
Barium	µg/L	24.6	32.4	30.6	66.5	23.6	29.3	26.8	29.4	29.5	27.3	41.9	56.0	74.0
Beryllium	µg/L	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1
Boron	mg/L	1.32	0.508	0.067	0.165	0.098	0.239	3.59	2.37	2.69	3.63	6.37	4.94	4.56
Cadmium	µg/L	0.012 J1	0.015 J1	0.005 J1	0.015 J1	0.011 J1	0.010 J1	0.017 J1	0.167	0.008 J1	0.045	0.064	0.059	0.02 U1
Calcium	mg/L	213	151	102	166	77.0	166	160	246	212 M1, P3	156	199	201	222 M1
Chloride	mg/L	70.8	32.5	71.7	16.7	7.89	14.1	60.9	96.1	99.3	81.4	191	169	165
Chromium	µg/L	0.45	0.33	0.38	0.30	0.42	0.57	0.26	0.50	0.25	0.44	0.28	0.25	0.29
Cobalt	µg/L	1.88	0.080	0.017 J1	0.014 J1	0.015 J1	0.031	0.112	1.89	1.24	0.547	1.41	0.145	0.897
Combined Radium	pCi/L	1.35	0.33	0.68	1.52	0.96	4.44	2.13	2.63	2.06	1.04	2.35	0.52	1.54
Fluoride	mg/L	0.25	0.20	0.24	0.10	0.26	0.07	0.21	0.24	0.20	0.26	0.24	0.36	0.47
Lead	µg/L	0.07 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.08 J1	0.07 J1	0.2 U1	0.17 J1	0.2 U1	0.2 U1	0.2 U1
Lithium	mg/L	0.0291	0.00331	0.00238	0.00377	0.0137	0.0174	0.0190	0.0358	0.0430	0.0444	0.0591	0.0571	0.0988
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1
Molybdenum	µg/L	36.3	0.1 J1	0.8	0.5	1.1	0.3 J1	1.6	13.5	32.0	13.0	62.5	51.8	64.3
Selenium	µg/L	0.10 J1	0.49 J1	2.29	0.58	0.5 U1	0.16 J1	2.11	0.60	0.5 U1	0.59	2.18	1.43	0.5 U1
Sulfate	mg/L	454	245	83.8	239	178	424	440	622	566	513	585	529	641
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.22	0.2 U1	0.2 U1	0.06 J1	0.06 J1	0.2 U1
Total Dissolved Solids	mg/L	1,060	730	470	680	480	880	1,060	1,340	1,270	1,180	1,380	1,300	1,560
pH	SU	7.32	6.81	7.02	6.69	6.62	6.7	6.85	6.95	7.29	7.24	7.22	7.05	7.41

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Non-detected at or above method detection limit (MDL). For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

P3: The precision on the MSD was above acceptance limits.

-: Not analyzed

**Table 1 - Groundwater Data Summary
Mountaineer Plant - Bottom Ash Pond**

Parameter	Unit	MW-1607S	MW-1608	MW-1805	MW-1921	MW-1922D	MW-1922S	MW-1923	MW-1924	MW-1925	MW-1926	MW-1927	MW-1929	JTMN-1	JTMN-2
		11/8/2022	11/1/2022	11/4/2022	11/1/2022	11/4/2022	11/4/2022	11/1/2022	11/2/2022	11/1/2022	11/2/2022	11/3/2022	11/1/2022	11/3/2022	11/3/2022
Antimony	µg/L	0.44	0.03 J1	0.1 U1	0.10	0.80	0.04 J1	0.18	0.06 J1	0.20	0.06 J1	0.07 J1	0.03 J1	0.09 J1	0.07 J1
Arsenic	µg/L	0.91	0.43	40.2	1.14	384 M1, P3	1.89	0.79	0.43	0.24	0.28	0.20	0.28	2.38	1.33
Barium	µg/L	64.0	25.1	40.3	63.0	406 M1, P3	27.6	101	48.1	39.7	18.9	57.0	44.3	102 P3	85.7
Beryllium	µg/L	0.25 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.022 J1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.065	0.045 J1
Boron	mg/L	2.76	0.065	2.84	0.603	0.063	3.01	1.17	5.20	3.35	0.108	0.421	0.210	0.332	0.372
Cadmium	µg/L	0.034	0.005 J1	0.02 U1	0.01 J1	0.02 U1	0.005 J1	0.012 J1	0.054	0.040	0.032	0.068	0.007 J1	0.038	0.034
Calcium	mg/L	170	84.5	147	93.7	58.3 M1, P3	276	120 M1, P3	191	174	82.7	157	98.7	219 M1, P3	214
Chloride	mg/L	126	2.07	119	60.7	17.2	103	34.2	133	109	3.00	11.8	6.81	62.3	61.4
Chromium	µg/L	0.31	0.44	0.31	0.28	0.24	0.22	0.83	0.38	0.28	0.50	0.30	0.43	2.45	1.78
Cobalt	µg/L	1.37	0.024	0.130	0.588	0.134	0.840	0.799	2.32	0.920	0.875	0.442	0.101	2.44	1.47
Combined Radium	pCi/L	1.42	1.19	3.14	1.27	8.17	1.72	1.49	1.15	0.95	0.53	2.17	0.78	2.04	1.64
Fluoride	mg/L	0.21	0.25	0.31	1.01	0.28	0.15	0.22	0.49	0.27	0.26	0.14	0.23	0.26	0.31
Lead	µg/L	0.07 J1	0.22	0.2 U1	0.06 J1	0.2 U1	0.2 U1	0.66	0.06 J1	0.2 U1	0.2 U1	0.2 U1	0.07 J1	2.46	1.13
Lithium	mg/L	0.105	0.00231	0.0306	0.0981	0.00738	0.0467	0.194	0.0850	0.0680	0.00661	0.00619	0.00435	0.0118	0.0198
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005	0.008
Molybdenum	µg/L	31.8	0.9	21.2	386	36.6	26.6	315 M1, P3	113	41.2	4.3	0.9	0.6	11.7	22.7
Selenium	µg/L	2.25	2.07	0.5 U1	0.5 U1	0.5 U1	0.5 U1	47.6	0.76	5.10	2.22	0.94	2.23	0.54	0.54
Sulfate	mg/L	290	83.3	408	163	16.0	735	263	626	474	28.2	287	211	453	456
Thallium	µg/L	0.06 J1	0.2 U1	0.2 U1	0.05 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	1,060	370	1,140	520	330	1,460	630	1,380	1,130	350	790	490	1,010	1,060
pH	SU	7.18	7.02	7.47	7.51	7.24	7	7.29	7.21	6.94	7.15	6.89	7.35	6.85	6.88

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Non-detected at or above method detection limit (MDL). For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

P3: The precision on the MSD was above acceptance limits.

-: Not analyzed

**Table 2 - Appendix IV Groundwater Protection Standards
Mountaineer Plant - Bottom Ash Pond**

Geosyntec Consultants, Inc.

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000520	0.00600
Arsenic, Total (mg/L)	0.0100		0.000714	0.0100
Barium, Total (mg/L)	2.00		0.0678	2.00
Beryllium, Total (mg/L)	0.00400		0.0000500	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000500	0.00500
Chromium, Total (mg/L)	0.100		0.000738	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.000570	0.00600
Combined Radium, Total (pCi/L)	5.00		2.38	5.00
Fluoride, Total (mg/L)	4.00		0.300	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000881	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0300	0.0400
Mercury, Total (mg/L)	0.00200		0.0000500	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00273	0.100
Selenium, Total (mg/L)	0.0500		0.00430	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

MCL: Maximum Contaminant Level

CCR: Coal Combustion Residual

Calculated UTL (Upper Tolerance Limit) represents site-specific background values.

GWPS: Groundwater Protection Standard

**Table 3 - Appendix III Data Summary
Mountaineer Plant - Bottom Ash Pond**

Analyte	Unit	Description	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S	MW-1607D	MW-1607S
			11/3/2022	11/3/2022	11/4/2022	11/4/2022	11/7/2022	11/8/2022	11/8/2022	11/8/2022
Boron	mg/L	Interwell Background Value (UPL)	0.491							
		Analytical Result	3.59	2.37	2.69	3.63	6.37	4.94	4.56	2.76
Calcium	mg/L	Interwell Background Value (UPL)	202							
		Analytical Result	160	246	212	156	199	201	222	170
Chloride	mg/L	Interwell Background Value (UPL)	57.8							
		Analytical Result	60.9	96.1	99.3	81.4	191	169	165	126
Fluoride	mg/L	Interwell Background Value (UPL)	0.300							
		Analytical Result	0.21	0.24	0.20	0.26	0.24	0.36	0.47	0.21
pH	SU	Intrawell Background Value (UPL)	7.8	7.7	7.8	7.7	7.8	7.8	8.0	7.9
		Intrawell Background Value (LPL)	6.5	6.6	6.8	6.8	6.8	6.3	7.0	6.8
		Analytical Result	6.9	7.0	7.3	7.2	7.2	7.1	7.4	7.2
Sulfate	mg/L	Interwell Background Value (UPL)	530							
		Analytical Result	440	622	566	513	585	529	641	290
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	1,010							
		Analytical Result	1,060	1,340	1,270	1,180	1,380	1,300	1,560	1,060

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

Bold values exceed the background value.

Background values are shaded gray.

ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Mountaineer Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



22663

License Number

West Virginia

Licensing State

03.02.23

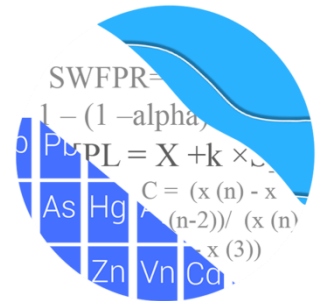
Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

February 23, 2023

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
500 W. Wilson Bridge Road, Suite 250
Worthington, OH 43085



Re: Mountaineer Bottom Ash Pond
Assessment Monitoring Report & Background Update – 2022

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background update and the Assessment Monitoring and Corrective Action statistical analysis of groundwater data through November 2022 at American Electric Power Company's Mountaineer Bottom Ash Pond. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at upgradient and downgradient wells for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** MW-1601A, MW-1602, MW-1603, and MW-1608
- **Downgradient wells:** MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S
- **Nature and Extent wells:** JTMN-1, JTMN-2, MW-016, MW-107, MW-112, MW-1805, MW-1921, MW-1922D, MW-1922S, MW-1923, MW-1924, MW-1925, MW-1926, MW-1927, and MW-203
- **Sentinel well:** MW-1929

Note that sampling began at the nature and extent wells along with the sentinel well in 2019. Although new upgradient well MW-1928 is considered part of the well network, it has been dry since 2019; therefore, it is not listed above, nor included in this analysis.

Data were sent electronically, and the statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC. This analysis was reviewed by Andrew Collins, Project Manager of Groundwater Stats Consulting.

The CCR program consists of the following constituents listed below. The terms “constituent” and “parameter” are interchangeable.

- **Appendix III** (Detection Monitoring) - boron, calcium, chloride, fluoride, pH, sulfate, and TDS
- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Time series and box plots for Appendix III and IV parameters are provided for all wells and constituents and are used to evaluate concentrations over the entire record (Figures A and B, respectively). Values in background which have previously been flagged as outliers may be seen in a lighter font and disconnected symbol on the graphs. Additionally, a summary of flagged values follows this letter (Figure C). While the reporting limits may vary from well to well, a single reporting limit substitution is used across all wells for a given parameter in the time series plots since the wells are plotted as a group.

Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. A summary of Appendix IV downgradient, nature and extent, and sentinel well/constituent pairs containing 100% non-detects follows this letter. For all constituents, a substitution of the most recent reporting limit is used for non-detect data. When calculating intrawell prediction limits, the substitution is performed for individual wells and may differ across wells. This generally gives the most conservative limit in each case.

Summary of Statistical Method – Appendix III & IV Parameters

Based on the original background screening described in the 2017 screening report, the following statistical methods were selected for Appendix III parameters:

- 1) Intrawell prediction limits, combined with a 1-of-2 resample plan for pH
- 2) Interwell prediction limits, combined with a 1-of-2 resample plan for boron, calcium, chloride, fluoride, sulfate, and TDS

Interwell upper tolerance limits, UTL's, are used to establish background limits for both Assessment Monitoring and Corrective Action Monitoring. A Ground Water Protection Standard, GWPS, for each Appendix IV constituent is then established using the higher of the background limit or a regulatory limit. A confidence interval for each downgradient well/constituent is compared against the corresponding GWPS. More details for both Assessment and Corrective Action monitoring are given below.

Parametric prediction and tolerance limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or most data are non-detects, a nonparametric test is utilized. While the annual false positive rate associated with parametric limits is fixed at 10% as recommended by the EPA Unified Guidance (2009), the false positive rate associated with nonparametric limits is not fixed and depends upon the available background sample size, number of future comparisons, and verification resample plan. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-parametric prediction and tolerance limits as appropriate. Non-detects are handled as follows:

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric prediction limits are used on data containing greater than 50% non-detects.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits is necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents may be re-evaluated when a minimum of 4 new data points are available to determine whether earlier concentrations are representative of present-day groundwater quality. In the interwell case, prediction limits are updated with upgradient well data following each sampling event after careful screening for any new outliers. In some cases,

deselecting the earlier portion of data may be necessary prior to construction of limits so that resulting statistical limits are conservative (lower) from a regulatory perspective and capable of rapidly detecting changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

Summary of Appendix III Background Update Summaries

November 2019

Samples from all wells for pH which is tested using intrawell prediction limits and from all upgradient wells for boron, calcium, chloride, fluoride, sulfate, and TDS which are tested using interwell prediction limits were evaluated using Tukey's outlier test and visual screening.

The Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through June 2017 to the new compliance samples at each well through April 2019 for pH to evaluate whether the groups are statistically different at the 99% confidence level. No statistically significant differences were found between the two groups for any of the well/constituent pairs; therefore, all background data sets for pH were updated.

For parameters tested using interwell analyses, the Sen's Slope/Mann-Kendall trend test was used on upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. A few statistically significant increasing and decreasing trends were noted; however, the magnitudes of the trends were low relative to average concentrations within each well. Therefore, interwell prediction limits were constructed with using pooled upgradient well data through April 2019.

January 2021

Prior to updating background data for the Fall 2020 analysis, Tukey's outlier test and visual screening were used to re-evaluate data for outliers at all wells for pH and at all upgradient wells for boron, calcium, chloride, fluoride, sulfate, and TDS. High pH values for wells MW-1607D and MW-1607S were flagged as outliers and deselected prior to constructing prediction limits to maintain intrawell prediction limits that are conservative (i.e., more pH neutral) from a regulatory perspective. An unusually high value for TDS in well MW-1606S was identified visually and flagged as an outlier. Since TDS is evaluated using interwell methods, the flagged value has no effect on the calculation of prediction limits. Tukey's

outlier test on pooled upgradient well data did not identify any potential outliers, and no new values were flagged.

For pH, which requires intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through April 2019 to the new compliance samples at each well through May 2020. No statistically significant differences were identified found between the two groups for pH; therefore, all background data sets for pH were updated using data through May 2020.

For parameters tested using interwell analyses (boron, calcium, chloride, fluoride, sulfate, and TDS) the Sen's Slope/Mann-Kendall trend test was used on upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. Although statistically significant trends were identified, the magnitudes of the trends above were either small relative to average concentrations within each well or would not greatly affect the interwell prediction limits. Therefore, all well/constituent pairs using interwell prediction limits were updated using data through October 2020.

January 2022

Upgradient well data through October 2021 were re-screened for the purpose of updating the interwell prediction limits for boron, calcium, chloride, fluoride, sulfate, and TDS. Intrawell prediction limits will be updated after the Fall 2022 sample event when sufficient compliance samples are available.

Prior to updating interwell prediction limits, Tukey's outlier test and visual screening were used to re-evaluate data through October 2021 at all upgradient wells for boron, calcium, chloride, fluoride, sulfate, and TDS. Tukey's outlier test on pooled upgradient well data did not identify any potential outliers, and no new values were flagged.

No changes to values flagged in previous background updates occurred. As mentioned above, any flagged data are displayed in a lighter font and as a disconnected symbol on the time series reports, as well as in a lighter font on the accompanying data pages. A summary table of all flagged outliers follows this report.

Intrawell prediction limits, combined with a 1-of-2 resample plan, are constructed using historical data through May 2020 for pH at all wells. As discussed earlier, background data sets for pH will be updated after the Fall 2022 sample event when a minimum of 4 new compliance samples are available.

For parameters tested using interwell analyses (boron, calcium, chloride, fluoride, sulfate, and TDS) the Sen's Slope/Mann-Kendall trend test was used on upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. Statistically significant trends were identified for the following upgradient well/constituent pairs:

Increasing:

- Calcium: MW-1601A
- Fluoride: MW-1602
- Sulfate: MW-1601A
- TDS: MW-1601A

Decreasing:

- Boron: MW-1601A, MW-1603, and MW-1608
- Chloride: MW-1603
- Fluoride: MW-1601A
- Sulfate: MW-1603

The magnitudes of the trends above are either small relative to average concentrations within each well or would not greatly affect the interwell prediction limits. With limited background samples collected to date, all data from upgradient wells were used to construct interwell prediction limits for all Appendix III parameters except pH which is tested using intrawell prediction limits. As more data are collected, all upgradient well data will be re-evaluated for possible deselection of earlier measurements if they no longer represent present-day groundwater quality conditions.

Interwell prediction limits, combined with a 1-of-2 resample plan, were updated using all available data from upgradient wells through October 2021 for boron, calcium, chloride, fluoride, sulfate, and TDS. Interwell prediction limits pool upgradient well data to establish a background limit for an individual constituent.

January 2023

Outlier Analysis

Prior to updating background data during this analysis, Tukey's outlier test was used to evaluate data through May 2022 at all wells for pH, which is tested using intrawell prediction limits, and through November 2022 at upgradient wells for boron, calcium, chloride, fluoride, sulfate, and TDS, which are tested using interwell prediction limits. (Figure C).

Tukey's outlier test on all wells for pH and on pooled upgradient well data for boron, calcium, chloride, fluoride, sulfate, and TDS did not identify any potential outliers; however, the highest value for boron early in the record at upgradient well MW-1603 was flagged to reduce variation and construct statistical limits that are conservative (i.e., lower) from a regulatory perspective.

No changes to values flagged in previous background updates occurred. As mentioned above, any flagged data are displayed in a lighter font and as a disconnected symbol on the time series reports, as well as in a lighter font on the accompanying data pages. A summary of all flagged outliers follows this report (Figure C).

Intrawell – Mann-Whitney Test

For pH, which is tested using intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through May 2020 to the new compliance samples at each well through May 2022 to evaluate whether the groups are statistically similar at the 99% confidence level, in which case background data may be updated with compliance data (Figure D). No statistically significant differences were found between the two groups for pH among wells that were tested; therefore, all data sets for pH were updated with compliance samples through May 2022.

Intrawell – Prediction Limits

Intrawell prediction limits using all historical data through May 2022 combined with a 1-of-2 resample plan, were constructed for pH and a summary of the limits follows this letter (Figure E).

Interwell – Trend Test Evaluation

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron, calcium, chloride, fluoride, sulfate, and TDS to identify statistically significant increasing or decreasing trends at the 99% confidence level (Figure F). The results of the trend analyses showed statistically significant trends for the following well/constituent pairs:

Increasing:

- Calcium: MW-1601A
- Fluoride: MW-1602
- Sulfate: MW-1601A
- TDS: MW-1601A

Decreasing:

- Boron: MW-1601A, MW-1603, and MW-1608
- Chloride: MW-1602, MW-1603, and MW-1608
- Fluoride: MW-1601A
- pH: MW-1601A
- Sulfate: MW-1603

The magnitudes of the trends above are either small relative to average concentrations within each well or would not greatly affect the interwell prediction limits. While concentrations are higher earlier in the record for chloride at MW-1601A, present-day conditions among downgradient wells such as MW-1604D resemble these naturally occurring groundwater concentrations upgradient of the facility; therefore, this record was not truncated. All records will be re-evaluated during the next background update and, if earlier measurements are no longer representative of present-day conditions, the historical portion of the records will be deselected prior to construction of statistical limits.

Interwell – Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were constructed using all pooled upgradient well data through November 2022 for boron, calcium, chloride, fluoride, sulfate, and TDS (Figure G). Time series graphs are included with the statistical limits for graphical representation of concentrations over time at upgradient wells. A summary table of the updated limits may be found following this letter in the Prediction Limit Summary Tables.

Summary of Appendix IV Background Update – Conducted in January 2023

Outlier Analysis

Prior to evaluating Appendix IV parameters, background (upgradient) data were screened through visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. High outliers are also 'cautiously' flagged in the downgradient wells when they are clearly much different from the rest of the data. This is intended to be a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals; although it will also reduce the mean and thus lower the entire interval. The intent is to better represent the actual downgradient mean.

For the January 2023 update, Tukey's outlier test on pooled upgradient well data did not identify any outliers; therefore, no new values were flagged. Additionally, no new values

were flagged among downgradient wells. Note that during the March/May 2022 analysis, a previously flagged high value of molybdenum in well MW-1604S was unflagged due to the observation being lower than present-day groundwater quality conditions.

Previous screenings identified high values for chromium in several wells (both upgradient and downgradient) during the November and December 2016 samples events. These values were flagged in the database as outliers as they did not appear to represent the population at these wells and do not represent current conditions. Additionally, several high values for antimony, arsenic, barium, cadmium, cobalt, fluoride, lead, and selenium were recorded during the December 2016 sample event for downgradient wells MW-1606D, MW-1607D, and MW-1607S. High values above the MCL were flagged and are likely the result of a systematic error since they all occurred for the same sample event.

For the September 2016 sample event, a high value of combined radium in well MW-1606D and for molybdenum in well MW-1604S as well as a low value for combined radium in well MW-1604S were identified visually and flagged as outliers. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data during the Fall 2022 statistical analysis using data through November 2022 for Appendix IV parameters (Figure H). Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were constructed using the highest background measurement. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. These limits are updated annually and will be updated again after the Fall 2023 sample event.

Groundwater Protection Standards

Interwell upper tolerance limits were compared to the Maximum Contaminant Levels (MCLs) and CCR-Rule specified levels in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure I).

Evaluation of Appendix IV Parameters – November 2022 Event

Assessment Monitoring

Confidence intervals were then constructed for downgradient, nature and extent, and sentinel wells for each of the Appendix IV parameters using data through November 2022 (Figure J). As discussed above, the highest limit of the MCL, CCR-Rule specified level, or background limit was used to establish the GWPS. A statistically significant level (SSL) is declared only when the entire confidence interval is above a GWPS. Complete graphical results of the confidence intervals follow this letter. Note that for lithium at wells which exceeded the GWPS during the previous analysis were evaluated only under the Corrective Action protocols described below. Confidence interval exceedances were identified for the following well/constituent pairs:

- Arsenic: MW-1805 and MW-1922D
- Molybdenum: MW-1921

Note that the exceedances listed above occurred in nature and extent wells, and no exceedances were identified among compliance wells. Further research beyond the scope of this analysis would be required to determine whether the exceedances are reflective of natural groundwater quality or are a result of practices at the site.

Corrective Action

In 2022, Mountaineer BAP entered Corrective Action protocols for lithium due to previously identified SSLs. Confidence intervals were constructed using data through November 2022 for this constituent at downgradient, nature and extent, and sentinel wells identified with SSL exceedances during Assessment Monitoring (Figure K). These confidence intervals are then compared to the same GWPS used in Assessment Monitoring to assess the effectiveness of remedial efforts over time. Only when the entire confidence interval is below the GWPS for a period of 3 years is the well/constituent pair declared to be in compliance with its respective standard.

Lithium will continue to be evaluated under Corrective Action protocols using confidence intervals for these well/constituent pairs during the Monitoring and Natural Attenuation program. In future analyses, if confidence interval exceedances are identified for lithium at additional wells during Assessment Monitoring, data from these wells will also be evaluated only within the Corrective Action protocols until compliance is achieved. Complete graphical results of the confidence intervals follow this letter. Exceedances were identified for the following well/constituent pairs:

- Lithium: MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S, MW-1921, MW-1922S, MW-1923, MW-1924, and MW-1925

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Mountaineer Bottom Ash Pond. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



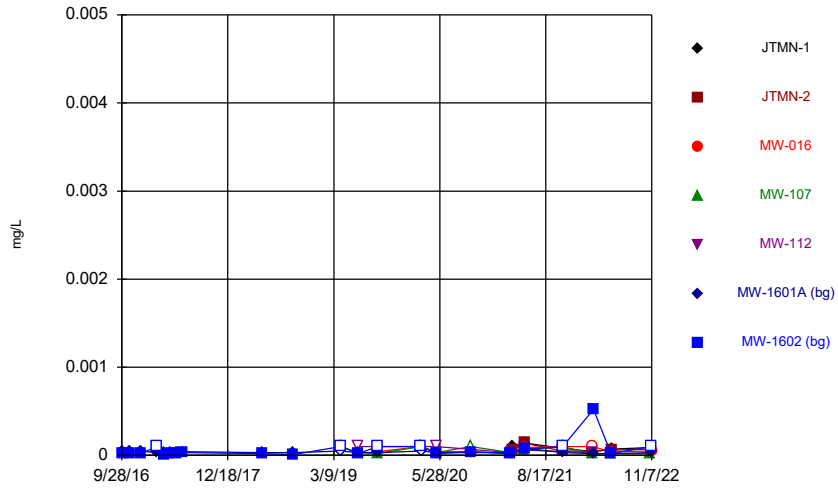
Tristan Clark
Groundwater Analyst



Andrew Collins
Project Manager

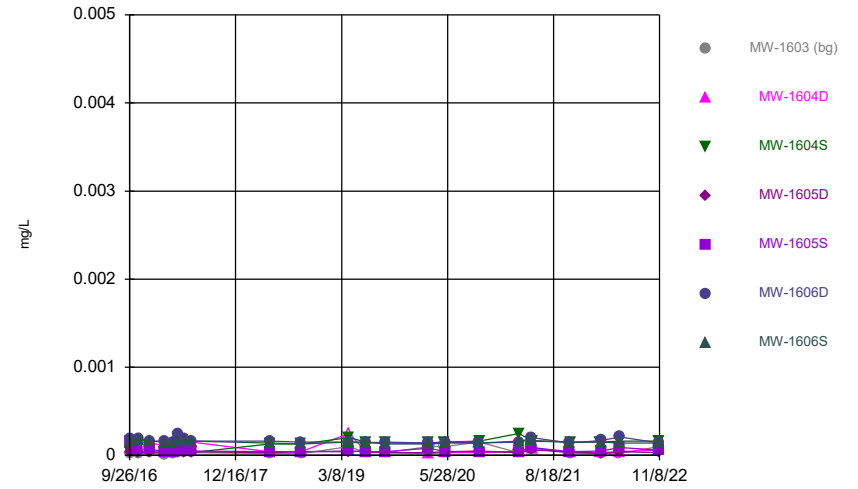
FIGURE A
Time Series

Time Series



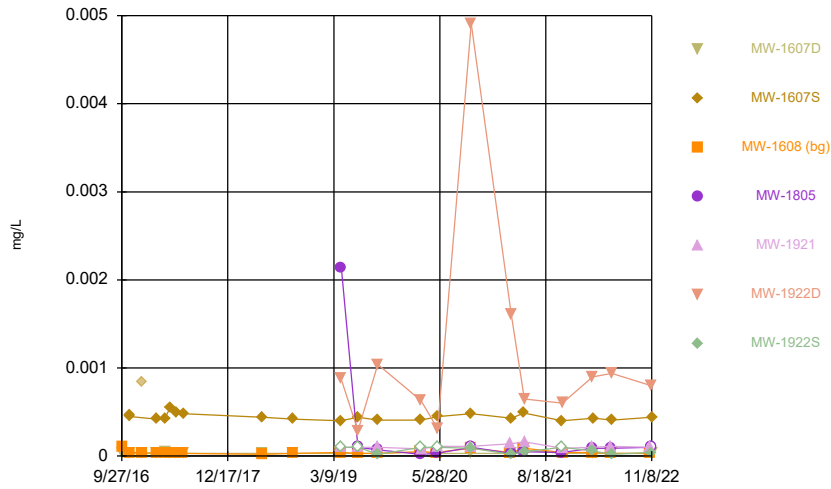
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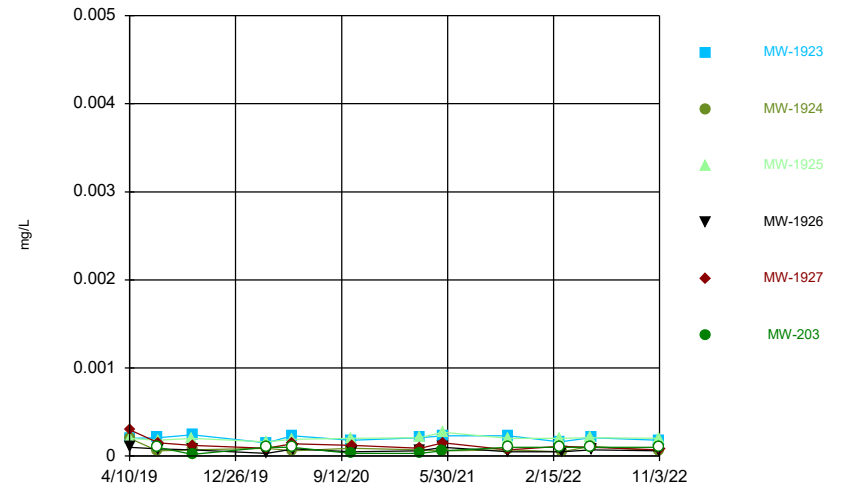
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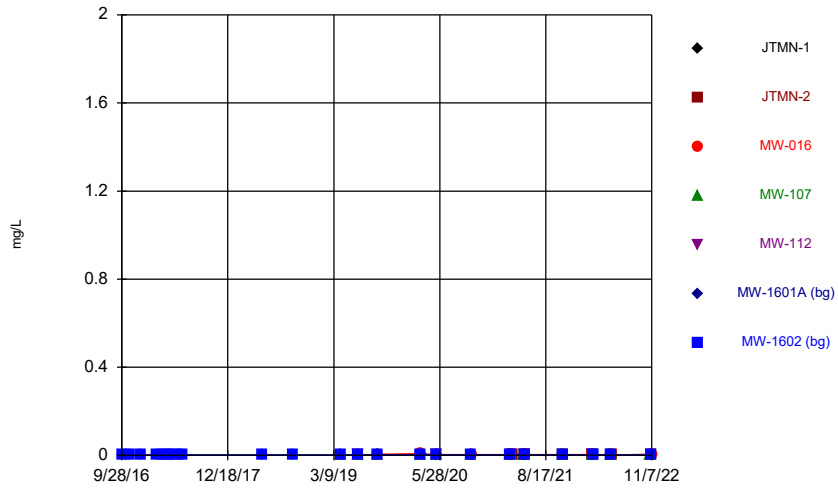
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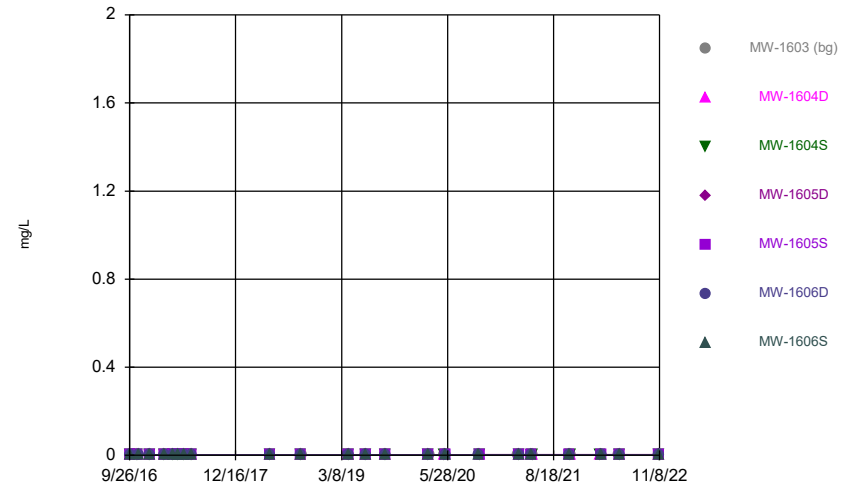
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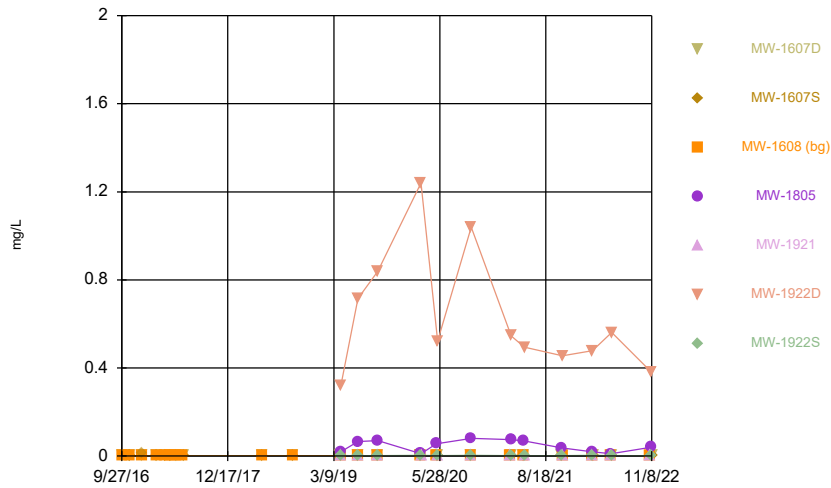
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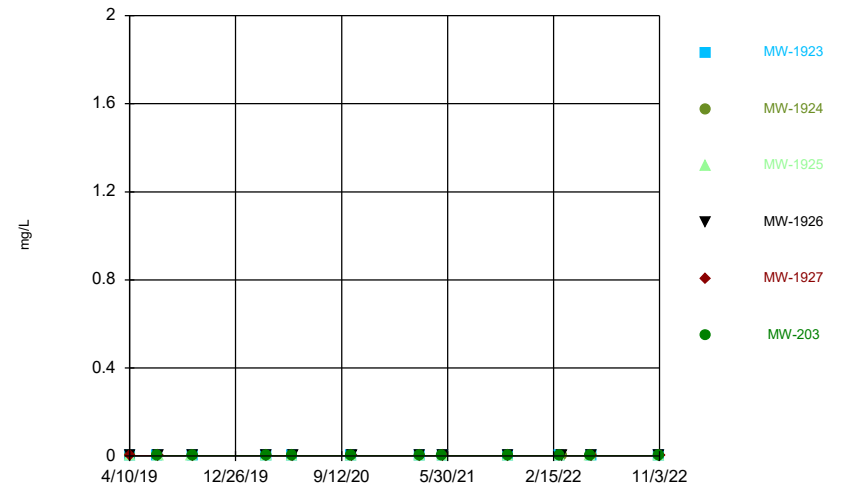
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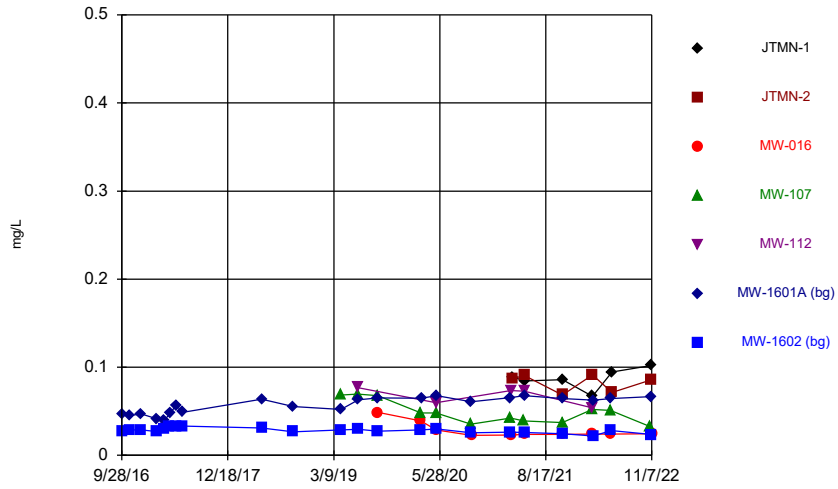
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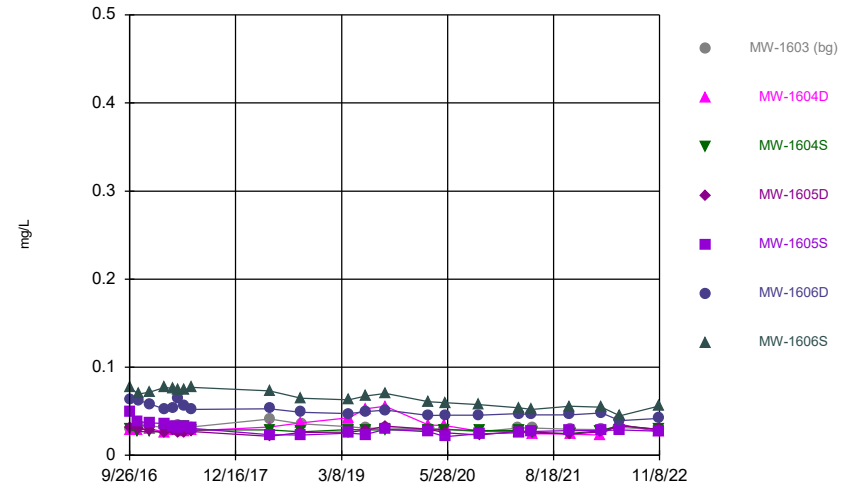
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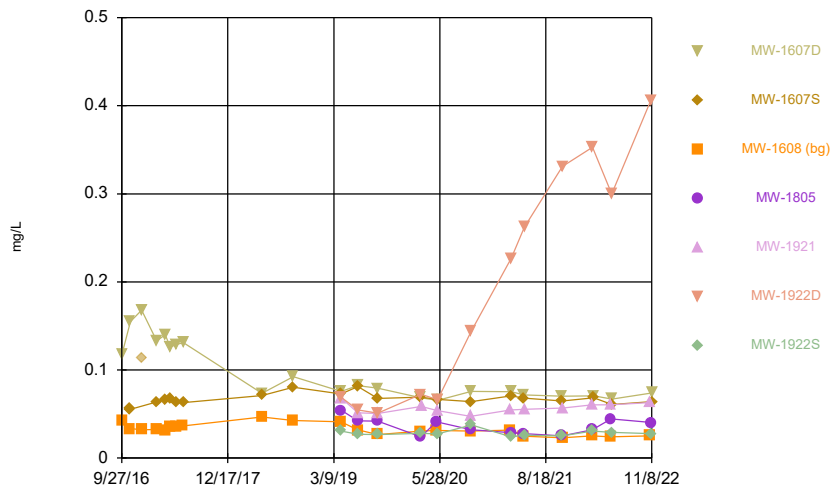
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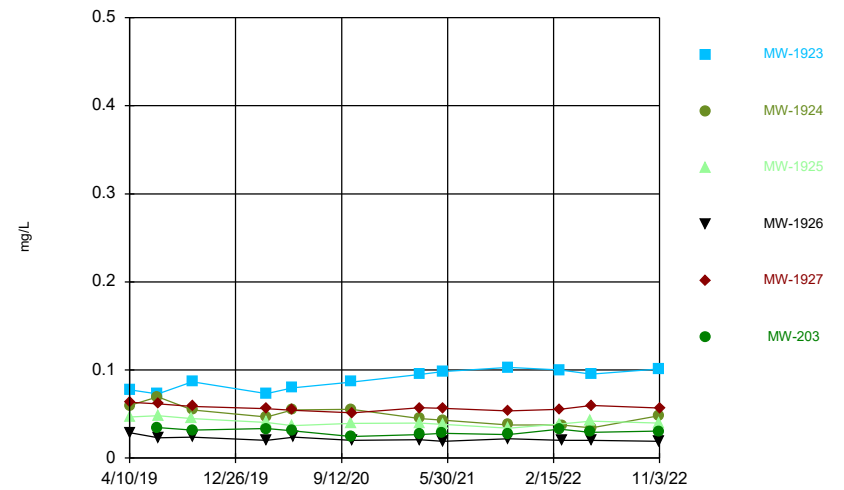
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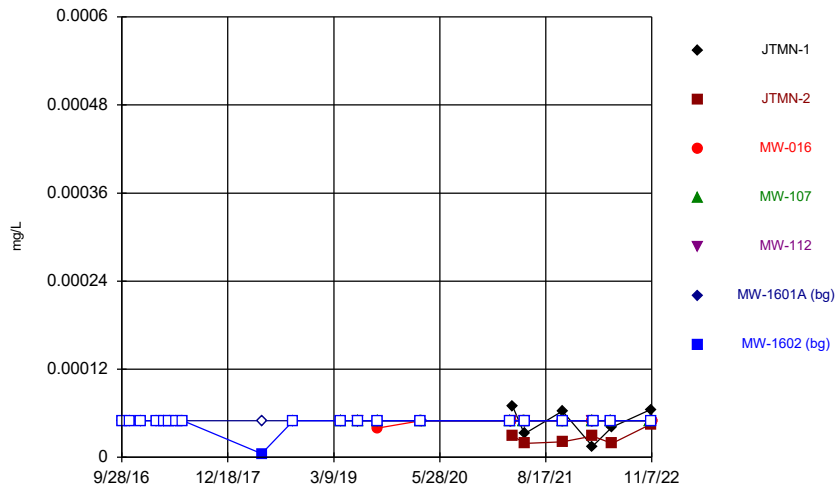
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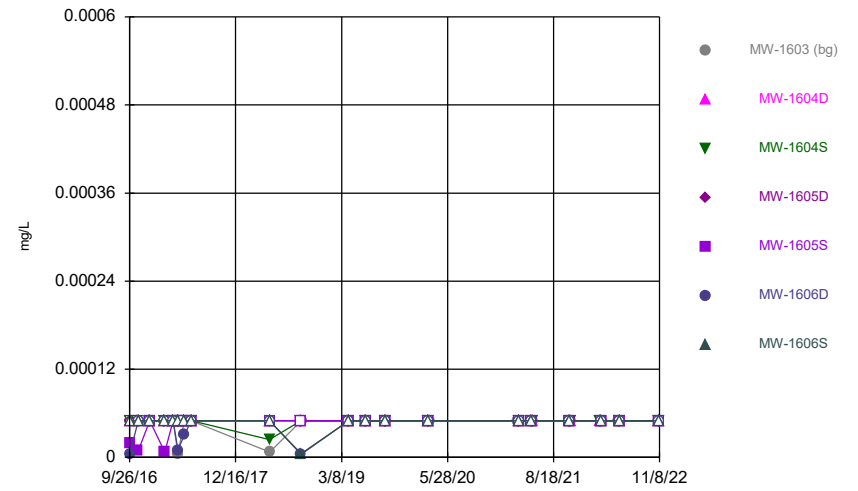
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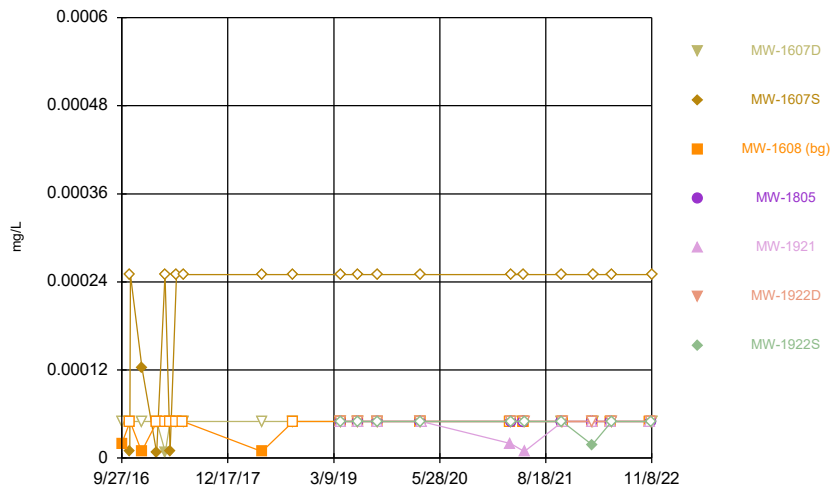
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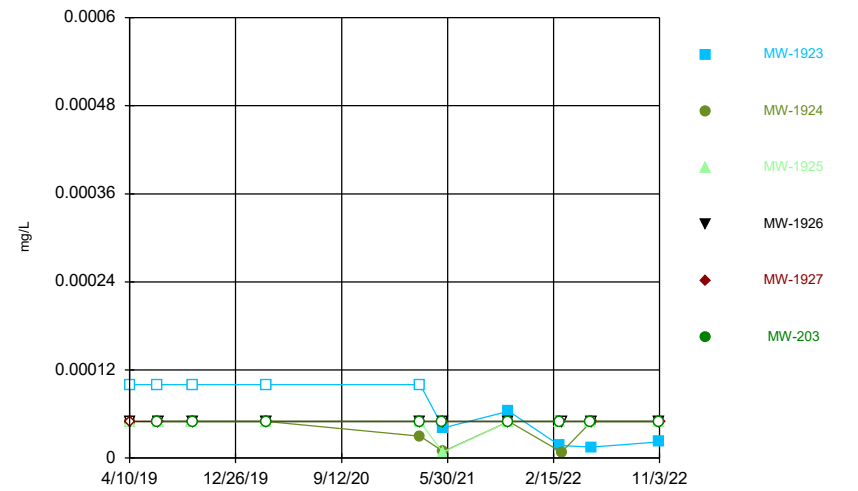
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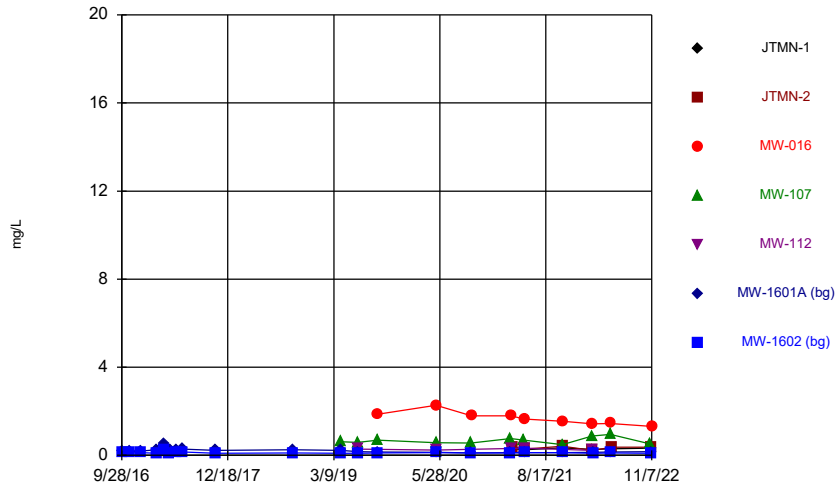
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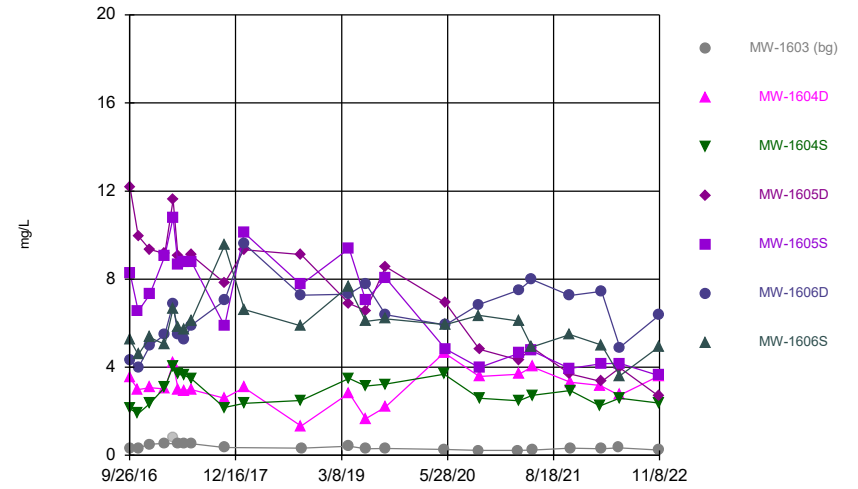
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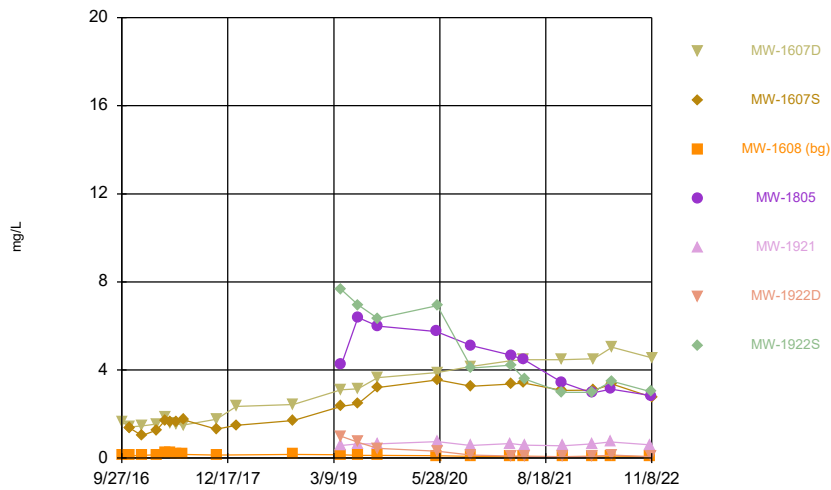
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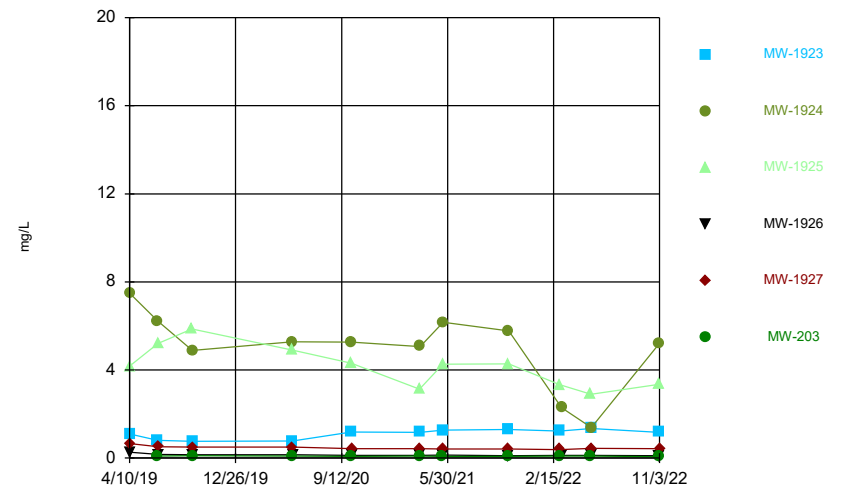
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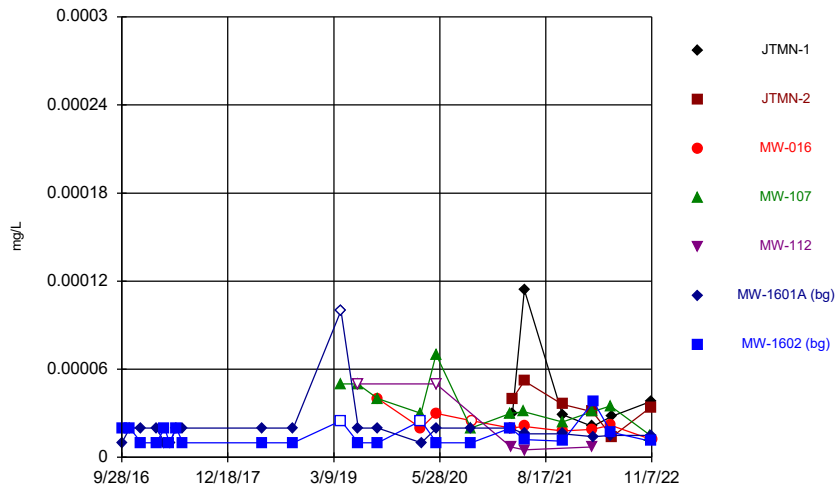
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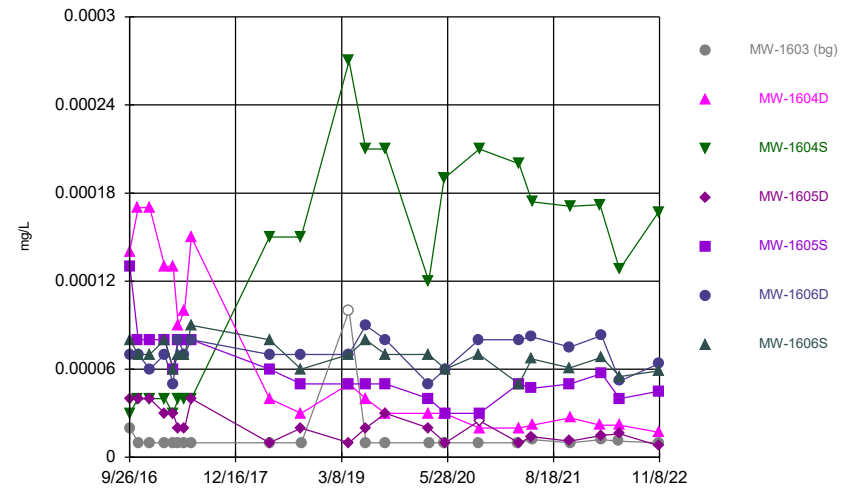
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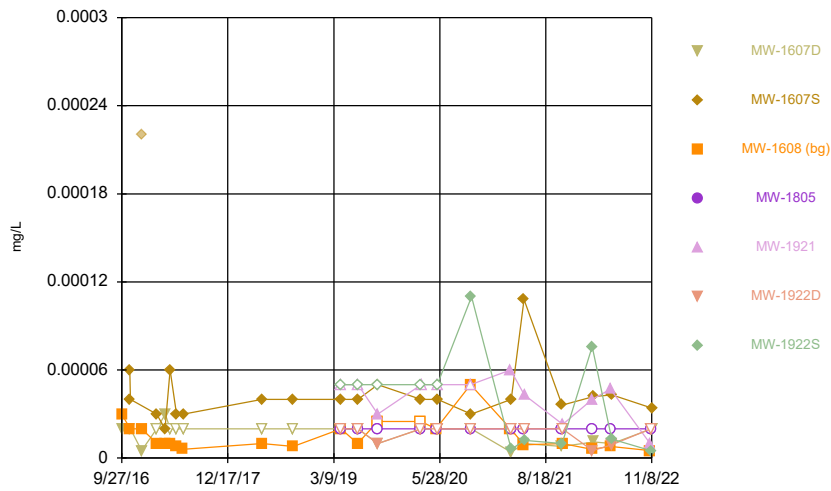
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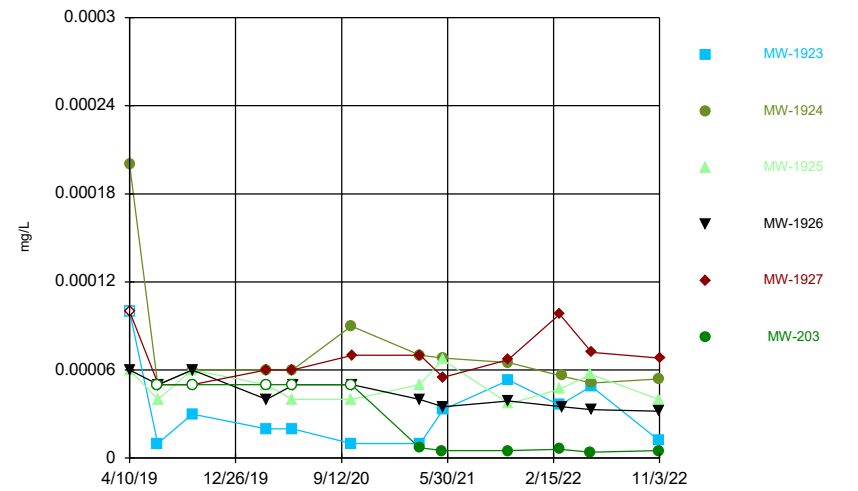
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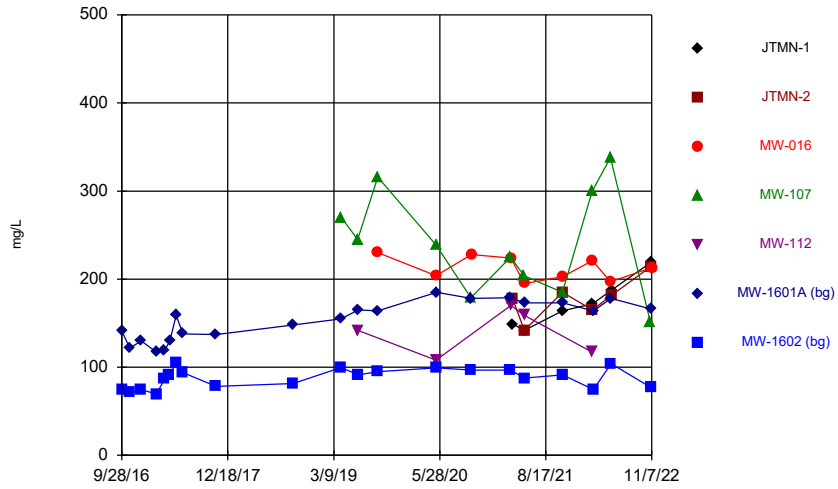
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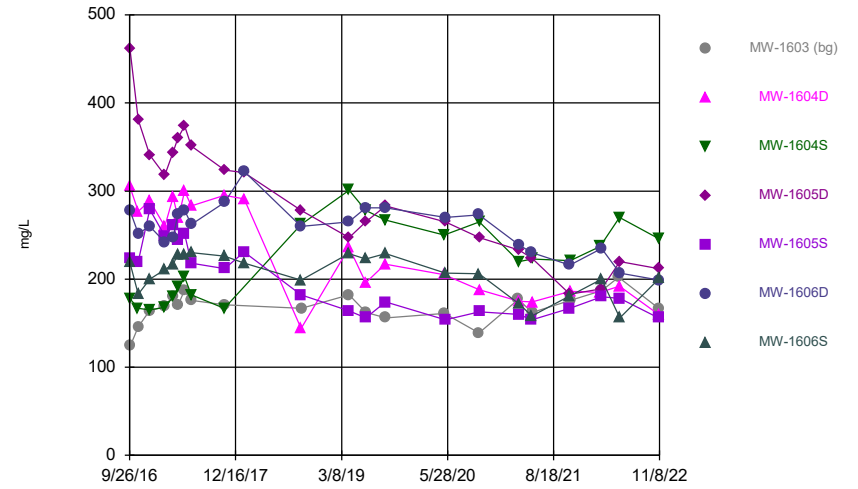
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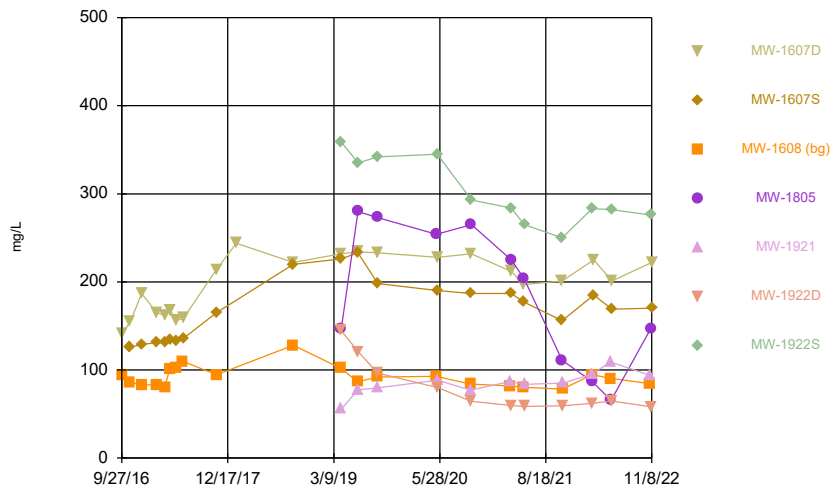
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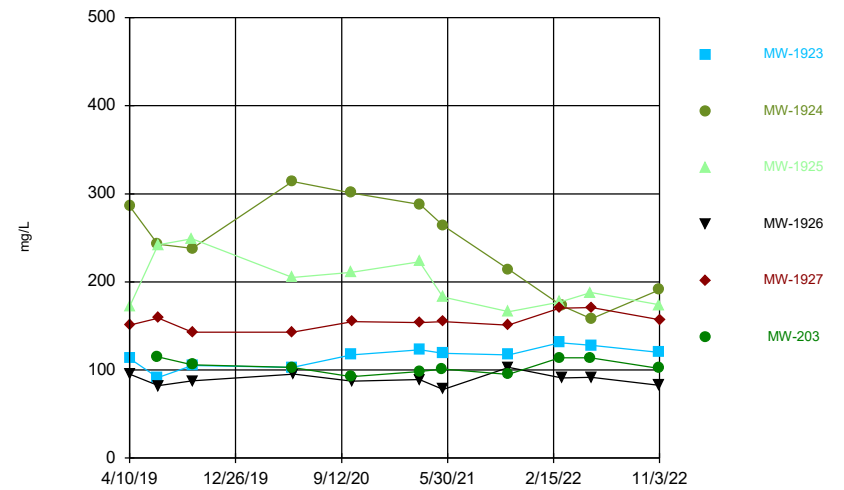
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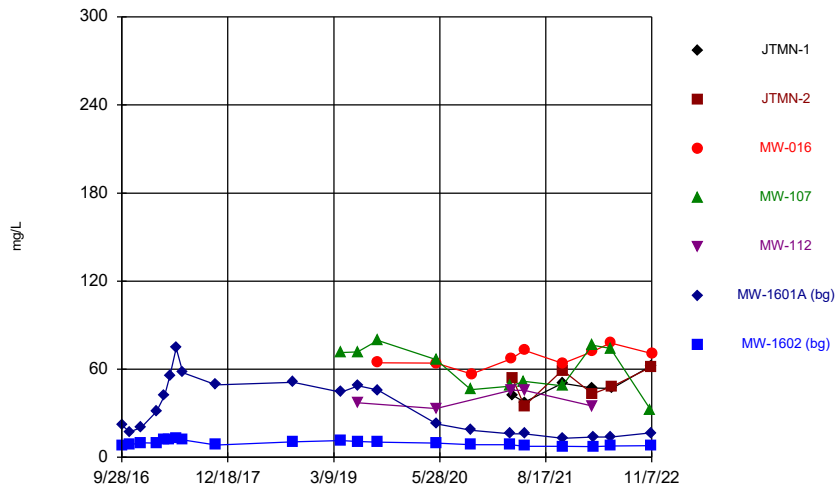
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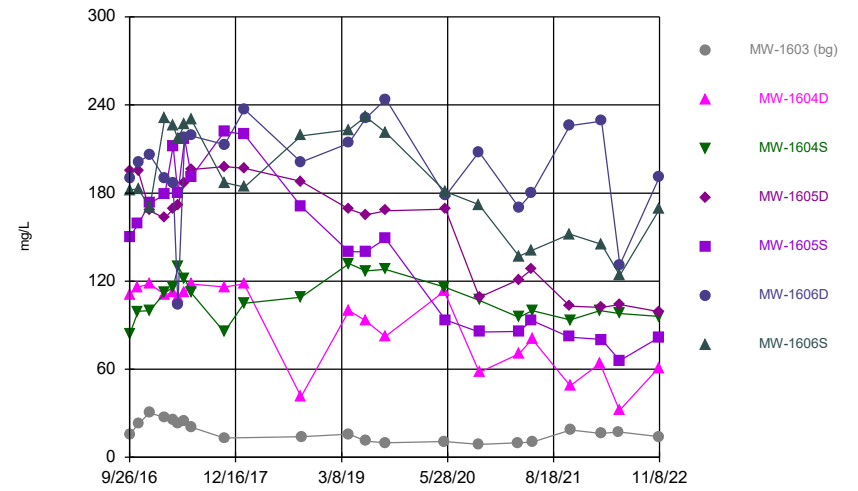
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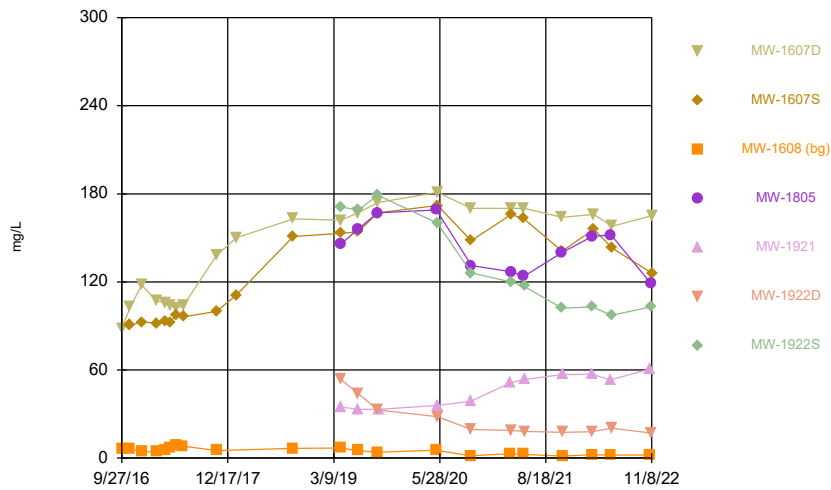
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



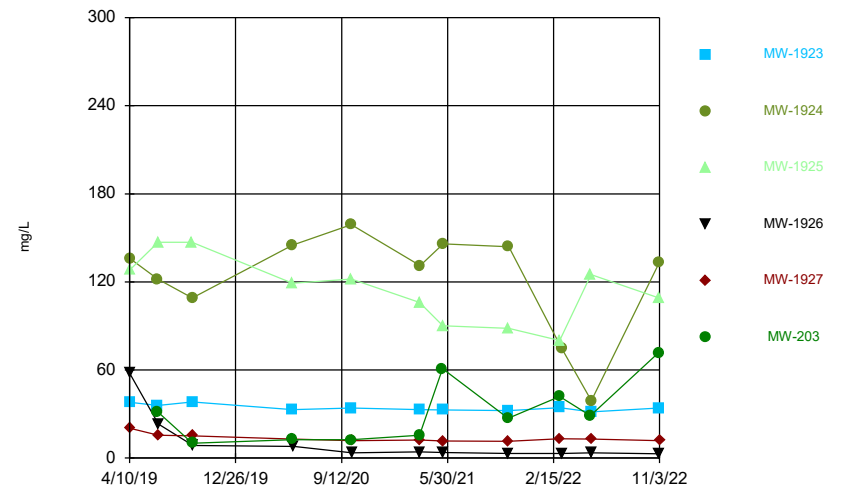
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Time Series



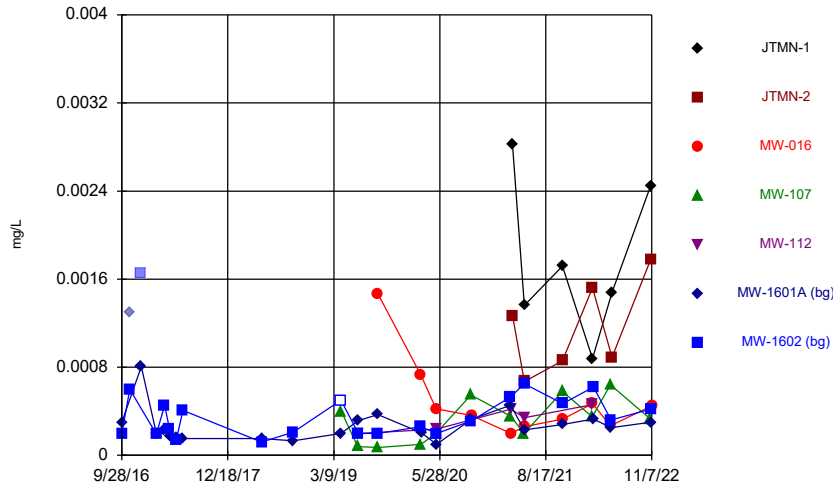
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Time Series



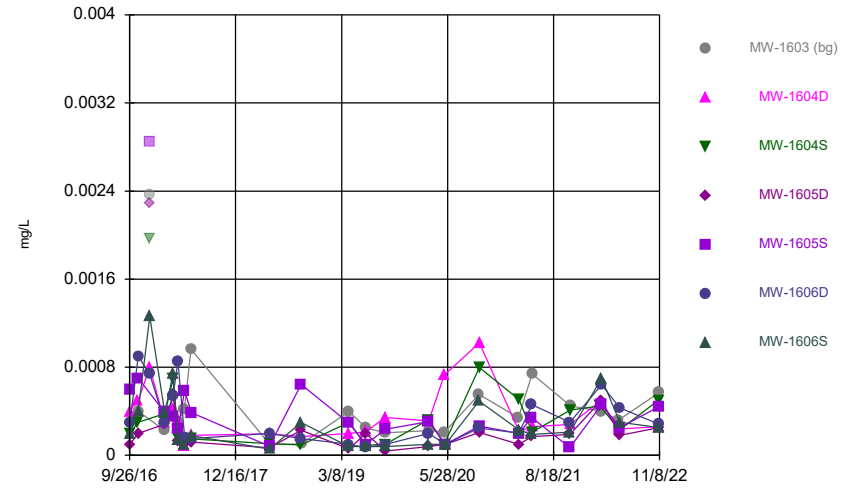
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Time Series



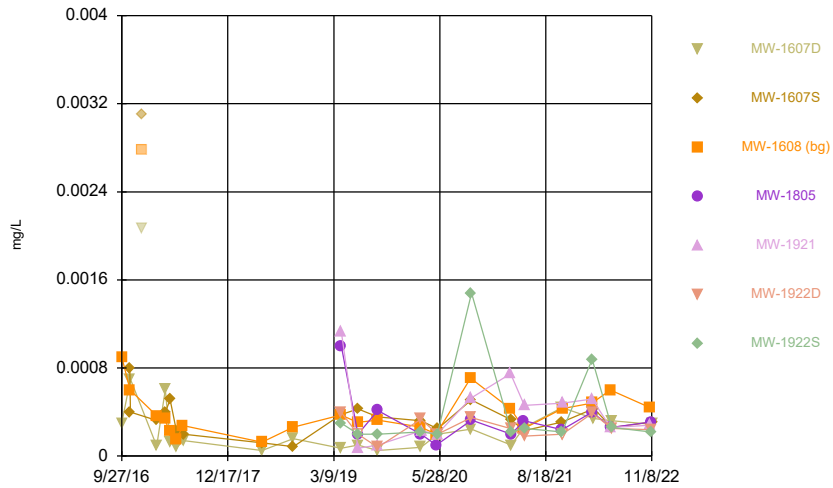
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Time Series



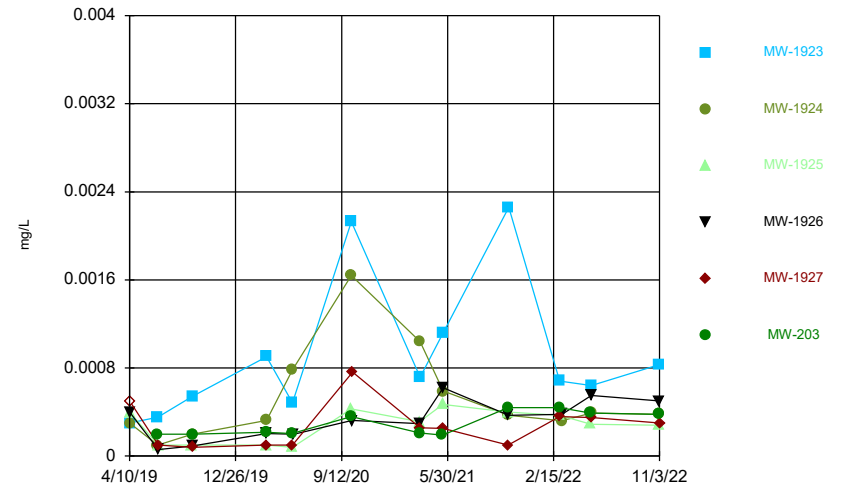
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Time Series



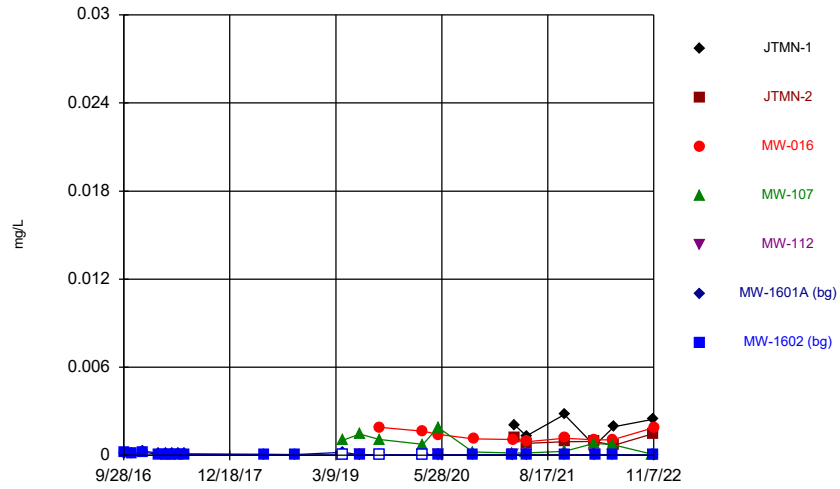
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Time Series



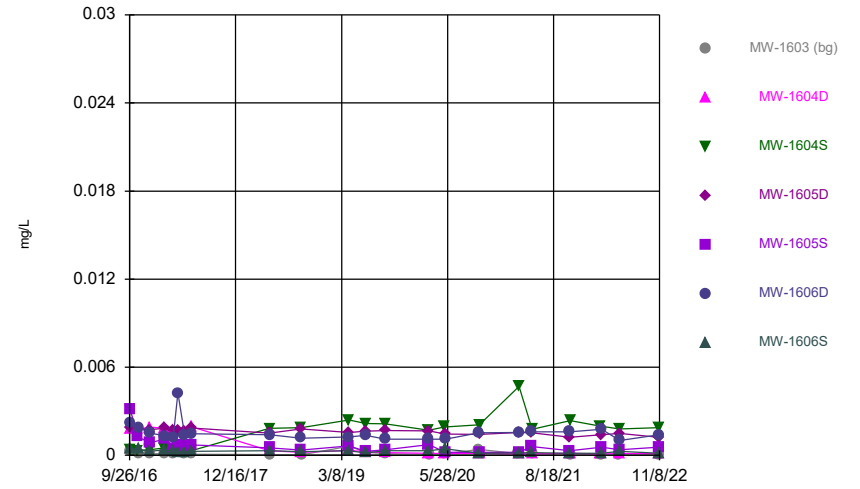
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Time Series



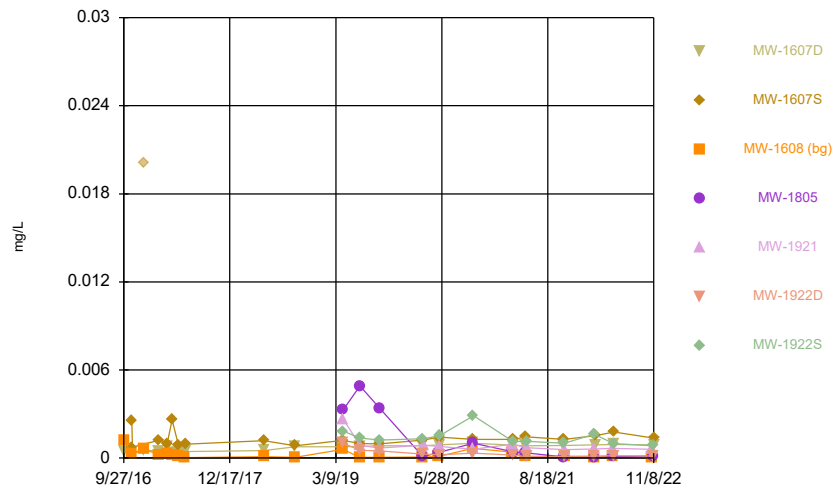
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Time Series



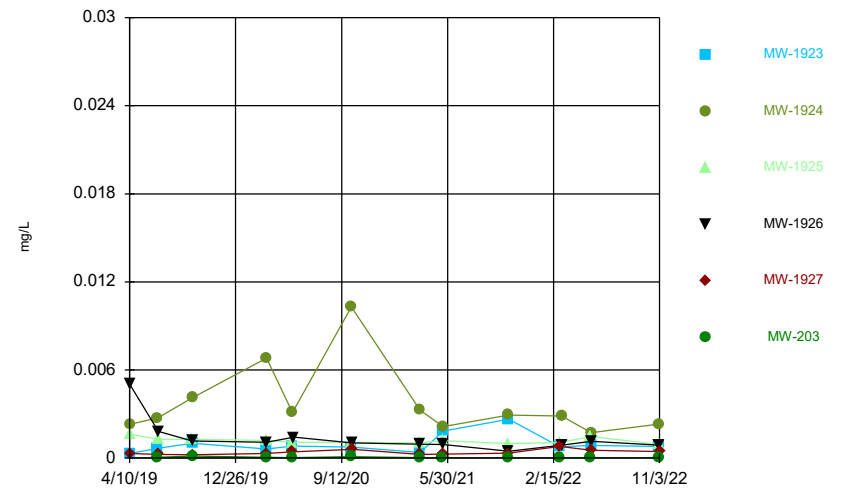
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Time Series



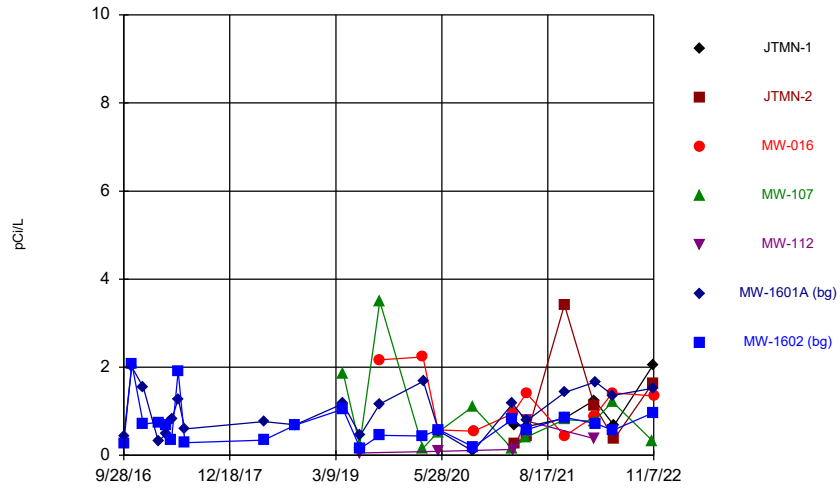
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



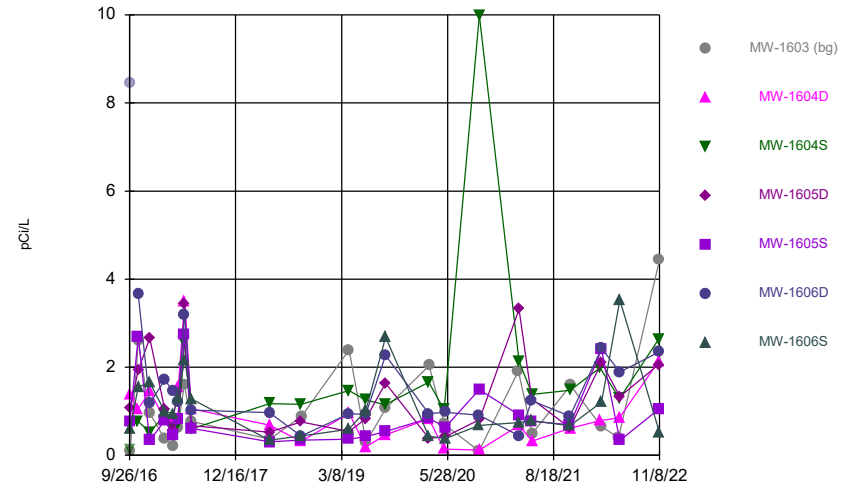
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Time Series



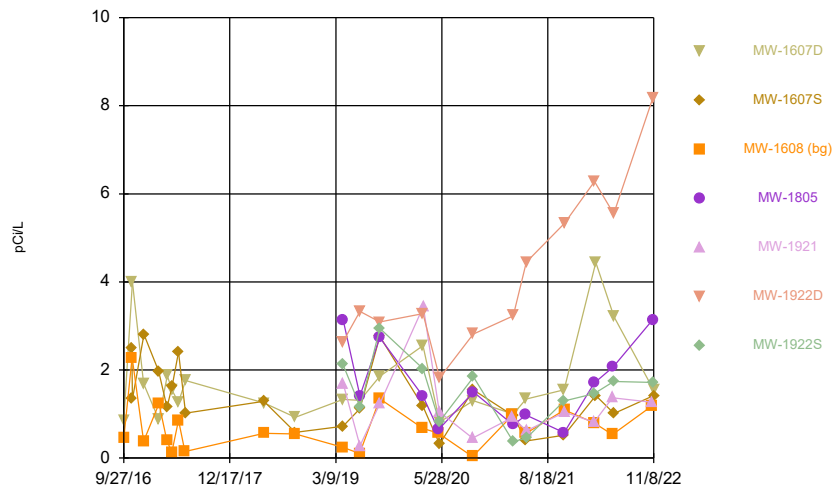
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Time Series



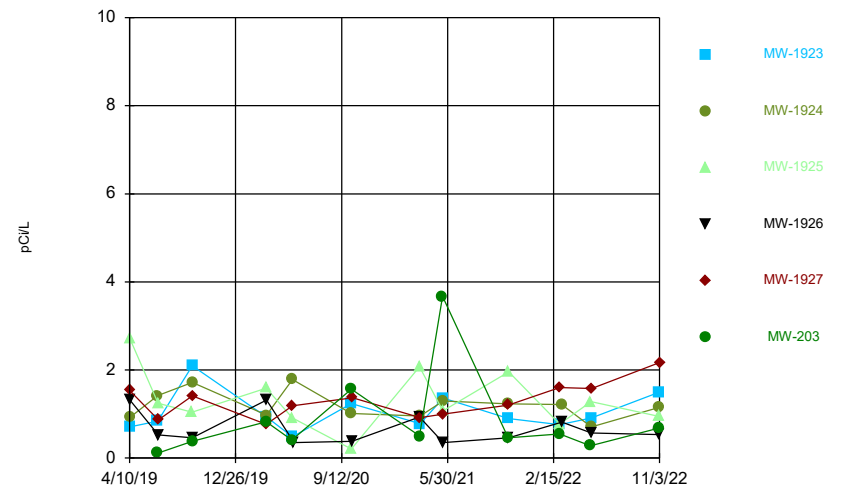
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Time Series



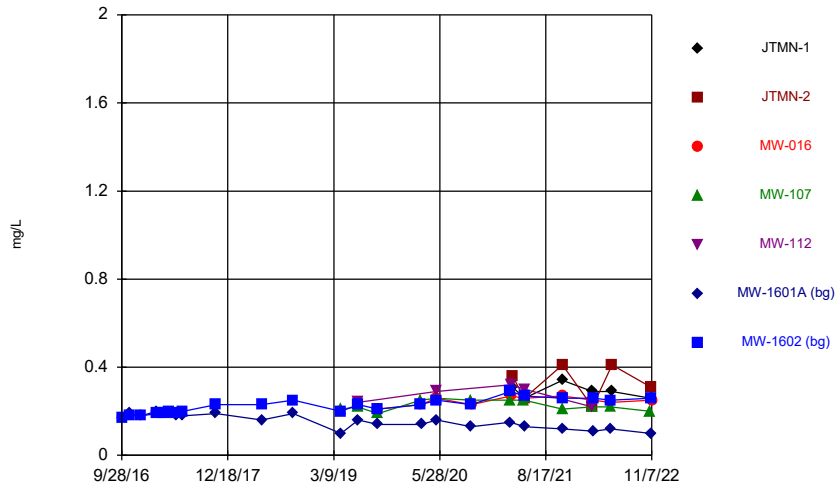
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Time Series



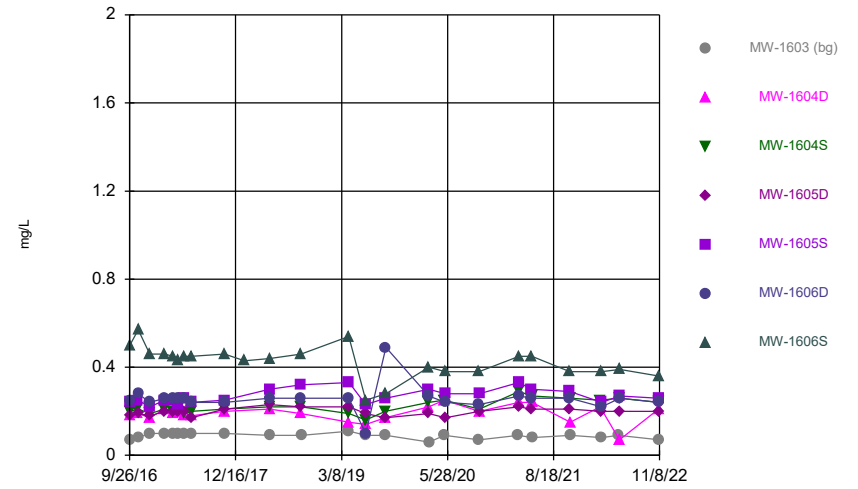
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Time Series



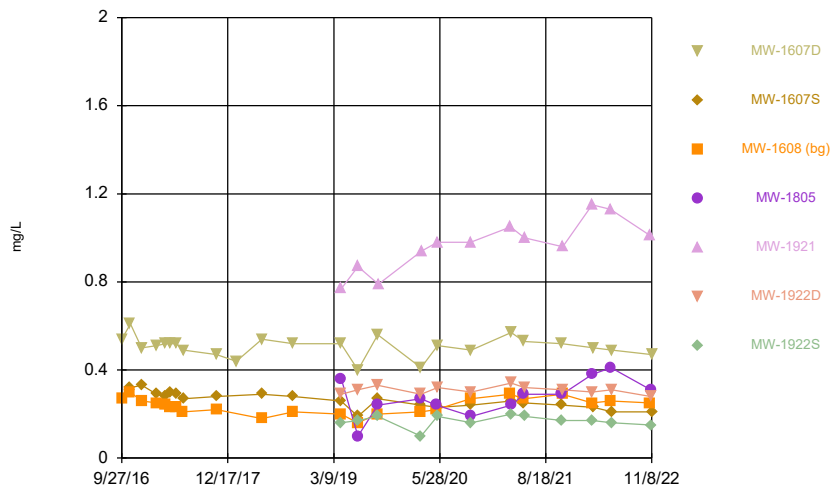
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Time Series



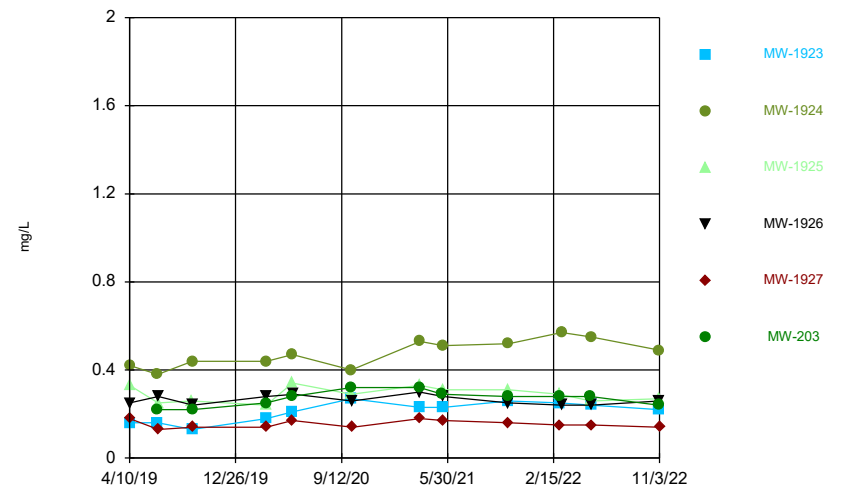
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Time Series



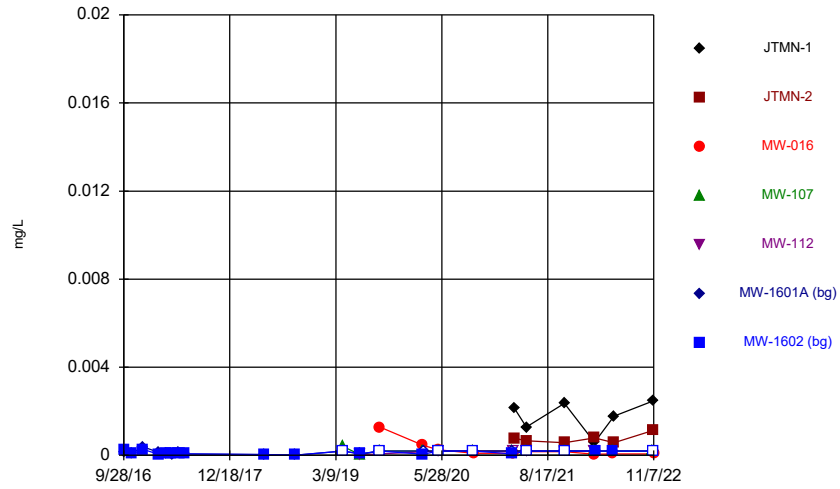
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Time Series



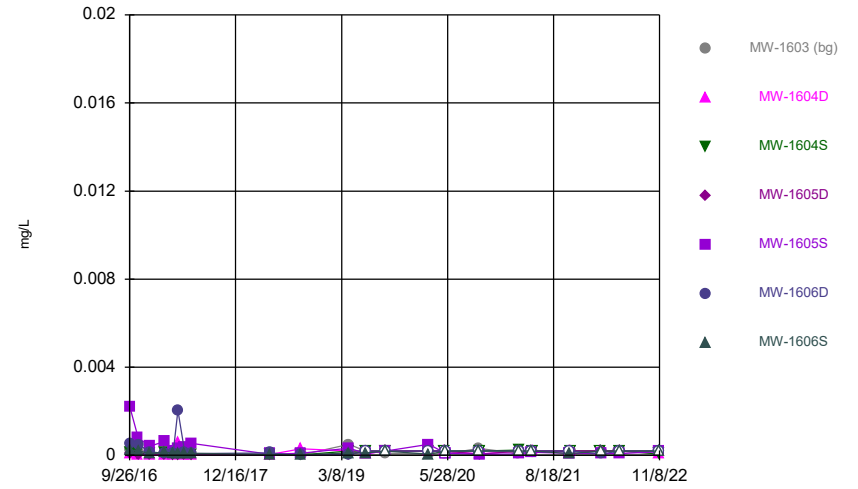
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Time Series



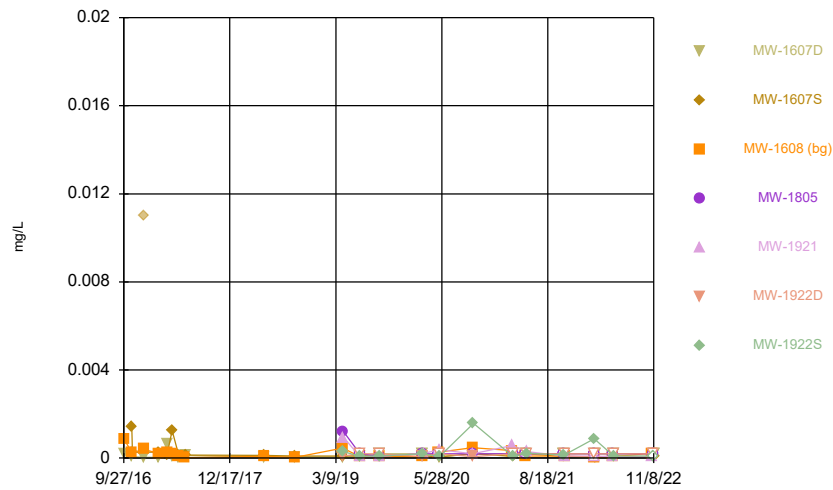
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Time Series



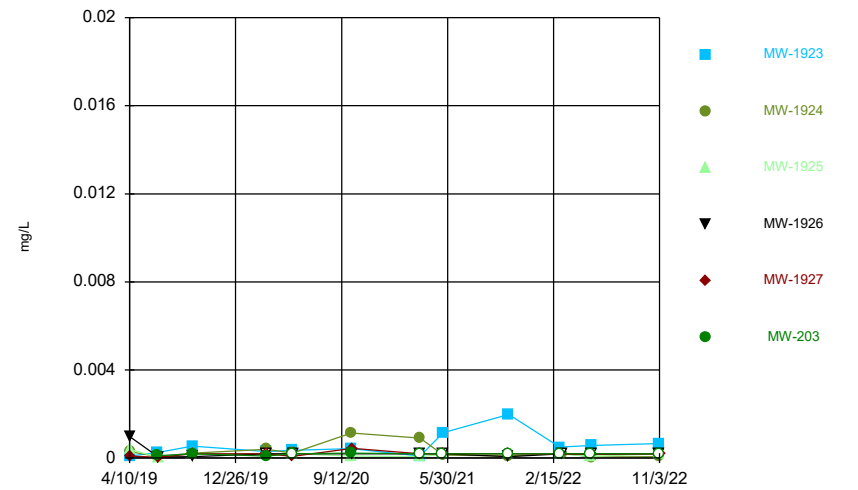
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Time Series



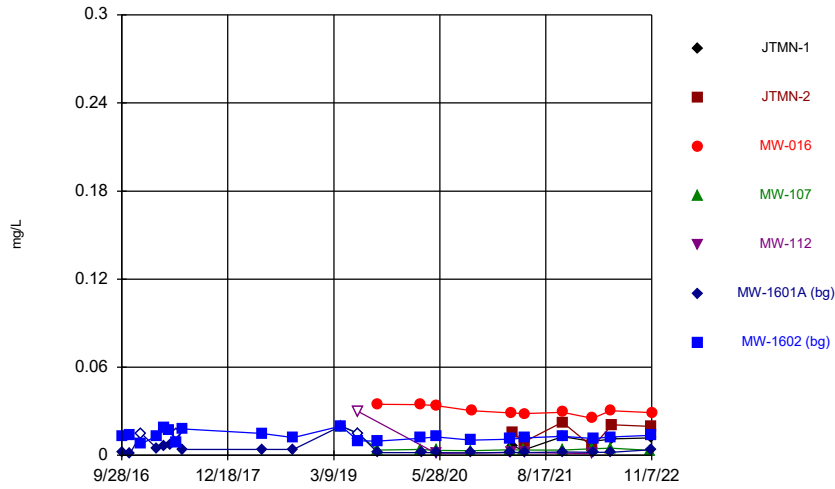
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Time Series



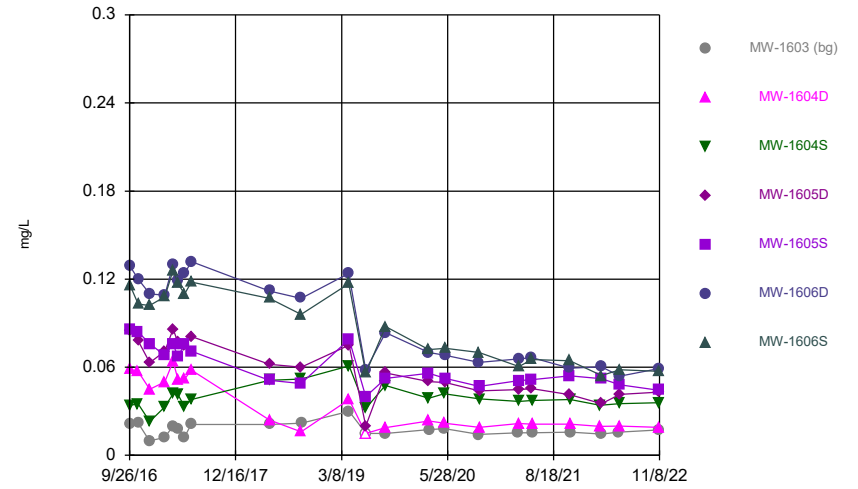
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Time Series



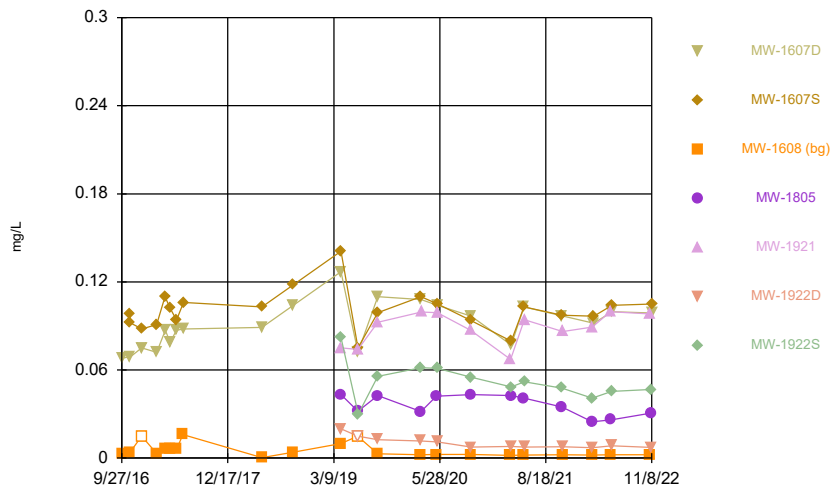
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Time Series



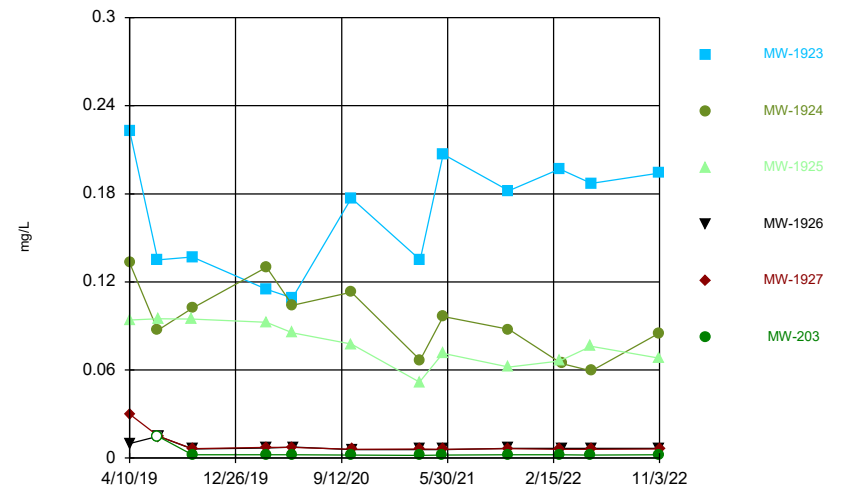
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Time Series



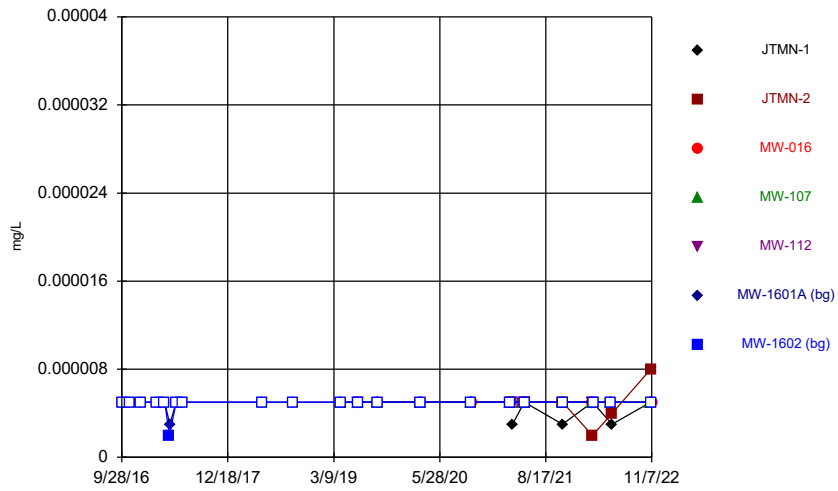
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Time Series



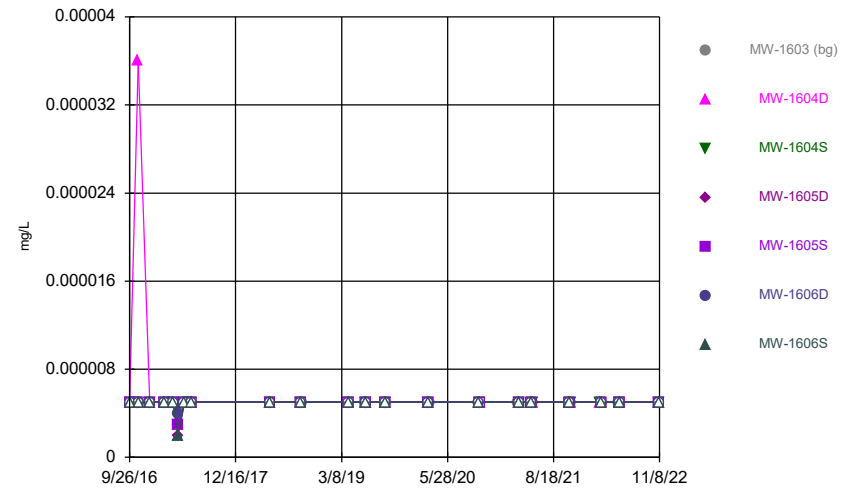
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Time Series



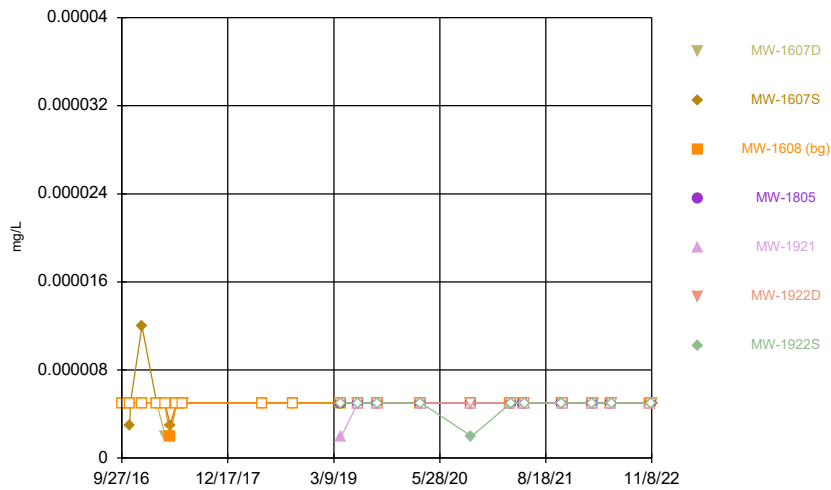
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Time Series



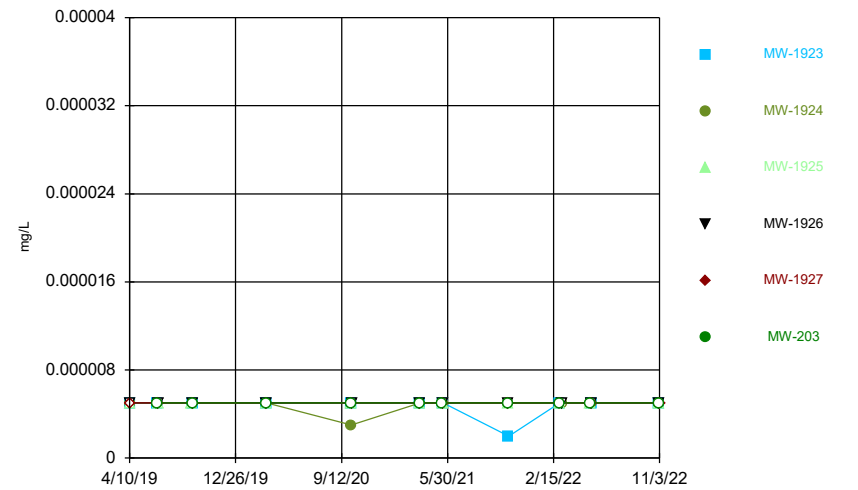
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Time Series



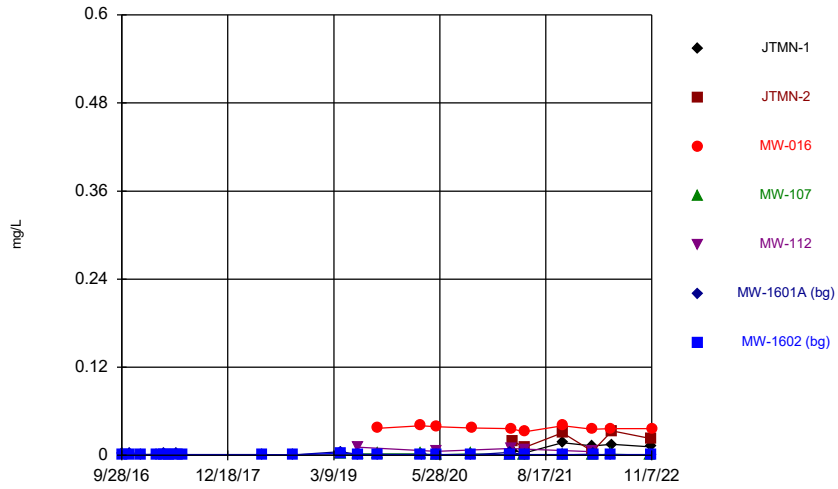
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Time Series



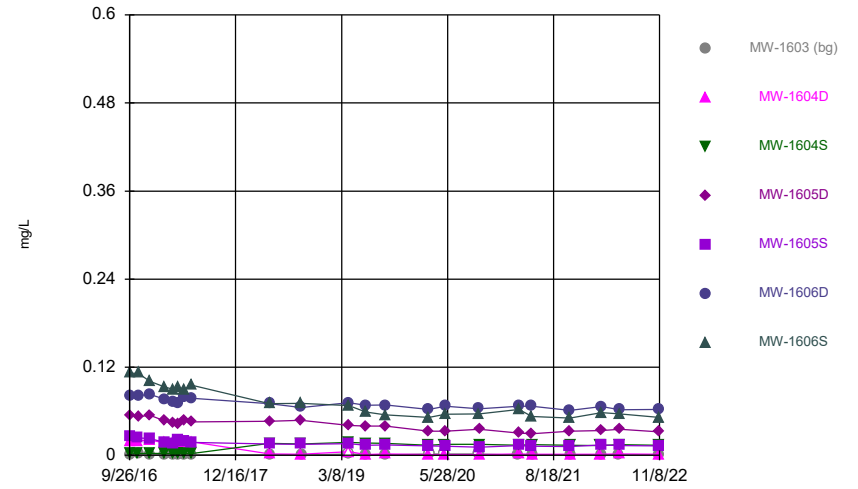
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Time Series



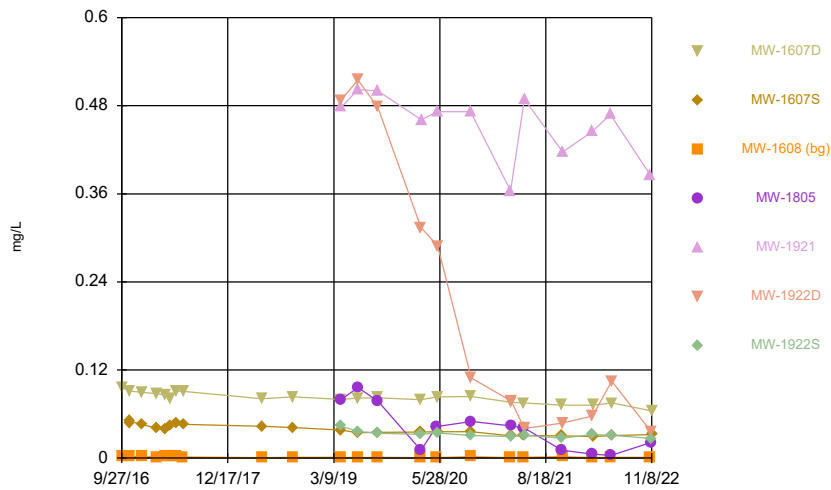
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Time Series



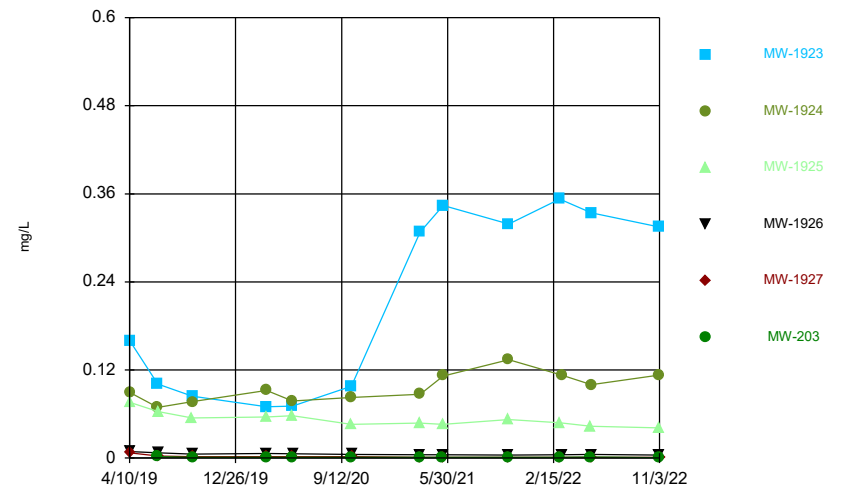
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Time Series



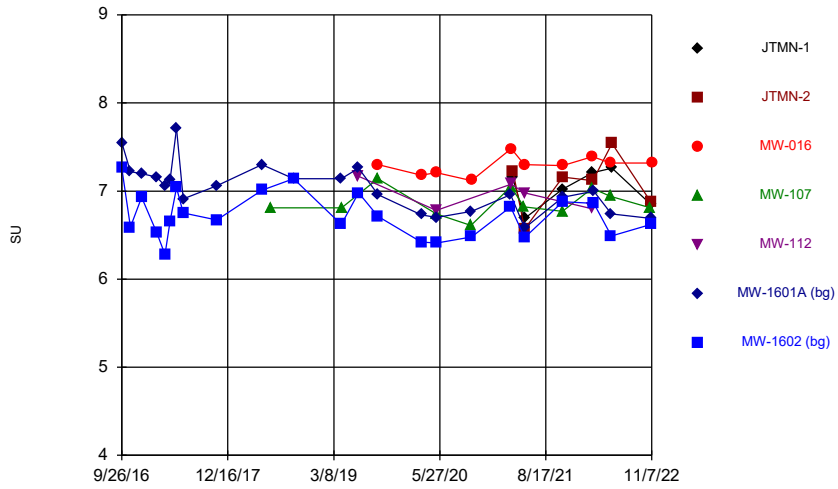
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Time Series



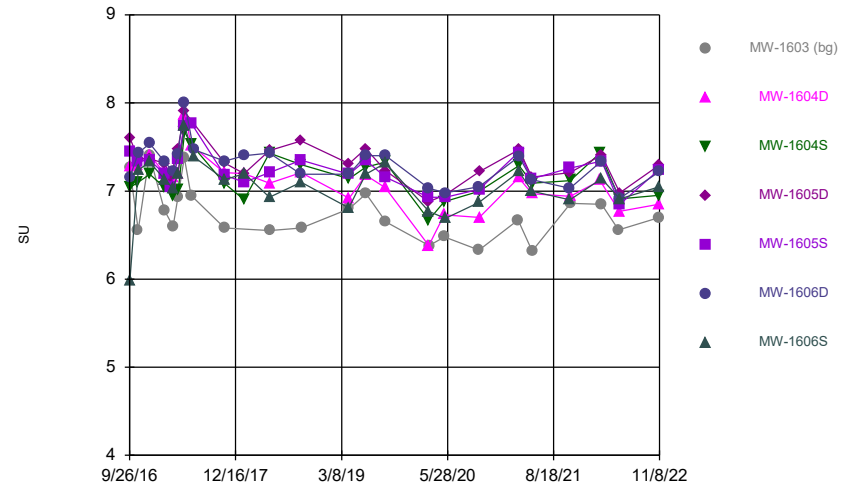
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Time Series



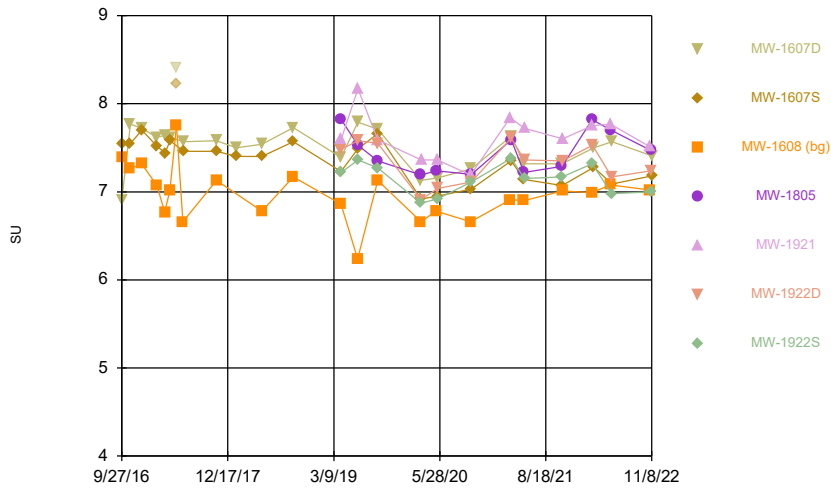
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Time Series



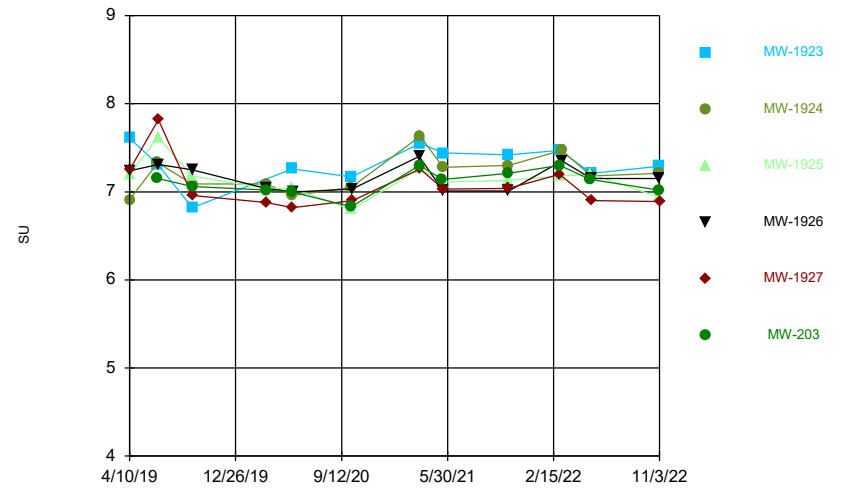
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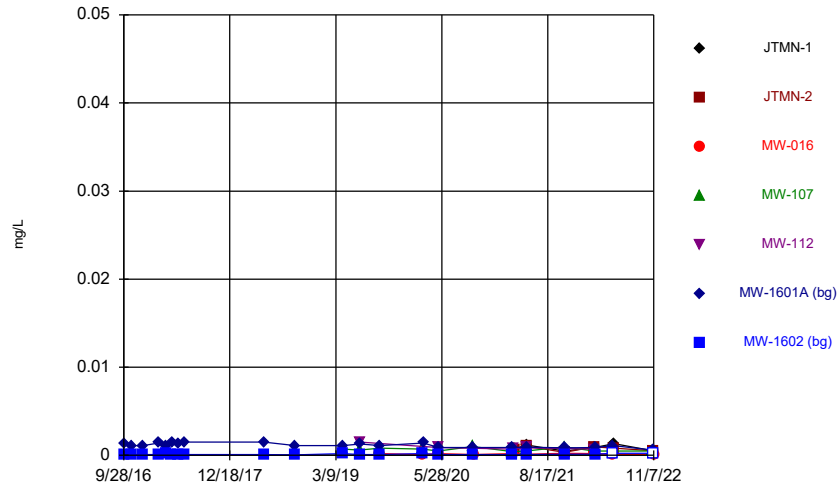
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Time Series



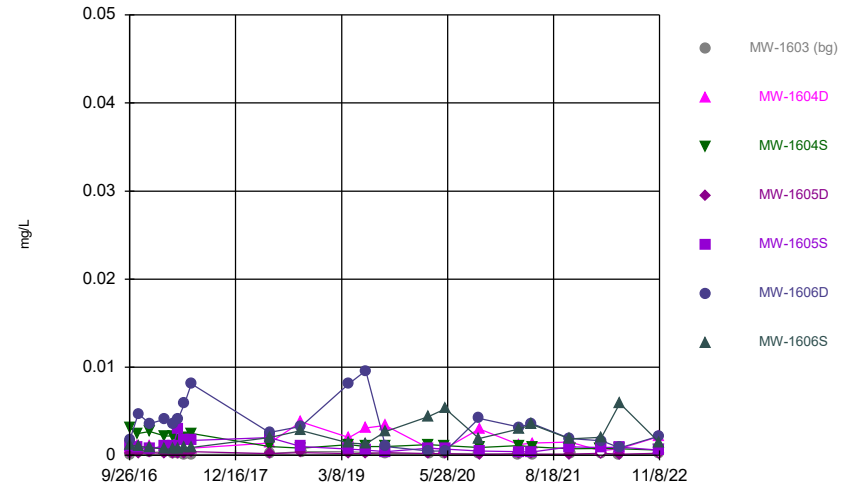
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Time Series



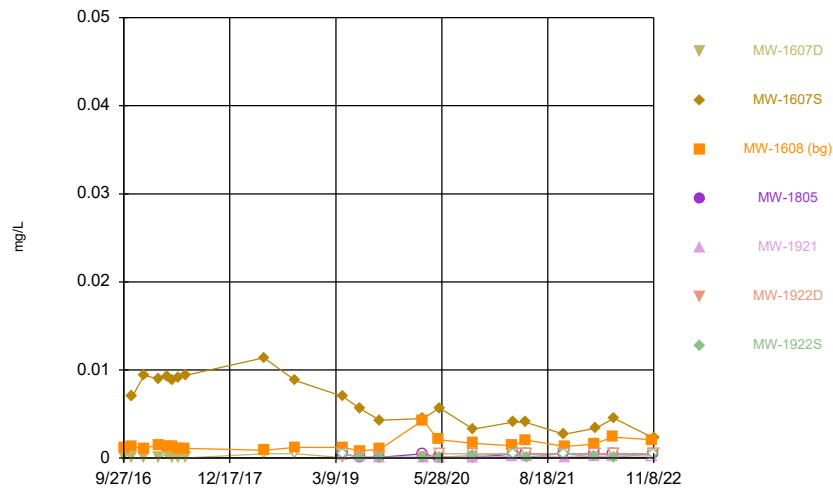
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Time Series



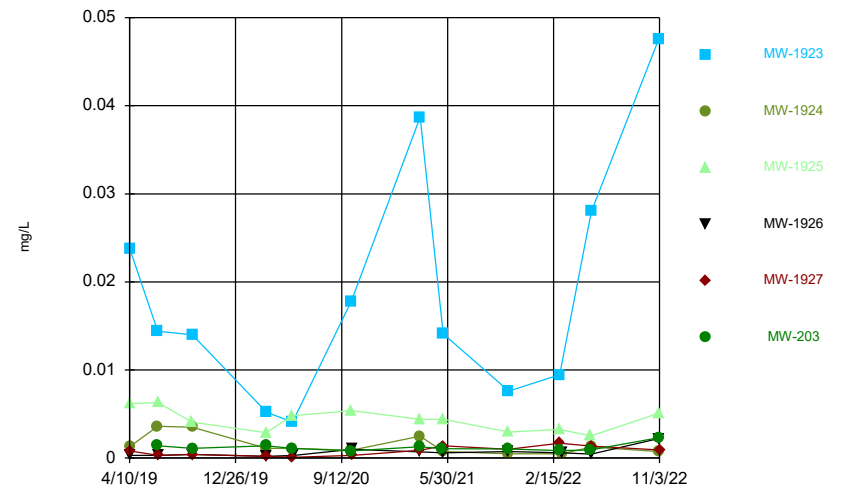
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Time Series



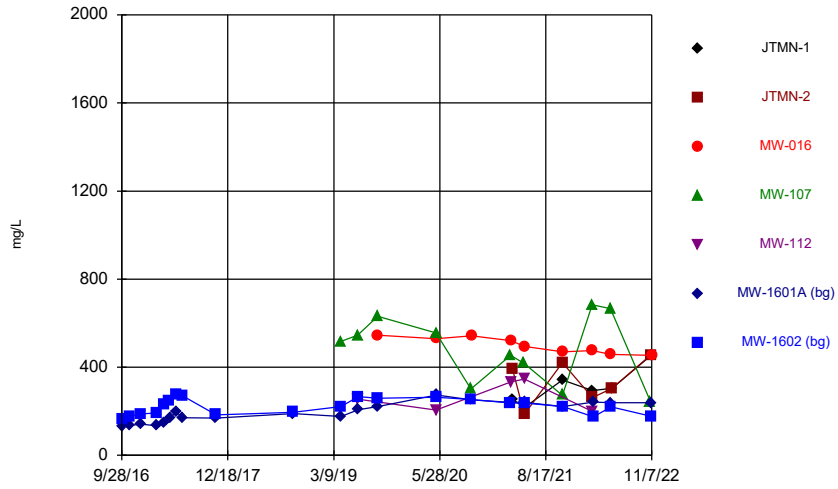
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Time Series



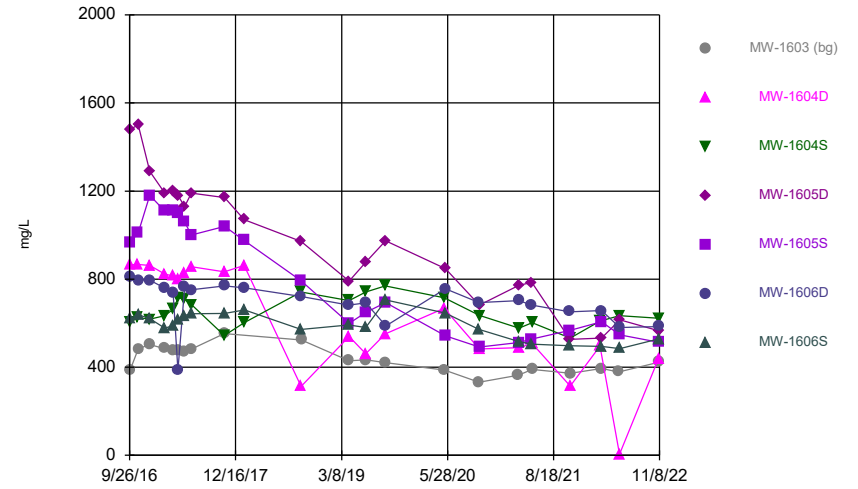
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Time Series



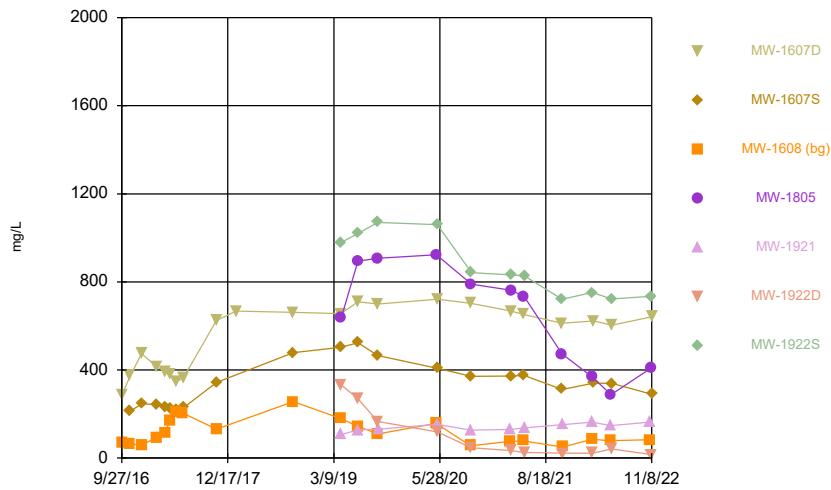
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Time Series



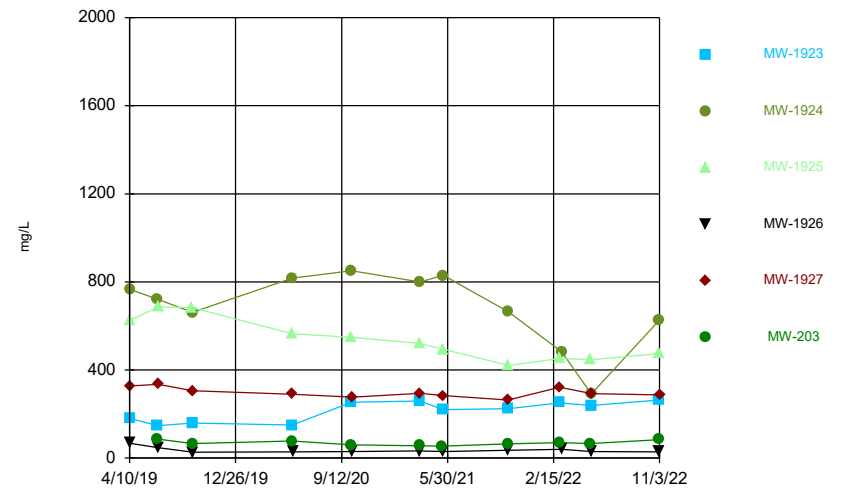
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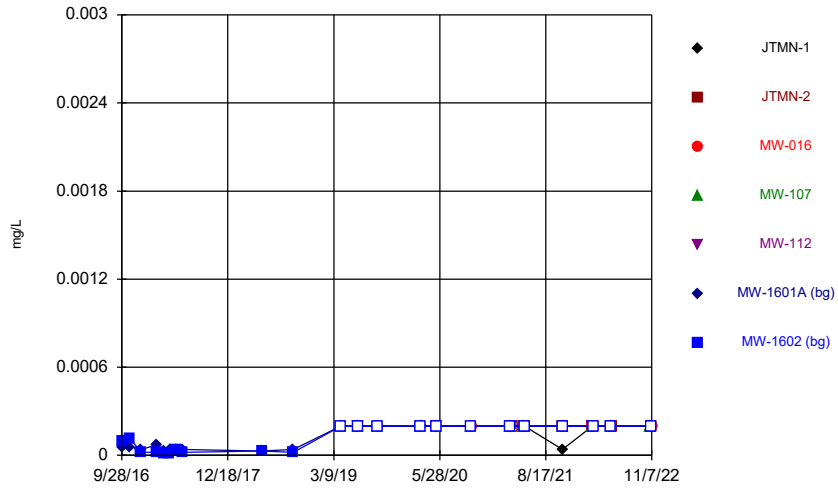
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Time Series



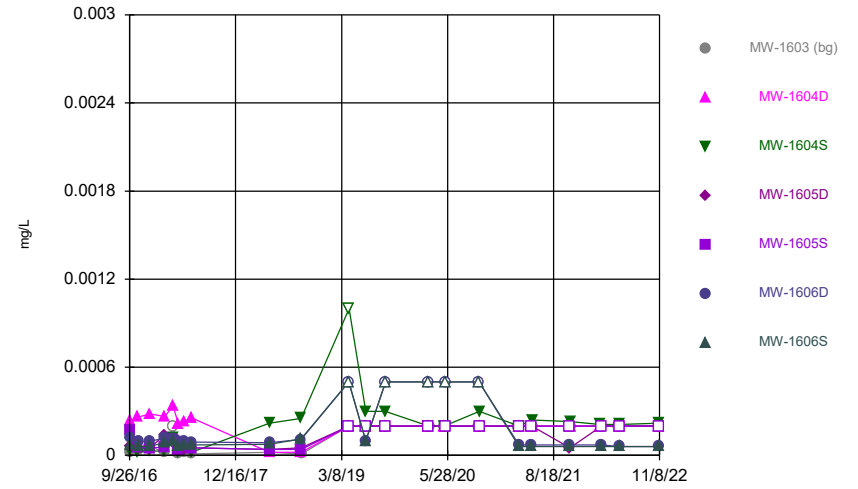
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Time Series



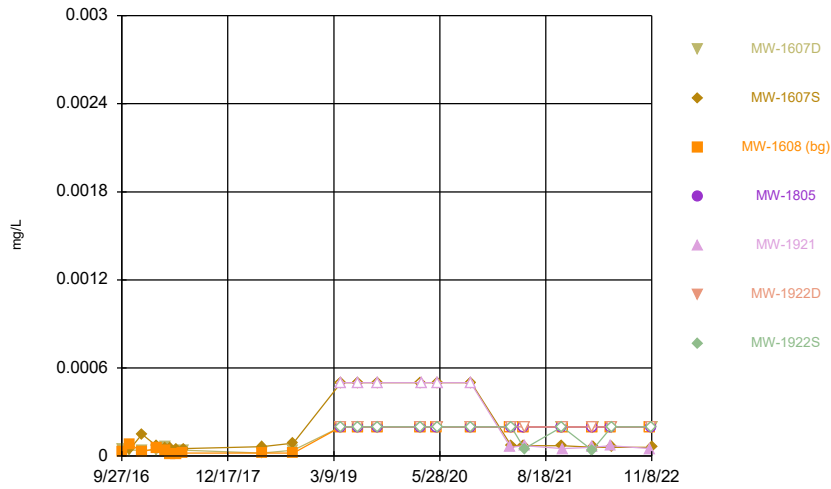
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Time Series



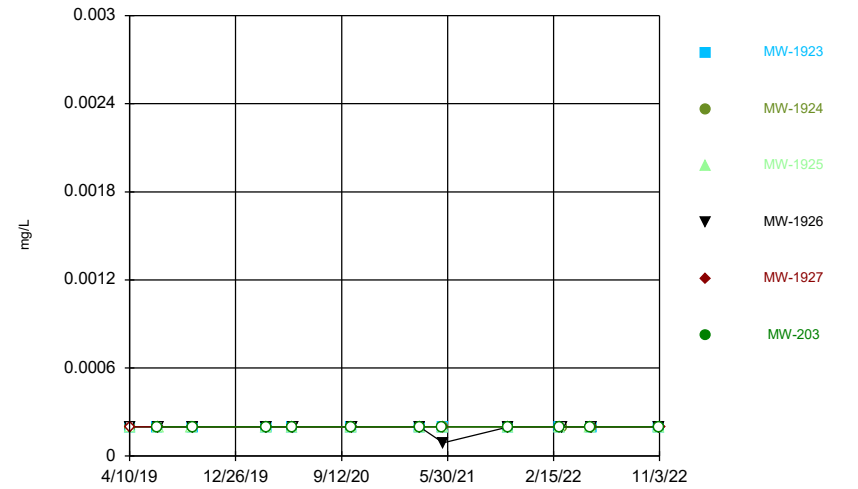
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Time Series



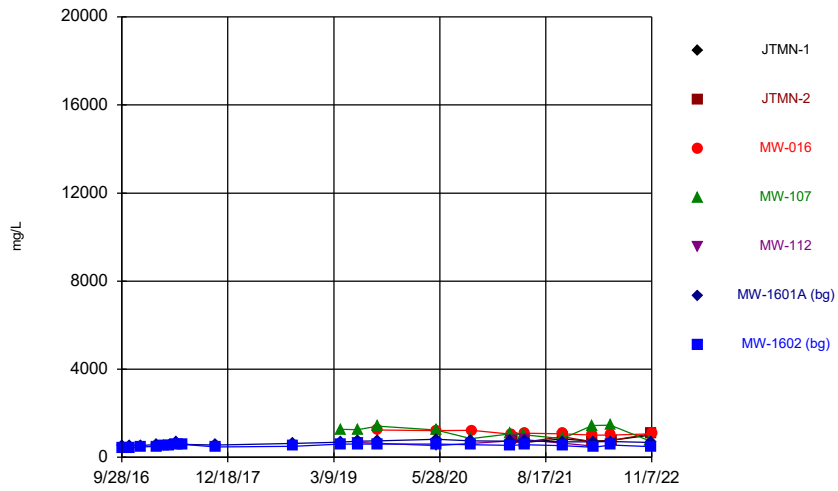
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Time Series



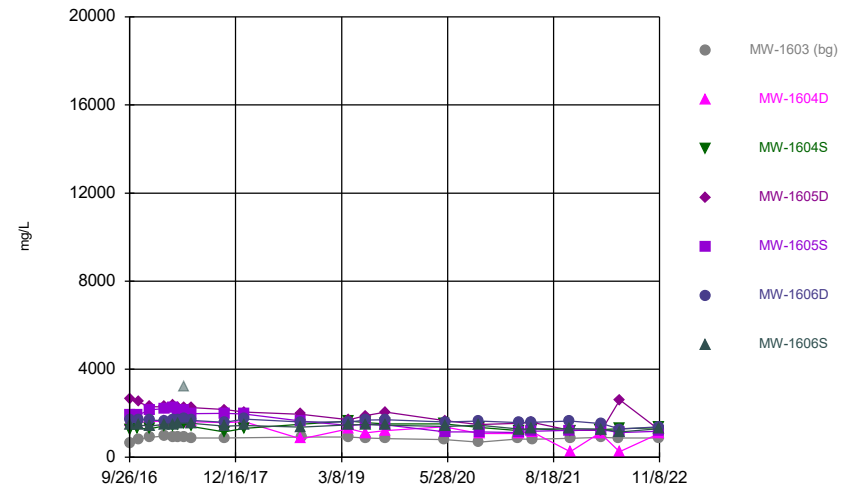
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Time Series



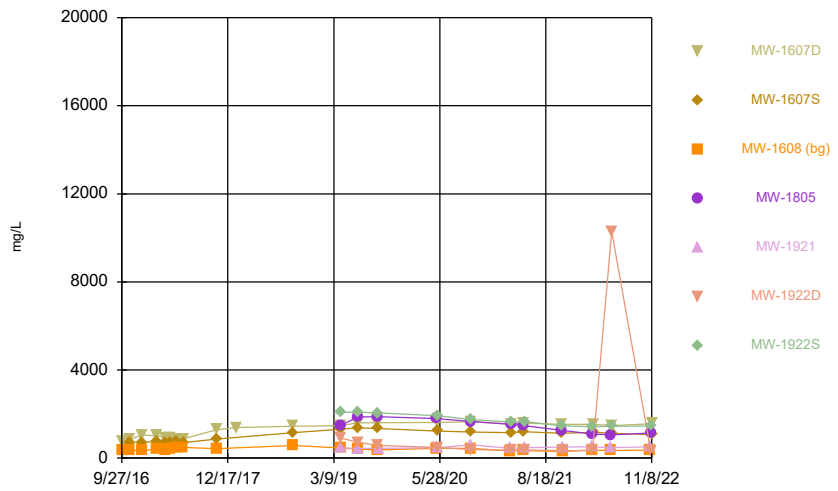
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



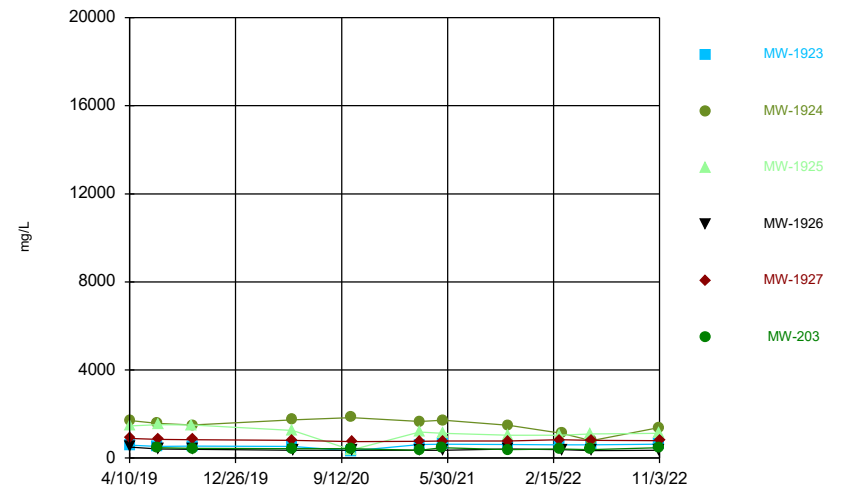
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:23 PM View: Time Series & Box Plot
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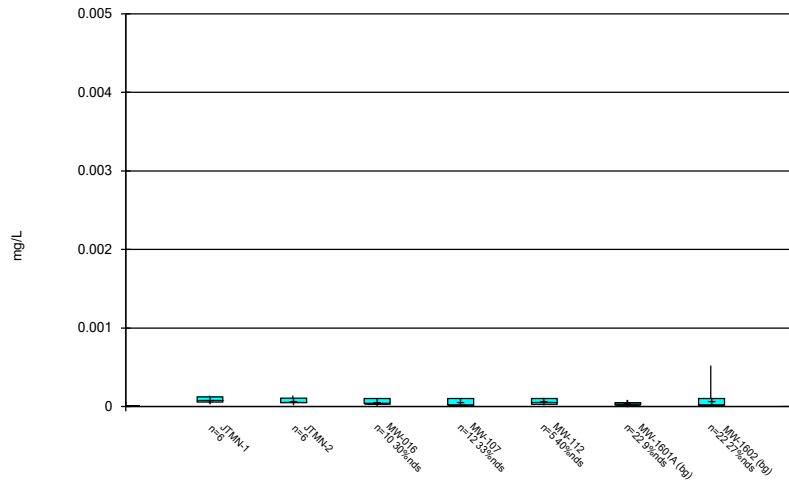
Time Series



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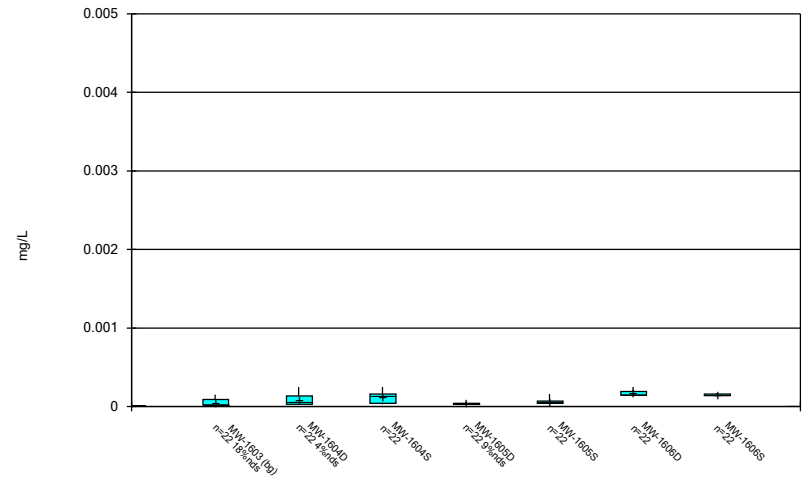
FIGURE B
Box Plots

Box & Whiskers Plot



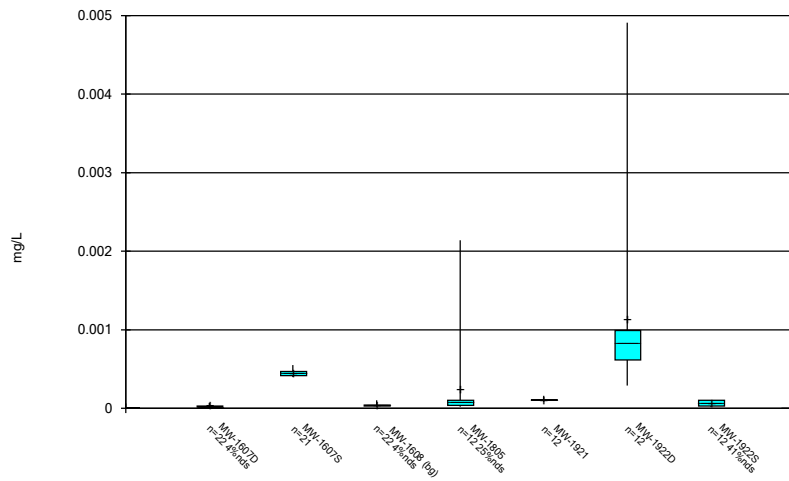
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Box & Whiskers Plot



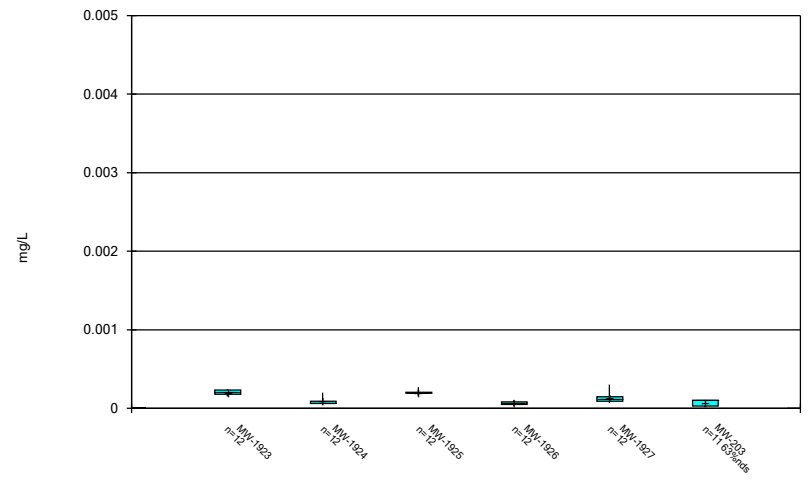
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



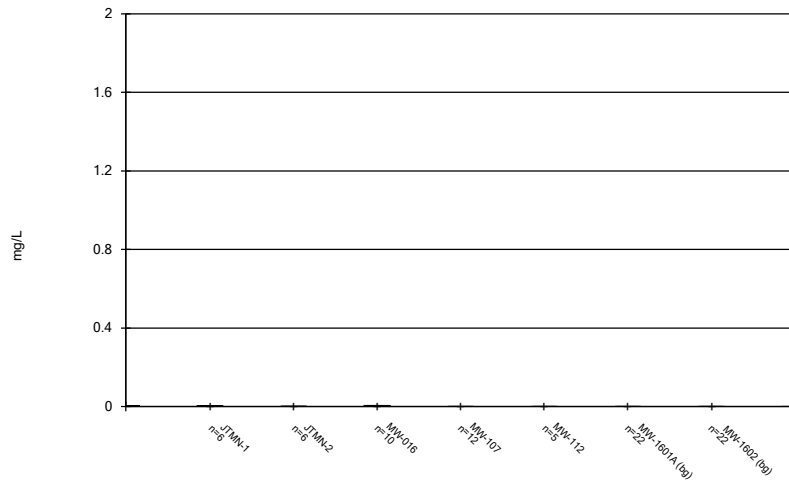
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



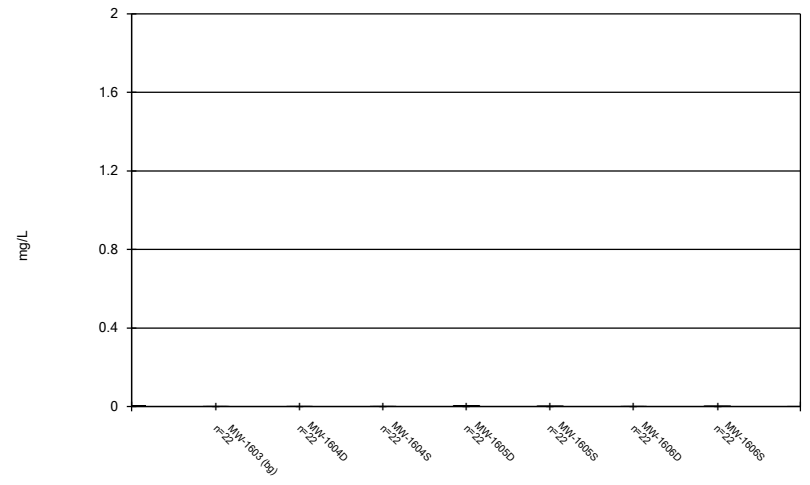
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



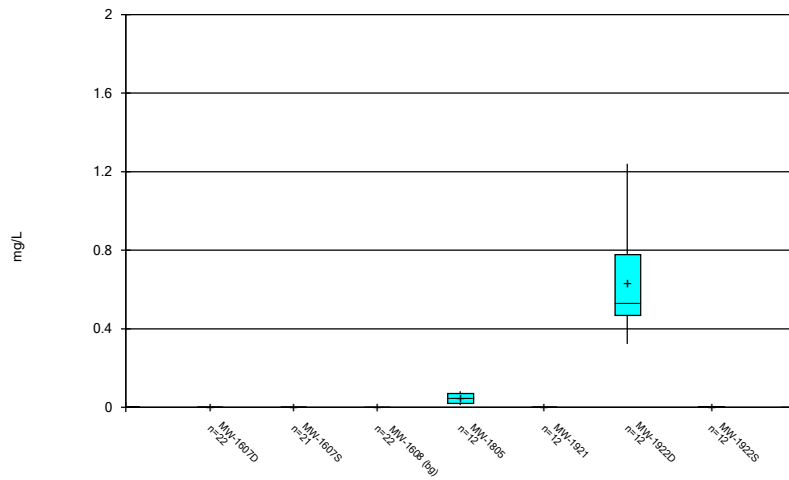
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



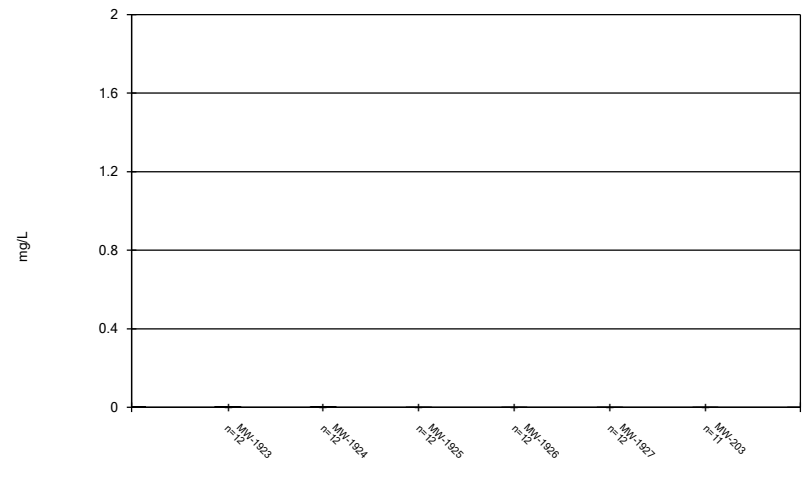
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



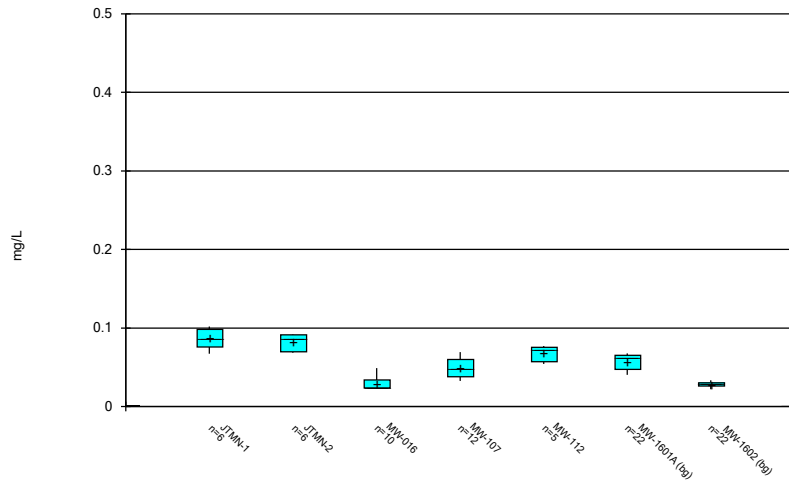
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



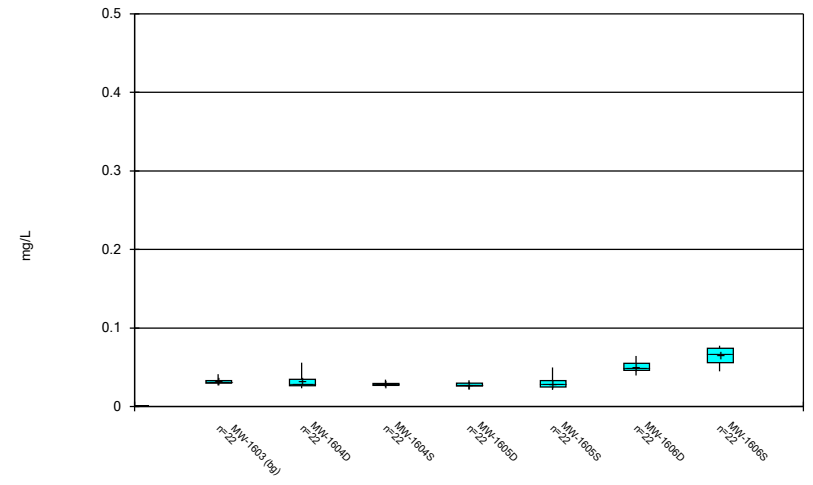
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



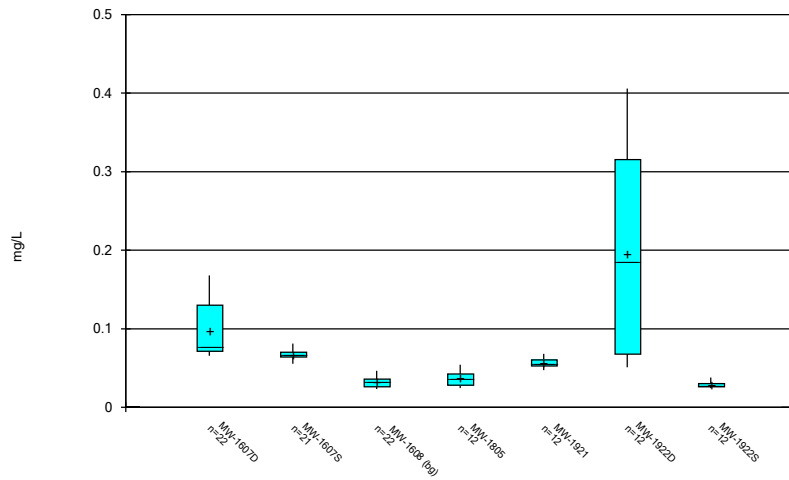
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Box & Whiskers Plot



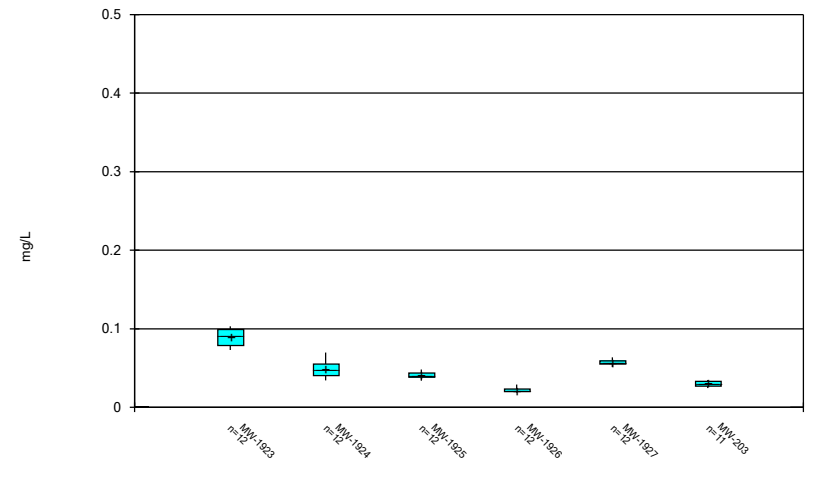
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



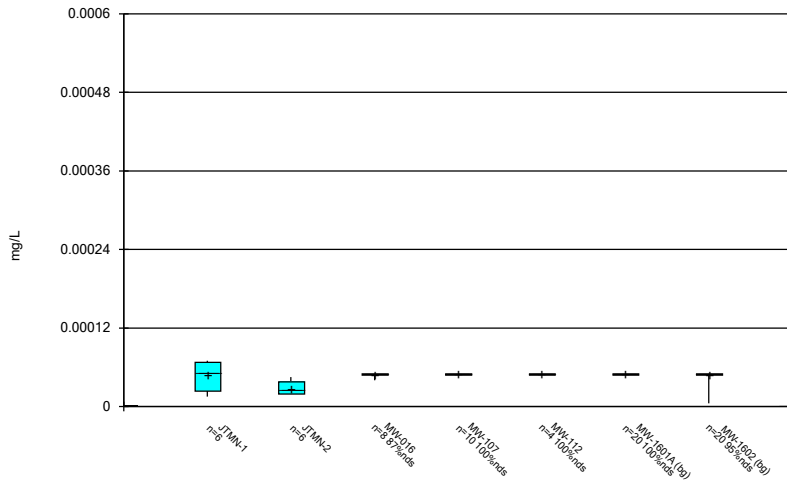
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



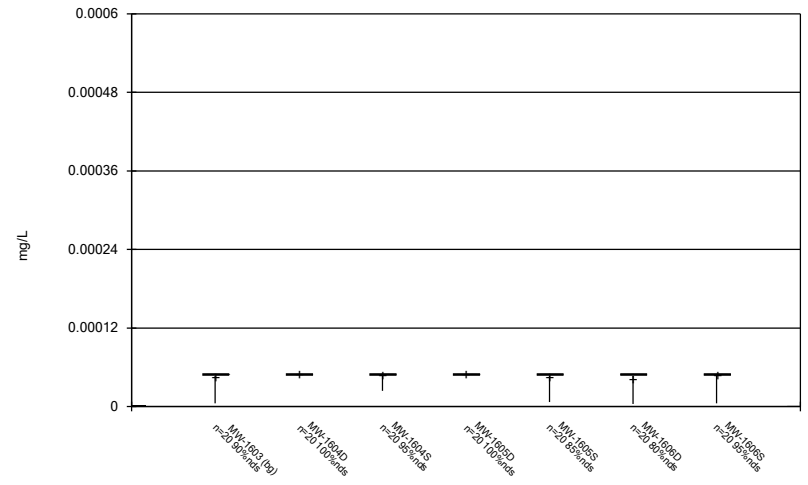
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



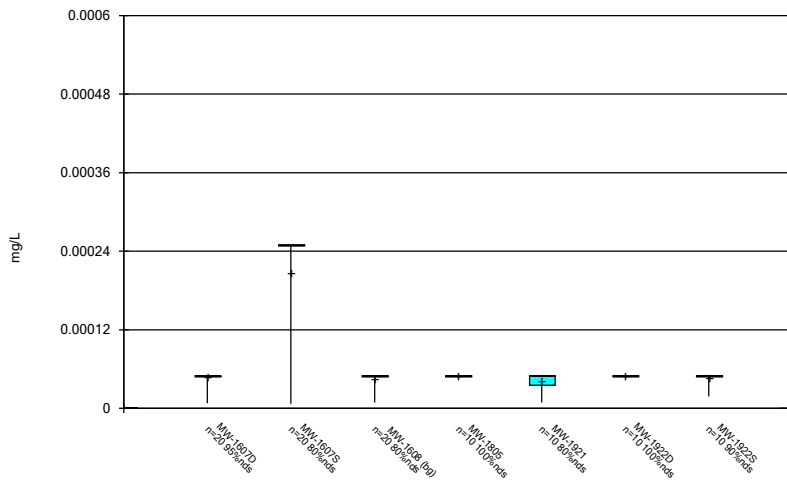
Constituent: Beryllium, total Analysis Run 1/26/2023 2:24 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



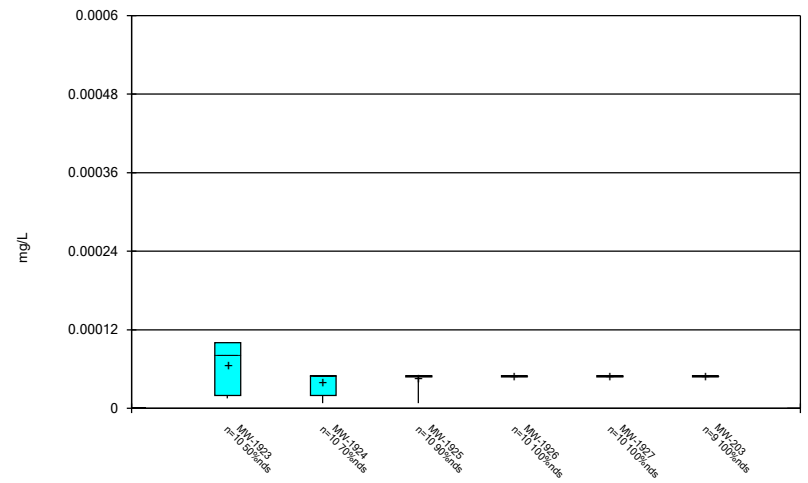
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



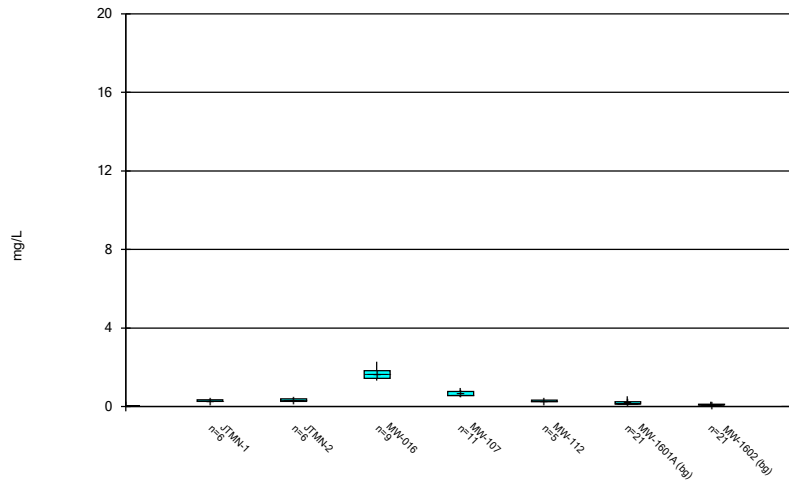
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



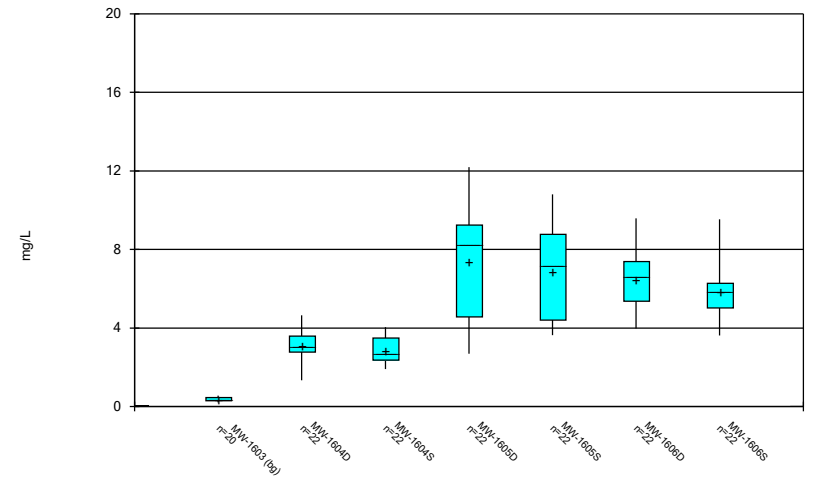
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



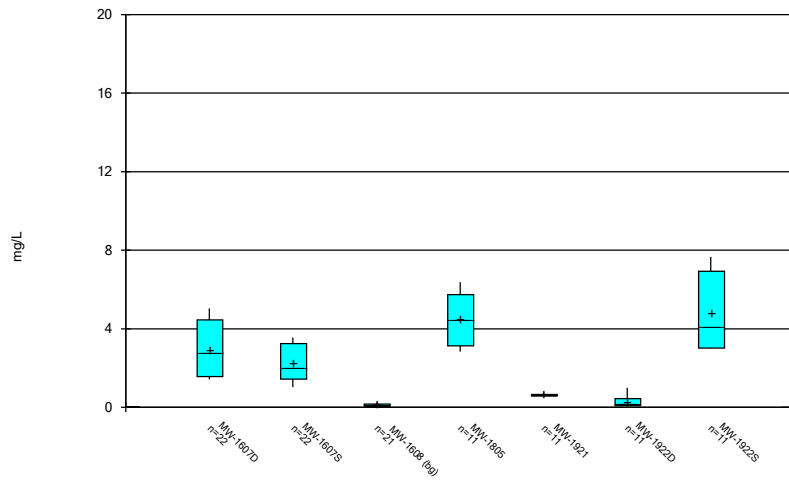
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



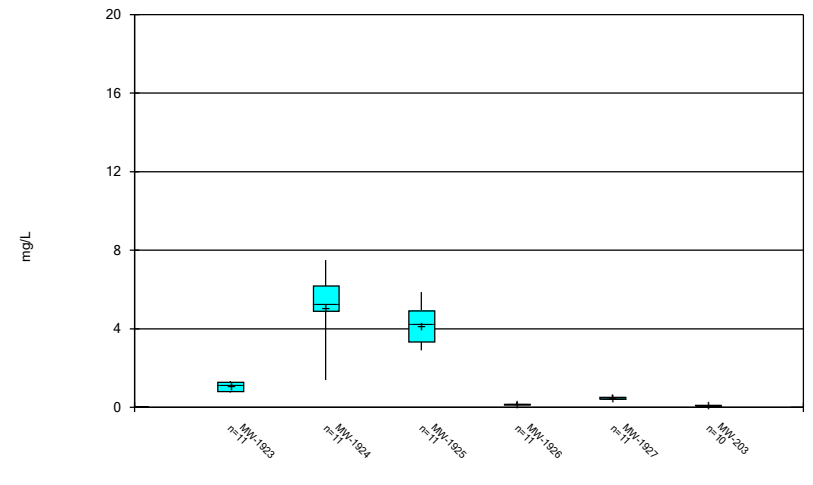
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



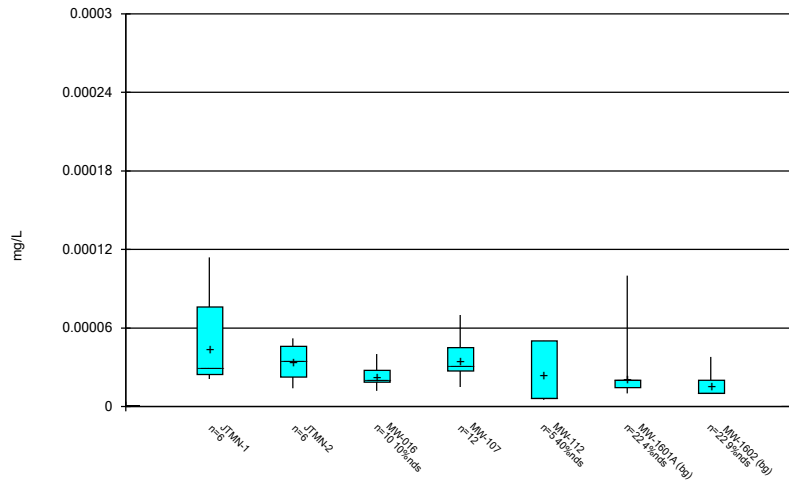
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



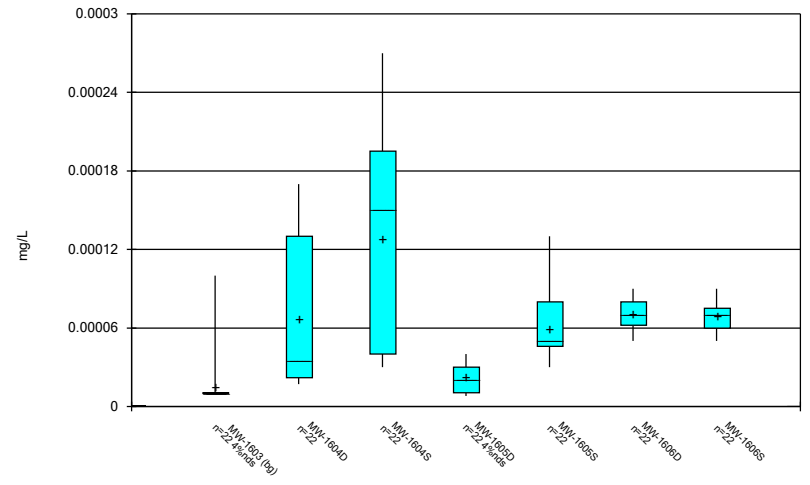
Constituent: Boron, total Analysis Run 1/26/2023 2:24 PM View: Time Series & Box Plot
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



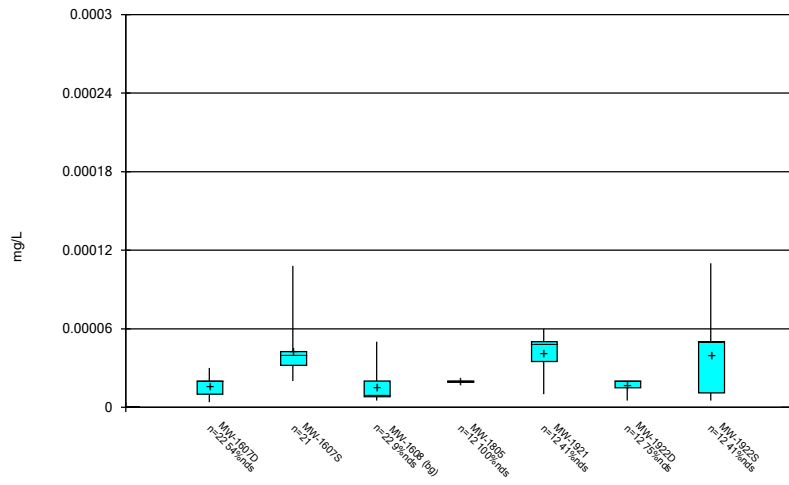
Constituent: Cadmium, total Analysis Run 1/26/2023 2:24 PM View: Time Series & Box Plot
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



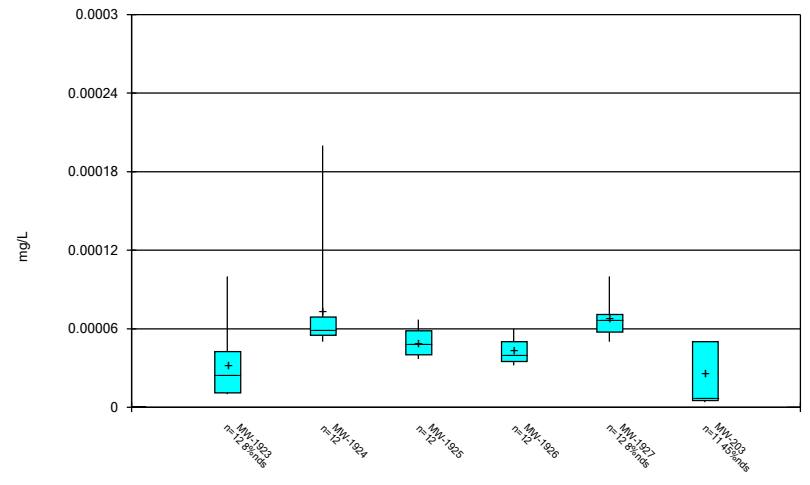
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



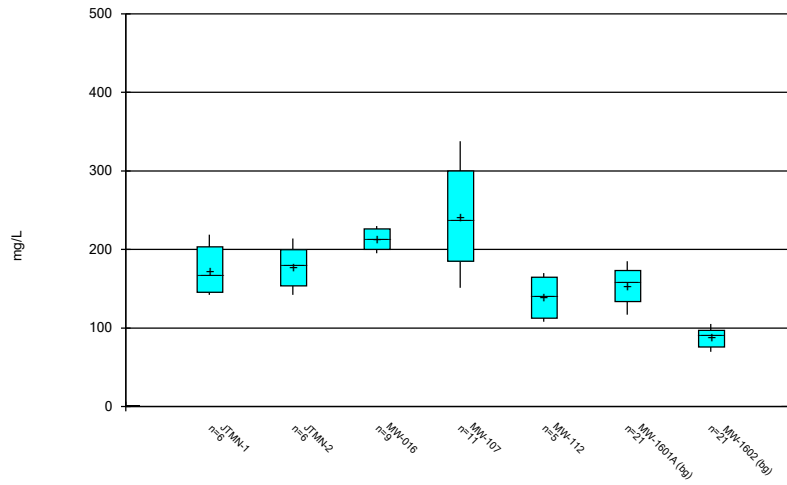
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



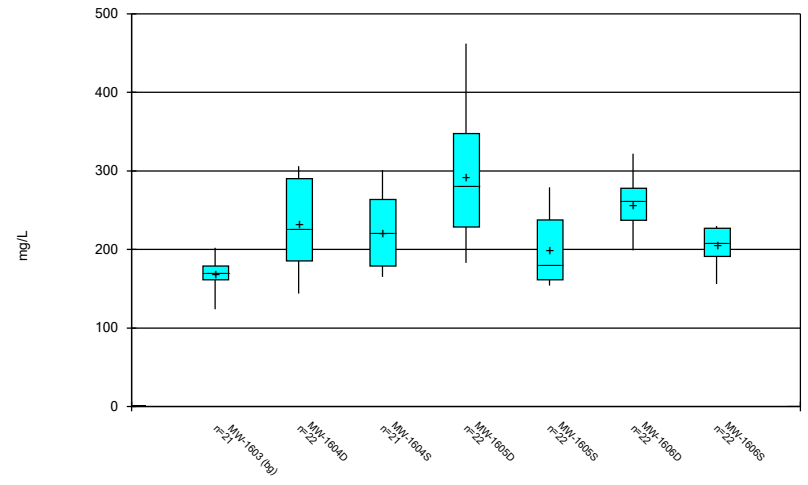
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



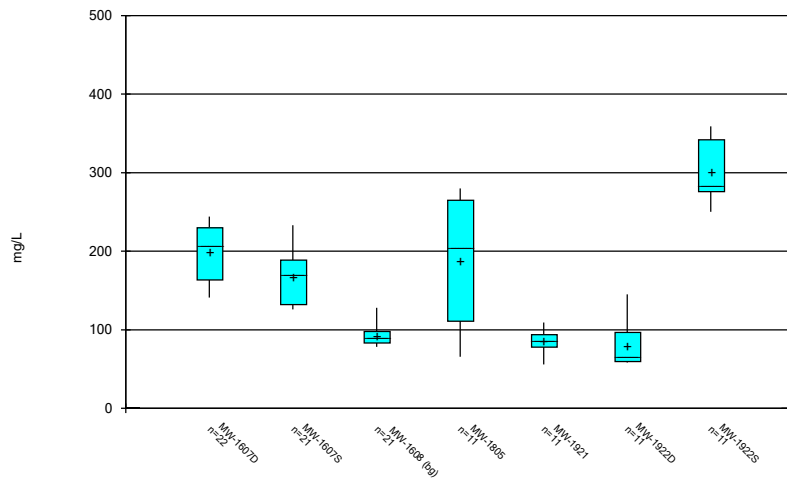
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Box & Whiskers Plot



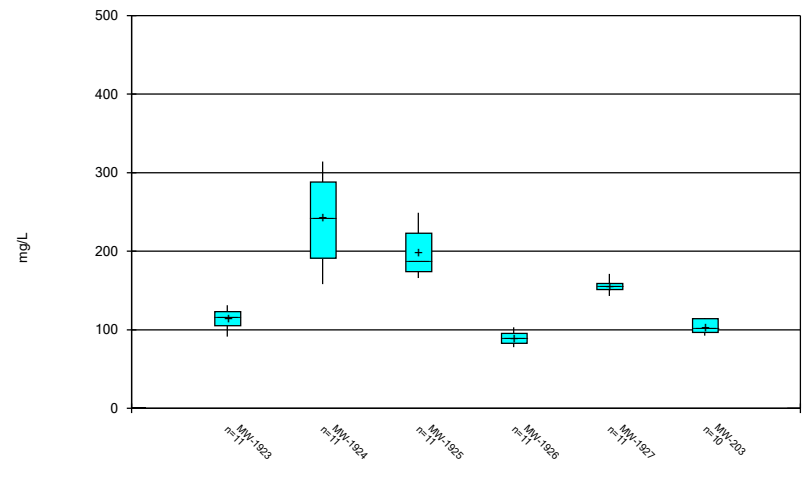
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Box & Whiskers Plot



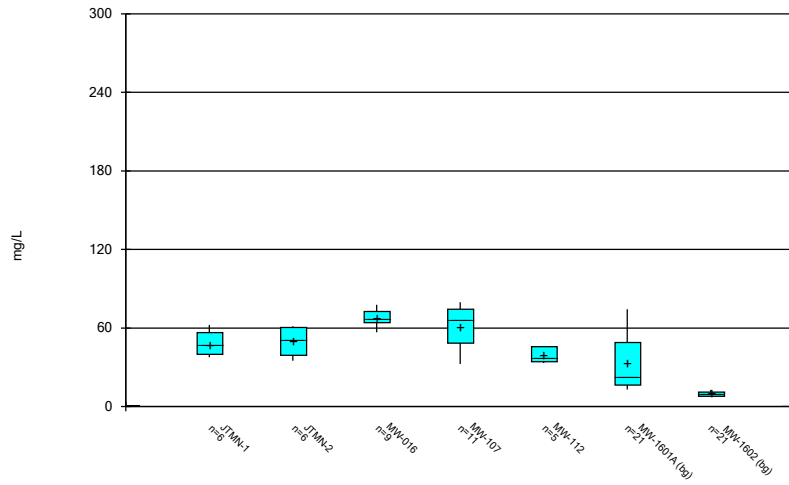
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



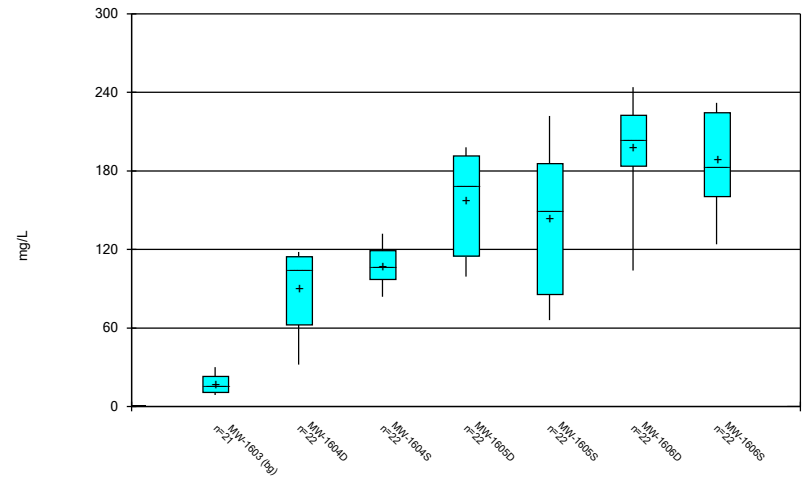
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



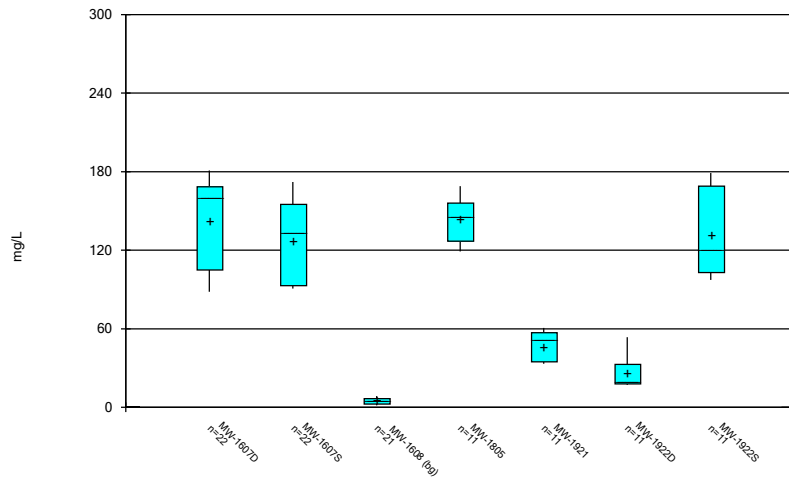
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



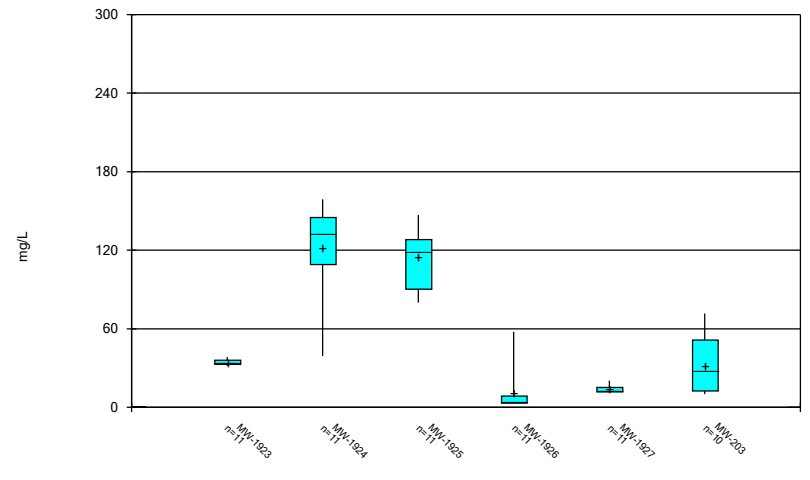
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Box & Whiskers Plot



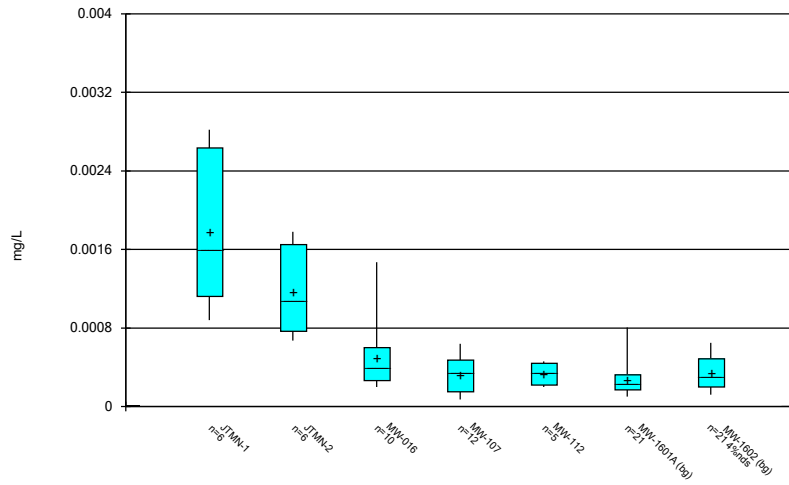
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Box & Whiskers Plot



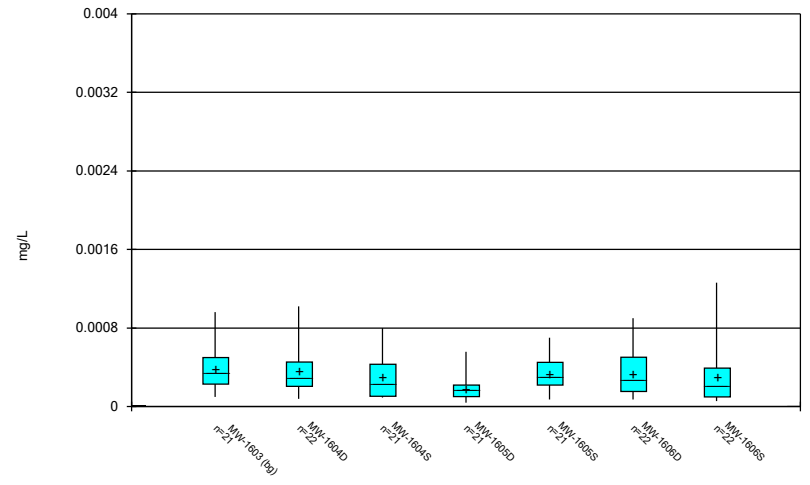
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



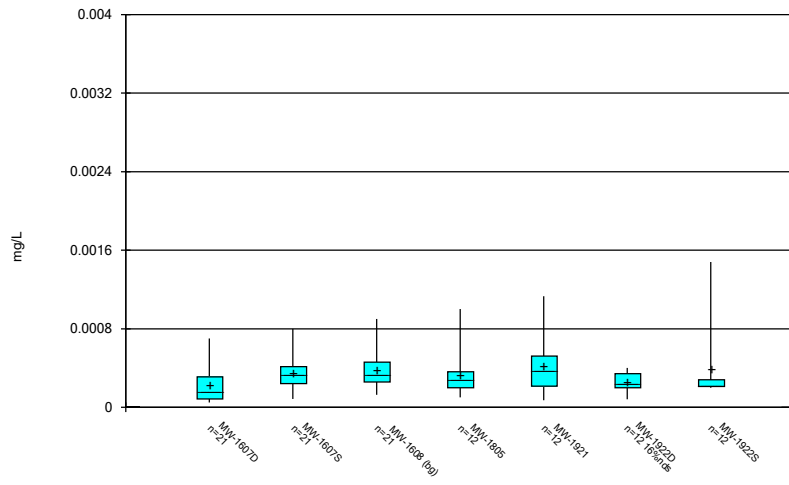
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



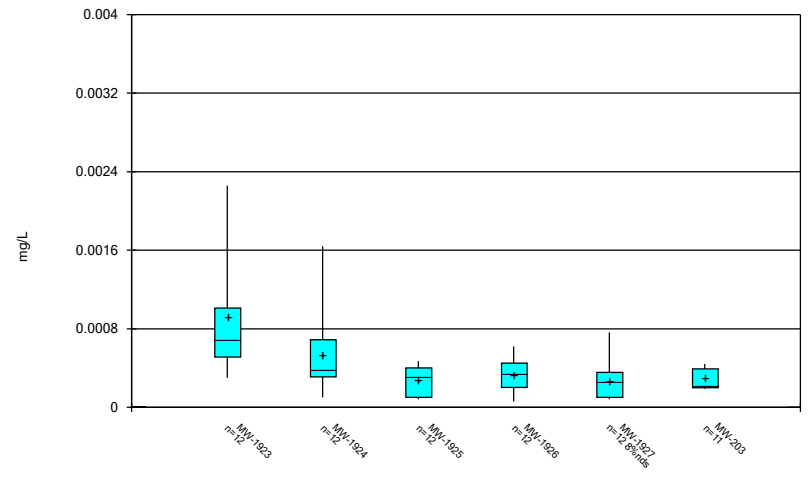
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Box & Whiskers Plot



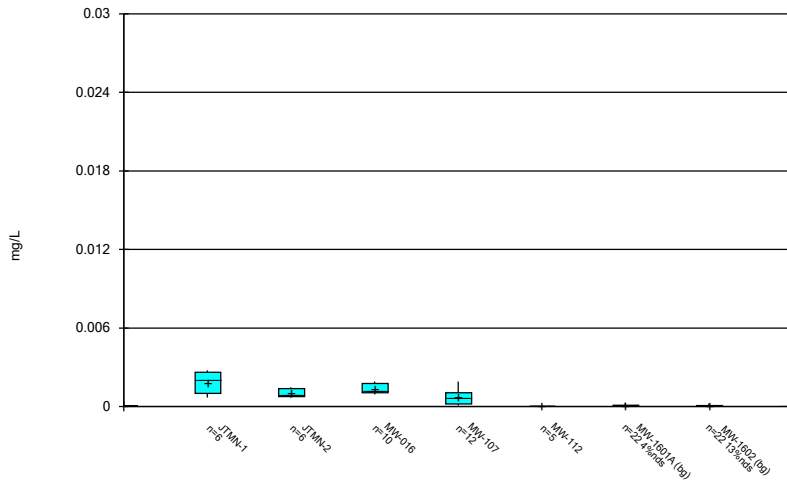
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



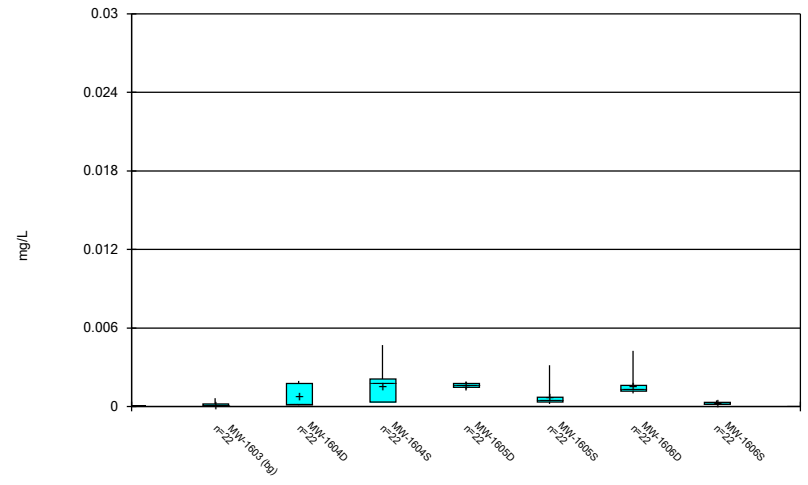
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



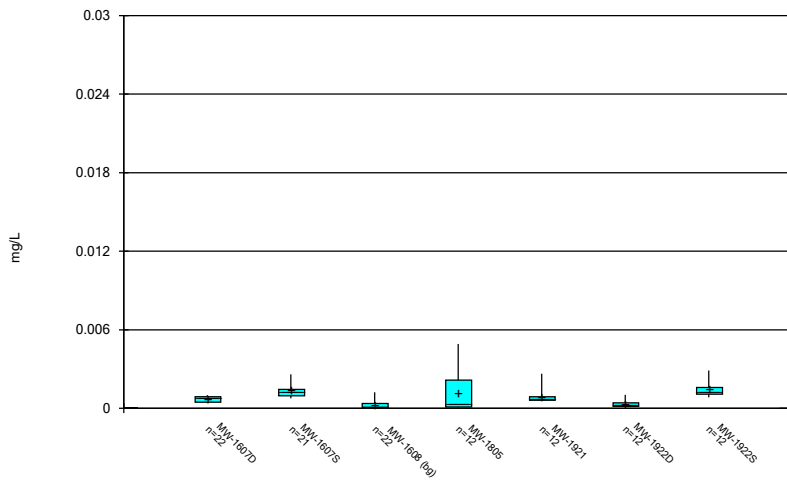
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



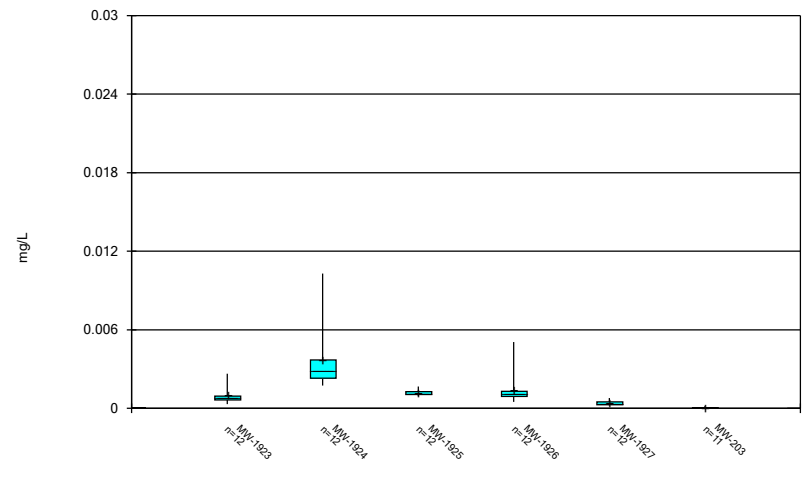
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Box & Whiskers Plot



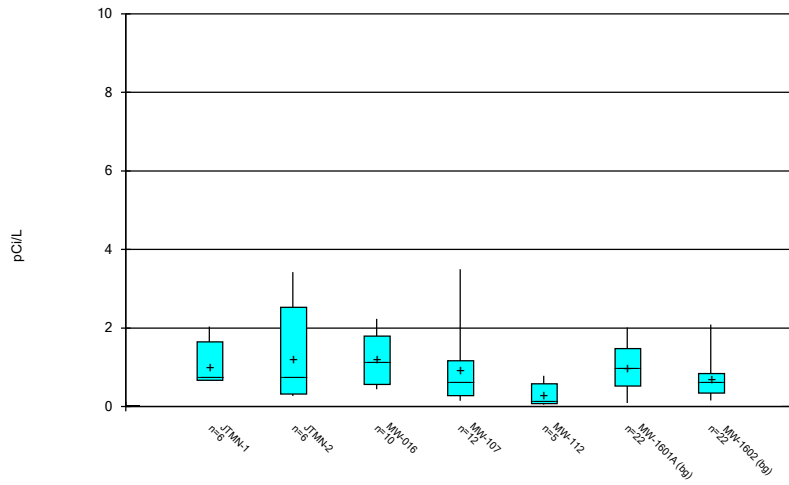
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



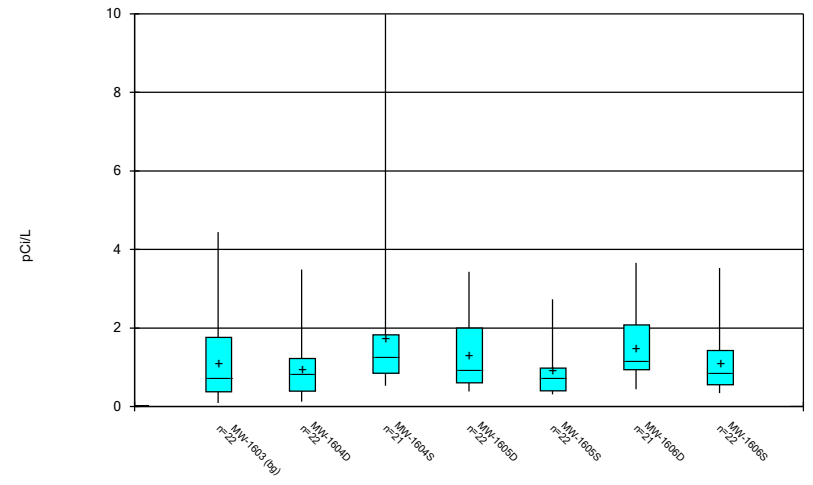
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



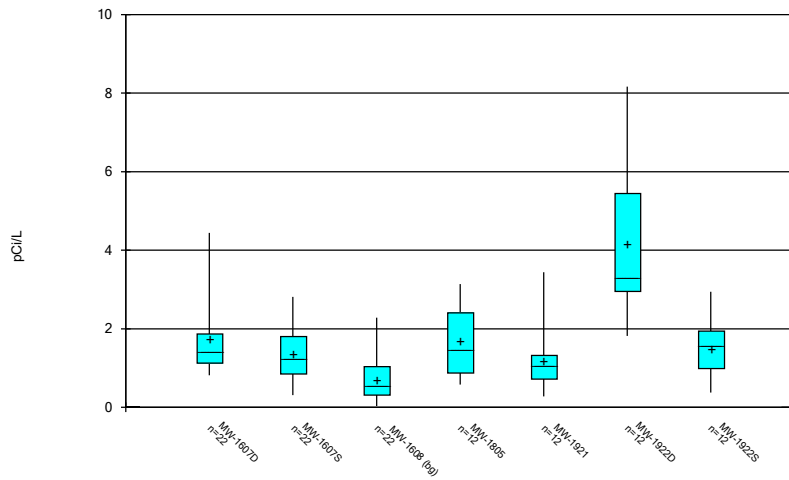
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Box & Whiskers Plot



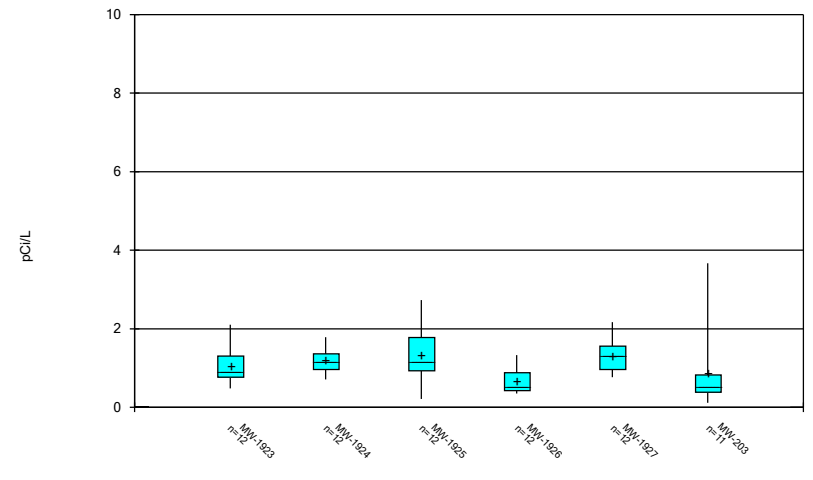
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Box & Whiskers Plot



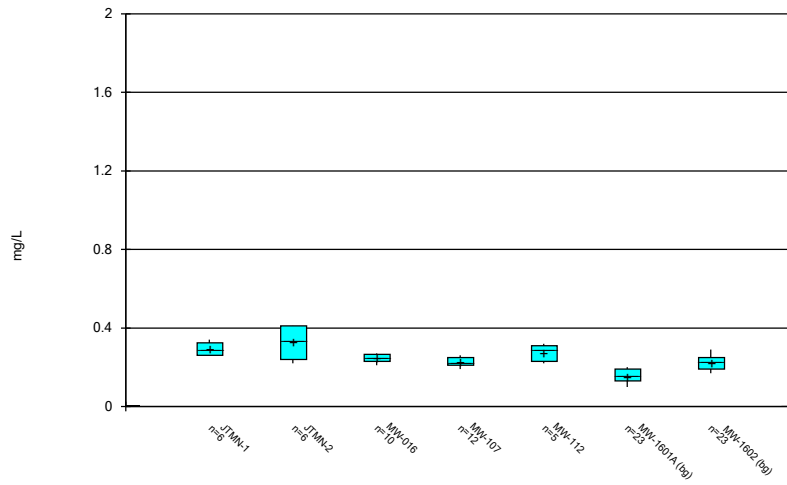
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Box & Whiskers Plot



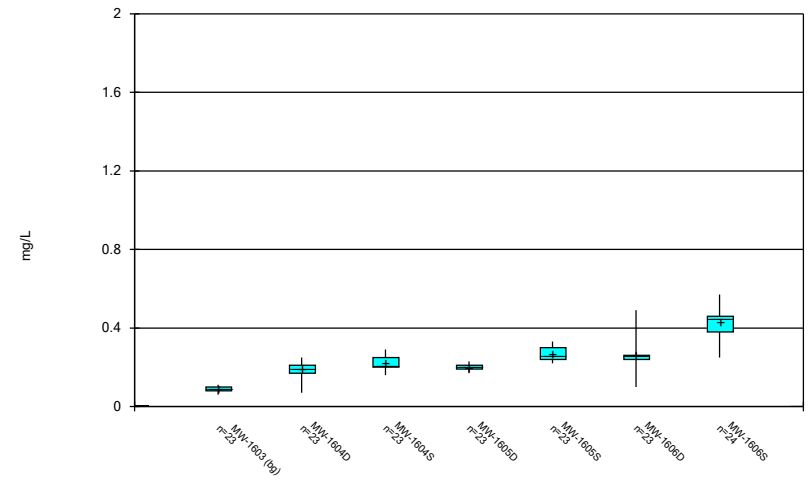
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Box & Whiskers Plot



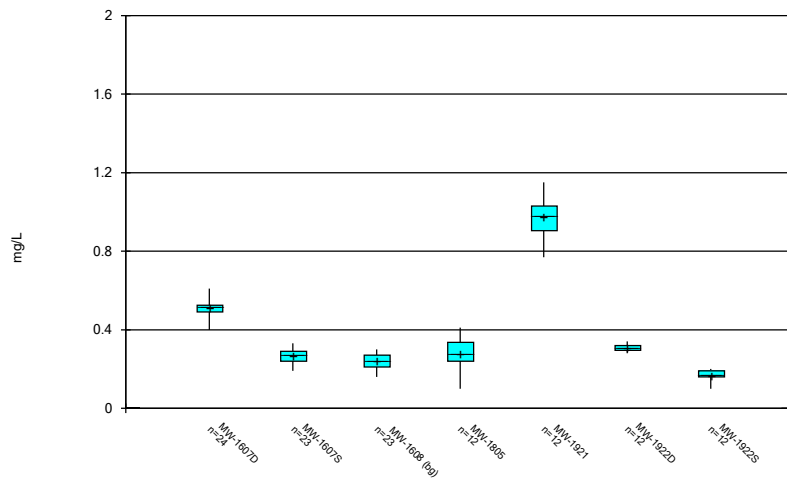
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



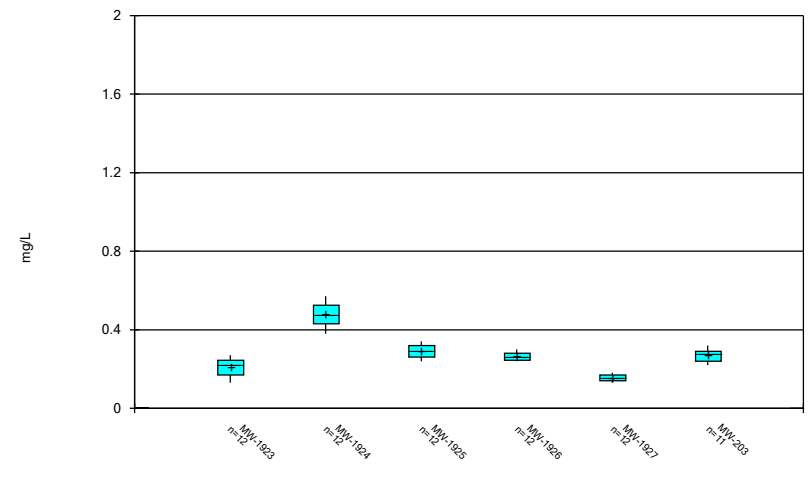
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



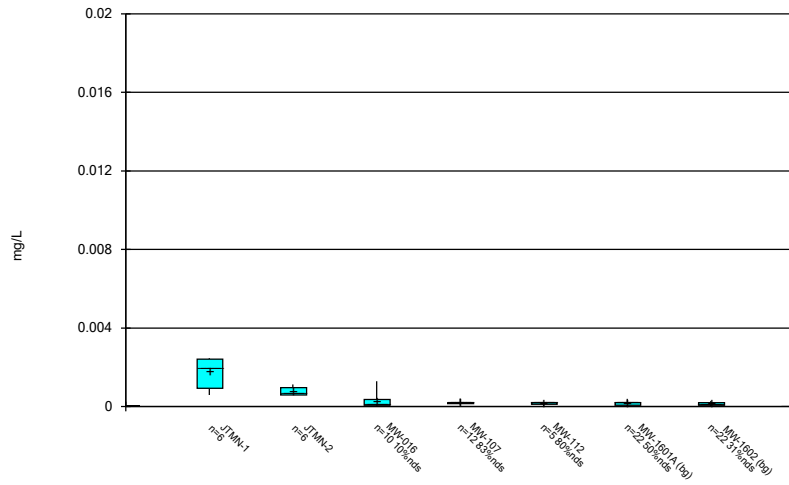
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



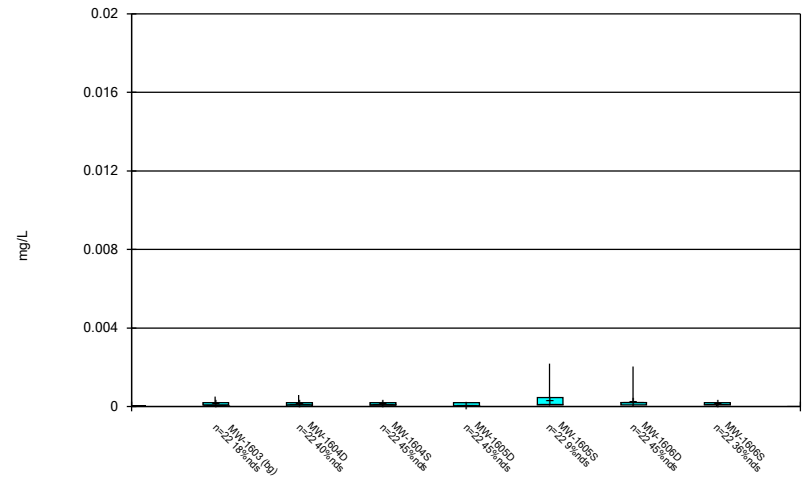
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



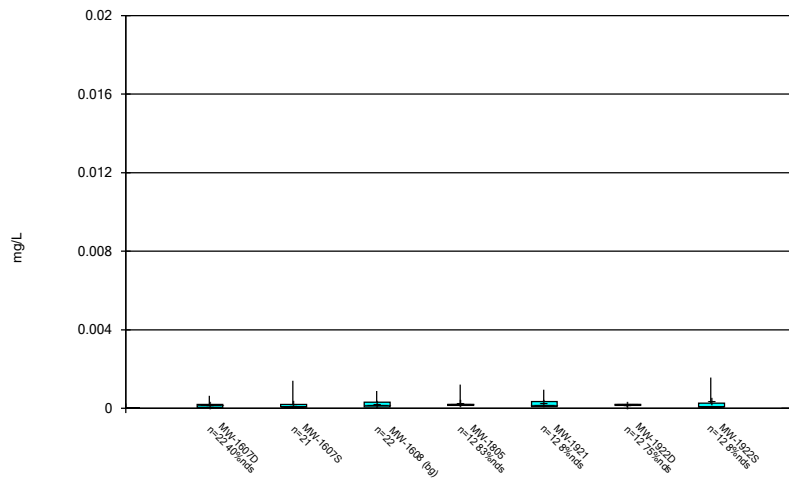
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



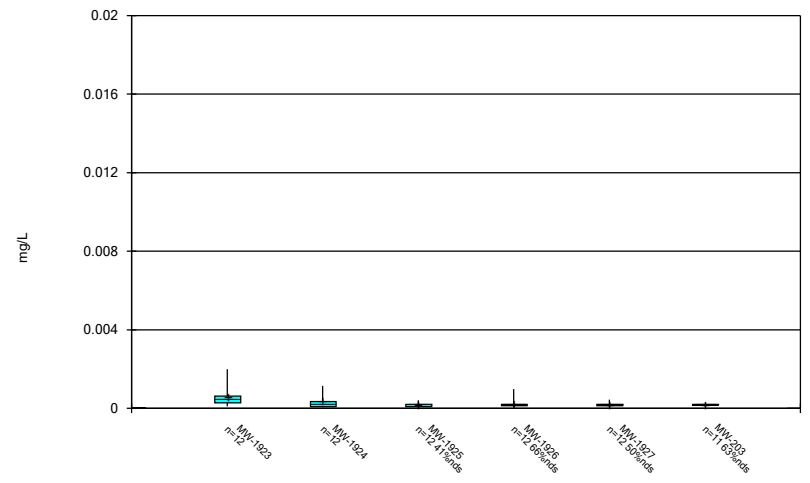
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



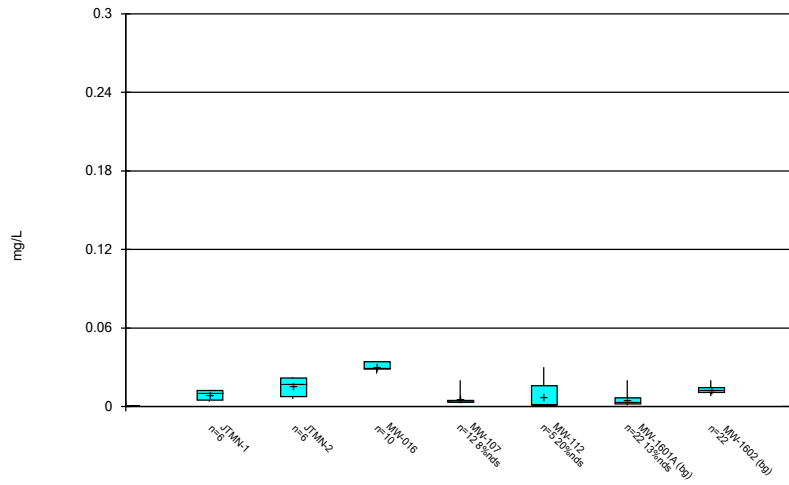
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



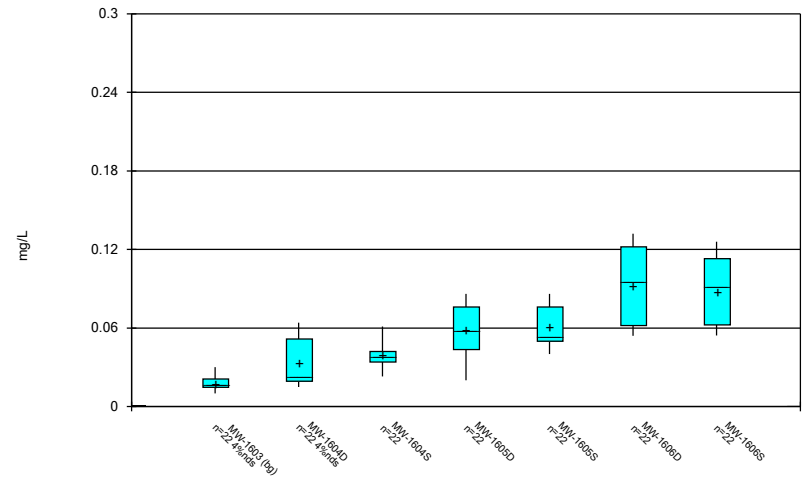
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



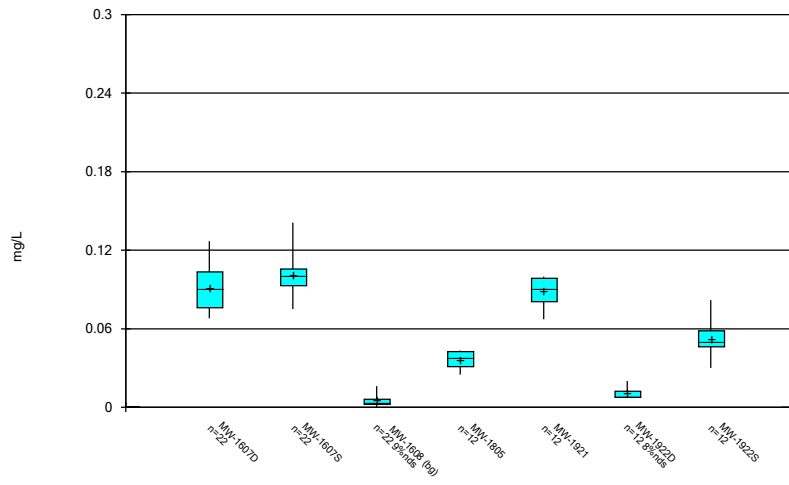
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



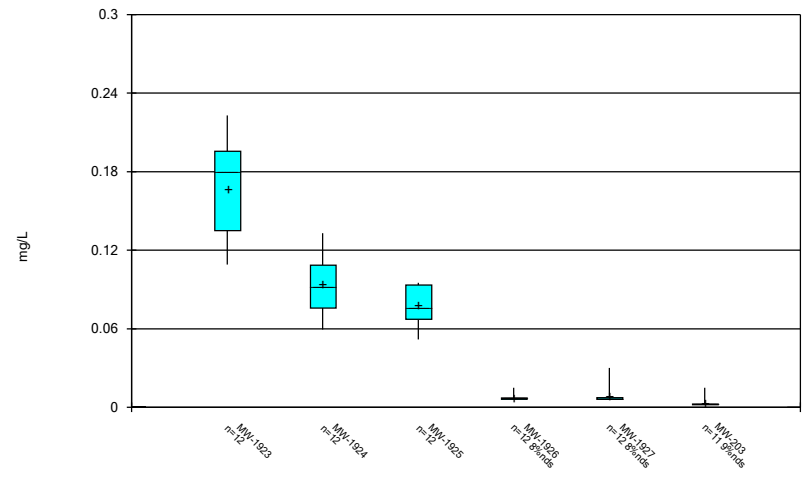
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



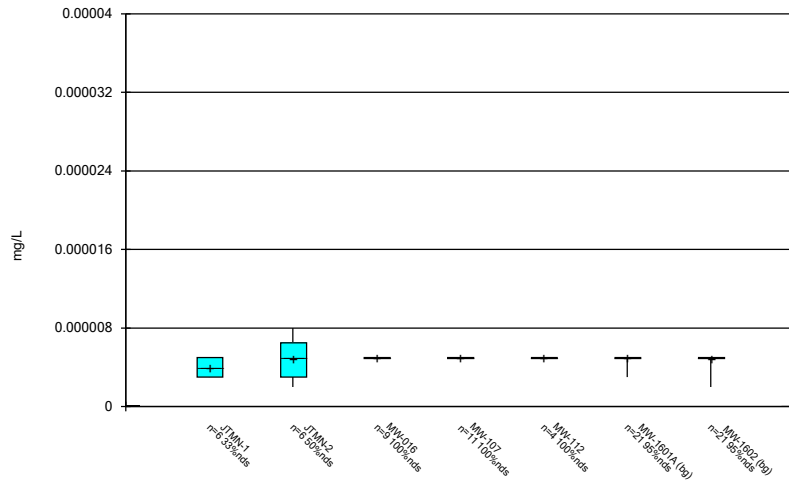
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



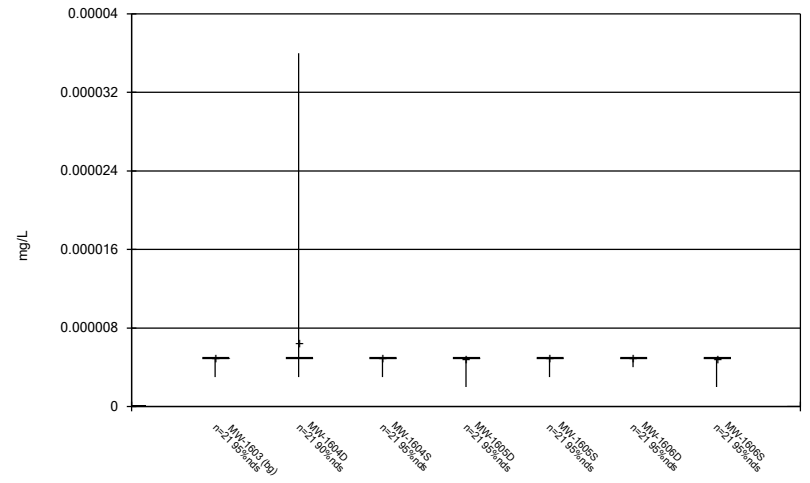
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Box & Whiskers Plot



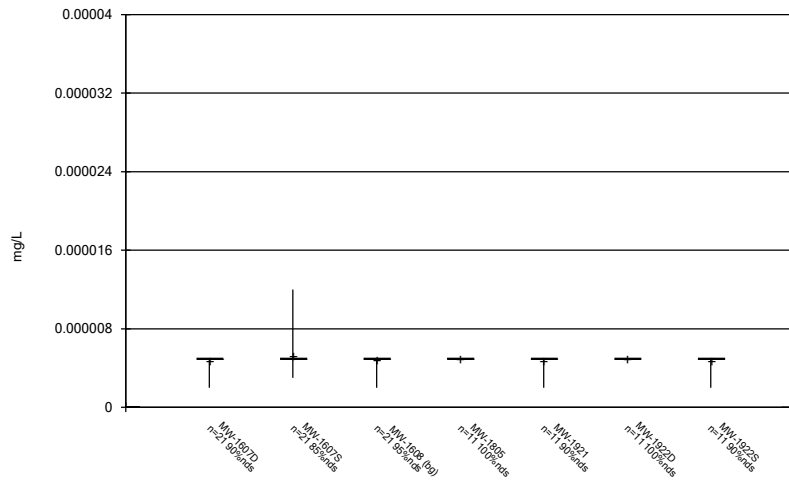
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



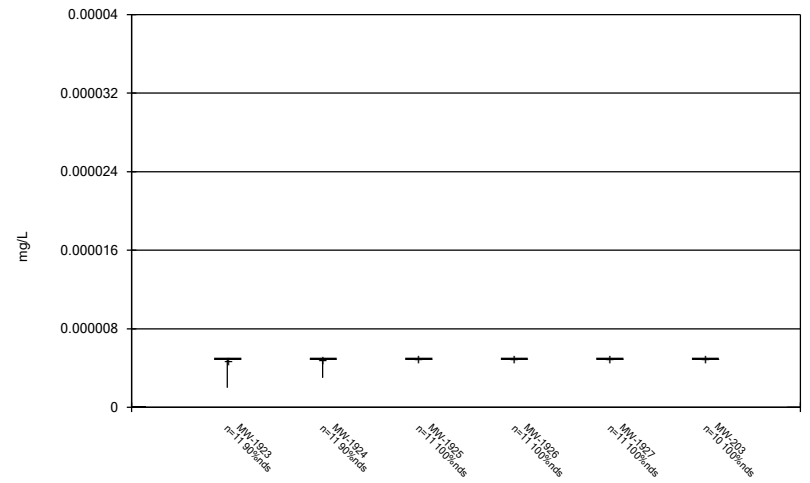
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



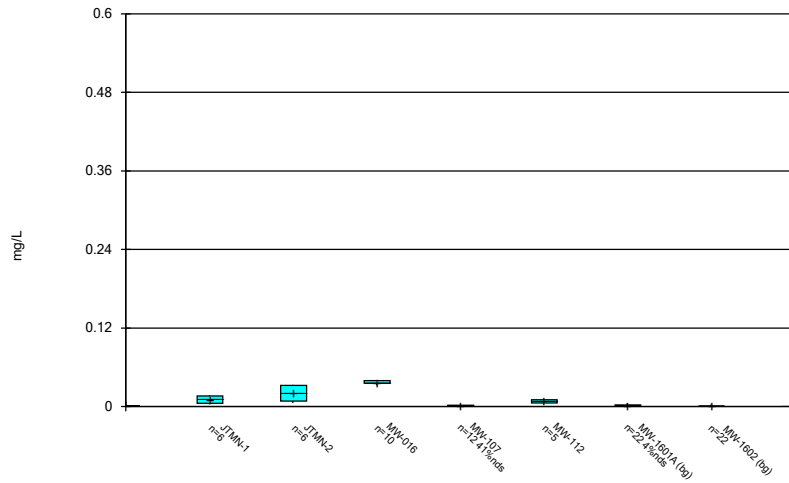
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



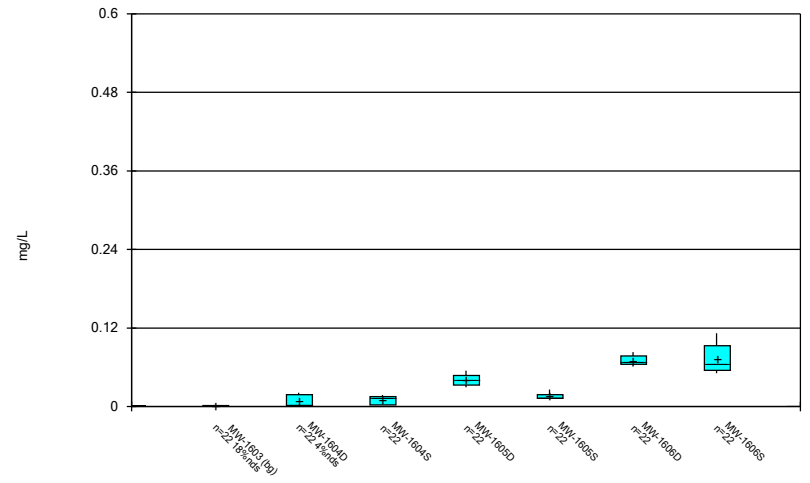
Constituent: Mercury, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



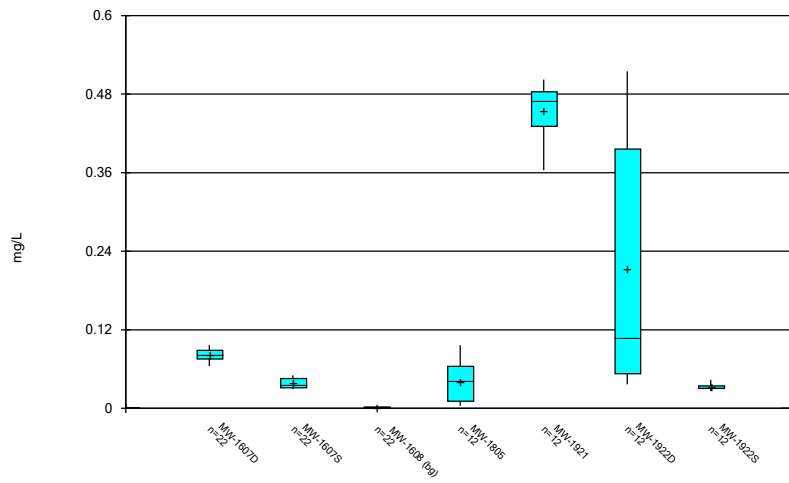
Constituent: Molybdenum, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



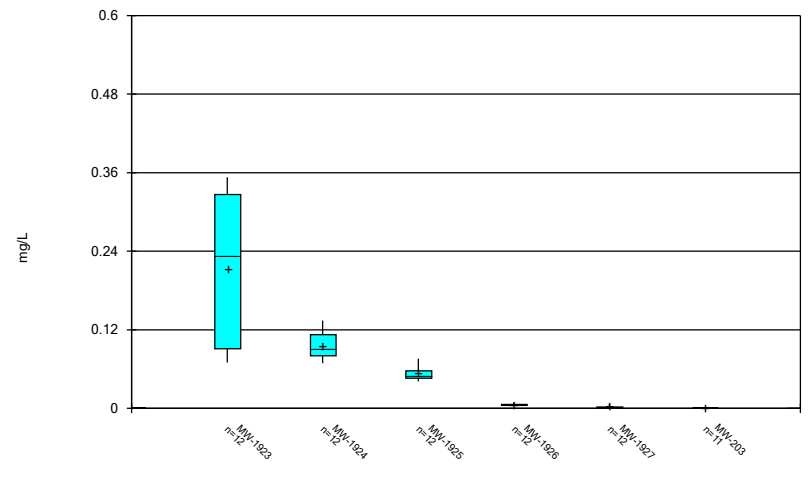
Constituent: Molybdenum, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



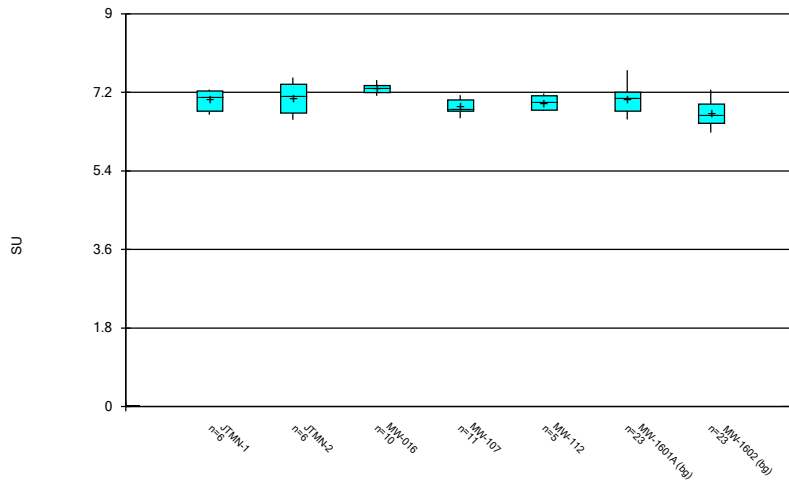
Constituent: Molybdenum, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



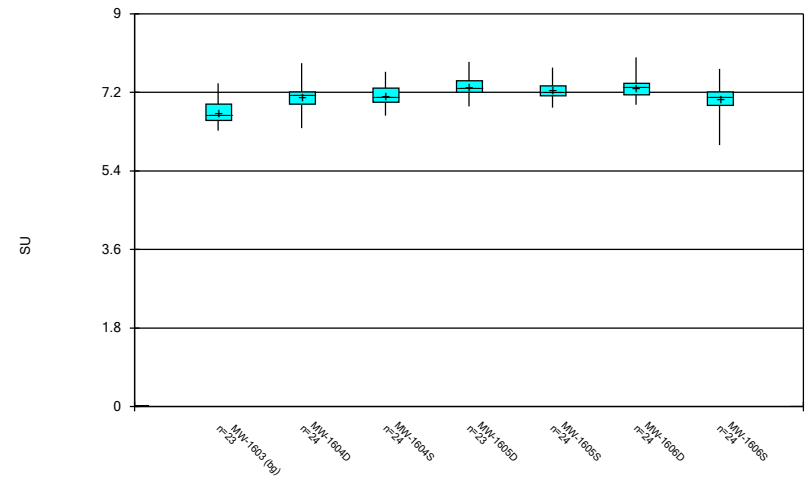
Constituent: Molybdenum, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



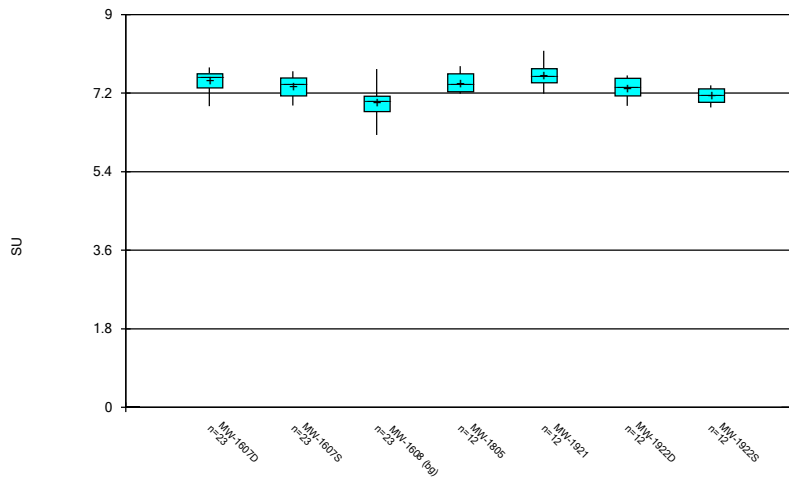
Constituent: pH, field Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



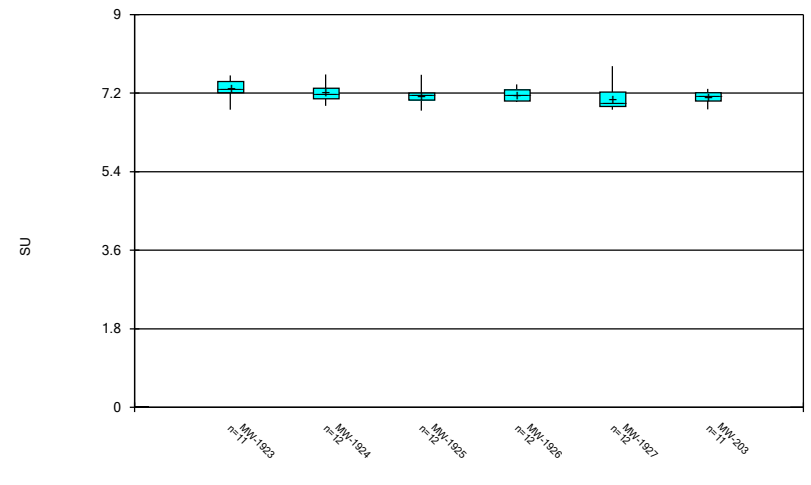
Constituent: pH, field Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



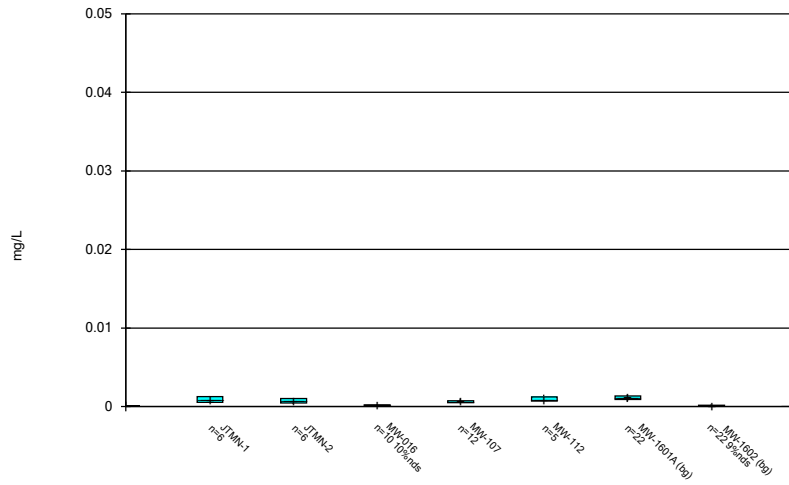
Constituent: pH, field Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



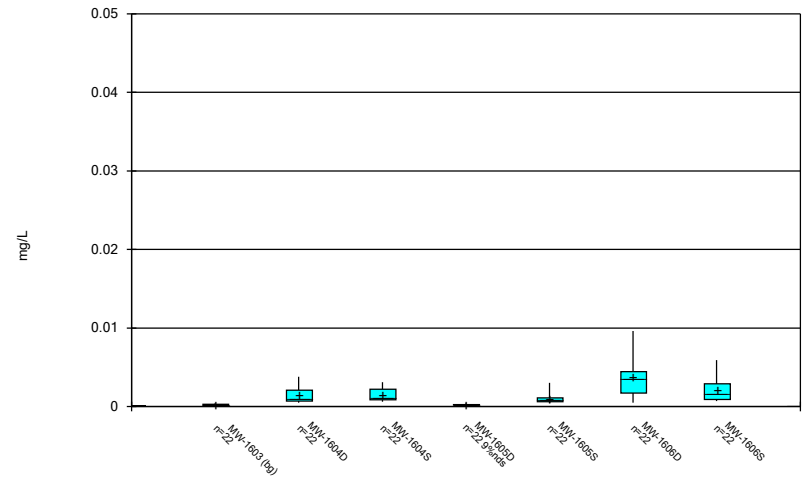
Constituent: pH, field Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



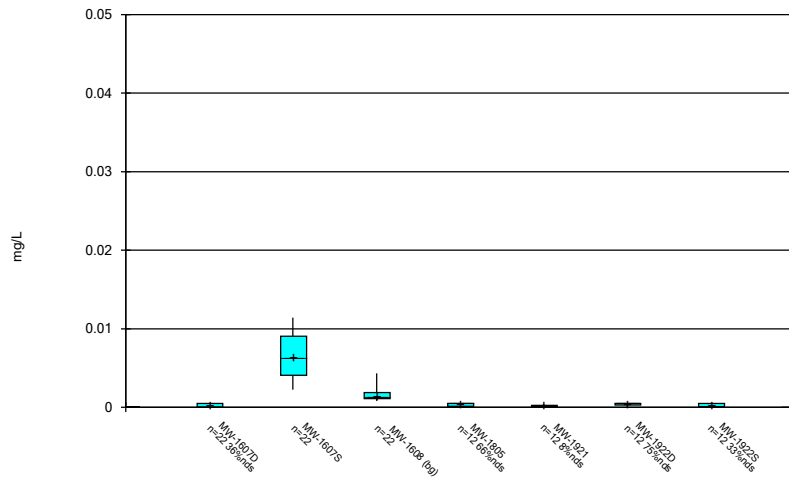
Constituent: Selenium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



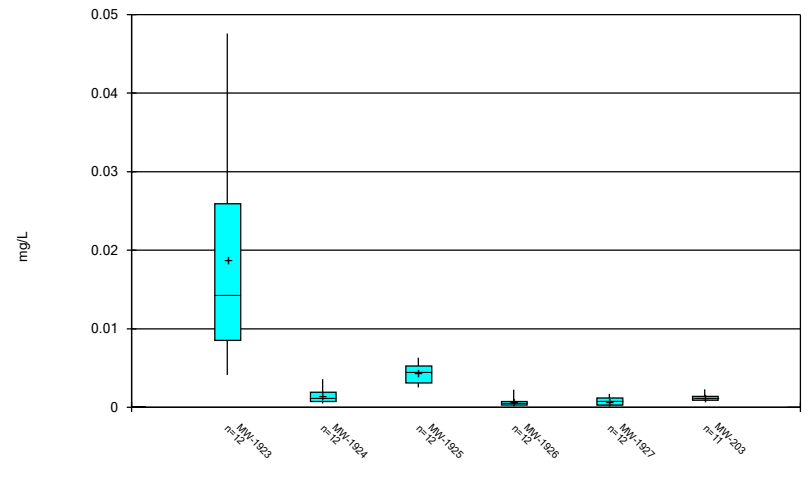
Constituent: Selenium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



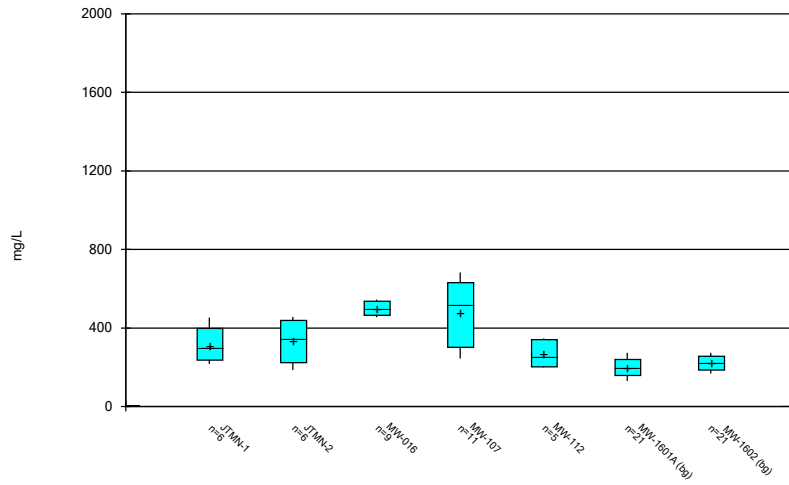
Constituent: Selenium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



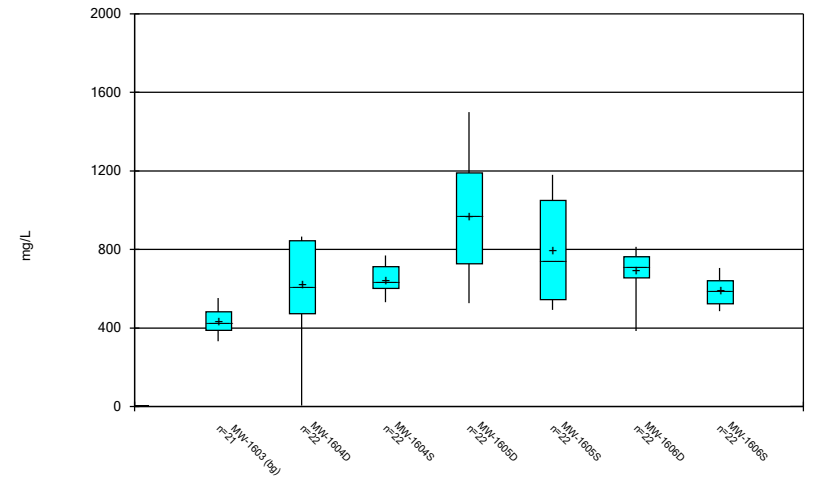
Constituent: Selenium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



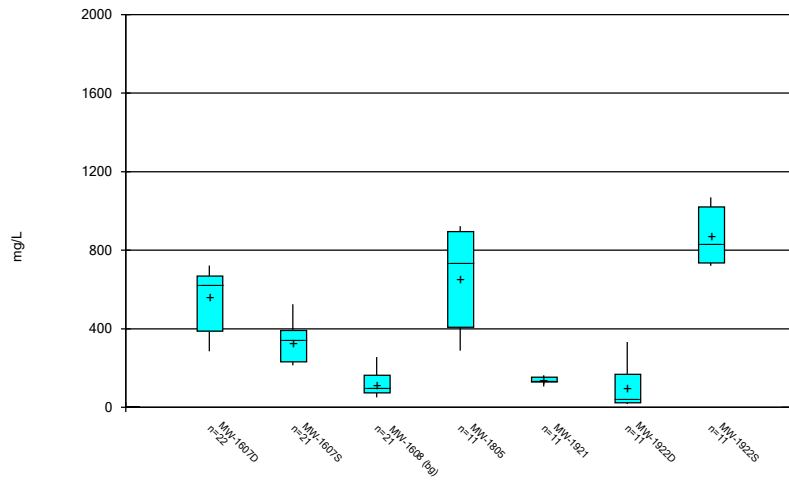
Constituent: Sulfate, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



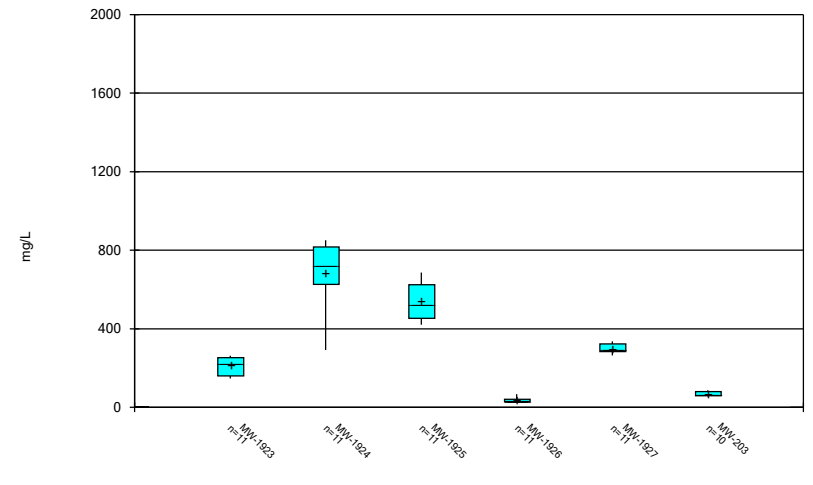
Constituent: Sulfate, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



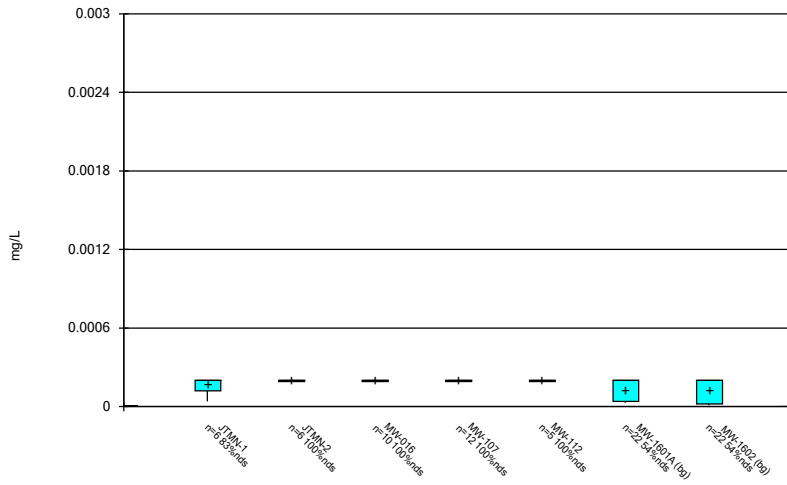
Constituent: Sulfate, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



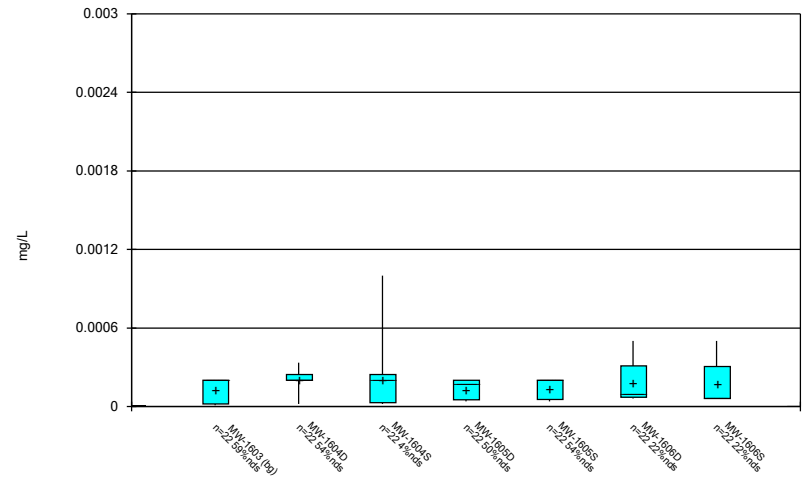
Constituent: Sulfate, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



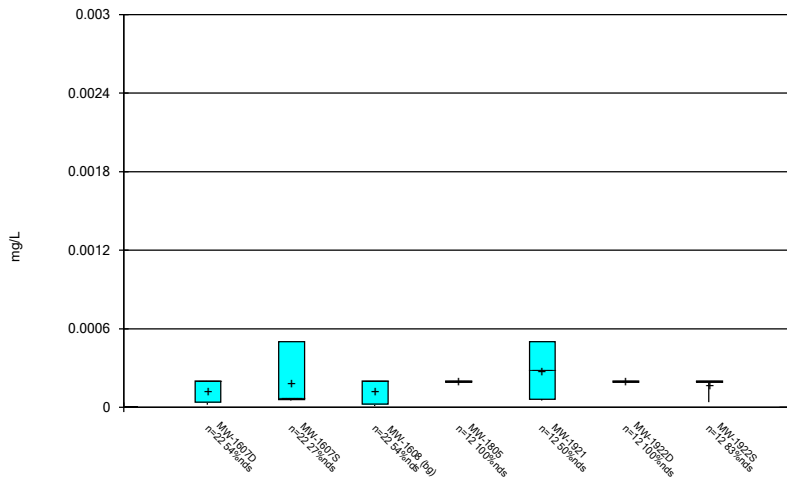
Constituent: Thallium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



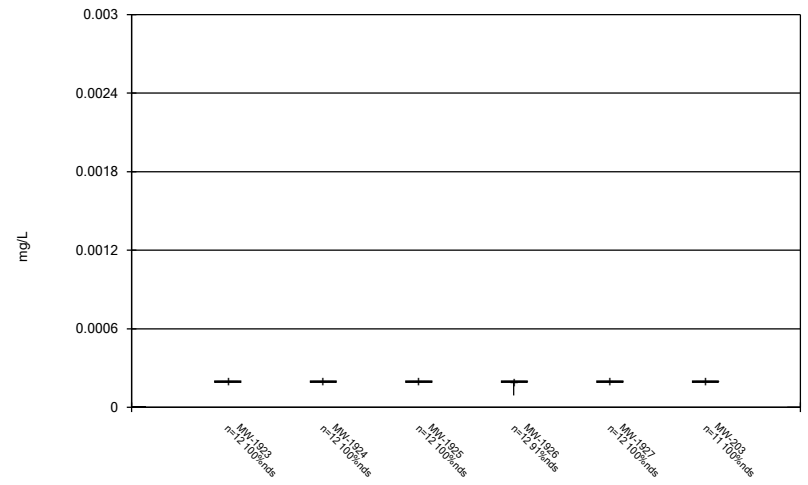
Constituent: Thallium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



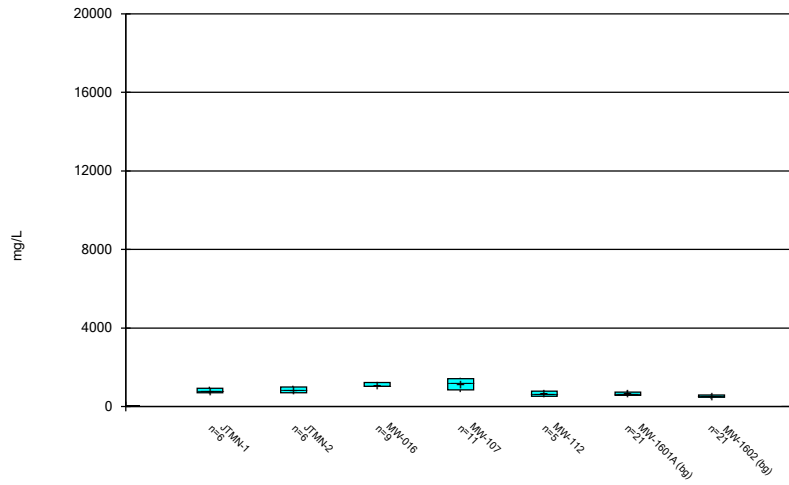
Constituent: Thallium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



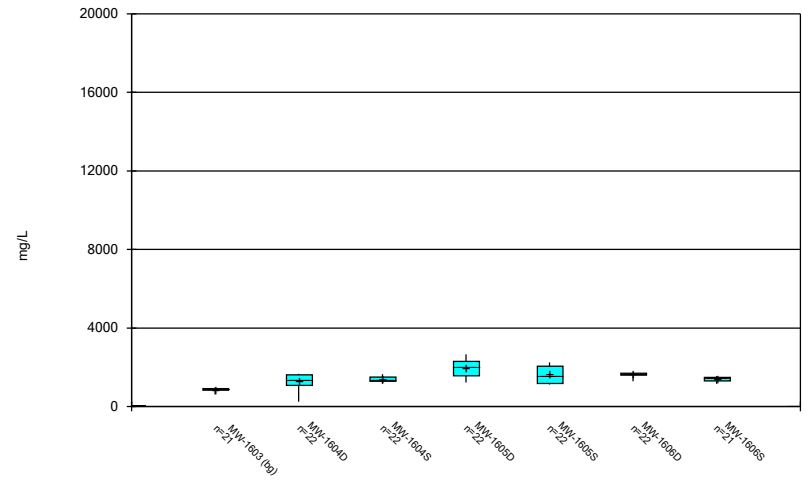
Constituent: Thallium, total Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



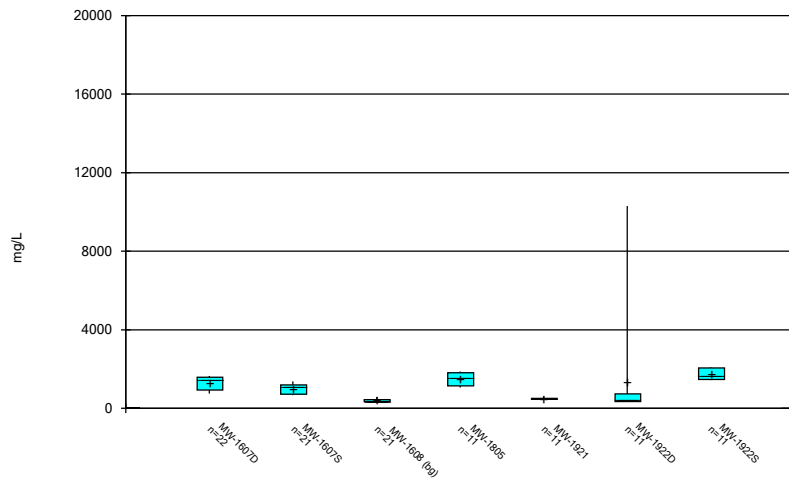
Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



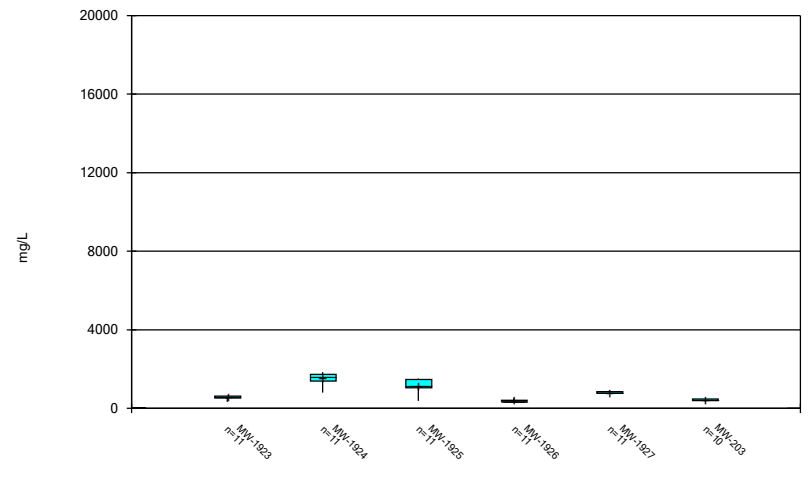
Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:25 PM View: Time Series & Box Plot
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE C

Outlier Summary and Tukey's Outlier Test

Outlier Summary

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/26/2023, 10:12 AM

Date	MW-1607S Antimony, total (mg/L)	MW-1607S Arsenic, total (mg/L)	MW-1607S Barium, total (mg/L)	MW-1603 Boron, total (mg/L)	MW-1607S Cadmium, total (mg/L)	MW-1601A Chromium, total (mg/L)	MW-1602 Chromium, total (mg/L)	MW-1603 Chromium, total (mg/L)	MW-1604S Chromium, total (mg/L)	MW-1605D Chromium, total (mg/L)
9/26/2016										
9/27/2016										
11/1/2016					0.0013 (o)					
12/19/2016						0.00165 (o)	0.00237 (o)			
12/20/2016								0.00197 (o)	0.00229 (o)	
12/21/2016	0.00084 (o)	0.0112 (o)	0.114 (o)		0.00022 (o)					
3/28/2017				0.781 (o)						
5/16/2017										

Date	MW-1605S Chromium, total (mg/L)	MW-1607D Chromium, total (mg/L)	MW-1607S Chromium, total (mg/L)	MW-1608 Chromium, total (mg/L)	MW-1607S Cobalt, total (mg/L)	MW-1604S Combined Radium 226 + 228 (pCi/L)	MW-1606D Combined Radium 226 + 228 (pCi/L)	MW-1607S Lead, total (mg/L)	MW-1607D pH, field (SU)	MW-1607S pH, field (SU)
9/26/2016					0.136 (o)					
9/27/2016						8.459 (o)				
11/1/2016										
12/19/2016				0.00278 (o)						
12/20/2016	0.00285 (o)	0.00207 (o)								
12/21/2016			0.0031 (o)		0.0201 (o)		0.011 (o)			
3/28/2017										
5/16/2017								8.41 (o)	8.23 (o)	

Date	MW-1606S Total Dissolved Solids [TDS] (mg/L)
9/26/2016	
9/27/2016	
11/1/2016	
12/19/2016	
12/20/2016	
12/21/2016	
3/28/2017	
5/16/2017	3230 (o)

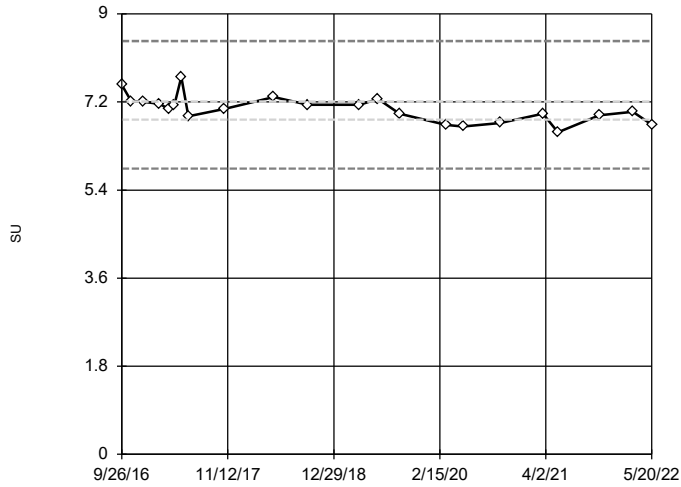
Tukey's Outlier Analysis - pH - All Results (No Significant)

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/26/2023, 10:29 AM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
pH, field (SU)	MW-1601A (bg)	No	n/a	NP	NaN	22	7.055	0.2718	ln(x)	ShapiroWilk
pH, field (SU)	MW-1602 (bg)	No	n/a	NP	NaN	22	6.727	0.2621	ln(x)	ShapiroWilk
pH, field (SU)	MW-1603 (bg)	No	n/a	NP	NaN	22	6.748	0.3108	ln(x)	ShapiroWilk
pH, field (SU)	MW-1604D	No	n/a	NP	NaN	23	7.11	0.3018	normal	ShapiroWilk
pH, field (SU)	MW-1604S	No	n/a	NP	NaN	23	7.147	0.2342	ln(x)	ShapiroWilk
pH, field (SU)	MW-1605D	No	n/a	NP	NaN	22	7.32	0.2308	ln(x)	ShapiroWilk
pH, field (SU)	MW-1605S	No	n/a	NP	NaN	23	7.248	0.2295	ln(x)	ShapiroWilk
pH, field (SU)	MW-1606D	No	n/a	NP	NaN	23	7.295	0.2336	ln(x)	ShapiroWilk
pH, field (SU)	MW-1606S	No	n/a	NP	NaN	23	7.053	0.3287	x^6	ShapiroWilk
pH, field (SU)	MW-1607D	No	n/a	NP	NaN	23	7.538	0.296	ln(x)	ShapiroWilk
pH, field (SU)	MW-1607S	No	n/a	NP	NaN	23	7.394	0.2917	ln(x)	ShapiroWilk
pH, field (SU)	MW-1608 (bg)	No	n/a	NP	NaN	22	6.979	0.3133	sqrt(x)	ShapiroWilk

Tukey's Outlier Screening

MW-1601A (bg)

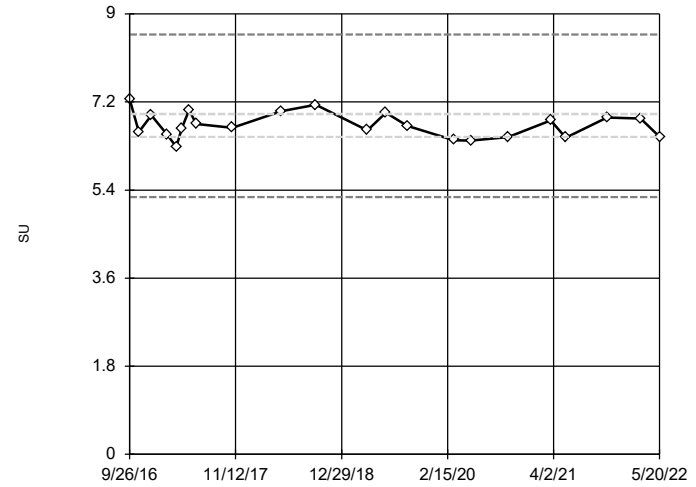


n = 22
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.446, low cutoff = 5.839, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1602 (bg)

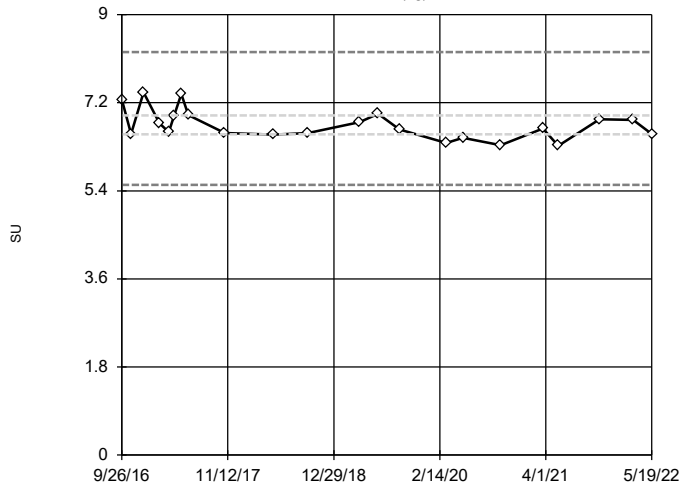


n = 22
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.579, low cutoff = 5.257, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1603 (bg)

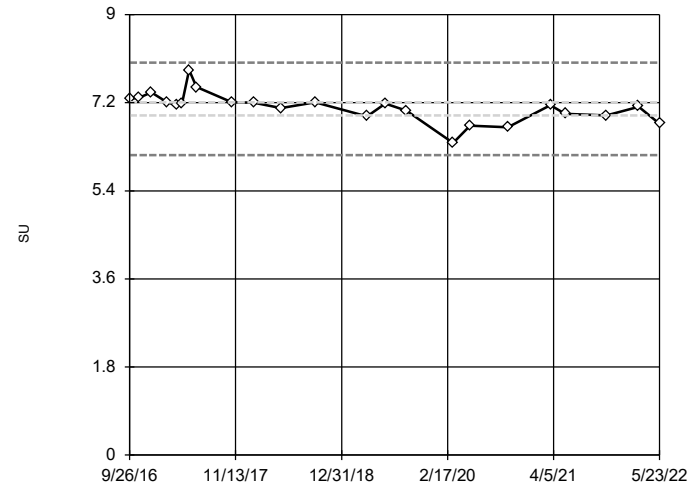


n = 22
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.236, low cutoff = 5.523, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1604D

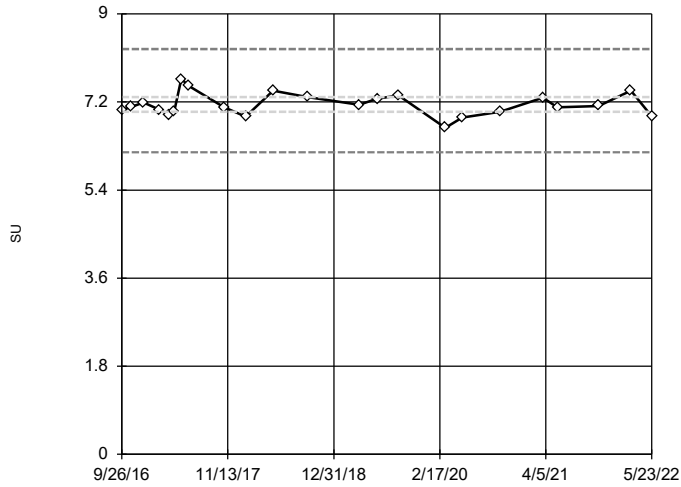


n = 23
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 8.02, low cutoff = 6.13, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1604S

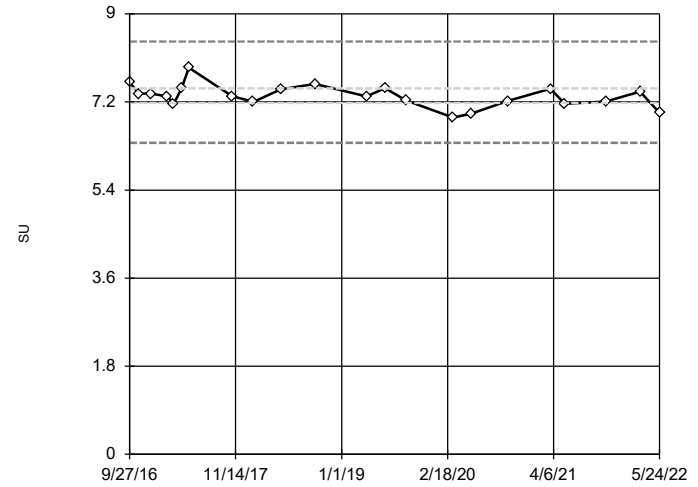


n = 23
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.279, low cutoff = 6.172, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1605D

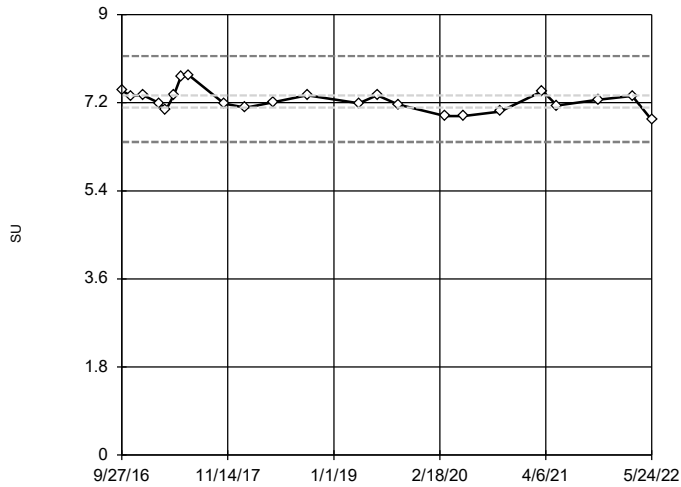


n = 22
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.435, low cutoff = 6.363, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1605S

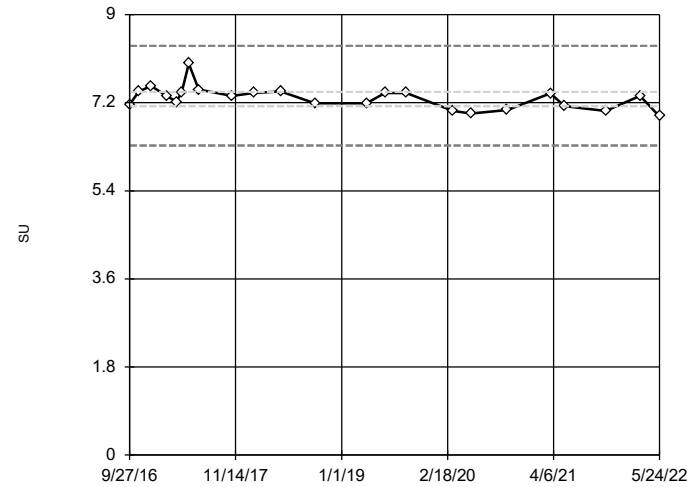


n = 23
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.154, low cutoff = 6.4, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1606D

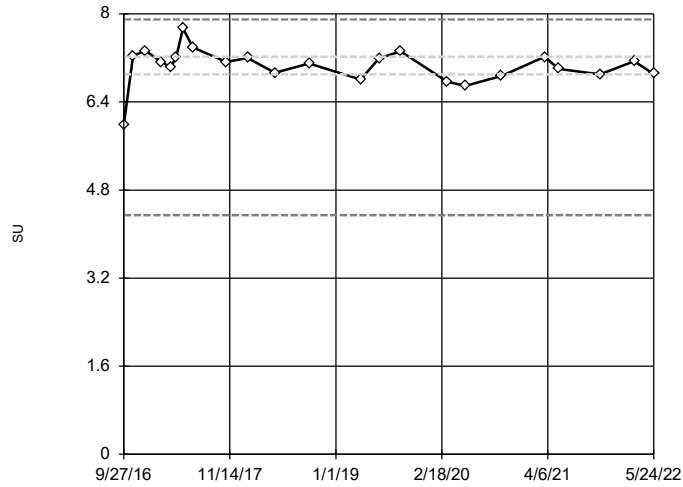


n = 23
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.363, low cutoff = 6.326, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1606S

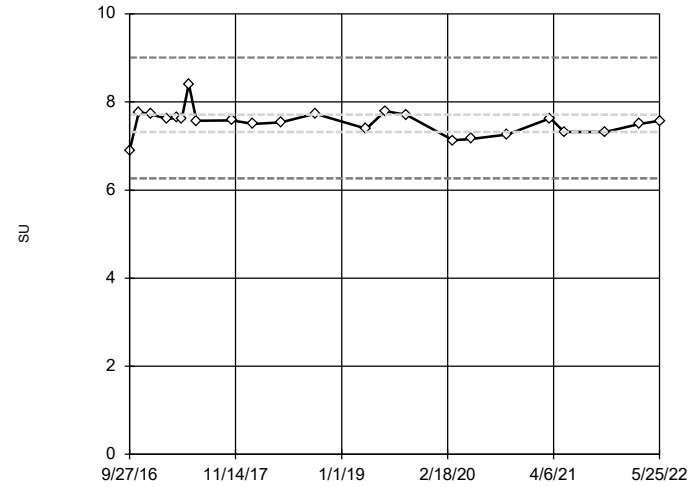


n = 23
 No outliers found.
 Tukey's method selected by user.
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 7.899, low cutoff = 4.344, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1607D

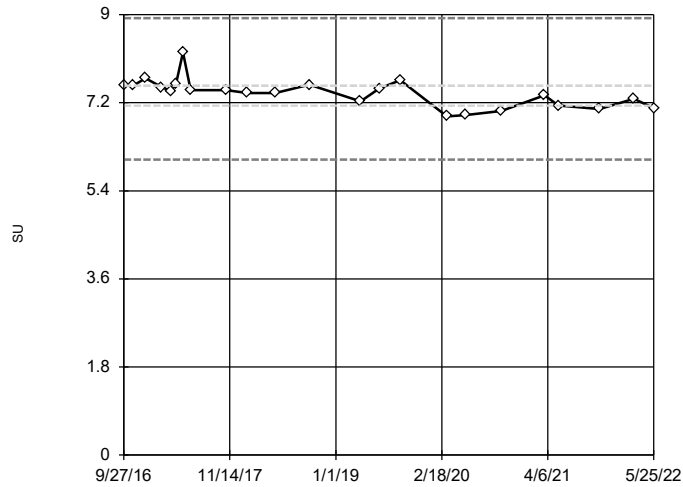


n = 23
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 9.009, low cutoff = 6.264, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1607S

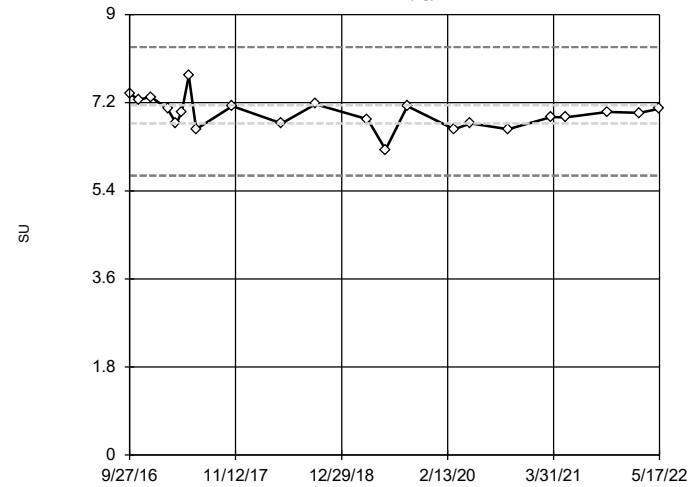


n = 23
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.927, low cutoff = 6.039, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening

MW-1608 (bg)



n = 22
 No outliers found.
 Tukey's method selected by user.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.336, low cutoff = 5.711, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/26/2023 10:27 AM View: Tukey's A3 All Wells
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

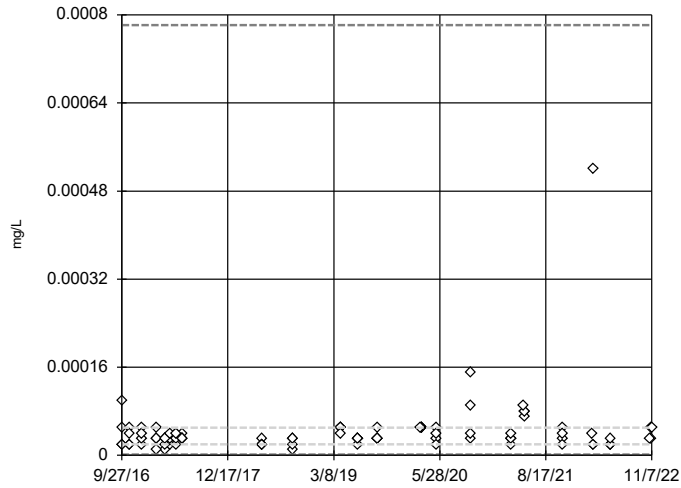
Tukey's Outlier Analysis - Upgradient Wells - All Results (No Significant)

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/30/2023, 11:28 AM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.00004261	0.00005572	ln(x)	ShapiroFrancia
Arsenic, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.0004424	0.0001293	ln(x)	ShapiroFrancia
Barium, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.03739	0.01303	ln(x)	ShapiroFrancia
Beryllium, total (mg/L)	MW-1601A,MW-1602,...	n/a	n/a	NP	NaN	80	0.00004694	0.00001091	unknown	ShapiroFrancia
Boron, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	84	0.2063	0.1366	ln(x)	ShapiroFrancia
Cadmium, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.00001489	0.000007275	ln(x)	ShapiroFrancia
Calcium, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	84	125.2	39.37	ln(x)	ShapiroFrancia
Chloride, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	84	16.05	14.47	ln(x)	ShapiroFrancia
Chromium, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.0004213	0.0004143	ln(x)	ShapiroFrancia
Cobalt, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.0001327	0.0001828	ln(x)	ShapiroFrancia
Combined Radium 226 + 228 (pCi/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.8764	0.7007	x^(1/3)	ShapiroFrancia
Fluoride, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	92	0.1765	0.06675	normal	ShapiroFrancia
Lead, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.0001639	0.0001317	x^(1/3)	ShapiroFrancia
Lithium, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.01022	0.006875	sqrt(x)	ShapiroFrancia
Mercury, total (mg/L)	MW-1601A,MW-1602,...	n/a	n/a	NP	NaN	84	0.000004881	5.5e-7	unknown	ShapiroFrancia
Molybdenum, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.001085	0.0007304	x^(1/3)	ShapiroFrancia
Selenium, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.0007501	0.000719	x^(1/3)	ShapiroFrancia
Sulfate, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	84	243.2	128.7	x^(1/3)	ShapiroFrancia
Thallium, total (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	88	0.0001267	0.00008421	ln(x)	ShapiroFrancia
Total Dissolved Solids [TDS] (mg/L)	MW-1601A,MW-1602,...	No	n/a	NP	NaN	84	610.7	186.3	x^(1/3)	ShapiroFrancia

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

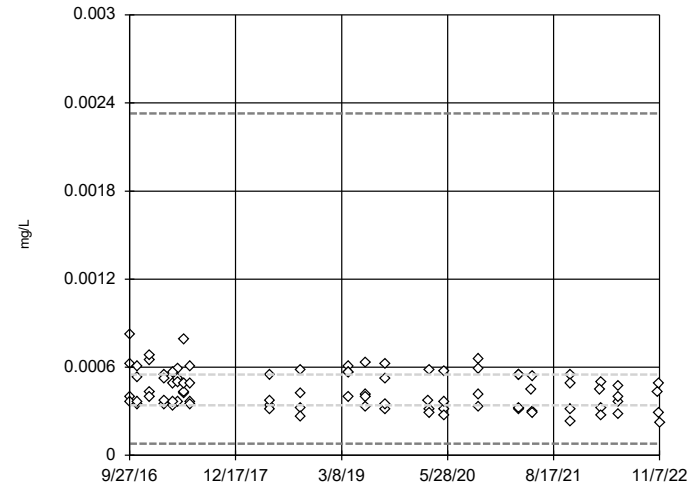


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.0007812,
 low cutoff = 0.00000128,
 based on IQR multiplier of 3.

Constituent: Antimony, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

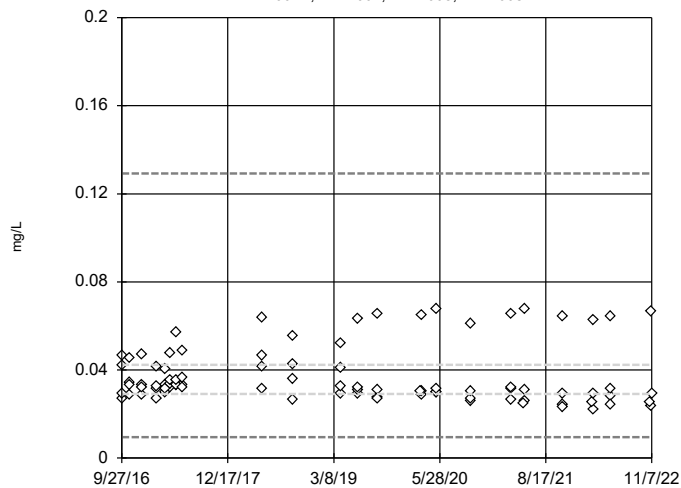


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.002328,
 low cutoff = 0.00008032,
 based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

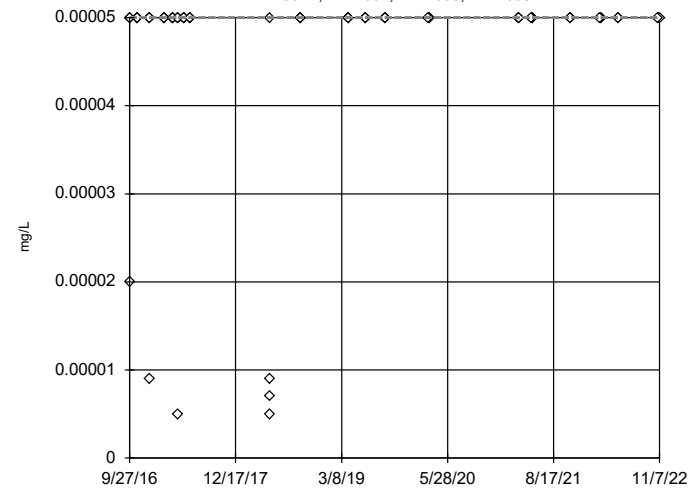


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.1292,
 low cutoff = 0.00954,
 based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

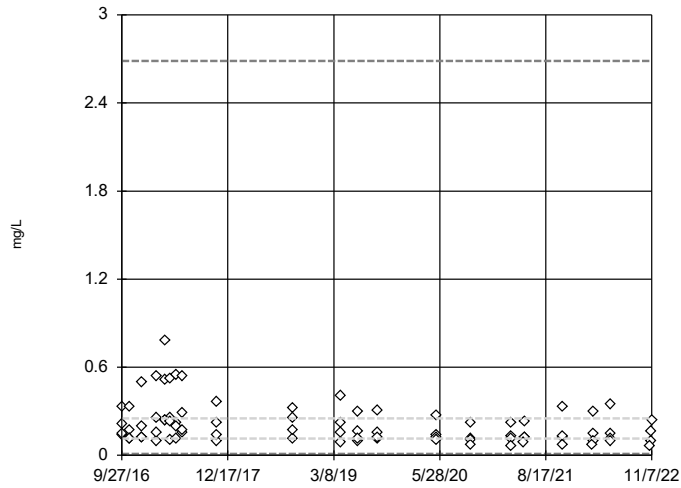


n = 80
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

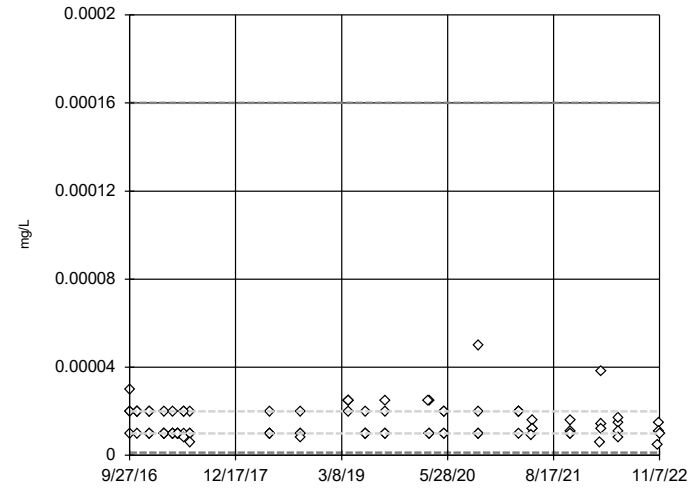


n = 84
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 2.686, low cutoff = 0.01074, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

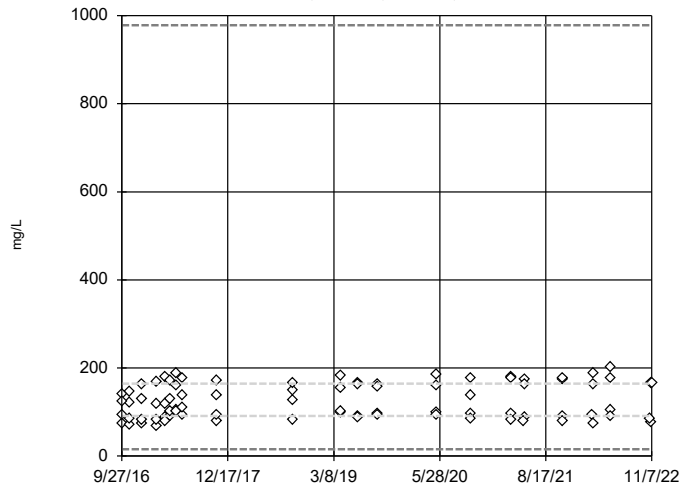


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.00016, low cutoff = 0.00000125, based on IQR multiplier of 3.

Constituent: Cadmium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

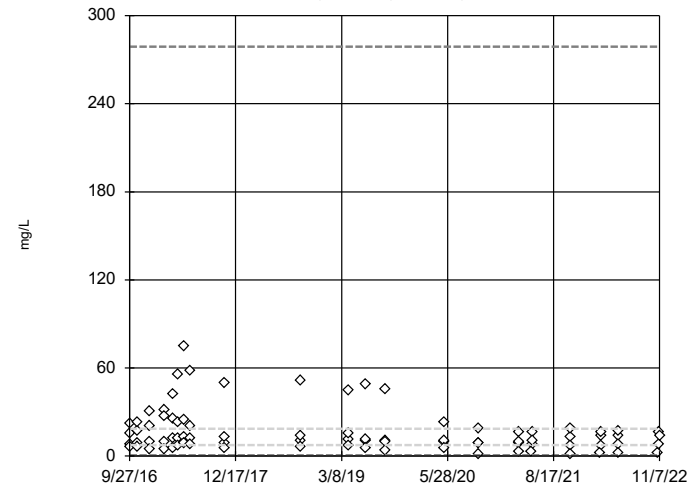


n = 84
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 978.1, low cutoff = 15.27, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

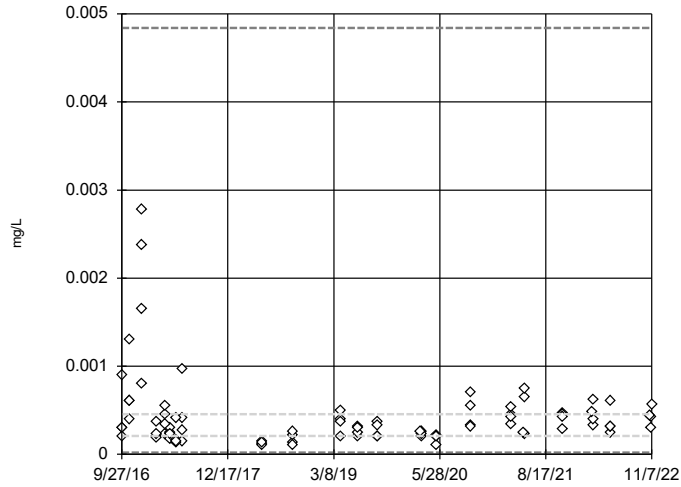


n = 84
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 279, low cutoff = 0.4997, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

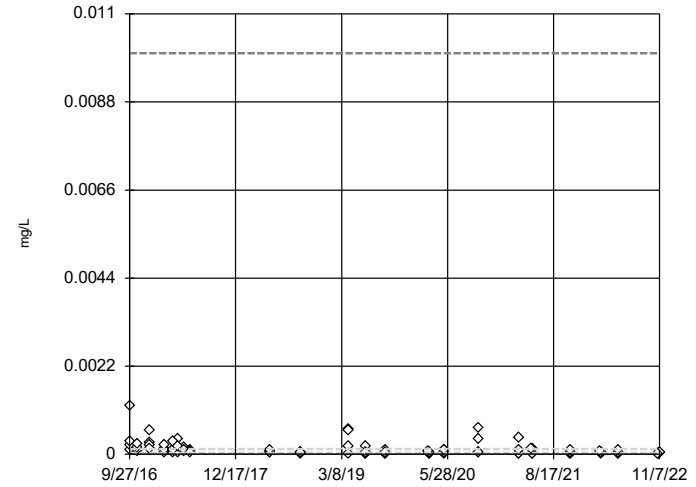


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.004841, low cutoff = 0.00001955, based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

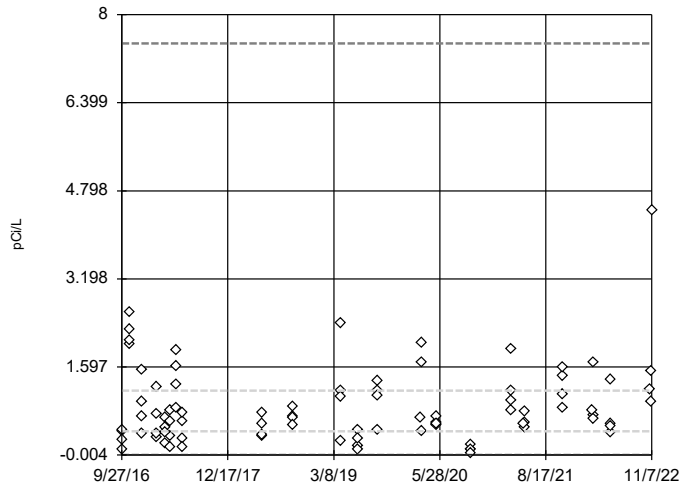


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.01001, low cutoff = 4.2e-7, based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

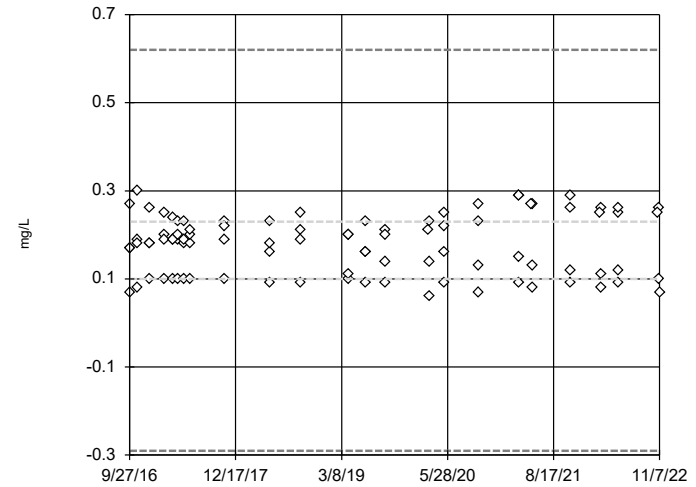


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 7.477, low cutoff = -0.003281, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

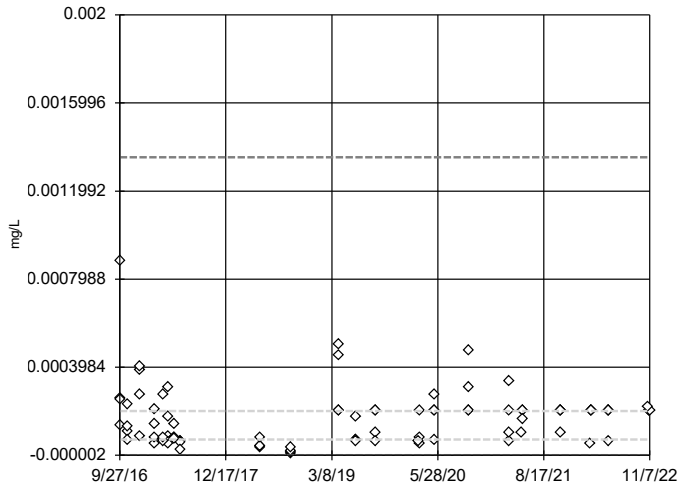


n = 92
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 0.62, low cutoff = -0.29, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

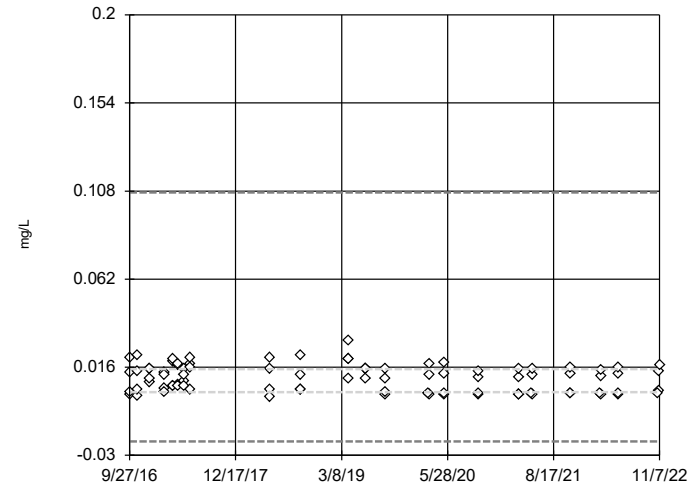


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.001352,
 low cutoff = -0.00001325,
 based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

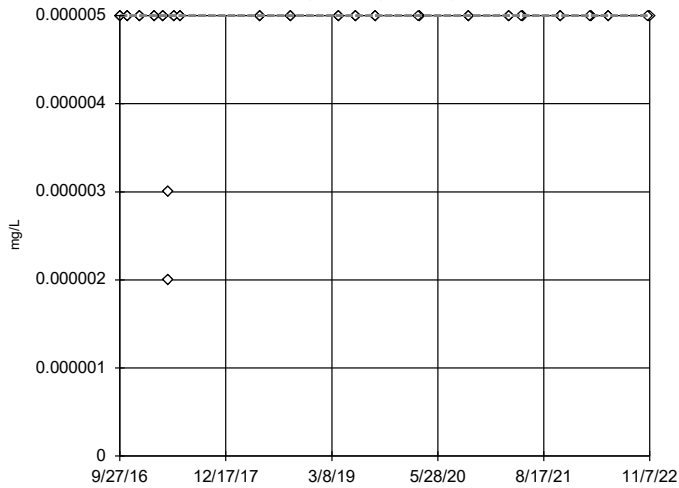


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.1073,
 low cutoff = -0.02278,
 based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

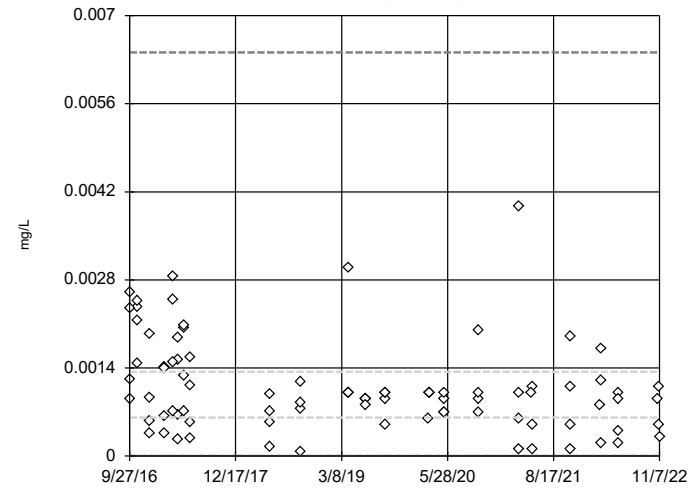


n = 84
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

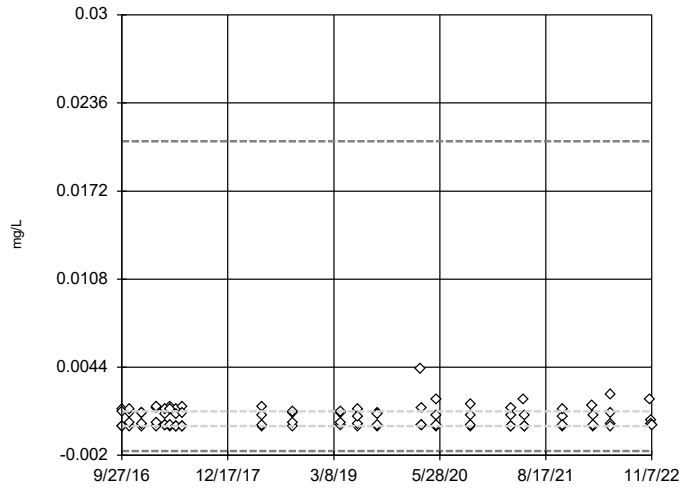


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.006413,
 low cutoff = 8.5e-7, based on IQR multiplier of 3.

Constituent: Molybdenum, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

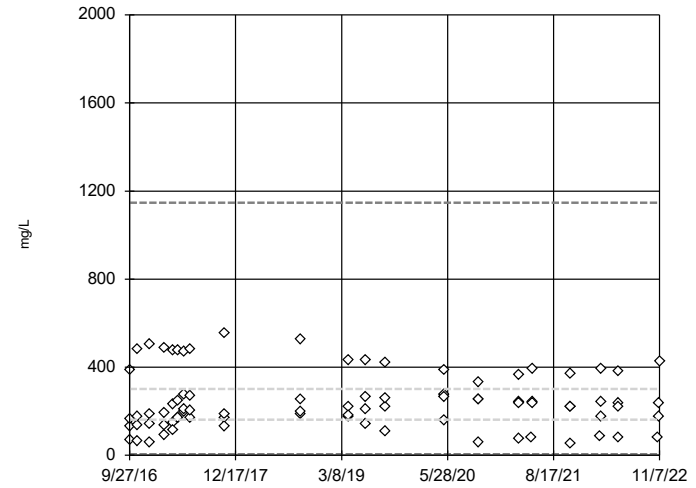


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.02082, low cutoff = -0.001678, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

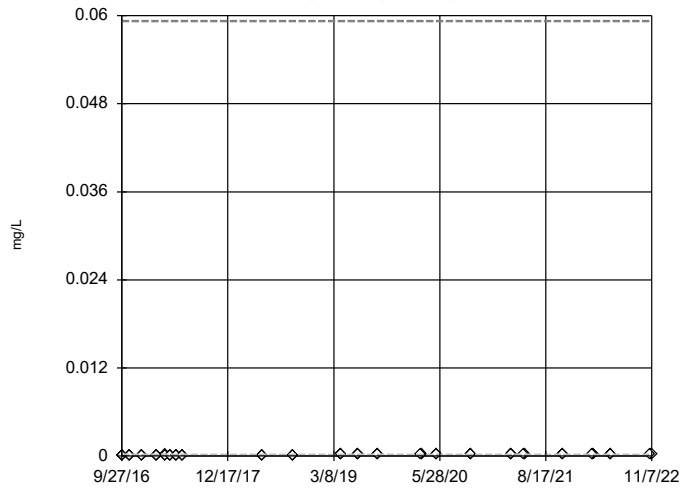


n = 84
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1148, low cutoff = 4.886, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608

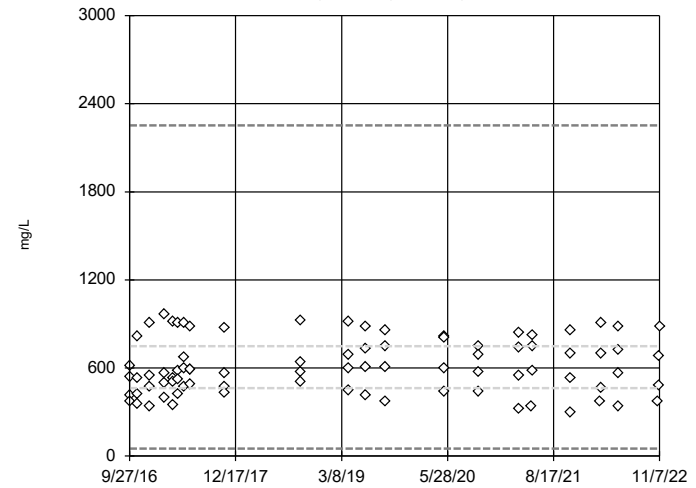


n = 88
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.05926, low cutoff = 1.0e-7, based on IQR multiplier of 3.

Constituent: Thallium, total Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Tukey's Outlier Screening, Pooled Background

MW-1601A,MW-1602,MW-1603,MW-1608



n = 84
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 2253, low cutoff = 51.31, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/30/2023 11:27 AM View: Outlier Tests
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE D
Mann-Whitney

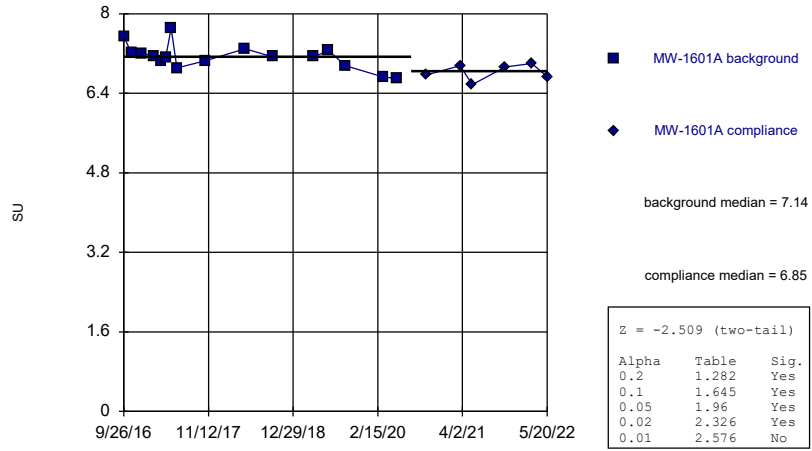
Mann-Whitney Test - All Results (No Significant)

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/26/2023, 2:30 PM

<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Sig.</u>	<u>Method</u>
pH, field (SU)	MW-1601A (bg)	-2.509	No	No	Mann-W
pH, field (SU)	MW-1602 (bg)	-0.7003	No	No	Mann-W
pH, field (SU)	MW-1603 (bg)	-1.254	No	No	Mann-W
pH, field (SU)	MW-1604D	-2.277	No	No	Mann-W
pH, field (SU)	MW-1604S	-0.1051	No	No	Mann-W
pH, field (SU)	MW-1605D	-1.107	No	No	Mann-W
pH, field (SU)	MW-1605S	-0.9118	No	No	Mann-W
pH, field (SU)	MW-1606D	-2.14	No	No	Mann-W
pH, field (SU)	MW-1606S	-0.9457	No	No	Mann-W
pH, field (SU)	MW-1607D	-1.365	No	No	Mann-W
pH, field (SU)	MW-1607S	-2.546	No	No	Mann-W
pH, field (SU)	MW-1608 (bg)	-0.6648	No	No	Mann-W

Mann-Whitney (Wilcoxon Rank Sum)

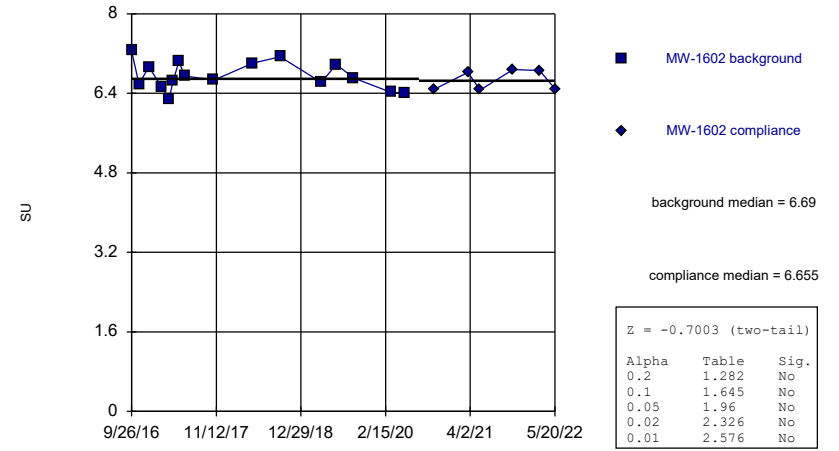
MW-1601A (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

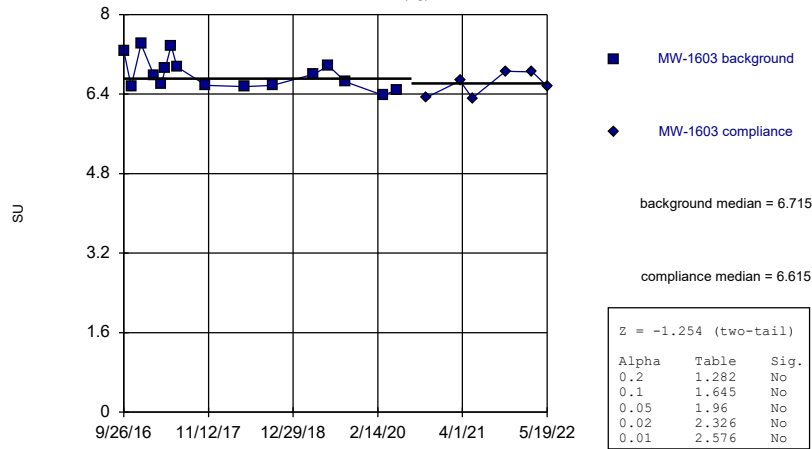
MW-1602 (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

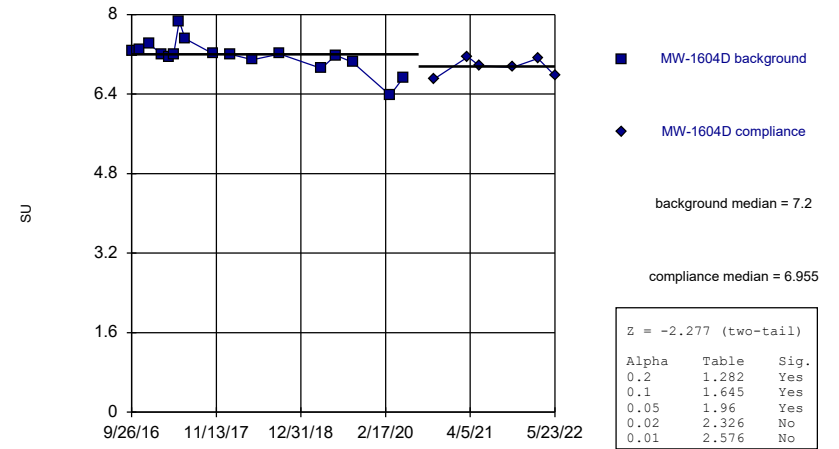
MW-1603 (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

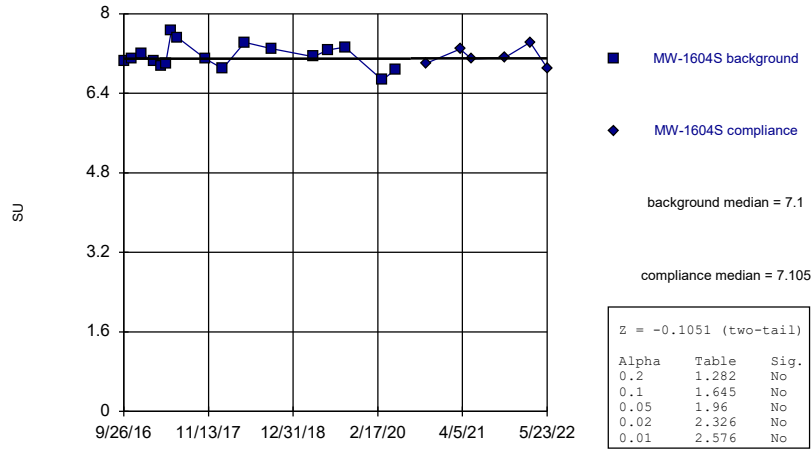
MW-1604D



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

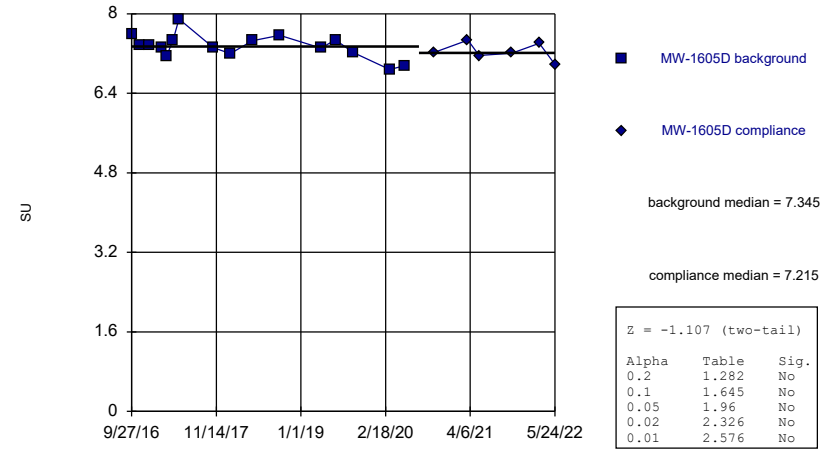
MW-1604S



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

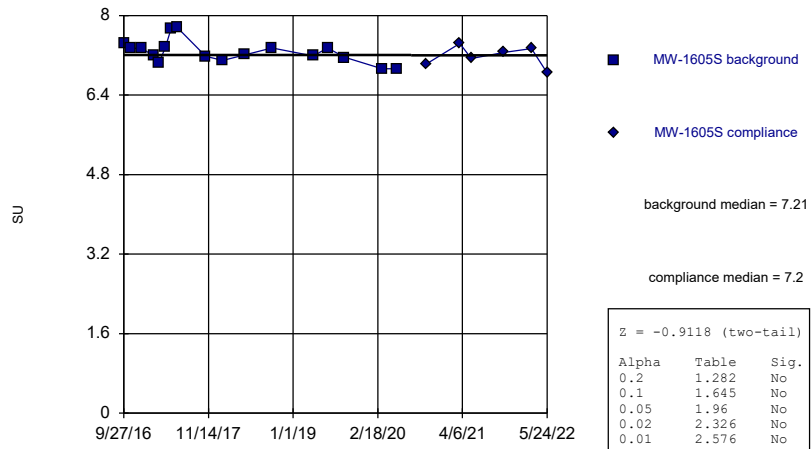
MW-1605D



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

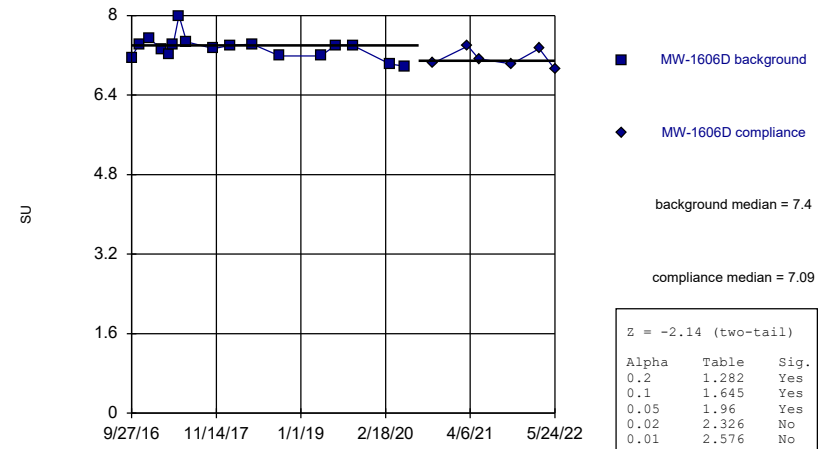
MW-1605S



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

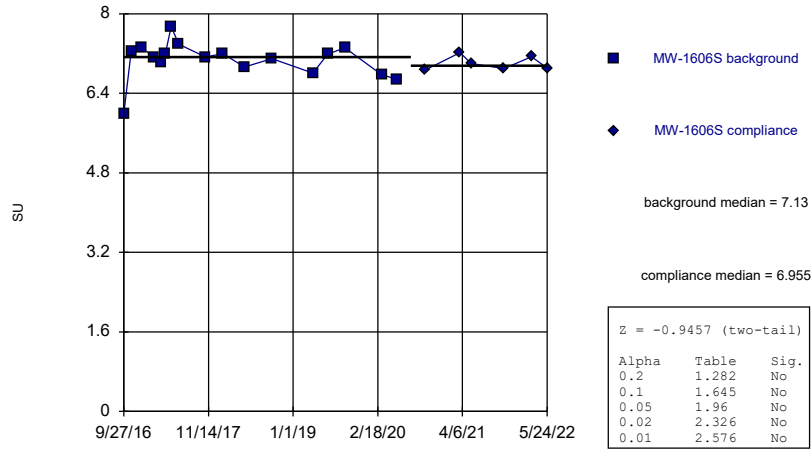
MW-1606D



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

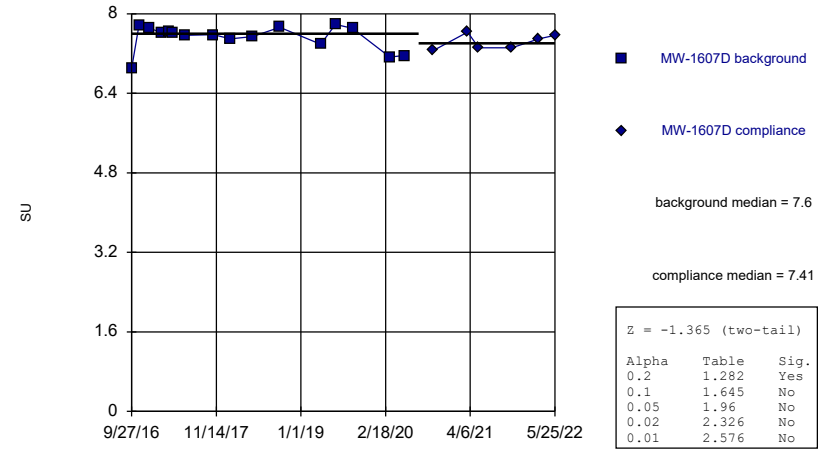
MW-1606S



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

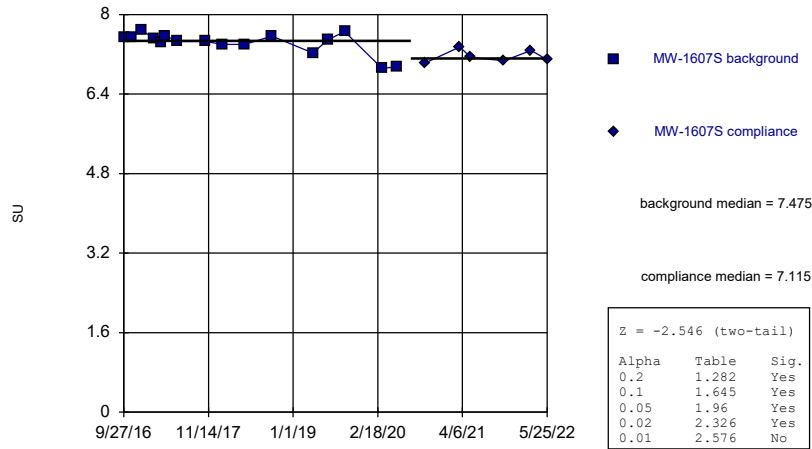
MW-1607D



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

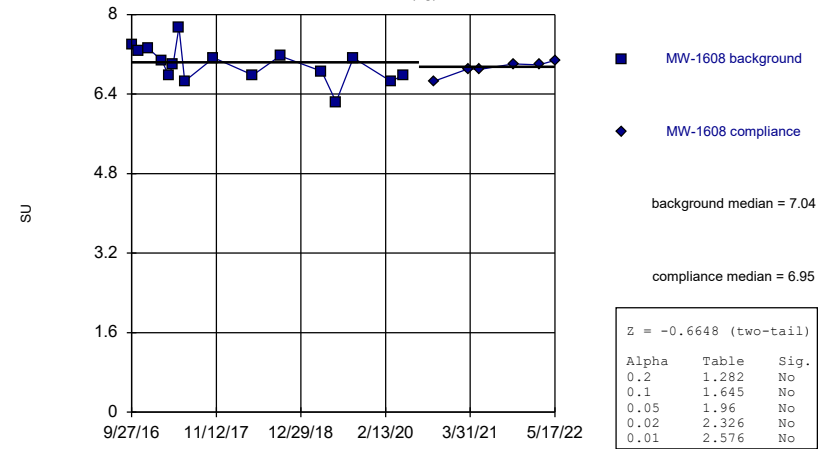
MW-1607S



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Mann-Whitney (Wilcoxon Rank Sum)

MW-1608 (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:30 PM View: Mann Whitney
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE E
Intrawell PL

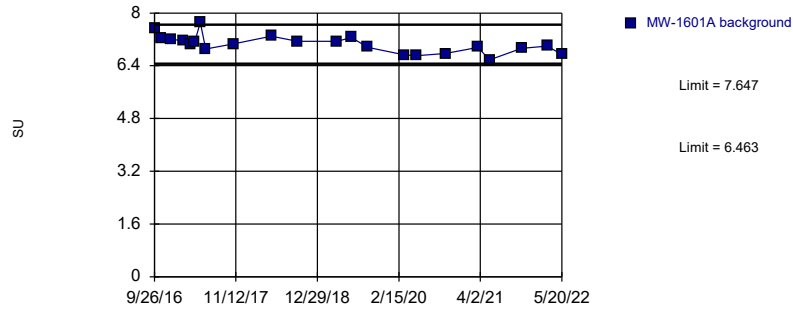
Intrawell Prediction Limits - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/30/2023, 11:42 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
pH, field (SU)	MW-1601A	7.647	6.463	n/a	1 future	n/a	22	7.055	0.2718	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1602	7.298	6.157	n/a	1 future	n/a	22	6.727	0.2621	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1603	7.425	6.072	n/a	1 future	n/a	22	6.748	0.3108	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1604D	7.763	6.458	n/a	1 future	n/a	23	7.11	0.3018	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1604S	7.653	6.64	n/a	1 future	n/a	23	7.147	0.2342	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1605D	7.823	6.818	n/a	1 future	n/a	22	7.32	0.2308	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1605S	7.744	6.752	n/a	1 future	n/a	23	7.248	0.2295	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1606D	7.8	6.79	n/a	1 future	n/a	23	7.295	0.2336	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1606S	7.764	6.343	n/a	1 future	n/a	23	7.053	0.3287	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1607D	8.004	6.993	n/a	1 future	n/a	22	7.499	0.2322	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1607S	7.864	6.849	n/a	1 future	n/a	22	7.356	0.2331	0	None	No	0.0004701	Param Intra 1 of 2
pH, field (SU)	MW-1608	7.661	6.297	n/a	1 future	n/a	22	6.979	0.3133	0	None	No	0.0004701	Param Intra 1 of 2

Prediction Limit

Intrawell Parametric, MW-1601A (bg)

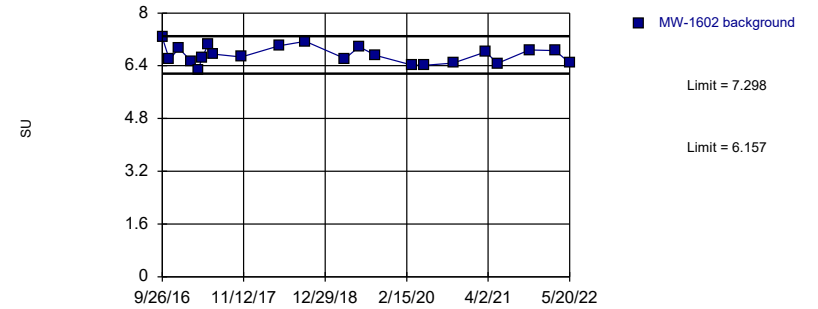


Background Data Summary: Mean=7.055, Std. Dev.=0.2718, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9655, critical = 0.878. Kappa = 2.177 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1602 (bg)

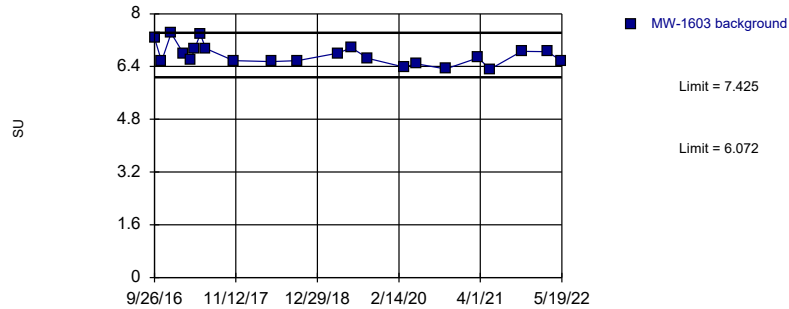


Background Data Summary: Mean=6.727, Std. Dev.=0.2621, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9756, critical = 0.878. Kappa = 2.177 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1603 (bg)

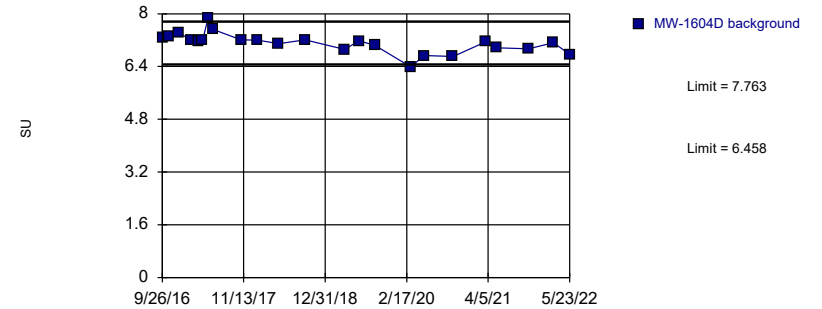


Background Data Summary: Mean=6.748, Std. Dev.=0.3108, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9217, critical = 0.878. Kappa = 2.177 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1604D

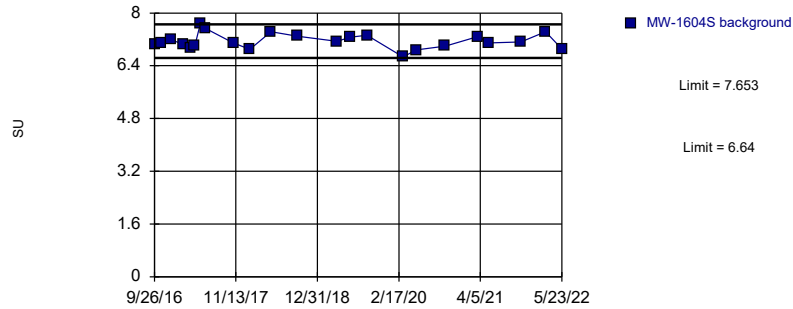


Background Data Summary: Mean=7.11, Std. Dev.=0.3018, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9513, critical = 0.881. Kappa = 2.161 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1604S

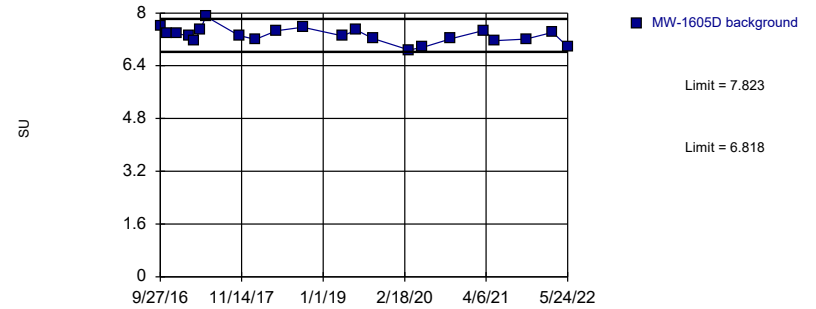


Background Data Summary: Mean=7.147, Std. Dev.=0.2342, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9799, critical = 0.881. Kappa = 2.161 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1605D

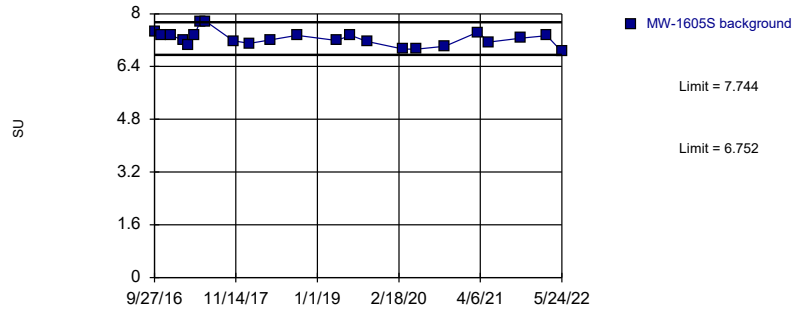


Background Data Summary: Mean=7.32, Std. Dev.=0.2308, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9705, critical = 0.878. Kappa = 2.177 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1605S

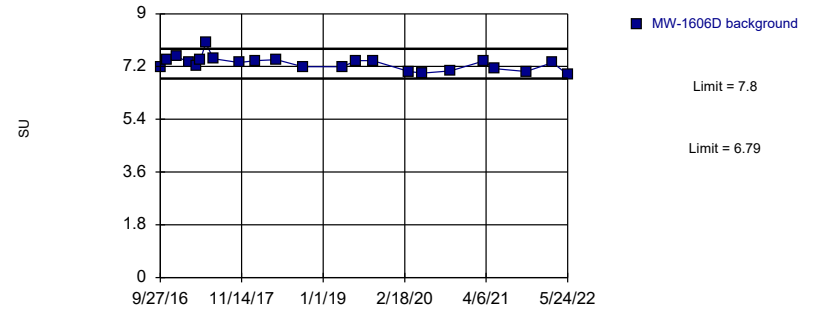


Background Data Summary: Mean=7.248, Std. Dev.=0.2295, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.95, critical = 0.881. Kappa = 2.161 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1606D

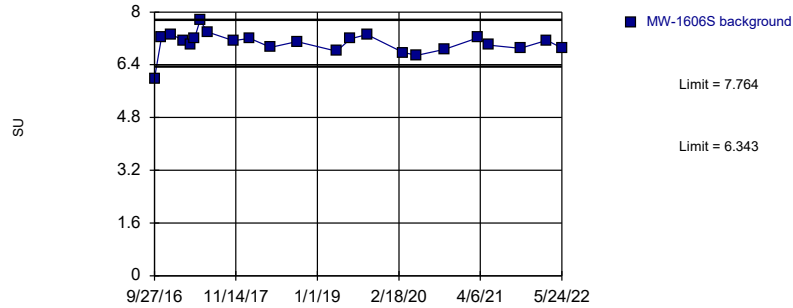


Background Data Summary: Mean=7.295, Std. Dev.=0.2336, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9113, critical = 0.881. Kappa = 2.161 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1606S

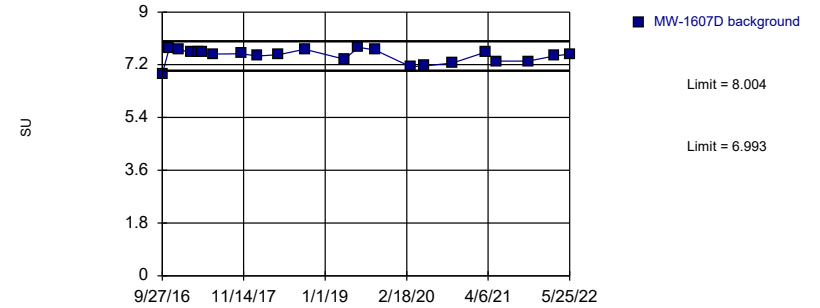


Background Data Summary: Mean=7.053, Std. Dev.=0.3287, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8956, critical = 0.881. Kappa = 2.161 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1607D

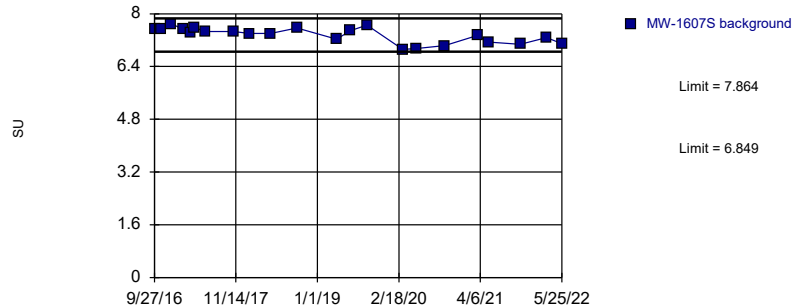


Background Data Summary: Mean=7.499, Std. Dev.=0.2322, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9134, critical = 0.878. Kappa = 2.177 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1607S

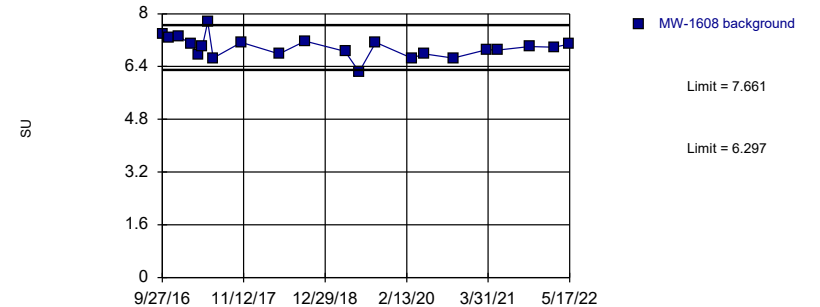


Background Data Summary: Mean=7.356, Std. Dev.=0.2331, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9323, critical = 0.878. Kappa = 2.177 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit

Intrawell Parametric, MW-1608 (bg)



Background Data Summary: Mean=6.979, Std. Dev.=0.3133, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9731, critical = 0.878. Kappa = 2.177 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/30/2023 11:41 AM View: Intrawell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE F
Trend Test (Upgradient)

Appendix III Trend Test - Upgradient Wells - Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/26/2023, 2:27 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	MW-1601A (bg)	-0.01796	-97	-87	Yes	21	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1603 (bg)	-0.03437	-82	-81	Yes	20	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1608 (bg)	-0.01759	-114	-87	Yes	21	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1601A (bg)	9.002	128	87	Yes	21	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1602 (bg)	-0.5403	-88	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1603 (bg)	-1.928	-88	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1608 (bg)	-0.7751	-110	-87	Yes	21	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1601A (bg)	-0.01361	-161	-98	Yes	23	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1602 (bg)	0.01489	184	98	Yes	23	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-1601A (bg)	-0.101	-138	-98	Yes	23	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1601A (bg)	19.27	149	87	Yes	21	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1603 (bg)	-20.63	-96	-87	Yes	21	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1601A (bg)	36.34	119	87	Yes	21	0	n/a	n/a	0.01	NP

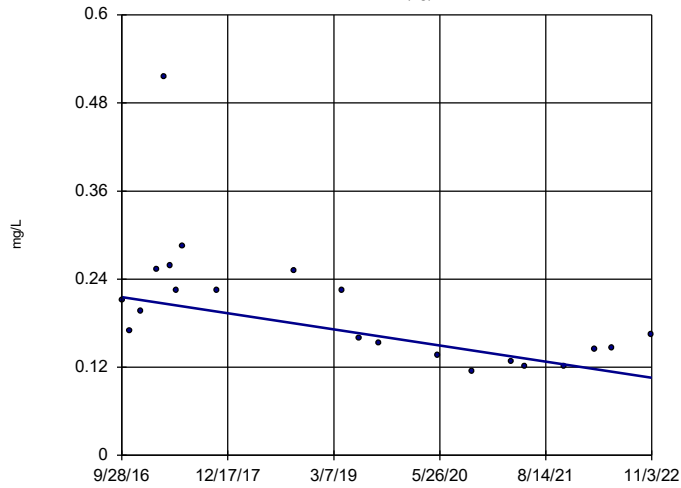
Appendix III Trend Test - Upgradient Wells - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/26/2023, 2:27 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	MW-1601A (bg)	-0.01796	-97	-87	Yes	21	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1602 (bg)	-0.001505	-30	-87	No	21	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1603 (bg)	-0.03437	-82	-81	Yes	20	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	MW-1608 (bg)	-0.01759	-114	-87	Yes	21	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1601A (bg)	9.002	128	87	Yes	21	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1602 (bg)	2.666	58	87	No	21	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1603 (bg)	2.596	39	87	No	21	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	MW-1608 (bg)	-0.995	-33	-87	No	21	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1601A (bg)	-3.489	-78	-87	No	21	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1602 (bg)	-0.5403	-88	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1603 (bg)	-1.928	-88	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	MW-1608 (bg)	-0.7751	-110	-87	Yes	21	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1601A (bg)	-0.01361	-161	-98	Yes	23	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1602 (bg)	0.01489	184	98	Yes	23	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1603 (bg)	-0.002205	-78	-98	No	23	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	MW-1608 (bg)	0	-7	-98	No	23	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-1601A (bg)	-0.101	-138	-98	Yes	23	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-1602 (bg)	-0.02861	-36	-98	No	23	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-1603 (bg)	-0.06053	-67	-98	No	23	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-1608 (bg)	-0.04435	-49	-98	No	23	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1601A (bg)	19.27	149	87	Yes	21	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1602 (bg)	1.721	12	87	No	21	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1603 (bg)	-20.63	-96	-87	Yes	21	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	MW-1608 (bg)	-3.663	-22	-87	No	21	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1601A (bg)	36.34	119	87	Yes	21	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1602 (bg)	11.01	43	87	No	21	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1603 (bg)	-5.282	-24	-87	No	21	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-1608 (bg)	-5.288	-21	-87	No	21	0	n/a	n/a	0.01	NP

Sen's Slope Estimator

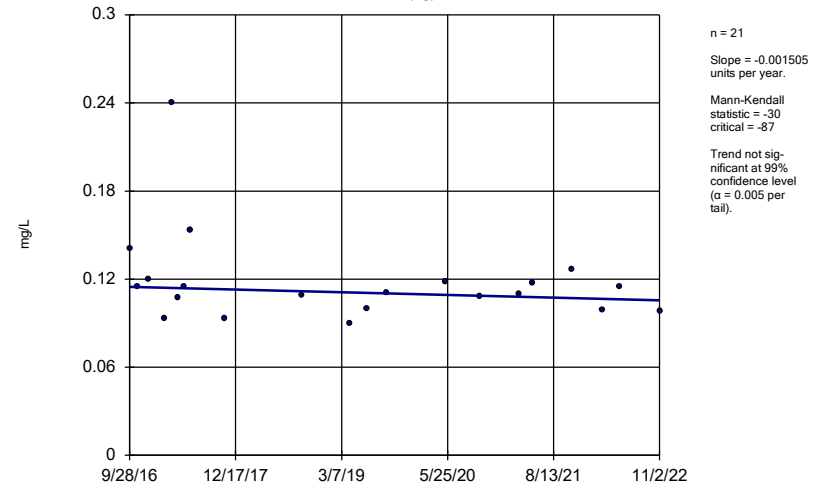
MW-1601A (bg)



Constituent: Boron, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

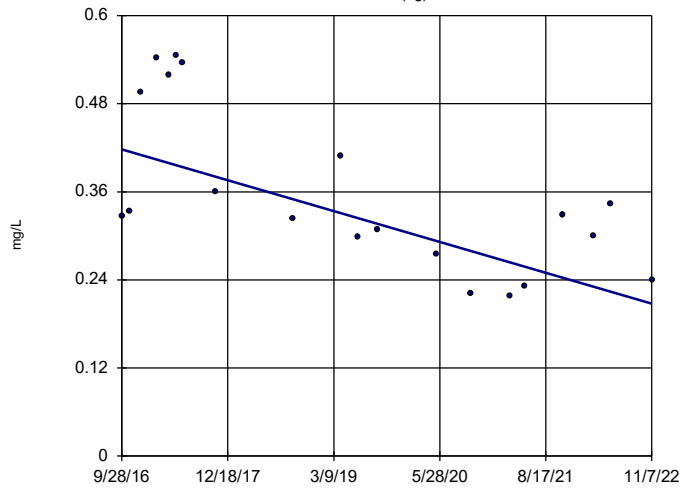
MW-1602 (bg)



Constituent: Boron, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

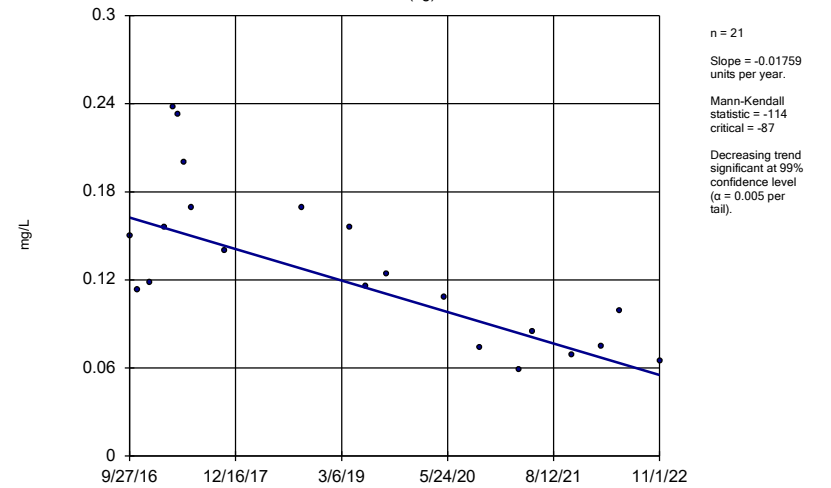
MW-1603 (bg)



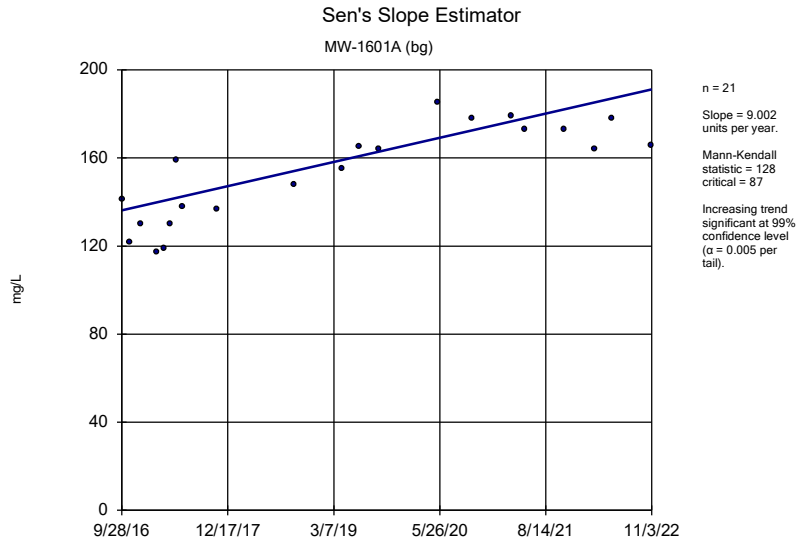
Constituent: Boron, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

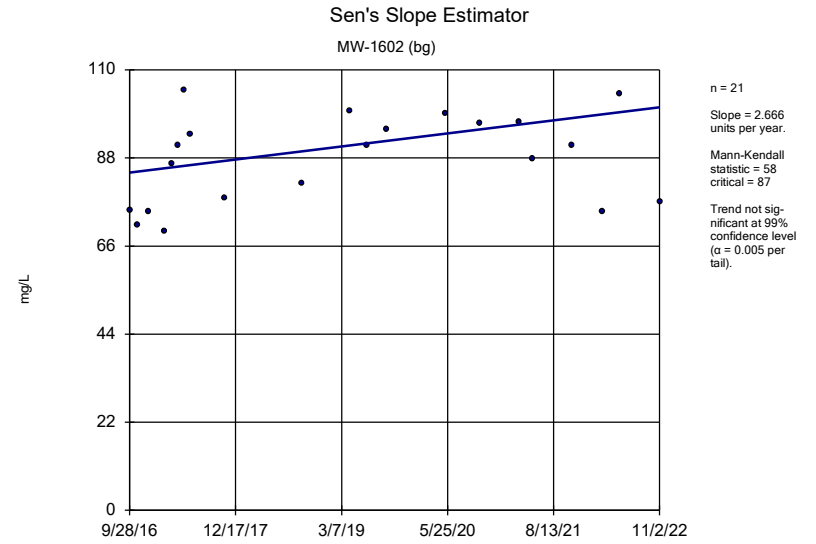
MW-1608 (bg)



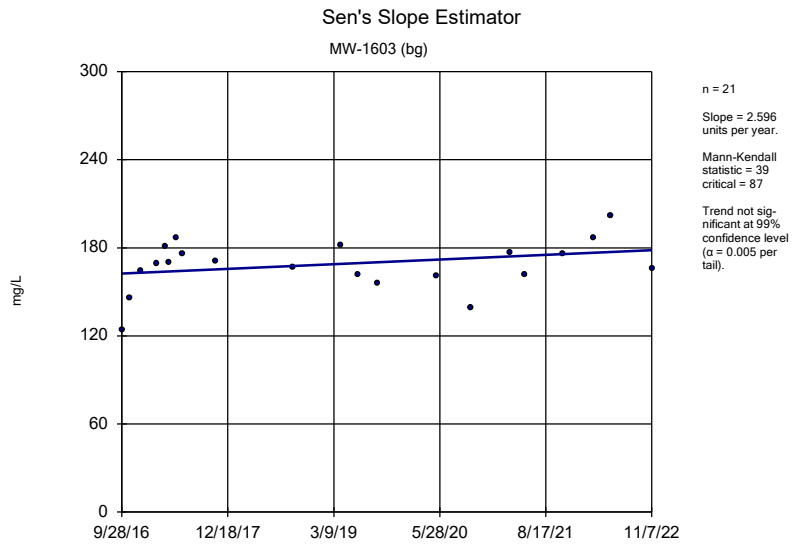
Constituent: Boron, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP



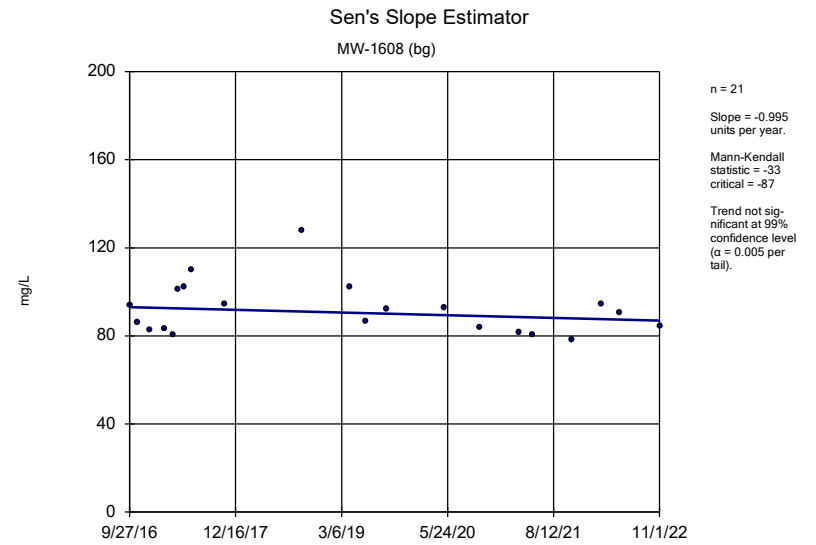
Constituent: Calcium, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP



Constituent: Calcium, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP



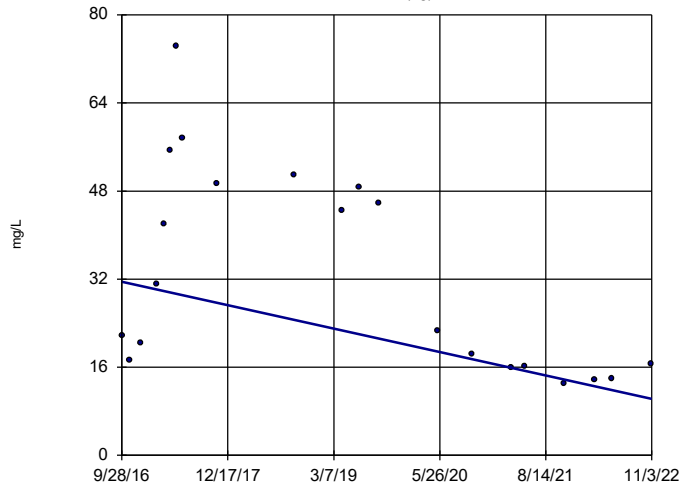
Constituent: Calcium, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP



Constituent: Calcium, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1601A (bg)

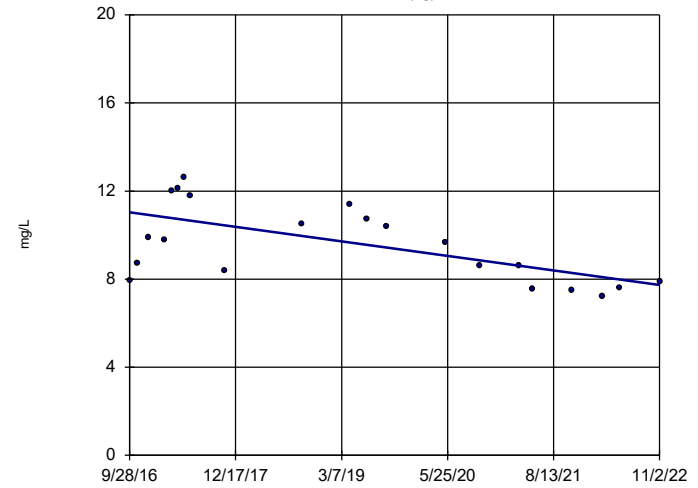


n = 21
 Slope = -3.489
 units per year.
 Mann-Kendall
 statistic = -78
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Chloride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1602 (bg)

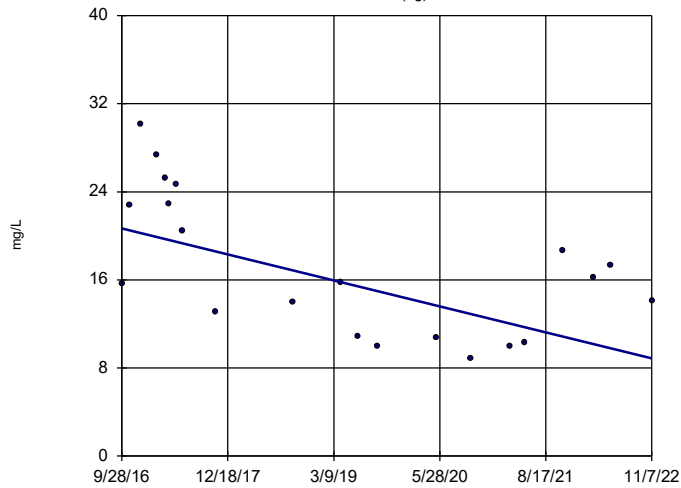


n = 21
 Slope = -0.5403
 units per year.
 Mann-Kendall
 statistic = -88
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Chloride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1603 (bg)

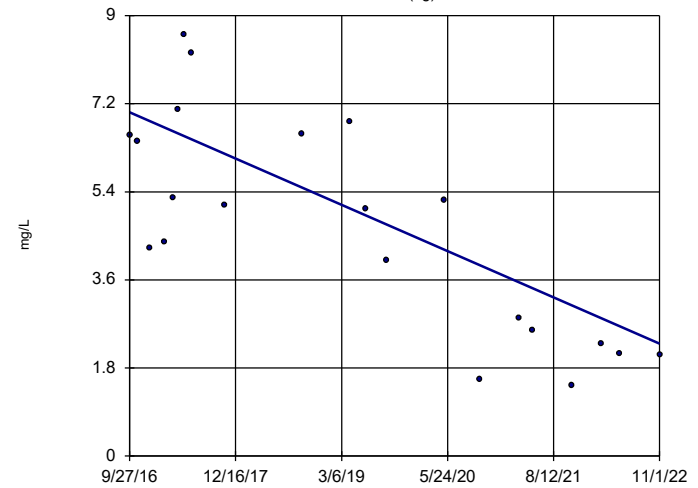


n = 21
 Slope = -1.928
 units per year.
 Mann-Kendall
 statistic = -88
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Chloride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

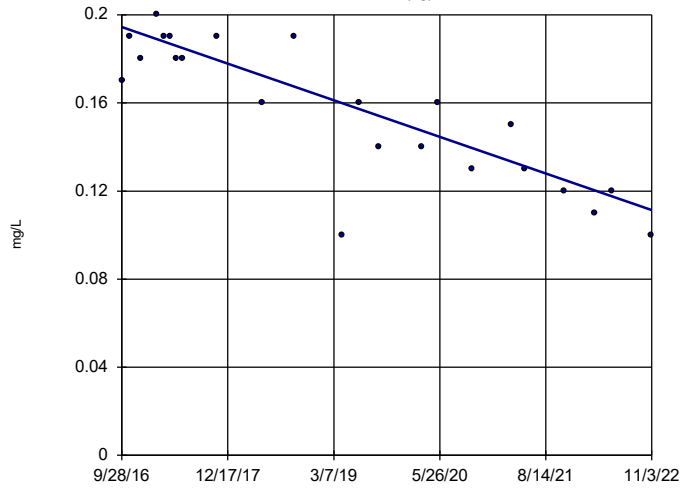


n = 21
 Slope = -0.7751
 units per year.
 Mann-Kendall
 statistic = -110
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Chloride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1601A (bg)

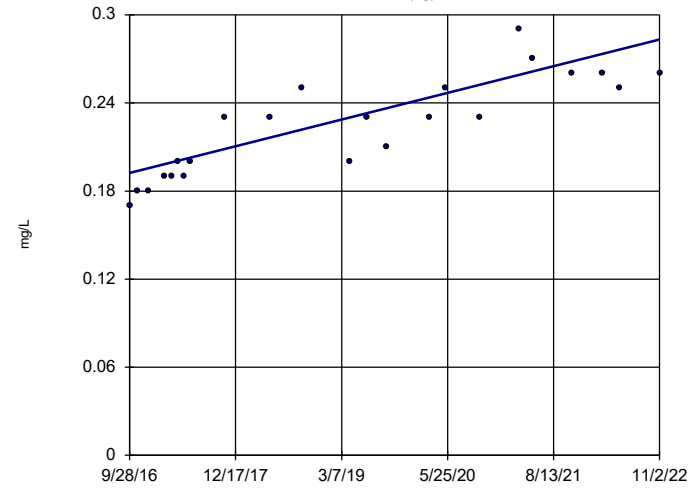


n = 23
 Slope = -0.01361
 units per year.
 Mann-Kendall
 statistic = -161
 critical = -98
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Fluoride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1602 (bg)

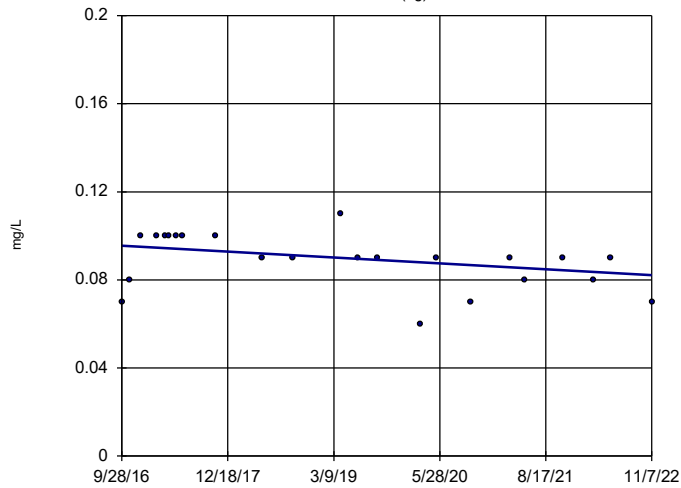


n = 23
 Slope = 0.01489
 units per year.
 Mann-Kendall
 statistic = 184
 critical = 98
 Increasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Fluoride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1603 (bg)

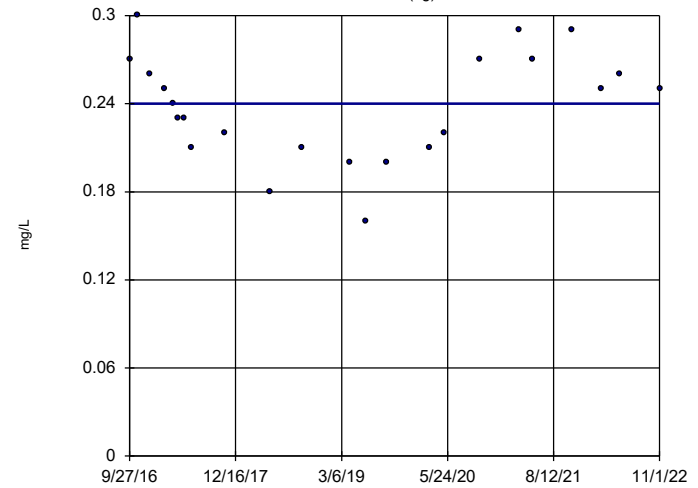


n = 23
 Slope = -0.002205
 units per year.
 Mann-Kendall
 statistic = -78
 critical = -98
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Fluoride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)

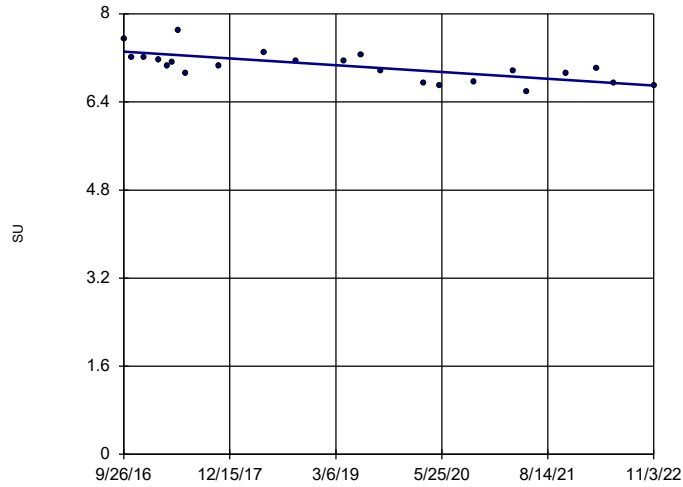


n = 23
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -7
 critical = -98
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Fluoride, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

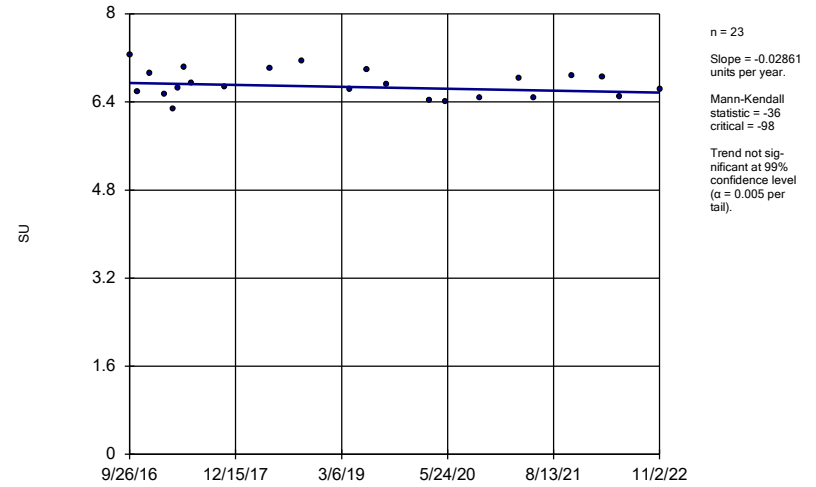
MW-1601A (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

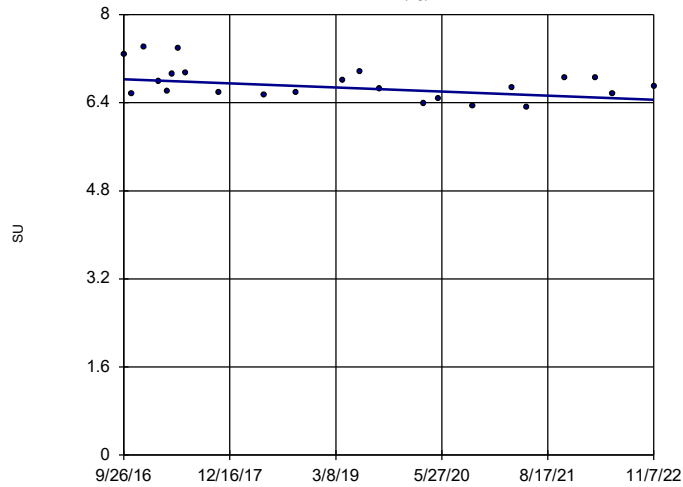
MW-1602 (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

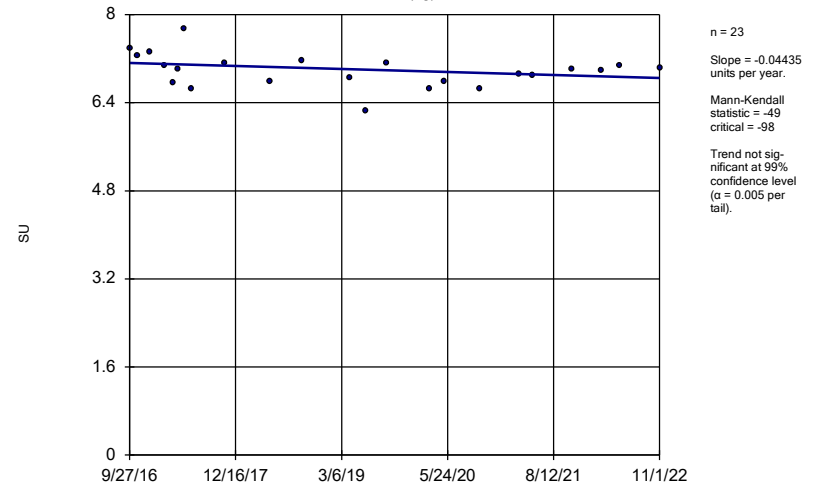
MW-1603 (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

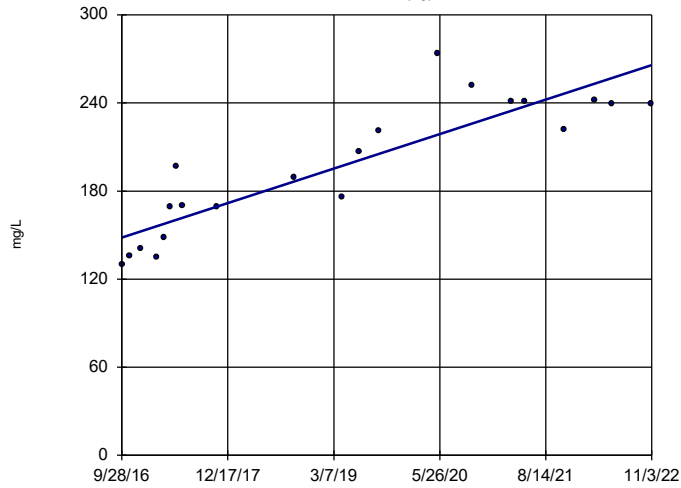
MW-1608 (bg)



Constituent: pH, field Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

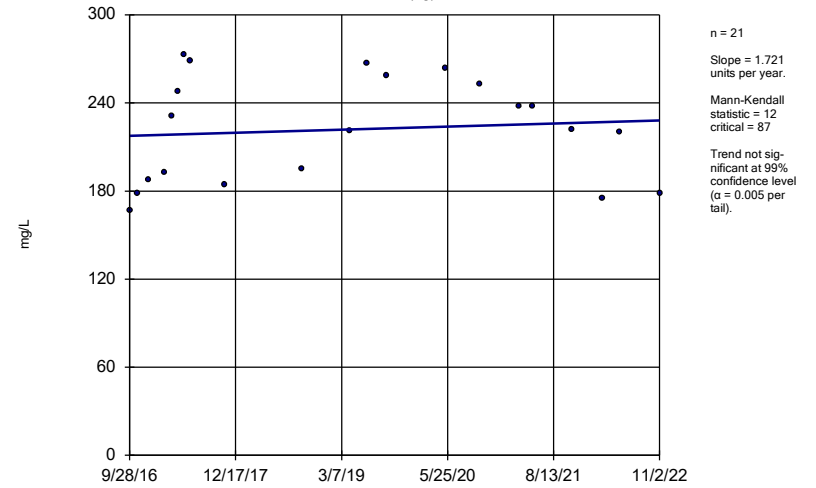
MW-1601A (bg)



Constituent: Sulfate, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

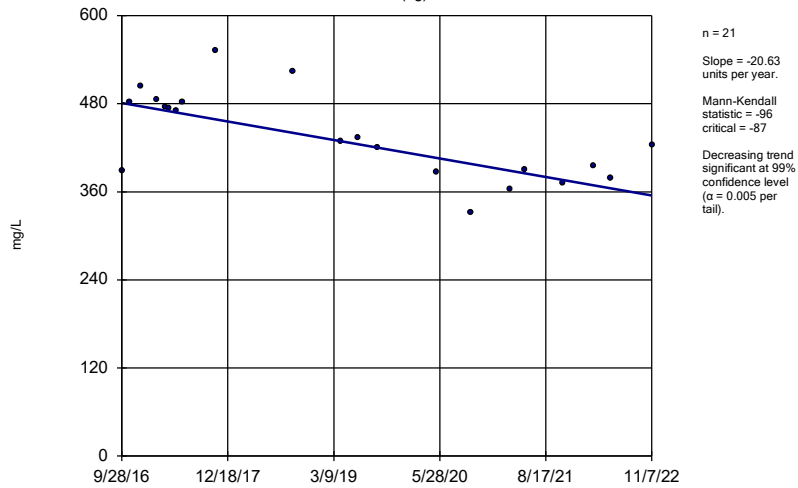
MW-1602 (bg)



Constituent: Sulfate, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

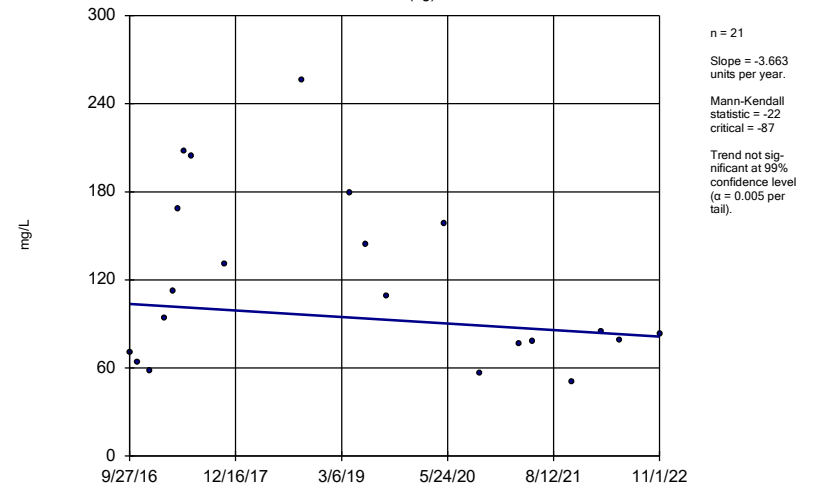
MW-1603 (bg)



Constituent: Sulfate, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

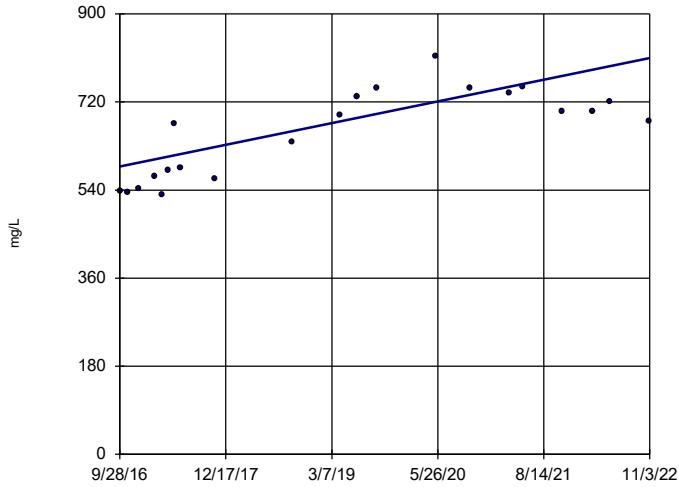
MW-1608 (bg)



Constituent: Sulfate, total Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1601A (bg)

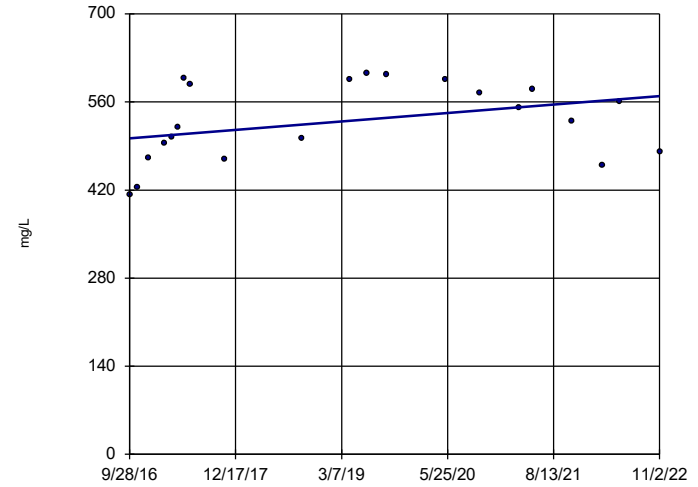


n = 21
 Slope = 36.34
 units per year.
 Mann-Kendall
 statistic = 119
 critical = 87
 Increasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1602 (bg)

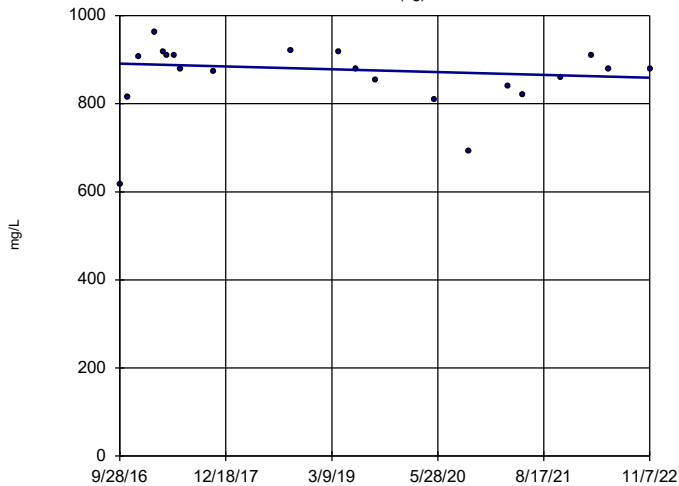


n = 21
 Slope = 11.01
 units per year.
 Mann-Kendall
 statistic = 43
 critical = 87
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1603 (bg)

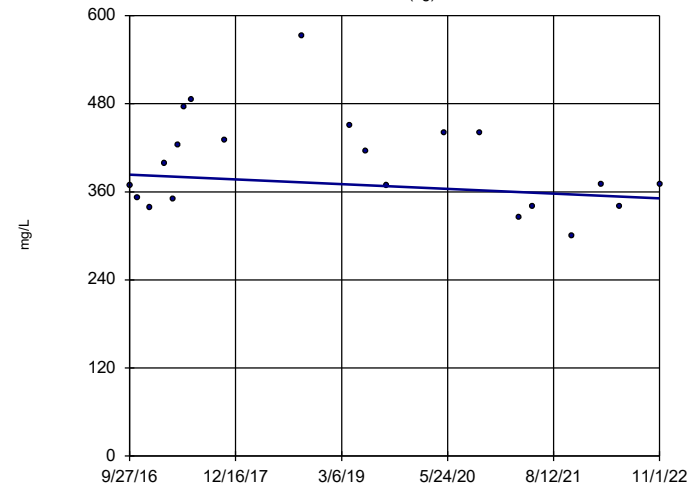


n = 21
 Slope = -5.282
 units per year.
 Mann-Kendall
 statistic = -24
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope Estimator

MW-1608 (bg)



n = 21
 Slope = -5.288
 units per year.
 Mann-Kendall
 statistic = -21
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:26 PM View: Trend Test - Upgradient
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

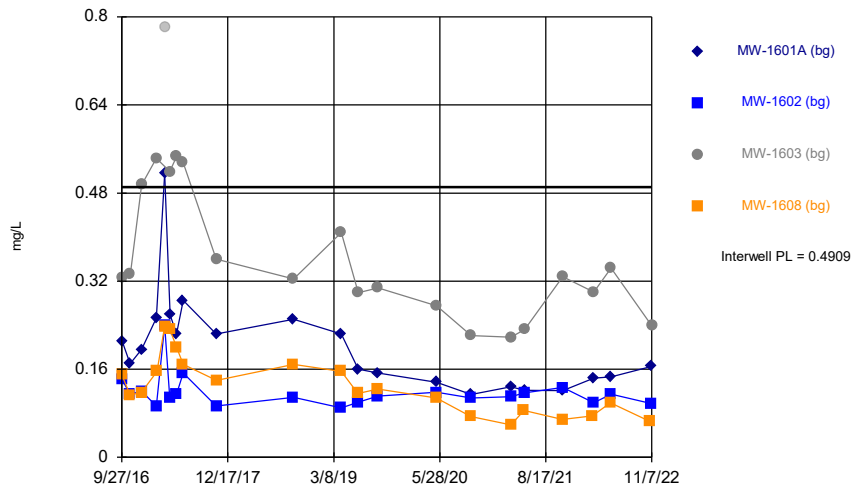
FIGURE G
Interwell PL

Interwell Prediction Limits - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/30/2023, 11:40 AM

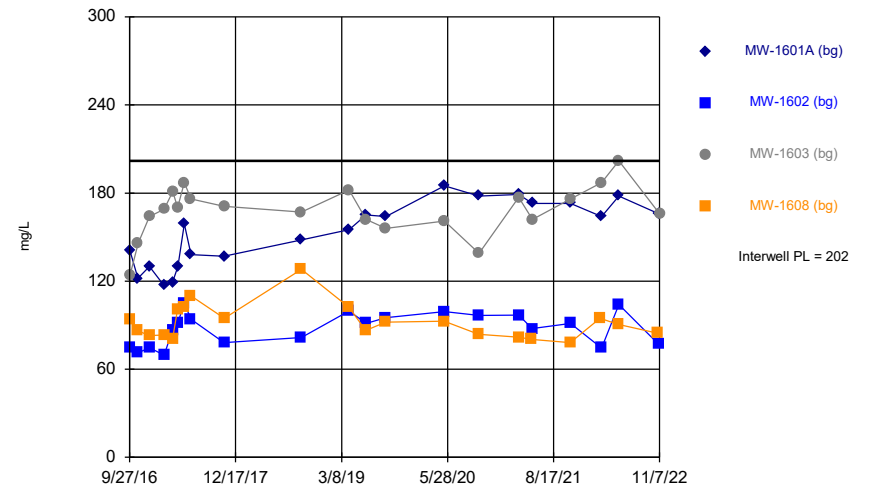
<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron, total (mg/L)	n/a	0.4909	n/a	n/a	8 future	n/a	83	-1.768	0.5472	0	None	ln(x)	0.0009403	Param Inter 1 of 2
Calcium, total (mg/L)	n/a	202	n/a	n/a	8 future	n/a	84	n/a	n/a	0	n/a	n/a	0.0002735	NP Inter (normality) 1 of 2
Chloride, total (mg/L)	n/a	57.83	n/a	n/a	8 future	n/a	84	2.442	0.837	0	None	ln(x)	0.0009403	Param Inter 1 of 2
Fluoride, total (mg/L)	n/a	0.3	n/a	n/a	8 future	n/a	92	n/a	n/a	0	n/a	n/a	0.000228	NP Inter (normality) 1 of 2
Sulfate, total (mg/L)	n/a	529.6	n/a	n/a	8 future	n/a	84	15.05	4.128	0	None	sqrt(x)	0.0009403	Param Inter 1 of 2
Total Dissolved Solids [TDS] (mg/L)	n/a	1007	n/a	n/a	8 future	n/a	84	24.42	3.786	0	None	sqrt(x)	0.0009403	Param Inter 1 of 2

Time Series



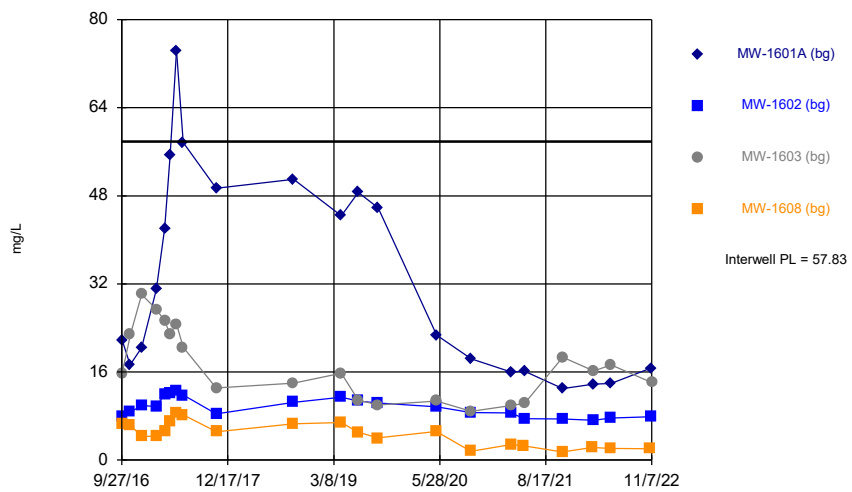
Constituent: Boron, total Analysis Run 1/26/2023 2:29 PM View: Interwell PL
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



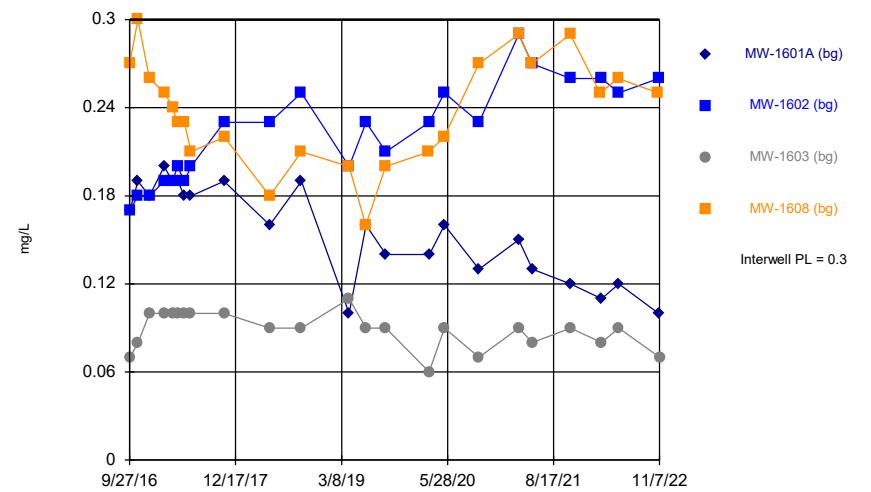
Constituent: Calcium, total Analysis Run 1/26/2023 2:29 PM View: Interwell PL
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



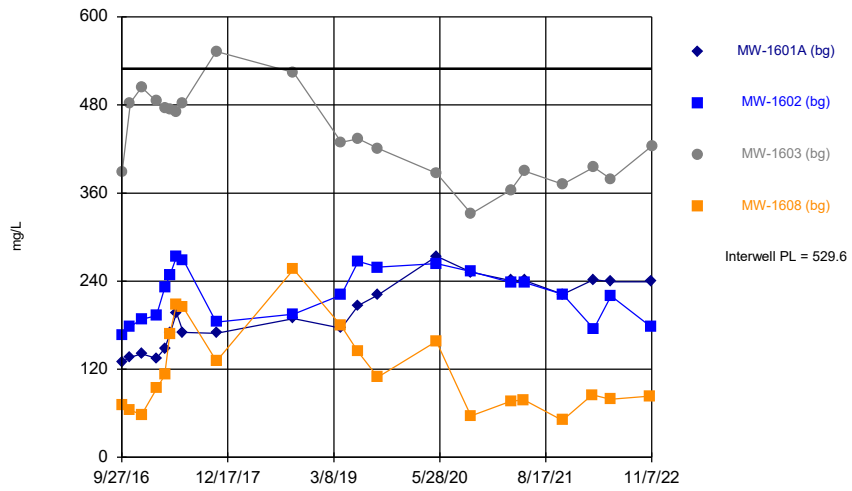
Constituent: Chloride, total Analysis Run 1/26/2023 2:29 PM View: Interwell PL
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



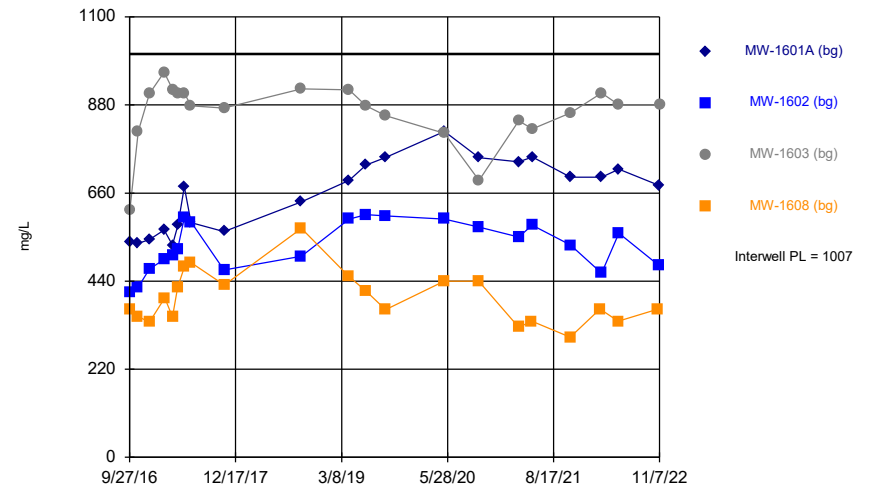
Constituent: Fluoride, total Analysis Run 1/26/2023 2:29 PM View: Interwell PL
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



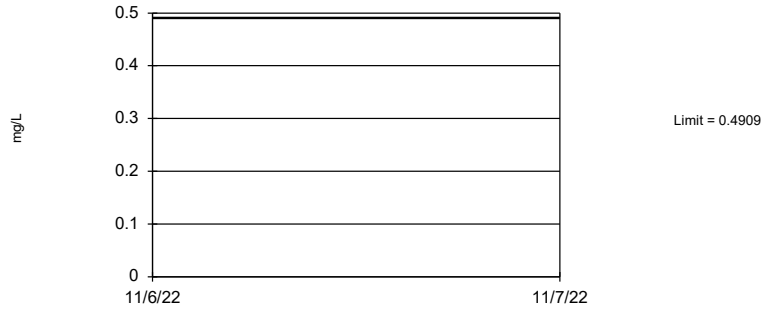
Constituent: Sulfate, total Analysis Run 1/26/2023 2:29 PM View: Interwell PL
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/26/2023 2:29 PM View: Interwell PL
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

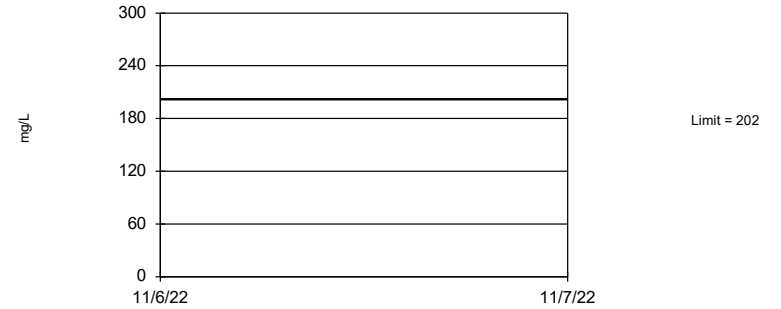
Prediction Limit Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-1.768, Std. Dev.=0.5472, n=83. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9694, critical = 0.96. Kappa = 1.931 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Assumes 8 future values.

Constituent: Boron, total Analysis Run 1/30/2023 11:39 AM View: Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

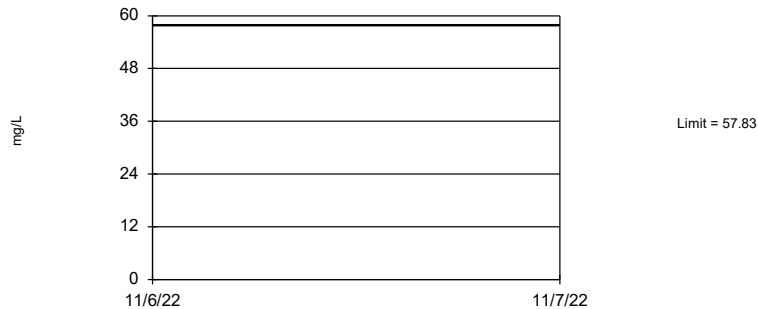
Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 84 background values. Annual per-constituent alpha = 0.004366. Individual comparison alpha = 0.0002735 (1 of 2). Assumes 8 future values.

Constituent: Calcium, total Analysis Run 1/30/2023 11:39 AM View: Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=2.442, Std. Dev.=0.837, n=84. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9813, critical = 0.96. Kappa = 1.93 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Assumes 8 future values.

Constituent: Chloride, total Analysis Run 1/30/2023 11:39 AM View: Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

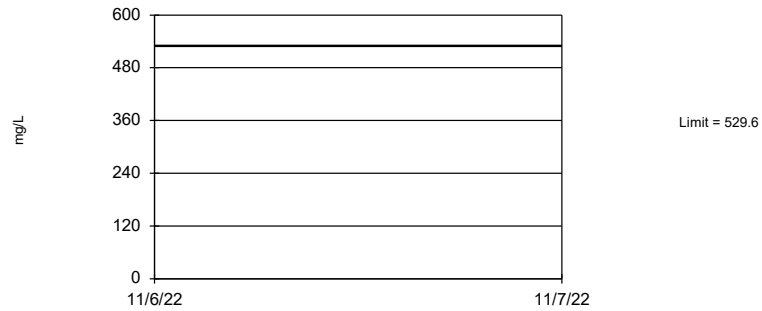
Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 92 background values. Annual per-constituent alpha = 0.003642. Individual comparison alpha = 0.000228 (1 of 2). Assumes 8 future values.

Constituent: Fluoride, total Analysis Run 1/30/2023 11:39 AM View: Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

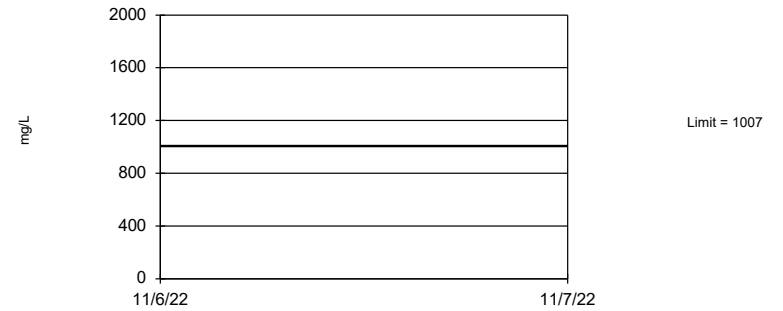
Prediction Limit Interwell Parametric



Background Data Summary (based on square root transformation): Mean=15.05, Std. Dev.=4.128, n=84. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9746, critical = 0.96. Kappa = 1.93 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Assumes 8 future values.

Constituent: Sulfate, total Analysis Run 1/30/2023 11:39 AM View: Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Prediction Limit Interwell Parametric



Background Data Summary (based on square root transformation): Mean=24.42, Std. Dev.=3.786, n=84. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9685, critical = 0.96. Kappa = 1.93 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Assumes 8 future values.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/30/2023 11:39 AM View: Interwell
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE H
UTL

Upper Tolerance Limits

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/20/2023, 3:32 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg.N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.00052	n/a	n/a	n/a	88	14.77	n/a	0.01096	NP Inter(normality)
Arsenic, total (mg/L)	n/a	0.0007143	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Barium, total (mg/L)	n/a	0.0678	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Beryllium, total (mg/L)	n/a	0.00005	n/a	n/a	n/a	80	91.25	n/a	0.01652	NP Inter(NDs)
Cadmium, total (mg/L)	n/a	0.00005	n/a	n/a	n/a	88	6.818	n/a	0.01096	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.0007382	n/a	n/a	n/a	84	1.19	sqrt(x)	0.05	Inter
Cobalt, total (mg/L)	n/a	0.0005696	n/a	n/a	n/a	88	4.545	ln(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	2.383	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	n/a	0.3	n/a	n/a	n/a	92	0	n/a	0.008924	NP Inter(normality)
Lead, total (mg/L)	n/a	0.000881	n/a	n/a	n/a	88	25	n/a	0.01096	NP Inter(normality)
Lithium, total (mg/L)	n/a	0.03	n/a	n/a	n/a	88	6.818	n/a	0.01096	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.000005	n/a	n/a	n/a	84	95.24	n/a	0.01345	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.002728	n/a	n/a	n/a	88	5.682	sqrt(x)	0.05	Inter
Selenium, total (mg/L)	n/a	0.0043	n/a	n/a	n/a	88	2.273	n/a	0.01096	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.0002	n/a	n/a	n/a	88	55.68	n/a	0.01096	NP Inter(NDs)

FIGURE I
GWPS

MOUNTAINEER BAP GWPS				
Constituent Name	MCL	CCR Rule-Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00052	0.006
Arsenic, Total (mg/L)	0.01		0.00071	0.01
Barium, Total (mg/L)	2		0.068	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00005	0.005
Chromium, Total (mg/L)	0.1		0.00074	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.00057	0.006
Combined Radium, Total (pCi/L)	5		2.38	5
Fluoride, Total (mg/L)	4		0.3	4
Lead, Total (mg/L)	0.015		0.00088	0.015
Lithium, Total (mg/L)	n/a	0.04	0.03	0.04
Mercury, Total (mg/L)	0.002		0.000005	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0028	0.1
Selenium, Total (mg/L)	0.05		0.0043	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**GWPS = Groundwater Protection Standard*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

FIGURE J
Confidence Intervals

Confidence Intervals - Assessment Monitoring - Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 2/22/2023, 10:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Arsenic, total (mg/L)	MW-1805	0.06699	0.02581	0.01	Yes	12	0.0464	0.02625	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1922D	0.8503	0.4164	0.01	Yes	12	0.6333	0.2765	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1921	0.489	0.42	0.1	Yes	12	0.4545	0.04399	0	None	No	0.01	Param.

Confidence Intervals - Assessment Monitoring - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 2/22/2023, 10:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	MW-1604D	0.0001025	0.00004549	0.006	No	22	0.00008318	0.00006082	4.545	None	x^(1/3)	0.01	Param.
Antimony, total (mg/L)	MW-1604S	0.00016	0.00004	0.006	No	22	0.0001141	0.00006602	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1605D	0.00004	0.00003	0.006	No	22	0.00003636	0.000009021	9.091	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1605S	0.00006603	0.00004343	0.006	No	22	0.00005818	0.00002856	0	None	ln(x)	0.01	Param.
Antimony, total (mg/L)	MW-1606D	0.00019	0.00014	0.006	No	22	0.0001655	0.00002841	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1606S	0.0001557	0.0001425	0.006	No	22	0.0001491	0.00001231	0	None	No	0.01	Param.
Antimony, total (mg/L)	MW-1607D	0.00004	0.00003	0.006	No	22	0.00003409	0.00001008	4.545	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1607S	0.0004656	0.0004239	0.006	No	21	0.0004448	0.00003776	0	None	No	0.01	Param.
Antimony, total (mg/L)	JTMN-1	0.0001324	0.00004097	0.006	No	6	0.00008667	0.00003327	0	None	No	0.01	Param.
Antimony, total (mg/L)	JTMN-2	0.00014	0.00005	0.006	No	6	0.00007167	0.0000343	0	None	No	0.0155	NP (normality)
Antimony, total (mg/L)	MW-107	0.0001	0.00002	0.006	No	12	0.0000525	0.00003671	33.33	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-112	0.0000637	0.0000163	0.006	No	5	0.000064	0.00003507	40	Kaplan-Meier	No	0.01	Param.
Antimony, total (mg/L)	MW-1805	0.00214	0.00003	0.006	No	12	0.0002383	0.0005996	25	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1921	0.0001238	0.000092	0.006	No	12	0.0001083	0.00002167	0	None	x^(1/3)	0.01	Param.
Antimony, total (mg/L)	MW-1922S	0.0001	0.00002	0.006	No	12	0.00006667	0.00003525	41.67	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1923	0.0002255	0.0001795	0.006	No	12	0.0002025	0.00002927	0	None	No	0.01	Param.
Antimony, total (mg/L)	MW-1924	0.00011	0.00005	0.006	No	12	0.0000825	0.0000407	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1925	0.00021	0.00018	0.006	No	12	0.0002017	0.00002552	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1926	0.00008317	0.00005016	0.006	No	12	0.00006667	0.00002103	0	None	No	0.01	Param.
Antimony, total (mg/L)	MW-1927	0.000163	0.00008369	0.006	No	12	0.0001258	0.00006142	0	None	x^(1/3)	0.01	Param.
Antimony, total (mg/L)	MW-1929	0.0001	0.00002	0.006	No	12	0.00004167	0.00002887	16.67	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-203	0.0001	0.00003	0.006	No	11	0.00007636	0.00003414	63.64	None	No	0.006	NP (NDs)
Antimony, total (mg/L)	MW-016	0.00005144	0.00001893	0.006	No	10	0.000062	0.00003155	30	Kaplan-Meier	ln(x)	0.01	Param.
Antimony, total (mg/L)	MW-1922D	0.001483	0.0004656	0.006	No	12	0.00113	0.00124	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1604D	0.0004322	0.0003133	0.01	No	22	0.0003727	0.0001108	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1604S	0.0004029	0.0003116	0.01	No	22	0.0003573	0.00008509	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1605D	0.002886	0.002433	0.01	No	22	0.00266	0.0004226	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1605S	0.0007264	0.0004976	0.01	No	22	0.0006295	0.0002416	0	None	x^(1/3)	0.01	Param.
Arsenic, total (mg/L)	MW-1606D	0.0005389	0.0003491	0.01	No	22	0.0004755	0.000252	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1606S	0.0007901	0.0006745	0.01	No	22	0.0007323	0.0001077	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1607D	0.001643	0.001237	0.01	No	22	0.00144	0.0003783	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1607S	0.00117	0.0009	0.01	No	21	0.001053	0.0002641	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	JTMN-1	0.002757	0.00105	0.01	No	6	0.001903	0.0006214	0	None	No	0.01	Param.
Arsenic, total (mg/L)	JTMN-2	0.001284	0.0007357	0.01	No	6	0.00101	0.0001997	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-107	0.0005485	0.0002995	0.01	No	12	0.0004392	0.0002212	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-112	0.0004338	0.0003062	0.01	No	5	0.00037	0.00003808	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1805	0.06699	0.02581	0.01	Yes	12	0.0464	0.2625	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1921	0.00161	0.00114	0.01	No	12	0.001438	0.000627	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1922S	0.00325	0.00179	0.01	No	12	0.002312	0.0007214	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1923	0.0009715	0.0005723	0.01	No	12	0.0007908	0.0003235	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1924	0.0009024	0.0005242	0.01	No	12	0.0007225	0.0002696	0	None	x^(1/3)	0.01	Param.
Arsenic, total (mg/L)	MW-1925	0.0005486	0.000297	0.01	No	12	0.0004275	0.0001765	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1926	0.00038	0.0003	0.01	No	12	0.0003817	0.0001814	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1927	0.0003365	0.0002328	0.01	No	12	0.0002858	0.0000696	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1929	0.000558	0.0003333	0.01	No	12	0.000455	0.0001702	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-203	0.0002975	0.0002389	0.01	No	11	0.0002682	0.00003516	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-016	0.005335	0.002998	0.01	No	10	0.004214	0.001635	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1922D	0.8503	0.4164	0.01	Yes	12	0.6333	0.2765	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1604D	0.0342	0.0268	2	No	22	0.03191	0.008584	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	MW-1604S	0.02974	0.02749	2	No	22	0.02861	0.002099	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1605D	0.02909	0.02591	2	No	22	0.0275	0.002962	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1605S	0.03309	0.02617	2	No	22	0.02963	0.006444	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1606D	0.05455	0.04722	2	No	22	0.05089	0.006825	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1606S	0.0702	0.05983	2	No	22	0.06501	0.009654	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1607D	0.129	0.0717	2	No	22	0.0973	0.03291	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	MW-1607S	0.07048	0.06355	2	No	21	0.06701	0.006282	0	None	No	0.01	Param.
Barium, total (mg/L)	JTMN-1	0.1034	0.07108	2	No	6	0.08723	0.01176	0	None	No	0.01	Param.
Barium, total (mg/L)	JTMN-2	0.09622	0.06861	2	No	6	0.08242	0.01005	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-107	0.05958	0.03894	2	No	12	0.04926	0.01315	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-112	0.08409	0.05071	2	No	5	0.0674	0.009961	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1805	0.04349	0.02905	2	No	12	0.03627	0.0092	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1921	0.06125	0.05225	2	No	12	0.05675	0.005741	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1922S	0.03099	0.02565	2	No	12	0.02835	0.003541	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1923	0.0978	0.0804	2	No	12	0.0891	0.01109	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1924	0.0569	0.0407	2	No	12	0.0488	0.01032	0	None	No	0.01	Param.

Confidence Intervals - Assessment Monitoring - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 2/22/2023, 10:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Barium, total (mg/L)	MW-1925	0.04392	0.0375	2	No	12	0.04071	0.004091	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1926	0.02381	0.01958	2	No	12	0.02172	0.002799	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1927	0.05971	0.05439	2	No	12	0.05705	0.003387	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1929	0.05157	0.04521	2	No	12	0.04839	0.004051	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-203	0.0326	0.02729	2	No	11	0.02995	0.003184	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-016	0.0391	0.0232	2	No	10	0.02831	0.008676	0	None	No	0.011	NP (normality)
Barium, total (mg/L)	MW-1922D	0.2992	0.09026	2	No	12	0.1947	0.1331	0	None	No	0.01	Param.
Beryllium, total (mg/L)	MW-1604S	0.00005	0.000024	0.004	No	20	0.0000487	0.000005814	95	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1605S	0.00005	0.00002	0.004	No	20	0.0000443	0.00001411	85	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1606D	0.00005	0.000031	0.004	No	20	0.0000425	0.00001618	80	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1606S	0.00005	0.000005	0.004	No	20	0.00004775	0.00001006	95	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1607D	0.00005	0.000008	0.004	No	20	0.0000479	0.000009391	95	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1607S	0.00025	0.000123	0.004	No	20	0.0002075	0.0000901	80	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	JTMN-1	0.00007771	0.00001762	0.004	No	6	0.00004767	0.00002187	0	None	No	0.01	Param.
Beryllium, total (mg/L)	JTMN-2	0.00004092	0.00001342	0.004	No	6	0.00002717	0.00001001	0	None	No	0.01	Param.
Beryllium, total (mg/L)	MW-1921	0.00005	0.00002	0.004	No	10	0.0000429	0.00001519	80	None	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1922S	0.00005	0.00005	0.004	No	10	0.0000468	0.00001012	90	None	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1923	0.0001	0.000017	0.004	No	10	0.0000659	0.00003851	50	None	No	0.011	NP (normality)
Beryllium, total (mg/L)	MW-1924	0.00005	0.000009	0.004	No	10	0.0000397	0.00001759	70	None	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1925	0.00005	0.00005	0.004	No	10	0.0000458	0.00001328	90	None	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-016	0.00005	0.00004	0.004	No	8	0.00004875	0.000003536	87.5	None	No	0.004	NP (NDs)
Cadmium, total (mg/L)	MW-1604D	0.00013	0.000022	0.005	No	22	0.00006727	0.00005555	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1604S	0.0001809	0.0001068	0.005	No	22	0.0001283	0.00007668	0	None	x^2	0.01	Param.
Cadmium, total (mg/L)	MW-1605D	0.0000277	0.00001585	0.005	No	22	0.00002177	0.00001104	4.545	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1605S	0.00007005	0.00004728	0.005	No	22	0.00005995	0.00002279	0	None	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-1606D	0.00007668	0.00006477	0.005	No	22	0.00007073	0.0000111	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1606S	0.00007374	0.00006353	0.005	No	22	0.00006864	0.00000951	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1607D	0.00002	0.00001	0.005	No	22	0.00001673	0.000006438	54.55	None	No	0.01	NP (NDs)
Cadmium, total (mg/L)	MW-1607S	0.00004816	0.00003334	0.005	No	21	0.00004252	0.00001769	0	None	ln(x)	0.01	Param.
Cadmium, total (mg/L)	JTMN-1	0.000114	0.000021	0.005	No	6	0.00004333	0.00003504	0	None	No	0.0155	NP (normality)
Cadmium, total (mg/L)	JTMN-2	0.00005156	0.00001744	0.005	No	6	0.00003345	0.00001242	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-107	0.00004739	0.00002361	0.005	No	12	0.0000355	0.00001515	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-112	0.00005	0.000005	0.005	No	5	0.0000238	0.00002393	40	None	No	0.031	NP (normality)
Cadmium, total (mg/L)	MW-1921	0.00004652	0.00002514	0.005	No	12	0.00004192	0.00001415	41.67	Kaplan-Meier	x^2	0.01	Param.
Cadmium, total (mg/L)	MW-1922S	0.00004837	-0.00002039	0.005	No	12	0.00004017	0.00003232	41.67	Kaplan-Meier	No	0.01	Param.
Cadmium, total (mg/L)	MW-1923	0.00004793	0.00001327	0.005	No	12	0.00003192	0.00002614	8.333	None	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-1924	0.00009	0.000051	0.005	No	12	0.00007367	0.00004121	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1925	0.00005686	0.00004114	0.005	No	12	0.000049	0.00001002	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1926	0.00005152	0.00003581	0.005	No	12	0.00004367	0.00001001	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1927	0.00008106	0.00005561	0.005	No	12	0.00006833	0.00001622	8.333	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1929	0.00001895	0.000006122	0.005	No	12	0.00002067	0.00001657	16.67	Kaplan-Meier	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-203	0.00005	0.000005	0.005	No	11	0.00002564	0.00002334	45.45	None	No	0.006	NP (normality)
Cadmium, total (mg/L)	MW-016	0.00002952	0.00001588	0.005	No	10	0.0000227	0.000007646	10	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1922D	0.00002	0.000009	0.005	No	12	0.000017	0.000005543	75	None	No	0.01	NP (NDs)
Chromium, total (mg/L)	MW-1604D	0.0004469	0.0002338	0.1	No	22	0.0003601	0.0002285	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1604S	0.0004077	0.0001821	0.1	No	21	0.0002949	0.0002044	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1605D	0.0002336	0.0001088	0.1	No	21	0.0001837	0.0001326	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1605S	0.0004378	0.0002331	0.1	No	21	0.0003354	0.0001856	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1606D	0.0004291	0.0001905	0.1	No	22	0.0003375	0.0002498	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1606S	0.000385	0.0001441	0.1	No	22	0.0002981	0.0002877	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1607D	0.0002921	0.0001197	0.1	No	21	0.000226	0.0001796	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1607S	0.0004259	0.0002571	0.1	No	21	0.0003415	0.000153	0	None	No	0.01	Param.
Chromium, total (mg/L)	JTMN-1	0.002778	0.0007924	0.1	No	6	0.001785	0.0007225	0	None	No	0.01	Param.
Chromium, total (mg/L)	JTMN-2	0.001757	0.0005729	0.1	No	6	0.001165	0.000431	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-107	0.0004758	0.0001663	0.1	No	12	0.0003211	0.0001972	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-112	0.0005196	0.0001424	0.1	No	5	0.000331	0.0001125	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1805	0.0004563	0.0001805	0.1	No	12	0.0003309	0.0002293	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	MW-1921	0.0006525	0.0001812	0.1	No	12	0.0004168	0.0003003	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1922S	0.00088	0.0002	0.1	No	12	0.0003877	0.0003927	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	MW-1923	0.001318	0.0004528	0.1	No	12	0.000913	0.0006414	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1924	0.0008004	0.0002306	0.1	No	12	0.0005365	0.0004328	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1925	0.0003916	0.0001632	0.1	No	12	0.0002774	0.0001456	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1926	0.0004696	0.0001959	0.1	No	12	0.0003328	0.0001744	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1927	0.0004046	0.0001176	0.1	No	12	0.0002716	0.0002053	8.333	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1929	0.0005389	0.0003474	0.1	No	12	0.0004432	0.000122	0	None	No	0.01	Param.

Confidence Intervals - Assessment Monitoring - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 2/22/2023, 10:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Chromium, total (mg/L)	MW-203	0.00044	0.0002	0.1	No	11	0.0002938	0.0001063	0	None	No	0.006	NP (normality)
Chromium, total (mg/L)	MW-016	0.0007347	0.0002368	0.1	No	10	0.0004964	0.0003727	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	MW-1922D	0.000326	0.000163	0.1	No	12	0.0002562	0.00009557	16.67	Kaplan-Meier	No	0.01	Param.
Cobalt, total (mg/L)	MW-1604D	0.00174	0.000126	0.006	No	22	0.0007518	0.0007978	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1604S	0.00208	0.000358	0.006	No	22	0.001521	0.001083	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1605D	0.001708	0.001508	0.006	No	22	0.001608	0.0001868	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1605S	0.0007539	0.0003751	0.006	No	22	0.0006726	0.0006202	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1606D	0.0016	0.00117	0.006	No	22	0.001555	0.0006689	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1606S	0.0003216	0.0002148	0.006	No	22	0.0002682	0.00009948	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1607D	0.0008473	0.0006602	0.006	No	22	0.0007125	0.0002102	0	None	x^3	0.01	Param.
Cobalt, total (mg/L)	MW-1607S	0.001523	0.001045	0.006	No	21	0.001318	0.0004944	0	None	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	JTMN-1	0.00292	0.0008182	0.006	No	6	0.001869	0.0007649	0	None	No	0.01	Param.
Cobalt, total (mg/L)	JTMN-2	0.00141	0.0006198	0.006	No	6	0.001015	0.0002877	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-107	0.001173	0.0002686	0.006	No	12	0.0007206	0.000576	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-112	0.0000314	0.0000166	0.006	No	5	0.000024	0.000004416	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1805	0.001403	0.0001028	0.006	No	12	0.001183	0.001686	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1921	0.000951	0.000588	0.006	No	12	0.0008814	0.0005675	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1922S	0.001775	0.001014	0.006	No	12	0.001408	0.000543	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1923	0.001331	0.0005049	0.006	No	12	0.0009559	0.0006561	0	None	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	MW-1924	0.004804	0.002181	0.006	No	12	0.003716	0.002454	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1925	0.001351	0.001019	0.006	No	12	0.001185	0.0002115	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1926	0.00181	0.000875	0.006	No	12	0.001401	0.001193	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1927	0.0005304	0.0002621	0.006	No	12	0.0003963	0.000171	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1929	0.0008253	0.0001552	0.006	No	12	0.0006526	0.0008842	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-203	0.0000744	0.00001982	0.006	No	11	0.00004845	0.00003947	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	MW-016	0.001647	0.0009989	0.006	No	10	0.001323	0.0003633	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1922D	0.0004482	0.0001363	0.006	No	12	0.0003108	0.0002637	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1604D	1.202	0.5098	5	No	22	0.9404	0.7539	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1604S	1.896	0.9224	5	No	21	1.738	1.984	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1605D	1.65	0.7851	5	No	22	1.31	0.9124	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1605S	1.045	0.5135	5	No	22	0.9247	0.7413	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606D	1.838	0.9754	5	No	21	1.479	0.8601	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606S	1.403	0.6728	5	No	22	1.115	0.8042	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607D	2.075	1.214	5	No	22	1.74	0.9783	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607S	1.76	0.974	5	No	22	1.367	0.7325	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	JTMN-1	1.738	0.4983	5	No	6	1.024	0.5458	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	JTMN-2	2.882	0.0844	5	No	6	1.207	1.208	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-107	1.458	0.2704	5	No	12	0.9218	0.9589	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-112	0.7965	-0.2224	5	No	5	0.287	0.304	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1805	2.391	0.9494	5	No	12	1.67	0.9186	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1921	1.695	0.5983	5	No	12	1.181	0.8146	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1922S	2.075	0.9183	5	No	12	1.497	0.7371	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1923	1.386	0.6961	5	No	12	1.041	0.4398	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1924	1.452	0.9474	5	No	12	1.2	0.3214	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1925	1.849	0.789	5	No	12	1.319	0.6755	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1926	0.8943	0.4086	5	No	12	0.6686	0.3522	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1927	1.612	0.9895	5	No	12	1.301	0.3966	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1929	1.756	0.6159	5	No	12	1.244	0.9154	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-203	1.328	0.2502	5	No	11	0.8577	1.007	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-016	1.768	0.6292	5	No	10	1.199	0.6382	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1922D	5.605	2.725	5	No	12	4.165	1.835	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1604D	0.2099	0.1693	4	No	23	0.1896	0.03879	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1604S	0.2373	0.2045	4	No	23	0.2209	0.03132	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1605D	0.207	0.1895	4	No	23	0.1983	0.01669	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1605S	0.2857	0.2517	4	No	23	0.2687	0.03252	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1606D	0.27	0.24	4	No	23	0.257	0.0616	0	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	MW-1606S	0.4609	0.3891	4	No	24	0.425	0.0704	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1607D	0.5301	0.4824	4	No	24	0.5063	0.0467	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1607S	0.283	0.2448	4	No	23	0.2639	0.03652	0	None	No	0.01	Param.
Fluoride, total (mg/L)	JTMN-1	0.3337	0.2496	4	No	6	0.2917	0.03061	0	None	No	0.01	Param.
Fluoride, total (mg/L)	JTMN-2	0.4366	0.22	4	No	6	0.3283	0.07885	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-107	0.2459	0.2091	4	No	12	0.2275	0.0234	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-112	0.3447	0.2033	4	No	5	0.274	0.04219	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1805	0.3434	0.2099	4	No	12	0.2767	0.0851	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1921	1.061	0.8774	4	No	12	0.9692	0.117	0	None	No	0.01	Param.

Confidence Intervals - Assessment Monitoring - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 2/22/2023, 10:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Fluoride, total (mg/L)	MW-1922S	0.1871	0.1496	4	No	12	0.1675	0.02633	0	None	x^2	0.01	Param.
Fluoride, total (mg/L)	MW-1923	0.2466	0.1768	4	No	12	0.2117	0.04448	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1924	0.5247	0.4286	4	No	12	0.4767	0.06125	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1925	0.3168	0.2632	4	No	12	0.29	0.03411	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1926	0.2807	0.2476	4	No	12	0.2642	0.02109	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1927	0.1677	0.1406	4	No	12	0.1542	0.0173	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1929	0.2395	0.2005	4	No	12	0.22	0.02486	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-203	0.2999	0.2419	4	No	11	0.2709	0.03477	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-016	0.2644	0.2296	4	No	10	0.247	0.01947	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1922D	0.3221	0.2946	4	No	12	0.3083	0.01749	0	None	No	0.01	Param.
Lead, total (mg/L)	MW-1604D	0.000106	0.0000287	0.015	No	22	0.0001453	0.000131	40.91	Kaplan-Meier	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1604S	0.0002	0.000065	0.015	No	22	0.0001373	0.00007371	45.45	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1605D	0.0002	0.00002	0.015	No	22	0.000107	0.00008804	45.45	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1605S	0.0003384	0.0001148	0.015	No	22	0.0003385	0.0004623	9.091	None	ln(x)	0.01	Param.
Lead, total (mg/L)	MW-1606D	0.000491	0.000087	0.015	No	22	0.0002662	0.0004146	45.45	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1606S	0.0001147	0.00006228	0.015	No	22	0.0001368	0.00006859	36.36	Kaplan-Meier	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1607D	0.0002	0.000044	0.015	No	22	0.0001471	0.0001296	40.91	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1607S	0.0002	0.00008	0.015	No	21	0.0002382	0.0003674	0	None	No	0.01	NP (normality)
Lead, total (mg/L)	JTMN-1	0.002755	0.0007787	0.015	No	6	0.001767	0.0007192	0	None	No	0.01	Param.
Lead, total (mg/L)	JTMN-2	0.001036	0.0004693	0.015	No	6	0.0007525	0.0002061	0	None	No	0.01	Param.
Lead, total (mg/L)	MW-107	0.0004	0.00004	0.015	No	12	0.0002033	0.00007715	83.33	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-112	0.0002	0.00002	0.015	No	5	0.000164	0.0000805	80	None	No	0.031	NP (NDs)
Lead, total (mg/L)	MW-1805	0.00121	0.0001	0.015	No	12	0.0002758	0.0002956	83.33	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-1921	0.0004067	0.00007585	0.015	No	12	0.0002573	0.0002676	8.333	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1922S	0.0003873	0.00007622	0.015	No	12	0.0003167	0.0004548	8.333	None	ln(x)	0.01	Param.
Lead, total (mg/L)	MW-1923	0.0008903	0.0002124	0.015	No	12	0.0005798	0.0005254	0	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1924	0.0005081	0.0000843	0.015	No	12	0.000318	0.0003486	0	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1925	0.0001669	0.00005059	0.015	No	12	0.00017	0.0000962	41.67	Kaplan-Meier	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1926	0.000981	0.00006	0.015	No	12	0.0002301	0.0002446	66.67	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-1927	0.000441	0.00008	0.015	No	12	0.0001834	0.00009972	50	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1929	0.0003886	0.00008267	0.015	No	12	0.0002958	0.0003511	0	None	ln(x)	0.01	Param.
Lead, total (mg/L)	MW-203	0.0002	0.000113	0.015	No	11	0.0001854	0.00003986	63.64	None	No	0.006	NP (NDs)
Lead, total (mg/L)	MW-016	0.0003861	0.00006408	0.015	No	10	0.0002719	0.0003751	10	None	ln(x)	0.01	Param.
Lead, total (mg/L)	MW-1922D	0.0002	0.00007	0.015	No	12	0.00017	0.00005477	75	None	No	0.01	NP (NDs)
Lithium, total (mg/L)	MW-1604D	0.051	0.0197	0.04	No	22	0.03341	0.01722	4.545	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1604S	0.04338	0.03471	0.04	No	22	0.03905	0.008079	0	None	No	0.01	Param.
Lithium, total (mg/L)	JTMN-1	0.01408	0.004225	0.04	No	6	0.009153	0.003588	0	None	No	0.01	Param.
Lithium, total (mg/L)	JTMN-2	0.02481	0.006319	0.04	No	6	0.01557	0.006732	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-107	0.015	0.00331	0.04	No	12	0.006047	0.005478	8.333	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-112	0.03	0.00127	0.04	No	5	0.007288	0.0127	20	None	No	0.031	NP (normality)
Lithium, total (mg/L)	MW-1805	0.043	0.026	0.04	No	12	0.03618	0.007017	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1926	0.01	0.00585	0.04	No	12	0.007457	0.002629	8.333	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1927	0.015	0.00594	0.04	No	12	0.009031	0.007072	8.333	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1929	0.01	0.00352	0.04	No	12	0.005433	0.003498	8.333	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-203	0.00238	0.00199	0.04	No	11	0.003343	0.00387	9.091	None	No	0.006	NP (normality)
Lithium, total (mg/L)	MW-016	0.03321	0.02777	0.04	No	10	0.03049	0.003052	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1922D	0.015	0.00738	0.04	No	12	0.01034	0.003968	8.333	None	No	0.01	NP (normality)
Mercury, total (mg/L)	MW-1604D	0.000036	0.000003	0.002	No	21	0.000006381	0.000006801	90.48	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1604S	0.000005	0.000003	0.002	No	21	0.000004905	4.4e-7	95.24	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1605D	0.000005	0.000002	0.002	No	21	0.000004857	6.5e-7	95.24	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1605S	0.000005	0.000003	0.002	No	21	0.000004905	4.4e-7	95.24	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1606D	0.000005	0.000004	0.002	No	21	0.000004952	2.2e-7	95.24	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1606S	0.000005	0.000002	0.002	No	21	0.000004857	6.5e-7	95.24	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1607D	0.000005	0.000002	0.002	No	21	0.000004714	9.0e-7	90.48	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1607S	0.000012	0.000003	0.002	No	21	0.000005143	0.000001682	85.71	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	JTMN-1	0.000005	0.000003	0.002	No	6	0.000004	0.000001095	33.33	None	No	0.0155	NP (normality)
Mercury, total (mg/L)	JTMN-2	0.000006684	9.8e-7	0.002	No	6	0.000004833	0.000001941	50	Kaplan-Meier	No	0.01	Param.
Mercury, total (mg/L)	MW-1921	0.000005	0.000005	0.002	No	11	0.000004727	9.0e-7	90.91	Kaplan-Meier	No	0.006	NP (NDs)
Mercury, total (mg/L)	MW-1922S	0.000005	0.000005	0.002	No	11	0.000004727	9.0e-7	90.91	Kaplan-Meier	No	0.006	NP (NDs)
Mercury, total (mg/L)	MW-1923	0.000005	0.000005	0.002	No	11	0.000004727	9.0e-7	90.91	None	No	0.006	NP (NDs)
Mercury, total (mg/L)	MW-1924	0.000005	0.000005	0.002	No	11	0.000004818	6.0e-7	90.91	None	No	0.006	NP (NDs)
Molybdenum, total (mg/L)	MW-1604D	0.0181	0.0014	0.1	No	22	0.007933	0.00844	4.545	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1604S	0.01493	0.01145	0.1	No	22	0.01047	0.006176	0	None	x^4	0.01	Param.
Molybdenum, total (mg/L)	MW-1605D	0.04518	0.03657	0.1	No	22	0.04088	0.008025	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1605S	0.01792	0.01374	0.1	No	22	0.01599	0.004105	0	None	sqrt(x)	0.01	Param.

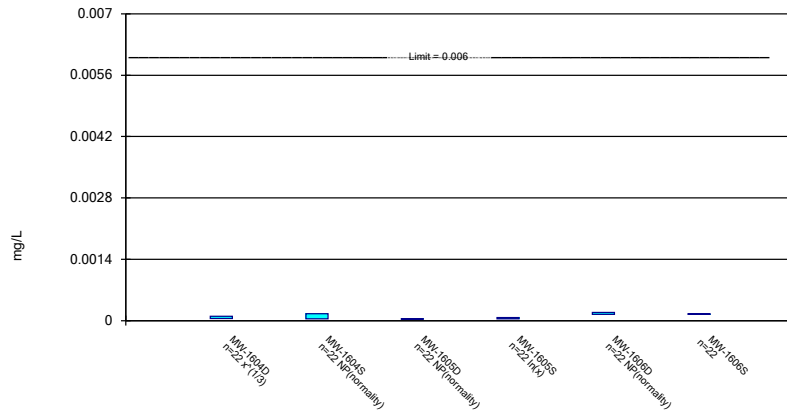
Confidence Intervals - Assessment Monitoring - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 2/22/2023, 10:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Molybdenum, total (mg/L)	MW-1606D	0.07403	0.06664	0.1	No	22	0.07034	0.006878	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1606S	0.0924	0.056	0.1	No	22	0.07298	0.02099	0	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1607D	0.08607	0.0779	0.1	No	22	0.08198	0.007609	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1607S	0.04212	0.03483	0.1	No	22	0.03847	0.006786	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	JTMN-1	0.01831	0.003883	0.1	No	6	0.0111	0.005252	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	JTMN-2	0.03545	0.005517	0.1	No	6	0.02048	0.0109	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-107	0.002	0.0002	0.1	No	12	0.001183	0.0008266	41.67	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-112	0.0121	0.003696	0.1	No	5	0.0079	0.002509	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1805	0.06502	0.01557	0.1	No	12	0.04029	0.03151	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1921	0.489	0.42	0.1	Yes	12	0.4545	0.04399	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1922S	0.03588	0.02887	0.1	No	12	0.03238	0.004468	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1923	0.344	0.0709	0.1	No	12	0.2131	0.1235	0	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1924	0.1106	0.0805	0.1	No	12	0.09555	0.01918	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1925	0.06044	0.04506	0.1	No	12	0.05275	0.009801	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1926	0.006444	0.004386	0.1	No	12	0.005439	0.001411	0	None	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1927	0.00282	0.001	0.1	No	12	0.002018	0.001677	0	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1929	0.0008	0.0003	0.1	No	12	0.0009333	0.001289	8.333	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-203	0.0013	0.0009	0.1	No	11	0.001109	0.0003208	0	None	No	0.006	NP (normality)
Molybdenum, total (mg/L)	MW-016	0.03922	0.03484	0.1	No	10	0.03703	0.002457	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1922D	0.3052	0.06042	0.1	No	12	0.2132	0.1922	0	None	ln(x)	0.01	Param.
Selenium, total (mg/L)	MW-1604D	0.00177	0.0008726	0.05	No	22	0.001452	0.001008	0	None	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	MW-1604S	0.001773	0.001017	0.05	No	22	0.001455	0.0007591	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1605D	0.000245	0.0001722	0.05	No	22	0.0002123	0.00006914	9.091	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1605S	0.001235	0.0006688	0.05	No	22	0.001002	0.0006177	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1606D	0.004934	0.002257	0.05	No	22	0.003596	0.002494	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1606S	0.002672	0.001267	0.05	No	22	0.00212	0.001499	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1607D	0.0005	0.00005	0.05	No	22	0.0002377	0.0002241	36.36	None	No	0.01	NP (normality)
Selenium, total (mg/L)	MW-1607S	0.007836	0.004956	0.05	No	22	0.006396	0.002683	0	None	No	0.01	Param.
Selenium, total (mg/L)	JTMN-1	0.00133	0.0003871	0.05	No	6	0.0008583	0.000343	0	None	No	0.01	Param.
Selenium, total (mg/L)	JTMN-2	0.001084	0.000356	0.05	No	6	0.00072	0.000265	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-107	0.0007916	0.0004734	0.05	No	12	0.0006325	0.0002027	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-112	0.001493	0.0004668	0.05	No	5	0.000928	0.0003327	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1805	0.0005	0.00005	0.05	No	12	0.0003625	0.0002035	66.67	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	MW-1921	0.0002473	0.0001167	0.05	No	12	0.000185	0.0000897	8.333	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1922S	0.0005	0.00008	0.05	No	12	0.0002492	0.0001945	33.33	None	No	0.01	NP (normality)
Selenium, total (mg/L)	MW-1923	0.02935	0.008112	0.05	No	12	0.01873	0.01353	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1924	0.002119	0.000688	0.05	No	12	0.001478	0.001102	0	None	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	MW-1925	0.005359	0.003364	0.05	No	12	0.004362	0.001271	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1926	0.0009264	0.0003025	0.05	No	12	0.00065	0.0005453	0	None	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	MW-1927	0.001193	0.0003684	0.05	No	12	0.0007808	0.0005256	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1929	0.001774	0.001041	0.05	No	12	0.001408	0.0004671	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-203	0.001512	0.0008904	0.05	No	11	0.001207	0.0004124	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-016	0.000209	0.000111	0.05	No	10	0.00016	0.00005497	10	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1922D	0.0005	0.00005	0.05	No	12	0.0003875	0.0002036	75	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1604D	0.000235	0.0002	0.002	No	22	0.0002056	0.00007001	54.55	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1604S	0.00024	0.00003	0.002	No	22	0.0001995	0.0002061	4.545	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1605D	0.0002	0.00005	0.002	No	22	0.0001299	0.00007457	50	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1605S	0.0002	0.000055	0.002	No	22	0.0001394	0.0000733	54.55	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1606D	0.000123	0.00007	0.002	No	22	0.0001826	0.0001771	22.73	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1606S	0.000112	0.00006	0.002	No	22	0.0001696	0.000184	22.73	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1607D	0.0002	0.00004	0.002	No	22	0.000126	0.00008346	54.55	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1607S	0.00015	0.000058	0.002	No	22	0.0001855	0.0001982	27.27	None	No	0.01	NP (normality)
Thallium, total (mg/L)	JTMN-1	0.0002	0.00004	0.002	No	6	0.0001733	0.00006532	83.33	None	No	0.0155	NP (NDs)
Thallium, total (mg/L)	MW-1921	0.0005	0.00005	0.002	No	12	0.00028	0.0002299	50	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1922S	0.0002	0.00005	0.002	No	12	0.0001742	0.00006037	83.33	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1926	0.0002	0.00009	0.002	No	12	0.0001908	0.00003175	91.67	None	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

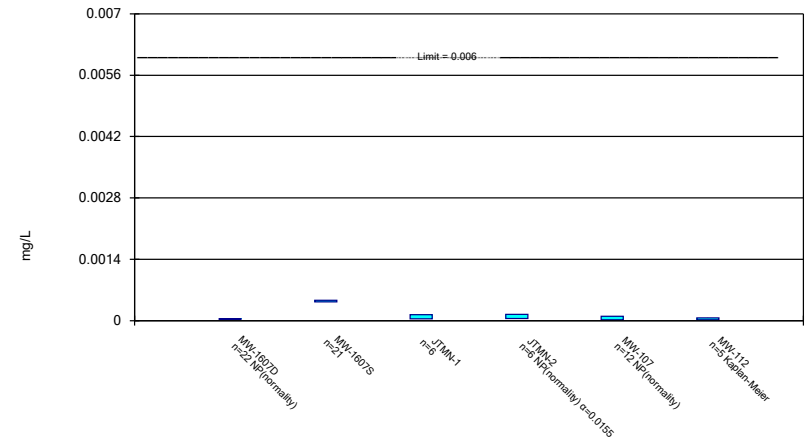
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony, total Analysis Run 2/22/2023 10:34 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

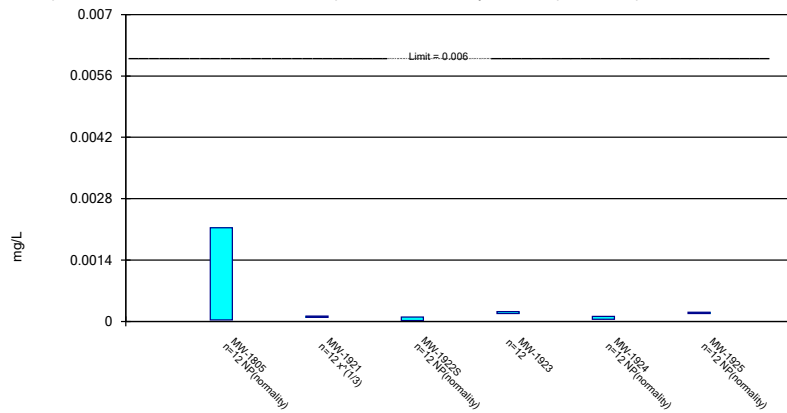
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Antimony, total Analysis Run 2/22/2023 10:34 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

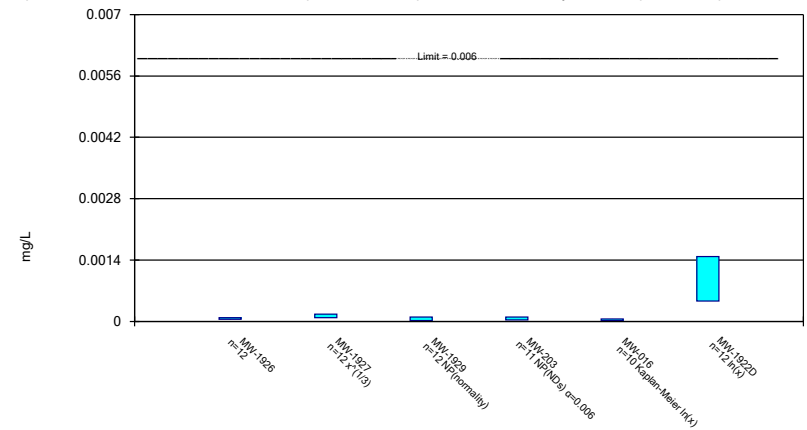
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony, total Analysis Run 2/22/2023 10:34 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

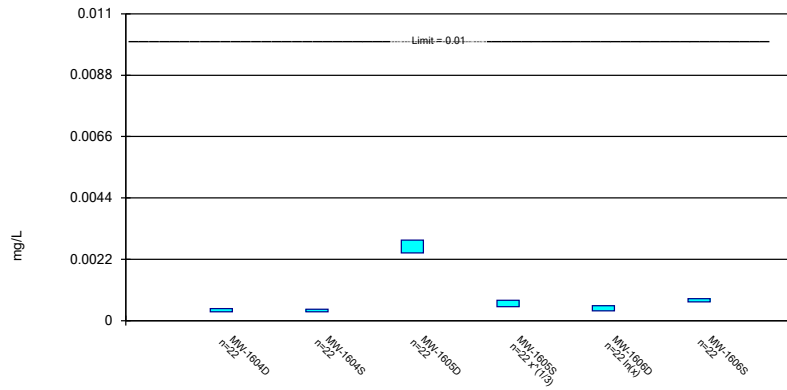
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Antimony, total Analysis Run 2/22/2023 10:34 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

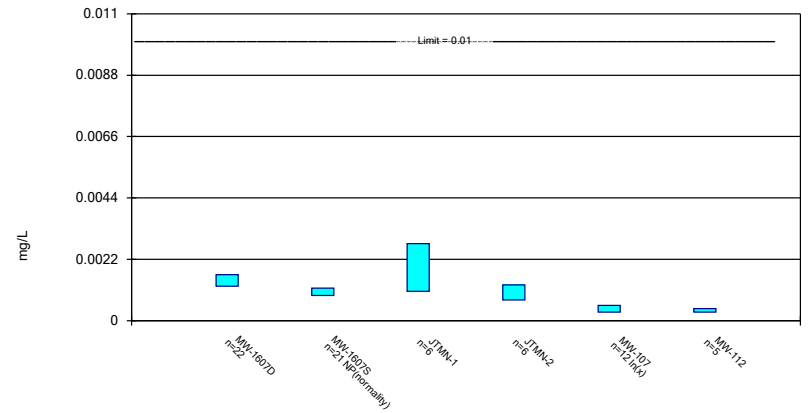
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 2/22/2023 10:34 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

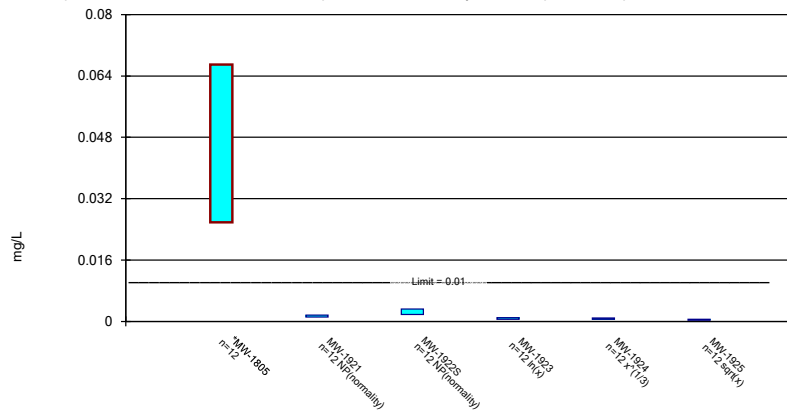
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 2/22/2023 10:34 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

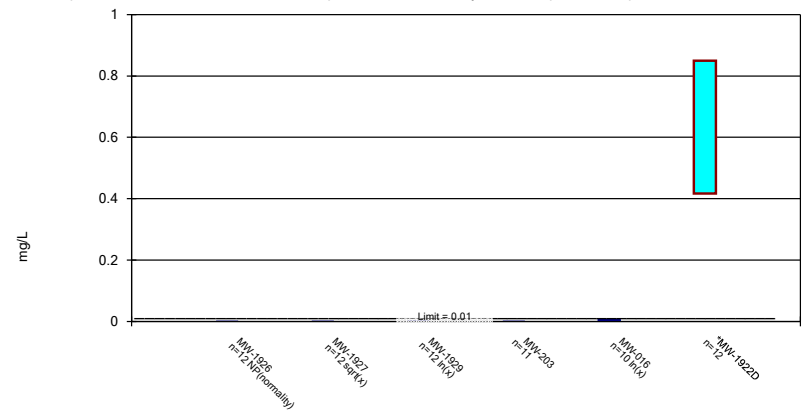
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

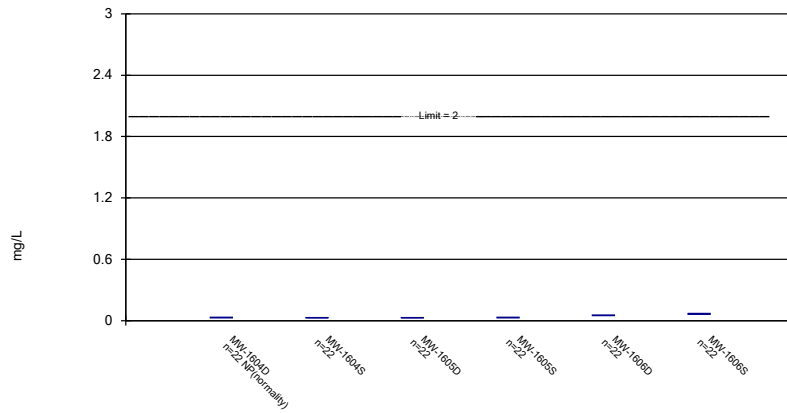
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

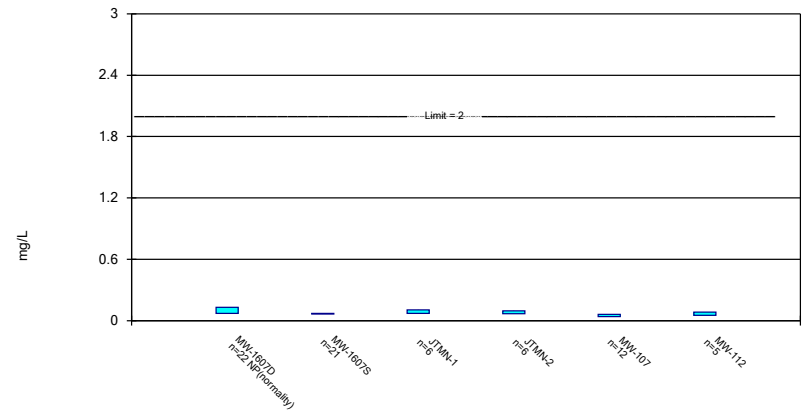
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

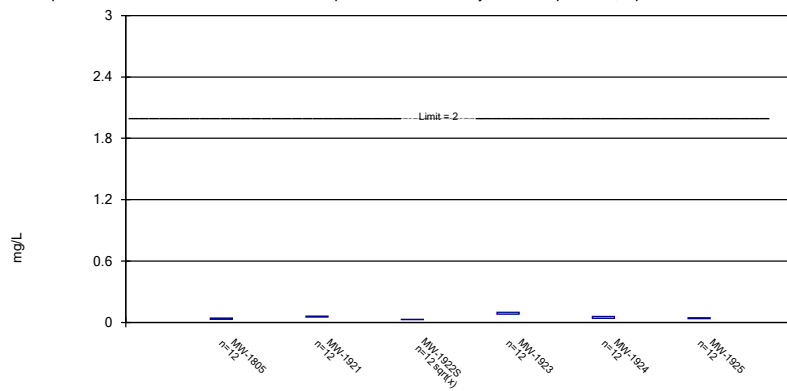
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

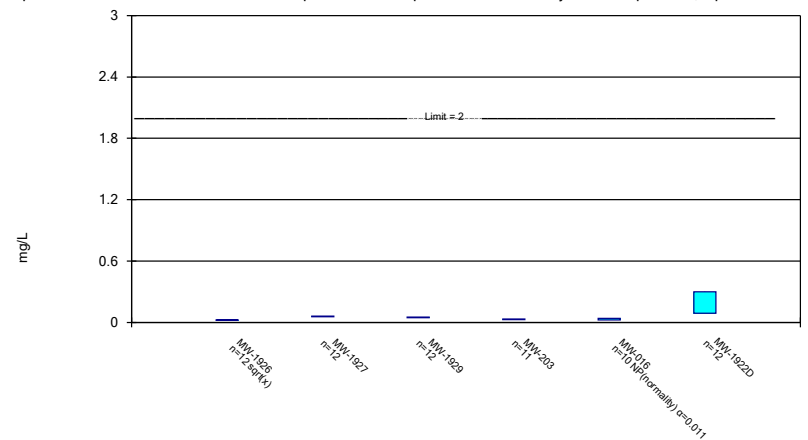
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

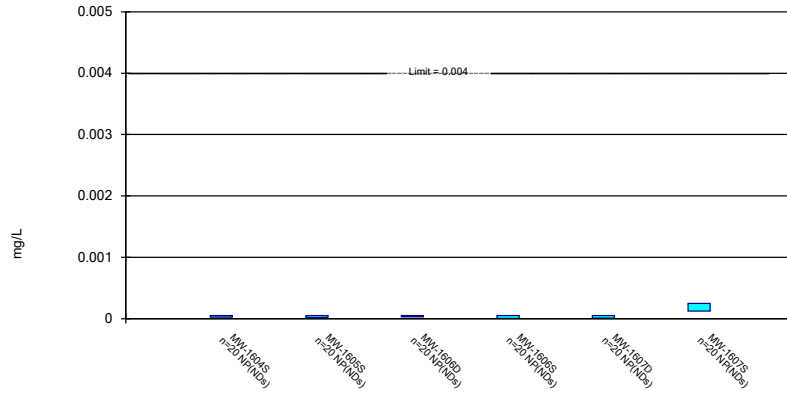
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

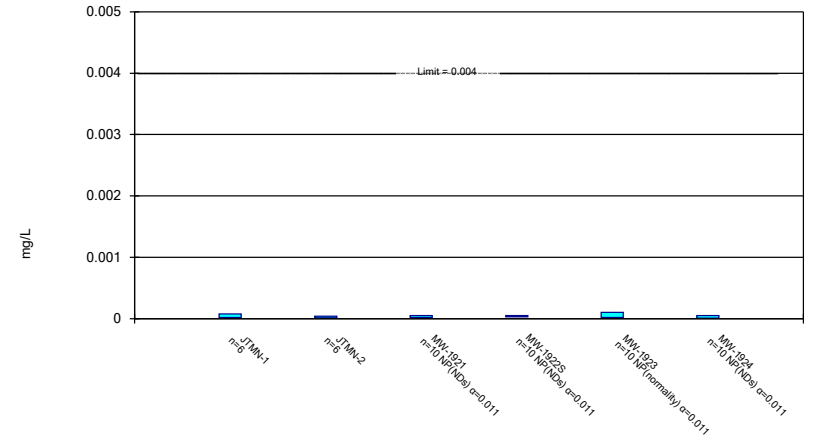
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

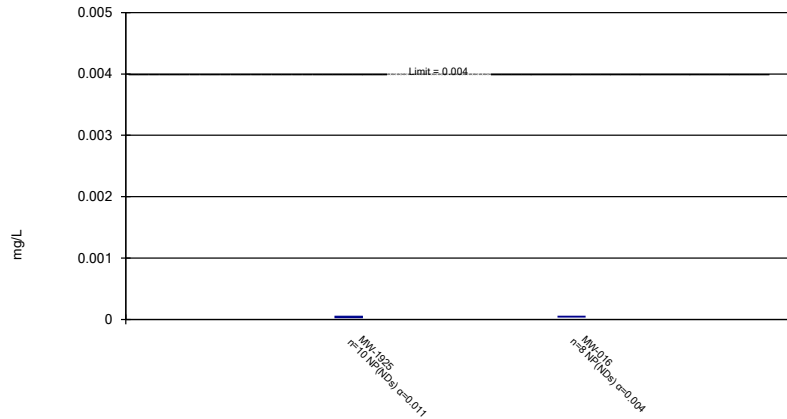
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Beryllium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

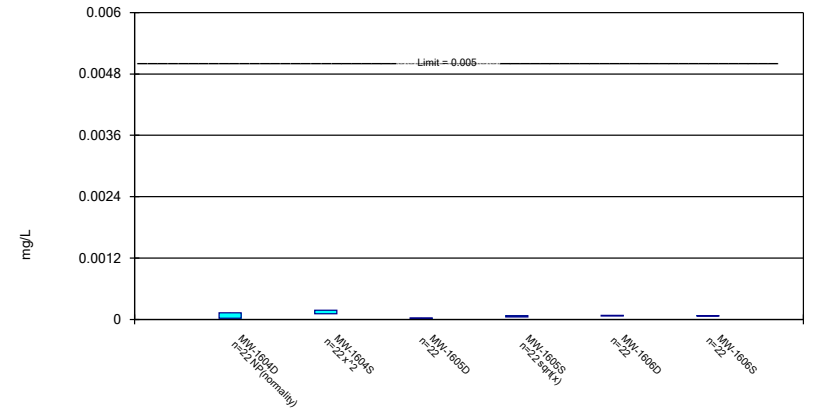
Compliance Limit is not exceeded.



Constituent: Beryllium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

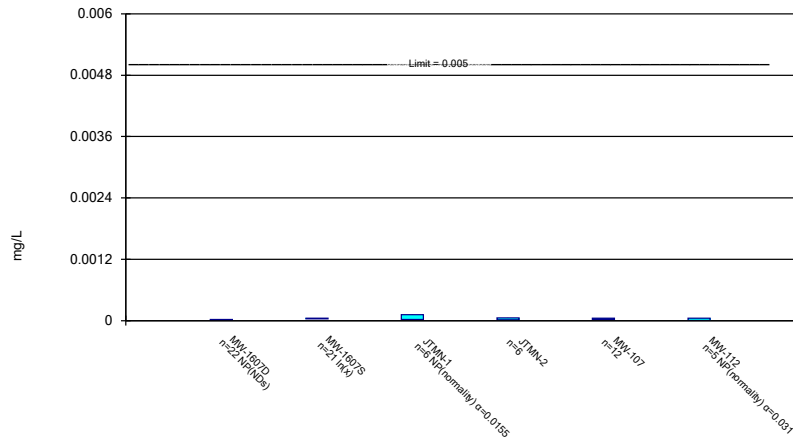
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

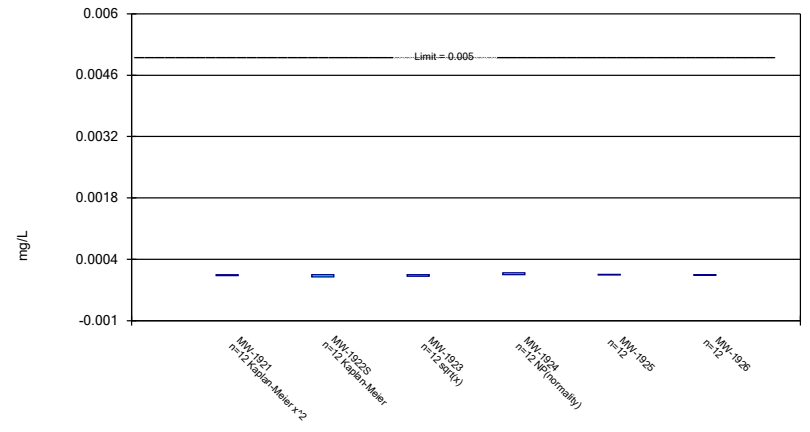
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Cadmium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

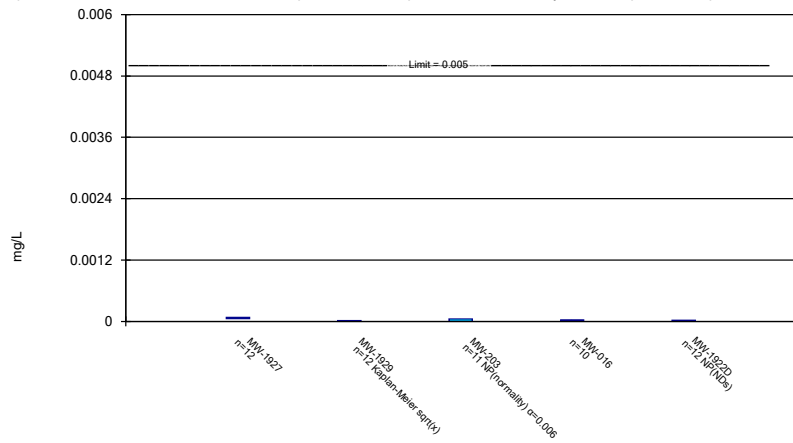
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

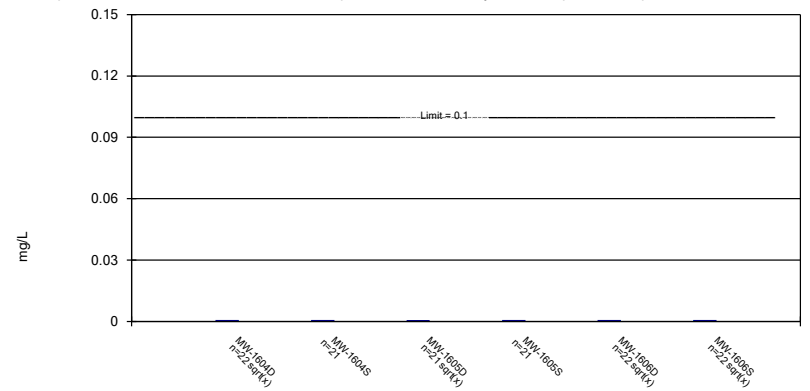
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Cadmium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

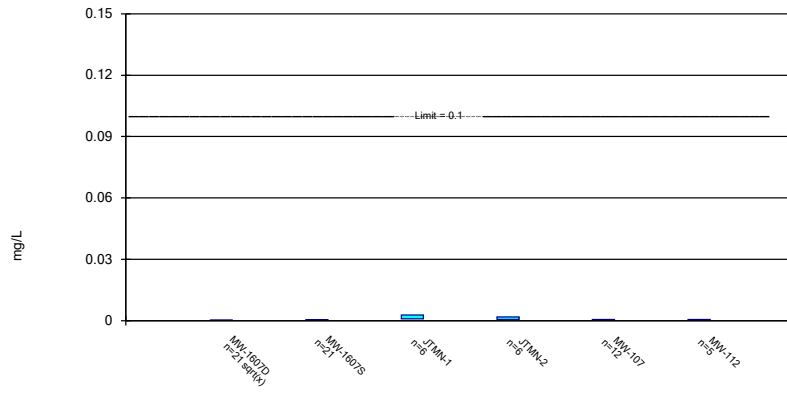
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

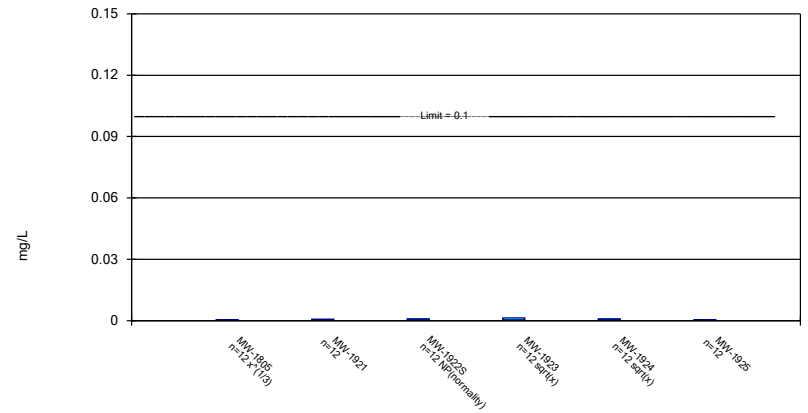
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

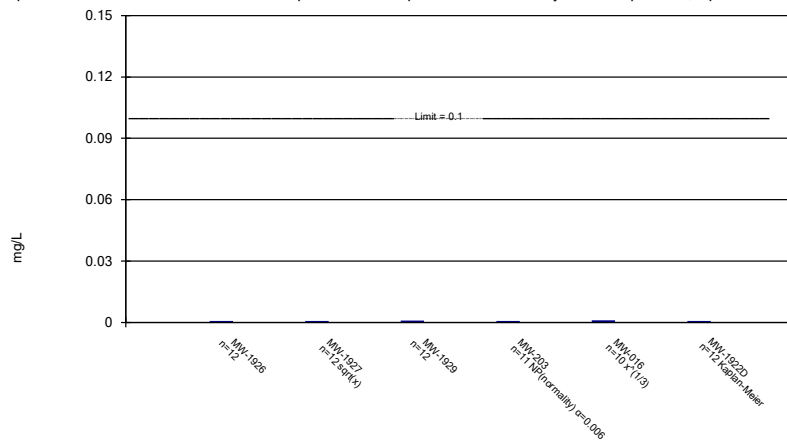
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

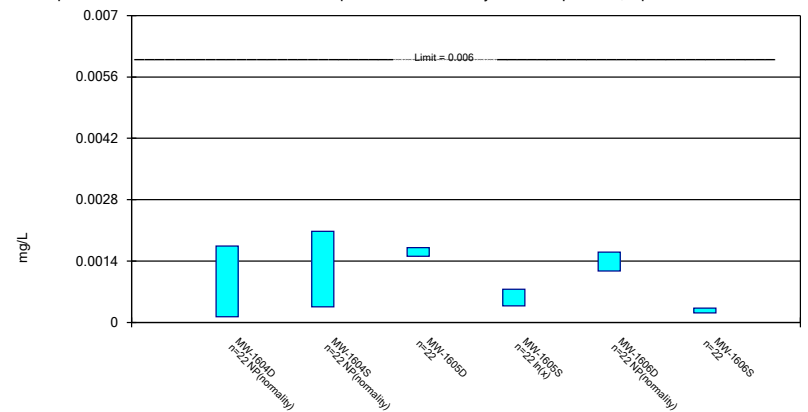
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Chromium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

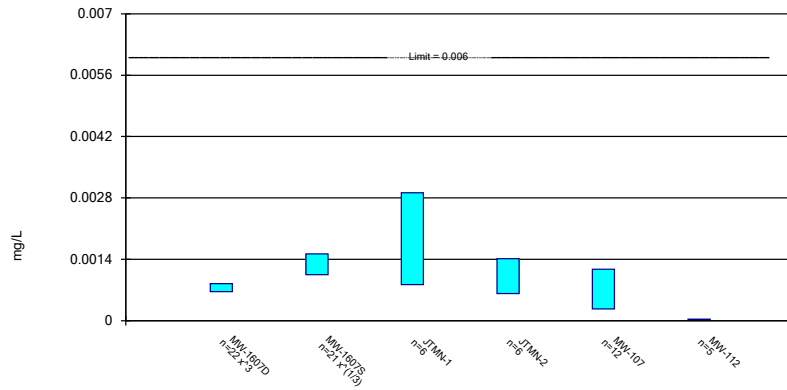
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

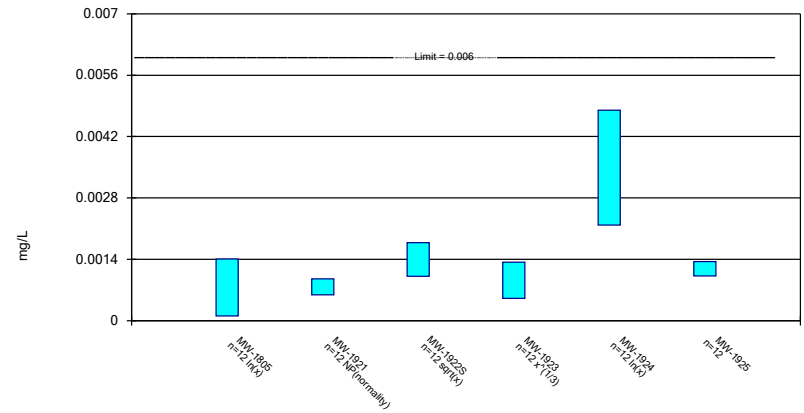
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

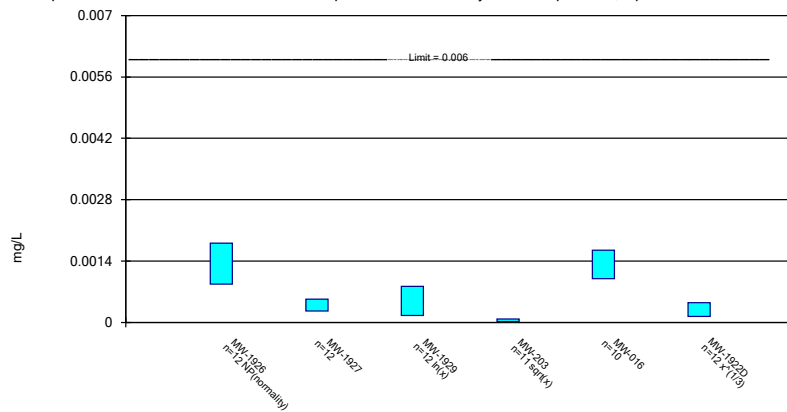
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

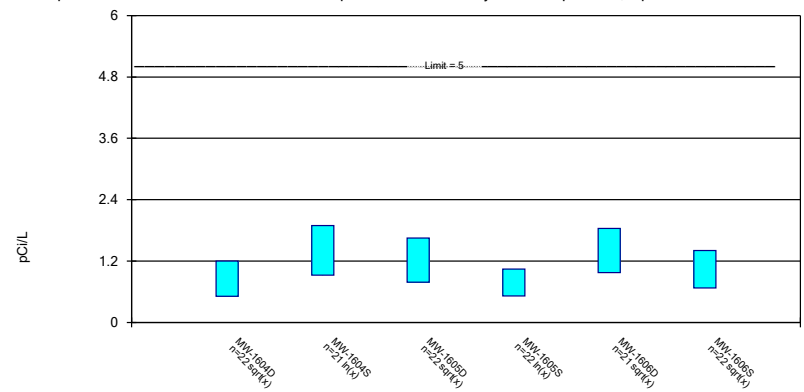
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

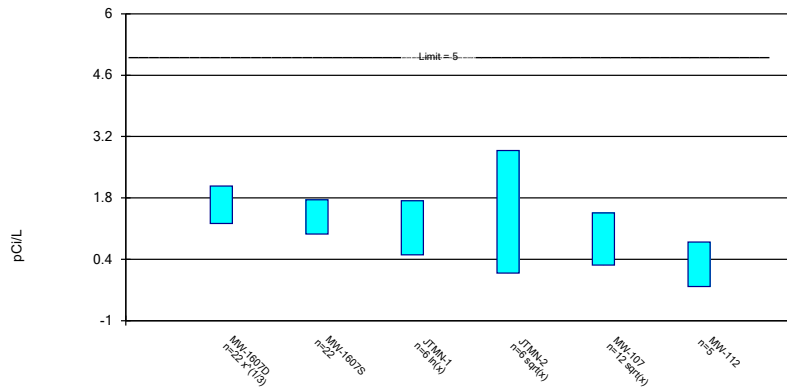
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

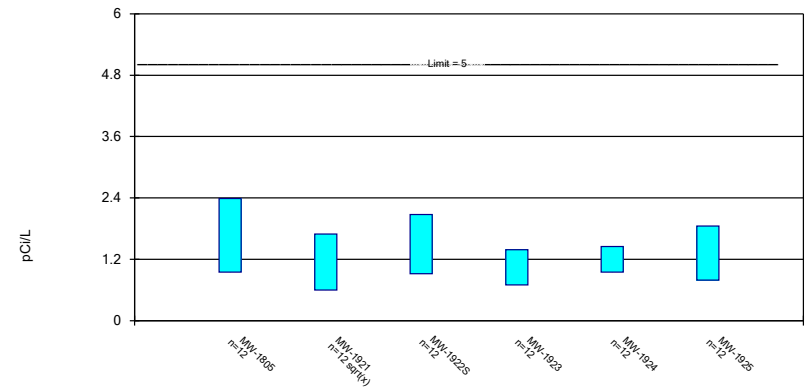
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

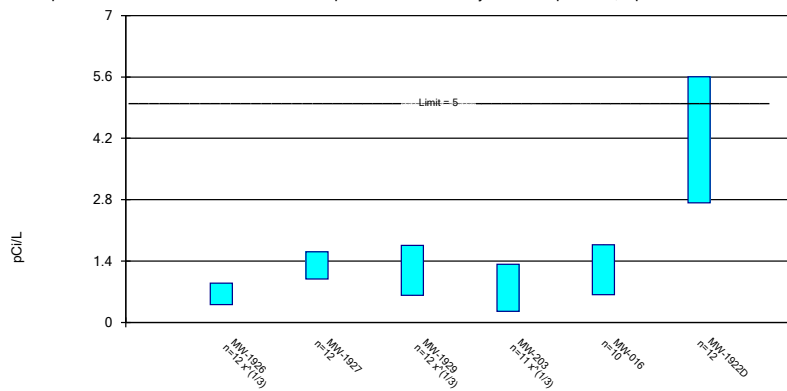
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

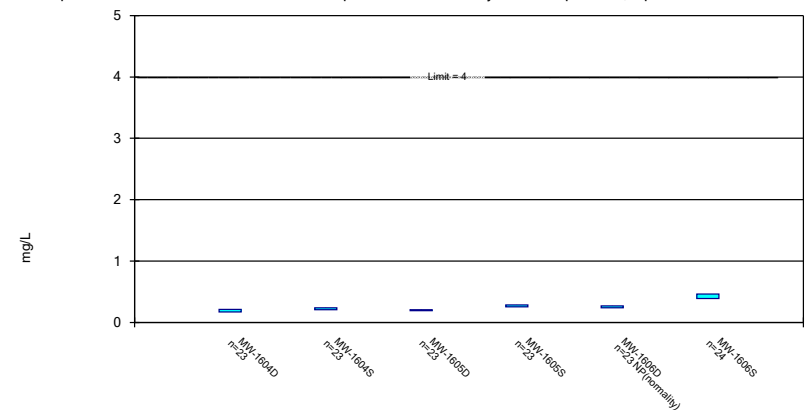
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

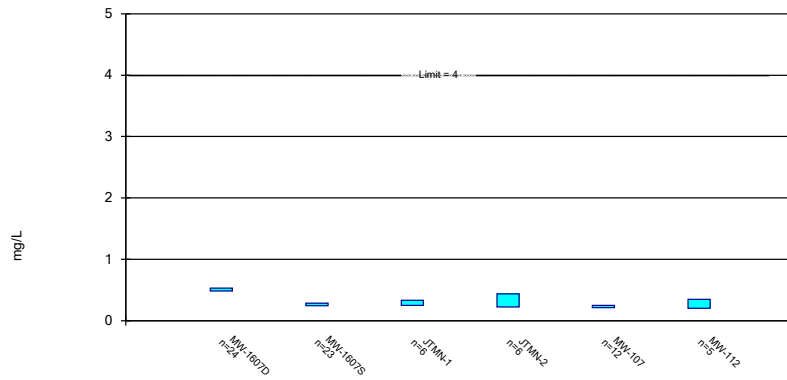
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

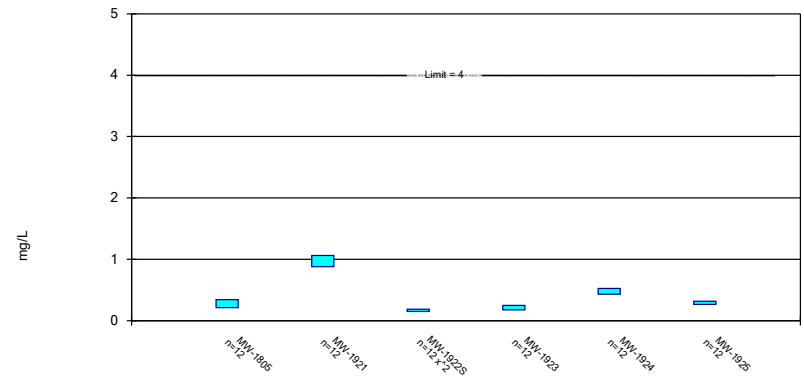
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

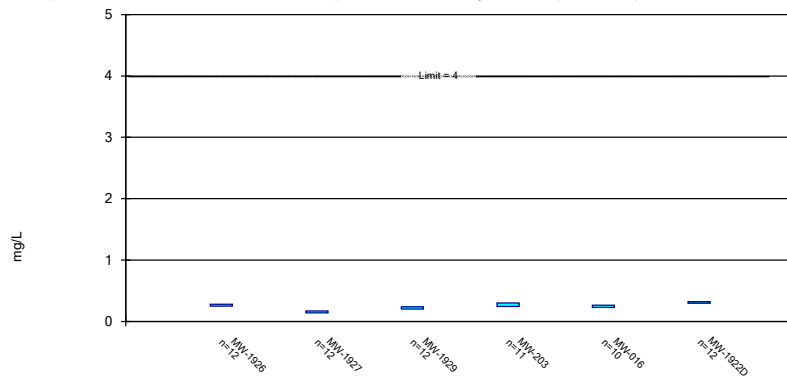
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

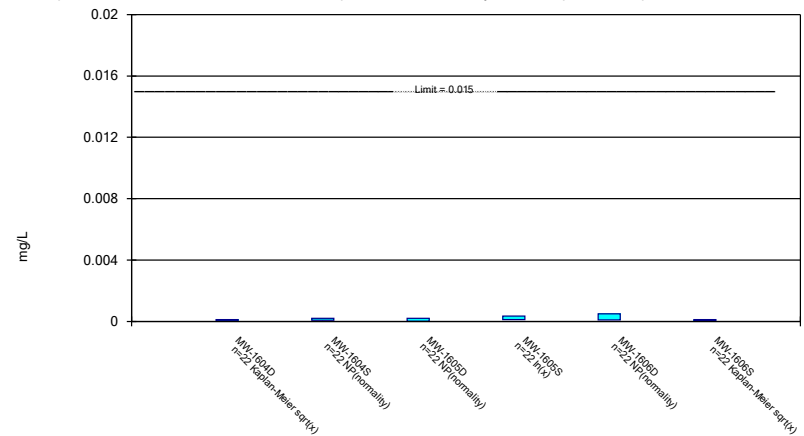
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

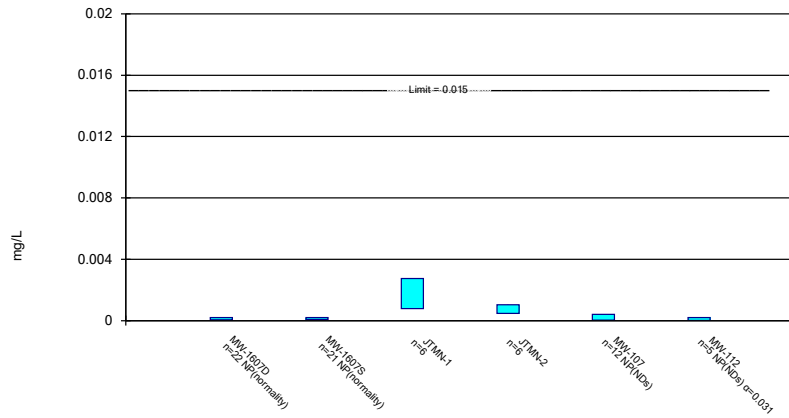
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

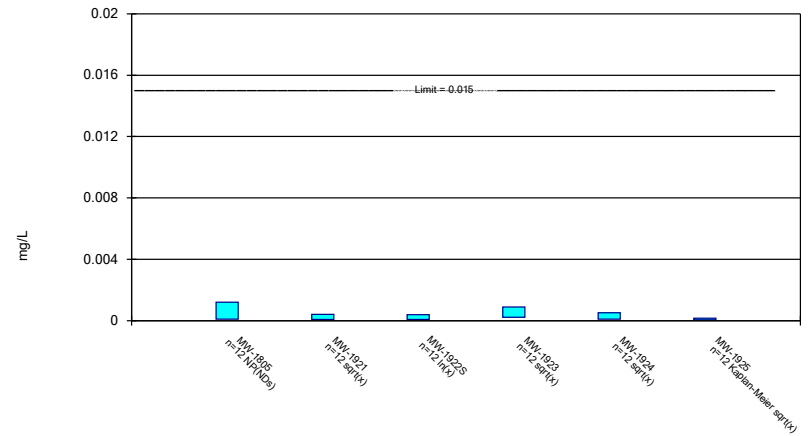
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Lead, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

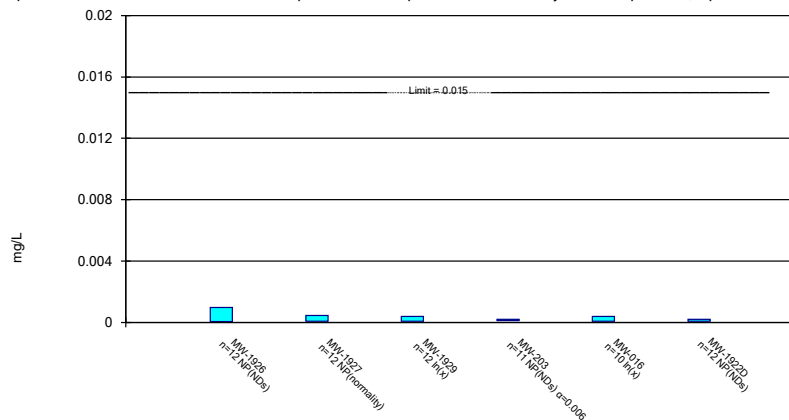
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

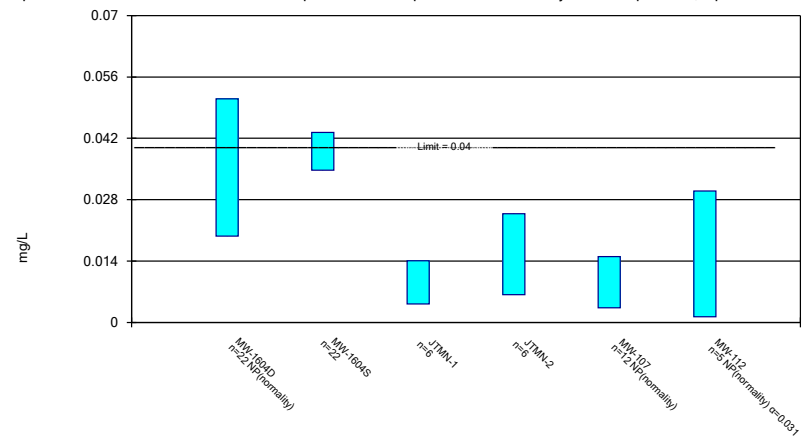
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Lead, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

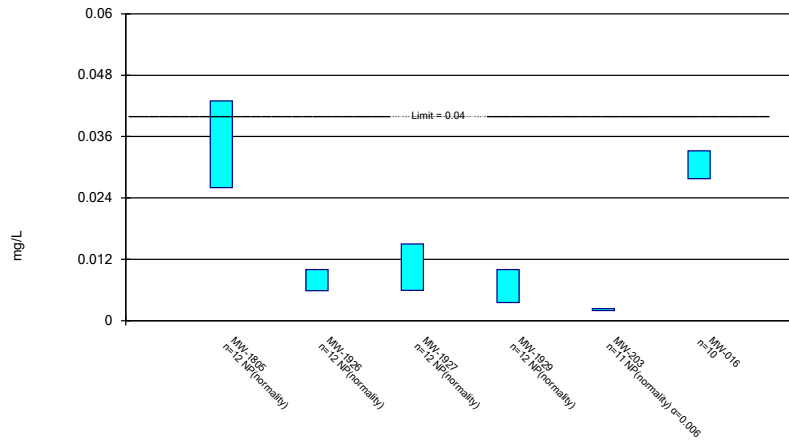
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Lithium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

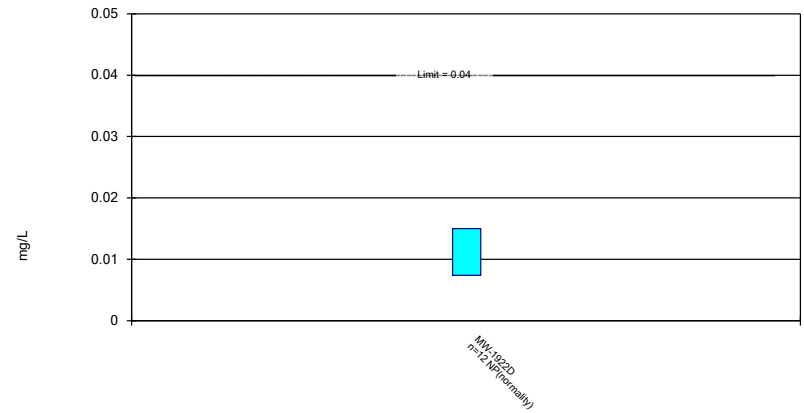
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Lithium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

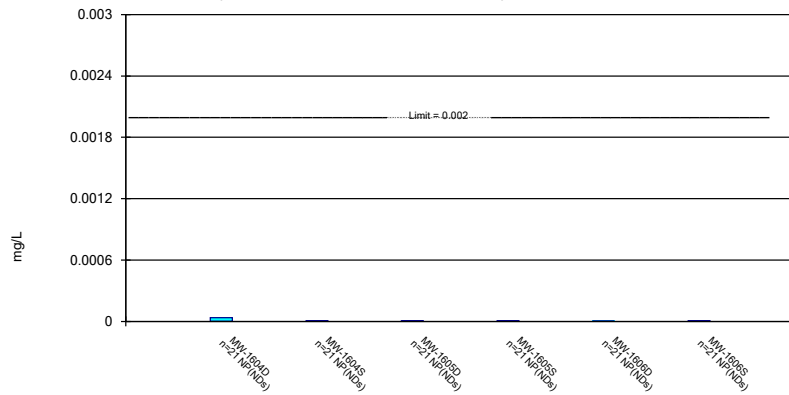
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lithium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

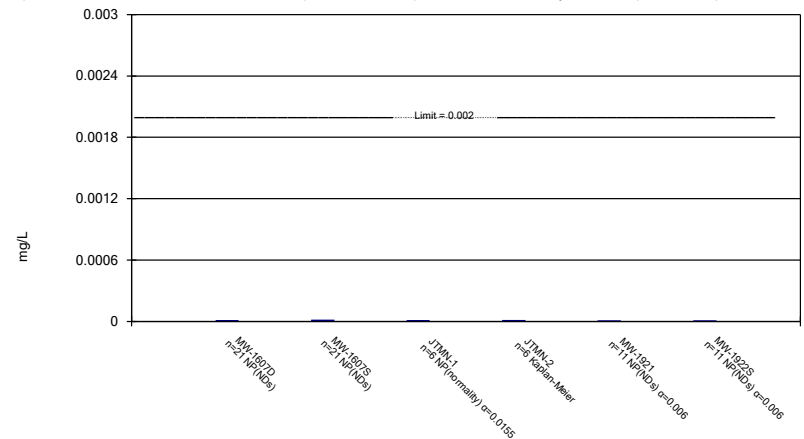
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

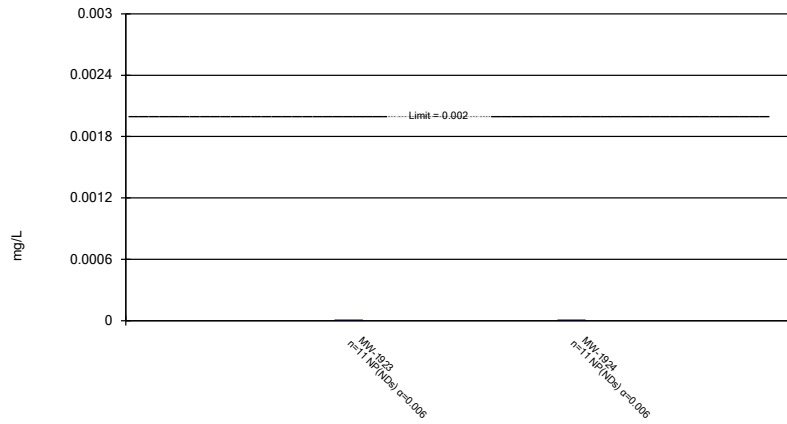
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Mercury, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

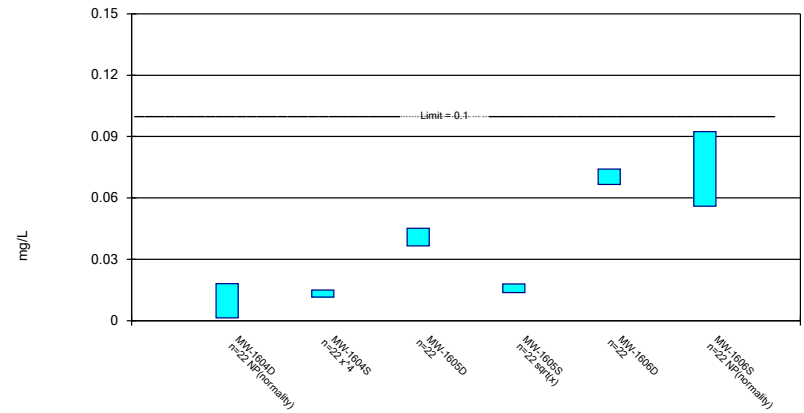
Compliance Limit is not exceeded.



Constituent: Mercury, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

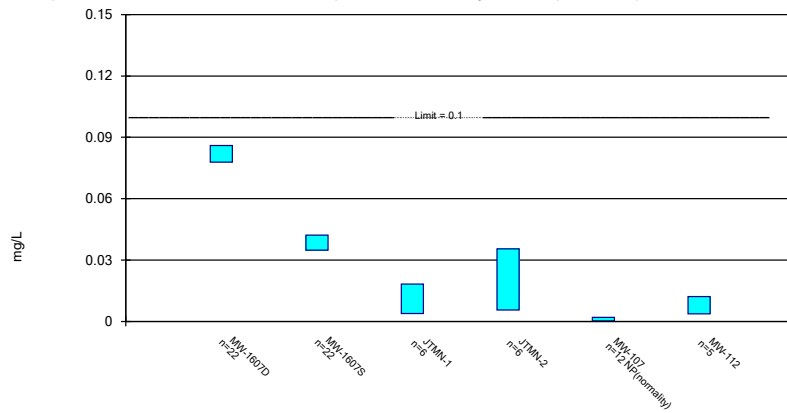
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

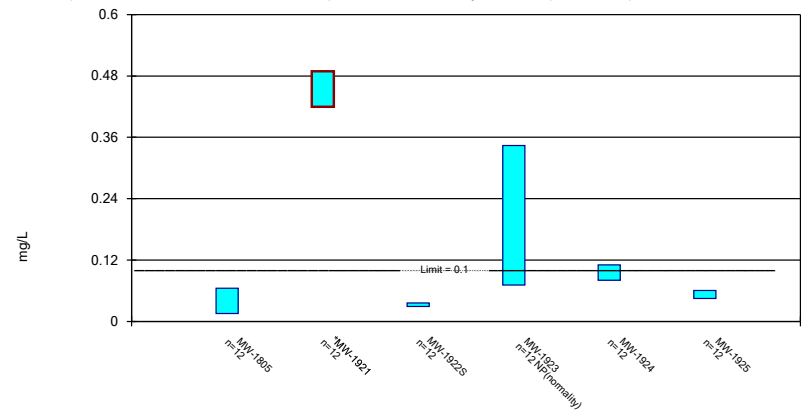
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

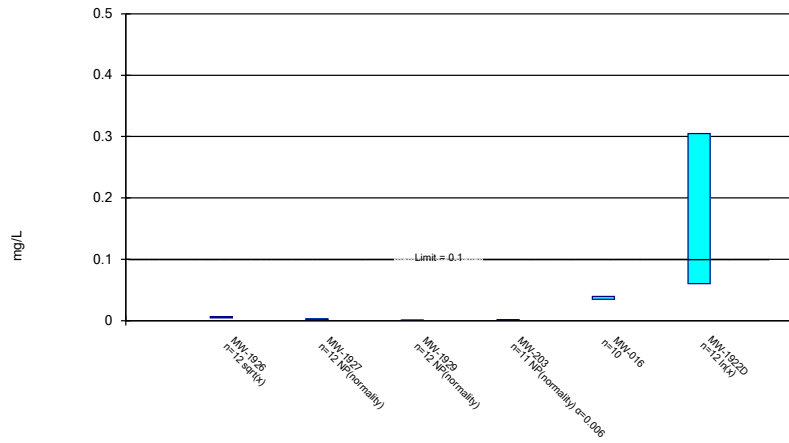
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

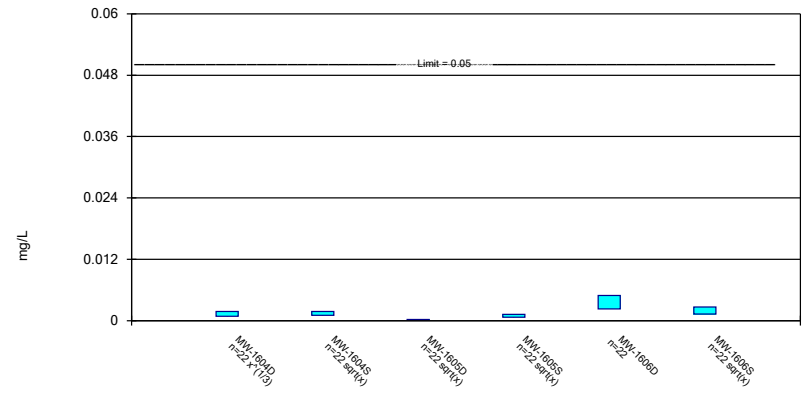
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based



Constituent: Molybdenum, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

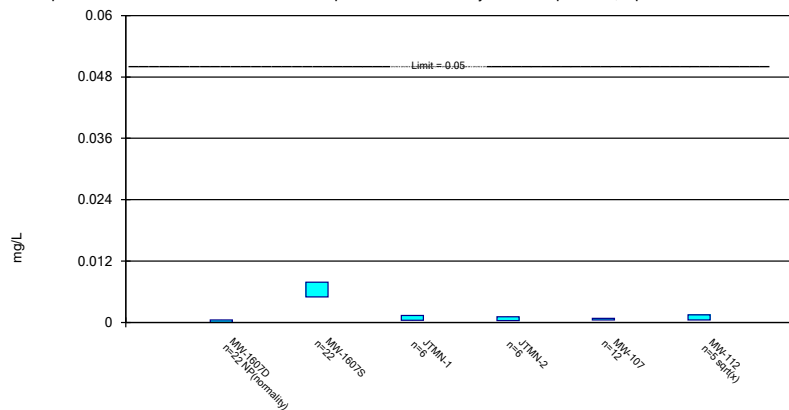
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

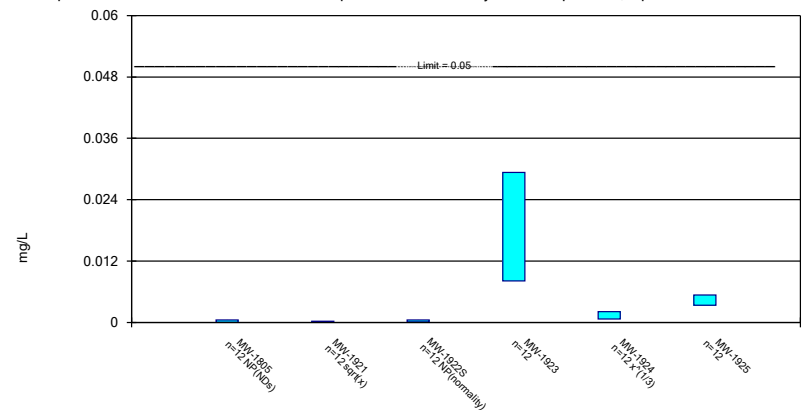
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

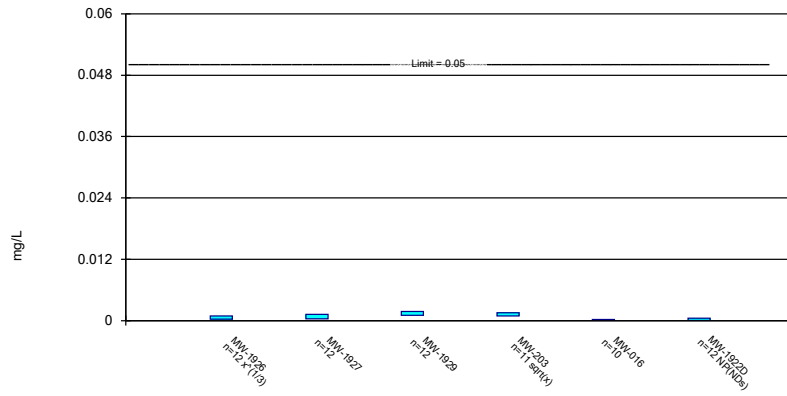
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

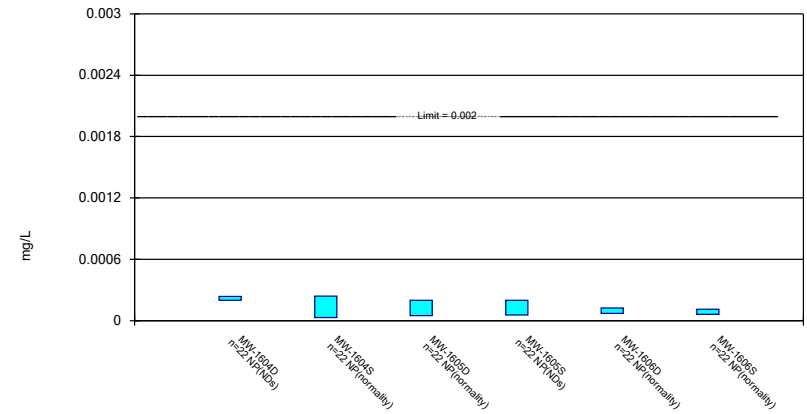
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

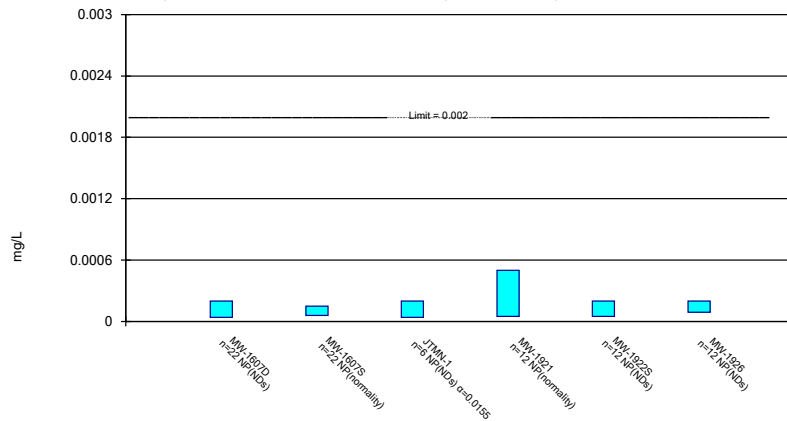
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 2/22/2023 10:35 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Confidence Interval

Constituent: Antimony, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.00014	4E-05 (J)				
9/27/2016			3E-05 (J)	0.00016	0.00019	0.00016
11/1/2016	0.00015	4E-05 (J)		7E-05		
11/2/2016			3E-05 (J)		0.00019	0.00017
12/20/2016	0.00014	4E-05 (J)	3E-05 (J)	7E-05 (J)	0.00016	0.00016
2/21/2017	0.00011	3E-05 (J)	4E-05 (J)	4E-05 (J)	0.00016	0.00015
3/28/2017	0.00013	3E-05 (J)	4E-05 (J)	3E-05 (J)	0.00015	0.00014
4/18/2017			3E-05 (J)	6E-05 (J)	0.00025	0.00016
4/19/2017	0.00012	3E-05 (J)				
5/16/2017	0.00013	4E-05 (J)	3E-05 (J)	6E-05 (J)	0.00019	0.00016
6/13/2017	0.00015	3E-05 (J)	4E-05 (J)	5E-05 (J)	0.00016	0.00016
5/9/2018	4E-05 (J)	0.00013	3E-05 (J)	4E-05 (J)	0.00016	0.00014
9/19/2018	4E-05 (J)	0.00013	4E-05 (J)	4E-05 (J)	0.00015	0.00013
4/8/2019					0.00015	0.00015
4/9/2019	<0.0005	0.0002 (J)	4E-05 (J)	5E-05 (J)		
6/19/2019	4E-05 (J)	0.00015	<0.0001	4E-05 (J)	0.00014	0.00015
9/9/2019	3E-05 (J)	0.00014				
9/10/2019			3E-05 (J)	4E-05 (J)	0.00015	0.00013
3/10/2020	2E-05 (J)	0.00014	3E-05 (J)	8E-05 (J)	0.00014	0.00013
5/14/2020	3E-05 (J)	0.00015				
5/19/2020			4E-05 (J)	4E-05 (J)	0.00015	0.00014
10/8/2020					0.00014	0.00014
10/9/2020	3E-05 (J)	0.00016	<0.0001	4E-05 (J)		
3/24/2021				4E-05 (J)		
3/25/2021	4E-05 (J)	0.00025	3E-05 (J)		0.00015	0.00016
5/18/2021					0.0002	0.00017
5/19/2021			6E-05 (J)	9E-05 (J)		
5/20/2021	8E-05 (J)	0.00016				
10/26/2021			4E-05 (J)	4E-05 (J)	0.00014	0.00015
10/27/2021	3E-05 (J)	0.00015				
3/2/2022	3E-05 (J)	0.00015				
3/9/2022			2E-05 (J)	5E-05 (J)	0.00017	0.00015
5/23/2022	4E-05 (J)	0.00016				
5/24/2022			4E-05 (J)	9E-05 (J)	0.00021	0.00014
11/3/2022	6E-05 (J)	0.00016				
11/4/2022			3E-05 (J)	6E-05 (J)		
11/7/2022					0.00014	
11/8/2022						0.00014
Mean	8.318E-05	0.0001141	3.636E-05	5.818E-05	0.0001655	0.0001491
Std. Dev.	6.082E-05	6.602E-05	9.021E-06	2.856E-05	2.841E-05	1.231E-05
Upper Lim.	0.0001025	0.00016	4E-05	6.603E-05	0.00019	0.0001557
Lower Lim.	4.549E-05	4E-05	3E-05	4.343E-05	0.00014	0.0001425

Confidence Interval

Constituent: Antimony, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	4E-05 (J)					
10/31/2016		0.00046				
11/2/2016	3E-05 (J)	0.00045				
12/20/2016	3E-05 (J)					
12/21/2016		0.00084 (o)				
2/21/2017	3E-05 (J)	0.00042				
3/28/2017		0.00043				
3/29/2017	5E-05					
4/18/2017	3E-05 (J)	0.00055				
5/16/2017	3E-05 (J)	0.0005				
6/14/2017	3E-05 (J)	0.00048				
5/10/2018	3E-05 (J)	0.00044				
9/20/2018	3E-05 (J)	0.00042				
4/8/2019	3E-05 (J)	0.0004				
4/10/2019					<0.0001	
6/18/2019					3E-05 (J)	
6/19/2019	3E-05 (J)	0.00044				<0.0001
9/10/2019	3E-05 (J)	0.00041			2E-05 (J)	
3/10/2020		0.00041			<0.0001	
3/11/2020	<0.0001					
5/13/2020					3E-05 (J)	<0.0001
5/20/2020	3E-05 (J)	0.00045				
10/6/2020					<0.0001	
10/8/2020	3E-05 (J)	0.00048				
3/23/2021					3E-05 (J)	
3/24/2021						3E-05 (J)
3/25/2021	3E-05 (J)	0.00043				
3/31/2021			0.0001 (J)	6E-05 (J)		
5/18/2021	7E-05 (J)	0.00049			6E-05 (J)	
5/19/2021						6E-05 (J)
5/20/2021			0.00014	0.00014		
10/26/2021	3E-05 (J)	0.0004				
10/27/2021			8E-05 (J)	5E-05 (J)	<0.0001	
3/1/2022					2E-05 (J)	3E-05 (J)
3/3/2022			4E-05 (J)	5E-05 (J)		
3/8/2022	3E-05 (J)	0.00043				
5/17/2022					2E-05 (J)	
5/24/2022			7E-05 (J)	6E-05 (J)		
5/25/2022	3E-05 (J)	0.00041				
11/1/2022					2E-05 (J)	
11/3/2022			9E-05 (J)	7E-05 (J)		
11/8/2022	3E-05 (J)	0.00044				
Mean	3.409E-05	0.0004448	8.667E-05	7.167E-05	5.25E-05	6.4E-05
Std. Dev.	1.008E-05	3.776E-05	3.327E-05	3.43E-05	3.671E-05	3.507E-05
Upper Lim.	4E-05	0.0004656	0.0001324	0.00014	0.0001	6.37E-05
Lower Lim.	3E-05	0.0004239	4.097E-05	5E-05	2E-05	1.63E-05

Confidence Interval

Constituent: Antimony, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			<0.0001			
4/10/2019	0.00214	0.0001 (J)		0.0002 (J)	0.0002 (J)	0.0002 (J)
6/18/2019				0.00021	6E-05 (J)	
6/19/2019	<0.0001	0.0001				0.00018
6/20/2019			<0.0001			
9/10/2019	7E-05 (J)		2E-05 (J)			0.0002
9/11/2019		0.0001 (J)		0.00024	7E-05 (J)	
3/10/2020	2E-05 (J)					
3/11/2020			<0.0001			0.00016
3/12/2020		8E-05 (J)		0.00015	9E-05 (J)	
5/14/2020	3E-05 (J)			0.00023	6E-05 (J)	0.00019
5/18/2020		0.00011	<0.0001			
10/6/2020		0.00011		0.00018	9E-05 (J)	0.0002
10/9/2020	<0.0001		9E-05 (J)			
3/23/2021		0.00014				0.00021
3/24/2021				0.00021	7E-05 (J)	
3/25/2021	3E-05 (J)		2E-05 (J)			
5/19/2021	5E-05 (J)					0.00027
5/20/2021		0.00016	5E-05 (J)	0.00023	6E-05 (J)	
10/26/2021	4E-05 (J)		<0.0001			
10/28/2021				0.00023	7E-05 (J)	0.0002
10/29/2021		9E-05 (J)				
3/2/2022	9E-05 (J)	0.0001	6E-05 (J)	0.00016		0.0002
3/7/2022					5E-05 (J)	
5/18/2022		0.00011				0.00021
5/19/2022				0.00021	0.00011	
5/20/2022	9E-05 (J)					
5/23/2022			2E-05 (J)			
11/1/2022		0.0001		0.00018		0.0002
11/2/2022					6E-05 (J)	
11/4/2022	<0.0001		4E-05 (J)			
Mean	0.0002383	0.0001083	6.667E-05	0.0002025	8.25E-05	0.0002017
Std. Dev.	0.0005996	2.167E-05	3.525E-05	2.927E-05	4.07E-05	2.552E-05
Upper Lim.	0.00214	0.0001238	0.0001	0.0002255	0.00011	0.00021
Lower Lim.	3E-05	9.2E-05	2E-05	0.0001795	5E-05	0.00018

Confidence Interval

Constituent: Antimony, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.00088
4/10/2019	0.0001 (J)	0.0003 (J)	<0.0001			
6/18/2019			2E-05 (J)	<0.0001		
6/19/2019						0.00029
6/20/2019	8E-05 (J)	0.00015				
9/10/2019			3E-05 (J)			0.00104
9/11/2019	7E-05 (J)	0.00012		2E-05 (J)	4E-05 (J)	
3/10/2020			<0.0001			
3/11/2020		9E-05 (J)		<0.0001	<0.0001	0.00063
3/12/2020	3E-05 (J)					
5/13/2020			4E-05 (J)	<0.0001	4E-05 (J)	
5/14/2020		0.00014				
5/18/2020	8E-05 (J)					
5/19/2020						0.00031
10/6/2020				3E-05 (J)		
10/8/2020	5E-05 (J)					0.00491
10/9/2020		0.00012	2E-05 (J)		4E-05 (J)	
3/23/2021	6E-05 (J)		4E-05 (J)	3E-05 (J)		
3/24/2021		9E-05 (J)			2E-05 (J)	
3/25/2021						0.00161
5/18/2021			5E-05 (J)	6E-05 (J)		
5/19/2021					9E-05 (J)	
5/20/2021	0.0001	0.00015				0.00065
10/27/2021		7E-05 (J)	2E-05 (J)	<0.0001		0.0006
10/28/2021	5E-05 (J)				<0.0001	
3/1/2022			3E-05 (J)			
3/2/2022		0.00011		<0.0001	<0.0001	
3/3/2022						0.0009
3/8/2022	5E-05 (J)					
5/17/2022			2E-05 (J)	<0.0001	4E-05 (J)	
5/19/2022	7E-05 (J)					
5/20/2022		0.0001				
5/23/2022						0.00094
10/31/2022				<0.0001		
11/1/2022			3E-05 (J)			
11/2/2022	6E-05 (J)					
11/3/2022		7E-05 (J)				
11/4/2022						0.0008
11/7/2022					5E-05 (J)	
Mean	6.667E-05	0.0001258	4.167E-05	7.636E-05	6.2E-05	0.00113
Std. Dev.	2.103E-05	6.142E-05	2.887E-05	3.414E-05	3.155E-05	0.00124
Upper Lim.	8.317E-05	0.000163	0.0001	0.0001	5.144E-05	0.001483
Lower Lim.	5.016E-05	8.369E-05	2E-05	3E-05	1.893E-05	0.0004656

Confidence Interval

Constituent: Arsenic, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.00048	0.00039				
9/27/2016			0.00229	0.00138	0.00071	0.00088
11/1/2016	0.00059	0.00046		0.00093		
11/2/2016			0.00248		0.00084	0.00094
12/20/2016	0.00057	0.00042	0.00226	0.00088	0.00063	0.00083
2/21/2017	0.00045	0.00042	0.00223	0.00086	0.00051	0.00088
3/28/2017	0.00041	0.00037	0.00201	0.00063	0.00044	0.00078
4/18/2017			0.00225	0.00074	0.00138	0.00086
4/19/2017	0.00049	0.00044				
5/16/2017	0.00054	0.00051	0.00245	0.00088	0.00063	0.0009
6/13/2017	0.00046	0.00041	0.00199	0.00075	0.00052	0.00081
5/9/2018	0.00034	0.00033	0.00222	0.0005	0.00044	0.00072
9/19/2018	0.00029	0.00032	0.00251	0.00049	0.00038	0.00069
4/8/2019					0.00035	0.0007
4/9/2019	0.0004 (J)	0.00054	0.00281	0.00064		
6/19/2019	0.00028	0.00033	0.00267	0.00047	0.00037	0.00063
9/9/2019	0.0003	0.00034				
9/10/2019			0.00278	0.00059	0.0004	0.00067
3/10/2020	0.00031	0.00029	0.00301	0.00062	0.00035	0.00062
5/14/2020	0.00028	0.0003				
5/19/2020			0.00273	0.00047	0.00032	0.00065
10/8/2020					0.00036	0.00068
10/9/2020	0.00029	0.00032	0.00309	0.00047		
3/24/2021				0.00042		
3/25/2021	0.00028	0.00035	0.00298		0.00035	0.0007
5/18/2021					0.00033	0.00063
5/19/2021			0.00283	0.00043		
5/20/2021	0.00025	0.00025				
10/26/2021			0.0029	0.00039	0.00028	0.00061
10/27/2021	0.00029	0.00035				
3/2/2022	0.00026	0.00024				
3/9/2022			0.00333	0.00043	0.0003	0.0007
5/23/2022	0.0004	0.00026				
5/24/2022			0.00327	0.00043	0.00027	0.00061
11/3/2022	0.00024	0.00022				
11/4/2022			0.00342	0.00045		
11/7/2022					0.0003	
11/8/2022						0.00062
Mean	0.0003727	0.0003573	0.00266	0.0006295	0.0004755	0.0007323
Std. Dev.	0.0001108	8.509E-05	0.0004226	0.0002416	0.000252	0.0001077
Upper Lim.	0.0004322	0.0004029	0.002886	0.0007264	0.0005389	0.0007901
Lower Lim.	0.0003133	0.0003116	0.002433	0.0004976	0.0003491	0.0006745

Confidence Interval

Constituent: Arsenic, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.00091					
10/31/2016		0.00186				
11/2/2016	0.00102	0.0013				
12/20/2016	0.00102					
12/21/2016		0.0112 (o)				
2/21/2017	0.00114	0.00119				
3/28/2017		0.00117				
3/29/2017	0.00124					
4/18/2017	0.001	0.00162				
5/16/2017	0.00111	0.00117				
6/14/2017	0.00098	0.0011				
5/10/2018	0.00115	0.00093				
9/20/2018	0.00134	0.0009				
4/8/2019	0.00131	0.00094				
4/10/2019					0.00108	
6/18/2019					0.00044	
6/19/2019	0.00161	0.00096				0.0004
9/10/2019	0.00153	0.00087			0.00044	
3/10/2020		0.00092			0.00042	
3/11/2020	0.00156					
5/13/2020					0.00059	0.00033
5/20/2020	0.00142	0.00093				
10/6/2020					0.00034	
10/8/2020	0.0018	0.00089				
3/23/2021					0.00033	
3/24/2021						0.00041
3/25/2021	0.00186	0.00093				
3/31/2021			0.00216	0.00109		
5/18/2021	0.00186	0.00091			0.00025	
5/19/2021						0.00038
5/20/2021			0.00146	0.00083		
10/26/2021	0.00187	0.00092				
10/27/2021			0.00252	0.00079	0.0003	
3/1/2022					0.00042	0.00033
3/3/2022			0.00088	0.00108		
3/8/2022	0.00207	0.00085				
5/17/2022					0.00037	
5/24/2022			0.00202	0.00094		
5/25/2022	0.00193	0.00084				
11/1/2022					0.00029	
11/3/2022			0.00238	0.00133		
11/8/2022	0.00195	0.00091				
Mean	0.00144	0.001053	0.001903	0.00101	0.0004392	0.00037
Std. Dev.	0.0003783	0.0002641	0.0006214	0.0001997	0.0002212	3.808E-05
Upper Lim.	0.001643	0.00117	0.002757	0.001284	0.0005485	0.0004338
Lower Lim.	0.001237	0.0009	0.00105	0.0007357	0.0002995	0.0003062

Confidence Interval

Constituent: Arsenic, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			0.00195			
4/10/2019	0.0203	0.00336		0.00055	0.00091	0.00088
6/18/2019				0.00056	0.00055	
6/19/2019	0.0663	0.00119				0.00035
6/20/2019			0.00189			
9/10/2019	0.0704		0.00175			0.00041
9/11/2019		0.00125		0.00075	0.00061	
3/10/2020	0.0114					
3/11/2020			0.00292			0.00037
3/12/2020		0.00121		0.00058	0.00072	
5/14/2020	0.056			0.00069	0.00066	0.00032
5/18/2020		0.00112	0.00179			
10/6/2020		0.00118		0.00062	0.0013	0.00056
10/9/2020	0.0809		0.00325			
3/23/2021		0.00161				0.00053
3/24/2021				0.00052	0.00118	
3/25/2021	0.0742		0.00212			
5/19/2021	0.0695					0.00052
5/20/2021		0.00159	0.00204	0.00114	0.00056	
10/26/2021	0.0373		0.00207			
10/28/2021				0.00166	0.00057	0.00028
10/29/2021		0.00122				
3/2/2022	0.0194	0.00114	0.00408	0.00078		0.00028
3/7/2022					0.00064	
5/18/2022		0.00125				0.00039
5/19/2022				0.00085	0.00054	
5/20/2022	0.0109					
5/23/2022			0.00199			
11/1/2022		0.00114		0.00079		0.00024
11/2/2022					0.00043	
11/4/2022	0.0402		0.00189			
Mean	0.0464	0.001438	0.002312	0.0007908	0.0007225	0.0004275
Std. Dev.	0.02625	0.000627	0.0007214	0.0003235	0.0002696	0.0001765
Upper Lim.	0.06699	0.00161	0.00325	0.0009715	0.0009024	0.0005486
Lower Lim.	0.02581	0.00114	0.00179	0.0005723	0.0005242	0.000297

Confidence Interval

Constituent: Arsenic, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.323
4/10/2019	0.00095	0.0004 (J)	0.0008			
6/18/2019			0.00037	0.0003		
6/19/2019						0.716
6/20/2019	0.00038	0.00028				
9/10/2019			0.00047			0.839
9/11/2019	0.00037	0.00027		0.00033	0.00455	
3/10/2020			0.00041			
3/11/2020		0.00029		0.00025	0.00851	1.24
3/12/2020	0.00033					
5/13/2020			0.00079	0.00029	0.00402	
5/14/2020		0.00029				
5/18/2020	0.00036					
5/19/2020						0.522
10/6/2020				0.00028		
10/8/2020	0.00032					1.04
10/9/2020		0.00044	0.00041		0.0041	
3/23/2021	0.00033		0.00046	0.00029		
3/24/2021		0.00025			0.00411	
3/25/2021						0.546
5/18/2021			0.00047	0.00027		
5/19/2021					0.00307	
5/20/2021	0.00031	0.00022				0.494
10/27/2021		0.00023	0.00033	0.00025		0.456
10/28/2021	0.00031				0.00355	
3/1/2022			0.00032			
3/2/2022		0.00028		0.00021	0.00347	
3/3/2022						0.478
3/8/2022	0.0003					
5/17/2022			0.00035	0.00026	0.00245	
5/19/2022	0.00034					
5/20/2022		0.00028				
5/23/2022						0.562
10/31/2022				0.00022		
11/1/2022			0.00028			
11/2/2022	0.00028					
11/3/2022		0.0002				
11/4/2022						0.384
11/7/2022					0.00431	
Mean	0.0003817	0.0002858	0.000455	0.0002682	0.004214	0.6333
Std. Dev.	0.0001814	6.96E-05	0.0001702	3.516E-05	0.001635	0.2765
Upper Lim.	0.00038	0.0003365	0.000558	0.0002975	0.005335	0.8503
Lower Lim.	0.0003	0.0002328	0.0003333	0.0002389	0.002998	0.4164

Confidence Interval

Constituent: Barium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.0291	0.0294				
9/27/2016			0.0315	0.0496	0.064	0.0767
11/1/2016	0.0284	0.0272		0.0382		
11/2/2016			0.0306		0.0626	0.0697
12/20/2016	0.0303	0.0266	0.0282	0.037	0.0584	0.0716
2/21/2017	0.0262	0.0267	0.0259	0.036	0.0526	0.0772
3/28/2017	0.0289	0.0316	0.0279	0.0325	0.0536	0.0757
4/18/2017			0.0258	0.0319	0.0642	0.0742
4/19/2017	0.0279	0.0289				
5/16/2017	0.0275	0.0322	0.0263	0.0333	0.0567	0.0741
6/13/2017	0.0279	0.0287	0.0272	0.0308	0.052	0.0771
5/9/2018	0.032	0.0287	0.0216	0.0235	0.053	0.0732
9/19/2018	0.037	0.0266	0.0259	0.0231	0.0489	0.0648
4/8/2019					0.0473	0.0631
4/9/2019	0.0425	0.0291	0.0264	0.0252		
6/19/2019	0.0529	0.029	0.0286	0.0236	0.0494	0.0672
9/9/2019	0.0556	0.029				
9/10/2019			0.0331	0.0296	0.0514	0.0704
3/10/2020	0.0342	0.0289	0.0296	0.0265	0.0453	0.0609
5/14/2020	0.0341	0.0291				
5/19/2020			0.0257	0.0211	0.0456	0.0598
10/8/2020					0.0456	0.0574
10/9/2020	0.0273	0.0282	0.023	0.0246		
3/24/2021				0.0257		
3/25/2021	0.0265	0.0282	0.0273		0.0473	0.0541
5/18/2021					0.0461	0.0521
5/19/2021			0.0266	0.0269		
5/20/2021	0.0244	0.0253				
10/26/2021			0.0243	0.0282	0.0461	0.0556
10/27/2021	0.0241	0.0249				
3/2/2022	0.0232	0.0278				
3/9/2022			0.0266	0.0283	0.0481	0.0546
5/23/2022	0.0353	0.034				
5/24/2022			0.0335	0.029	0.0394	0.0448
11/3/2022	0.0268	0.0294				
11/4/2022			0.0295	0.0273		
11/7/2022					0.0419	
11/8/2022						0.056
Mean	0.03191	0.02861	0.0275	0.02963	0.05089	0.06501
Std. Dev.	0.008584	0.002099	0.002962	0.006444	0.006825	0.009654
Upper Lim.	0.0342	0.02974	0.02909	0.03309	0.05455	0.0702
Lower Lim.	0.0268	0.02749	0.02591	0.02617	0.04722	0.05983

Confidence Interval

Constituent: Barium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.117					
10/31/2016		0.0567				
11/2/2016	0.155	0.0555				
12/20/2016	0.168					
12/21/2016		0.114 (o)				
2/21/2017	0.133	0.0639				
3/28/2017		0.0668				
3/29/2017	0.14					
4/18/2017	0.126	0.0676				
5/16/2017	0.129	0.0637				
6/14/2017	0.131	0.0629				
5/10/2018	0.0735	0.0711				
9/20/2018	0.0923	0.0806				
4/8/2019	0.0757	0.0727				
4/10/2019					0.0683	
6/18/2019					0.0694	
6/19/2019	0.0823	0.081				0.0769
9/10/2019	0.0793	0.0677			0.0678	
3/10/2020		0.0692			0.0482	
3/11/2020	0.0683					
5/13/2020					0.0481	0.0597
5/20/2020	0.0656	0.0668				
10/6/2020					0.0354	
10/8/2020	0.0758	0.064				
3/23/2021					0.0424	
3/24/2021						0.0737
3/25/2021	0.0753	0.0707				
3/31/2021			0.0891	0.0871		
5/18/2021	0.0717	0.068			0.039	
5/19/2021						0.0727
5/20/2021			0.0846	0.0906		
10/26/2021	0.0703	0.065				
10/27/2021			0.0859	0.0683	0.0371	
3/1/2022					0.0521	0.054
3/3/2022			0.0671	0.0915		
3/8/2022	0.0705	0.0686				
5/17/2022					0.0509	
5/24/2022			0.0947	0.0713		
5/25/2022	0.067	0.0608				
11/1/2022					0.0324	
11/3/2022			0.102	0.0857		
11/8/2022	0.074	0.064				
Mean	0.0973	0.06701	0.08723	0.08242	0.04926	0.0674
Std. Dev.	0.03291	0.006282	0.01176	0.01005	0.01315	0.009961
Upper Lim.	0.129	0.07048	0.1034	0.09622	0.05958	0.08409
Lower Lim.	0.0717	0.06355	0.07108	0.06861	0.03894	0.05071

Confidence Interval

Constituent: Barium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			0.0307			
4/10/2019	0.0543	0.068		0.0776	0.0598	0.0466
6/18/2019				0.0729	0.0695	
6/19/2019	0.0424	0.0512				0.048
6/20/2019			0.0269			
9/10/2019	0.0419		0.0265			0.045
9/11/2019		0.0508		0.0866	0.0545	
3/10/2020	0.0243					
3/11/2020			0.028			0.0404
3/12/2020		0.0585		0.0733	0.0467	
5/14/2020	0.0413			0.0798	0.0545	0.0368
5/18/2020		0.0541	0.0274			
10/6/2020		0.0474		0.0864	0.0553	0.0395
10/9/2020	0.0322		0.0377			
3/23/2021		0.0547				0.0397
3/24/2021				0.0951	0.0447	
3/25/2021	0.0288		0.0243			
5/19/2021	0.0277					0.0383
5/20/2021		0.0555	0.0258	0.0981	0.0429	
10/26/2021	0.0252		0.0254			
10/28/2021				0.103	0.0377	0.0339
10/29/2021		0.0569				
3/2/2022	0.0323	0.0603	0.0307	0.0999		0.0385
3/7/2022					0.0376	
5/18/2022		0.0606				0.0421
5/19/2022				0.0955	0.0343	
5/20/2022	0.0445					
5/23/2022			0.0292			
11/1/2022		0.063		0.101		0.0397
11/2/2022					0.0481	
11/4/2022	0.0403		0.0276			
Mean	0.03627	0.05675	0.02835	0.0891	0.0488	0.04071
Std. Dev.	0.0092	0.005741	0.003541	0.01109	0.01032	0.004091
Upper Lim.	0.04349	0.06125	0.03099	0.0978	0.0569	0.04392
Lower Lim.	0.02905	0.05225	0.02565	0.0804	0.0407	0.0375

Confidence Interval

Constituent: Barium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.0693
4/10/2019	0.0288	0.0634	0.0569			
6/18/2019			0.0476	0.0347		
6/19/2019						0.0547
6/20/2019	0.0229	0.0615				
9/10/2019			0.0521			0.051
9/11/2019	0.0239	0.0587		0.0316	0.0487	
3/10/2020			0.0438			
3/11/2020		0.0562		0.0334	0.0391	0.0723
3/12/2020	0.0203					
5/13/2020			0.0521	0.031	0.0287	
5/14/2020		0.0544				
5/18/2020	0.0237					
5/19/2020						0.0663
10/6/2020				0.0246		
10/8/2020	0.02					0.144
10/9/2020		0.0513	0.0446		0.0226	
3/23/2021	0.0208		0.0459	0.0267		
3/24/2021		0.0571			0.0232	
3/25/2021						0.227
5/18/2021			0.0519	0.0282		
5/19/2021					0.0239	
5/20/2021	0.0191	0.0565				0.262
10/27/2021		0.0534	0.0454	0.0265		0.331
10/28/2021	0.022				0.0239	
3/1/2022			0.0483			
3/2/2022		0.0555		0.0328	0.0242	
3/3/2022						0.353
3/8/2022	0.0202					
5/17/2022			0.0478	0.0293	0.0242	
5/19/2022	0.02					
5/20/2022		0.0596				
5/23/2022						0.3
10/31/2022				0.0306		
11/1/2022			0.0443			
11/2/2022	0.0189					
11/3/2022		0.057				
11/4/2022						0.406
11/7/2022					0.0246	
Mean	0.02172	0.05705	0.04839	0.02995	0.02831	0.1947
Std. Dev.	0.002799	0.003387	0.004051	0.003184	0.008676	0.1331
Upper Lim.	0.02381	0.05971	0.05157	0.0326	0.0391	0.2992
Lower Lim.	0.01958	0.05439	0.04521	0.02729	0.0232	0.09026

Confidence Interval

Constituent: Beryllium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604S	MW-1605S	MW-1606D	MW-1606S	MW-1607D	MW-1607S
9/26/2016	<5E-05					
9/27/2016		2E-05 (J)	5E-06 (J)	<5E-05	<5E-05	
10/31/2016						1E-05 (J)
11/1/2016	<5E-05	9E-06 (J)				
11/2/2016			<5E-05	<5E-05	<5E-05	<0.00025
12/20/2016	<5E-05	<5E-05	<5E-05	<5E-05	<5E-05	
12/21/2016						0.000123
2/21/2017	<5E-05	7E-06 (J)	<5E-05	<5E-05	<5E-05	7E-06 (J)
3/28/2017	<5E-05	<5E-05	<5E-05	<5E-05		<0.00025
3/29/2017					8E-06 (J)	
4/18/2017		<5E-05	1E-05 (J)	<5E-05	<5E-05	1E-05 (J)
4/19/2017	<5E-05					
5/16/2017	<5E-05	<5E-05	3.1E-05	<5E-05	<5E-05	<0.00025
6/13/2017	<5E-05	<5E-05	<5E-05	<5E-05		
6/14/2017					<5E-05	<0.00025
5/9/2018	2.4E-05	<5E-05	<5E-05	<5E-05		
5/10/2018					<5E-05	<0.00025
9/19/2018	<5E-05	<5E-05	4E-06 (J)	5E-06 (J)		
9/20/2018					<5E-05	<0.00025
4/8/2019			<5E-05	<5E-05	<5E-05	<0.00025
4/9/2019	<5E-05	<5E-05				
6/19/2019	<5E-05	<5E-05	<5E-05	<5E-05	<5E-05	<0.00025
9/9/2019	<5E-05					
9/10/2019		<5E-05	<5E-05	<5E-05	<5E-05	<0.00025
3/10/2020	<5E-05	<5E-05	<5E-05	<5E-05		<0.00025
3/11/2020					<5E-05	
3/24/2021		<5E-05				
3/25/2021	<5E-05		<5E-05	<5E-05	<5E-05	<0.00025
5/18/2021			<5E-05	<5E-05	<5E-05	<0.00025
5/19/2021		<5E-05				
5/20/2021	<5E-05					
10/26/2021		<5E-05	<5E-05	<5E-05	<5E-05	<0.00025
10/27/2021	<5E-05					
3/2/2022	<5E-05					
3/8/2022					<5E-05	<0.00025
3/9/2022		<5E-05	<5E-05	<5E-05		
5/23/2022	<5E-05					
5/24/2022		<5E-05	<5E-05	<5E-05		
5/25/2022					<5E-05	<0.00025
11/3/2022	<5E-05					
11/4/2022		<5E-05				
11/7/2022			<5E-05			
11/8/2022				<5E-05	<5E-05	<0.00025
Mean	4.87E-05	4.43E-05	4.25E-05	4.775E-05	4.79E-05	0.0002075
Std. Dev.	5.814E-06	1.411E-05	1.618E-05	1.006E-05	9.391E-06	9.01E-05
Upper Lim.	5E-05	5E-05	5E-05	5E-05	5E-05	0.00025
Lower Lim.	2.4E-05	2E-05	3.1E-05	5E-06	8E-06	0.000123

Confidence Interval

Constituent: Beryllium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	JTMN-1	JTMN-2	MW-1921	MW-1922S	MW-1923	MW-1924
4/9/2019				<5E-05		
4/10/2019			<5E-05		<0.0001	<5E-05
6/18/2019					<0.0001	<5E-05
6/19/2019			<5E-05			
6/20/2019				<5E-05		
9/10/2019				<5E-05		
9/11/2019			<5E-05		<0.0001	<5E-05
3/11/2020				<5E-05		
3/12/2020			<5E-05		<0.0001	<5E-05
3/23/2021			2E-05 (J)			
3/24/2021					<0.0001	3E-05 (J)
3/25/2021				<5E-05		
3/31/2021	7E-05 (J)	3E-05 (J)				
5/20/2021	3.2E-05 (J)	1.9E-05 (J)	9E-06 (J)	<5E-05	4.1E-05 (J)	9E-06 (J)
10/26/2021				<5E-05		
10/27/2021	6.3E-05	2.1E-05 (J)				
10/28/2021					6.4E-05	<5E-05
10/29/2021			<5E-05			
3/2/2022			<5E-05	1.8E-05 (J)	1.7E-05 (J)	
3/3/2022	1.5E-05 (J)	2.9E-05 (J)				
3/7/2022						8E-06 (J)
5/18/2022			<5E-05			
5/19/2022					1.5E-05 (J)	<5E-05
5/23/2022				<5E-05		
5/24/2022	4.1E-05 (J)	1.9E-05 (J)				
11/1/2022			<5E-05		2.2E-05 (J)	
11/2/2022						<5E-05
11/3/2022	6.5E-05	4.5E-05 (J)				
11/4/2022				<5E-05		
Mean	4.767E-05	2.717E-05	4.29E-05	4.68E-05	6.59E-05	3.97E-05
Std. Dev.	2.187E-05	1.001E-05	1.519E-05	1.012E-05	3.851E-05	1.759E-05
Upper Lim.	7.771E-05	4.092E-05	5E-05	5E-05	0.0001	5E-05
Lower Lim.	1.762E-05	1.342E-05	2E-05	5E-05	1.7E-05	9E-06

Confidence Interval

Constituent: Beryllium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1925	MW-016
4/10/2019	<5E-05	
6/19/2019	<5E-05	
9/10/2019	<5E-05	
9/11/2019		4E-05 (J)
3/11/2020	<5E-05	<5E-05
3/23/2021	<5E-05	
3/24/2021		<5E-05
5/19/2021	8E-06 (J)	<5E-05
10/28/2021	<5E-05	<5E-05
3/2/2022	<5E-05	<5E-05
5/17/2022		<5E-05
5/18/2022	<5E-05	
11/1/2022	<5E-05	
11/7/2022		<5E-05
Mean	4.58E-05	4.875E-05
Std. Dev.	1.328E-05	3.536E-06
Upper Lim.	5E-05	5E-05
Lower Lim.	5E-05	4E-05

Confidence Interval

Constituent: Cadmium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.00014	3E-05				
9/27/2016			4E-05	0.00013	7E-05	8E-05
11/1/2016	0.00017	4E-05		8E-05		
11/2/2016			4E-05		7E-05	7E-05
12/20/2016	0.00017	4E-05	4E-05 (J)	8E-05	6E-05	7E-05
2/21/2017	0.00013	4E-05	3E-05	8E-05	7E-05	8E-05
3/28/2017	0.00013	3E-05	3E-05	6E-05	5E-05	6E-05
4/18/2017			2E-05 (J)	8E-05	8E-05	7E-05
4/19/2017	9E-05	4E-05				
5/16/2017	0.0001	4E-05	2E-05 (J)	8E-05	7E-05	7E-05
6/13/2017	0.00015	4E-05	4E-05	8E-05	8E-05	9E-05
5/9/2018	4E-05	0.00015	1E-05 (J)	6E-05	7E-05	8E-05
9/19/2018	3E-05	0.00015	2E-05 (J)	5E-05	7E-05	6E-05
4/8/2019					7E-05	7E-05
4/9/2019	5E-05 (J)	0.00027	1E-05 (J)	5E-05		
6/19/2019	4E-05 (J)	0.00021	2E-05 (J)	5E-05 (J)	9E-05	8E-05
9/9/2019	3E-05 (J)	0.00021				
9/10/2019			3E-05 (J)	5E-05 (J)	8E-05	7E-05
3/10/2020	3E-05 (J)	0.00012	2E-05 (J)	4E-05 (J)	5E-05	7E-05
5/14/2020	3E-05 (J)	0.00019				
5/19/2020			1E-05 (J)	3E-05 (J)	6E-05	6E-05
10/8/2020					8E-05	7E-05
10/9/2020	2E-05 (J)	0.00021	<5E-05	3E-05 (J)		
3/24/2021				5E-05 (J)		
3/25/2021	2E-05 (J)	0.0002	1E-05 (J)		8E-05	5E-05
5/18/2021					8.2E-05	6.7E-05
5/19/2021			1.4E-05 (J)	4.7E-05		
5/20/2021	2.2E-05	0.000174				
10/26/2021			1.1E-05 (J)	5E-05	7.5E-05	6.1E-05
10/27/2021	2.7E-05	0.000171				
3/2/2022	2.2E-05	0.000172				
3/9/2022			1.5E-05 (J)	5.7E-05	8.3E-05	6.8E-05
5/23/2022	2.2E-05	0.000128				
5/24/2022			1.6E-05 (J)	4E-05	5.2E-05	5.5E-05
11/3/2022	1.7E-05 (J)	0.000167				
11/4/2022			8E-06 (J)	4.5E-05		
11/7/2022					6.4E-05	
11/8/2022						5.9E-05
Mean	6.727E-05	0.0001283	2.177E-05	5.995E-05	7.073E-05	6.864E-05
Std. Dev.	5.555E-05	7.668E-05	1.104E-05	2.279E-05	1.11E-05	9.51E-06
Upper Lim.	0.00013	0.0001809	2.77E-05	7.005E-05	7.668E-05	7.374E-05
Lower Lim.	2.2E-05	0.0001068	1.585E-05	4.728E-05	6.477E-05	6.353E-05

Confidence Interval

Constituent: Cadmium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	2E-05 (J)					
10/31/2016		6E-05				
11/2/2016	2E-05 (J)	4E-05				
12/20/2016	5E-06 (J)					
12/21/2016		0.00022 (o)				
2/21/2017	<2E-05	3E-05				
3/28/2017		2E-05				
3/29/2017	3E-05					
4/18/2017	<2E-05	6E-05				
5/16/2017	<2E-05	3E-05				
6/14/2017	<2E-05	3E-05				
5/10/2018	<2E-05	4E-05				
9/20/2018	<2E-05	4E-05				
4/8/2019	<2E-05	4E-05 (J)				
4/10/2019					5E-05 (J)	
6/18/2019					5E-05	
6/19/2019	<2E-05	4E-05 (J)				<5E-05
9/10/2019	1E-05 (J)	5E-05 (J)			4E-05 (J)	
3/10/2020		4E-05 (J)			3E-05 (J)	
3/11/2020	<2E-05					
5/13/2020					7E-05	<5E-05
5/20/2020	<2E-05	4E-05 (J)				
10/6/2020					2E-05 (J)	
10/8/2020	<2E-05	3E-05 (J)				
3/23/2021					3E-05 (J)	
3/24/2021						7E-06 (J)
3/25/2021	4E-06 (J)	4E-05 (J)				
3/31/2021			3E-05 (J)	4E-05 (J)		
5/18/2021	1E-05 (J)	0.000108			3.1E-05	
5/19/2021						5E-06 (J)
5/20/2021			0.000114	5.2E-05		
10/26/2021	8E-06 (J)	3.6E-05				
10/27/2021			2.9E-05	3.6E-05	2.4E-05	
3/1/2022					3.1E-05	7E-06 (J)
3/3/2022			2.1E-05	3.1E-05		
3/8/2022	1.1E-05 (J)	4.2E-05				
5/17/2022					3.5E-05	
5/24/2022			2.8E-05	1.4E-05 (J)		
5/25/2022	1E-05 (J)	4.3E-05				
11/1/2022					1.5E-05 (J)	
11/3/2022			3.8E-05	3.4E-05		
11/8/2022	<2E-05	3.4E-05				
Mean	1.673E-05	4.252E-05	4.333E-05	3.45E-05	3.55E-05	2.38E-05
Std. Dev.	6.438E-06	1.769E-05	3.504E-05	1.242E-05	1.515E-05	2.393E-05
Upper Lim.	2E-05	4.816E-05	0.000114	5.156E-05	4.739E-05	5E-05
Lower Lim.	1E-05	3.334E-05	2.1E-05	1.744E-05	2.361E-05	5E-06

Confidence Interval

Constituent: Cadmium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925	MW-1926
4/9/2019		<5E-05				
4/10/2019	<5E-05		<0.0002	0.0002 (J)	6E-05 (J)	6E-05 (J)
6/18/2019			1E-05 (J)	5E-05		
6/19/2019	<5E-05				4E-05 (J)	
6/20/2019		<5E-05				5E-05
9/10/2019		<5E-05			6E-05	
9/11/2019	3E-05 (J)		3E-05 (J)	6E-05		6E-05
3/11/2020		<5E-05			5E-05 (J)	
3/12/2020	<5E-05		2E-05 (J)	6E-05		4E-05 (J)
5/14/2020			2E-05 (J)	6E-05	4E-05 (J)	
5/18/2020	<5E-05	<5E-05				5E-05
10/6/2020	<5E-05		1E-05 (J)	9E-05	4E-05 (J)	
10/8/2020						5E-05 (J)
10/9/2020		0.00011				
3/23/2021	6E-05				5E-05 (J)	4E-05 (J)
3/24/2021			1E-05 (J)	7E-05		
3/25/2021		6E-06 (J)				
5/19/2021					6.7E-05	
5/20/2021	4.3E-05	1.2E-05 (J)	3.3E-05	6.8E-05		3.5E-05
10/26/2021		1E-05 (J)				
10/28/2021			5.3E-05	6.5E-05	3.7E-05	3.9E-05
10/29/2021	2.3E-05					
3/2/2022	4E-05	7.6E-05	3.6E-05		4.7E-05	
3/7/2022				5.6E-05		
3/8/2022						3.5E-05
5/18/2022	4.7E-05				5.7E-05	
5/19/2022			4.9E-05	5.1E-05		3.3E-05
5/23/2022		1.3E-05 (J)				
11/1/2022	1E-05 (J)		1.2E-05 (J)		4E-05	
11/2/2022				5.4E-05		3.2E-05
11/4/2022		5E-06 (J)				
Mean	4.192E-05	4.017E-05	3.192E-05	7.367E-05	4.9E-05	4.367E-05
Std. Dev.	1.415E-05	3.232E-05	2.614E-05	4.121E-05	1.002E-05	1.001E-05
Upper Lim.	4.652E-05	4.837E-05	4.793E-05	9E-05	5.686E-05	5.152E-05
Lower Lim.	2.514E-05	-2.039E-06	1.327E-05	5.1E-05	4.114E-05	3.581E-05

Confidence Interval

Constituent: Cadmium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019					<2E-05
4/10/2019	<0.0002	<5E-05			
6/18/2019		2E-05 (J)	<5E-05		
6/19/2019					<2E-05
6/20/2019	5E-05 (J)				
9/10/2019		1E-05 (J)			1E-05 (J)
9/11/2019	5E-05		<5E-05	4E-05 (J)	
3/10/2020		<5E-05			
3/11/2020	6E-05		<5E-05	2E-05 (J)	<2E-05
5/13/2020		4E-05 (J)	<5E-05	3E-05 (J)	
5/14/2020	6E-05				
5/19/2020					<2E-05
10/6/2020			<5E-05		
10/8/2020					<2E-05
10/9/2020	7E-05	1E-05 (J)		<5E-05	
3/23/2021		2E-05 (J)	7E-06 (J)		
3/24/2021	7E-05			2E-05 (J)	
3/25/2021					<2E-05
5/18/2021		1.7E-05 (J)	5E-06 (J)		
5/19/2021				2.1E-05	
5/20/2021	5.5E-05				<2E-05
10/27/2021	6.7E-05	5E-06 (J)	5E-06 (J)		<2E-05
10/28/2021				1.8E-05 (J)	
3/1/2022		9E-06 (J)			
3/2/2022	9.8E-05		6E-06 (J)	1.9E-05 (J)	
3/3/2022					5E-06 (J)
5/17/2022		1E-05 (J)	4E-06 (J)	2.2E-05	
5/20/2022	7.2E-05				
5/23/2022					9E-06 (J)
10/31/2022			5E-06 (J)		
11/1/2022		7E-06 (J)			
11/3/2022	6.8E-05				
11/4/2022					<2E-05
11/7/2022				1.2E-05 (J)	
Mean	6.833E-05	2.067E-05	2.564E-05	2.27E-05	1.7E-05
Std. Dev.	1.622E-05	1.657E-05	2.334E-05	7.646E-06	5.543E-06
Upper Lim.	8.106E-05	1.895E-05	5E-05	2.952E-05	2E-05
Lower Lim.	5.561E-05	6.122E-06	5E-06	1.588E-05	9E-06

Confidence Interval

Constituent: Chromium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.0004	0.0002				
9/27/2016			0.0001	0.0006	0.0003	0.0002
11/1/2016	0.0005	0.0003		0.0007		
11/2/2016			0.0002		0.0009	0.0004
12/20/2016	0.000798	0.00197 (o)	0.00229 (o)	0.00285 (o)	0.000736	0.00126
2/21/2017	0.000297	0.000379	0.000282	0.00039	0.0003	0.000384
3/28/2017	0.000416	0.000692	0.000556	0.000349	0.000541	0.000742
4/18/2017			0.000127	0.000245	0.000853	0.000134
4/19/2017	0.000323	0.000158				
5/16/2017	7.9E-05	9.8E-05	9.9E-05	0.000585	0.000163	9.3E-05
6/13/2017	0.00018	0.000149	0.00012	0.000387	0.000153	0.000178
5/9/2018	0.000195	0.000107	6.7E-05	8.3E-05	0.000198	5.6E-05
9/19/2018	0.000169	9.3E-05	0.000229	0.000644	0.000151	0.000297
4/8/2019					0.0001 (J)	8E-05 (J)
4/9/2019	0.0002 (J)	0.0003 (J)	6E-05 (J)	0.000293		
6/19/2019	0.000212	9E-05 (J)	0.0002 (J)	0.0001 (J)	7E-05 (J)	8E-05 (J)
9/9/2019	0.000345	0.0001 (J)				
9/10/2019			4E-05 (J)	0.000237	0.0001 (J)	8E-05 (J)
3/10/2020	0.000311	0.000323	8E-05 (J)	0.000305	0.0002 (J)	0.0001 (J)
5/14/2020	0.000729	0.0001 (J)				
5/19/2020			0.0001 (J)	0.0001 (J)	0.0001 (J)	0.0001 (J)
10/8/2020					0.000247	0.000492
10/9/2020	0.00102	0.000798	0.000208	0.000266		
3/24/2021				0.0002 (J)		
3/25/2021	0.000219	0.000506	0.0001 (J)		0.000202	0.000232
5/18/2021					0.00046	0.00019 (J)
5/19/2021			0.00017 (J)	0.00034		
5/20/2021	0.00026	0.00021				
10/26/2021			0.00019 (J)	7E-05 (J)	0.0003	0.00021
10/27/2021	0.00028	0.00041				
3/2/2022	0.00049	0.00045				
3/9/2022			0.0005	0.00046	0.00064	0.0007
5/23/2022	0.00024	0.00023				
5/24/2022			0.00018 (J)	0.00025	0.00043	0.0003
11/3/2022	0.00026	0.0005				
11/4/2022			0.00025	0.00044		
11/7/2022					0.00028	
11/8/2022						0.00025
Mean	0.0003601	0.0002949	0.0001837	0.0003354	0.0003375	0.0002981
Std. Dev.	0.0002285	0.0002044	0.0001326	0.0001856	0.0002498	0.0002877
Upper Lim.	0.0004469	0.0004077	0.0002336	0.0004378	0.0004291	0.000385
Lower Lim.	0.0002338	0.0001821	0.0001088	0.0002331	0.0001905	0.0001441

Confidence Interval

Constituent: Chromium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.0003					
10/31/2016		0.0008				
11/2/2016	0.0007	0.0004				
12/20/2016	0.00207 (o)					
12/21/2016		0.0031 (o)				
2/21/2017	9E-05	0.000325				
3/28/2017		0.00039				
3/29/2017	0.000602					
4/18/2017	0.000133	0.000514				
5/16/2017	7.8E-05	0.000226				
6/14/2017	0.000141	0.0002				
5/10/2018	5.1E-05	0.000121				
9/20/2018	0.000158	8.6E-05				
4/8/2019	7E-05 (J)	0.000376				
4/10/2019					0.0004 (J)	
6/18/2019					8E-05 (J)	
6/19/2019	0.0001 (J)	0.000428				0.0002 (J)
9/10/2019	5E-05 (J)	0.000357			7E-05 (J)	
3/10/2020		0.000321			0.0001 (J)	
3/11/2020	8E-05 (J)					
5/13/2020					0.0002 (J)	0.000236
5/20/2020	0.0002 (J)	0.000249				
10/6/2020					0.000548	
10/8/2020	0.000244	0.000509				
3/23/2021					0.000355	
3/24/2021						0.000419
3/25/2021	0.0001 (J)	0.000329				
3/31/2021			0.00282	0.00127		
5/18/2021	0.00026	0.00023			0.0002	
5/19/2021						0.00034
5/20/2021			0.00136	0.00067		
10/26/2021	0.00044	0.00031				
10/27/2021			0.00172	0.00086	0.00058	
3/1/2022					0.00035	0.00046
3/3/2022			0.00088	0.00152		
3/8/2022	0.00034	0.00043				
5/17/2022					0.00064	
5/24/2022			0.00148	0.00089		
5/25/2022	0.00032	0.00026				
11/1/2022					0.00033	
11/3/2022			0.00245	0.00178		
11/8/2022	0.00029	0.00031				
Mean	0.000226	0.0003415	0.001785	0.001165	0.0003211	0.000331
Std. Dev.	0.0001796	0.000153	0.0007225	0.000431	0.0001972	0.0001125
Upper Lim.	0.0002921	0.0004259	0.002778	0.001757	0.0004758	0.0005196
Lower Lim.	0.0001197	0.0002571	0.0007924	0.0005729	0.0001663	0.0001424

Confidence Interval

Constituent: Chromium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			0.0003 (J)			
4/10/2019	0.001	0.00113		0.0003 (J)	0.0003 (J)	0.0004 (J)
6/18/2019				0.000353	0.0001 (J)	
6/19/2019	0.0002 (J)	7E-05 (J)				0.0001 (J)
6/20/2019			0.0002 (J)			
9/10/2019	0.000415		0.0002 (J)			0.0001 (J)
9/11/2019		0.0001 (J)		0.000541	0.0002 (J)	
3/10/2020	0.0002 (J)					
3/11/2020			0.00022			0.0001 (J)
3/12/2020		0.00023		0.000903	0.000324	
5/14/2020	0.0001 (J)			0.000484	0.000784	8E-05 (J)
5/18/2020		0.0002 (J)	0.0002 (J)			
10/6/2020		0.000524		0.00213	0.00164	0.000428
10/9/2020	0.000326		0.00148			
3/23/2021		0.000748				0.000311
3/24/2021				0.000715	0.00104	
3/25/2021	0.0002 (J)		0.000222			
5/19/2021	0.00032					0.00047
5/20/2021		0.00046	0.00025	0.00112	0.00059	
10/26/2021	0.00024		0.00022			
10/28/2021				0.00226	0.00037	0.0004
10/29/2021		0.00048				
3/2/2022	0.0004	0.00052	0.00088	0.00068		0.00037
3/7/2022					0.00032	
5/18/2022		0.00026				0.00029
5/19/2022				0.00064	0.00039	
5/20/2022	0.00026					
5/23/2022			0.00026			
11/1/2022		0.00028		0.00083		0.00028
11/2/2022					0.00038	
11/4/2022	0.00031		0.00022			
Mean	0.0003309	0.0004168	0.0003877	0.000913	0.0005365	0.0002774
Std. Dev.	0.0002293	0.0003003	0.0003927	0.0006414	0.0004328	0.0001456
Upper Lim.	0.0004563	0.0006525	0.00088	0.001318	0.0008004	0.0003916
Lower Lim.	0.0001805	0.0001812	0.0002	0.0004528	0.0002306	0.0001632

Confidence Interval

Constituent: Chromium, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.0004 (J)
4/10/2019	0.0004 (J)	<0.001	0.0005 (J)			
6/18/2019			0.0002 (J)	0.0002 (J)		
6/19/2019						<0.0002
6/20/2019	6E-05 (J)	0.0001 (J)				
9/10/2019			0.00028			8E-05 (J)
9/11/2019	9E-05 (J)	8E-05 (J)		0.0002 (J)	0.00147	
3/10/2020			0.000529			
3/11/2020		0.0001 (J)		0.000217	0.000728	0.000335
3/12/2020	0.000206					
5/13/2020			0.000584	0.000204	0.000423	
5/14/2020		0.0001 (J)				
5/18/2020	0.0002 (J)					
5/19/2020						0.0002 (J)
10/6/2020				0.00036		
10/8/2020	0.000323					0.000351
10/9/2020		0.000763	0.000416		0.000363	
3/23/2021	0.000294		0.000639	0.000211		
3/24/2021		0.000256			0.0002 (J)	
3/25/2021						0.000248
5/18/2021			0.0004	0.00019 (J)		
5/19/2021					0.00026	
5/20/2021	0.00062	0.00025				0.00018 (J)
10/27/2021		0.0001 (J)	0.00051	0.00044		<0.0002
10/28/2021	0.00037				0.00033	
3/1/2022			0.0004			
3/2/2022		0.00036		0.00044	0.00047	
3/3/2022						0.00039
3/8/2022	0.00038					
5/17/2022			0.00043	0.00039	0.00027	
5/19/2022	0.00055					
5/20/2022		0.00035				
5/23/2022						0.00025
10/31/2022				0.00038		
11/1/2022			0.00043			
11/2/2022	0.0005					
11/3/2022		0.0003				
11/4/2022						0.00024
11/7/2022					0.00045	
Mean	0.0003328	0.0002716	0.0004432	0.0002938	0.0004964	0.0002562
Std. Dev.	0.0001744	0.0002053	0.000122	0.0001063	0.0003727	9.557E-05
Upper Lim.	0.0004696	0.0004046	0.0005389	0.00044	0.0007347	0.000326
Lower Lim.	0.0001959	0.0001176	0.0003474	0.0002	0.0002368	0.000163

Confidence Interval

Constituent: Cobalt, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.00176	0.000358				
9/27/2016			0.00191	0.00316	0.0022	0.000466
11/1/2016	0.00178	0.000307		0.00126		
11/2/2016			0.00179		0.00192	0.000432
12/20/2016	0.00192	0.00039	0.00175	0.000861	0.00152	0.00028
2/21/2017	0.00185	0.000501	0.00184	0.0011	0.00133	0.000372
3/28/2017	0.00174	0.000308	0.00169	0.000448	0.00117	0.000258
4/18/2017			0.00169	0.000715	0.00426	0.000234
4/19/2017	0.0016	0.000317				
5/16/2017	0.0016	0.000317	0.00163	0.000647	0.00139	0.000241
6/13/2017	0.00195	0.000308	0.00186	0.000708	0.00146	0.000281
5/9/2018	0.000314	0.00183	0.00151	0.000518	0.0014	0.000318
9/19/2018	0.000203	0.00188	0.0018	0.00036	0.00117	0.00026
4/8/2019					0.00125	0.00032
4/9/2019	0.000345	0.00241	0.00156	0.000631		
6/19/2019	0.000242	0.00216	0.00165	0.000279	0.00136	0.000171
9/9/2019	0.000181	0.00214				
9/10/2019			0.00169	0.000379	0.00109	0.000312
3/10/2020	0.000138	0.00172	0.00167	0.000723	0.00111	0.000322
5/14/2020	0.000117	0.00193				
5/19/2020			0.00145	0.000208	0.0011	0.000435
10/8/2020					0.00154	0.000148
10/9/2020	0.00014	0.00208	0.00143	0.000195		
3/24/2021				0.000208		
3/25/2021	0.000105	0.0047	0.00155		0.00156	0.000153
5/18/2021					0.0016	0.000192
5/19/2021			0.00154	0.000603		
5/20/2021	9.1E-05	0.00177				
10/26/2021			0.00123	0.000324	0.0016	0.000142
10/27/2021	0.000134	0.00236				
3/2/2022	9.2E-05	0.00199				
3/9/2022			0.00141	0.000547	0.00177	0.000139
5/23/2022	0.000126	0.00179				
5/24/2022			0.00149	0.000377	0.00101	0.00028
11/3/2022	0.000112	0.00189				
11/4/2022			0.00124	0.000547		
11/7/2022					0.00141	
11/8/2022						0.000145
Mean	0.0007518	0.001521	0.001608	0.0006726	0.001555	0.0002682
Std. Dev.	0.0007978	0.001083	0.0001868	0.0006202	0.0006689	9.948E-05
Upper Lim.	0.00174	0.00208	0.001708	0.0007539	0.0016	0.0003216
Lower Lim.	0.000126	0.000358	0.001508	0.0003751	0.00117	0.0002148

Confidence Interval

Constituent: Cobalt, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.000439					
10/31/2016		0.00259				
11/2/2016	0.000396	0.000752				
12/20/2016	0.000526					
12/21/2016		0.0201 (o)				
2/21/2017	0.000481	0.00121				
3/28/2017		0.000942				
3/29/2017	0.000805					
4/18/2017	0.000414	0.0026				
5/16/2017	0.000399	0.000851				
6/14/2017	0.000439	0.000936				
5/10/2018	0.000521	0.00118				
9/20/2018	0.000769	0.00084				
4/8/2019	0.000778	0.00121				
4/10/2019					0.00103	
6/18/2019					0.00145	
6/19/2019	0.000799	0.00099				2E-05 (J)
9/10/2019	0.000848	0.000971			0.00108	
3/10/2020		0.00123			0.000741	
3/11/2020	0.000846					
5/13/2020					0.0019	2E-05 (J)
5/20/2020	0.000913	0.00142				
10/6/2020					0.000219	
10/8/2020	0.00101	0.00127				
3/23/2021					0.000154	
3/24/2021						3E-05 (J)
3/25/2021	0.000874	0.00128				
3/31/2021			0.00207	0.00124		
5/18/2021	0.000843	0.00145			0.000169	
5/19/2021						2.3E-05
5/20/2021			0.00131	0.000826		
10/26/2021	0.000853	0.00127				
10/27/2021			0.00277	0.000928	0.000269	
3/1/2022					0.000821	2.7E-05
3/3/2022			0.000674	0.000938		
3/8/2022	0.000902	0.00153				
5/17/2022					0.000734	
5/24/2022			0.00195	0.000688		
5/25/2022	0.000923	0.00178				
11/1/2022					8E-05	
11/3/2022			0.00244	0.00147		
11/8/2022	0.000897	0.00137				
Mean	0.0007125	0.001318	0.001869	0.001015	0.0007206	2.4E-05
Std. Dev.	0.0002102	0.0004944	0.0007649	0.0002877	0.000576	4.416E-06
Upper Lim.	0.0008473	0.001523	0.00292	0.00141	0.001173	3.14E-05
Lower Lim.	0.0006602	0.001045	0.0008182	0.0006198	0.0002686	1.66E-05

Confidence Interval

Constituent: Cobalt, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			0.00183			
4/10/2019	0.00331	0.00264		0.000317	0.00229	0.00165
6/18/2019				0.000657	0.00274	
6/19/2019	0.00491	0.00086				0.00128
6/20/2019			0.00137			
9/10/2019	0.00339		0.00123			0.00127
9/11/2019		0.000692		0.00101	0.0041	
3/10/2020	9.1E-05					
3/11/2020			0.00131			0.00121
3/12/2020		0.000879		0.000622	0.0068	
5/14/2020	0.000384			0.000814	0.0031	0.00107
5/18/2020		0.000795	0.00152			
10/6/2020		0.000604		0.000747	0.0103	0.00107
10/9/2020	0.00101		0.00288			
3/23/2021		0.000951				0.00103
3/24/2021				0.00037	0.00326	
3/25/2021	0.000417		0.00112			
5/19/2021	0.000358					0.00118
5/20/2021		0.000707	0.00114	0.00184	0.00215	
10/26/2021	6.6E-05		0.00102			
10/28/2021				0.00265	0.00293	0.000996
10/29/2021		0.000574				
3/2/2022	3.7E-05	0.00063	0.00163	0.00078		0.00106
3/7/2022					0.00286	
5/18/2022		0.000657				0.00148
5/19/2022				0.000865	0.00174	
5/20/2022	9.8E-05					
5/23/2022			0.001			
11/1/2022		0.000588		0.000799		0.00092
11/2/2022					0.00232	
11/4/2022	0.00013		0.00084			
Mean	0.001183	0.0008814	0.001408	0.0009559	0.003716	0.001185
Std. Dev.	0.001686	0.0005675	0.000543	0.0006561	0.002454	0.0002115
Upper Lim.	0.001403	0.000951	0.001775	0.001331	0.004804	0.001351
Lower Lim.	0.0001028	0.000588	0.001014	0.0005049	0.002181	0.001019

Confidence Interval

Constituent: Cobalt, total (mg/L) Analysis Run 2/22/2023 10:39 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.00102
4/10/2019	0.00505	0.000319	0.00303			
6/18/2019			0.000157	5.4E-05		
6/19/2019						0.00053
6/20/2019	0.00181	0.000251				
9/10/2019			0.000606			0.000492
9/11/2019	0.00117	0.000225		0.000139	0.0019	
3/10/2020			0.000214			
3/11/2020		0.000319		5E-05 (J)	0.00164	0.000267
3/12/2020	0.00108					
5/13/2020			0.00181	3E-05 (J)	0.00142	
5/14/2020		0.000434				
5/18/2020	0.00142					
5/19/2020						0.000218
10/6/2020				0.000107		
10/8/2020	0.00103					0.000326
10/9/2020		0.000602	0.000363		0.00112	
3/23/2021	0.000953		0.000638	4E-05 (J)		
3/24/2021		0.000255			0.00107	
3/25/2021						0.000215
5/18/2021			0.000437	2.7E-05		
5/19/2021					0.00092	
5/20/2021	0.000925	0.000264				0.000104
10/27/2021		0.000331	0.000182	1.5E-05 (J)		0.000124
10/28/2021	0.000475				0.00117	
3/1/2022			0.00016			
3/2/2022		0.000791		2.4E-05	0.00106	
3/3/2022						0.000138
3/8/2022	0.000889					
5/17/2022			0.000133	3E-05	0.00105	
5/19/2022	0.00114					
5/20/2022		0.000522				
5/23/2022						0.000161
10/31/2022				1.7E-05 (J)		
11/1/2022			0.000101			
11/2/2022	0.000875					
11/3/2022		0.000442				
11/4/2022						0.000134
11/7/2022					0.00188	
Mean	0.001401	0.0003963	0.0006526	4.845E-05	0.001323	0.0003108
Std. Dev.	0.001193	0.000171	0.0008842	3.947E-05	0.0003633	0.0002637
Upper Lim.	0.00181	0.0005304	0.0008253	7.44E-05	0.001647	0.0004482
Lower Lim.	0.000875	0.0002621	0.0001552	1.982E-05	0.0009989	0.0001363

Confidence Interval

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	1.38	0.136 (o)				
9/27/2016			1.06	0.777	8.459 (o)	0.592
11/1/2016	1.056	0.769		2.692		
11/2/2016			1.925		3.659	1.55
12/20/2016	1.45	0.5256	2.662	0.337	1.179	1.656
2/21/2017	0.824	0.92	1.033	0.785	1.71	0.993
3/28/2017	0.806	0.585	0.578	0.466	1.459	0.945
4/18/2017			0.821	0.827	1.212	1.303
4/19/2017	1.537	0.722				
5/16/2017	3.489	2.577	3.433	2.733	3.18	2.167
6/13/2017	1.058	0.598	0.668	0.611	1.026	1.28
5/9/2018	0.687 (U)	1.17	0.523 (U)	0.305 (U)	0.972	0.344 (U)
9/19/2018	0.316 (U)	1.16	0.759	0.347 (U)	0.438 (U)	0.439 (U)
4/8/2019					0.94	0.595
4/9/2019	0.957	1.47	0.543	0.369		
6/19/2019	0.1922	1.256	0.831	0.424	0.933	1.0123
9/9/2019	0.464	1.15				
9/10/2019			1.641	0.542	2.2714	2.682
3/10/2020	0.834	1.662	0.3851 (U)	0.842	0.946	0.434 (U)
5/14/2020	0.1393 (U)	1.038				
5/19/2020			0.425 (U)	0.639	0.975	0.3814 (U)
10/8/2020					0.908	0.682
10/9/2020	0.123	9.989	0.8083	1.4891		
3/24/2021				0.919		
3/25/2021	0.677	2.14	3.315		0.444 (U)	0.745
5/18/2021					1.24	0.79
5/19/2021			1.28	0.77 (U)		
5/20/2021	0.32 (U)	1.38				
10/26/2021			0.62 (U)	0.69 (U)	0.89	0.67 (U)
10/27/2021	0.61 (U)	1.48				
3/2/2022	0.79 (U)	1.99				
3/9/2022			2.11	2.4	2.43	1.21
5/23/2022	0.85	1.29				
5/24/2022			1.33	0.34 (U)	1.89	3.53
11/3/2022	2.13	2.63				
11/4/2022			2.06	1.04		
11/7/2022					2.35	
11/8/2022						0.52 (U)
Mean	0.9404	1.738	1.31	0.9247	1.479	1.115
Std. Dev.	0.7539	1.984	0.9124	0.7413	0.8601	0.8042
Upper Lim.	1.202	1.896	1.65	1.045	1.838	1.403
Lower Lim.	0.5098	0.9224	0.7851	0.5135	0.9754	0.6728

Confidence Interval

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.86					
10/31/2016		2.504				
11/2/2016	3.997	1.338				
12/20/2016	1.689					
12/21/2016		2.81				
2/21/2017	0.883	1.974				
3/28/2017		1.153				
3/29/2017	1.872					
4/18/2017	1.535	1.632				
5/16/2017	1.265	2.408				
6/14/2017	1.764	1.017				
5/10/2018	1.25	1.29				
9/20/2018	0.926	0.584				
4/8/2019	1.33	0.723				
4/10/2019					1.854	
6/18/2019					0.2284 (U)	
6/19/2019	1.31	1.121				0.0507 (U)
9/10/2019	1.855	2.765			3.5	
3/10/2020		1.171			0.161 (U)	
3/11/2020	2.552					
5/13/2020					0.524 (U)	0.08899 (U)
5/20/2020	0.815	0.3123 (U)				
10/6/2020					1.111	
10/8/2020	1.304	1.553				
3/23/2021					0.1427 (U)	
3/24/2021						0.13538 (U)
3/25/2021	1.002	0.963				
3/31/2021			0.686	0.27 (U)		
5/18/2021	1.34	0.39 (U)			0.41 (U)	
5/19/2021						0.78
5/20/2021			0.65	0.42 (U)		
10/26/2021	1.55	0.52 (U)				
10/27/2021			0.84	3.42	0.81	
3/1/2022					0.77	0.38 (U)
3/3/2022			1.25	1.12		
3/8/2022	4.44	1.42				
5/17/2022					1.22	
5/24/2022			0.68 (U)	0.37 (U)		
5/25/2022	3.21	1.01				
11/1/2022					0.33 (U)	
11/3/2022			2.04	1.64		
11/8/2022	1.54	1.42				
Mean	1.74	1.367	1.024	1.207	0.9218	0.287
Std. Dev.	0.9783	0.7325	0.5458	1.208	0.9589	0.304
Upper Lim.	2.075	1.76	1.738	2.882	1.458	0.7965
Lower Lim.	1.214	0.974	0.4983	0.0844	0.2704	-0.2224

Confidence Interval

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			2.124			
4/10/2019	3.12	1.678		0.706 (U)	0.921	2.726
6/18/2019				0.836	1.417	
6/19/2019	1.412	0.276 (U)				1.245
6/20/2019			1.156			
9/10/2019	2.7353		2.945			1.041
9/11/2019		1.228		2.099	1.719	
3/10/2020	1.409					
3/11/2020			2.028			1.59
3/12/2020		3.441		0.935	0.974	
5/14/2020	0.641 (U)			0.48	1.785	0.91
5/18/2020		1.053	0.821			
10/6/2020		0.451 (U)		1.241	1.013	0.2096 (U)
10/9/2020	1.5		1.844			
3/23/2021		0.925				2.076
3/24/2021				0.778	0.956	
3/25/2021	0.755		0.372 (U)			
5/19/2021	0.98					1.07
5/20/2021		0.62 (U)	0.45 (U)	1.36	1.3	
10/26/2021	0.58 (U)		1.3			
10/28/2021				0.9	1.23	1.96
10/29/2021		1.04				
3/2/2022	1.7	0.82	1.46	0.76		0.77 (U)
3/7/2022					1.22	
5/18/2022		1.37				1.28
5/19/2022				0.91	0.71 (U)	
5/20/2022	2.07					
5/23/2022			1.74			
11/1/2022		1.27		1.49		0.95
11/2/2022					1.15	
11/4/2022	3.14		1.72			
Mean	1.67	1.181	1.497	1.041	1.2	1.319
Std. Dev.	0.9186	0.8146	0.7371	0.4398	0.3214	0.6755
Upper Lim.	2.391	1.695	2.075	1.386	1.452	1.849
Lower Lim.	0.9494	0.5983	0.9183	0.6961	0.9474	0.789

Confidence Interval

Constituent: Combined Radium 226 + 228 (pCi/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						2.64
4/10/2019	1.327	1.533	0.823			
6/18/2019			0.398 (U)	0.1139 (U)		
6/19/2019						3.332
6/20/2019	0.524 (U)	0.866				
9/10/2019			2.994			3.089
9/11/2019	0.4608 (U)	1.415		0.381 (U)	2.17	
3/10/2020			0.478 (U)			
3/11/2020		0.765 (U)		0.824	2.23	3.28
3/12/2020	1.316					
5/13/2020			0.88	0.4071 (U)	0.577 (U)	
5/14/2020		1.19				
5/18/2020	0.3552 (U)					
5/19/2020						1.816
10/6/2020				1.568		
10/8/2020	0.379 (U)					2.815
10/9/2020		1.371	0.988		0.548 (U)	
3/23/2021	0.9312		1.373	0.501 (U)		
3/24/2021		0.918			0.951	
3/25/2021						3.232
5/18/2021			1.17	3.67		
5/19/2021					1.41	
5/20/2021	0.35 (U)	1				4.45
10/27/2021		1.2	3.24	0.46 (U)		5.33
10/28/2021	0.46 (U)				0.44 (U)	
3/1/2022			0.8			
3/2/2022		1.6		0.55 (U)	0.89 (U)	
3/3/2022						6.28
3/8/2022	0.82 (U)					
5/17/2022			1	0.28 (U)	1.42	
5/19/2022	0.57 (U)					
5/20/2022		1.58				
5/23/2022						5.55
10/31/2022				0.68 (U)		
11/1/2022			0.78 (U)			
11/2/2022	0.53 (U)					
11/3/2022		2.17				
11/4/2022						8.17
11/7/2022					1.35	
Mean	0.6686	1.301	1.244	0.8577	1.199	4.165
Std. Dev.	0.3522	0.3966	0.9154	1.007	0.6382	1.835
Upper Lim.	0.8943	1.612	1.756	1.328	1.768	5.605
Lower Lim.	0.4086	0.9895	0.6159	0.2502	0.6292	2.725

Confidence Interval

Constituent: Fluoride, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.18	0.2				
9/27/2016			0.18	0.24	0.25	0.5
11/1/2016	0.19	0.21		0.25		
11/2/2016			0.19		0.28	0.57
12/20/2016	0.17	0.19	0.18	0.22	0.24	0.46
2/21/2017	0.21	0.21	0.2	0.25	0.26	0.46
3/28/2017	0.19	0.2	0.2	0.25	0.26	0.45
4/18/2017			0.2	0.23	0.26	0.43
4/19/2017	0.2	0.21				
5/16/2017	0.18	0.19	0.2	0.26	0.26	0.45
6/13/2017	0.18	0.2	0.17	0.24	0.24	0.45
10/30/2017	0.2	0.21				
10/31/2017			0.21	0.25	0.24	0.46
1/23/2018						0.43
5/9/2018	0.21	0.22	0.23	0.3	0.26	0.44
9/19/2018	0.19	0.22	0.22	0.32	0.26	0.46
4/8/2019					0.26	0.54
4/9/2019	0.15	0.19	0.22	0.33		
6/19/2019	0.14	0.16	0.19	0.23	0.1 (J)	0.25
9/9/2019	0.17	0.2				
9/10/2019			0.17	0.26		
9/11/2019					0.49	0.28
3/10/2020	0.22	0.24	0.19	0.3	0.27	0.4
5/14/2020	0.25	0.25				
5/19/2020			0.17	0.28	0.24	0.38
10/8/2020					0.23	0.38
10/9/2020	0.2	0.21	0.2	0.28		
3/24/2021				0.33		
3/25/2021	0.24	0.29	0.22		0.27	0.45
5/18/2021					0.26	0.45
5/19/2021			0.21	0.3		
5/20/2021	0.24	0.27				
10/26/2021			0.21	0.29	0.26	0.38
10/27/2021	0.15	0.26				
3/2/2022	0.22	0.25				
3/9/2022			0.2	0.24	0.22	0.38
5/23/2022	0.07	0.26				
5/24/2022			0.2	0.27	0.26	0.39
11/3/2022	0.21	0.24				
11/4/2022			0.2	0.26		
11/7/2022					0.24	
11/8/2022						0.36
Mean	0.1896	0.2209	0.1983	0.2687	0.257	0.425
Std. Dev.	0.03879	0.03132	0.01669	0.03252	0.0616	0.0704
Upper Lim.	0.2099	0.2373	0.207	0.2857	0.27	0.4609
Lower Lim.	0.1693	0.2045	0.1895	0.2517	0.24	0.3891

Confidence Interval

Constituent: Fluoride, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.54					
10/31/2016		0.31				
11/2/2016	0.61	0.32				
12/20/2016	0.5					
12/21/2016		0.33				
2/21/2017	0.51	0.29				
3/28/2017		0.28				
3/29/2017	0.52					
4/18/2017	0.52	0.3				
5/16/2017	0.52	0.29				
6/14/2017	0.49	0.27				
10/31/2017	0.47	0.28				
1/23/2018	0.44					
5/10/2018	0.54	0.29				
9/20/2018	0.52	0.28				
4/8/2019	0.52	0.26				
4/10/2019					0.21	
6/18/2019					0.22	
6/19/2019	0.4	0.19				0.24
9/10/2019					0.19	
9/11/2019	0.56	0.27				
3/10/2020		0.24			0.25	
3/11/2020	0.41					
5/13/2020					0.26	0.29
5/20/2020	0.51	0.23				
10/6/2020					0.25	
10/8/2020	0.49	0.24				
3/23/2021					0.25	
3/24/2021						0.32
3/25/2021	0.57	0.26				
3/31/2021			0.31	0.36		
5/18/2021	0.53	0.25			0.25	
5/19/2021						0.3
5/20/2021			0.26	0.26		
10/26/2021	0.52	0.24				
10/27/2021			0.34	0.41	0.21	
3/1/2022					0.22	0.22
3/3/2022			0.29	0.22		
3/8/2022	0.5	0.23				
5/17/2022					0.22	
5/24/2022			0.29	0.41		
5/25/2022	0.49	0.21				
11/1/2022					0.2	
11/3/2022			0.26	0.31		
11/8/2022	0.47	0.21				
Mean	0.5063	0.2639	0.2917	0.3283	0.2275	0.274
Std. Dev.	0.0467	0.03652	0.03061	0.07885	0.0234	0.04219
Upper Lim.	0.5301	0.283	0.3337	0.4366	0.2459	0.3447
Lower Lim.	0.4824	0.2448	0.2496	0.22	0.2091	0.2033

Confidence Interval

Constituent: Fluoride, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			0.16			
4/10/2019	0.36	0.77		0.16	0.42	0.33
6/18/2019				0.16	0.38	
6/19/2019	0.1 (J)	0.87				0.25
6/20/2019			0.17			
9/10/2019						0.26
9/11/2019	0.24		0.19	0.13	0.44	
9/13/2019		0.79				
3/10/2020	0.27					
3/11/2020			0.1 (J)			0.24
3/12/2020		0.94		0.18	0.44	
5/14/2020	0.24			0.21	0.47	0.34
5/18/2020		0.98	0.19			
10/6/2020		0.98		0.27	0.4	0.29
10/9/2020	0.19		0.16			
3/23/2021		1.05				0.33
3/24/2021				0.23	0.53	
3/25/2021	0.24		0.2			
5/19/2021	0.29					0.31
5/20/2021		1	0.19	0.23	0.51	
10/26/2021	0.29		0.17			
10/28/2021				0.26	0.52	0.31
10/29/2021		0.96				
3/2/2022	0.38	1.15	0.17	0.25		0.29
3/7/2022					0.57	
5/18/2022		1.13				0.26
5/19/2022				0.24	0.55	
5/20/2022	0.41					
5/23/2022			0.16			
11/1/2022		1.01		0.22		0.27
11/2/2022					0.49	
11/4/2022	0.31		0.15			
Mean	0.2767	0.9692	0.1675	0.2117	0.4767	0.29
Std. Dev.	0.0851	0.117	0.02633	0.04448	0.06125	0.03411
Upper Lim.	0.3434	1.061	0.1871	0.2466	0.5247	0.3168
Lower Lim.	0.2099	0.8774	0.1496	0.1768	0.4286	0.2632

Confidence Interval

Constituent: Fluoride, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.29
4/10/2019	0.25	0.18	0.19			
6/18/2019			0.2	0.22		
6/19/2019						0.31
6/20/2019	0.28	0.13				
9/10/2019			0.19			
9/11/2019				0.22	0.21	0.33
9/13/2019	0.24	0.14				
3/10/2020			0.23			
3/11/2020		0.14		0.25	0.23	0.29
3/12/2020	0.28					
5/13/2020			0.23	0.28	0.26	
5/14/2020		0.17				
5/18/2020	0.29					
5/19/2020						0.32
10/6/2020				0.32		
10/8/2020	0.26					0.3
10/9/2020		0.14	0.22		0.23	
3/23/2021	0.3		0.27	0.32		
3/24/2021		0.18			0.27	
3/25/2021						0.34
5/18/2021			0.23	0.29		
5/19/2021					0.26	
5/20/2021	0.28	0.17				0.32
10/27/2021		0.16	0.25	0.28		0.31
10/28/2021	0.25				0.27	
3/1/2022			0.2			
3/2/2022		0.15		0.28	0.25	
3/3/2022						0.3
3/8/2022	0.24					
5/17/2022			0.2	0.28	0.24	
5/19/2022	0.24					
5/20/2022		0.15				
5/23/2022						0.31
10/31/2022				0.24		
11/1/2022			0.23			
11/2/2022	0.26					
11/3/2022		0.14				
11/4/2022						0.28
11/7/2022					0.25	
Mean	0.2642	0.1542	0.22	0.2709	0.247	0.3083
Std. Dev.	0.02109	0.0173	0.02486	0.03477	0.01947	0.01749
Upper Lim.	0.2807	0.1677	0.2395	0.2999	0.2644	0.3221
Lower Lim.	0.2476	0.1406	0.2005	0.2419	0.2296	0.2946

Confidence Interval

Constituent: Lead, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.000106	0.000114				
9/27/2016			8E-05	0.00218	0.000522	0.000234
11/1/2016	3.9E-05	6.5E-05		0.000793		
11/2/2016			4.4E-05		0.000491	0.000207
12/20/2016	2E-05 (J)	9.3E-05	3E-05 (J)	0.00041	0.000164	8.4E-05
2/21/2017	2E-05 (J)	0.00014	2.1E-05	0.000636	8.2E-05	0.000158
3/28/2017	2.2E-05	5.5E-05	2E-05 (J)	0.000181	8.7E-05	9.6E-05
4/18/2017			2E-05 (J)	0.000285	0.00204	7E-05
4/19/2017	0.000584	5.1E-05				
5/16/2017	2.7E-05	0.0001	1E-05 (J)	0.000382	0.000162	6.2E-05
6/13/2017	3E-05 (J)	3.3E-05	2E-05 (J)	0.000541	8.4E-05	9E-05
5/9/2018	3.5E-05	3.4E-05	2E-05 (J)	5.6E-05	0.000115	4E-05
9/19/2018	0.000303	2E-05 (J)	1E-05 (J)	9.3E-05	1E-05 (J)	2E-05 (J)
4/8/2019					3E-05 (J)	0.000107
4/9/2019	<0.0002	<0.0002	3E-05 (J)	0.000331		
6/19/2019	7E-05 (J)	<0.0002	<0.0002	8E-05 (J)	<0.0002	0.000111
9/9/2019	<0.0002	<0.0002				
9/10/2019			<0.0002	0.000202	<0.0002	<0.0002
3/10/2020	<0.0002	<0.0002	<0.0002	0.000497	<0.0002	5E-05 (J)
5/14/2020	<0.0002	<0.0002				
5/19/2020			<0.0002	<0.0002	<0.0002	<0.0002
10/8/2020					<0.0002	<0.0002
10/9/2020	6E-05 (J)	<0.0002	5E-05 (J)	5E-05 (J)		
3/24/2021				6E-05 (J)		
3/25/2021	<0.0002	0.000245	<0.0002		<0.0002	<0.0002
5/18/2021					<0.0002	<0.0002
5/19/2021			<0.0002	0.00014 (J)		
5/20/2021	<0.0002	<0.0002				
10/26/2021			<0.0002	<0.0002	<0.0002	8E-05 (J)
10/27/2021	<0.0002	<0.0002				
3/2/2022	<0.0002	<0.0002				
3/9/2022			<0.0002	8E-05 (J)	7E-05 (J)	<0.0002
5/23/2022	<0.0002	<0.0002				
5/24/2022			<0.0002	8E-05 (J)	<0.0002	<0.0002
11/3/2022	8E-05 (J)	7E-05 (J)				
11/4/2022			<0.0002	0.00017 (J)		
11/7/2022					<0.0002	
11/8/2022						<0.0002
Mean	0.0001453	0.0001373	0.000107	0.0003385	0.0002662	0.0001368
Std. Dev.	0.000131	7.371E-05	8.804E-05	0.0004623	0.0004146	6.859E-05
Upper Lim.	0.000106	0.0002	0.0002	0.0003384	0.000491	0.0001147
Lower Lim.	2.87E-05	6.5E-05	2E-05	0.0001148	8.7E-05	6.228E-05

Confidence Interval

Constituent: Lead, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.000179					
10/31/2016		0.0014				
11/2/2016	5.8E-05	0.000264				
12/20/2016	3.8E-05					
12/21/2016		0.011 (o)				
2/21/2017	4.1E-05	0.000267				
3/28/2017		0.000134				
3/29/2017	0.000628					
4/18/2017	7E-05	0.00125				
5/16/2017	4.1E-05	0.000159				
6/14/2017	0.000124	0.000138				
5/10/2018	4.3E-05	0.000128				
9/20/2018	4.4E-05	9.4E-05				
4/8/2019	5E-05 (J)	9E-05 (J)				
4/10/2019					0.0004 (J)	
6/18/2019					4E-05 (J)	
6/19/2019	7E-05 (J)	0.000108				2E-05 (J)
9/10/2019	<0.0002	9E-05 (J)			<0.0002	
3/10/2020		6E-05 (J)			<0.0002	
3/11/2020	<0.0002					
5/13/2020					<0.0002	<0.0002
5/20/2020	5E-05 (J)	6E-05 (J)				
10/6/2020					<0.0002	
10/8/2020	<0.0002	0.0002 (J)				
3/23/2021					<0.0002	
3/24/2021						<0.0002
3/25/2021	<0.0002	8E-05 (J)				
3/31/2021			0.00213	0.000775		
5/18/2021	<0.0002	0.00019 (J)			<0.0002	
5/19/2021						<0.0002
5/20/2021			0.00128	0.00066		
10/26/2021	<0.0002	8E-05 (J)				
10/27/2021			0.00236	0.00058	<0.0002	
3/1/2022					<0.0002	<0.0002
3/3/2022			0.00059	0.00079		
3/8/2022	<0.0002	5E-05 (J)				
5/17/2022					<0.0002	
5/24/2022			0.00178	0.00058		
5/25/2022	<0.0002	9E-05 (J)				
11/1/2022					<0.0002	
11/3/2022			0.00246	0.00113		
11/8/2022	<0.0002	7E-05 (J)				
Mean	0.0001471	0.0002382	0.001767	0.0007525	0.0002033	0.000164
Std. Dev.	0.0001296	0.0003674	0.0007192	0.0002061	7.715E-05	8.05E-05
Upper Lim.	0.0002	0.0002	0.002755	0.001036	0.0004	0.0002
Lower Lim.	4.4E-05	8E-05	0.0007787	0.0004693	4E-05	2E-05

Confidence Interval

Constituent: Lead, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			0.0003 (J)			
4/10/2019	0.00121	0.000944		0.0001 (J)	0.0003 (J)	0.0004 (J)
6/18/2019				0.000255	7E-05 (J)	
6/19/2019	<0.0002	6E-05 (J)				4E-05 (J)
6/20/2019			8E-05 (J)			
9/10/2019	0.0001 (J)		0.0001 (J)			0.0002 (J)
9/11/2019		8E-05 (J)		0.000543	0.000218	
3/10/2020	<0.0002					
3/11/2020			0.0002 (J)			<0.0002
3/12/2020		0.000217		0.000302	0.000394	
5/14/2020	<0.0002			0.000354	0.000229	<0.0002
5/18/2020		0.000385	6E-05 (J)			
10/6/2020		0.0002 (J)		0.000434	0.00114	9E-05 (J)
10/9/2020	<0.0002		0.00157			
3/23/2021		0.000572				6E-05 (J)
3/24/2021				9E-05 (J)	0.000905	
3/25/2021	<0.0002		6E-05 (J)			
5/19/2021	<0.0002					0.00017 (J)
5/20/2021		0.0003	0.00022	0.00116	0.00013 (J)	
10/26/2021	<0.0002		0.00014 (J)			
10/28/2021				0.00198	0.0001 (J)	<0.0002
10/29/2021		0.0001 (J)				
3/2/2022	<0.0002	<0.0002	0.00088	0.0005		<0.0002
3/7/2022					0.00022	
5/18/2022		7E-05 (J)				8E-05 (J)
5/19/2022				0.00058	5E-05 (J)	
5/20/2022	<0.0002					
5/23/2022			9E-05 (J)			
11/1/2022		6E-05 (J)		0.00066		<0.0002
11/2/2022					6E-05 (J)	
11/4/2022	<0.0002		<0.0002			
Mean	0.0002758	0.0002573	0.0003167	0.0005798	0.000318	0.00017
Std. Dev.	0.0002956	0.0002676	0.0004548	0.0005254	0.0003486	9.62E-05
Upper Lim.	0.00121	0.0004067	0.0003873	0.0008903	0.0005081	0.0001669
Lower Lim.	0.0001	7.585E-05	7.622E-05	0.0002124	8.43E-05	5.059E-05

Confidence Interval

Constituent: Lead, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.0001 (J)
4/10/2019	0.000981	0.0001 (J)	0.00115			
6/18/2019			8E-05 (J)	0.000113		
6/19/2019						<0.0002
6/20/2019	5E-05 (J)	3E-05 (J)				
9/10/2019			0.000274			<0.0002
9/11/2019	7E-05 (J)	<0.0002		0.0002 (J)	0.00128	
3/10/2020			0.0001 (J)			
3/11/2020		<0.0002		0.0001 (J)	0.000459	7E-05 (J)
3/12/2020	<0.0002					
5/13/2020			0.00087	<0.0002	0.00026	
5/14/2020		8E-05 (J)				
5/18/2020	<0.0002					
5/19/2020						<0.0002
10/6/2020				0.000226		
10/8/2020	<0.0002					7E-05 (J)
10/9/2020		0.000441	0.0002 (J)		0.0001 (J)	
3/23/2021	<0.0002		0.000355	<0.0002		
3/24/2021		<0.0002			<0.0002	
3/25/2021						<0.0002
5/18/2021			0.00021	<0.0002		
5/19/2021					0.00017 (J)	
5/20/2021	<0.0002	<0.0002				<0.0002
10/27/2021		<0.0002	0.0001 (J)	<0.0002		<0.0002
10/28/2021	6E-05 (J)				0.00017 (J)	
3/1/2022			8E-05 (J)			
3/2/2022		0.00018 (J)		<0.0002	5E-05 (J)	
3/3/2022						<0.0002
3/8/2022	<0.0002					
5/17/2022			6E-05 (J)	<0.0002	6E-05 (J)	
5/19/2022	<0.0002					
5/20/2022		0.00017 (J)				
5/23/2022						<0.0002
10/31/2022				<0.0002		
11/1/2022			7E-05 (J)			
11/2/2022	<0.0002					
11/3/2022		<0.0002				
11/4/2022						<0.0002
11/7/2022					7E-05 (J)	
Mean	0.0002301	0.0001834	0.0002958	0.0001854	0.0002719	0.00017
Std. Dev.	0.0002446	9.972E-05	0.0003511	3.986E-05	0.0003751	5.477E-05
Upper Lim.	0.000981	0.000441	0.0003886	0.0002	0.0003861	0.0002
Lower Lim.	6E-05	8E-05	8.267E-05	0.000113	6.408E-05	7E-05

Confidence Interval

Constituent: Lithium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	JTMN-1	JTMN-2	MW-107	MW-112
9/26/2016	0.059	0.034				
11/1/2016	0.057	0.035				
12/20/2016	0.045	0.023				
2/21/2017	0.05	0.033				
3/28/2017	0.064	0.042				
4/19/2017	0.051	0.041				
5/16/2017	0.052	0.033				
6/13/2017	0.058	0.038				
5/9/2018	0.024	0.051				
9/19/2018	0.016	0.052				
4/9/2019	0.038	0.061				
4/10/2019					0.02 (J)	
6/18/2019					<0.03	
6/19/2019	<0.03	0.032				<0.03
9/9/2019	0.0188	0.0476				
9/10/2019					0.00358	
3/10/2020	0.0235	0.039			0.0041	
5/13/2020					0.00336	0.00151
5/14/2020	0.0218	0.0419				
10/6/2020					0.00308	
10/9/2020	0.019	0.0384				
3/23/2021					0.0037	
3/24/2021						0.0018
3/25/2021	0.0217	0.0368				
3/31/2021			0.00594	0.0151		
5/18/2021					0.0035	
5/19/2021						0.00186
5/20/2021	0.0213	0.0374	0.0037	0.00934		
10/27/2021	0.0213	0.038	0.0127	0.0225	0.00357	
3/1/2022					0.00451	0.00127
3/2/2022	0.0197	0.034				
3/3/2022			0.00948	0.00586		
5/17/2022					0.00486	
5/23/2022	0.0199	0.0351				
5/24/2022			0.0113	0.0208		
11/1/2022					0.00331	
11/3/2022	0.019	0.0358	0.0118	0.0198		
Mean	0.03341	0.03905	0.009153	0.01557	0.006047	0.007288
Std. Dev.	0.01722	0.008079	0.003588	0.006732	0.005478	0.0127
Upper Lim.	0.051	0.04338	0.01408	0.02481	0.015	0.03
Lower Lim.	0.0197	0.03471	0.004225	0.006319	0.00331	0.00127

Confidence Interval

Constituent: Lithium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1926	MW-1927	MW-1929	MW-203	MW-016
4/10/2019	0.043	0.01 (J)	0.03 (J)	0.01 (J)		
6/18/2019				<0.03	<0.03	
6/19/2019	0.032					
6/20/2019		<0.03	<0.03			
9/10/2019	0.0426			0.0048		
9/11/2019		0.00624	0.00638		0.0023	0.0348
3/10/2020	0.0316			0.00382		
3/11/2020			0.00723		0.00237	0.0345
3/12/2020		0.00675				
5/13/2020				0.00416	0.00227	0.0338
5/14/2020	0.0422		0.00725			
5/18/2020		0.00744				
10/6/2020					0.00205	
10/8/2020		0.00575				
10/9/2020	0.0432		0.00598	0.0043		0.0305
3/23/2021		0.00585		0.00352	0.00194	
3/24/2021			0.00612			0.0289
3/25/2021	0.0426					
5/18/2021				0.00363	0.00199	
5/19/2021	0.0409					0.0284
5/20/2021		0.00586	0.00594			
10/26/2021	0.0347					
10/27/2021			0.00631	0.00463	0.00224	
10/28/2021		0.00673				0.0293
3/1/2022				0.00331		
3/2/2022	0.0248		0.00594		0.00224	0.0252
3/8/2022		0.00667				
5/17/2022				0.00368	0.00199	0.0304
5/19/2022		0.00658				
5/20/2022	0.026		0.00603			
10/31/2022					0.00238	
11/1/2022				0.00435		
11/2/2022		0.00661				
11/3/2022			0.00619			
11/4/2022	0.0306					
11/7/2022						0.0291
Mean	0.03618	0.007457	0.009031	0.005433	0.003343	0.03049
Std. Dev.	0.007017	0.002629	0.007072	0.003498	0.00387	0.003052
Upper Lim.	0.043	0.01	0.015	0.01	0.00238	0.03321
Lower Lim.	0.026	0.00585	0.00594	0.00352	0.00199	0.02777

Confidence Interval

Constituent: Lithium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1922D
4/9/2019	0.02 (J)
6/19/2019	<0.03
9/10/2019	0.0126
3/11/2020	0.0117
5/19/2020	0.011
10/8/2020	0.00747
3/25/2021	0.00796
5/20/2021	0.00755
10/27/2021	0.00779
3/3/2022	0.00712
5/23/2022	0.00848
11/4/2022	0.00738
Mean	0.01034
Std. Dev.	0.003968
Upper Lim.	0.015
Lower Lim.	0.00738

Confidence Interval

Constituent: Mercury, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	<5E-06	<5E-06				
9/27/2016			<5E-06	<5E-06	<5E-06	<5E-06
11/1/2016	3.6E-05	<5E-06		<5E-06		
11/2/2016			<5E-06		<5E-06	<5E-06
12/20/2016	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
2/21/2017	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
3/28/2017	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
4/18/2017			2E-06 (J)	3E-06 (J)	4E-06 (J)	2E-06 (J)
4/19/2017	3E-06 (J)	3E-06 (J)				
5/16/2017	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
6/13/2017	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
5/9/2018	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
9/19/2018	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
4/8/2019					<5E-06	<5E-06
4/9/2019	<5E-06	<5E-06	<5E-06	<5E-06		
6/19/2019	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
9/9/2019	<5E-06	<5E-06				
9/10/2019			<5E-06	<5E-06	<5E-06	<5E-06
3/10/2020	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06	<5E-06
10/8/2020					<5E-06	<5E-06
10/9/2020	<5E-06	<5E-06	<5E-06	<5E-06		
3/24/2021				<5E-06		
3/25/2021	<5E-06	<5E-06	<5E-06		<5E-06	<5E-06
5/18/2021					<5E-06	<5E-06
5/19/2021			<5E-06	<5E-06		
5/20/2021	<5E-06	<5E-06				
10/26/2021			<5E-06	<5E-06	<5E-06	<5E-06
10/27/2021	<5E-06	<5E-06				
3/2/2022	<5E-06	<5E-06				
3/9/2022			<5E-06	<5E-06	<5E-06	<5E-06
5/23/2022	<5E-06	<5E-06				
5/24/2022			<5E-06	<5E-06	<5E-06	<5E-06
11/3/2022	<5E-06	<5E-06				
11/4/2022			<5E-06	<5E-06		
11/7/2022					<5E-06	
11/8/2022						<5E-06
Mean	6.381E-06	4.905E-06	4.857E-06	4.905E-06	4.952E-06	4.857E-06
Std. Dev.	6.801E-06	4.4E-07	6.5E-07	4.4E-07	2.2E-07	6.5E-07
Upper Lim.	3.6E-05	5E-06	5E-06	5E-06	5E-06	5E-06
Lower Lim.	3E-06	3E-06	2E-06	3E-06	4E-06	2E-06

Confidence Interval

Constituent: Mercury, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-1921	MW-1922S
9/27/2016	<5E-06					
10/31/2016		3E-06 (J)				
11/2/2016	<5E-06	<5E-06				
12/20/2016	<5E-06					
12/21/2016		1.2E-05				
2/21/2017	<5E-06	<5E-06				
3/28/2017		<5E-06				
3/29/2017	2E-06 (J)					
4/18/2017	2E-06 (J)	3E-06 (J)				
5/16/2017	<5E-06	<5E-06				
6/14/2017	<5E-06	<5E-06				
5/10/2018	<5E-06	<5E-06				
9/20/2018	<5E-06	<5E-06				
4/8/2019	<5E-06	<5E-06				
4/9/2019						<5E-06
4/10/2019					2E-06 (J)	
6/19/2019	<5E-06	<5E-06			<5E-06	
6/20/2019						<5E-06
9/10/2019	<5E-06	<5E-06				<5E-06
9/11/2019					<5E-06	
3/10/2020		<5E-06				
3/11/2020	<5E-06					<5E-06
3/12/2020					<5E-06	
10/6/2020					<5E-06	
10/8/2020	<5E-06	<5E-06				
10/9/2020						2E-06 (J)
3/23/2021					<5E-06	
3/25/2021	<5E-06	<5E-06				<5E-06
3/31/2021			3E-06 (J)	<5E-06		
5/18/2021	<5E-06	<5E-06				
5/20/2021			<5E-06	<5E-06	<5E-06	<5E-06
10/26/2021	<5E-06	<5E-06				<5E-06
10/27/2021			3E-06 (J)	<5E-06		
10/29/2021					<5E-06	
3/2/2022					<5E-06	<5E-06
3/3/2022			<5E-06	2E-06 (J)		
3/8/2022	<5E-06	<5E-06				
5/18/2022					<5E-06	
5/23/2022						<5E-06
5/24/2022			3E-06 (J)	4E-06 (J)		
5/25/2022	<5E-06	<5E-06				
11/1/2022					<5E-06	
11/3/2022			5E-06	8E-06		
11/4/2022						<5E-06
11/8/2022	<5E-06	<5E-06				
Mean	4.714E-06	5.143E-06	4E-06	4.833E-06	4.727E-06	4.727E-06
Std. Dev.	9E-07	1.682E-06	1.095E-06	1.941E-06	9E-07	9E-07
Upper Lim.	5E-06	1.2E-05	5E-06	6.684E-06	5E-06	5E-06
Lower Lim.	2E-06	3E-06	3E-06	9.8E-07	5E-06	5E-06

Confidence Interval

Constituent: Mercury, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1923	MW-1924
4/10/2019	<5E-06	<5E-06
6/18/2019	<5E-06	<5E-06
9/11/2019	<5E-06	<5E-06
3/12/2020	<5E-06	<5E-06
10/6/2020	<5E-06	3E-06 (J)
3/24/2021	<5E-06	<5E-06
5/20/2021	<5E-06	<5E-06
10/28/2021	2E-06 (J)	<5E-06
3/2/2022	<5E-06	
3/7/2022		<5E-06
5/19/2022	<5E-06	<5E-06
11/1/2022	<5E-06	
11/2/2022		<5E-06
Mean	4.727E-06	4.818E-06
Std. Dev.	9E-07	6E-07
Upper Lim.	5E-06	5E-06
Lower Lim.	5E-06	5E-06

Confidence Interval

Constituent: Molybdenum, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.0198	0.0032				
9/27/2016			0.0546	0.0258	0.0814	0.112
11/1/2016	0.02	0.00247		0.0239		
11/2/2016			0.0524		0.0812	0.112
12/20/2016	0.0208	0.00271	0.0547	0.0229	0.0832	0.101
2/21/2017	0.0174	0.00252	0.0468	0.0175	0.0766	0.0931
3/28/2017	0.0182	0.00253	0.0446	0.0154	0.0733	0.0901
4/18/2017			0.0432	0.0208	0.0715	0.0924
4/19/2017	0.0174	0.00253				
5/16/2017	0.0181	0.00254	0.0481	0.0186	0.0791	0.0902
6/13/2017	0.0183	0.00241	0.0455	0.0178	0.0778	0.0957
5/9/2018	0.00205	0.0162	0.0464	0.0156	0.0703	0.0702
9/19/2018	0.00157	0.0156	0.0479	0.0151	0.0653	0.0706
4/8/2019					0.0718	0.0677
4/9/2019	<0.01	0.0178	0.0406	0.0159		
6/19/2019	0.001 (J)	0.0166	0.04	0.0136	0.0683	0.0589
9/9/2019	0.002 (J)	0.0163				
9/10/2019			0.0397	0.0142	0.0685	0.0549
3/10/2020	0.001 (J)	0.0137	0.0327	0.0128	0.0625	0.0517
5/14/2020	0.001 (J)	0.0149				
5/19/2020			0.0328	0.0123	0.067	0.056
10/8/2020					0.0636	0.0564
10/9/2020	0.001 (J)	0.015	0.0357	0.0112		
3/24/2021				0.0134		
3/25/2021	0.002 (J)	0.0137	0.0301		0.0669	0.0625
5/18/2021					0.0669	0.0528
5/19/2021			0.0293	0.0124		
5/20/2021	0.0014	0.0145				
10/26/2021			0.033	0.0119	0.0612	0.0506
10/27/2021	0.0015	0.0139				
3/2/2022	0.0015	0.0134				
3/9/2022			0.0337	0.0143	0.0665	0.0583
5/23/2022	0.0019	0.0144				
5/24/2022			0.0355	0.0134	0.062	0.0566
11/3/2022	0.0016	0.0135				
11/4/2022			0.032	0.013		
11/7/2022					0.0625	
11/8/2022						0.0518
Mean	0.007933	0.01047	0.04088	0.01599	0.07034	0.07298
Std. Dev.	0.00844	0.006176	0.008025	0.004105	0.006878	0.02099
Upper Lim.	0.0181	0.01493	0.04518	0.01792	0.07403	0.0924
Lower Lim.	0.0014	0.01145	0.03657	0.01374	0.06664	0.056

Confidence Interval

Constituent: Molybdenum, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.0962					
10/31/2016		0.0484				
11/2/2016	0.0911	0.0504				
12/20/2016	0.0896					
12/21/2016		0.0457				
2/21/2017	0.0877	0.0413				
3/28/2017		0.0392				
3/29/2017	0.0859					
4/18/2017	0.0818	0.0451				
5/16/2017	0.0912	0.0481				
6/14/2017	0.0908	0.0461				
5/10/2018	0.0809	0.0432				
9/20/2018	0.0834	0.0415				
4/8/2019	0.0798	0.0379				
4/10/2019					<0.002	
6/18/2019					<0.002	
6/19/2019	0.0818	0.0346				0.0112
9/10/2019	0.0821	0.035			<0.002	
3/10/2020		0.0355			<0.002	
3/11/2020	0.0796					
5/13/2020					0.0007 (J)	0.00562
5/20/2020	0.0835	0.0358				
10/6/2020					<0.002	
10/8/2020	0.0838	0.0359				
3/23/2021					0.0007 (J)	
3/24/2021						0.00918
3/25/2021	0.0759	0.0304				
3/31/2021			0.00659	0.02		
5/18/2021	0.075	0.0305			0.0002 (J)	
5/19/2021						0.0083
5/20/2021			0.0032	0.0107		
10/26/2021	0.0723	0.0301				
10/27/2021			0.0171	0.0308	0.0006	
3/1/2022					0.0002 (J)	0.0052
3/3/2022			0.013	0.0055		
3/8/2022	0.0719	0.0294				
5/17/2022					0.0017	
5/24/2022			0.015	0.0332		
5/25/2022	0.075	0.0305				
11/1/2022					0.0001 (J)	
11/3/2022			0.0117	0.0227		
11/8/2022	0.0643	0.0318				
Mean	0.08198	0.03847	0.0111	0.02048	0.001183	0.0079
Std. Dev.	0.007609	0.006786	0.005252	0.0109	0.0008266	0.002509
Upper Lim.	0.08607	0.04212	0.01831	0.03545	0.002	0.0121
Lower Lim.	0.0779	0.03483	0.003883	0.005517	0.0002	0.003696

Confidence Interval

Constituent: Molybdenum, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			0.0435			
4/10/2019	0.0801	0.478		0.16	0.0895	0.076
6/18/2019				0.101	0.069	
6/19/2019	0.0962	0.502				0.0635
6/20/2019			0.0364			
9/10/2019	0.078		0.0339			0.0546
9/11/2019		0.5		0.0842	0.0767	
3/10/2020	0.0107					
3/11/2020			0.0324			0.0562
3/12/2020		0.461		0.0701	0.092	
5/14/2020	0.0427			0.0709	0.0776	0.0579
5/18/2020		0.472	0.0343			
10/6/2020		0.472		0.098	0.0827	0.0458
10/9/2020	0.05		0.0307			
3/23/2021		0.364				0.0478
3/24/2021				0.308	0.0871	
3/25/2021	0.0439		0.0294			
5/19/2021	0.041					0.0461
5/20/2021		0.489	0.0311	0.344	0.112	
10/26/2021	0.0106		0.0274			
10/28/2021				0.319	0.134	0.0523
10/29/2021		0.417				
3/2/2022	0.0053	0.445	0.0318	0.353		0.0482
3/7/2022					0.113	
5/18/2022		0.468				0.0434
5/19/2022				0.334	0.1	
5/20/2022	0.0038					
5/23/2022			0.031			
11/1/2022		0.386		0.315		0.0412
11/2/2022					0.113	
11/4/2022	0.0212		0.0266			
Mean	0.04029	0.4545	0.03238	0.2131	0.09555	0.05275
Std. Dev.	0.03151	0.04399	0.004468	0.1235	0.01918	0.009801
Upper Lim.	0.06502	0.489	0.03588	0.344	0.1106	0.06044
Lower Lim.	0.01557	0.42	0.02887	0.0709	0.0805	0.04506

Confidence Interval

Constituent: Molybdenum, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						0.488
4/10/2019	0.009 (J)	0.007 (J)	<0.01			
6/18/2019			0.0007 (J)	0.002 (J)		
6/19/2019						0.515
6/20/2019	0.00705	0.00282				
9/10/2019			0.0007 (J)			0.478
9/11/2019	0.00538	0.002 (J)		0.001 (J)	0.0368	
3/10/2020			0.0005 (J)			
3/11/2020		0.002 (J)		0.001 (J)	0.0405	0.314
3/12/2020	0.00616					
5/13/2020			0.0006 (J)	0.001 (J)	0.039	
5/14/2020		0.002 (J)				
5/18/2020	0.00572					
5/19/2020						0.289
10/6/2020				0.0009 (J)		
10/8/2020	0.00504					0.109
10/9/2020		0.002 (J)	0.0006 (J)		0.0373	
3/23/2021	0.00452		0.0006 (J)	0.001 (J)		
3/24/2021		0.001 (J)			0.0363	
3/25/2021						0.0776
5/18/2021			0.0005	0.001		
5/19/2021					0.0321	
5/20/2021	0.0047	0.0011				0.0405
10/27/2021		0.0011	0.0008	0.0011		0.0477
10/28/2021	0.0041				0.0402	
3/1/2022			0.0003 (J)			
3/2/2022		0.0011		0.0011	0.0355	
3/3/2022						0.0574
3/8/2022	0.0044					
5/17/2022			0.0003 (J)	0.0013	0.0363	
5/19/2022	0.0049					
5/20/2022		0.0012				
5/23/2022						0.105
10/31/2022				0.0008		
11/1/2022			0.0006			
11/2/2022	0.0043					
11/3/2022		0.0009				
11/4/2022						0.0366
11/7/2022					0.0363	
Mean	0.005439	0.002018	0.0009333	0.001109	0.03703	0.2132
Std. Dev.	0.001411	0.001677	0.001289	0.0003208	0.002457	0.1922
Upper Lim.	0.006444	0.00282	0.0008	0.0013	0.03922	0.3052
Lower Lim.	0.004386	0.001	0.0003	0.0009	0.03484	0.06042

Confidence Interval

Constituent: Selenium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.0009	0.0031				
9/27/2016			0.0002	0.0011	0.0018	0.0012
11/1/2016	0.001	0.0025		0.0009		
11/2/2016			0.0002		0.0047	0.001
12/20/2016	0.001	0.0027	0.0003	0.0007	0.0036	0.0009
2/21/2017	0.0007	0.0022	0.0002	0.0011	0.0041	0.0007
3/28/2017	0.0007	0.0022	0.0002	0.001	0.0036	0.0007
4/18/2017			0.0002 (J)	0.003	0.0041	0.0008
4/19/2017	0.0007	0.0017				
5/16/2017	0.0005	0.002	0.0002	0.0017	0.0059	0.0009
6/13/2017	0.0008	0.0025	0.0004	0.0017	0.0081	0.0009
5/9/2018	0.0014	0.001	0.0002	0.002	0.0026	0.002
9/19/2018	0.0038	0.0008	0.0003	0.001	0.0033	0.0028
4/8/2019					0.0081	0.0014
4/9/2019	0.002	0.0012	0.0002	0.0007		
6/19/2019	0.0031	0.001	0.0002 (J)	0.0006	0.0096	0.0013
9/9/2019	0.0034	0.001				
9/10/2019			0.0003	0.0004	0.001	0.0027
3/10/2020	0.0008	0.0012	0.0002 (J)	0.0008	0.0005	0.0044
5/14/2020	0.0007	0.0011				
5/19/2020			0.0002 (J)	0.0007	0.0005	0.0053
10/8/2020					0.0042	0.0019
10/9/2020	0.003	0.0009	9E-05 (J)	0.0005		
3/24/2021				0.0004 (J)		
3/25/2021	0.0012	0.0011	0.0002 (J)		0.0032	0.003
5/18/2021					0.00362	0.00349
5/19/2021			0.00014 (J)	0.00039 (J)		
5/20/2021	0.00139	0.00096				
10/26/2021			0.00011 (J)	0.00096	0.00192	0.00187
10/27/2021	0.00149	0.00076				
3/2/2022	0.00051	0.00077				
3/9/2022			<0.0005	0.00088	0.00164	0.00204
5/23/2022	0.00074	0.00073				
5/24/2022			0.00013 (J)	0.00092	0.00085	0.0059
11/3/2022	0.00211	0.0006				
11/4/2022			<0.0005	0.00059		
11/7/2022					0.00218	
11/8/2022						0.00143
Mean	0.001452	0.001455	0.0002123	0.001002	0.003596	0.00212
Std. Dev.	0.001008	0.0007591	6.914E-05	0.0006177	0.002494	0.001499
Upper Lim.	0.00177	0.001773	0.000245	0.001235	0.004934	0.002672
Lower Lim.	0.0008726	0.001017	0.0001722	0.0006688	0.002257	0.001267

Confidence Interval

Constituent: Selenium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	JTMN-2	MW-107	MW-112
9/27/2016	0.0001					
10/31/2016		0.0071				
11/2/2016	7E-05 (J)	0.007				
12/20/2016	3E-05 (J)					
12/21/2016		0.0094				
2/21/2017	3E-05 (J)	0.009				
3/28/2017		0.0092				
3/29/2017	0.0005					
4/18/2017	5E-05 (J)	0.0089				
5/16/2017	4E-05 (J)	0.0091				
6/14/2017	3E-05 (J)	0.0094				
5/10/2018	<0.0005	0.0114				
9/20/2018	<0.0005	0.0088				
4/8/2019	5E-05 (J)	0.007				
4/10/2019					0.0007 (J)	
6/18/2019					0.0006	
6/19/2019	6E-05 (J)	0.0056				0.0015
9/10/2019	9E-05 (J)	0.0043			0.0008	
3/10/2020		0.0045			0.0007	
3/11/2020	4E-05 (J)					
5/13/2020					0.0005	0.0009
5/20/2020	8E-05 (J)	0.0057				
10/6/2020					0.001	
10/8/2020	6E-05 (J)	0.0033				
3/23/2021					0.0004	
3/24/2021						0.0007
3/25/2021	<0.0005	0.0041				
3/31/2021			0.0007	0.0006		
5/18/2021	<0.0005	0.00405			0.00047 (J)	
5/19/2021						0.00085
5/20/2021			0.00119	0.00105		
10/26/2021	<0.0005	0.00271				
10/27/2021			0.0005	0.00036 (J)	0.00097	
3/1/2022					0.00048 (J)	0.00069
3/3/2022			0.00089	0.00096		
3/8/2022	<0.0005	0.00338				
5/17/2022					0.00048 (J)	
5/24/2022			0.00133	0.00081		
5/25/2022	<0.0005	0.00453				
11/1/2022					0.00049 (J)	
11/3/2022			0.00054	0.00054		
11/8/2022	<0.0005	0.00225				
Mean	0.0002377	0.006396	0.0008583	0.00072	0.0006325	0.000928
Std. Dev.	0.0002241	0.002683	0.000343	0.000265	0.0002027	0.0003327
Upper Lim.	0.0005	0.007836	0.00133	0.001084	0.0007916	0.001493
Lower Lim.	5E-05	0.004956	0.0003871	0.000356	0.0004734	0.0004668

Confidence Interval

Constituent: Selenium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1805	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019			<0.0005			
4/10/2019	<0.0005	0.0004 (J)		0.0238	0.0013	0.0062
6/18/2019				0.0144	0.0036	
6/19/2019	0.0001 (J)	0.0002 (J)				0.0063
6/20/2019			7E-05 (J)			
9/10/2019	0.0001 (J)		8E-05 (J)			0.0041
9/11/2019		0.0001 (J)		0.014	0.0035	
3/10/2020	<0.0005					
3/11/2020			9E-05 (J)			0.0029
3/12/2020		0.0001 (J)		0.0052	0.0011	
5/14/2020	0.0001 (J)			0.0041	0.0011	0.0048
5/18/2020		0.0001 (J)	0.0001 (J)			
10/6/2020		0.0001 (J)		0.0178	0.0009	0.0054
10/9/2020	5E-05 (J)		0.0003			
3/23/2021		0.0002				0.0044
3/24/2021				0.0387	0.0025	
3/25/2021	<0.0005		<0.0005			
5/19/2021	<0.0005					0.00441
5/20/2021		0.00019 (J)	0.00011 (J)	0.0141	0.00074	
10/26/2021	<0.0005		<0.0005			
10/28/2021				0.00759	0.0005	0.00296
10/29/2021		0.00013 (J)				
3/2/2022	<0.0005	0.00019 (J)	0.00014 (J)	0.00947		0.00326
3/7/2022					0.00048 (J)	
5/18/2022		0.00026 (J)				0.00251
5/19/2022				0.028	0.00126	
5/20/2022	<0.0005					
5/23/2022			0.0001 (J)			
11/1/2022		<0.0005		0.0476		0.0051
11/2/2022					0.00076	
11/4/2022	<0.0005		<0.0005			
Mean	0.0003625	0.000185	0.0002492	0.01873	0.001478	0.004362
Std. Dev.	0.0002035	8.97E-05	0.0001945	0.01353	0.001102	0.001271
Upper Lim.	0.0005	0.0002473	0.0005	0.02935	0.002119	0.005359
Lower Lim.	5E-05	0.0001167	8E-05	0.008112	0.000688	0.003364

Confidence Interval

Constituent: Selenium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1926	MW-1927	MW-1929	MW-203	MW-016	MW-1922D
4/9/2019						<0.0005
4/10/2019	0.0003 (J)	0.0008 (J)	0.0013			
6/18/2019			0.0013	0.0014		
6/19/2019						4E-05 (J)
6/20/2019	0.0003	0.0003				
9/10/2019			0.0017			6E-05 (J)
9/11/2019	0.0004	0.0004		0.0011	0.0002	
3/10/2020			0.0009			
3/11/2020		0.0002 (J)		0.0014	0.0001 (J)	5E-05 (J)
3/12/2020	0.0002					
5/13/2020			0.0011	0.0011	0.0002 (J)	
5/14/2020		0.0001 (J)				
5/18/2020	0.0003					
5/19/2020						<0.0005
10/6/2020				0.0008		
10/8/2020	0.001					<0.0005
10/9/2020		0.0003	0.0018		9E-05 (J)	
3/23/2021	0.0007		0.0016	0.0013		
3/24/2021		0.0009			0.0002 (J)	
3/25/2021						<0.0005
5/18/2021			0.00089	0.00108		
5/19/2021					0.00014 (J)	
5/20/2021	0.00059	0.00139				<0.0005
10/27/2021		0.00098	0.00208	0.00105		<0.0005
10/28/2021	0.00073				<0.0005	
3/1/2022			0.00092			
3/2/2022		0.0017		0.00085	0.00019 (J)	
3/3/2022						<0.0005
3/8/2022	0.0006					
5/17/2022			0.00107	0.00091	0.00013 (J)	
5/19/2022	0.00046 (J)					
5/20/2022		0.00136				
5/23/2022						<0.0005
10/31/2022				0.00229		
11/1/2022			0.00223			
11/2/2022	0.00222					
11/3/2022		0.00094				
11/4/2022						<0.0005
11/7/2022					0.0001 (J)	
Mean	0.00065	0.0007808	0.001408	0.001207	0.00016	0.0003875
Std. Dev.	0.0005453	0.0005256	0.0004671	0.0004124	5.497E-05	0.0002036
Upper Lim.	0.0009264	0.001193	0.001774	0.001512	0.000209	0.0005
Lower Lim.	0.0003025	0.0003684	0.001041	0.0008904	0.000111	5E-05

Confidence Interval

Constituent: Thallium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S
9/26/2016	0.000235	3E-05 (J)				
9/27/2016			6E-05 (J)	0.000174	0.000123	7.4E-05
11/1/2016	0.000261	2E-05 (J)		5.5E-05		
11/2/2016			5E-05 (J)		9.2E-05	6E-05
12/20/2016	0.000283	3E-05 (J)	5E-05 (J)	5E-05 (J)	9.4E-05	6.3E-05
2/21/2017	0.000264	3E-05 (J)	0.000138	5.5E-05	0.000119	8.6E-05
3/28/2017	0.000336	0.000119	9E-05	0.000102	0.000113	0.0001
4/18/2017			4E-05 (J)	4E-05 (J)	9.7E-05	6.2E-05
4/19/2017	0.000217	2E-05 (J)				
5/16/2017	0.000231	4E-05 (J)	4E-05 (J)	6E-05 (J)	9.5E-05	6.9E-05
6/13/2017	0.000256	2E-05 (J)	5E-05 (J)	5E-05 (J)	9E-05 (J)	7E-05 (J)
5/9/2018	2E-05 (J)	0.00022	4E-05 (J)	4E-05 (J)	8.6E-05	7.6E-05
9/19/2018	2E-05 (J)	0.000251	5E-05 (J)	4E-05 (J)	0.000108	0.000112
4/8/2019					<0.0005	<0.0005
4/9/2019	<0.0002	<0.002	<0.0002	<0.0002		
6/19/2019	<0.0002	0.0003 (J)	<0.0002	<0.0002	0.0001 (J)	0.0001 (J)
9/9/2019	<0.0002	0.0003 (J)				
9/10/2019			<0.0002	<0.0002	<0.0005	<0.0005
3/10/2020	<0.0002	0.0002 (J)	<0.0002	<0.0002	<0.0005	<0.0005
5/14/2020	<0.0002	0.0002 (J)				
5/19/2020			<0.0002	<0.0002	<0.0005	<0.0005
10/8/2020					<0.0005	<0.0005
10/9/2020	<0.0002	0.0003 (J)	<0.0002	<0.0002		
3/24/2021				<0.0002		
3/25/2021	<0.0002	0.0002 (J)	<0.0002		7E-05 (J)	6E-05 (J)
5/18/2021					7E-05 (J)	6E-05 (J)
5/19/2021			<0.0002	<0.0002		
5/20/2021	<0.0002	0.00024				
10/26/2021			5E-05 (J)	<0.0002	7E-05 (J)	6E-05 (J)
10/27/2021	<0.0002	0.00023				
3/2/2022	<0.0002	0.00021				
3/9/2022			<0.0002	<0.0002	7E-05 (J)	6E-05 (J)
5/23/2022	<0.0002	0.00021				
5/24/2022			<0.0002	<0.0002	6E-05 (J)	6E-05 (J)
11/3/2022	<0.0002	0.00022				
11/4/2022			<0.0002	<0.0002		
11/7/2022					6E-05 (J)	
11/8/2022						6E-05 (J)
Mean	0.0002056	0.0001995	0.0001299	0.0001394	0.0001826	0.0001696
Std. Dev.	7.001E-05	0.0002061	7.457E-05	7.33E-05	0.0001771	0.000184
Upper Lim.	0.000235	0.00024	0.0002	0.0002	0.000123	0.000112
Lower Lim.	0.0002	3E-05	5E-05	5.5E-05	7E-05	6E-05

Confidence Interval

Constituent: Thallium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	MW-1921	MW-1922S	MW-1926
9/27/2016	5E-05 (J)					
10/31/2016		6E-05				
11/2/2016	4E-05 (J)	5E-05 (J)				
12/20/2016	4E-05 (J)					
12/21/2016		0.00015				
2/21/2017	4E-05 (J)	6.9E-05				
3/28/2017		5.2E-05				
3/29/2017	6.2E-05					
4/18/2017	2E-05 (J)	5.8E-05				
5/16/2017	2E-05 (J)	5E-05 (J)				
6/14/2017	4E-05 (J)	5E-05 (J)				
5/10/2018	2E-05 (J)	6.4E-05				
9/20/2018	4E-05 (J)	8.9E-05				
4/8/2019	<0.0002	<0.0005				
4/9/2019					<0.0002	
4/10/2019				<0.0005		<0.0002
6/19/2019	<0.0002	<0.0005		<0.0005		
6/20/2019					<0.0002	<0.0002
9/10/2019	<0.0002	<0.0005			<0.0002	
9/11/2019				<0.0005		<0.0002
3/10/2020		<0.0005				
3/11/2020	<0.0002				<0.0002	
3/12/2020				<0.0005		<0.0002
5/18/2020				<0.0005	<0.0002	<0.0002
5/20/2020	<0.0002	<0.0005				
10/6/2020				<0.0005		
10/8/2020	<0.0002	<0.0005				<0.0002
10/9/2020					<0.0002	
3/23/2021				6E-05 (J)		<0.0002
3/25/2021	<0.0002	7E-05 (J)			<0.0002	
3/31/2021			<0.0002			
5/18/2021	<0.0002	7E-05 (J)				
5/20/2021			<0.0002	7E-05 (J)	5E-05 (J)	9E-05 (J)
10/26/2021	<0.0002	7E-05 (J)			<0.0002	
10/27/2021			4E-05 (J)			
10/28/2021						<0.0002
10/29/2021				5E-05 (J)		
3/2/2022				6E-05 (J)	4E-05 (J)	
3/3/2022			<0.0002			
3/8/2022	<0.0002	6E-05 (J)				<0.0002
5/18/2022				7E-05 (J)		
5/19/2022						<0.0002
5/23/2022					<0.0002	
5/24/2022			<0.0002			
5/25/2022	<0.0002	6E-05 (J)				
11/1/2022				5E-05 (J)		
11/2/2022						<0.0002
11/3/2022			<0.0002			
11/4/2022					<0.0002	
11/8/2022	<0.0002	6E-05 (J)				
Mean	0.000126	0.0001855	0.0001733	0.00028	0.0001742	0.0001908
Std. Dev.	8.346E-05	0.0001982	6.532E-05	0.0002299	6.037E-05	3.175E-05

Confidence Interval

Constituent: Thallium, total (mg/L) Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1607D	MW-1607S	JTMN-1	MW-1921	MW-1922S	MW-1926
Upper Lim.	0.0002	0.00015	0.0002	0.0005	0.0002	0.0002
Lower Lim.	4E-05	5.8E-05	4E-05	5E-05	5E-05	9E-05

FIGURE K

Confidence Intervals (Corrective Action)

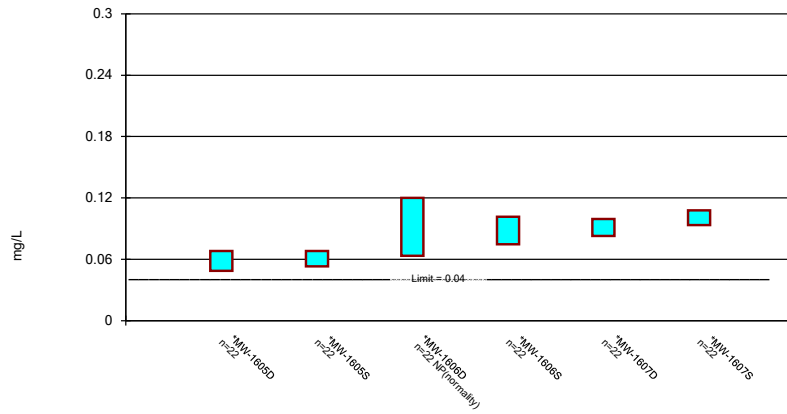
Confidence Intervals - Corrective Action - All Results (All Significant)

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 2/22/2023, 10:42 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Lithium, total (mg/L)	MW-1605D	0.06816	0.04857	0.04	Yes	22	0.05836	0.01825	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1605S	0.06808	0.053	0.04	Yes	22	0.06054	0.01405	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1606D	0.12	0.0633	0.04	Yes	22	0.092	0.02948	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1606S	0.1016	0.07467	0.04	Yes	22	0.08811	0.02505	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1607D	0.09933	0.08275	0.04	Yes	22	0.09104	0.01544	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1607S	0.1077	0.09334	0.04	Yes	22	0.1005	0.01337	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1921	0.09719	0.07978	0.04	Yes	12	0.08848	0.0111	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1922S	0.06226	0.04216	0.04	Yes	12	0.05221	0.01281	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1923	0.1965	0.1365	0.04	Yes	12	0.1665	0.03826	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1924	0.1129	0.07525	0.04	Yes	12	0.09407	0.02398	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1925	0.08929	0.06649	0.04	Yes	12	0.07789	0.01453	0	None	No	0.01	Param.

Parametric and Non-Parametric (NP) Confidence Interval, Corrective Action Mode

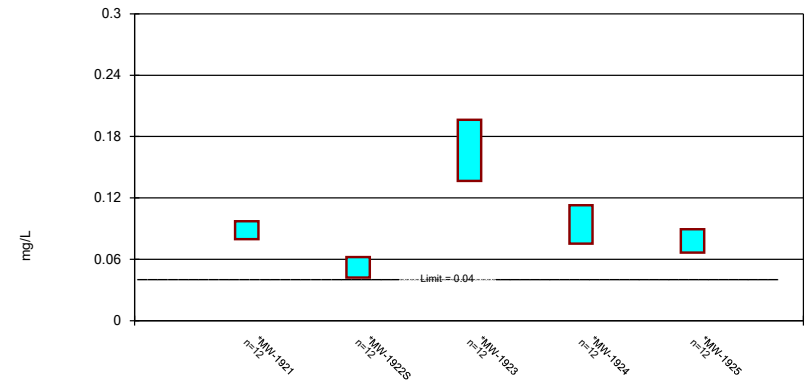
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals - CA
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval, Corrective Action Mode

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



Constituent: Lithium, total Analysis Run 2/22/2023 10:40 AM View: Confidence Intervals - CA
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Confidence Interval

Constituent: Lithium, total (mg/L) Analysis Run 2/22/2023 10:42 AM View: Confidence Intervals - CA

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1605D	MW-1605S	MW-1606D	MW-1606S	MW-1607D	MW-1607S
9/27/2016	0.085	0.086	0.129	0.116	0.068	
10/31/2016						0.098
11/1/2016		0.084				
11/2/2016	0.078		0.12	0.103	0.069	0.092
12/20/2016	0.063	0.076	0.11	0.102	0.075	
12/21/2016						0.088
2/21/2017	0.071	0.068	0.109	0.108	0.072	0.091
3/28/2017	0.086	0.076	0.13	0.126		0.11
3/29/2017					0.087	
4/18/2017	0.077	0.067	0.119	0.117	0.079	0.102
5/16/2017	0.075	0.076	0.124	0.11	0.087	0.094
6/13/2017	0.081	0.071	0.132	0.118		
6/14/2017					0.088	0.106
5/9/2018	0.062	0.051	0.112	0.107		
5/10/2018					0.089	0.103
9/19/2018	0.06	0.049	0.107	0.096		
9/20/2018					0.104	0.118
4/8/2019			0.124	0.117	0.127	0.141
4/9/2019	0.075	0.079				
6/19/2019	0.02 (J)	0.04	0.058	0.056	0.072	0.075
9/10/2019	0.0561	0.0524	0.0835	0.0877	0.11	0.099
3/10/2020	0.0502	0.0558	0.07	0.0721		0.11
3/11/2020					0.108	
5/19/2020	0.0495	0.0523	0.0681	0.073		
5/20/2020					0.104	0.105
10/8/2020			0.0633	0.0701	0.0966	0.0937
10/9/2020	0.0439	0.047				
3/24/2021		0.0509				
3/25/2021	0.0447		0.0658	0.0604	0.077	0.0796
5/18/2021			0.0666	0.0652	0.103	0.103
5/19/2021	0.0455	0.0516				
10/26/2021	0.0413	0.0542	0.0594	0.0644	0.0968	0.0974
3/8/2022					0.0919	0.0967
3/9/2022	0.0352	0.0522	0.0603	0.0543		
5/24/2022	0.0416	0.0481	0.054	0.0582		
5/25/2022					0.0998	0.104
11/4/2022	0.043	0.0444				
11/7/2022			0.0591			
11/8/2022				0.0571	0.0988	0.105
Mean	0.05836	0.06054	0.092	0.08811	0.09104	0.1005
Std. Dev.	0.01825	0.01405	0.02948	0.02505	0.01544	0.01337
Upper Lim.	0.06816	0.06808	0.12	0.1016	0.09933	0.1077
Lower Lim.	0.04857	0.053	0.0633	0.07467	0.08275	0.09334

Confidence Interval

Constituent: Lithium, total (mg/L) Analysis Run 2/22/2023 10:42 AM View: Confidence Intervals - CA

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

	MW-1921	MW-1922S	MW-1923	MW-1924	MW-1925
4/9/2019		0.082			
4/10/2019	0.075		0.223	0.133	0.094
6/18/2019			0.135	0.087	
6/19/2019	0.074				0.095
6/20/2019		0.03 (J)			
9/10/2019		0.0556			0.0947
9/11/2019	0.0926		0.137	0.102	
3/11/2020		0.0615			0.0926
3/12/2020	0.0995		0.115	0.13	
5/14/2020			0.109	0.104	0.0853
5/18/2020	0.099	0.0611			
10/6/2020	0.087		0.177	0.113	0.0776
10/9/2020		0.0551			
3/23/2021	0.0672				0.0517
3/24/2021			0.135	0.0668	
3/25/2021		0.0484			
5/19/2021					0.0714
5/20/2021	0.0942	0.052	0.207	0.0964	
10/26/2021		0.0477			
10/28/2021			0.182	0.0877	0.0621
10/29/2021	0.0862				
3/2/2022	0.0892	0.0409	0.197		0.0662
3/7/2022				0.0645	
5/18/2022	0.0998				0.0761
5/19/2022			0.187	0.0594	
5/23/2022		0.0455			
11/1/2022	0.0981		0.194		0.068
11/2/2022				0.085	
11/4/2022		0.0467			
Mean	0.08848	0.05221	0.1665	0.09407	0.07789
Std. Dev.	0.0111	0.01281	0.03826	0.02398	0.01453
Upper Lim.	0.09719	0.06226	0.1965	0.1129	0.08929
Lower Lim.	0.07978	0.04216	0.1365	0.07525	0.06649

STATISTICAL ANALYSIS SUMMARY, BOTTOM ASH PONDS

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Table 1:	Groundwater Data Summary
Table 2:	Appendix IV Groundwater Protection Standards
Table 3:	Appendix III Data Summary

LIST OF ATTACHMENTS

Attachment A:	Certification by Qualified Professional Engineer
Attachment B:	Statistical Analysis Output
Attachment C:	MW-1921 Statistical Analysis Output

ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
BAPs	Bottom Ash Ponds
CCR	coal combustion residuals
CFR	Code of Federal Regulations
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/L	milligrams per liter
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
TDS	total dissolved solids
UCL	upper confidence limit
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (Code of Federal Regulations [CFR] Title 40, Section 257, Subpart D), groundwater monitoring has been conducted at the Bottom Ash Ponds (BAPs), an existing CCR unit at the Mountaineer Power Plant in New Haven, West Virginia. Recent groundwater monitoring results were used to identify concentrations of Appendix IV constituents that are above site-specific groundwater protection standards (GWPS) and to evaluate progress towards completion of the selected corrective action.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, calcium, chloride, total dissolved solids (TDS), and sulfate at the BAPs. An alternative source was not identified at the time, so the BAPs initiated assessment monitoring in April 2018. GWPSs were set in accordance with 40 CFR 257.95(d)(2), and a statistical evaluation of the assessment monitoring data was conducted in January 2019. Statistically significant levels (SSLs) were observed for lithium (Geosyntec Consultants, Inc. [Geosyntec] 2019).

An alternative source was not identified, so the BAPs initiated an assessment of corrective measures in accordance with 40 CFR 257.96. Source Removal and Hydraulic Containment was selected as the remedial approach for lithium exceedances at the BAPs (Sanborn, Head & Associates, Inc [Sanborn Head] 2021). Corrective action monitoring was initiated in 2022. With statistical analysis completed for the corrective action monitoring network, exceedances for arsenic and molybdenum were identified at select nature-and-extent monitoring wells (Geosyntec 2022). An alternative source demonstration (ASD) was completed for arsenic and molybdenum to document that the BAPs was not the source of these concentrations above the GWPSs; updates to the demonstration were completed following the most recent corrective action monitoring event (Geosyntec 2023a).

Corrective action monitoring events were conducted at the BAPs in March 2023 and May 2023 in accordance with 40 CFR 257.98(a)(1) and the *Corrective Action Monitoring Plan* (Sanborn Head 2022). The results of these corrective action monitoring events are documented in this report.

Groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues that would impact data usability were identified.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were calculated for Appendix IV parameters at the compliance, nature-and-extent, and sentinel wells to assess whether Appendix IV parameters were present at SSLs above previously calculated GWPS. SSLs were identified for arsenic. Corrective action statistics identified concentrations of lithium above the GWPS. Therefore, the unit will continue corrective action monitoring as required by 40 CFR 275.98(a)(1). Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

2. BOTTOM ASH PONDS EVALUATION

2.1 Data Validation and QA/QC

During the corrective action monitoring program, two sets of samples were collected for analysis from the background and compliance wells to meet the requirements of 40 CFR 257.95(b) (March 2023) and 40 CFR 257.95(d)(1) (May 2023). The samples from both events were analyzed for all Appendix III and IV parameters. A summary of data collected during these assessment monitoring events may be found in Table 1.

Chemical analysis was completed by a National Environmental Laboratory Accreditation Program–certified analytical laboratory. The laboratory completed analysis of quality assurance and quality control (QA/QC) samples such as laboratory reagent blanks, continuing calibration verification samples, and laboratory fortified blanks.

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.35 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues that would impact data usability were noted.

2.2 Statistical Analysis

Statistical analyses for the BAPs were conducted in accordance with the January 2020 *Statistical Analysis Plan* (Geosyntec 2020). Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in March and May 2023 were screened for potential outliers; however, no outliers were identified in either set of data (Attachment B).

2.2.1 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, nonparametric confidence limits were calculated in some cases (e.g., when the data were not normally distributed or when the nondetect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) was above the GWPS (i.e., if the entire confidence interval was above the GWPS). The calculated confidence limits (Attachment B) were compared to the GWPSs provided in Table 2. The GWPSs were established during a previous statistical analysis as either (a) the background concentration or (b) the maximum contaminant level and risk-based levels specified in 40 CFR 257.95(h)(2), whichever was greater (Geosyntec 2023b).

The following SSLs were identified at the Mountaineer BAPs for assessment monitoring:

- The LCL for arsenic was above the GWPS of 0.0100 milligrams per liter (mg/L) at MW-1805 (0.0199 mg/L) and MW-1922D (0.423 mg/L).

As a result, either an ASD for arsenic will be prepared in accordance with 40 CFR 257.95(g)(3)(ii) or an assessment of corrective measures will be initiated for this constituent. Additionally, the Mountaineer BAPs will continue to monitor the groundwater monitoring network in accordance with the assessment monitoring program per 40 CFR 257.96(b).

It was previously noted that nature-and-extent well MW-1921 does not accurately represent groundwater conditions downgradient of the BAPs (Geosyntec 2023a). Statistical analyses were still completed for groundwater data at this location to support corrective action monitoring, but the analysis is no longer for compliance purposes. Results of the MW-1921 statistical analyses are provided in Attachment C. The following SSL was identified for MW-1921:

- The LCL for molybdenum was above the GWPS of 0.100 mg/L (0.418 mg/L).

Because this analysis was not completed for compliance purposes, an ASD is not required for the molybdenum concentrations observed at MW-1921.

2.2.2 Evaluation of Corrective Action Monitoring

The selected remedy of Source Removal and Hydraulic Containment is considered complete when it meets the requirements of 40 CFR 257.98(c), including the requirement to achieve compliance with the GWPS at all points within the plume of contamination (40 CFR 257.98[c][1]). For previously identified lithium exceedances, which are the subject of the current corrective measures, the upper confidence limit (UCL) of the confidence intervals constructed as described in Section 2.2.1 were compared to the GWPSs provided in Table 2. If the UCL is above the GWPS, compliance with the GWPSs has not been achieved. The following corrective action exceedances were identified:¹

- The UCL for lithium was above the GWPS of 0.0400 mg/L at MW-1605D (0.0661 mg/L), MW-1605S (0.0664 mg/L), MW-1606D (0.120 mg/L), MW-1606S (0.0983 mg/L), MW-1607D (0.0987 mg/L), MW-1607S (0.107 mg/L), MW-1922S (0.0594 mg/L), MW-1923 (0.200 mg/L), MW-1924 (0.107 mg/L), and MW-1925 (0.0859 mg/L).

For these lithium exceedances, which are the subject of corrective measures, concentrations remain above the GWPS, and the selected remedy will continue to be implemented.

Wells with confidence interval exceedances with visually apparent decreasing trends were further evaluated using Mann Kendall trend tests at the 95% confidence level, with confidence bands at 95% confidence around the trend line. Statistically significant decreasing trends were identified for lithium at MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1922S, MW-1924, and MW-1925. The 95% lower confidence band is below the lithium GWPS at MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1922S, and MW-1924. These results suggest the

¹ As discussed in Section 2.2.1, MW-1921 was also evaluated to support corrective action monitoring. The UCL for lithium at MW-1921 (0.0826 mg/L) was above the GWPS.

selected remedy is working as intended and lithium concentrations are decreasing downgradient of the BAPs.

2.2.3 Evaluation of Potential Appendix III SSIs

The Appendix III results were analyzed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data collected during the May 2023 assessment monitoring event from each compliance well were compared to previously established prediction limits to assess whether the results are above background values (Table 3). The following exceedances of the upper prediction limits (UPLs) were noted:

- Boron concentrations were above the interwell UPL of 0.491 mg/L at MW-1604D (0.566 mg/L), MW-1604S (1.90 mg/L), MW-1605D (3.15 mg/L), MW-1605S (3.28 mg/L), MW-1606D (4.07 mg/L), MW-1606S (3.33 mg/L), MW-1607D (4.16 mg/L), and MW-1607S (3.18 mg/L).
- Calcium concentrations were above the interwell UPL of 202 mg/L at MW-1604S (204 mg/L).
- Chloride concentrations were above the interwell UPL of 57.8 mg/L at MW-1604S (112 mg/L), MW-1605D (111 mg/L), MW-1605S (85.5 mg/L), MW-1606D (172 mg/L), MW-1606S (106 mg/L), MW-1607D (159 mg/L), and MW-1607S (138 mg/L).
- Fluoride concentrations were above the interwell UPL of 0.300 mg/L at MW-1606S (0.34 mg/L), and MW-1607D (0.46 mg/L).
- Sulfate concentrations were above the interwell UPL of 530 mg/L at MW-1604S (692 mg/L), MW-1605D (697 mg/L), MW-1605S (623 mg/L), MW-1606D (585 mg/L), and MW-1607D (629 mg/L).
- TDS concentrations were above the interwell UPL of 1,010 mg/L at MW-1604S (1,350 mg/L), MW-1605D (1,410 mg/L), MW-1605S (1,240 mg/L), MW-1606D (1,330 mg/L), MW-1606S (1,100 mg/L), MW-1607D (1,530 mg/L), and MW-1607S (1,140 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the May 2023 sample was above the UPL or below the lower prediction limit. Based on these results, concentrations of Appendix III constituents appear to be above background levels at the compliance wells.

2.3 Conclusions

Annual and semiannual corrective action monitoring events were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. A review of outliers identified no potential outliers in the March 2023 or May 2023 data. A confidence interval was constructed at each compliance, nature-and-extent, and sentinel well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval was above the GWPS. SSLs were identified for arsenic. For previous lithium exceedances, which are the subject of corrective measures, concentrations remain above the GWPSs, and the selected remedy will continue to be implemented. However,

statistically significant decreasing trends were observed for lithium at several locations in corrective action. Appendix III parameters were compared to previously calculated prediction limits, with exceedances identified for boron, calcium, chloride, fluoride, sulfate, and TDS.

Based on this evaluation, the Mountaineer BAPs CCR unit will continue corrective action monitoring as required by 40 CFR 275.98(a)(1).

3. REFERENCES

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TABLES

**Table 1. Groundwater Data Summary
Statistical Analysis Summary
Mountaineer Plant - Bottom Ash Pond**

Parameter	Unit	JTMN-1		JTMN-2		MW-016		MW-107		MW-1601A		MW-1602		MW-1603		MW-1604D		MW-1604S	
		2/14/2023	5/24/2023	2/14/2023	5/25/2023	2/16/2023	5/25/2023	2/13/2023	5/23/2023	2/13/2023	5/22/2023	2/13/2023	5/22/2023	2/13/2023	5/22/2023	2/15/2023	5/24/2023	2/15/2023	5/24/2023
Antimony	µg/L	0.03 J1	0.045 J1	0.03 J1	0.043 J1	0.10 U1	0.028 J1	0.02 J1	0.024 J1	0.02 J1	0.027 J1	0.10 U1	0.022 J1	0.02 J1	0.069 J1	0.03 J1	0.041 J1	0.15	0.117
Arsenic	µg/L	0.59	0.58	0.51	0.55	2.89	2.58	0.29	0.27	0.45	0.44	0.27	0.26	0.18	0.27	0.23	0.24	0.22	0.20
Barium	µg/L	66.6	57.5	89.4	61.6	25.1	22.1	33.6	33.5	60.6	58.5	25.1	24.0	28.1	29.5	24.1	25.6	29.9	25.5
Beryllium	µg/L	0.011 J1	0.01 J1	0.011 J1	0.012 J1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1
Boron	mg/L	0.292	0.257	0.262	0.372	1.25	1.09	0.786	0.632	0.144	0.143	0.100	0.107	0.190	0.203	3.20	0.566	2.11	1.90
Cadmium	µg/L	0.018 J1	0.017 J1	0.038	0.022	0.022	0.011 J1	0.022	0.024	0.013 J1	0.013 J1	0.012 J1	0.01 J1	0.012 J1	0.020	0.018 J1	0.014 J1	0.181	0.169
Calcium	mg/L	179	150	153	195	205	189	169	171	156	148	86.3	78.7	150	128	163 M1	105	240	204
Chloride	mg/L	52.2	48.0	45.7	63.6	73.9	80.0	36.0	46.5	17.0	13.5	8.75	8.29	12.7	11.3	78.1	3.75	112	112
Chromium	µg/L	0.67	0.61	0.65	0.64	0.41	0.23 J1	0.27	0.25 J1	0.26	0.21 J1	0.66	0.35	0.35	0.42	0.27	0.30	0.34	0.20 J1
Cobalt	µg/L	0.449	0.367	0.299	0.578	1.03	1.02	0.209	0.331	0.013 J1	0.013 J1	0.012 J1	0.016 J1	0.034	0.226	0.116	0.079	2.20	1.49
Combined Radium	pCi/L	0.35	0.31	0.78	1.14	0.98	2.00	0.35	0.78	0.37	1.02	0.78	0.24	0.49	0.77	0.70	0.54	1.83	0.99
Fluoride	mg/L	0.25	0.21	0.25	0.38	0.23	0.24	0.21	0.21	0.11	0.10	0.24	0.23	0.06	0.05 J1	0.21	0.24	0.23	0.22
Lead	µg/L	0.48	0.41	0.24	0.33	0.09 J1	0.06 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.21	0.2 U1	0.2 U1	0.2 U1	0.08 J1
Lithium	mg/L	0.00787	0.0062	0.00748	0.0224	0.0249	0.0262	0.00389	0.0034	0.00390	0.0029	0.0133	0.0131	0.0167	0.0165	0.0186	0.0140	0.0356	0.0306
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1
Molybdenum	µg/L	8.0	5.9	7.5	29.4	36.0	35.7	0.2 J1	0.3 J1	0.5	0.5	1.0	1.1	0.1 J1	0.5 U1	1.6	1.8	12.1	11.4
Selenium	µg/L	0.54	0.65	0.56	0.24 J1	0.12 J1	0.1 J1	0.43 J1	0.24 J1	0.57	0.53	0.11 J1	0.40 J1	0.38 J1	0.24 J1	1.19	3.46	0.53	0.55
Sulfate	mg/L	354	325	294	484	481	485	316	426	240	263	226	227	450	433	462	249	702	692
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.21	0.19 J1
Total Dissolved Solids	mg/L	840	820	750	1,000	1,040	1,040	860	1,040	650	710	540	530	830	800	1,070	650	1,360	1,350
pH	SU	6.96	6.99	6.83	7.32	7.29	7.29	6.95	6.94	6.62	7.00	6.42	6.73	6.35	6.51	6.76	7.07	6.86	7.14

**Table 1. Groundwater Data Summary
Statistical Analysis Summary
Mountaineer Plant - Bottom Ash Pond**

Parameter	Unit	MW-1605D		MW-1605S		MW-1606D		MW-1606S		MW-1607D		MW-1607S		MW-1608		MW-1805		MW-1921	
		2/15/2023	5/24/2023	2/15/2023	5/22/2023	2/15/2023	5/24/2023	2/15/2023	5/23/2023	2/15/2023	5/23/2023	2/15/2023	5/23/2023	2/14/2023	5/23/2023	2/14/2023	5/22/2023	2/14/2023	5/25/2023
Antimony	µg/L	0.03 J1	0.031 J1	0.04 J1	0.043 J1	0.15	0.140	0.14	0.130	0.04 J1	0.030 J1	0.40	0.399	0.03 J1	0.033 J1	0.03 J1	0.037 J1	0.10	0.095 J1
Arsenic	µg/L	2.97	2.72	0.39	0.34	0.27	0.26	0.64	0.51	2.51	1.97	0.84	0.80	0.38	0.33	15.2	8.77	1.14	1.11
Barium	µg/L	30.0	28.4	27.5	25.3	39.6	37.3	54.1	36.3	68.7	58.1	67.4	57.2 M1	23.4	26.8	56.7	77.9	62.2	58.1
Beryllium	µg/L	0.050 U1	0.050 M1, U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.05 M1, U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1
Boron	mg/L	2.96	3.15 M1	3.49	3.28	5.52 M1	4.07	5.06	3.33	4.40	4.16	2.58	3.18 M1	0.058	0.089	2.03	1.98	0.692	0.655
Cadmium	µg/L	0.008 J1	0.008 J1	0.046	0.049	0.061	0.057	0.061	0.043	0.020 U1	0.020 U1	0.038	0.032	0.006 J1	0.007 J1	0.020 U1	0.020 U1	0.020 U1	0.007 J1
Calcium	mg/L	214	202 M1	162	153	189 M1	194	196	127	218	175	181	146 M1	78.5 M1	91.5	39.5 M1	36.3	99.9	93.2
Chloride	mg/L	110	111	78.3	85.5	164	172	166	106	177	159	161	138	1.57	4.78	156	149	62.4	57.3
Chromium	µg/L	0.23	0.32	0.26	0.18 J1	0.52	0.48	0.26	0.22 J1	0.51	0.21 J1	0.27	0.26 J1	0.28	0.31	0.24	0.24 J1	0.31	0.15 J1
Cobalt	µg/L	1.24	1.25	0.306	0.344	1.31	1.23	0.195	0.136	0.989	0.839	1.57	1.39	0.052	0.049	0.039	0.033	0.655	0.675
Combined Radium	pCi/L	0.59	1.33	0.63	0.67	1.85	0.78	0.93	0.47	1.68	1.81	1.39	1.12	0.29	0.54	0.56	2.00	0.30	1.53
Fluoride	mg/L	0.20	0.19	0.25	0.23	0.24	0.23	0.34	0.34	0.46	0.46	0.21	0.22	0.26	0.23	0.63	0.60	1.09	1.09
Lead	µg/L	0.2 U1	0.2 U1	0.05 J1	0.06 J1	0.2 M1, P3, U1	0.2 U1	0.2 U1	0.06 J1	0.06 J1	0.2 U1	0.06 J1	0.07 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Lithium	mg/L	0.0417	0.0365 M1	0.0456	0.0415	0.0545 M1	0.0519	0.0545	0.0391	0.0997	0.0811	0.102	0.0890 M1	0.00226	0.0023	0.0178	0.0180	0.0992	0.0903
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1
Molybdenum	µg/L	30.2	27.5	12.8	13.6	65.3	59.3	52.8	44.4	63.2	60.0	28.4	44.4	30.5	0.7	0.8	7.7	2.2	408
Selenium	µg/L	0.11 J1	0.11 J1	0.45 J1	1.38	1.41	2.29	1.55	3.28	0.5 U1	0.5 U1	3.06	3.27	1.58	3.27	0.5 M1, U1	0.5 U1	0.18 J1	0.32 J1
Sulfate	mg/L	584	697	574	623	601	585	553	477	719	629	349	311	64.7	140	128	143	166	167
Thallium	µg/L	0.2 U1	0.02 J1	0.2 U1	0.03 J1	0.07 J1	0.06 J1	0.06 J1	0.04 J1	0.2 U1	0.2 U1	0.06 J1	0.05 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.06 J1	0.07 J1
Total Dissolved Solids	mg/L	1,250	1,410	1,170	1,240	1,320	1,330	1,280	1,100	1,600	1,530	1,160	1,140	320 S7	440	840	840	520	520
pH	SU	7.06	7.21	6.92	7.22	7.22	7.22	7.01	7.08	7.35	7.35	7.16	7.13	6.93	6.88	7.96	7.99	7.49	7.66

**Table 1. Groundwater Data Summary
Statistical Analysis Summary
Mountaineer Plant - Bottom Ash Pond**

Parameter	Unit	MW-1922D		MW-1922S		MW-1923		MW-1924		MW-1925		MW-1926		MW-1927		MW-1929		MW-203	
		2/15/2023	5/22/2023	2/15/2023	5/22/2023	2/16/2023	5/25/2023	2/16/2023	5/25/2023	2/14/2023	5/24/2023	2/13/2023	5/22/2023	2/14/2023	5/24/2023	2/13/2023	5/23/2023	2/13/2023	5/25/2023
Antimony	µg/L	0.85	0.530	0.03 J1	0.023 J1	0.36	0.192	0.07 J1	0.067 J1	0.20	0.195	0.06 J1	0.063 J1	0.07 J1	0.079 J1	0.02 J1	0.033 J1	0.10 U1	0.018 J1
Arsenic	µg/L	443	408	3.64	1.56	0.80	1.25	0.37	0.43	0.24	0.23	0.31	0.37	0.21	0.17	0.32	0.36	0.24	0.22
Barium	µg/L	402	327	28.1	26.1	93.4	96.5	46.3	41.3	39.6	37.4	19.4	18.1	56.1	49.5	46.3	43.7	24.6	24.4
Beryllium	µg/L	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.021 J1	0.051	0.050 U1	0.050 U1	0.050 U1	0.050 M1, U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1	0.050 U1
Boron	mg/L	0.073	0.079	2.87	2.21	1.15	1.21	2.49	3.28	3.35	3.02 M1	0.106	0.099	0.416	0.341	0.200	0.208	0.071	0.074
Cadmium	µg/L	0.020 U1	0.020 U1	0.007 J1	0.007 J1	0.012 J1	0.019 J1	0.035	0.035	0.045	0.041	0.036	0.032	0.068	0.067	0.008 J1	0.01 J1	0.004 J1	0.006 J1
Calcium	mg/L	58.8	51.9	264	244	115	113	180 M1	166	190 M1	172 M1	88.3 M1	82.4	157	138	106	101	87.7	84.4
Chloride	mg/L	17.4	18.2	113	110	30.2	29.6	79.8	88.4	98.1	116	2.61	3.49	11.2	13.5	6.15	6.52	22.3	27.8
Chromium	µg/L	0.28	0.18 J1	0.22	0.16 J1	0.99	1.19	0.37	0.31	0.29	0.23 J1	0.47	0.48	0.34	0.31	0.32	0.92	0.37	0.39
Cobalt	µg/L	0.178	0.129	0.934	0.933	0.726	1.99	1.99	3.31	1.03	1.03	0.788	0.728	0.442	0.434	0.144	0.257	0.017 J1	0.016 J1
Combined Radium	pCi/L	5.54	5.72	0.62	1.31	1.44	1.40	0.58	1.18	1.19	1.72	0.78	0.71	1.38	2.73	0.53	0.34	0.08	1.46
Fluoride	mg/L	0.29	0.29	0.15	0.14 J1	0.26	0.28	0.51	0.53	0.26	0.25	0.24	0.22	0.14	0.13	0.21	0.23	0.29	0.28
Lead	µg/L	0.10 J1	0.2 U1	0.08 J1	0.06 J1	0.70	1.49	0.05 J1	0.11 J1	0.2 U1	0.2 U1	0.10 J1	0.24	0.2 U1	0.2 U1	0.10 J1	0.20	0.2 U1	0.2 U1
Lithium	mg/L	0.00770	0.0068	0.0426	0.0370	0.215	0.202	0.0734	0.0640	0.0629	0.0601 M1	0.00683	0.0060	0.00593	0.0056	0.00445	0.0039	0.00203	0.0020
Mercury	µg/L	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1
Molybdenum	µg/L	41.6	56.4	29.0	24.2	293	284	72.9	119	43.3	39.5	4.4	4.1	1.0	0.9	0.4 J1	0.6	1.1	1.3
Selenium	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	17.8	4.39	1.35	0.41 J1	6.44	2.56	0.99	0.60	0.79	0.33 J1	1.72	1.91	0.82	0.63
Sulfate	mg/L	16.1	21.5	704	813	256	254	453	501	466	534	29.1	29.5	267	281	193	211	61.3	61.8
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.03 J1	0.2 U1	0.03 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.02 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	340	340	1,420	1,550	620	620	1,070	1,120	1,090	1,190	360	380	750	750	500	510	360	360
pH	SU	7.22	7.34	7.19	7.21	7.24	7.46	6.9	7.26	6.93	7.08	7.09	7.28	6.85	7.05	7.31	7.43	7.19	7.21

Notes:

µg/L: micrograms per liter

J1: Estimated value. Parameter was detected in concentrations below the reporting limit.

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.

S7: The sample did not achieve constant weight.

**Table 2. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Mountaineer Plant - Bottom Ash Pond**

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000150	0.00600
Arsenic, Total (mg/L)	0.0100		0.000732	0.0100
Barium, Total (mg/L)	2.00		0.0678	2.00
Beryllium, Total (mg/L)	0.00400		0.0000500	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000500	0.00500
Chromium, Total (mg/L)	0.100		0.000738	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.000654	0.00600
Combined Radium, Total (pCi/L)	5.00		2.24	5.00
Fluoride, Total (mg/L)	4.00		0.303	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000454	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0300	0.0400
Mercury, Total (mg/L)	0.00200		0.00000500	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00287	0.100
Selenium, Total (mg/L)	0.0500		0.00430	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

1. Calculated UTL (Upper Tolerance Limit) represents site-specific background values.

CCR: Coal Combustion Residuals

GWPS: Groundwater Protection Standard

MCL: Maximum Contaminant Level

mg/L: milligrams per liter

pCi/L: picocuries per liter

**Table 3. Appendix III Data Summary
Statistical Analysis Summary
Mountaineer Plant - Bottom Ash Pond**

Analyte	Unit	Description	MW-1604D	MW-1604S	MW-1605D	MW-1605S	MW-1606D	MW-1606S	MW-1607D	MW-1607S
			5/24/2023	5/24/2023	5/24/2023	5/22/2023	5/24/2023	5/23/2023	5/23/2023	5/23/2023
Boron	mg/L	Interwell Background Value (UPL)	0.491							
		Analytical Result	0.566	1.90	3.15	3.28	4.07	3.33	4.16	3.18
Calcium	mg/L	Interwell Background Value (UPL)	202							
		Analytical Result	105	204	202	153	194	127	175	146
Chloride	mg/L	Interwell Background Value (UPL)	57.8							
		Analytical Result	3.75	112	111	85.5	172	106	159	138
Fluoride	mg/L	Interwell Background Value (UPL)	0.300							
		Analytical Result	0.24	0.22	0.19	0.23	0.23	0.34	0.46	0.22
pH	SU	Intrawell Background Value (UPL)	7.8	7.7	7.8	7.7	7.8	7.8	8.0	7.9
		Intrawell Background Value (LPL)	6.5	6.6	6.8	6.8	6.8	6.3	7.0	6.8
		Analytical Result	7.1	7.1	7.2	7.2	7.2	7.1	7.4	7.1
Sulfate	mg/L	Interwell Background Value (UPL)	530							
		Analytical Result	249	692	697	623	585	477	629	311
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	1,010							
		Analytical Result	650	1,350	1,410	1,240	1,330	1,100	1,530	1,140

- Notes:
- 1. **Bold values exceed the background value.**
 - 2. Background values are shaded gray.
- LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

ATTACHMENT A

Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Mountaineer Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



22663

License Number

West Virginia

Licensing State

09.11.2023

Date

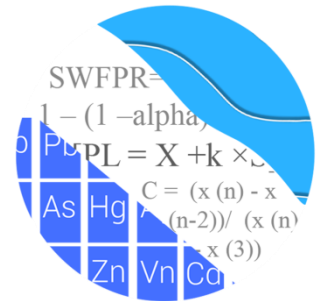
ATTACHMENT B

Statistical Analysis Output

GROUNDWATER STATS CONSULTING

July 6, 2023

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
500 W. Wilson Bridge Road, Suite 250
Worthington, OH 43085



Re: Mountaineer Bottom Ash Pond
Assessment Monitoring Report & Corrective Action – 2023

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the Assessment Monitoring and Corrective Action statistical analysis of groundwater data through May 2023 at American Electric Power Company's Mountaineer Bottom Ash Pond. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at upgradient and downgradient wells for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** MW-1601A, MW-1602, MW-1603, and MW-1608
- **Downgradient wells:** MW-1604D, MW-1604S, MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, and MW-1607S
- **Nature and Extent wells:** JTMN-1, JTMN-2, MW-016, MW-107, MW-112, MW-1805, MW-1921, MW-1922D, MW-1922S, MW-1923, MW-1924, MW-1925, MW-1926, MW-1927, and MW-203
- **Sentinel well:** MW-1929

Note that sampling began at the nature and extent wells along with the sentinel well in 2019. Although new upgradient well MW-1928 is considered part of the well network, it has been dry since 2019; therefore, it is not listed above, nor included in this analysis.

Nature and extent well MW-112 was not sampled for this analysis and was last sampled in March 2022; therefore, it is also not included in this analysis.

As requested by Geosyntec Consultants, Inc., MW-1921 was analyzed and discussed separately from the other wells.

Data were sent electronically, and the statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC. This analysis was reviewed by Andrew Collins, Project Manager of Groundwater Stats Consulting.

The CCR program consists of the following constituents listed below. The terms "constituent" and "parameter" are interchangeable.

- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Time series and box plots for Appendix IV parameters are provided for all wells and constituents and are used to evaluate concentrations over the entire record (Figures A and B, respectively). Values in background which have previously been flagged as outliers may be seen in a lighter font and disconnected symbol on the graphs. Additionally, a summary of flagged values follows this letter (Figure C). While the reporting limits may vary from well to well, a single reporting limit substitution is used across all wells for a given parameter in the time series plots since the wells are plotted as a group.

Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. A summary of Appendix IV downgradient, nature and extent, and sentinel well/constituent pairs containing 100% non-detects follows this letter. For all constituents, a substitution of the most recent reporting limit is used for non-detect data. When calculating confidence intervals, the substitution is performed for individual wells and may differ across wells. This generally gives the most conservative limit in each case.

Summary of Statistical Methods – Appendix IV Parameters

Interwell upper tolerance limits (UTLs) are used to establish background limits for both Assessment Monitoring and Corrective Action Monitoring. A Groundwater Protection Standard (GWPS) for each Appendix IV constituent is then established using the higher of

the background limit or a regulatory limit. A confidence interval for each downgradient well/constituent is compared against the corresponding GWPS. More details for both Assessment and Corrective Action monitoring are given below.

Parametric tolerance limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (USEPA, 2009), data are analyzed using either parametric or non-parametric tolerance limits as appropriate. Non-detects are handled as follows:

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits are used on data containing greater than 50% non-detects.

Summary of Appendix IV Background Update – Conducted in January 2023

Outlier Analysis

Prior to evaluating Appendix IV parameters, background (upgradient) data were screened through visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. High outliers are also 'cautiously' flagged in the downgradient wells when they are clearly much different from the rest of the data. This is intended to be a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals; although it will also reduce the mean and thus lower the entire interval. The intent is to better represent the actual downgradient mean.

For the January 2023 update, Tukey's outlier test on pooled upgradient well data did not identify any outliers; therefore, no new values were flagged. Additionally, no new values were flagged among downgradient wells. Note that during the March/May 2022 analysis,

a previously flagged high value of molybdenum in well MW-1604S was unflagged due to the observation being lower than present-day groundwater quality conditions.

Previous screenings identified high values for chromium in several wells (both upgradient and downgradient) during the November and December 2016 samples events. These values were flagged in the database as outliers as the measurements did not appear to represent the population at these wells or current groundwater quality conditions. Additionally, several high values for antimony, arsenic, barium, cadmium, cobalt, fluoride, lead, and selenium were recorded during the December 2016 sample event for downgradient wells MW-1606D, MW-1607D, and MW-1607S. High values above the MCL were flagged and are likely the result of a systematic error since they all occurred for the same sample event.

For the September 2016 sample event, a high value of combined radium in well MW-1606D and for molybdenum in well MW-1604S as well as a low value for combined radium in well MW-1604S were identified visually and flagged as outliers. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data during the Fall 2022 statistical analysis using data through November 2022 for Appendix IV parameters (Figure D). Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were constructed using the highest background measurement. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. These limits are updated annually and will be updated again after the Fall 2023 sample event.

Groundwater Protection Standards

Interwell upper tolerance limits were compared to the Maximum Contaminant Levels (MCLs) and CCR-Rule specified levels in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure E).

Evaluation of Appendix IV Parameters – May 2023 Event

Assessment Monitoring

Confidence intervals were constructed for downgradient, nature and extent, and sentinel wells for each of the Appendix IV parameters using data through May 2023 (Figure F). These intervals were constructed as either parametric or nonparametric confidence intervals depending on the data distribution and percentage of non-detects. When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. Nonparametric confidence intervals were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

As discussed above, the highest limit of the MCL, CCR-Rule specified level, or background limit was used to establish the GWPS. A statistically significant level (SSL) is declared only when the entire confidence interval is above a GWPS. Complete graphical results of the confidence intervals follow this letter. Note that lithium at wells which exceeded the GWPS during the previous analysis were evaluated only under the Corrective Action protocols described below. Confidence interval exceedances were identified for the following well/constituent pairs:

- Arsenic: MW-1805 and MW-1922D

Note that the exceedances listed above occurred in nature and extent wells, and no exceedances were identified among compliance wells. Further research beyond the scope of this analysis would be required to determine whether the exceedances are reflective of natural groundwater quality or are a result of practices at the site.

Corrective Action

In 2022, Mountaineer BAP entered Corrective Action protocols for lithium due to previously identified SSLs. Confidence intervals were constructed using data through May 2023 for this constituent at downgradient, nature and extent, and sentinel wells identified with SSL exceedances during Assessment Monitoring (Figure G). These confidence intervals are then compared to the same GWPS used in Assessment Monitoring to evaluate the effectiveness of remedial efforts over time. Only when the entire confidence

interval is below the GWPS for a period of 3 years is the well/constituent pair declared to be in compliance with its respective standard.

Lithium will continue to be evaluated under Corrective Action protocols using confidence intervals for these well/constituent pairs during the Monitoring and Natural Attenuation program. In future analyses, if confidence interval exceedances are identified for lithium at additional wells during Assessment Monitoring, data from these wells will also be evaluated only within the Corrective Action protocols until compliance is achieved. Complete graphical results of the confidence intervals follow this letter. Exceedances were identified for the following well/constituent pairs:

- Lithium: MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S, MW-1922S, MW-1923, MW-1924, and MW-1925

Trend Tests

Data at wells with confidence interval exceedances with visually apparent decreasing trends are further evaluated using the Sen's Slope/Mann Kendall trend test at the 95% confidence level with confidence bands at 95% confidence around the trend line to determine whether concentrations are statistically increasing, decreasing, or stable (Figure H). The 95% confidence level will identify whether statistically significant trends are present more rapidly and, therefore, is used in this analysis. The following well/constituent pairs meet these criteria:

- Lithium: MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1922S, MW-1924, and MW-1925

A summary of the Appendix IV trend test results follows this letter. Statistically significant decreasing trends were identified for each of the well/constituent pairs listed above.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Mountaineer Bottom Ash Pond. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



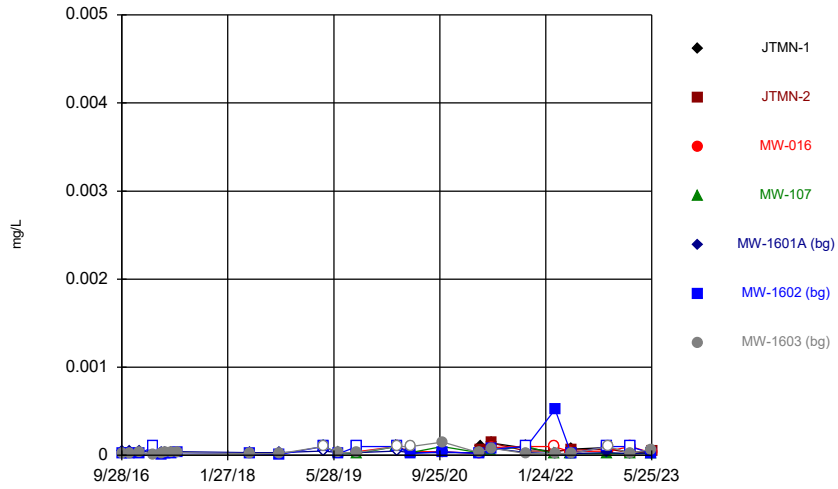
Tristan Clark
Groundwater Analyst



Andrew Collins
Project Manager

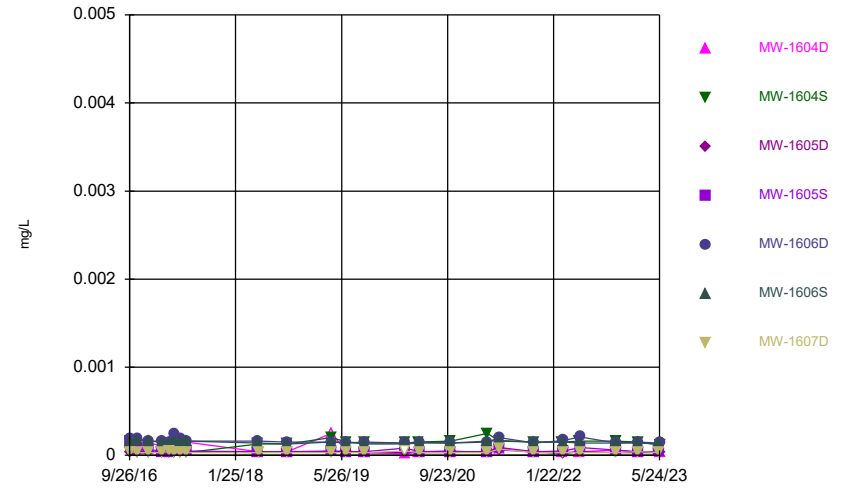
FIGURE A
Time Series

Time Series



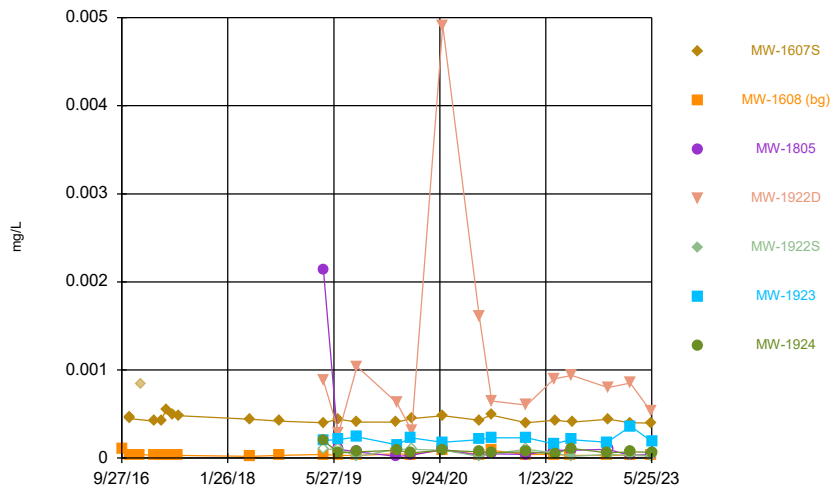
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Time Series



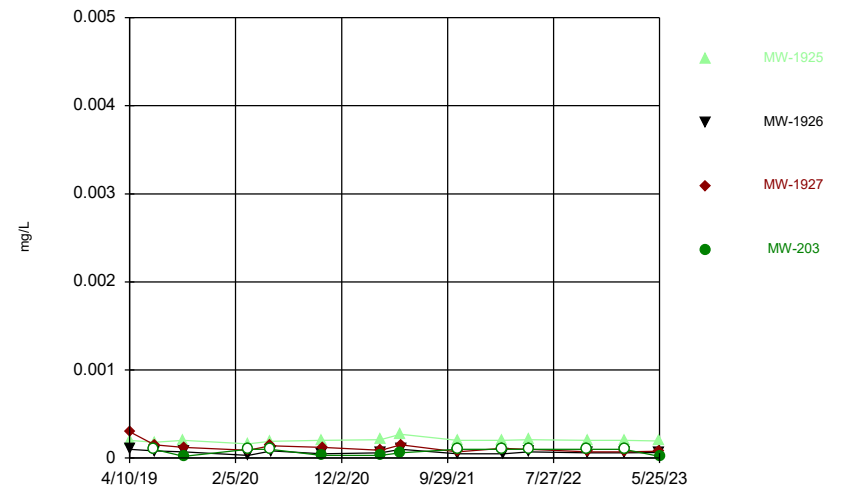
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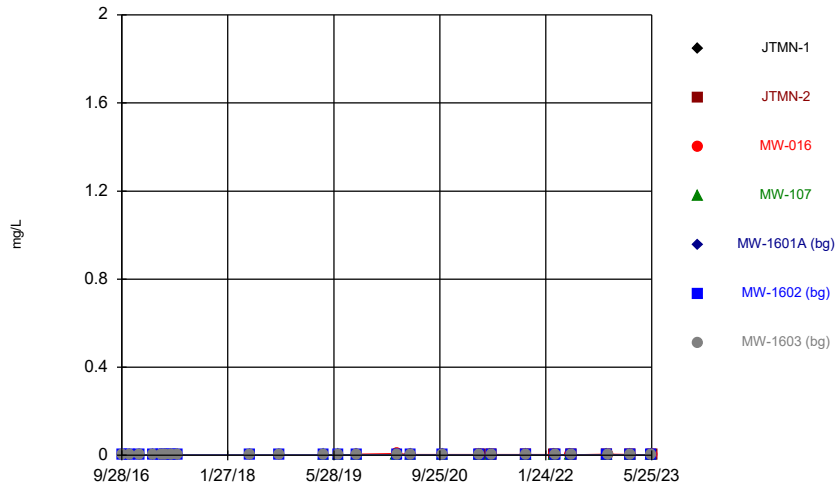
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Time Series



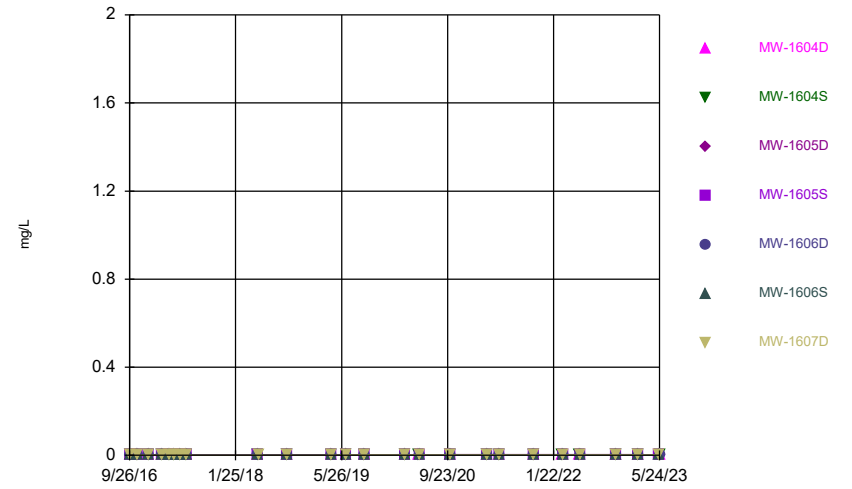
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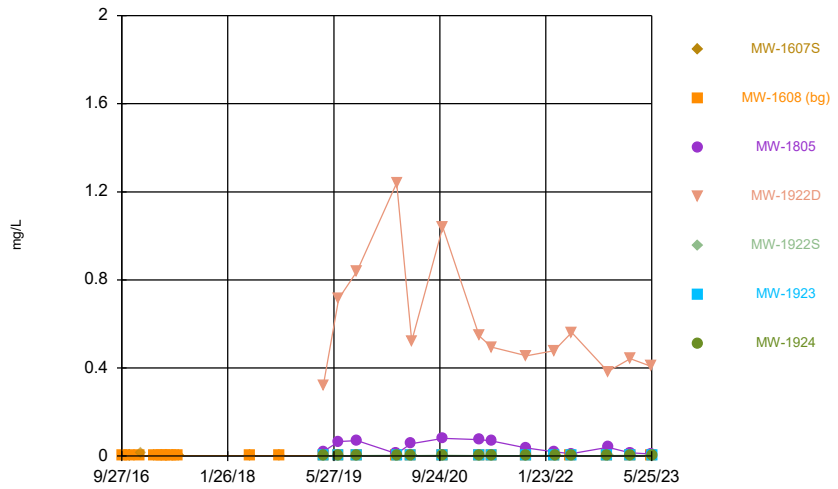
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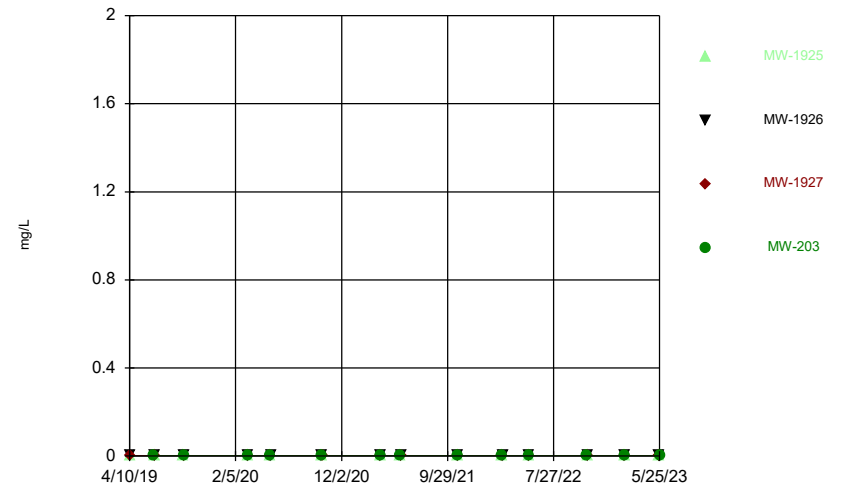
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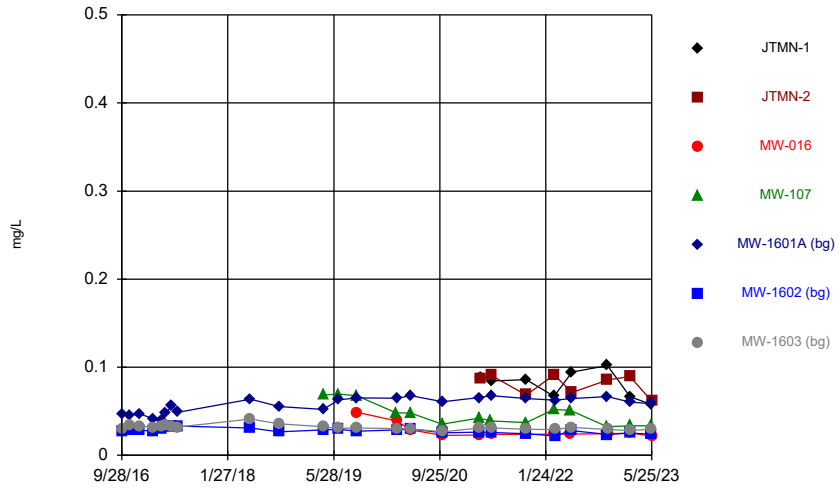
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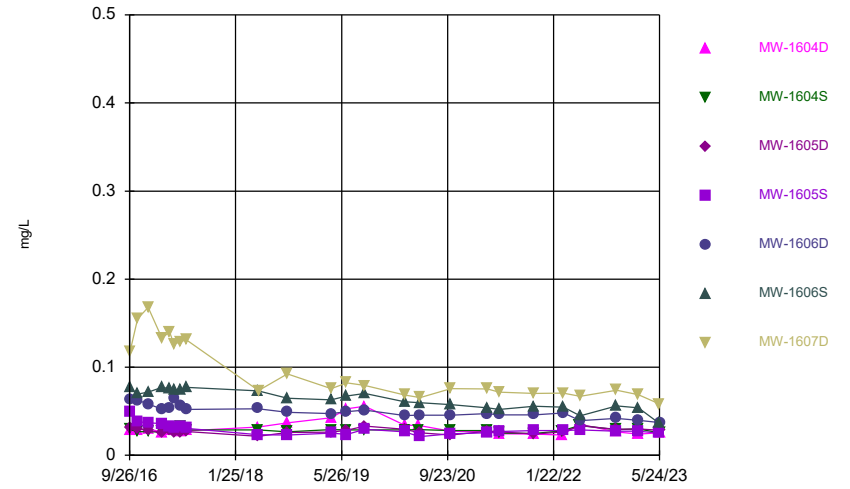
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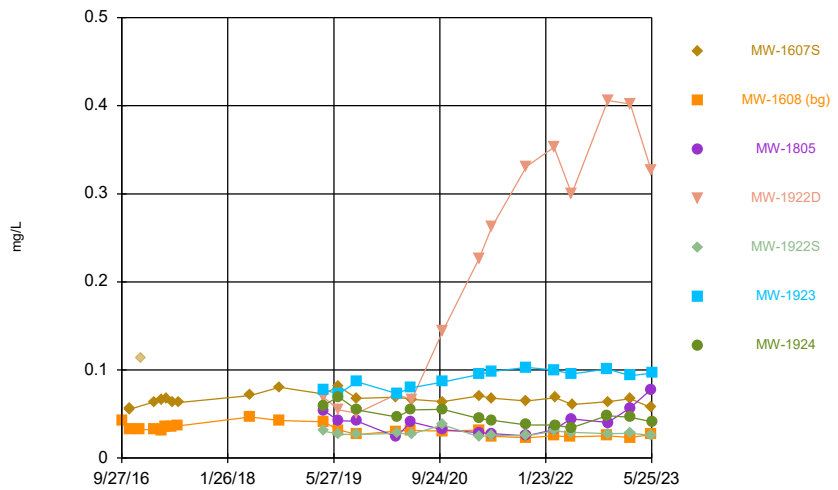
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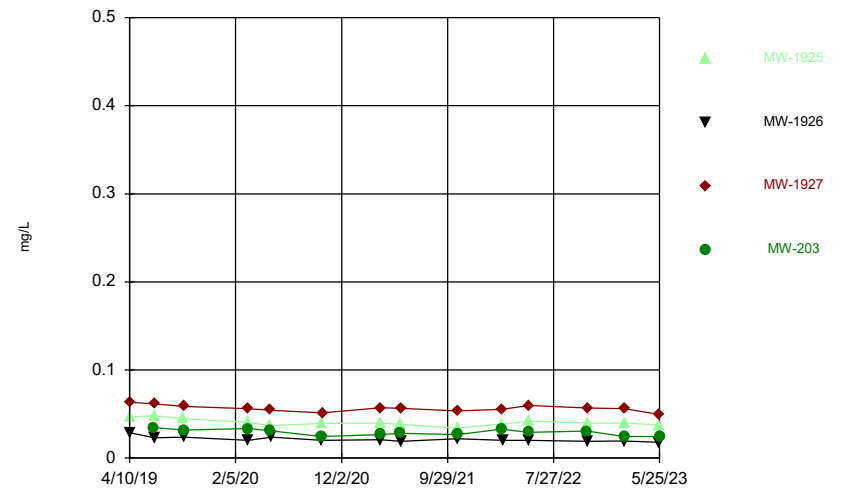
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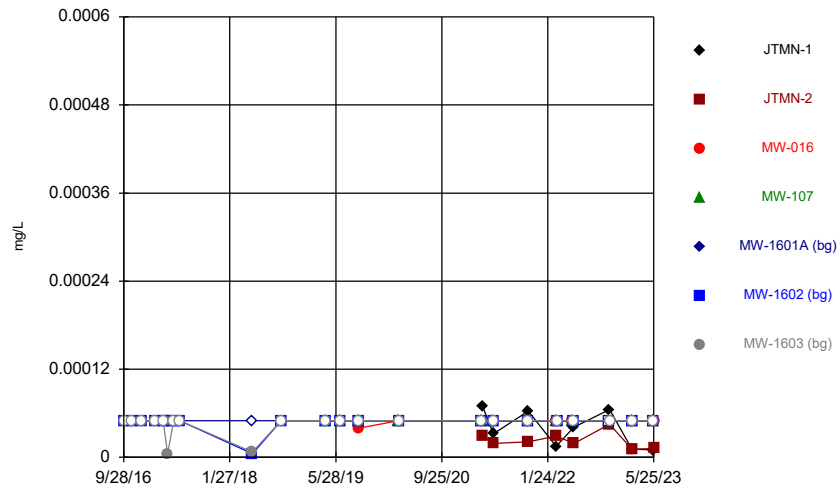
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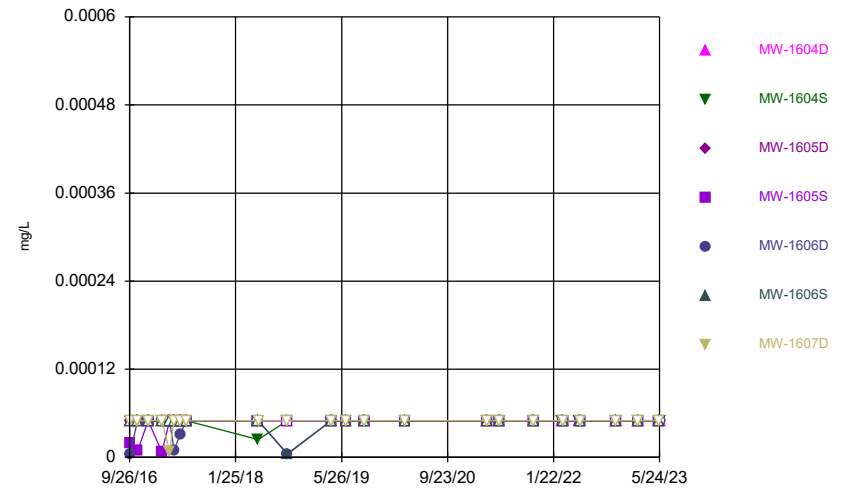
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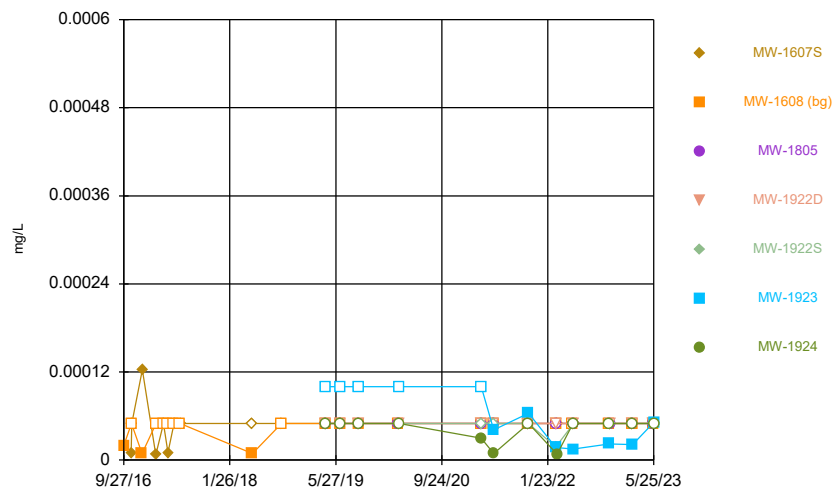
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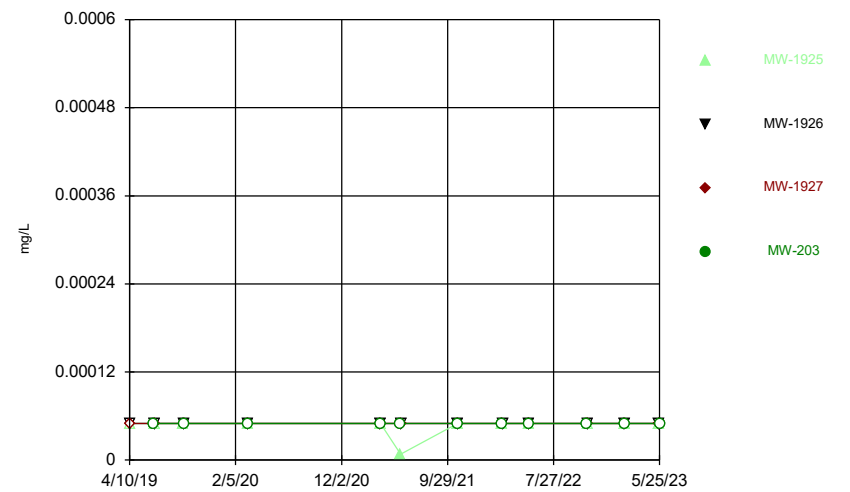
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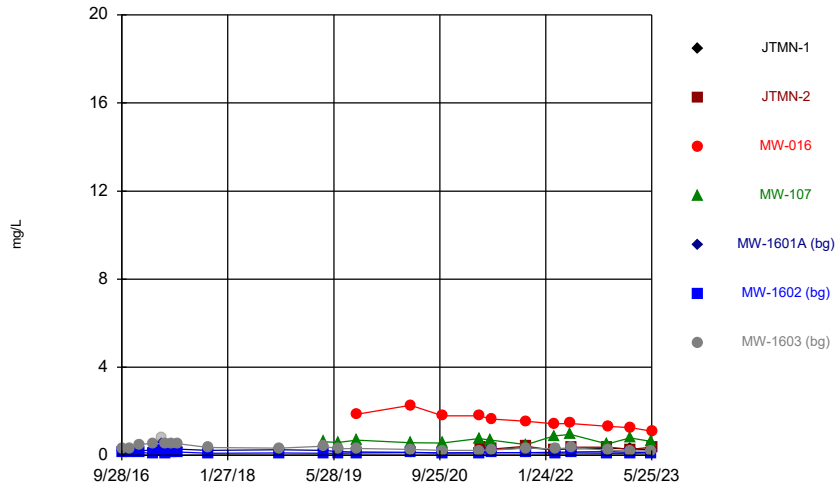
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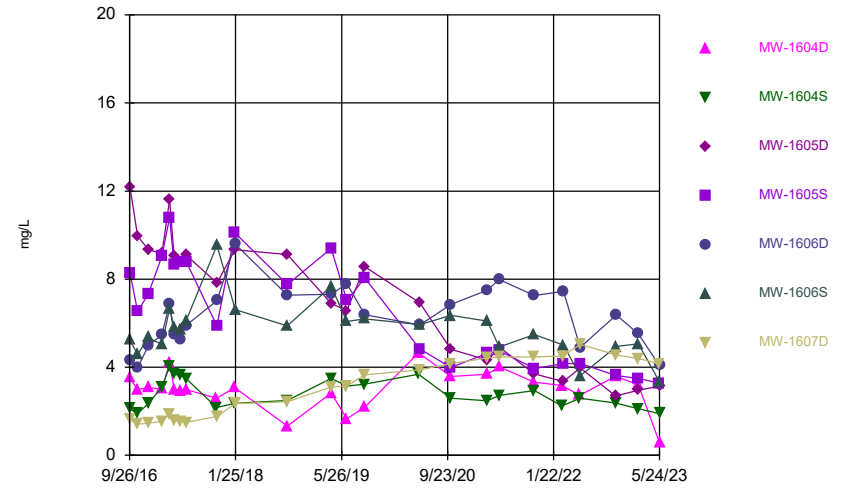
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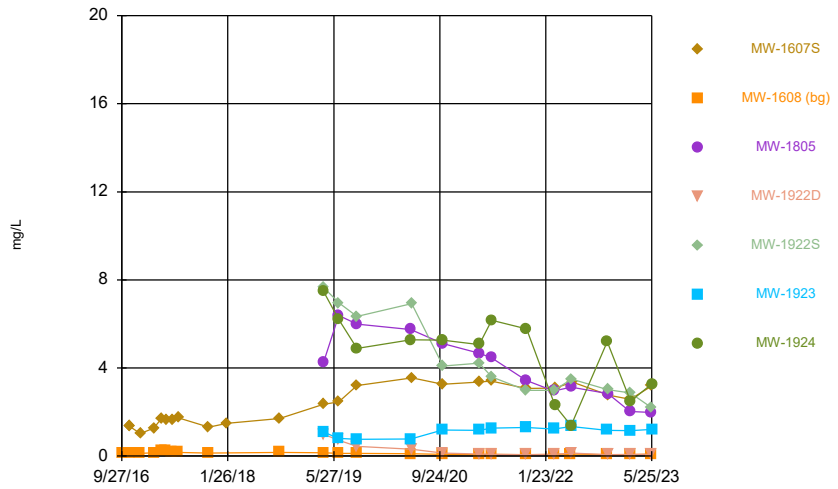
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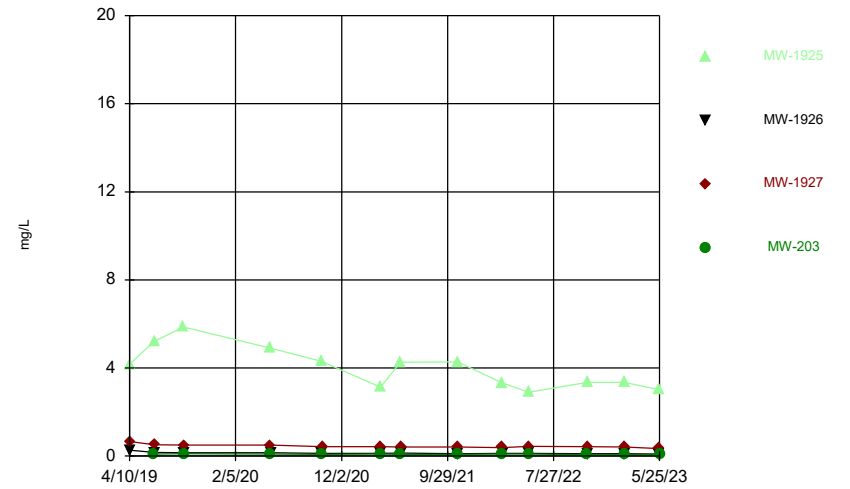
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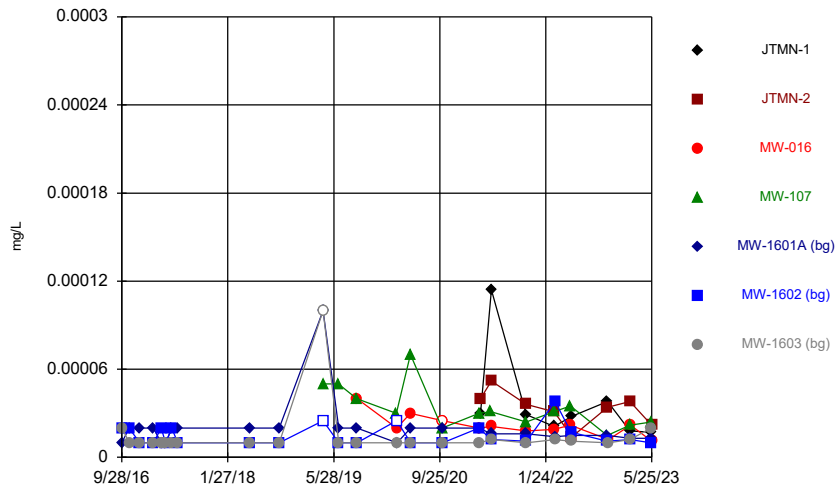
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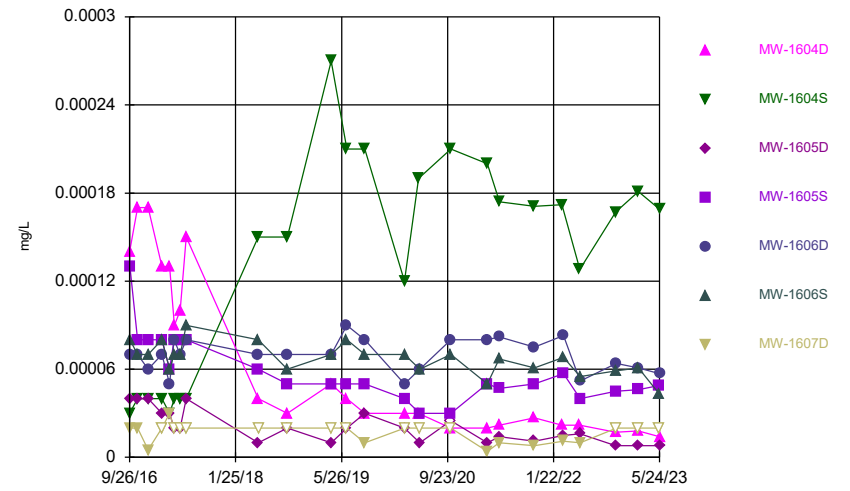
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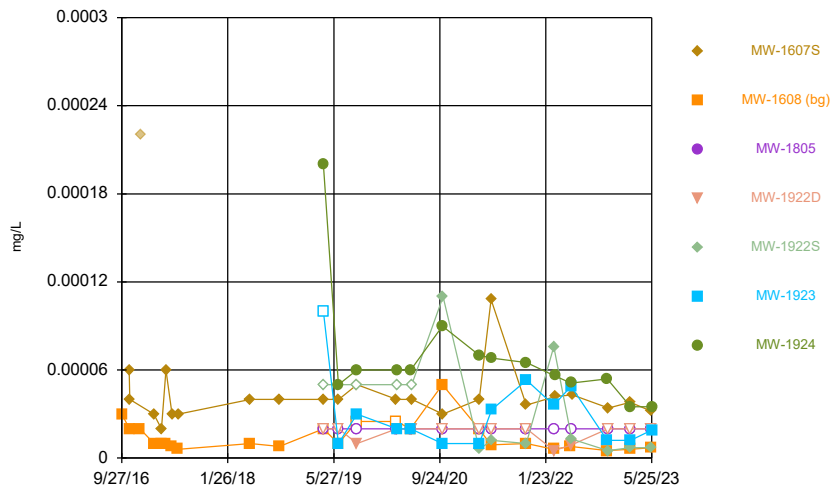
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Time Series



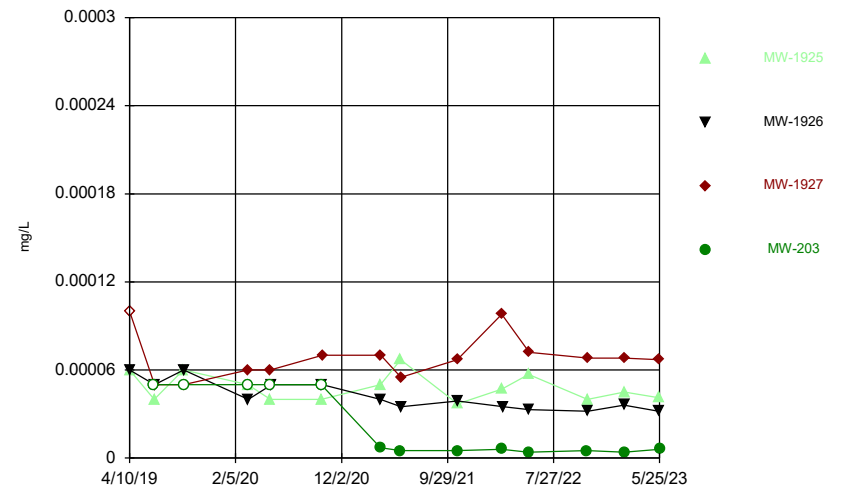
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Time Series



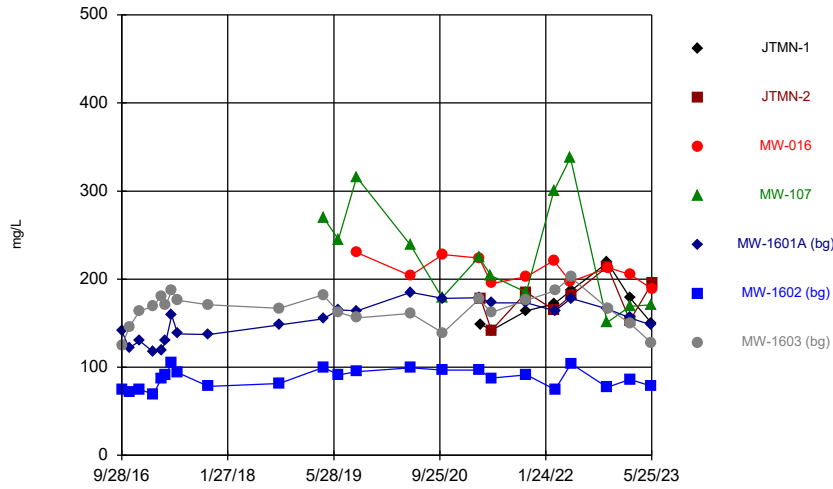
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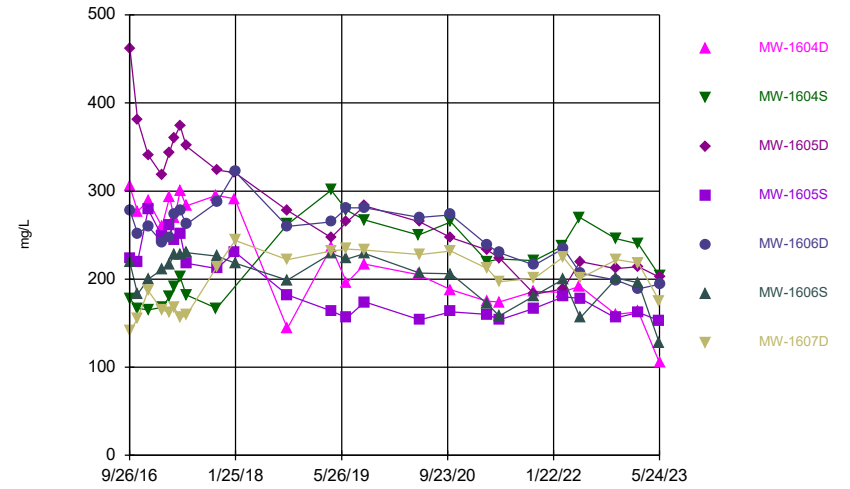
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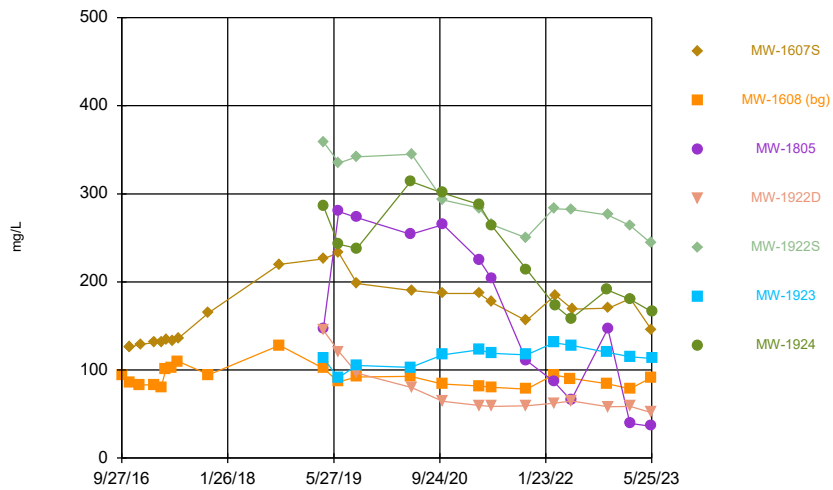
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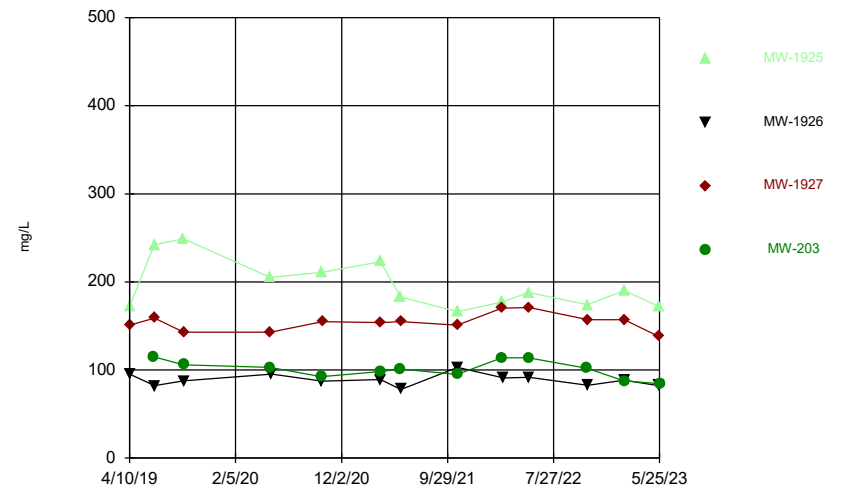
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Time Series



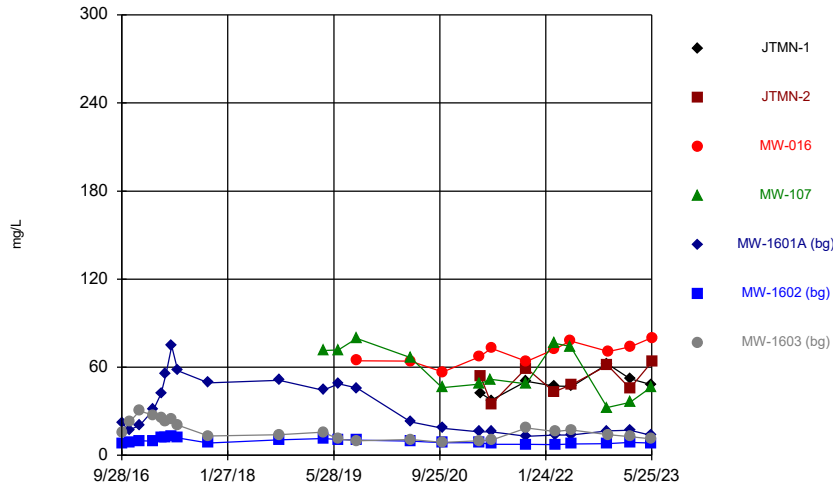
Constituent: Calcium, total Analysis Run 6/27/2023 4:59 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



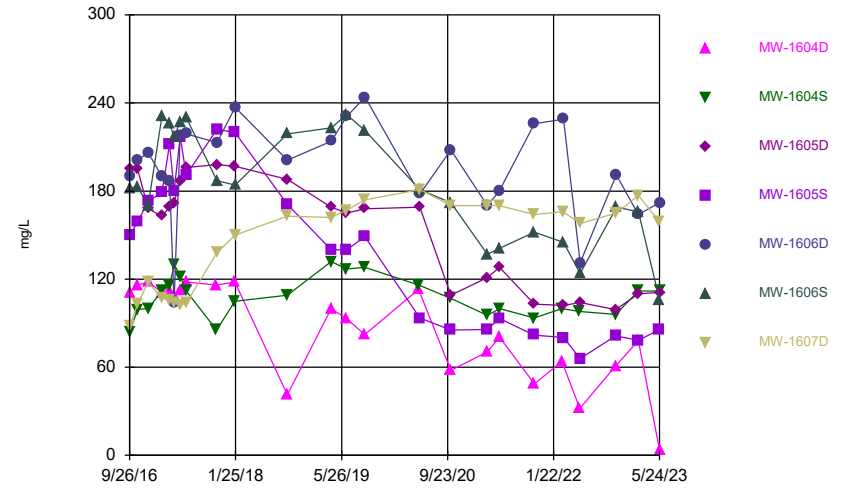
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



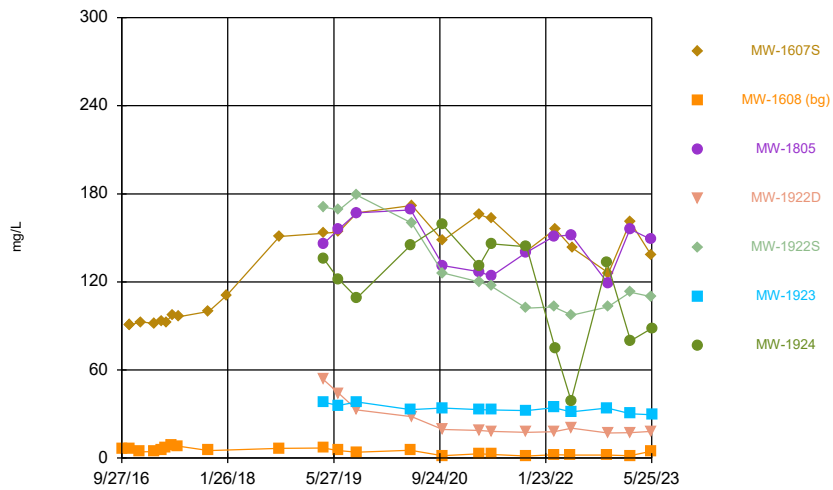
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



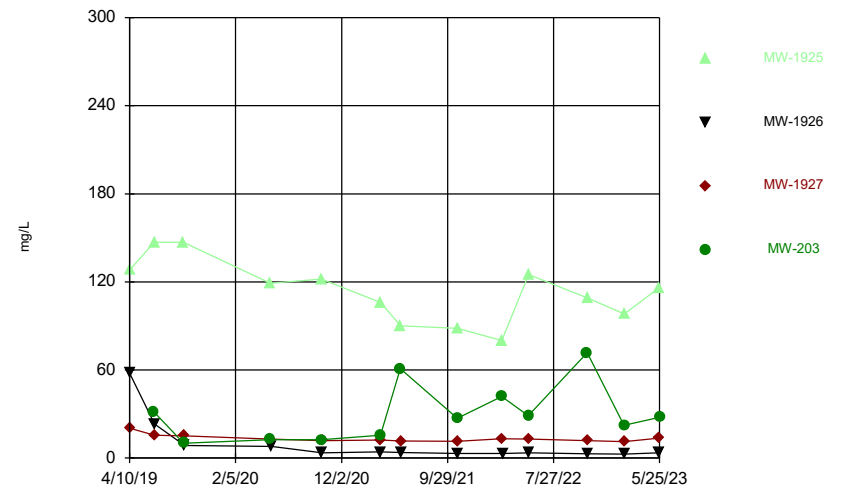
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



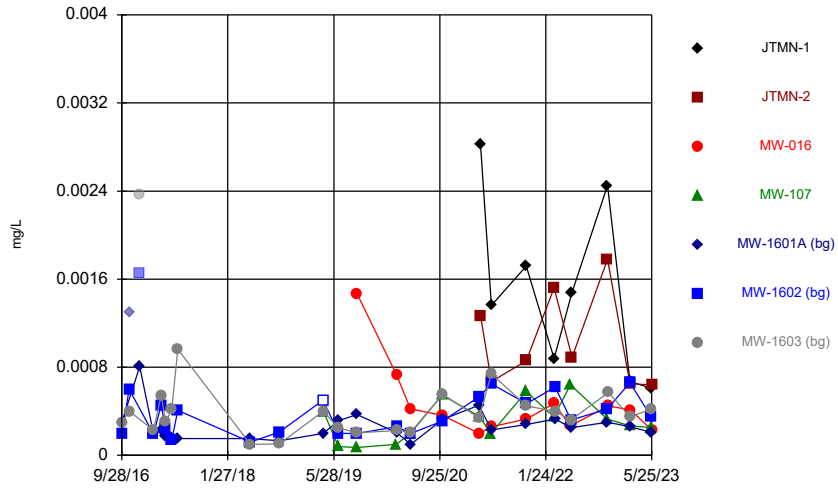
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



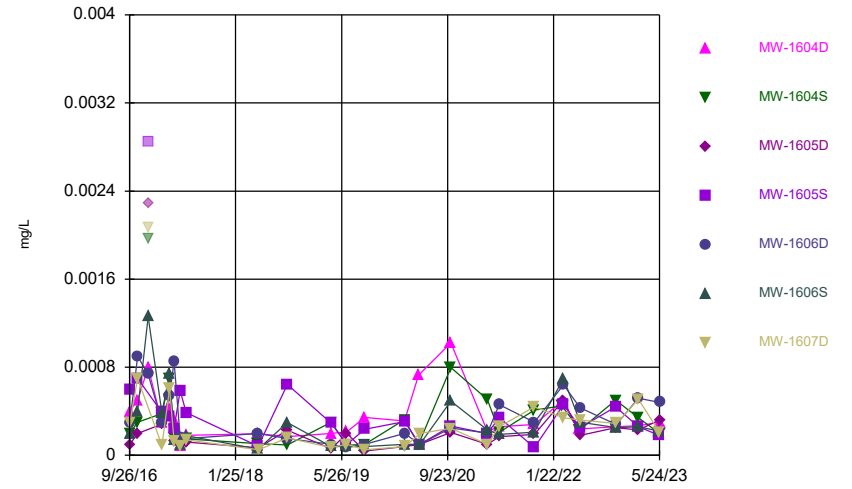
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



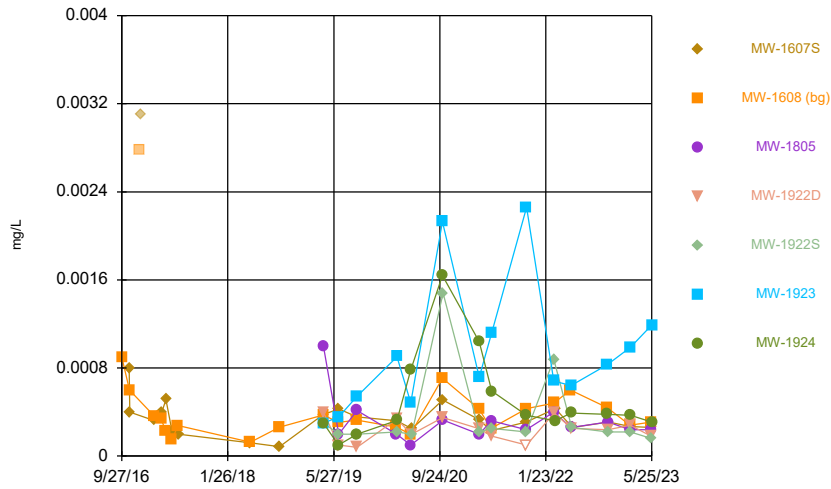
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



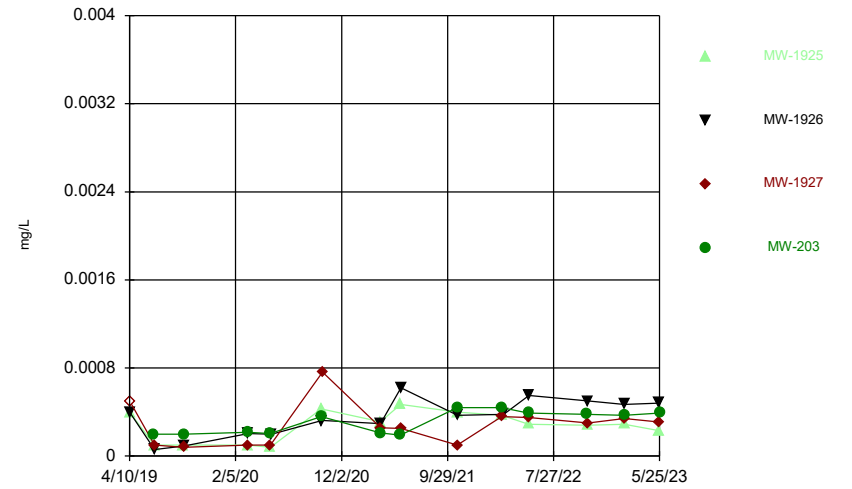
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



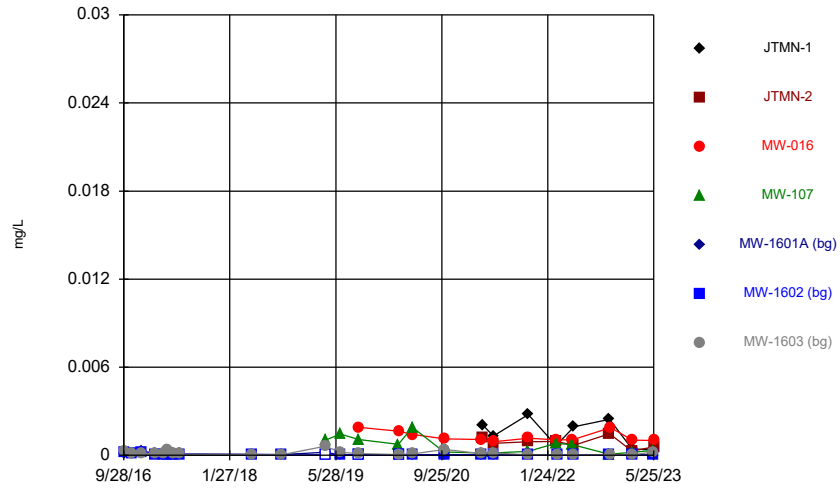
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Time Series



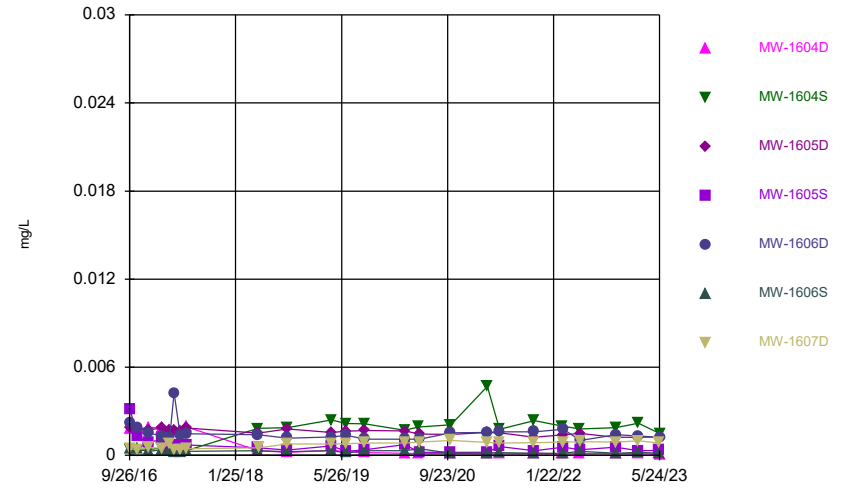
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



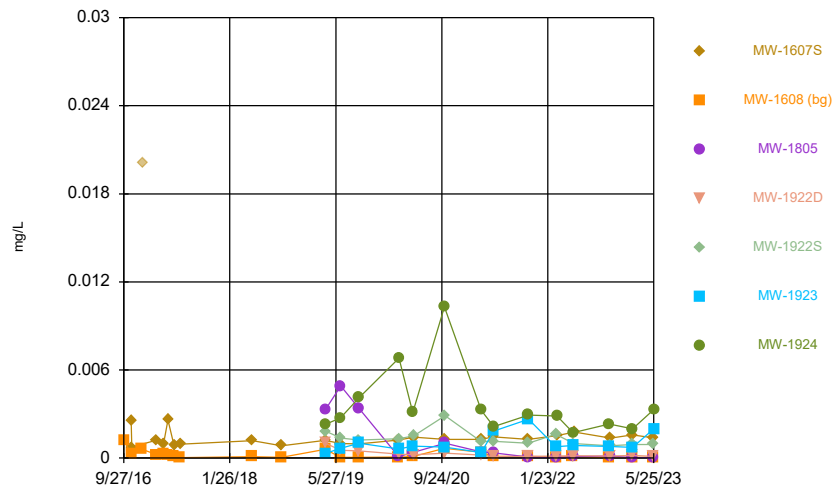
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



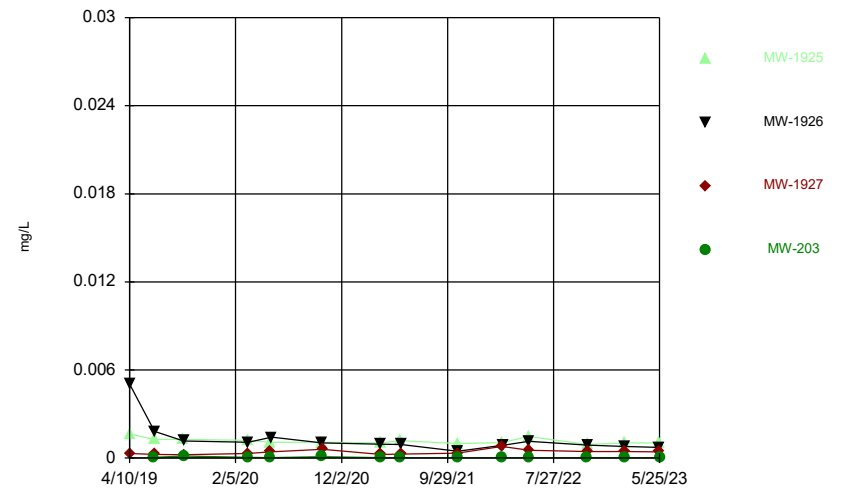
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



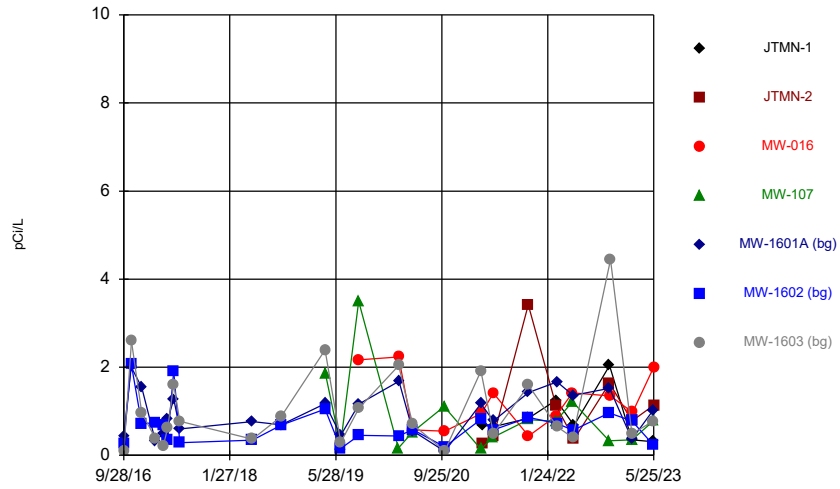
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



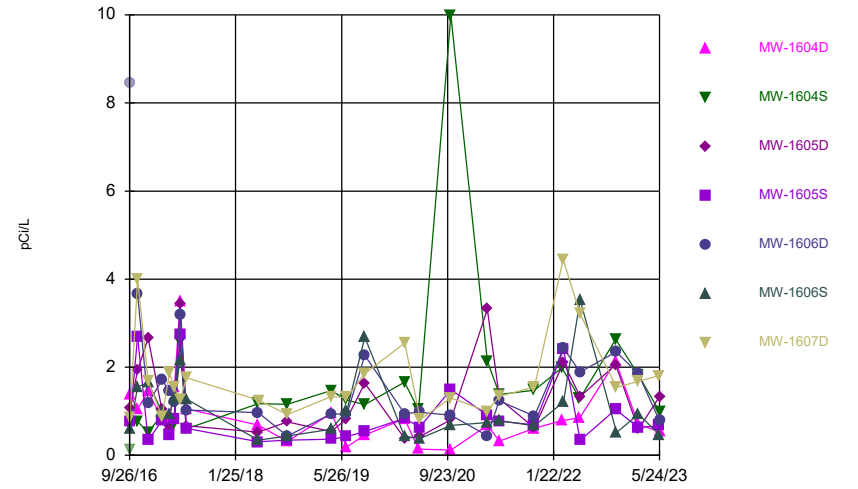
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



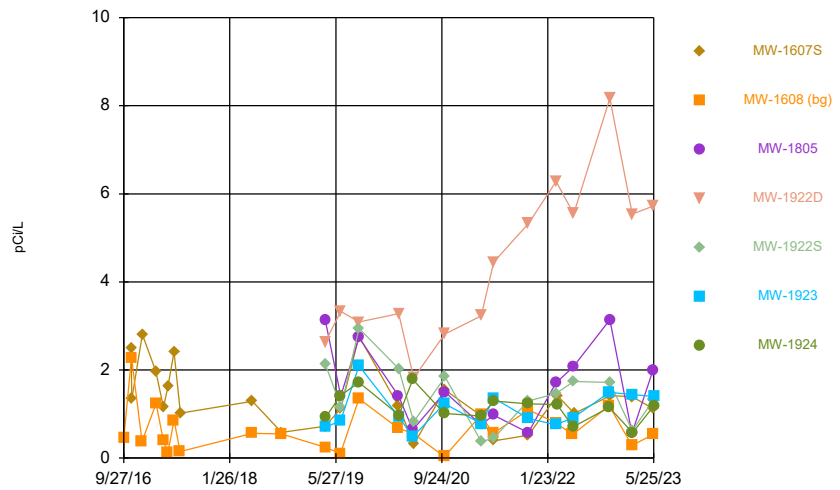
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



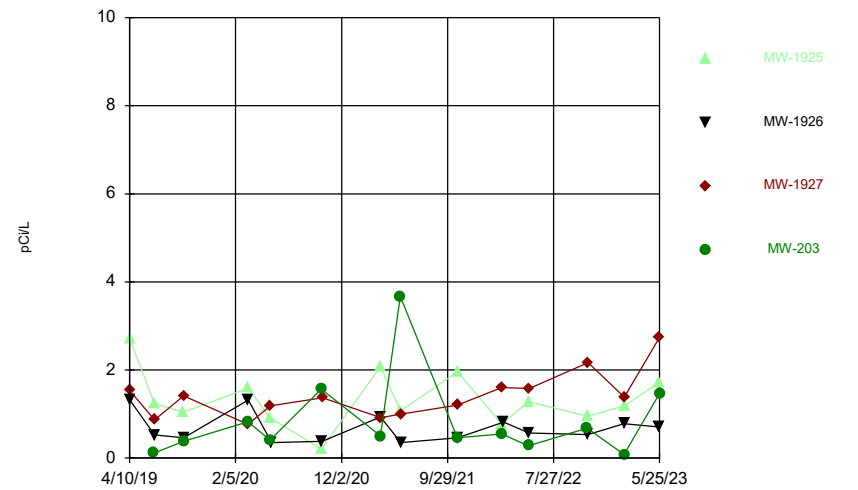
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



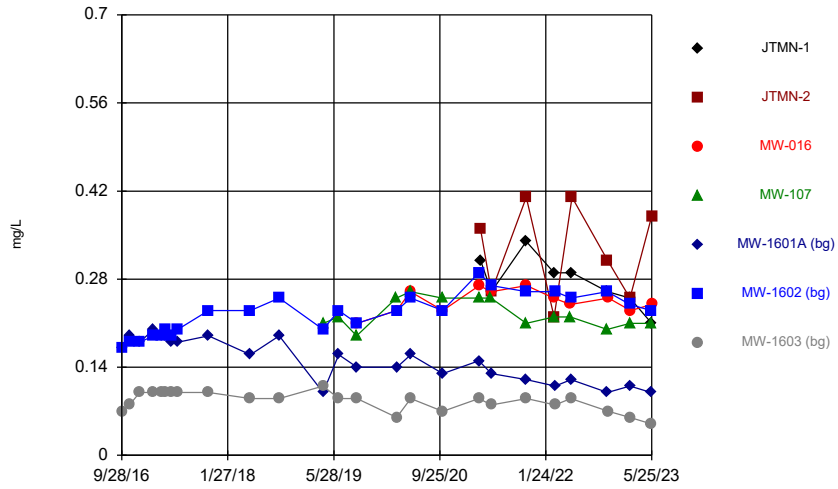
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



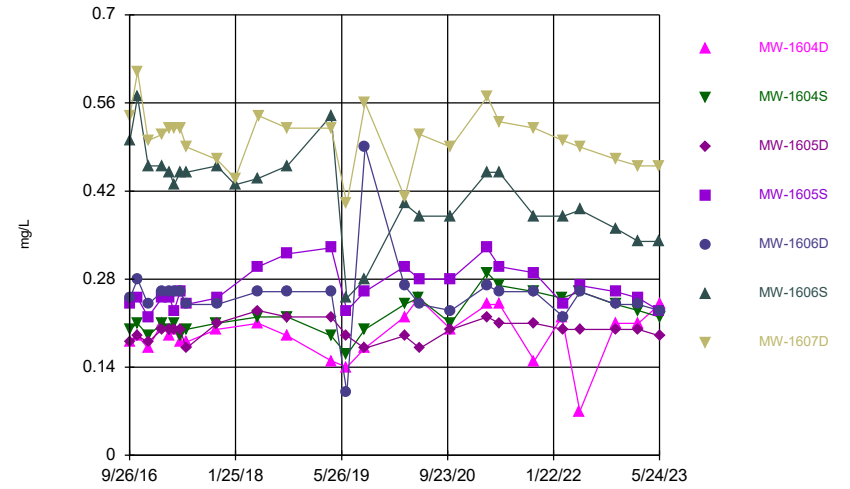
Constituent: Combined Radium 226 + 228 Analysis Run 6/27/2023 4:59 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



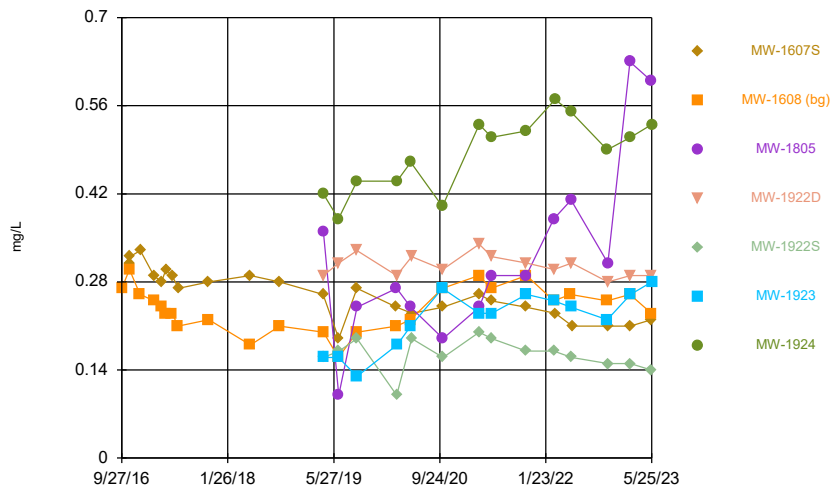
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



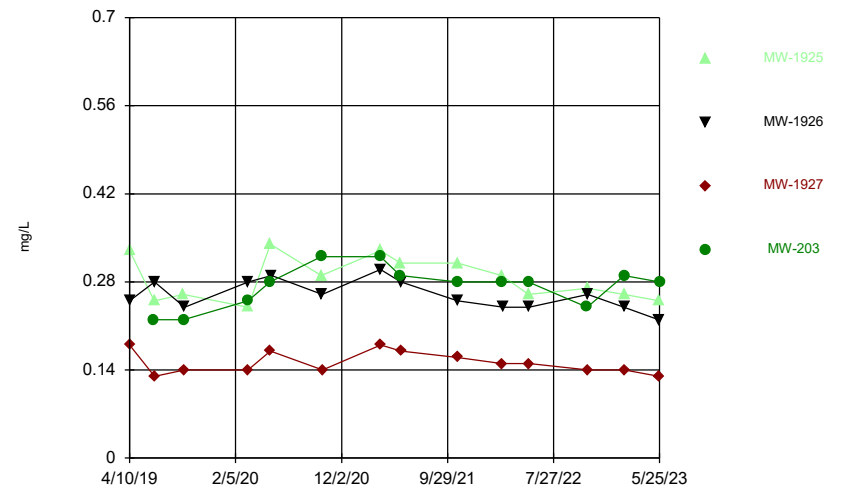
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Time Series



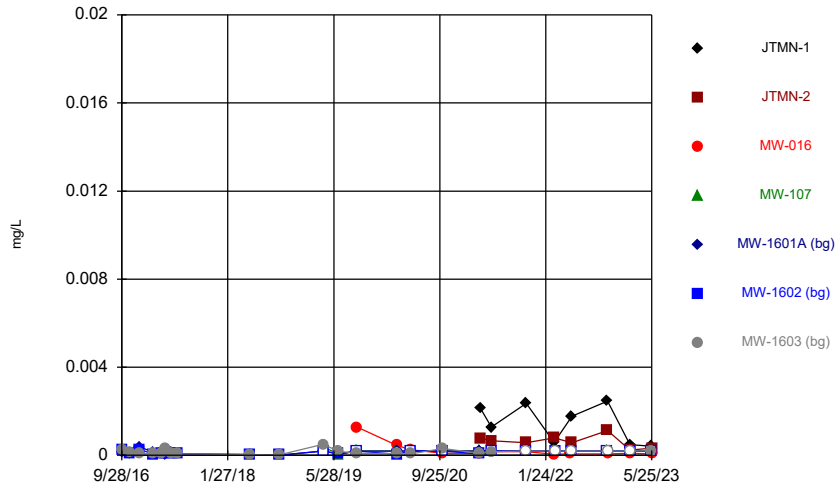
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Time Series



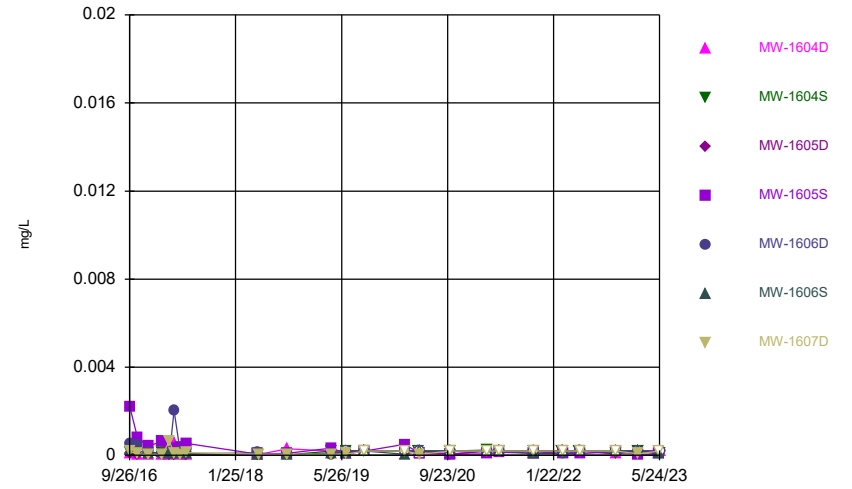
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



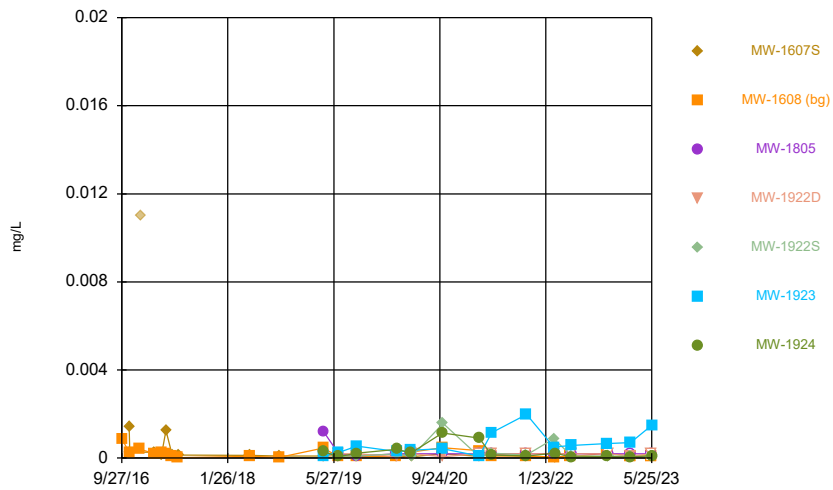
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



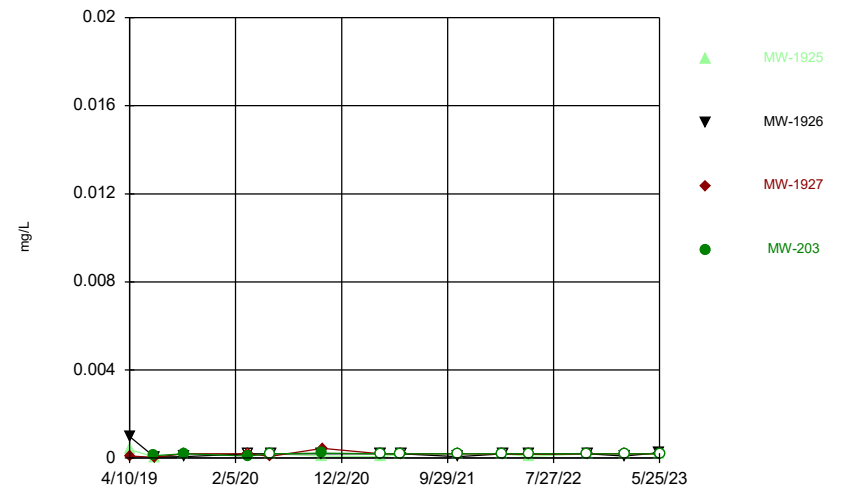
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Time Series



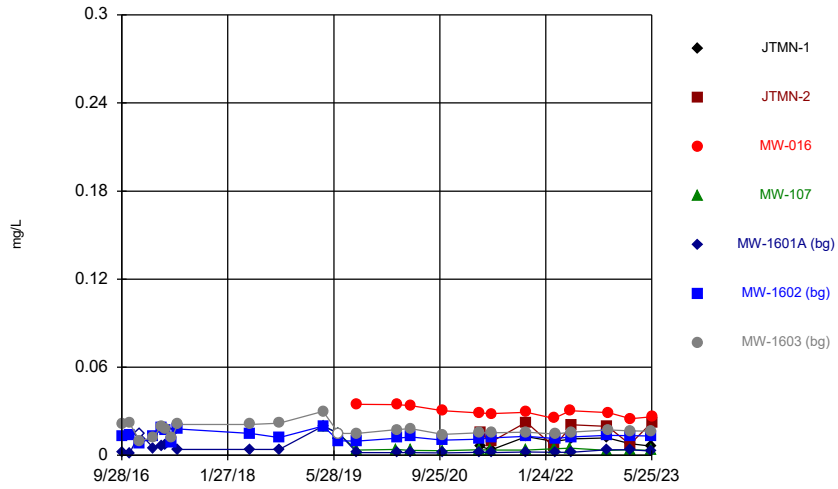
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Time Series



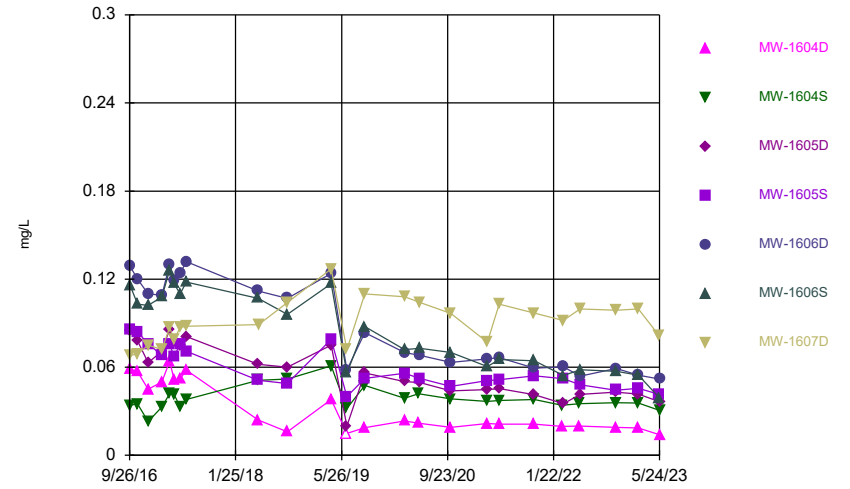
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Time Series



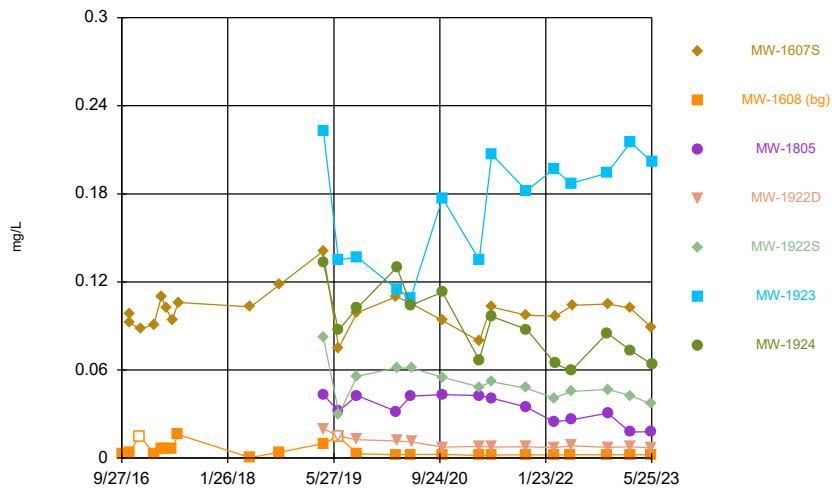
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Time Series



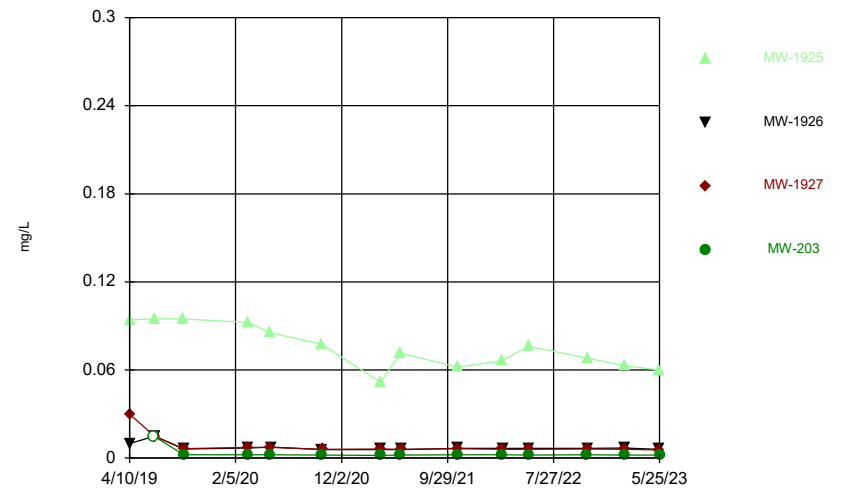
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Time Series



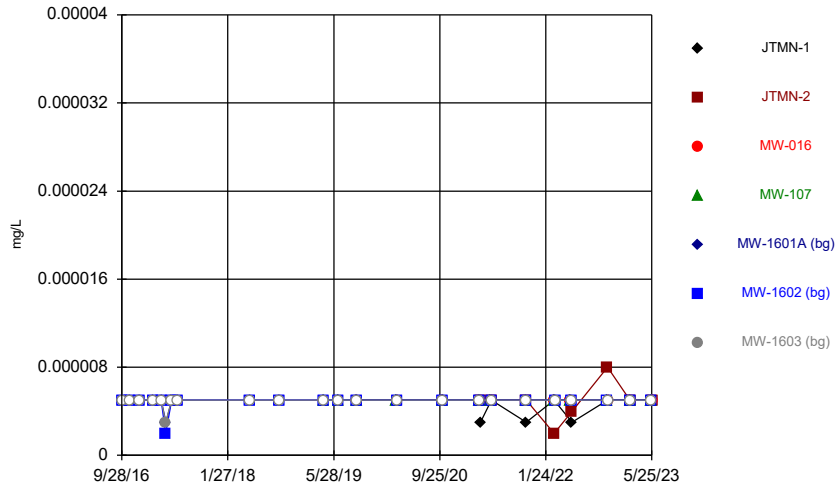
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Time Series



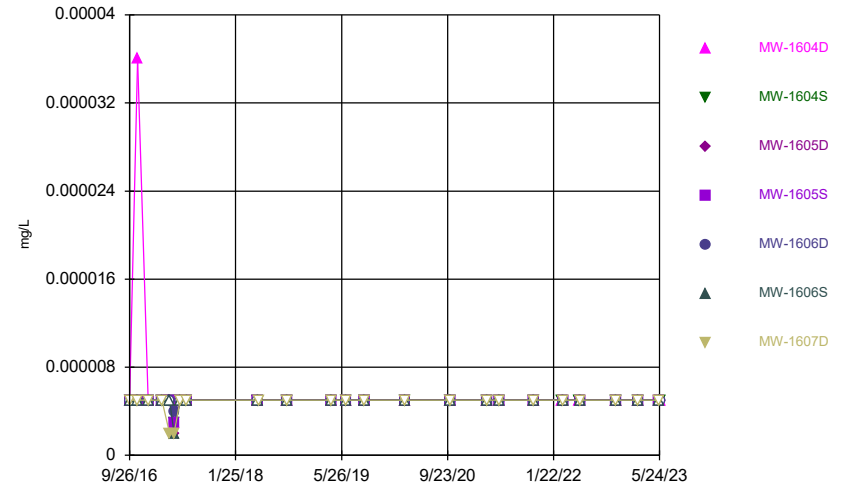
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Time Series



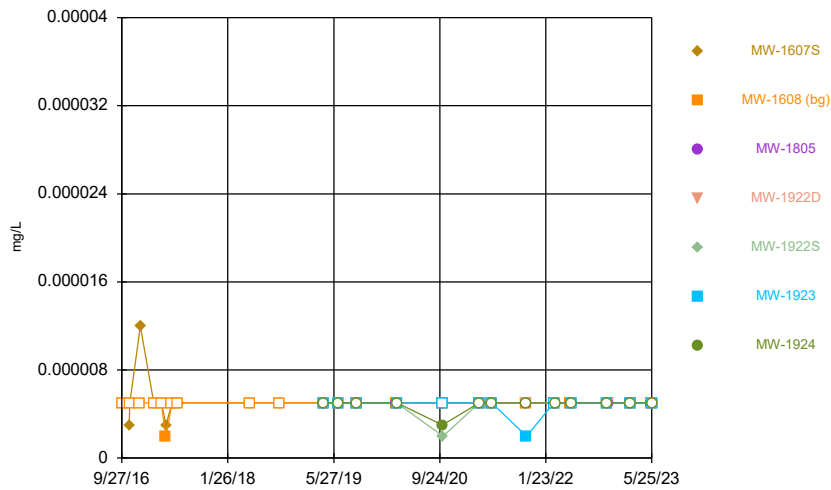
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



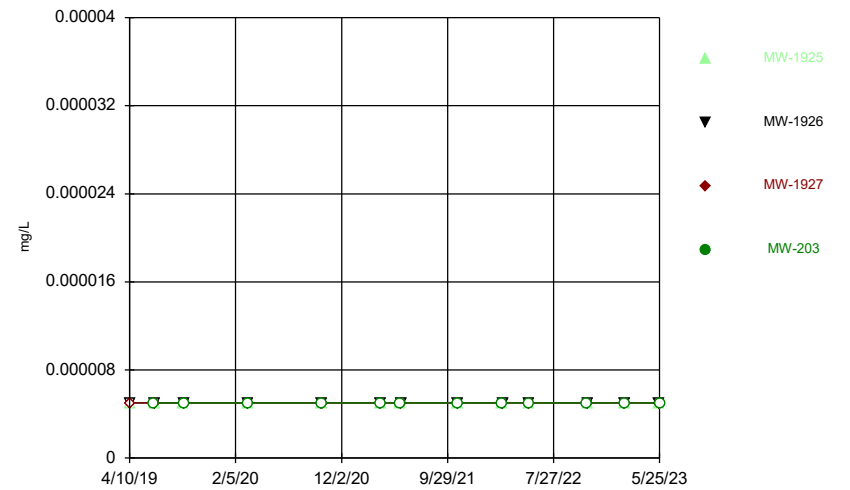
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Time Series



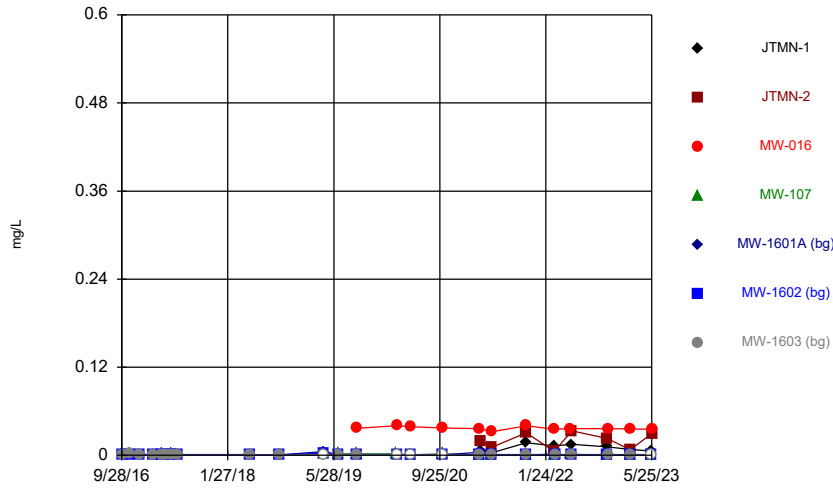
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



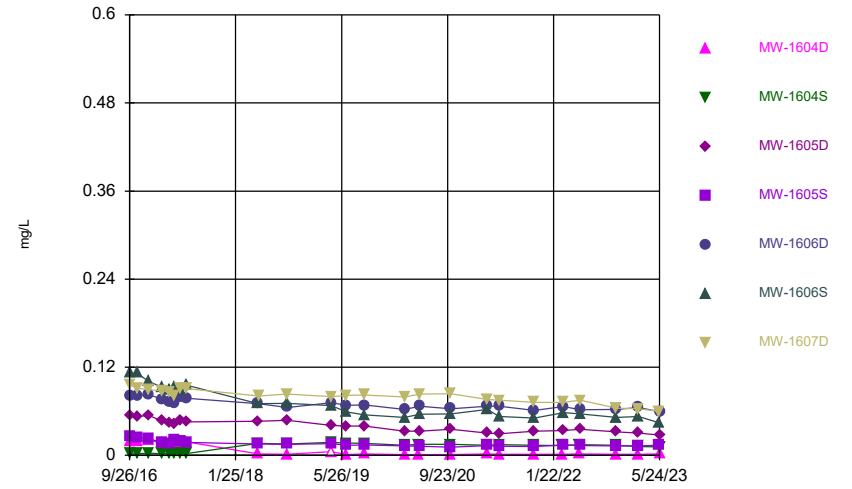
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Time Series



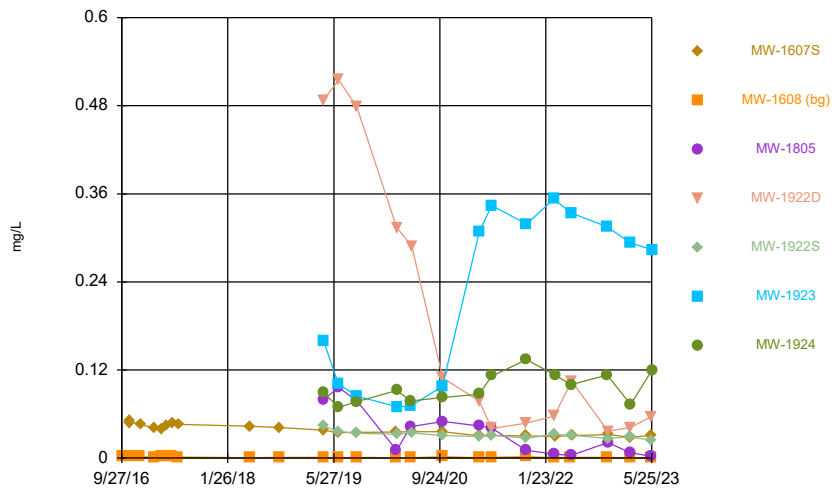
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Time Series



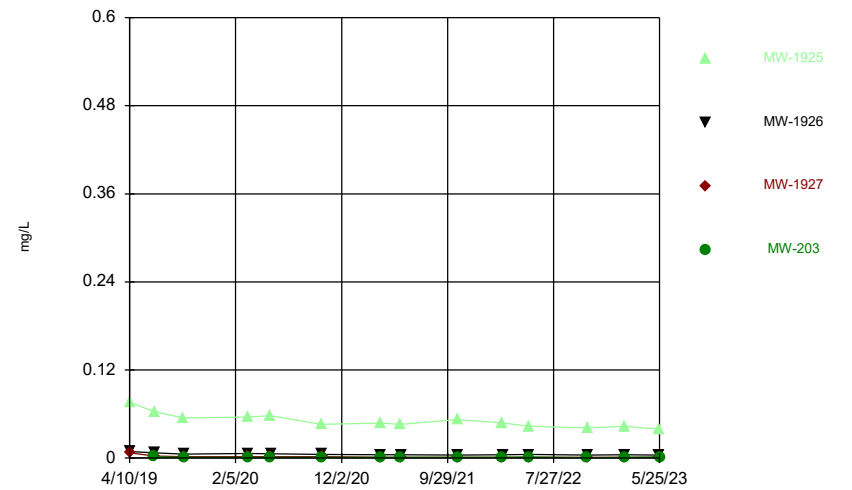
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Time Series



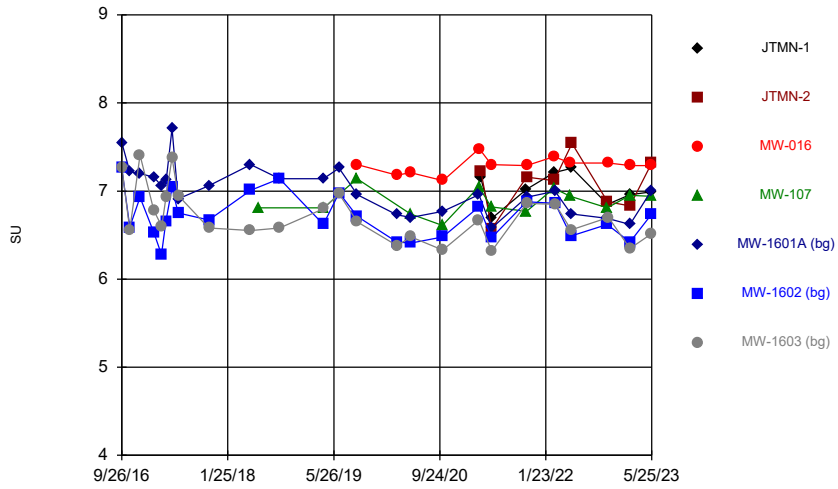
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



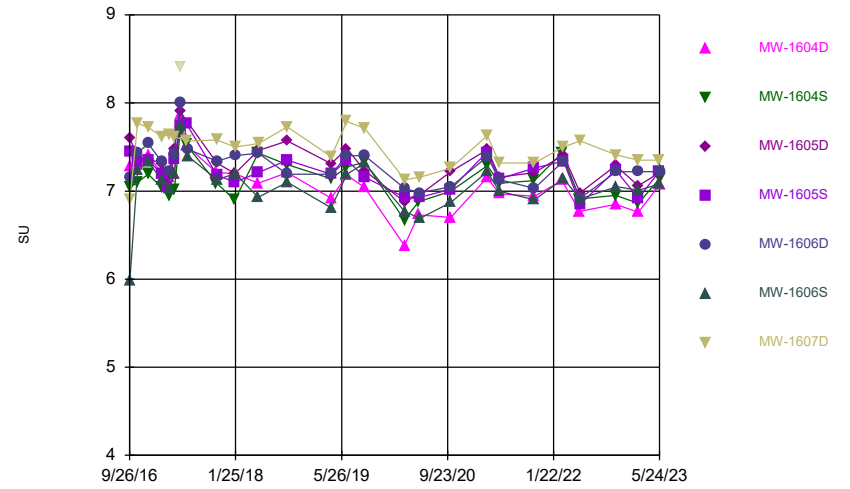
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



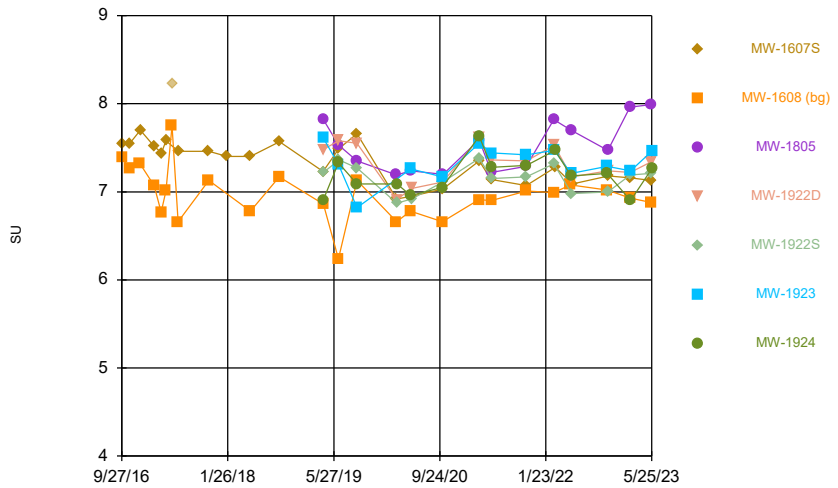
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Time Series



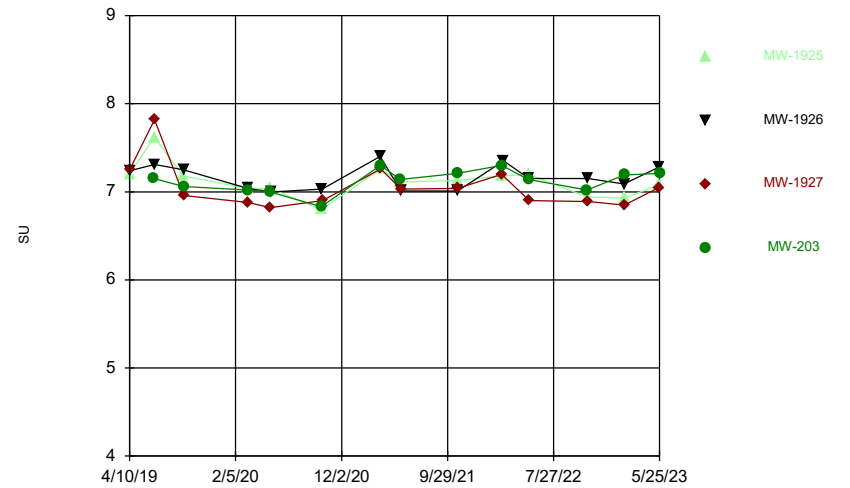
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Time Series



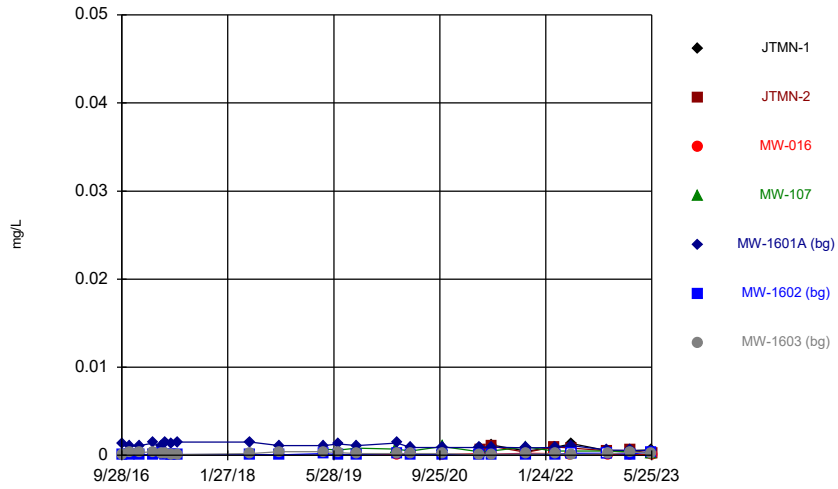
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



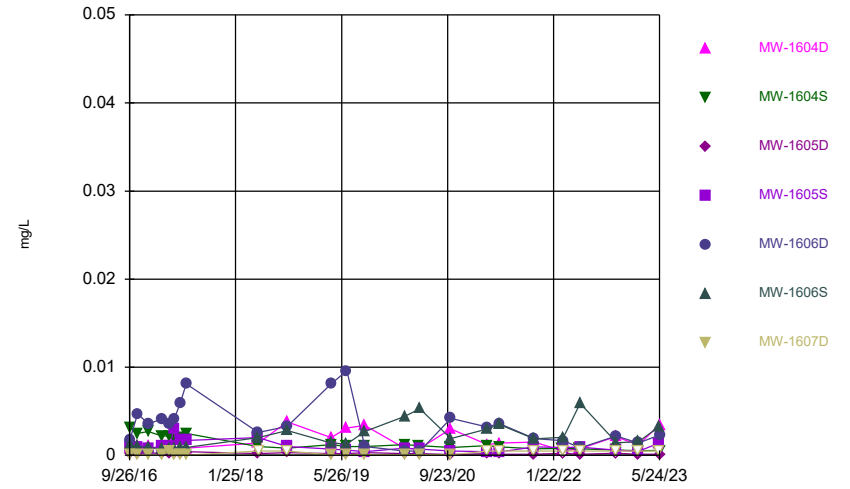
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



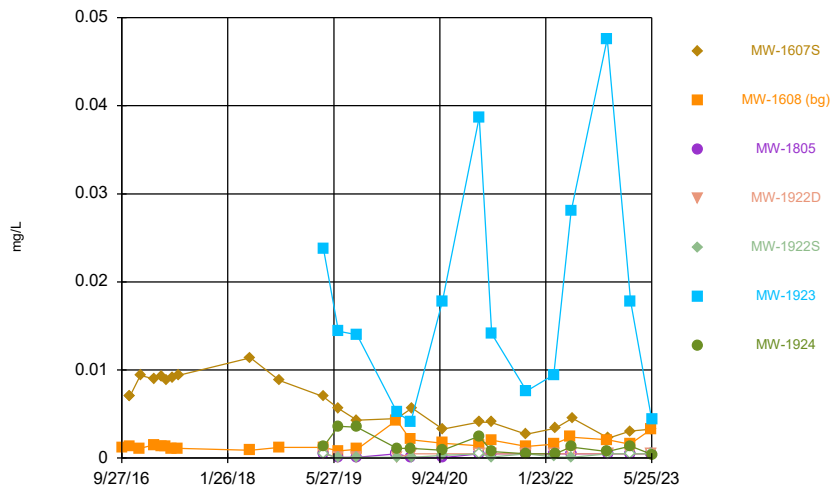
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Time Series



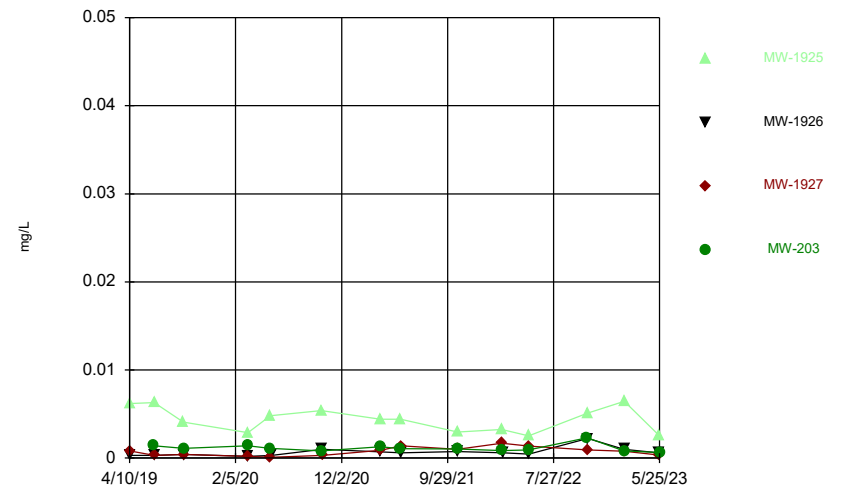
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Time Series



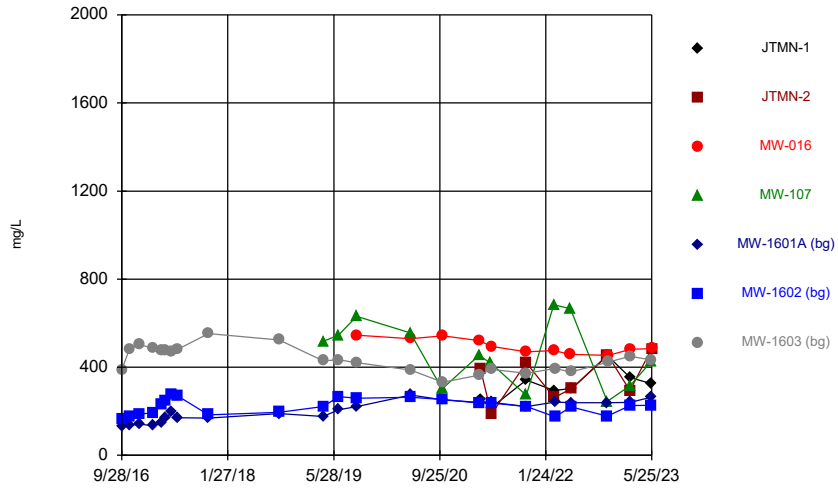
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



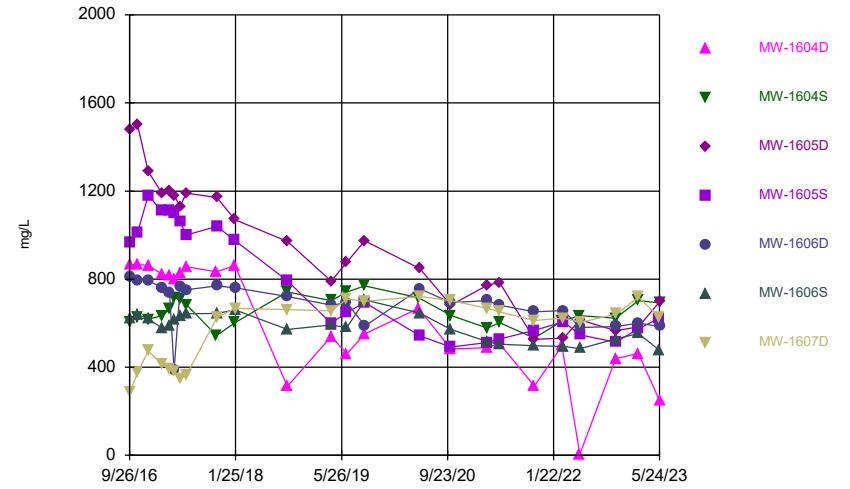
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



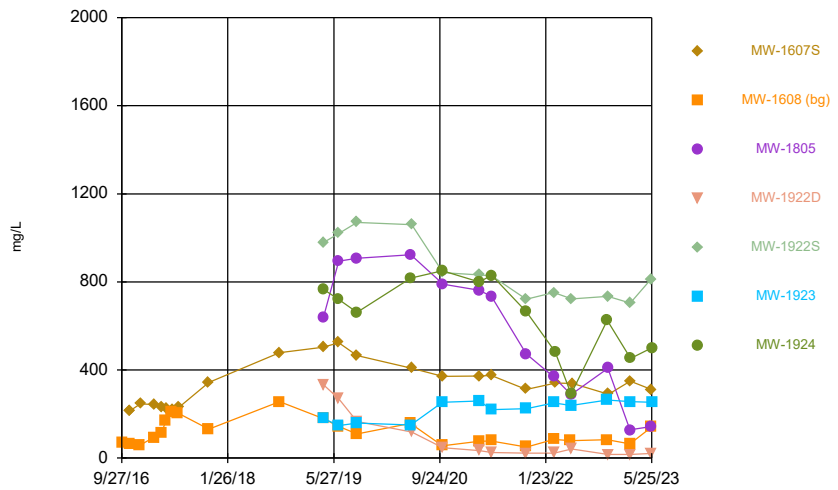
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



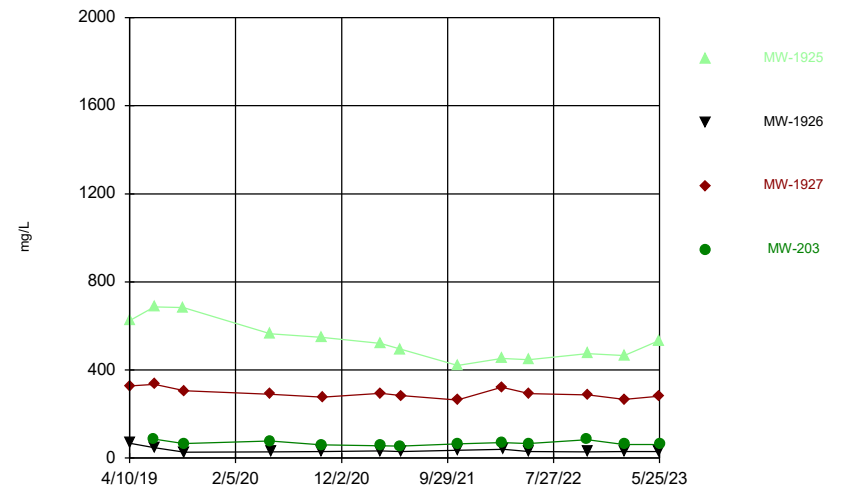
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



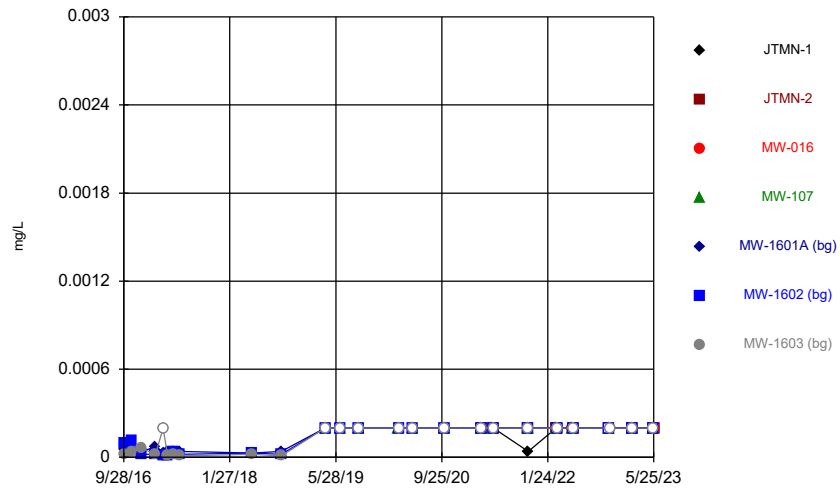
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



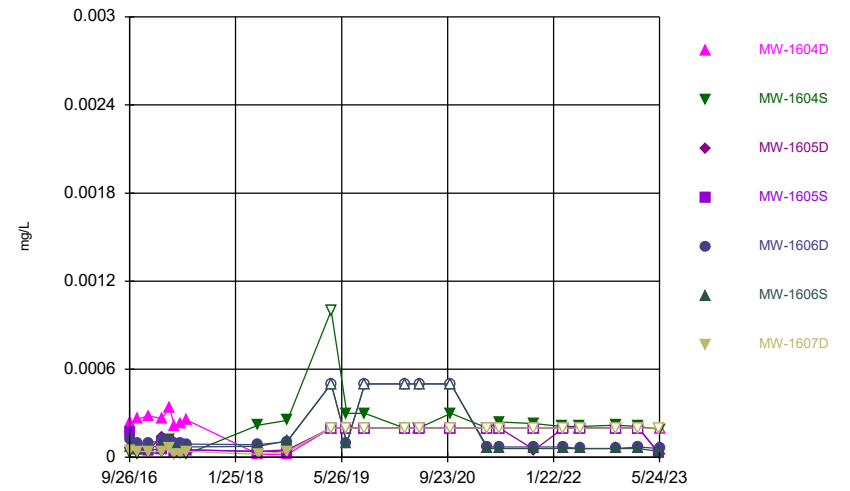
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



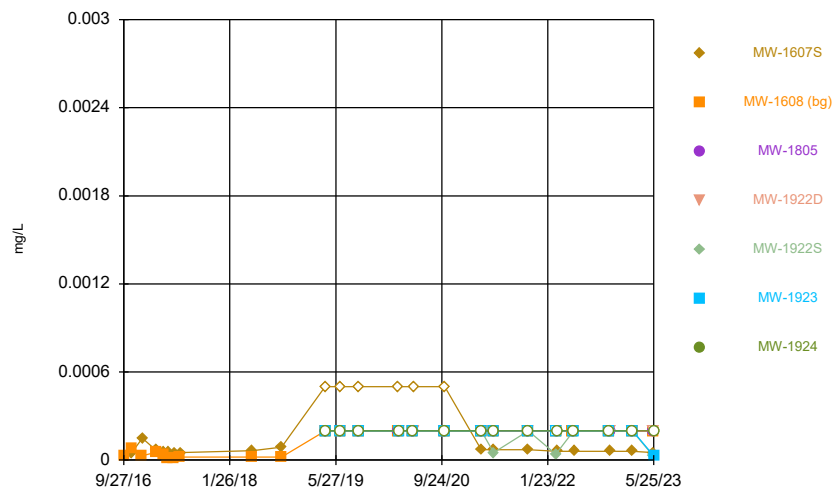
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



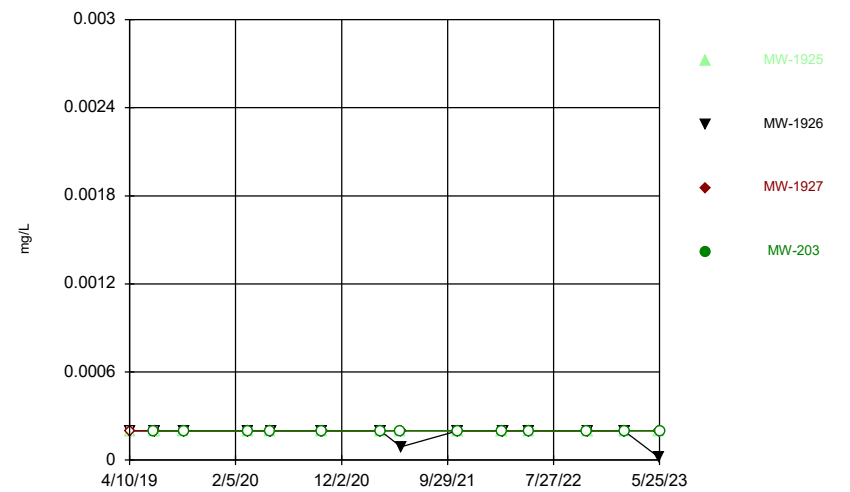
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



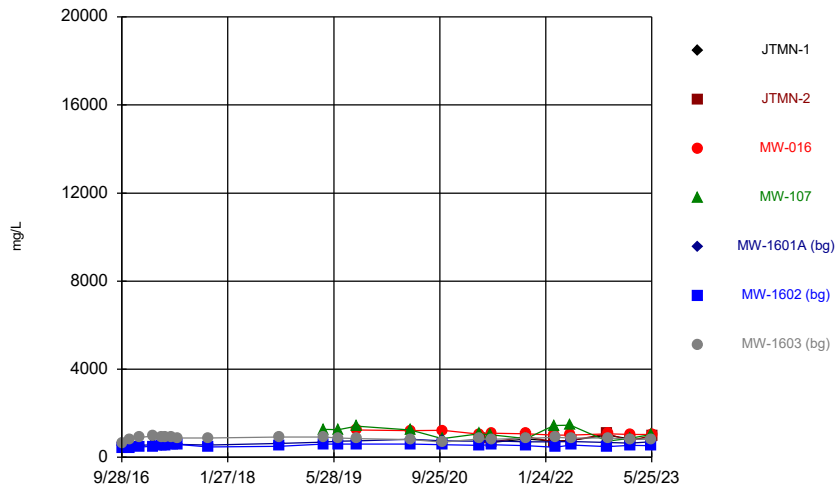
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



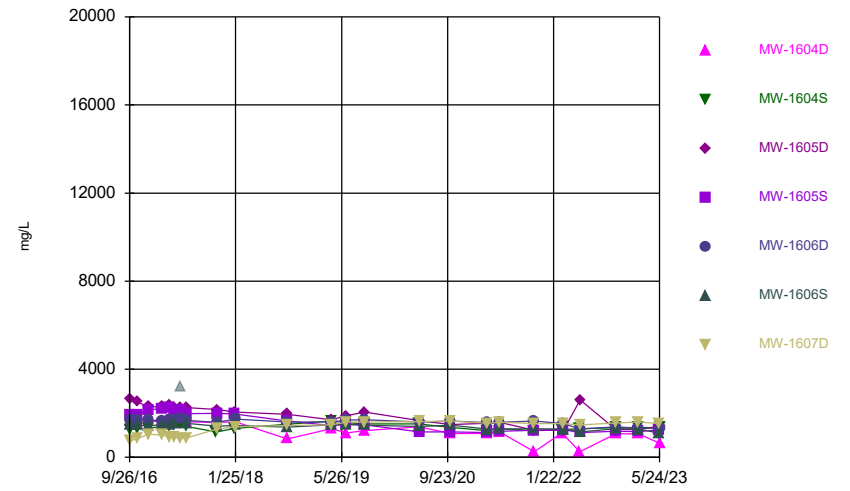
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



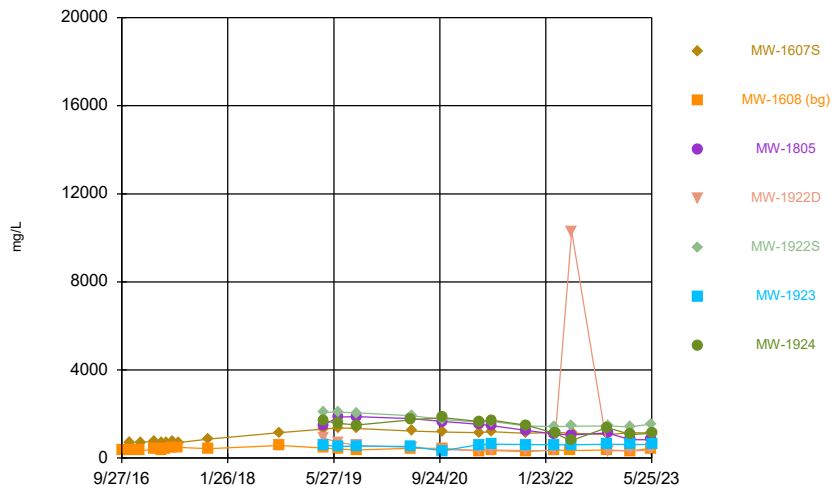
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



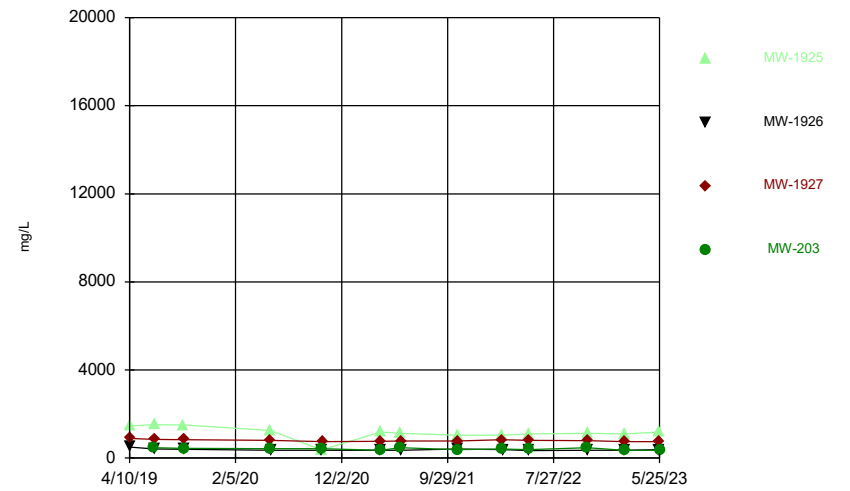
Constituent: Total Dissolved Solids [TDS] Analysis Run 6/27/2023 5:00 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 6/27/2023 5:00 PM View: Time Series & Box Plot
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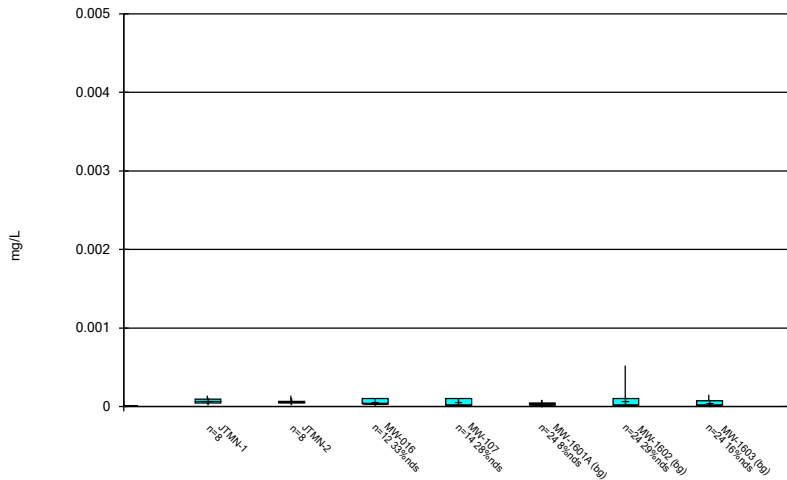
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 6/27/2023 5:00 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

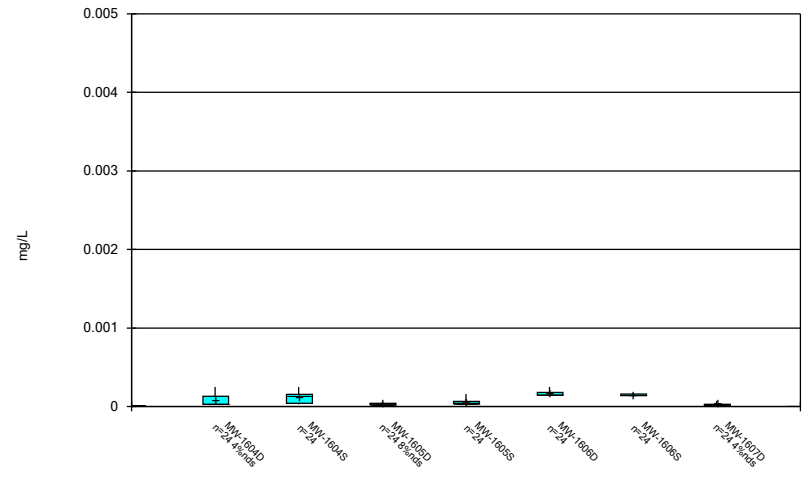
FIGURE B
Box Plots

Box & Whiskers Plot



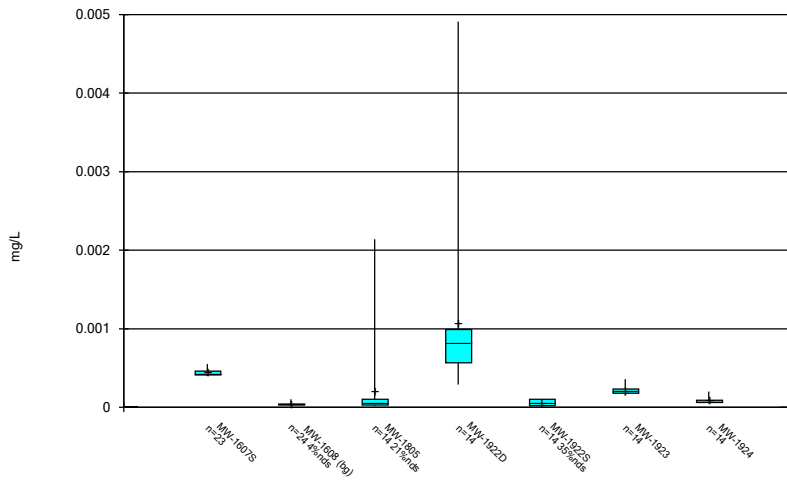
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



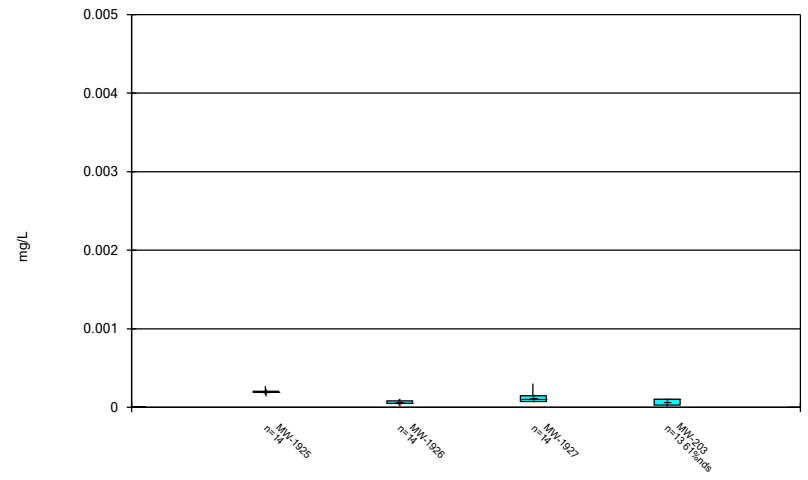
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



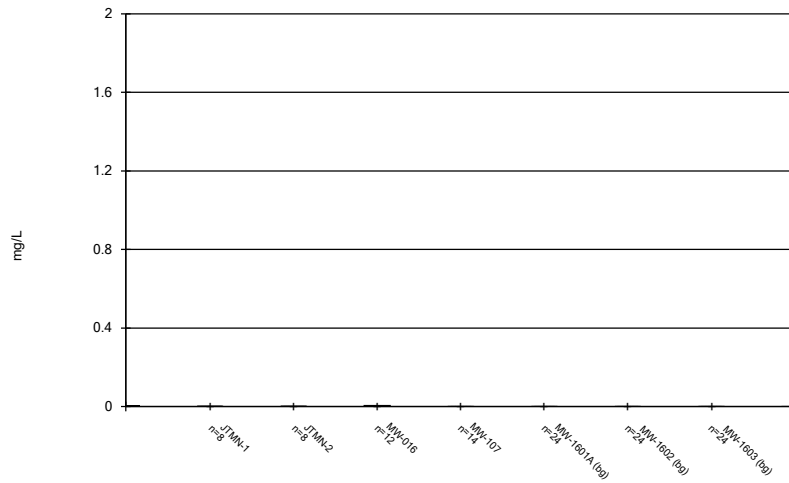
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Box & Whiskers Plot



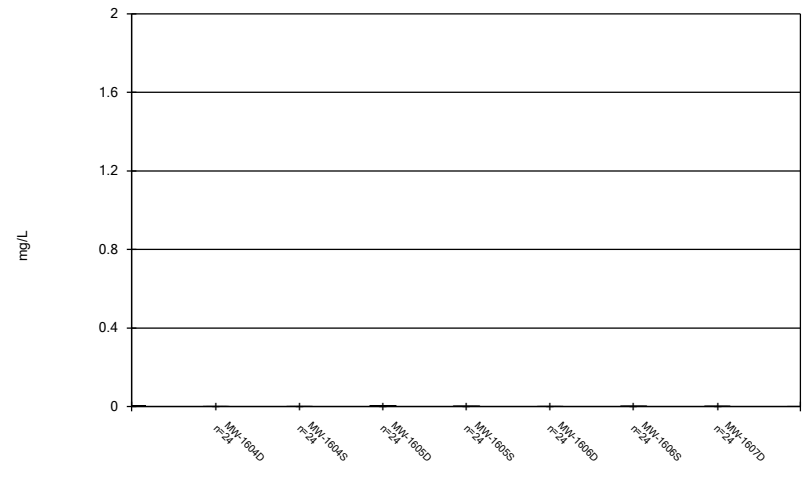
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



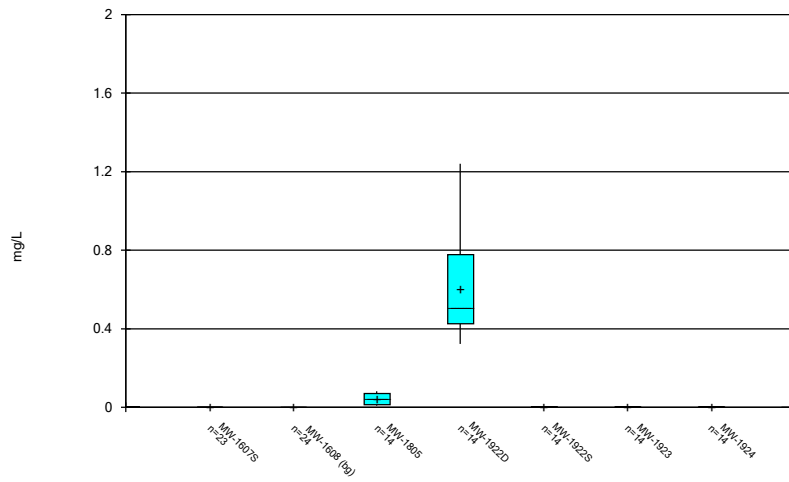
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Box & Whiskers Plot



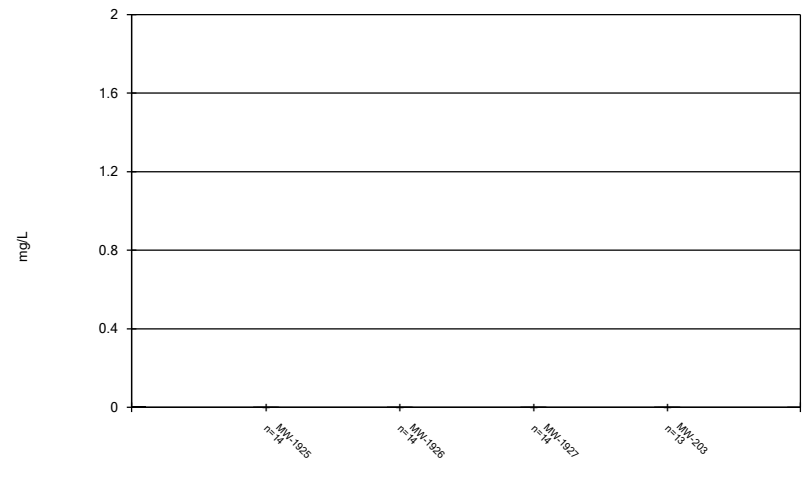
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Box & Whiskers Plot



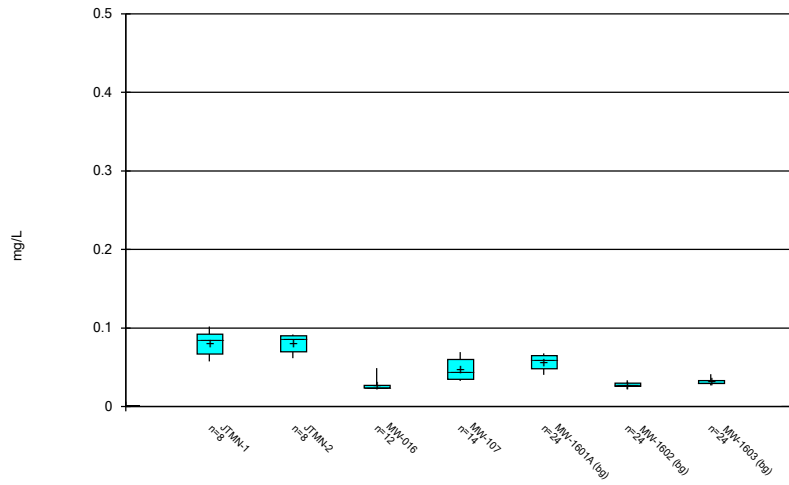
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



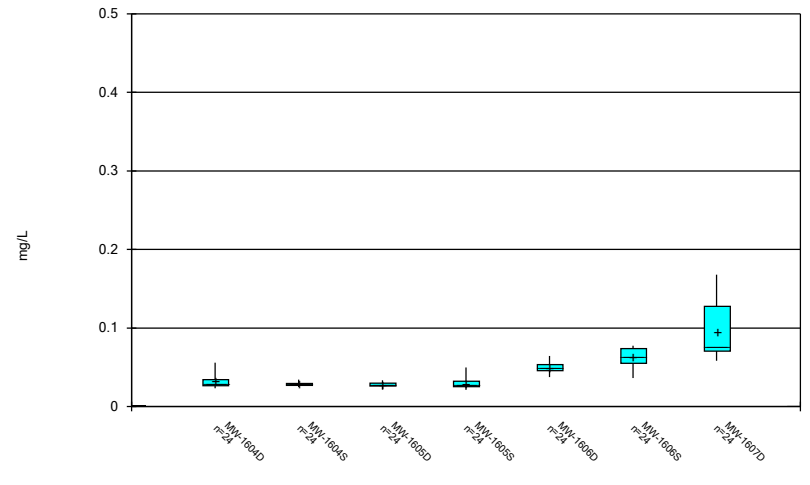
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Box & Whiskers Plot



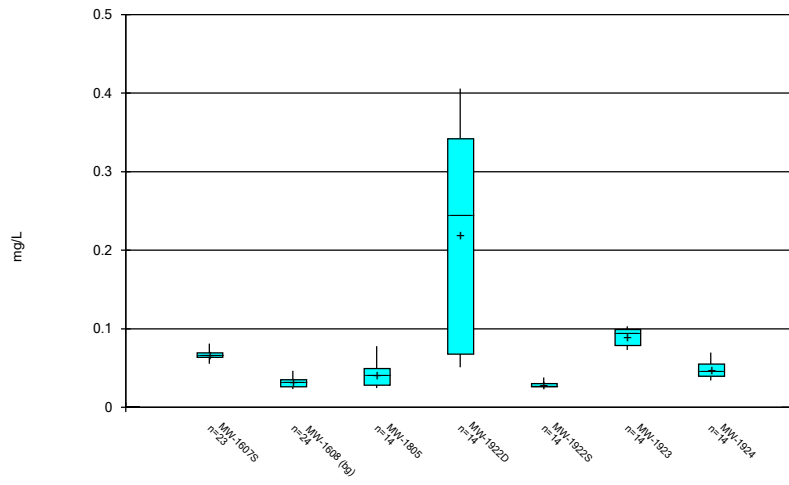
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Box & Whiskers Plot



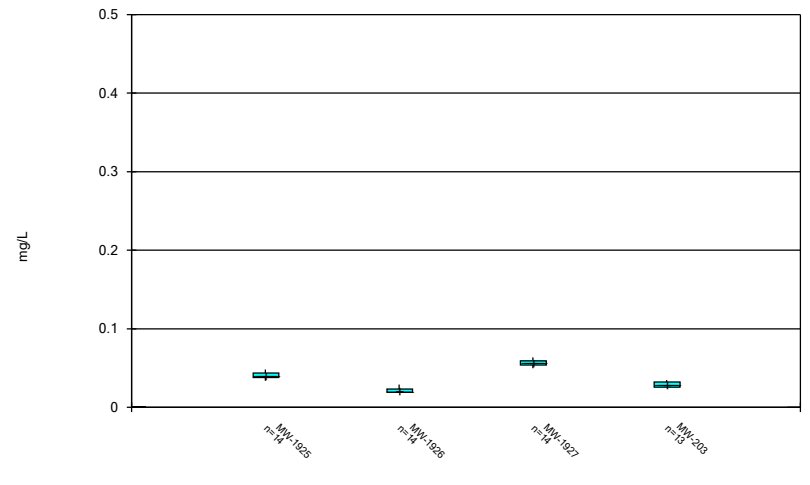
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Box & Whiskers Plot



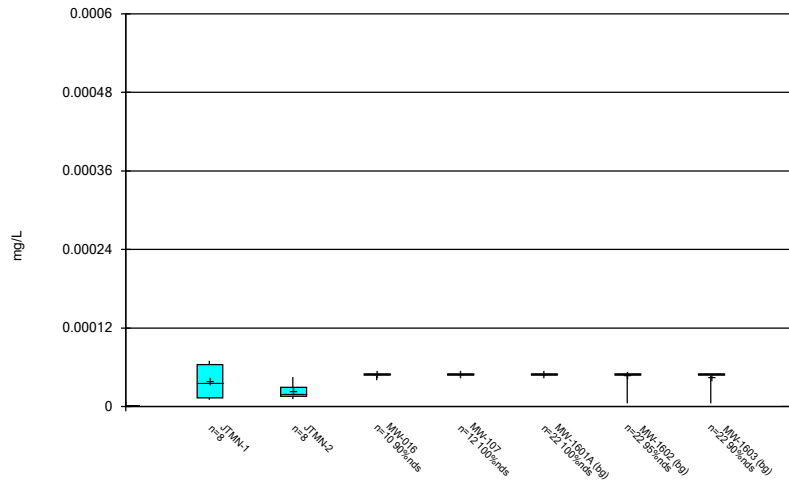
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



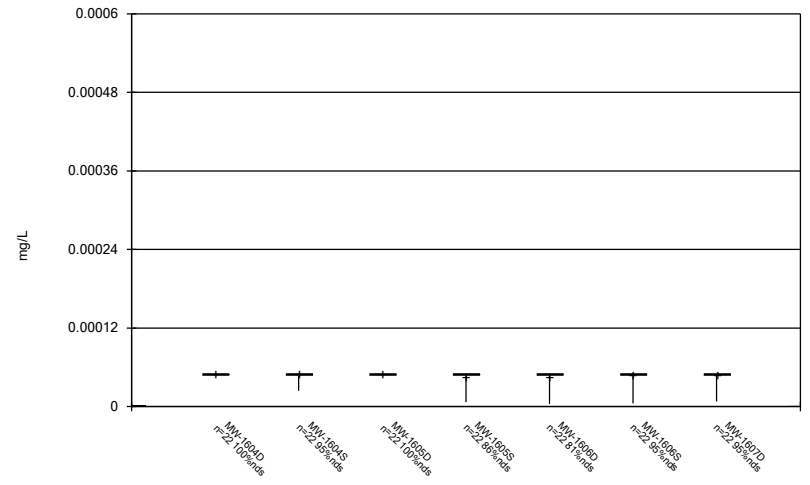
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



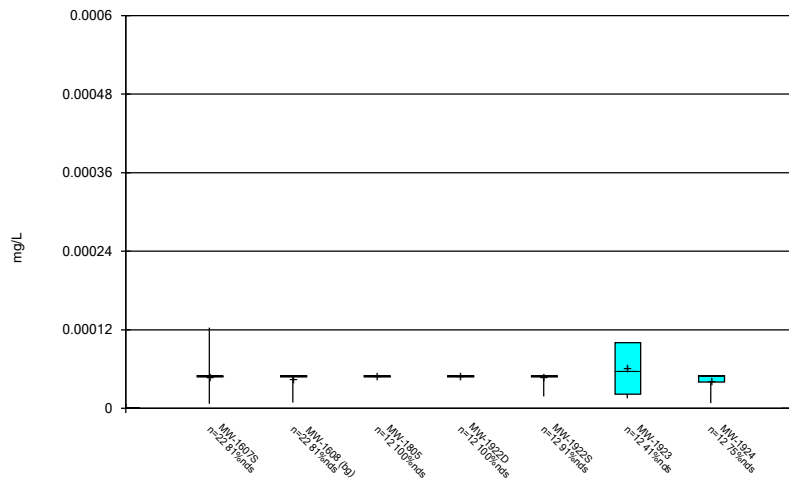
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Box & Whiskers Plot



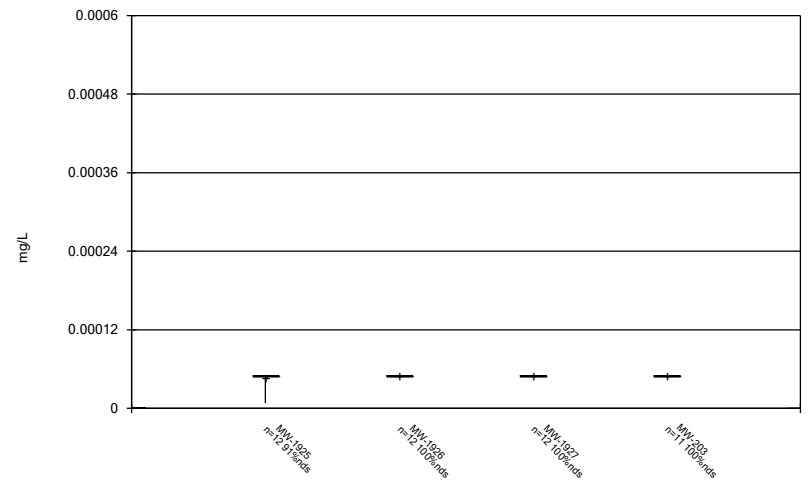
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Box & Whiskers Plot



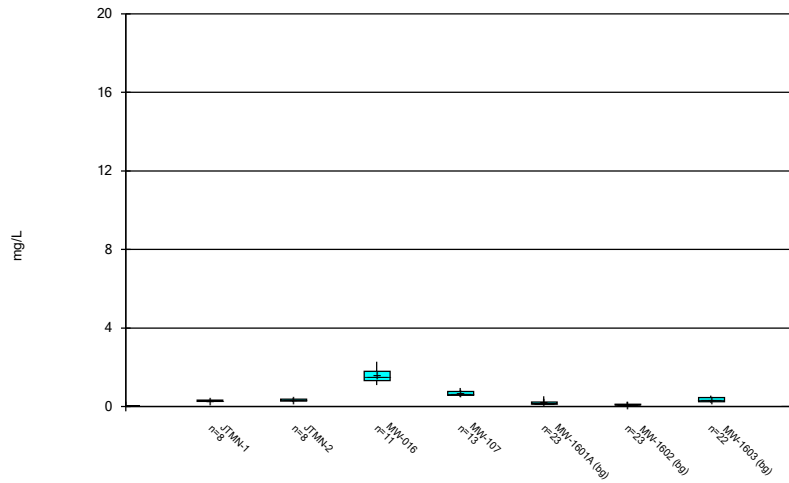
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Box & Whiskers Plot



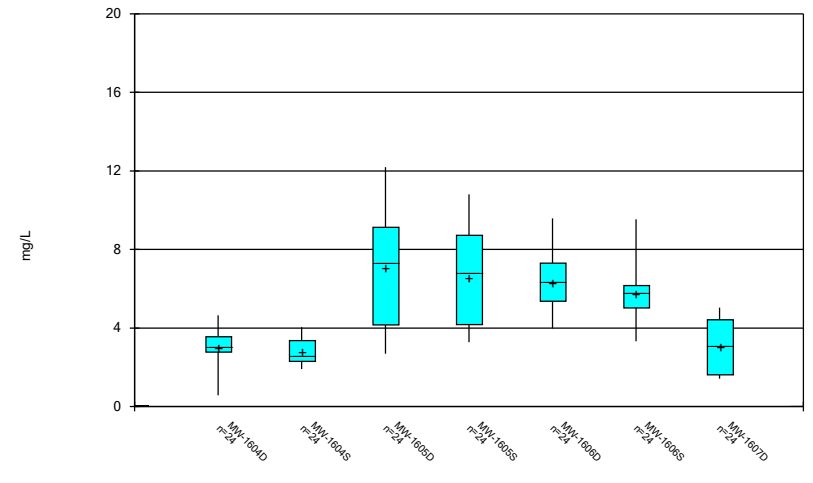
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Box & Whiskers Plot



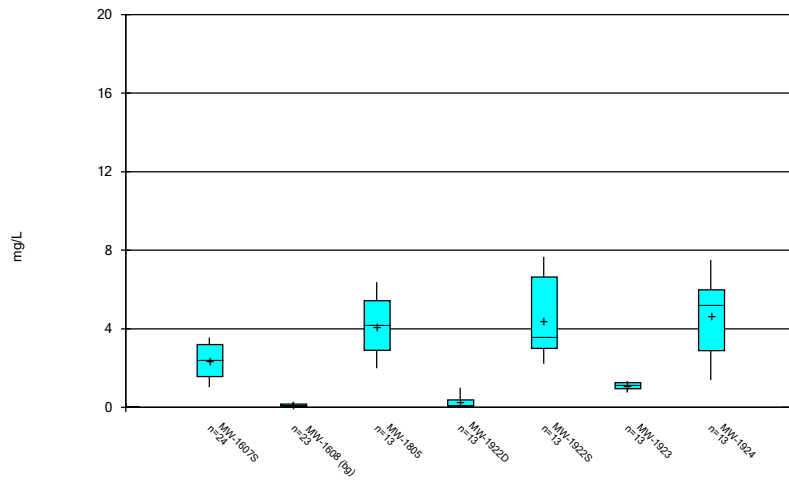
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



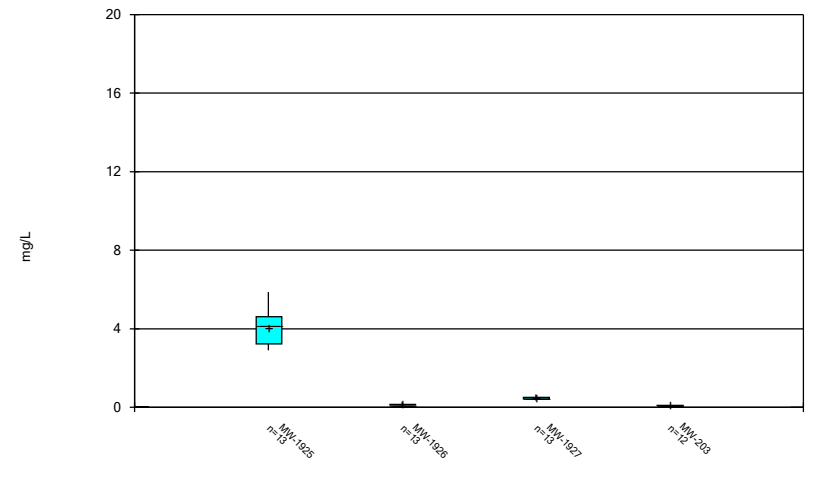
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Box & Whiskers Plot



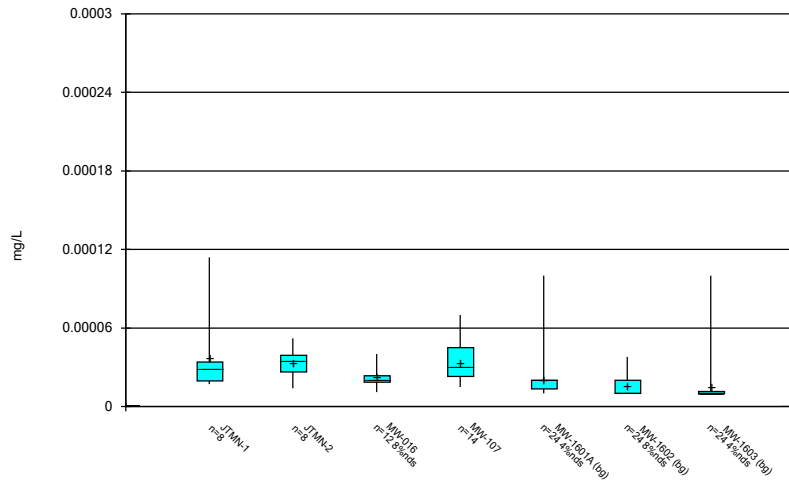
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



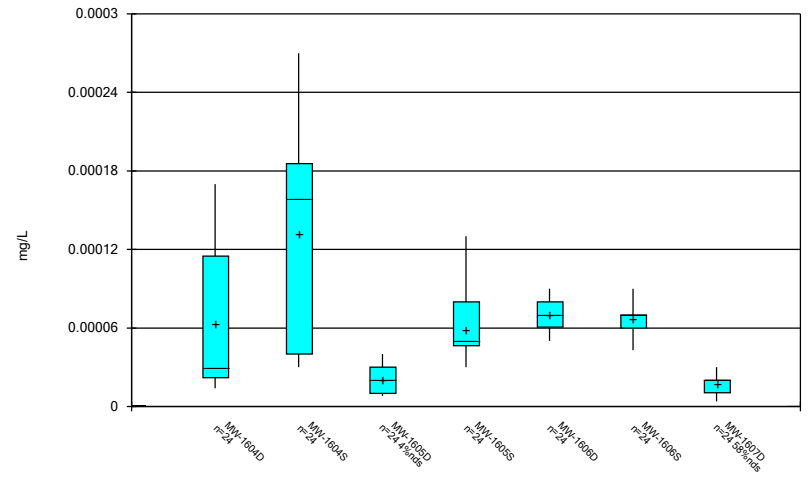
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



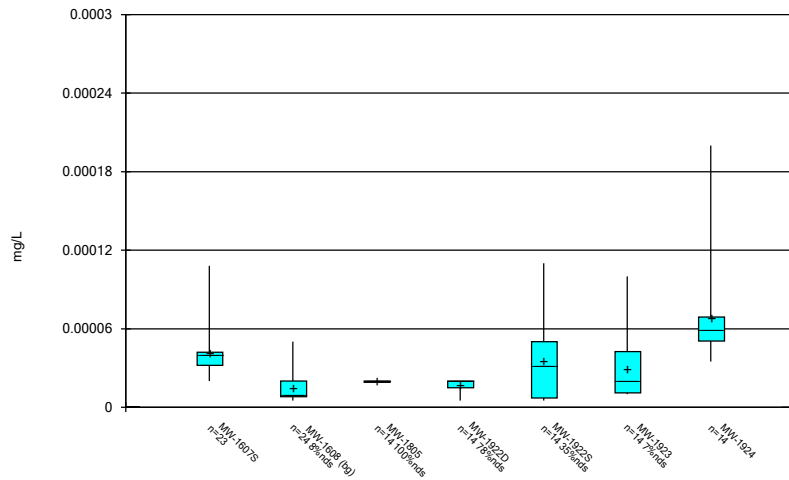
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



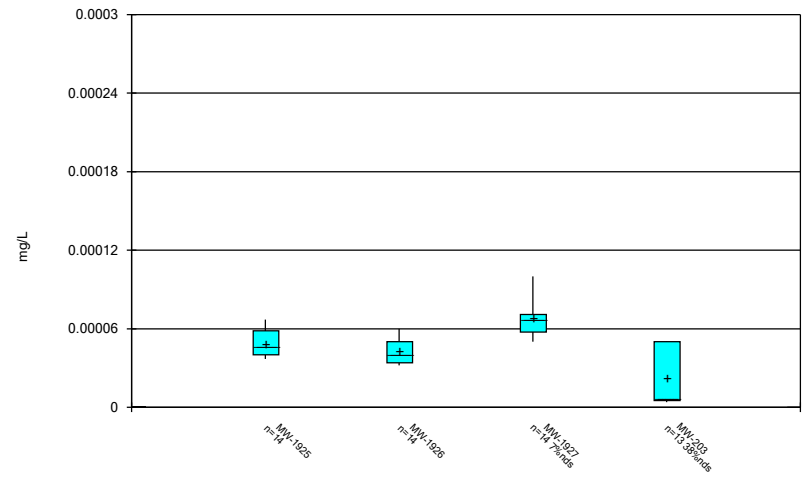
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



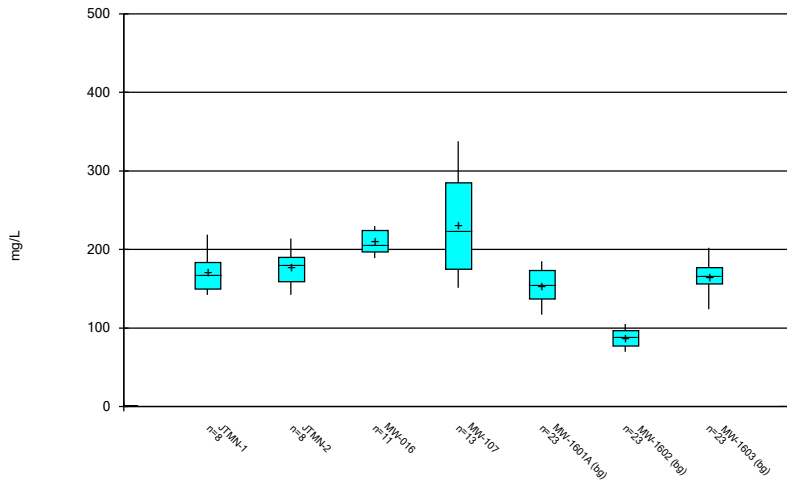
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Box & Whiskers Plot



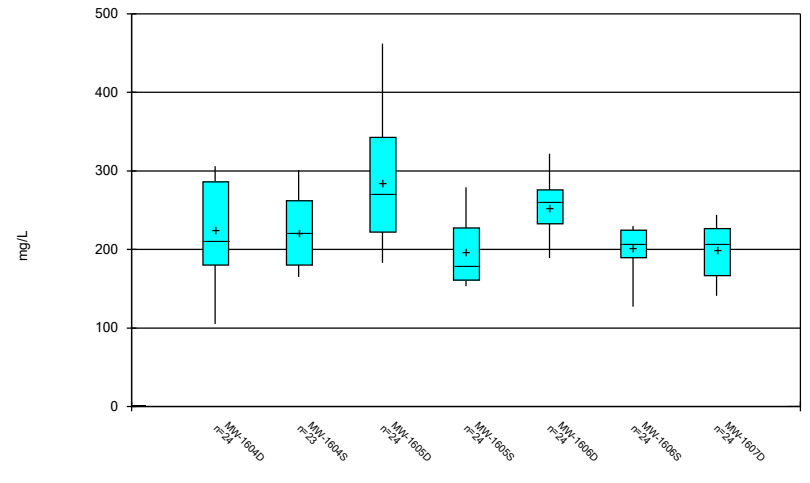
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Box & Whiskers Plot



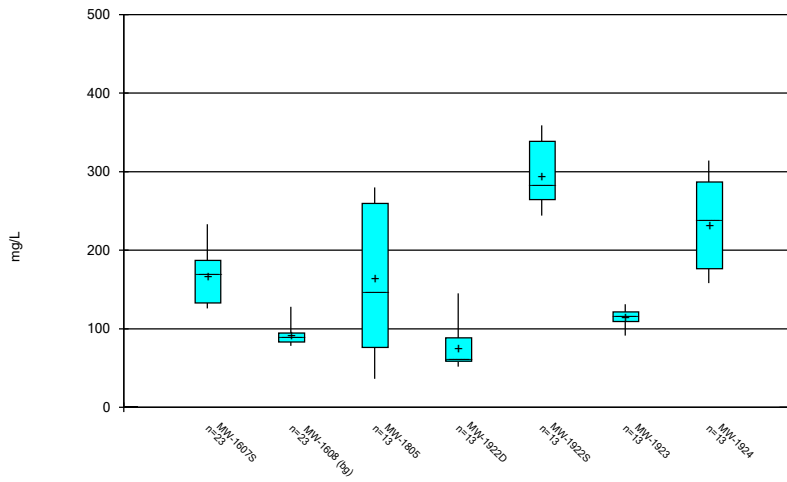
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Box & Whiskers Plot



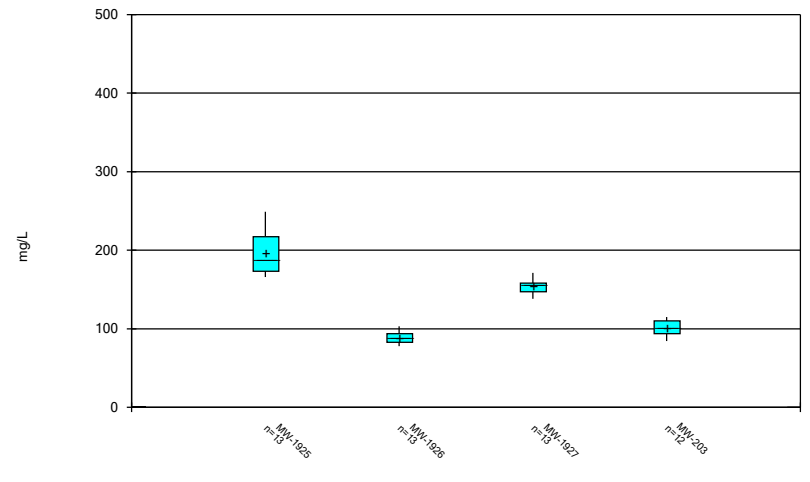
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Box & Whiskers Plot



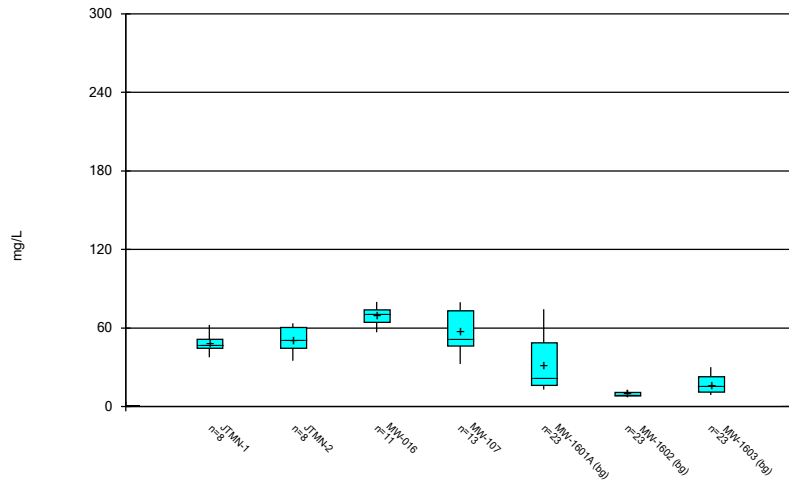
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Box & Whiskers Plot



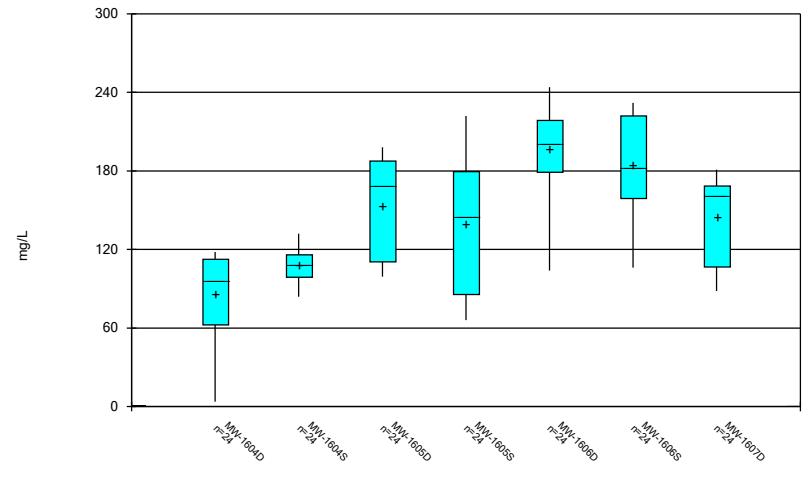
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



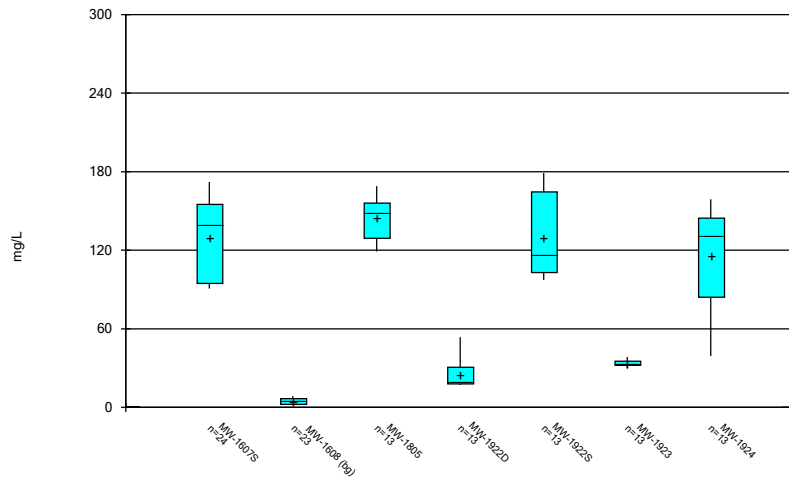
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Box & Whiskers Plot



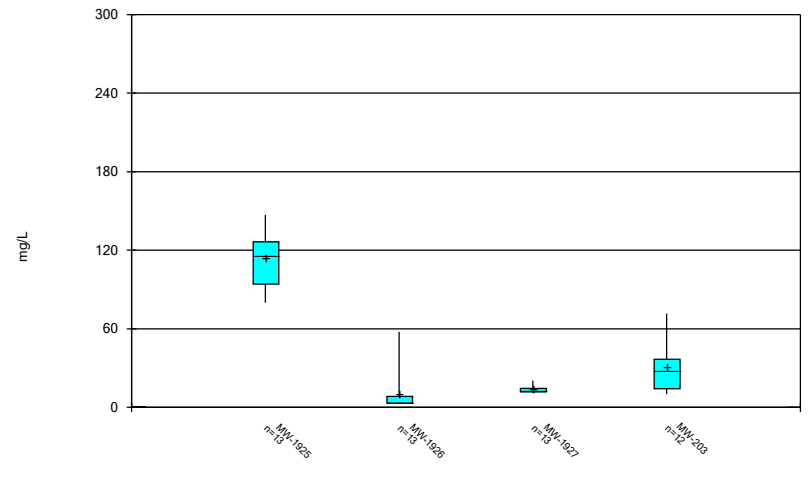
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Box & Whiskers Plot



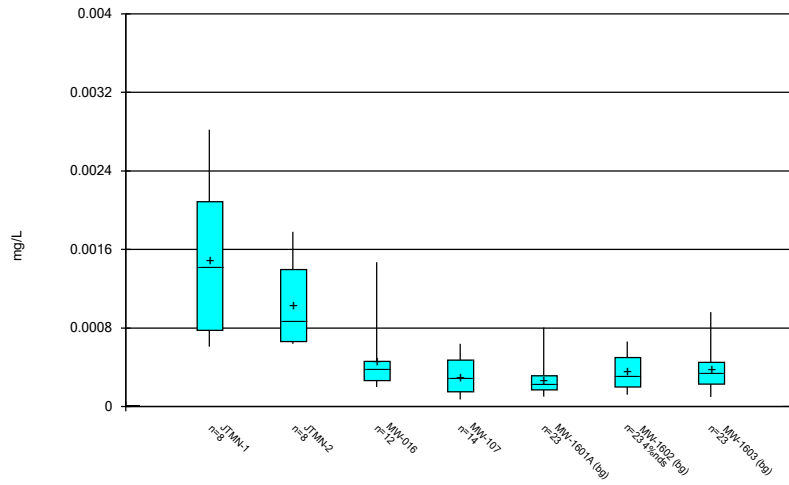
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Box & Whiskers Plot



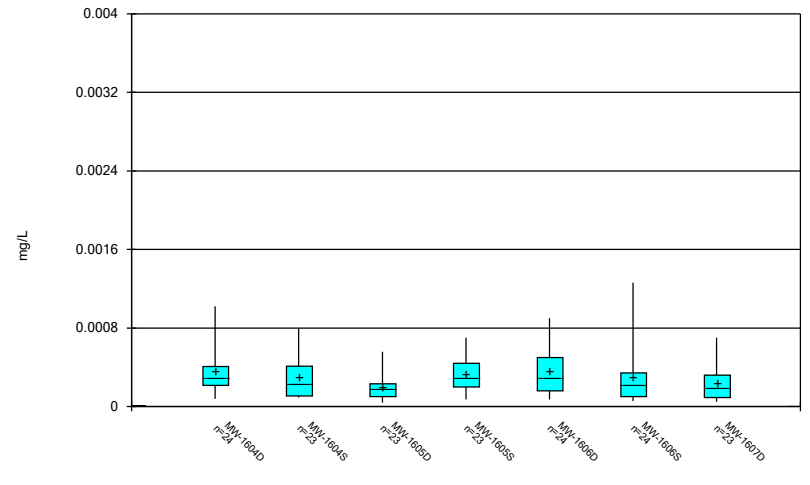
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Box & Whiskers Plot



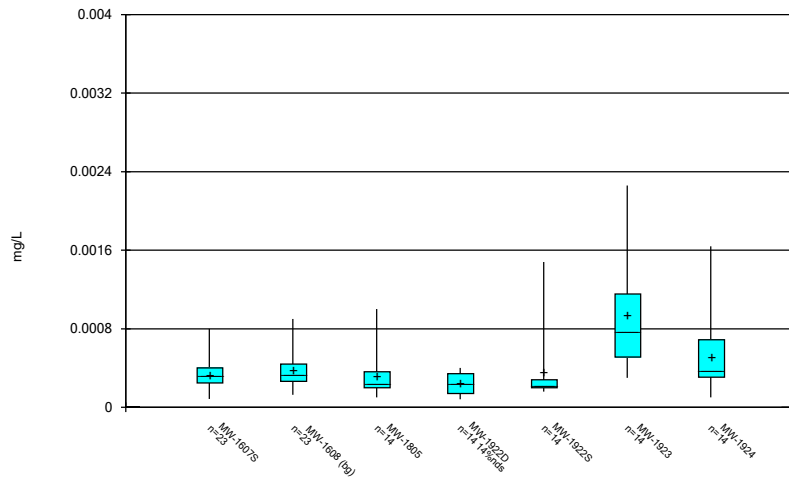
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Box & Whiskers Plot



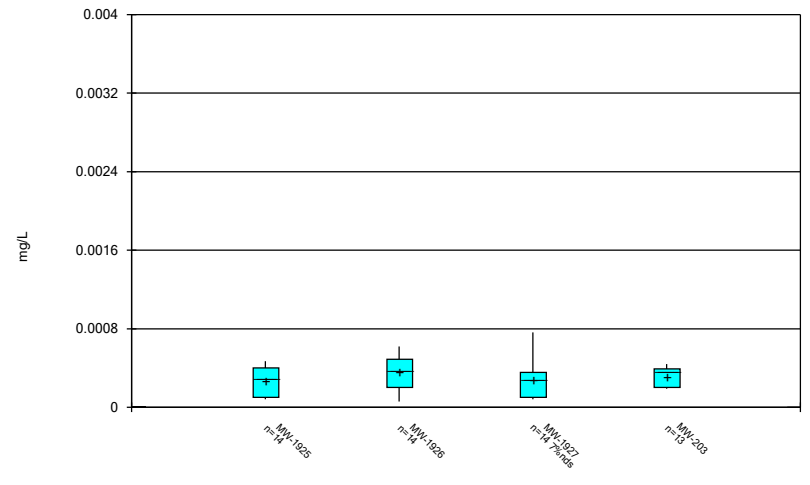
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Box & Whiskers Plot



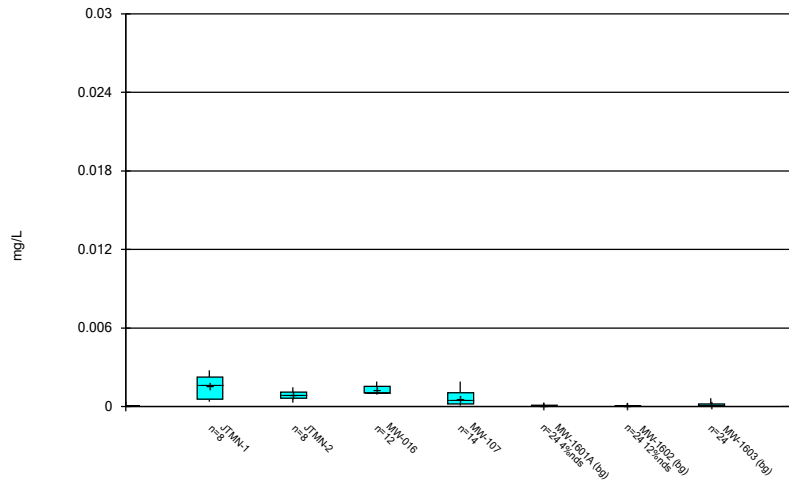
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Box & Whiskers Plot



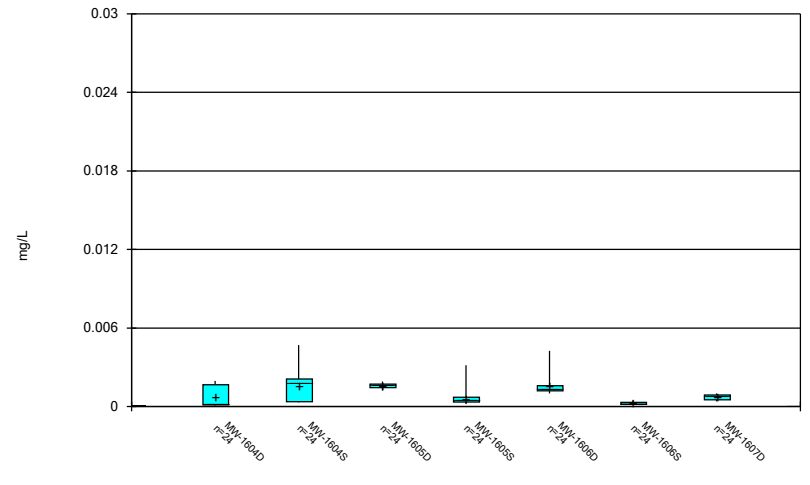
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



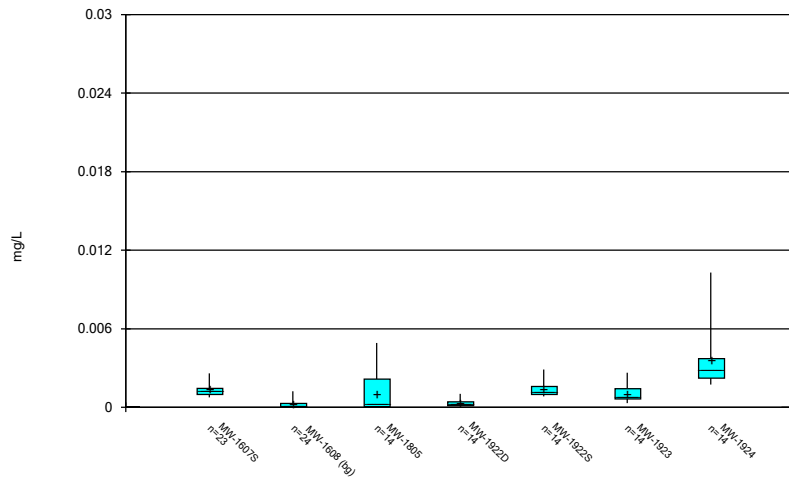
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



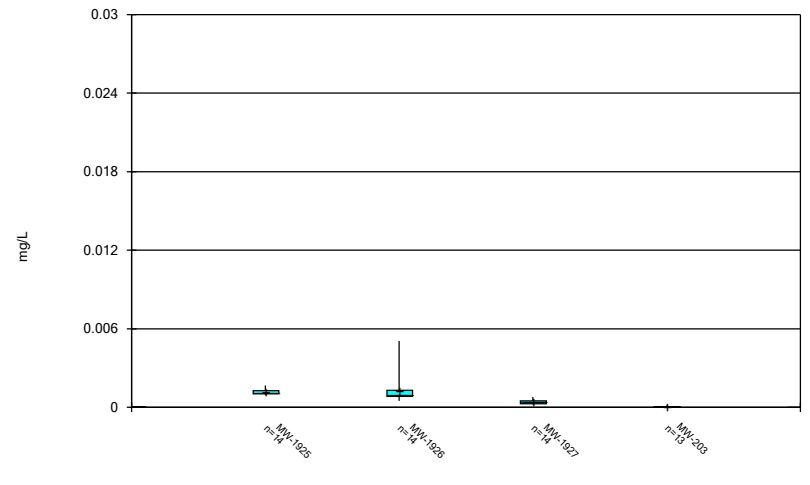
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Box & Whiskers Plot



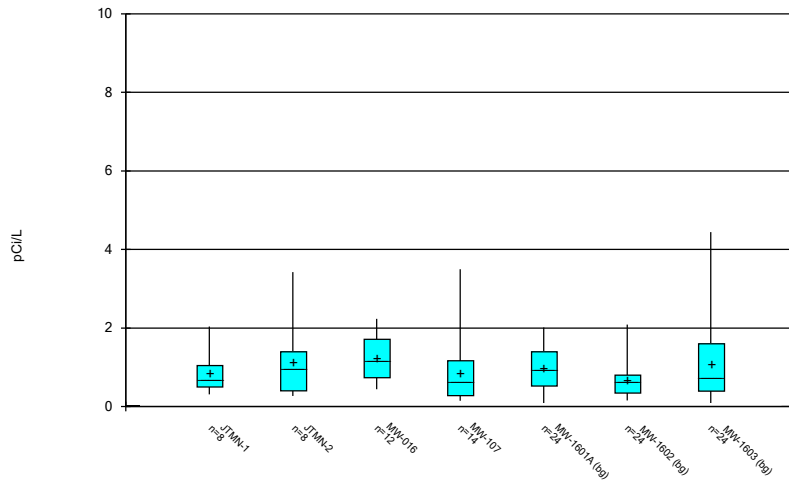
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Box & Whiskers Plot



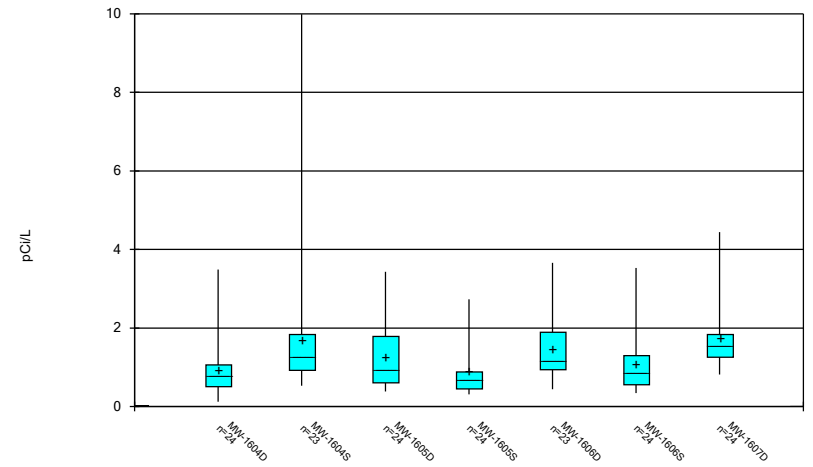
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Box & Whiskers Plot



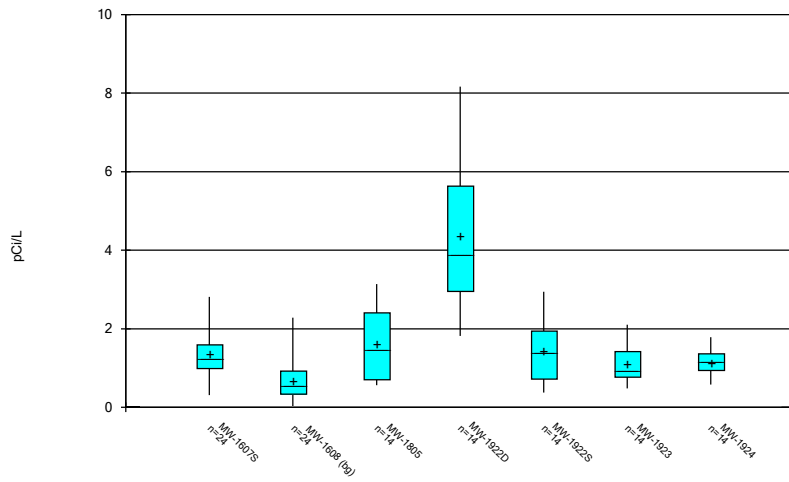
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Box & Whiskers Plot



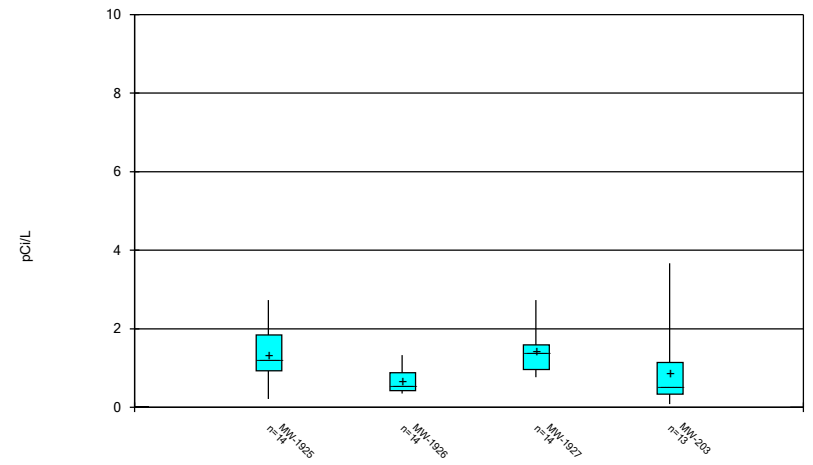
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Box & Whiskers Plot



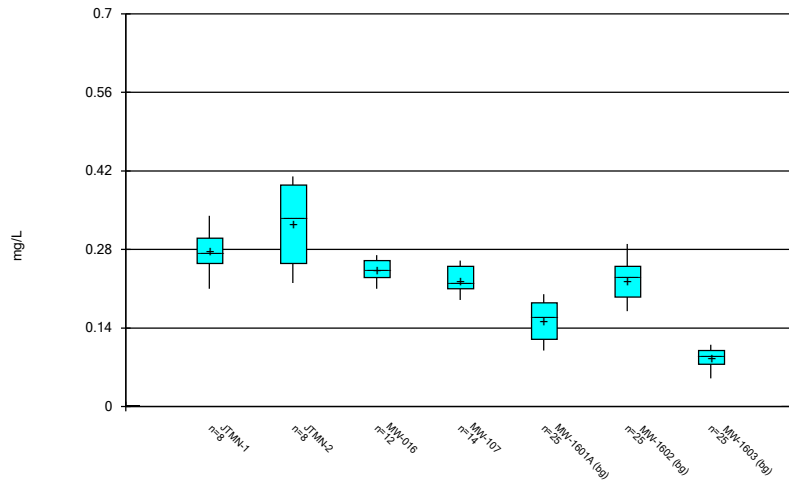
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Box & Whiskers Plot



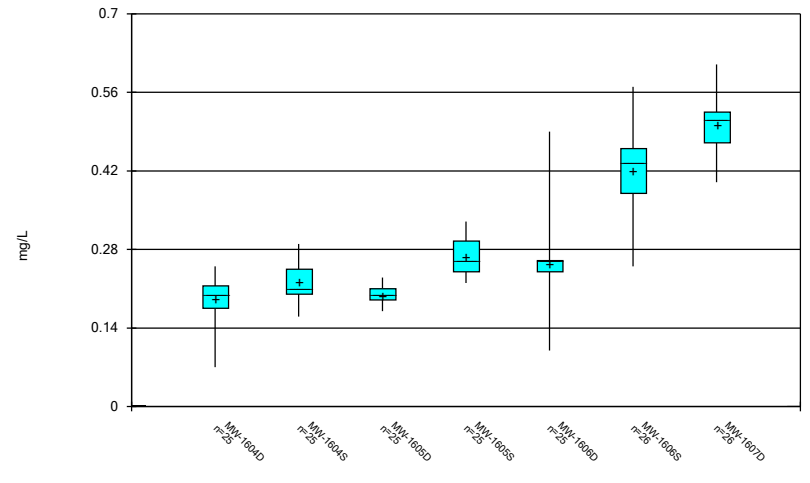
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Box & Whiskers Plot



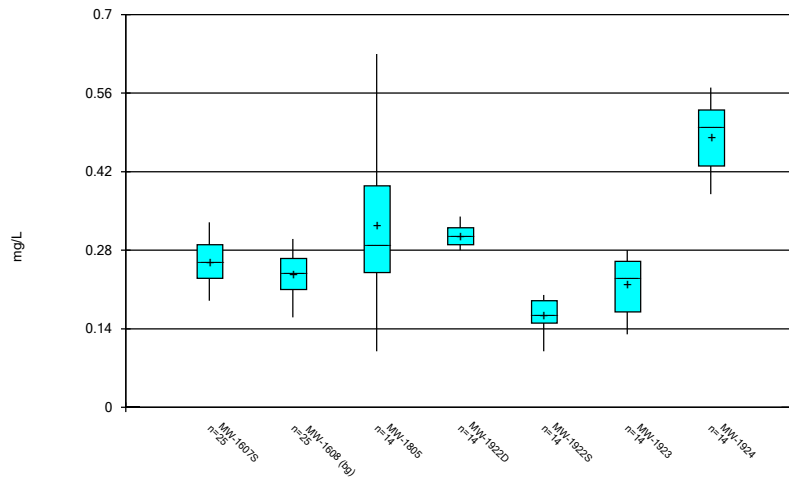
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



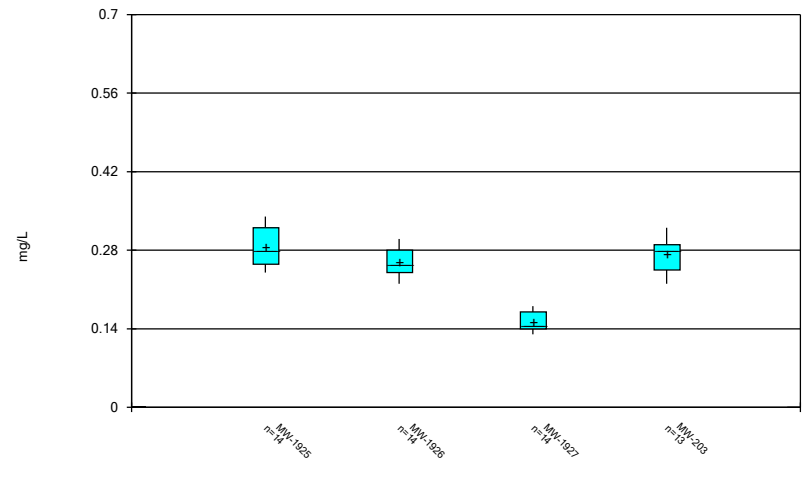
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



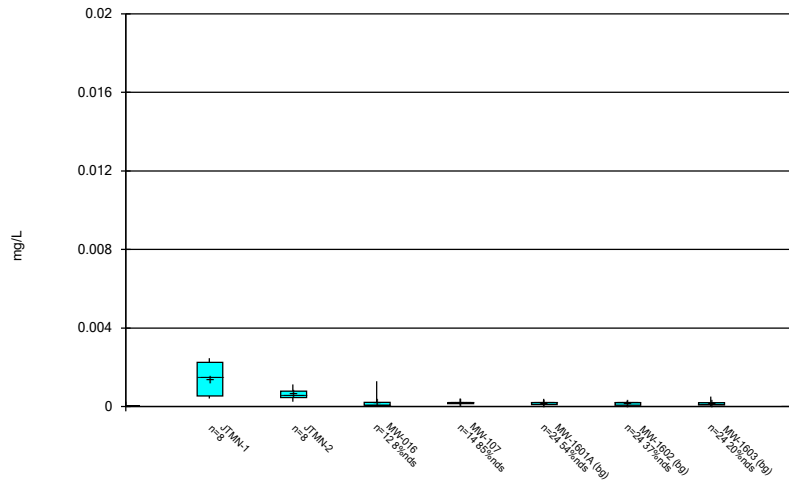
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



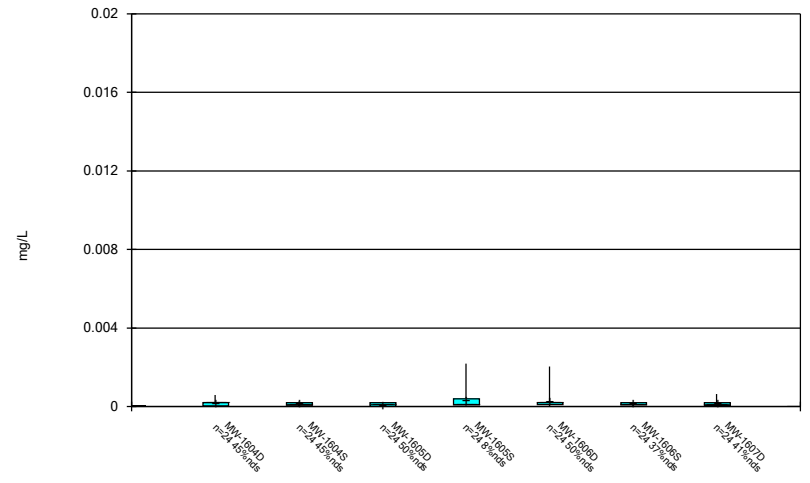
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Box & Whiskers Plot



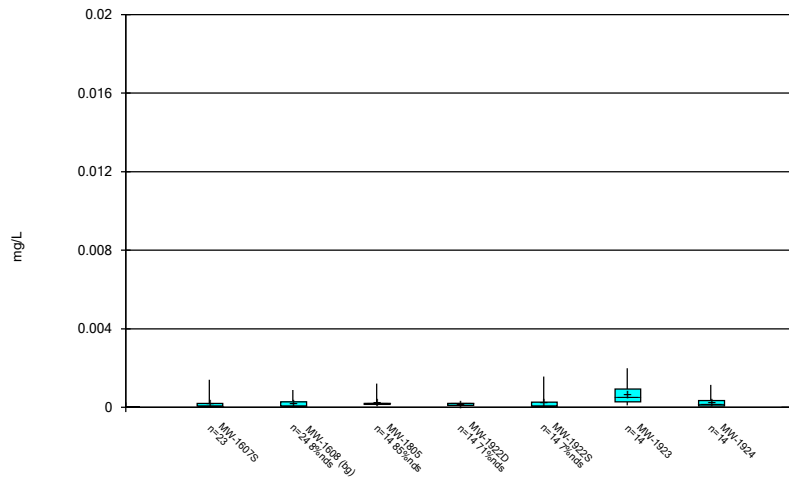
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



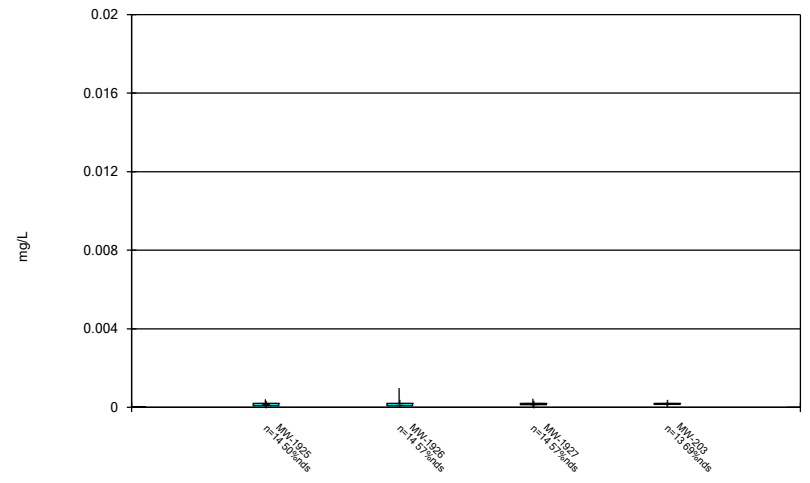
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Box & Whiskers Plot



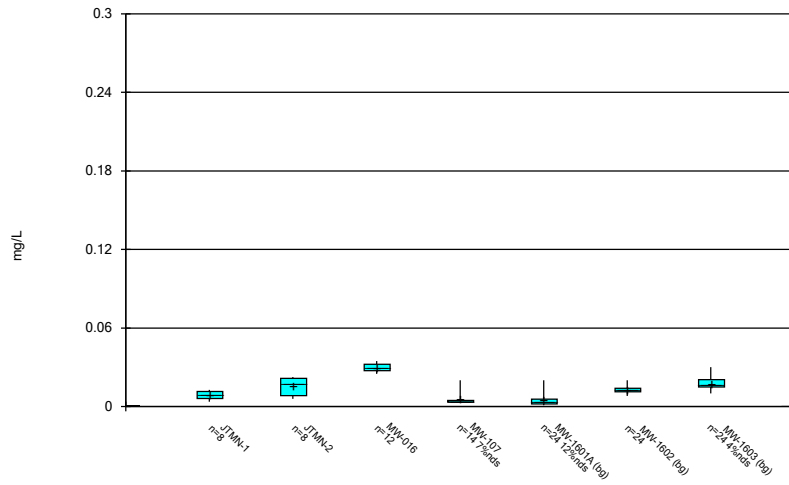
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Box & Whiskers Plot



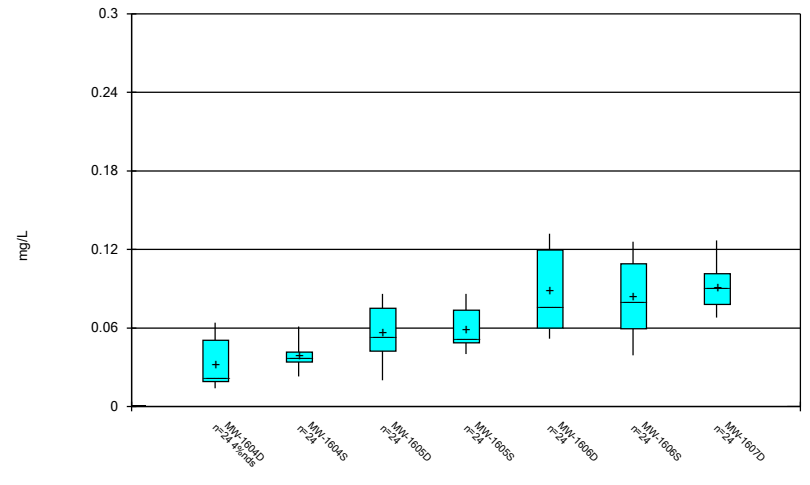
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



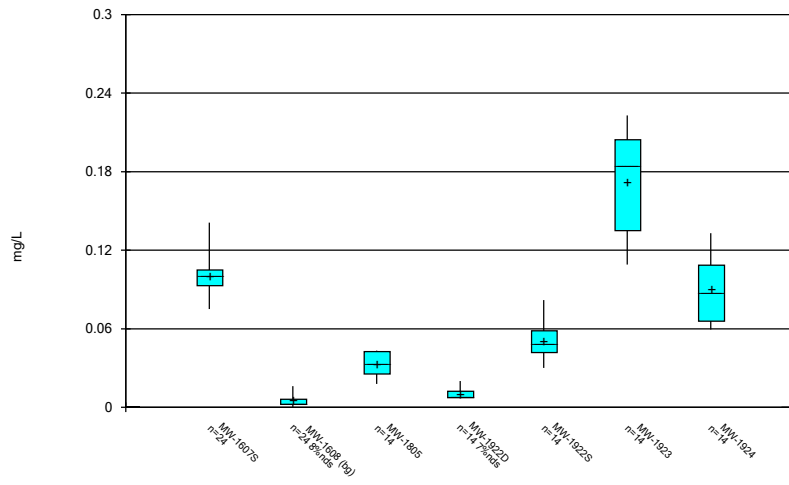
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



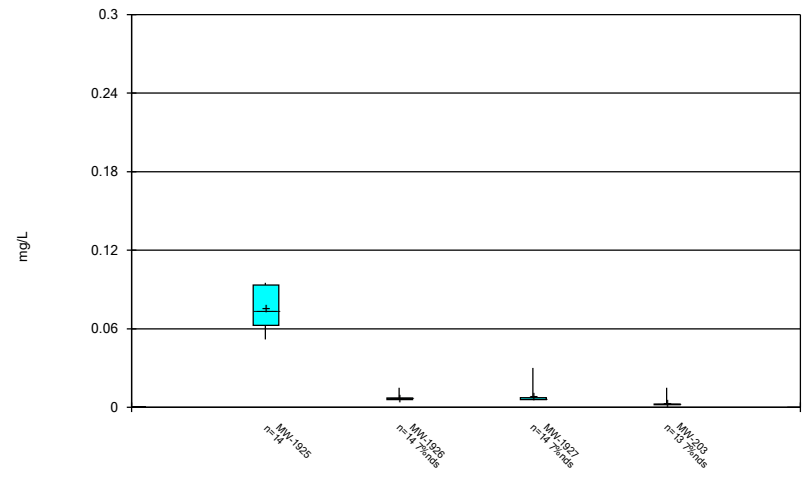
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Box & Whiskers Plot



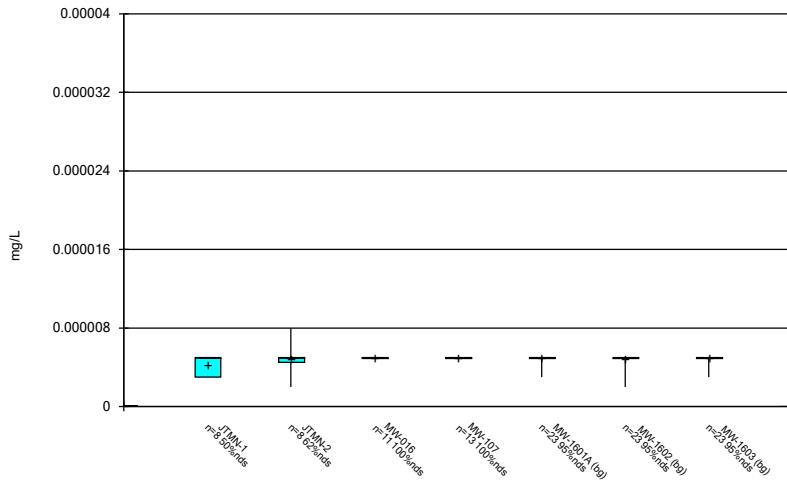
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Box & Whiskers Plot



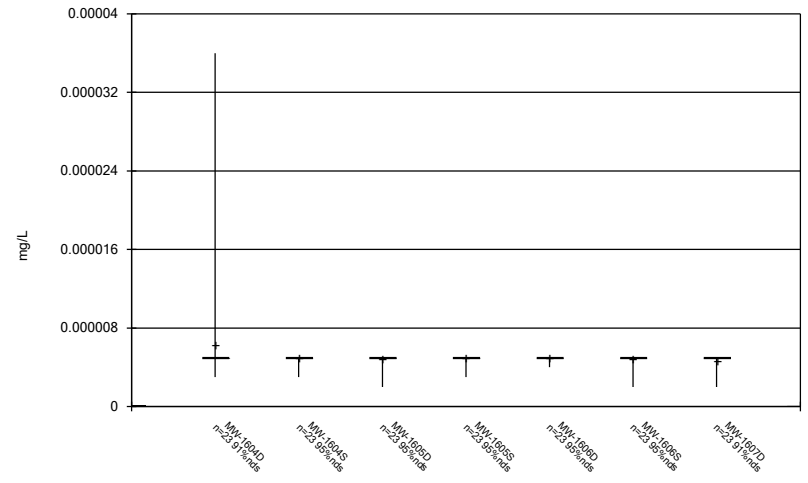
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



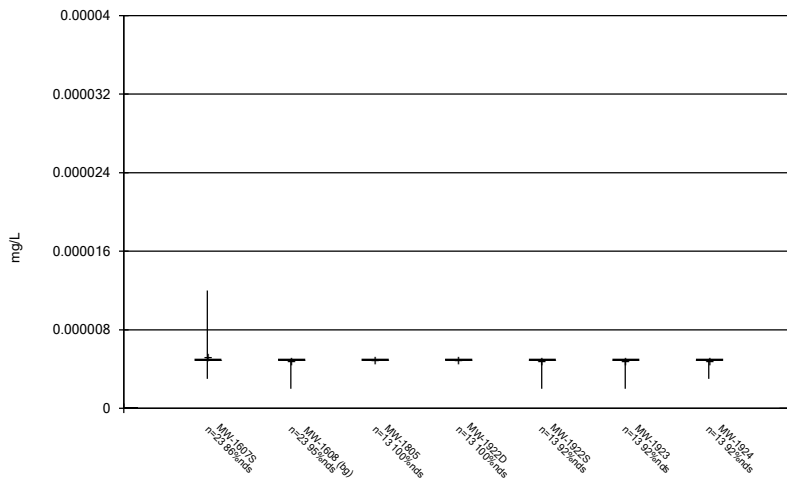
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Box & Whiskers Plot



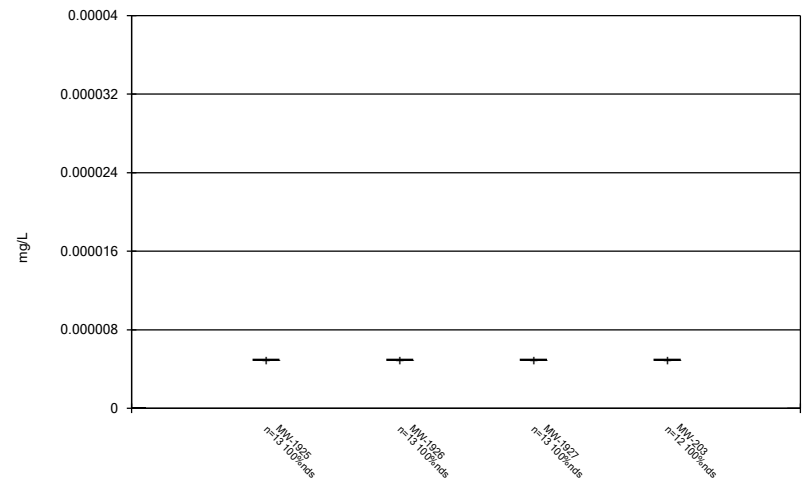
Constituent: Mercury, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



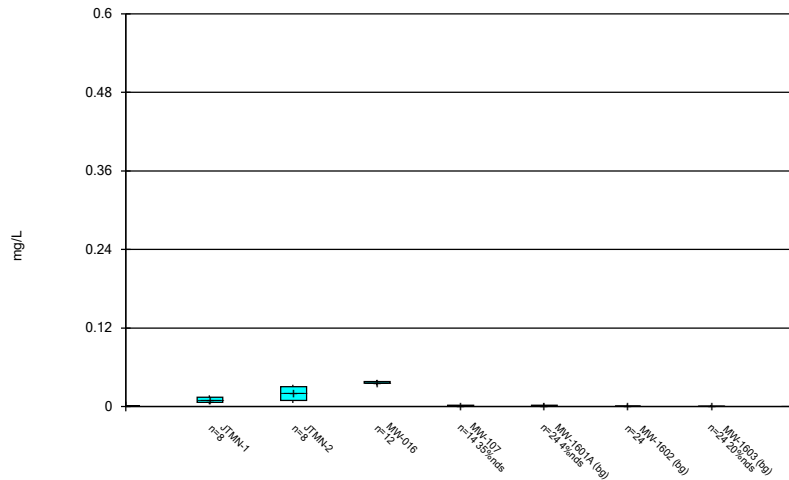
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



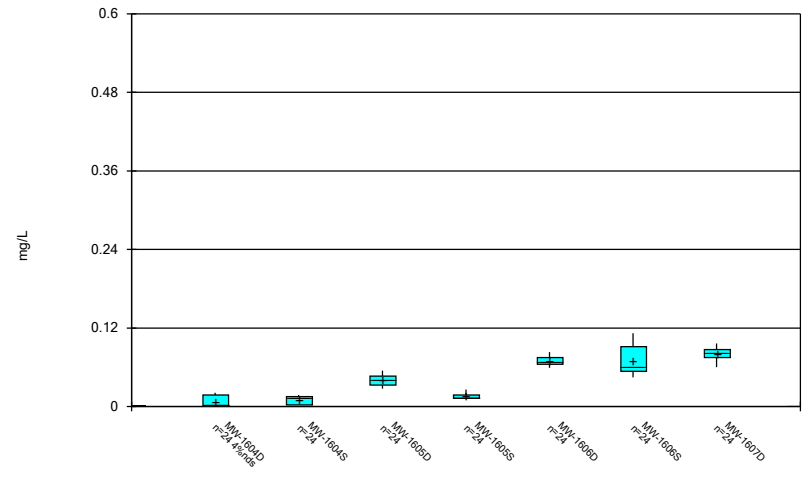
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



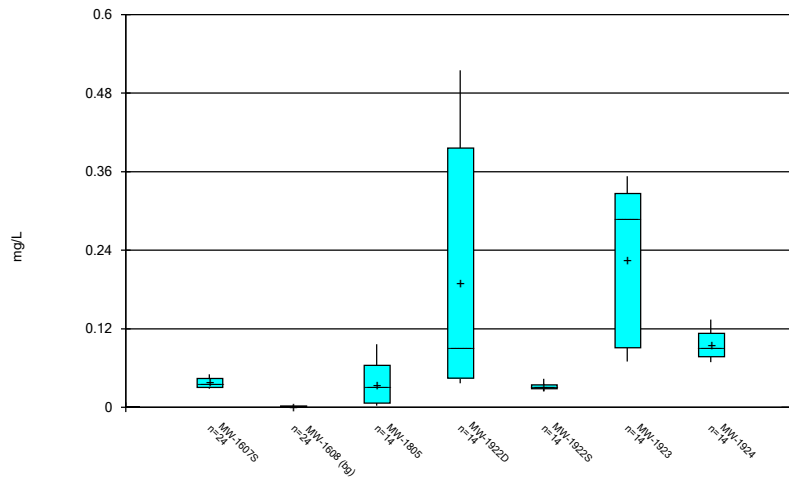
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



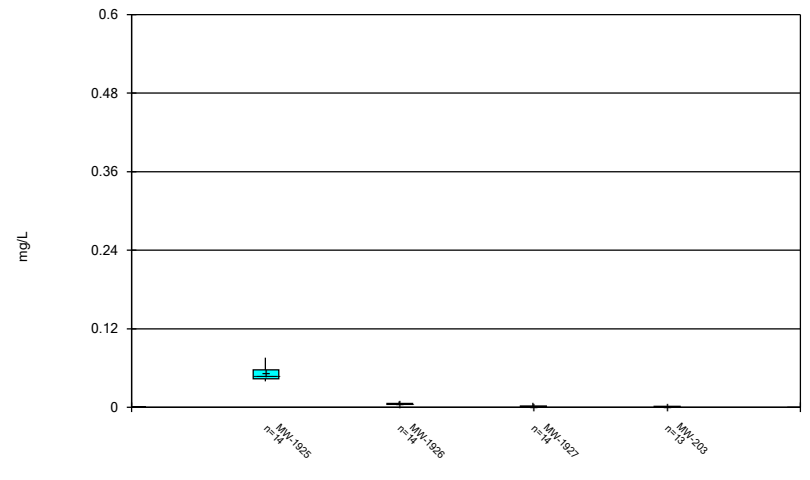
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



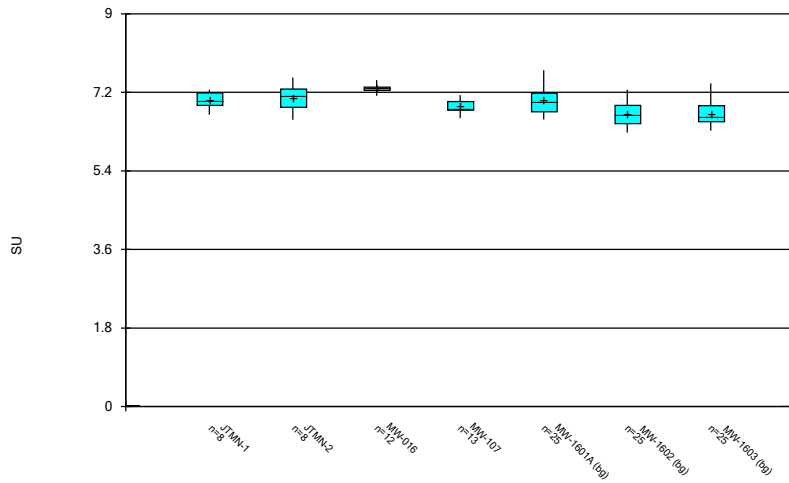
Constituent: Molybdenum, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



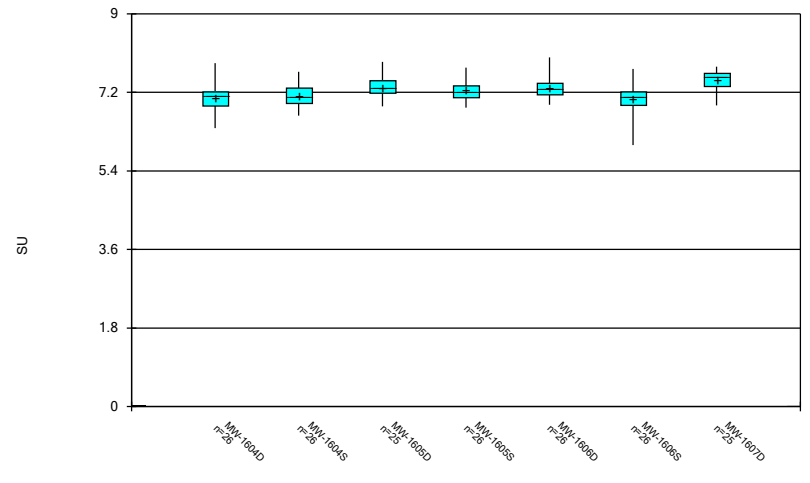
Constituent: Molybdenum, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



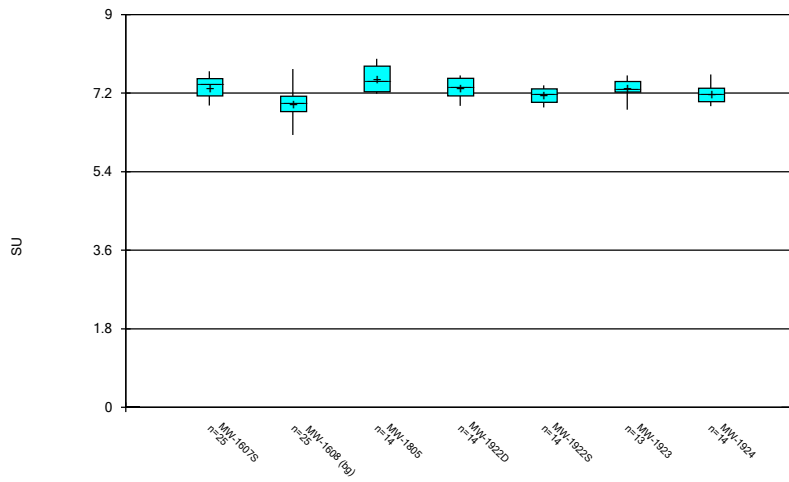
Constituent: pH, field Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



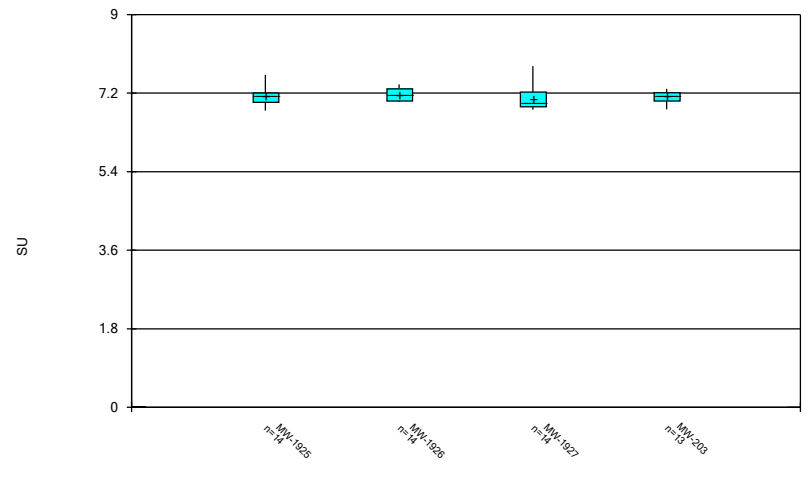
Constituent: pH, field Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



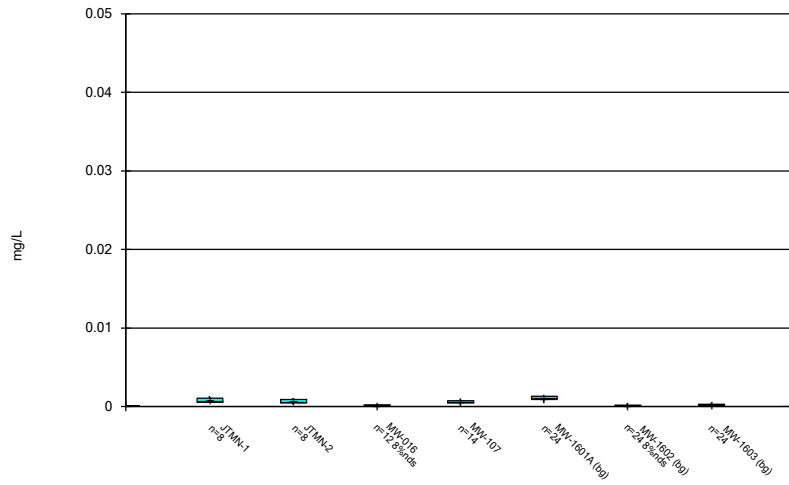
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Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



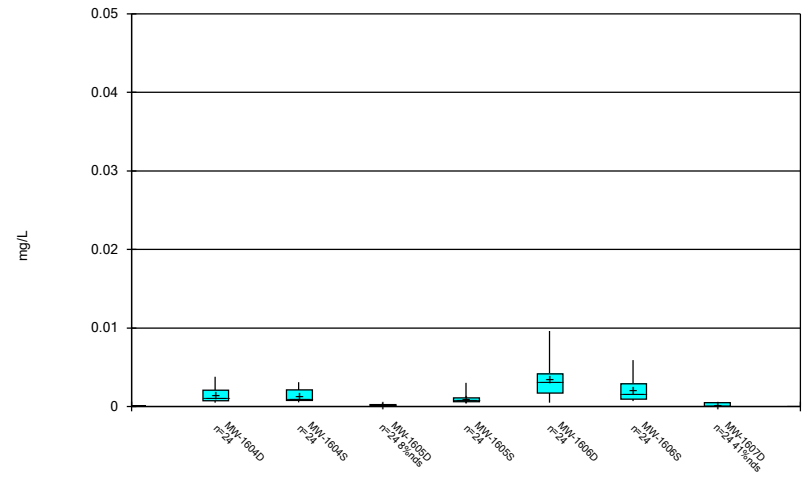
Constituent: pH, field Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



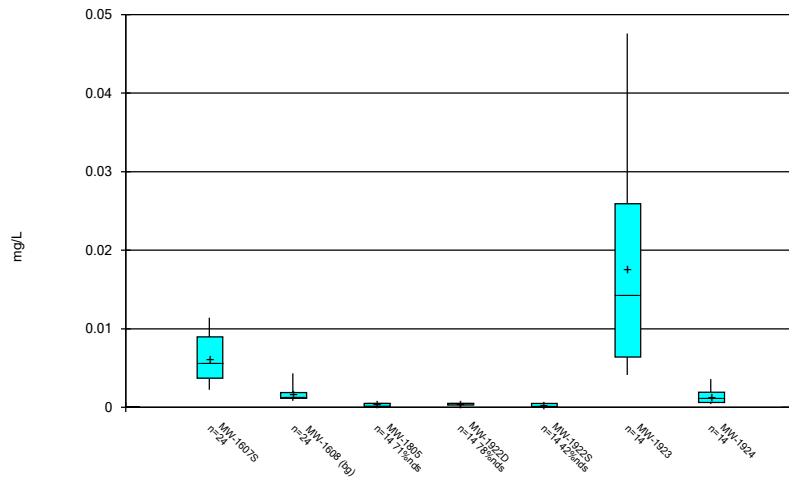
Constituent: Selenium, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



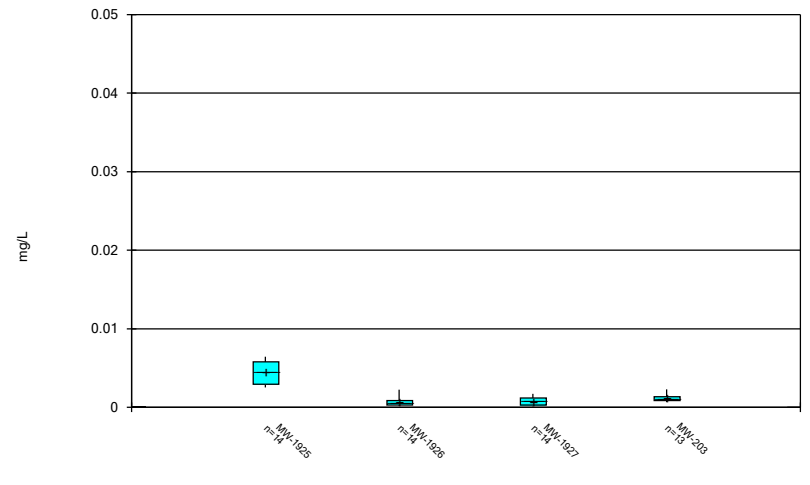
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



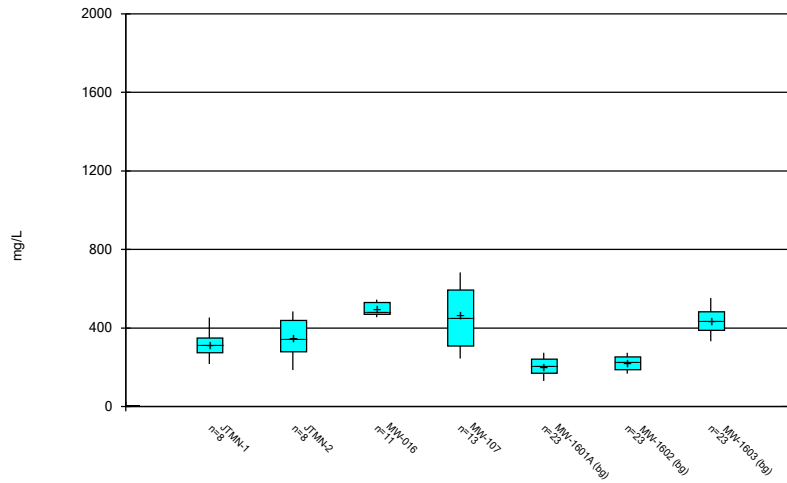
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



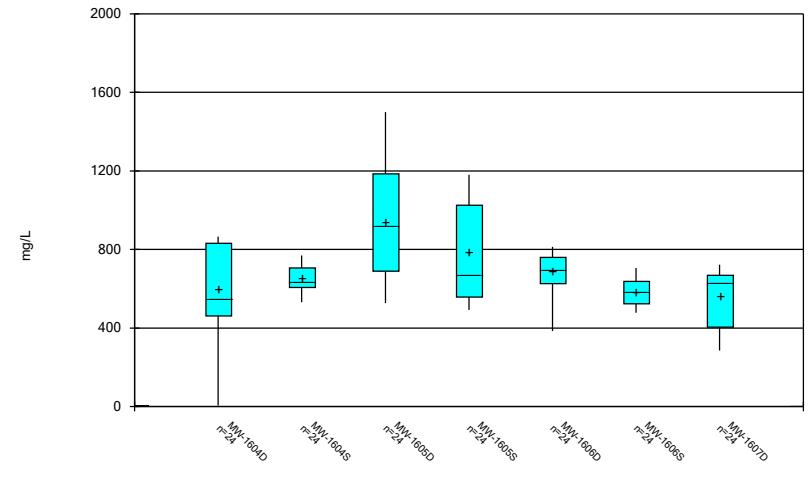
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 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



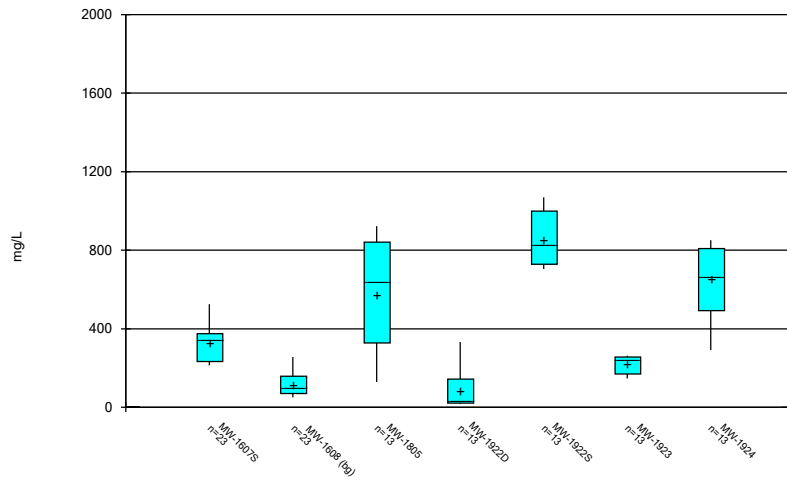
Constituent: Sulfate, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



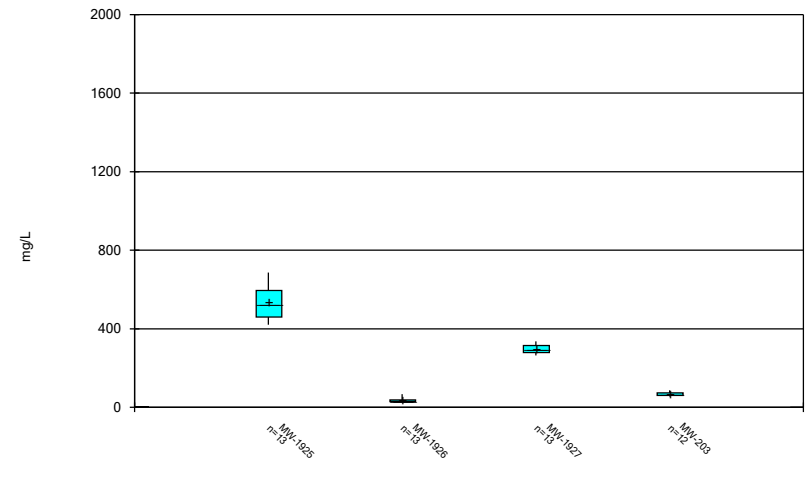
Constituent: Sulfate, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



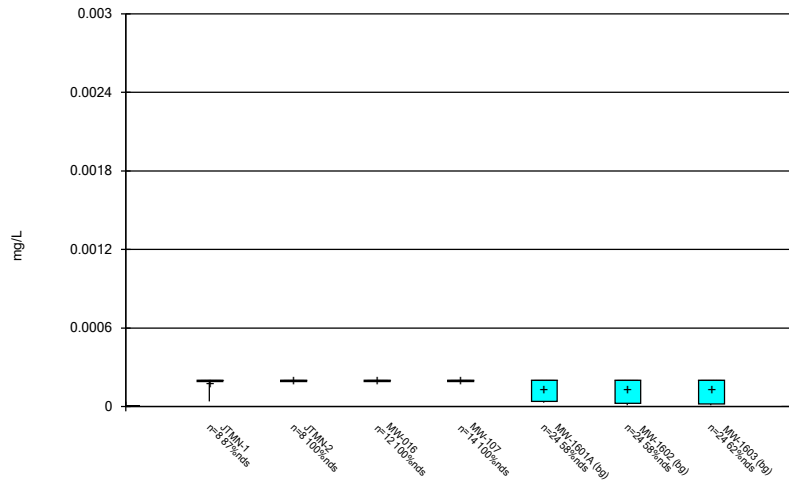
Constituent: Sulfate, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



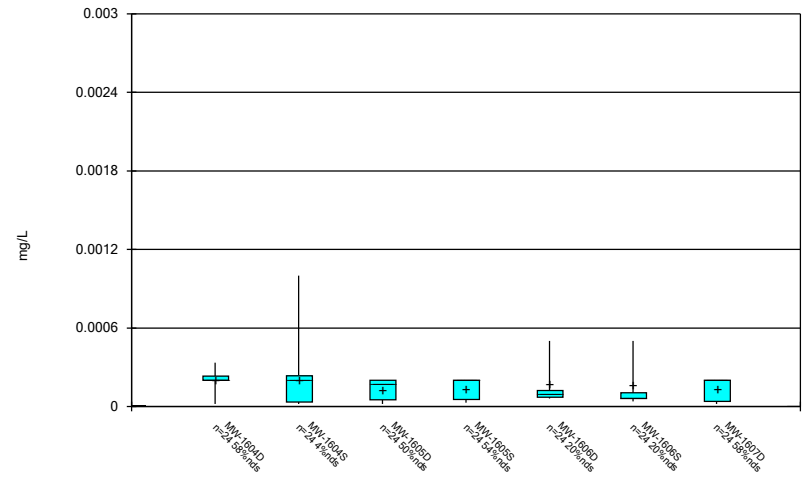
Constituent: Sulfate, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



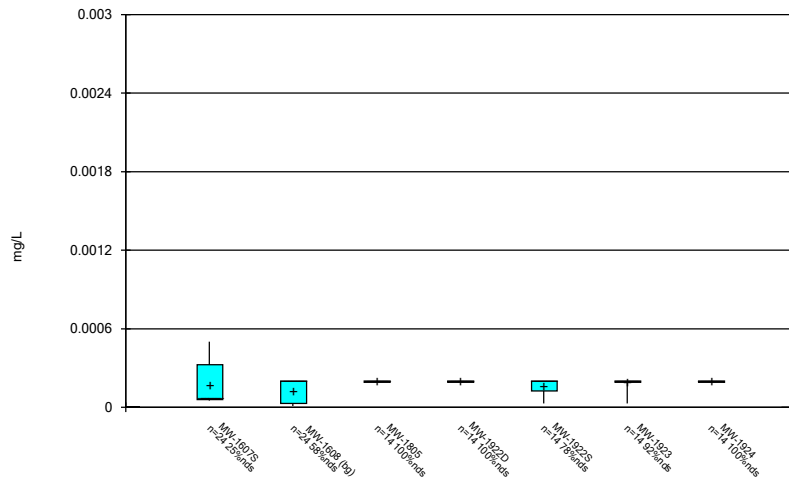
Constituent: Thallium, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



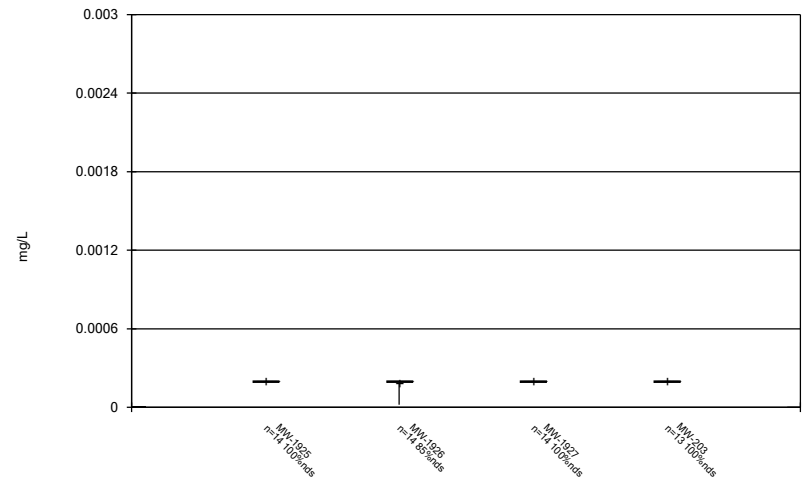
Constituent: Thallium, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



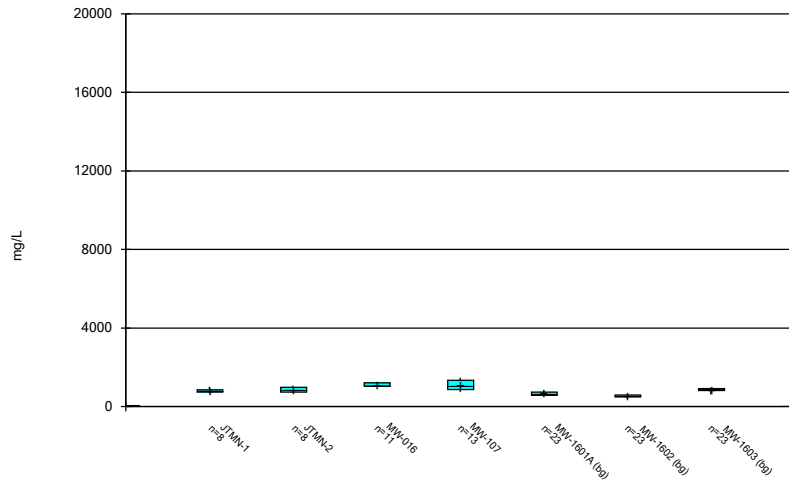
Constituent: Thallium, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



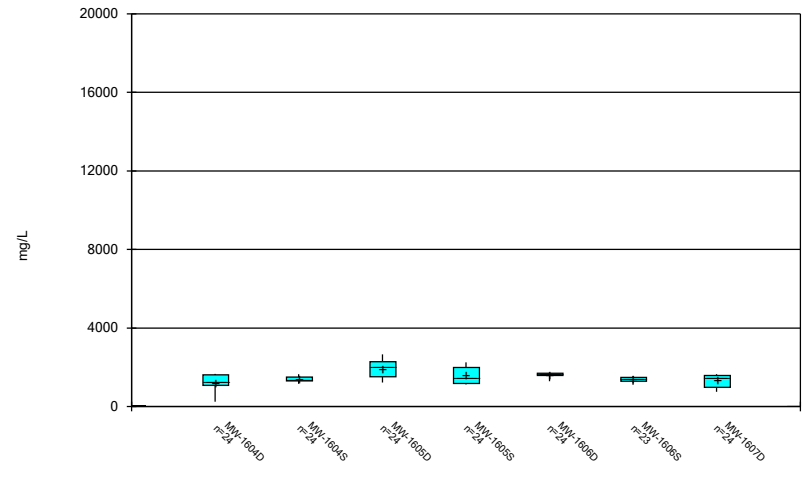
Constituent: Thallium, total Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



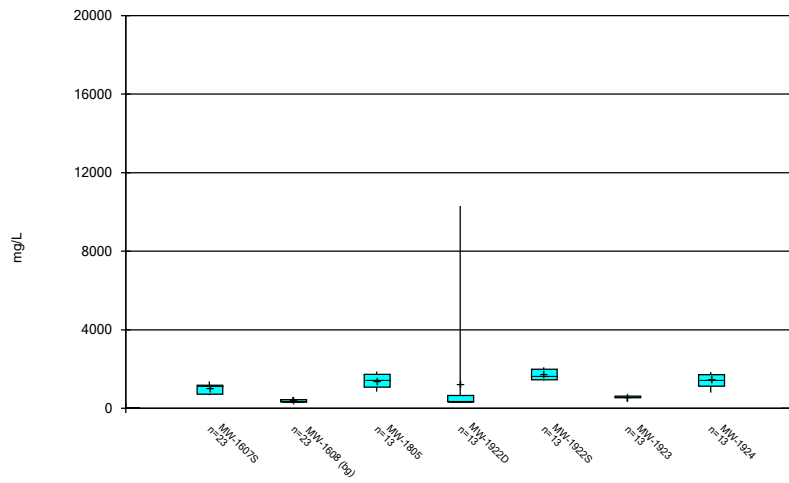
Constituent: Total Dissolved Solids [TDS] Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



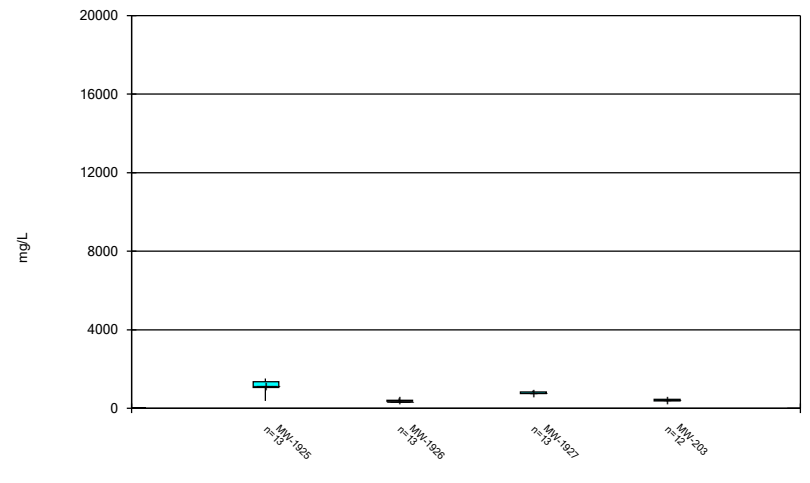
Constituent: Total Dissolved Solids [TDS] Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 6/27/2023 5:02 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE C
Outlier Summary

Outlier Summary

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/21/2023, 1:35 PM

Date	MW-1607S Antimony, total (mg/L)	MW-1607S Arsenic, total (mg/L)	MW-1607S Barium, total (mg/L)	MW-1603 Boron, total (mg/L)	MW-1607S Chromium, total (mg/L)	MW-1601A Cadmium, total (mg/L)	MW-1602 Chromium, total (mg/L)	MW-1603 Chromium, total (mg/L)	MW-1604S Chromium, total (mg/L)	MW-1605D Chromium, total (mg/L)
9/26/2016										
9/27/2016										
11/1/2016					0.0013 (o)					
12/19/2016						0.00165 (o)	0.00237 (o)			
12/20/2016								0.00197 (o)	0.00229 (o)	
12/21/2016	0.00084 (o)	0.0112 (o)	0.114 (o)		0.00022 (o)					
3/28/2017				0.781 (o)						
5/16/2017										

Date	MW-1605S Chromium, total (mg/L)	MW-1607D Chromium, total (mg/L)	MW-1607S Chromium, total (mg/L)	MW-1608 Chromium, total (mg/L)	MW-1607S Cobalt, total (mg/L)	MW-1604S Combined Radium 226 + 228 (pCi/L)	MW-1606D Combined Radium 226 + 228 (pCi/L)	MW-1607S Lead, total (mg/L)	MW-1607D pH, field (SU)	MW-1607S pH, field (SU)
9/26/2016					0.136 (o)					
9/27/2016						8.459 (o)				
11/1/2016										
12/19/2016				0.00278 (o)						
12/20/2016	0.00285 (o)	0.00207 (o)								
12/21/2016			0.0031 (o)		0.0201 (o)		0.011 (o)			
3/28/2017										
5/16/2017							8.41 (o)	8.23 (o)		

Date	MW-1606S Total Dissolved Solids [TDS] (mg/L)
9/26/2016	
9/27/2016	
11/1/2016	
12/19/2016	
12/20/2016	
12/21/2016	
3/28/2017	
5/16/2017	3230 (o)

FIGURE D
UTLs

Upper Tolerance Limits

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/20/2023, 3:32 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg.N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.00052	n/a	n/a	n/a	88	14.77	n/a	0.01096	NP Inter(normality)
Arsenic, total (mg/L)	n/a	0.0007143	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Barium, total (mg/L)	n/a	0.0678	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Beryllium, total (mg/L)	n/a	0.00005	n/a	n/a	n/a	80	91.25	n/a	0.01652	NP Inter(NDs)
Cadmium, total (mg/L)	n/a	0.00005	n/a	n/a	n/a	88	6.818	n/a	0.01096	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.0007382	n/a	n/a	n/a	84	1.19	sqrt(x)	0.05	Inter
Cobalt, total (mg/L)	n/a	0.0005696	n/a	n/a	n/a	88	4.545	ln(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	2.383	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	n/a	0.3	n/a	n/a	n/a	92	0	n/a	0.008924	NP Inter(normality)
Lead, total (mg/L)	n/a	0.000881	n/a	n/a	n/a	88	25	n/a	0.01096	NP Inter(normality)
Lithium, total (mg/L)	n/a	0.03	n/a	n/a	n/a	88	6.818	n/a	0.01096	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.000005	n/a	n/a	n/a	84	95.24	n/a	0.01345	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.002728	n/a	n/a	n/a	88	5.682	sqrt(x)	0.05	Inter
Selenium, total (mg/L)	n/a	0.0043	n/a	n/a	n/a	88	2.273	n/a	0.01096	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.0002	n/a	n/a	n/a	88	55.68	n/a	0.01096	NP Inter(NDs)

FIGURE E
GWPS

MOUNTAINEER BAP GWPS				
Constituent Name	MCL	CCR Rule-Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00052	0.006
Arsenic, Total (mg/L)	0.01		0.00071	0.01
Barium, Total (mg/L)	2		0.068	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00005	0.005
Chromium, Total (mg/L)	0.1		0.00074	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.00057	0.006
Combined Radium, Total (pCi/L)	5		2.38	5
Fluoride, Total (mg/L)	4		0.3	4
Lead, Total (mg/L)	0.015		0.00088	0.015
Lithium, Total (mg/L)	n/a	0.04	0.03	0.04
Mercury, Total (mg/L)	0.002		0.000005	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0028	0.1
Selenium, Total (mg/L)	0.05		0.0043	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**GWPS = Groundwater Protection Standard*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

FIGURE F
Confidence Interval (Assessment)

Confidence Interval - Assessment Monitoring- Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/27/2023, 5:11 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Arsenic, total (mg/L)	MW-1805	0.05871	0.01989	0.01	Yes	14	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1922D	0.7628	0.4234	0.01	Yes	14	0	None	sqrt(x)	0.01	Param.

Confidence Interval - Assessment Monitoring- All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/27/2023, 5:11 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	JTMN-1	0.000113	0.0000358	0.006	No	8	0	None	No	0.01	Param.
Antimony, total (mg/L)	JTMN-2	0.00009445	0.00003304	0.006	No	8	0	None	sqrt(x)	0.01	Param.
Antimony, total (mg/L)	MW-016	0.0001	0.000028	0.006	No	12	33.33	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-107	0.0001	0.00002	0.006	No	14	28.57	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1604D	0.00013	0.00003	0.006	No	24	4.167	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1604S	0.00016	0.00004	0.006	No	24	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1605D	0.00004	0.00003	0.006	No	24	8.333	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1605S	0.00007	0.00004	0.006	No	24	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1606D	0.00017	0.00014	0.006	No	24	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1606S	0.0001543	0.0001415	0.006	No	24	0	None	No	0.01	Param.
Antimony, total (mg/L)	MW-1607D	0.00004	0.00003	0.006	No	24	4.167	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1607S	0.0004609	0.0004208	0.006	No	23	0	None	No	0.01	Param.
Antimony, total (mg/L)	MW-1805	0.0001	0.00003	0.006	No	14	21.43	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1922D	0.001313	0.0004944	0.006	No	14	0	None	ln(x)	0.01	Param.
Antimony, total (mg/L)	MW-1922S	0.0001	0.00002	0.006	No	14	35.71	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1923	0.0002439	0.0001791	0.006	No	14	0	None	x^(1/3)	0.01	Param.
Antimony, total (mg/L)	MW-1924	0.00011	0.00006	0.006	No	14	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1925	0.00021	0.00019	0.006	No	14	0	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1926	0.0000797	0.00005215	0.006	No	14	0	None	No	0.01	Param.
Antimony, total (mg/L)	MW-1927	0.0001446	0.00008199	0.006	No	14	0	None	ln(x)	0.01	Param.
Antimony, total (mg/L)	MW-203	0.0001	0.00002	0.006	No	13	61.54	None	No	0.01	NP (NDs)
Arsenic, total (mg/L)	JTMN-1	0.002427	0.0007203	0.01	No	8	0	None	No	0.01	Param.
Arsenic, total (mg/L)	JTMN-2	0.001186	0.000594	0.01	No	8	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-016	0.004857	0.0029	0.01	No	12	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-107	0.00059	0.00027	0.01	No	14	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1604D	0.0004188	0.0003037	0.01	No	24	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1604S	0.0003916	0.0002984	0.01	No	24	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1605D	0.002884	0.002466	0.01	No	24	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1605S	0.0007054	0.0004809	0.01	No	24	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1606D	0.0005134	0.0003376	0.01	No	24	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1606S	0.0007772	0.0006611	0.01	No	24	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1607D	0.001728	0.001285	0.01	No	24	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1607S	0.00117	0.00089	0.01	No	23	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1805	0.05871	0.01989	0.01	Yes	14	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1922D	0.7628	0.4234	0.01	Yes	14	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1922S	0.00325	0.00179	0.01	No	14	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1923	0.001009	0.0006087	0.01	No	14	0	None	x^(1/3)	0.01	Param.
Arsenic, total (mg/L)	MW-1924	0.0008441	0.0004881	0.01	No	14	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1925	0.0005057	0.0002803	0.01	No	14	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	MW-1926	0.00038	0.0003	0.01	No	14	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1927	0.0003241	0.0002202	0.01	No	14	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-203	0.0002886	0.000236	0.01	No	13	0	None	No	0.01	Param.
Barium, total (mg/L)	JTMN-1	0.09738	0.0645	2	No	8	0	None	No	0.01	Param.
Barium, total (mg/L)	JTMN-2	0.09169	0.06927	2	No	8	0	None	x^4	0.01	Param.
Barium, total (mg/L)	MW-016	0.0391	0.0226	2	No	12	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	MW-107	0.05578	0.03748	2	No	14	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1604D	0.0342	0.0262	2	No	24	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	MW-1604S	0.02962	0.02745	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1605D	0.02912	0.02618	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1605S	0.03215	0.02616	2	No	24	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1606D	0.05363	0.04607	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1606S	0.06903	0.0577	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1607D	0.129	0.0703	2	No	24	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	MW-1607S	0.06992	0.06329	2	No	23	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1805	0.05111	0.03029	2	No	14	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1922D	0.353	0.0663	2	No	14	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	MW-1922S	0.03025	0.02593	2	No	14	0	None	ln(x)	0.01	Param.
Barium, total (mg/L)	MW-1923	0.09733	0.08254	2	No	14	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1924	0.05497	0.0412	2	No	14	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1925	0.04314	0.03765	2	No	14	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1926	0.02317	0.01935	2	No	14	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1927	0.05907	0.05381	2	No	14	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-203	0.03175	0.02646	2	No	13	0	None	No	0.01	Param.
Beryllium, total (mg/L)	JTMN-1	0.00006514	0.00001161	0.004	No	8	0	None	No	0.01	Param.
Beryllium, total (mg/L)	JTMN-2	0.00003506	0.00001144	0.004	No	8	0	None	No	0.01	Param.
Beryllium, total (mg/L)	MW-016	0.00005	0.00005	0.004	No	10	90	None	No	0.011	NP (NDs)
Beryllium, total (mg/L)	MW-1604S	0.00005	0.000024	0.004	No	22	95.45	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1605S	0.00005	0.00002	0.004	No	22	86.36	None	No	0.01	NP (NDs)

Confidence Interval - Assessment Monitoring- All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/27/2023, 5:11 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Beryllium, total (mg/L)	MW-1606D	0.00005	0.000031	0.004	No	22	81.82	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1606S	0.00005	0.000005	0.004	No	22	95.45	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1607D	0.00005	0.000008	0.004	No	22	95.45	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1607S	0.000123	0.00001	0.004	No	22	81.82	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1922S	0.00005	0.000018	0.004	No	12	91.67	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1923	0.0001	0.000017	0.004	No	12	41.67	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	MW-1924	0.00005	0.000009	0.004	No	12	75	None	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1925	0.00005	0.000008	0.004	No	12	91.67	None	No	0.01	NP (NDs)
Cadmium, total (mg/L)	JTMN-1	0.000114	0.000017	0.005	No	8	0	None	No	0.004	NP (normality)
Cadmium, total (mg/L)	JTMN-2	0.00004559	0.00002116	0.005	No	8	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-016	0.0000277	0.00001563	0.005	No	12	8.333	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-107	0.0000441	0.00002333	0.005	No	14	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1604D	0.0001	0.000022	0.005	No	24	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1604S	0.0001804	0.0001141	0.005	No	24	0	None	x^2	0.01	Param.
Cadmium, total (mg/L)	MW-1605D	0.00002504	0.00001413	0.005	No	24	4.167	None	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-1605S	0.00006804	0.00004727	0.005	No	24	0	None	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-1606D	0.00007543	0.00006407	0.005	No	24	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1606S	0.00007264	0.00006186	0.005	No	24	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1607D	0.00002	0.000011	0.005	No	24	58.33	None	No	0.01	NP (NDs)
Cadmium, total (mg/L)	MW-1607S	0.000042	0.000032	0.005	No	23	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1922D	0.00002	0.00001	0.005	No	14	78.57	None	No	0.01	NP (NDs)
Cadmium, total (mg/L)	MW-1922S	0.000076	0.000006	0.005	No	14	35.71	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1923	0.00004224	0.0000135	0.005	No	14	7.143	None	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-1924	0.00007	0.00005	0.005	No	14	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1925	0.00005487	0.00004141	0.005	No	14	0	None	No	0.01	Param.
Cadmium, total (mg/L)	MW-1926	0.00004867	0.00003527	0.005	No	14	0	None	x^(1/3)	0.01	Param.
Cadmium, total (mg/L)	MW-1927	0.00007802	0.00005776	0.005	No	14	7.143	None	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-203	0.00005	0.000004	0.005	No	13	38.46	None	No	0.01	NP (normality)
Chromium, total (mg/L)	JTMN-1	0.002356	0.0006415	0.1	No	8	0	None	No	0.01	Param.
Chromium, total (mg/L)	JTMN-2	0.001498	0.0005722	0.1	No	8	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-016	0.0006084	0.0002586	0.1	No	12	0	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-107	0.0004419	0.0001829	0.1	No	14	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1604D	0.0004313	0.0002384	0.1	No	24	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1604S	0.0003954	0.0001901	0.1	No	23	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1605D	0.0002386	0.0001189	0.1	No	23	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1605S	0.0004198	0.000231	0.1	No	23	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1606D	0.000475	0.000227	0.1	No	24	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1606S	0.0003704	0.0001518	0.1	No	24	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1607D	0.0003007	0.0001318	0.1	No	23	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1607S	0.000412	0.0002577	0.1	No	23	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1805	0.0003981	0.0001923	0.1	No	14	0	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-1922D	0.0003129	0.0001634	0.1	No	14	14.29	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1922S	0.0003	0.0002	0.1	No	14	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	MW-1923	0.001277	0.0005311	0.1	No	14	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-1924	0.0006944	0.0002502	0.1	No	14	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	MW-1925	0.0003702	0.0001796	0.1	No	14	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1926	0.0004724	0.0002337	0.1	No	14	0	None	No	0.01	Param.
Chromium, total (mg/L)	MW-1927	0.00039	0.0001424	0.1	No	14	7.143	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	MW-203	0.00044	0.0002	0.1	No	13	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	JTMN-1	0.002496	0.0005118	0.006	No	8	0	None	No	0.01	Param.
Cobalt, total (mg/L)	JTMN-2	0.001262	0.0004801	0.006	No	8	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-016	0.00188	0.00102	0.006	No	12	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-107	0.001049	0.000263	0.006	No	14	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1604D	0.00174	0.000116	0.006	No	24	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1604S	0.00214	0.000358	0.006	No	24	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1605D	0.001683	0.001473	0.006	No	24	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1605S	0.0007063	0.0003687	0.006	No	24	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1606D	0.00156	0.00123	0.006	No	24	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1606S	0.0003106	0.0002088	0.006	No	24	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1607D	0.0008579	0.0006839	0.006	No	24	0	None	x^3	0.01	Param.
Cobalt, total (mg/L)	MW-1607S	0.001534	0.001081	0.006	No	23	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1805	0.0009404	0.00007819	0.006	No	14	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1922D	0.0003631	0.0001417	0.006	No	14	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1922S	0.001633	0.0009969	0.006	No	14	0	None	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	MW-1923	0.001354	0.0005657	0.006	No	14	0	None	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	MW-1924	0.0041	0.00215	0.006	No	14	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1925	0.001297	0.001022	0.006	No	14	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1926	0.00142	0.000788	0.006	No	14	0	None	No	0.01	NP (normality)

Confidence Interval - Assessment Monitoring- All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/27/2023, 5:11 PM

Constituent	Well	Upper Lim.	Lower Lim.	ComplianceSig.	N	%NDs	ND Adj.	Transform	Alpha	Method	
Cobalt, total (mg/L)	MW-1927	0.0005141	0.0002903	0.006	No	14	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-203	0.00005676	0.00001968	0.006	No	13	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	JTMN-1	1.399	0.3419	5	No	8	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	JTMN-2	2.106	0.2783	5	No	8	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-016	1.739	0.755	5	No	12	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-107	1.29	0.3087	5	No	14	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1604D	1.145	0.5192	5	No	24	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1604S	1.841	0.9529	5	No	23	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1605D	1.586	0.7934	5	No	24	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1605S	1.002	0.525	5	No	24	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606D	1.79	0.9932	5	No	23	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606S	1.337	0.6705	5	No	24	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607D	2.042	1.256	5	No	24	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607S	1.716	0.9997	5	No	24	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1805	2.253	0.9754	5	No	14	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1922D	5.628	3.121	5	No	14	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1922S	1.929	0.9122	5	No	14	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1923	1.398	0.7926	5	No	14	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1924	1.394	0.914	5	No	14	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1925	1.786	0.8908	5	No	14	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1926	0.8773	0.452	5	No	14	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1927	1.782	1.035	5	No	14	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-203	1.303	0.2455	5	No	13	0	None	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	JTMN-1	0.3186	0.2339	4	No	8	0	None	No	0.01	Param.
Fluoride, total (mg/L)	JTMN-2	0.4049	0.2451	4	No	8	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-016	0.2594	0.2306	4	No	12	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-107	0.2409	0.2091	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1604D	0.2117	0.1731	4	No	25	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1604S	0.2362	0.2062	4	No	25	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1605D	0.206	0.19	4	No	25	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1605S	0.2825	0.2503	4	No	25	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1606D	0.26	0.24	4	No	25	0	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	MW-1606S	0.4532	0.3837	4	No	26	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1607D	0.5254	0.48	4	No	26	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1607S	0.2787	0.2413	4	No	25	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1805	0.4283	0.2217	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1922D	0.3181	0.2934	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1922S	0.1824	0.1461	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1923	0.2528	0.1872	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1924	0.5244	0.4413	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1925	0.309	0.261	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1926	0.2758	0.2427	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1927	0.1638	0.139	4	No	14	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-203	0.2971	0.2491	4	No	13	0	None	No	0.01	Param.
Lead, total (mg/L)	JTMN-1	0.002351	0.0005219	0.015	No	8	0	None	No	0.01	Param.
Lead, total (mg/L)	JTMN-2	0.0009312	0.00034	0.015	No	8	0	None	No	0.01	Param.
Lead, total (mg/L)	MW-016	0.0002946	0.00006518	0.015	No	12	8.333	None	ln(x)	0.01	Param.
Lead, total (mg/L)	MW-107	0.0004	0.00004	0.015	No	14	85.71	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-1604D	0.0002	0.000035	0.015	No	24	45.83	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1604S	0.0002	0.000065	0.015	No	24	45.83	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1605D	0.0002	0.000021	0.015	No	24	50	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1605S	0.0002994	0.0001048	0.015	No	24	8.333	None	ln(x)	0.01	Param.
Lead, total (mg/L)	MW-1606D	0.0002	0.000087	0.015	No	24	50	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1606S	0.0002	0.00007	0.015	No	24	37.5	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1607D	0.0002	0.00005	0.015	No	24	41.67	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1607S	0.00019	0.00007	0.015	No	23	0	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1805	0.00121	0.0001	0.015	No	14	85.71	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-1922D	0.0002	0.0001	0.015	No	14	71.43	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-1922S	0.0003	0.00006	0.015	No	14	7.143	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1923	0.0009459	0.0002757	0.015	No	14	0	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1924	0.0004003	0.00008378	0.015	No	14	0	None	x^(1/3)	0.01	Param.
Lead, total (mg/L)	MW-1925	0.0002	0.00008	0.015	No	14	50	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1926	0.00024	0.00007	0.015	No	14	57.14	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-1927	0.000441	0.0001	0.015	No	14	57.14	None	No	0.01	NP (NDs)
Lead, total (mg/L)	MW-203	0.0002	0.000113	0.015	No	13	69.23	None	No	0.01	NP (NDs)
Lithium, total (mg/L)	JTMN-1	0.01203	0.005213	0.04	No	8	0	None	No	0.01	Param.
Lithium, total (mg/L)	JTMN-2	0.02278	0.008039	0.04	No	8	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-016	0.03232	0.02702	0.04	No	12	0	None	No	0.01	Param.

Confidence Interval - Assessment Monitoring- All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/27/2023, 5:11 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Lithium, total (mg/L)	MW-107	0.00486	0.00336	0.04	No	14	7.143	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1604D	0.051	0.019	0.04	No	24	4.167	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1604S	0.0426	0.0345	0.04	No	24	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1805	0.043	0.0248	0.04	No	14	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1922D	0.0126	0.00738	0.04	No	14	7.143	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1926	0.00744	0.00586	0.04	No	14	7.143	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1927	0.00725	0.00593	0.04	No	14	7.143	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-203	0.00238	0.00199	0.04	No	13	7.692	None	No	0.01	NP (normality)
Mercury, total (mg/L)	JTMN-1	0.000005	0.000003	0.002	No	8	50	None	No	0.004	NP (normality)
Mercury, total (mg/L)	JTMN-2	0.000008	0.000002	0.002	No	8	62.5	None	No	0.004	NP (NDs)
Mercury, total (mg/L)	MW-1604D	0.000036	0.000003	0.002	No	23	91.3	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1604S	0.000005	0.000003	0.002	No	23	95.65	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1605D	0.000005	0.000002	0.002	No	23	95.65	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1605S	0.000005	0.000003	0.002	No	23	95.65	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1606D	0.000005	0.000004	0.002	No	23	95.65	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1606S	0.000005	0.000002	0.002	No	23	95.65	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1607D	0.000005	0.000002	0.002	No	23	91.3	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1607S	0.000012	0.000003	0.002	No	23	86.96	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1922S	0.000005	0.000002	0.002	No	13	92.31	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1923	0.000005	0.000002	0.002	No	13	92.31	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1924	0.000005	0.000003	0.002	No	13	92.31	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	JTMN-1	0.01522	0.0049	0.1	No	8	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	JTMN-2	0.03158	0.008367	0.1	No	8	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-016	0.03861	0.03505	0.1	No	12	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-107	0.002	0.0002	0.1	No	14	35.71	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1604D	0.0181	0.0015	0.1	No	24	4.167	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1604S	0.01449	0.01074	0.1	No	24	0	None	x^3	0.01	Param.
Molybdenum, total (mg/L)	MW-1605D	0.04416	0.03559	0.1	No	24	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1605S	0.01743	0.01366	0.1	No	24	0	None	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	MW-1606D	0.07324	0.06609	0.1	No	24	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1606S	0.07982	0.05929	0.1	No	24	0	None	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	MW-1607D	0.08502	0.07555	0.1	No	24	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1607S	0.04128	0.03416	0.1	No	24	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1805	0.05771	0.01277	0.1	No	14	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1922D	0.478	0.0416	0.1	No	14	0	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1922S	0.03489	0.02821	0.1	No	14	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1923	0.334	0.0842	0.1	No	14	0	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1924	0.1096	0.08157	0.1	No	14	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1925	0.05817	0.04409	0.1	No	14	0	None	No	0.01	Param.
Molybdenum, total (mg/L)	MW-1926	0.00616	0.0043	0.1	No	14	0	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-1927	0.00282	0.001	0.1	No	14	0	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	MW-203	0.0013	0.0009	0.1	No	13	0	None	No	0.01	NP (normality)
Selenium, total (mg/L)	JTMN-1	0.001127	0.0004577	0.05	No	8	0	None	No	0.01	Param.
Selenium, total (mg/L)	JTMN-2	0.0009387	0.0003413	0.05	No	8	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-016	0.0001937	0.0001096	0.05	No	12	8.333	None	No	0.01	Param.
Selenium, total (mg/L)	MW-107	0.0007449	0.0004351	0.05	No	14	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1604D	0.001831	0.000929	0.05	No	24	0	None	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	MW-1604S	0.001673	0.0009489	0.05	No	24	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1605D	0.0002405	0.000167	0.05	No	24	8.333	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1605S	0.00121	0.0006762	0.05	No	24	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1606D	0.004694	0.002207	0.05	No	24	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1606S	0.002652	0.001337	0.05	No	24	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1607D	0.0005	0.00005	0.05	No	24	41.67	None	No	0.01	NP (normality)
Selenium, total (mg/L)	MW-1607S	0.007516	0.004739	0.05	No	24	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1805	0.0005	0.0001	0.05	No	14	71.43	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	MW-1922D	0.0005	0.00006	0.05	No	14	78.57	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	MW-1922S	0.0005	0.00009	0.05	No	14	42.86	None	No	0.01	NP (normality)
Selenium, total (mg/L)	MW-1923	0.02686	0.008416	0.05	No	14	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1924	0.001962	0.0006835	0.05	No	14	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1925	0.00537	0.003393	0.05	No	14	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1926	0.0009328	0.0003487	0.05	No	14	0	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	MW-1927	0.001102	0.0003963	0.05	No	14	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-203	0.001404	0.0008374	0.05	No	13	0	None	sqrt(x)	0.01	Param.
Thallium, total (mg/L)	JTMN-1	0.0002	0.00004	0.002	No	8	87.5	None	No	0.004	NP (NDs)
Thallium, total (mg/L)	MW-1604D	0.000235	0.0002	0.002	No	24	58.33	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1604S	0.00024	0.00004	0.002	No	24	4.167	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1605D	0.0002	0.00005	0.002	No	24	50	None	No	0.01	NP (normality)
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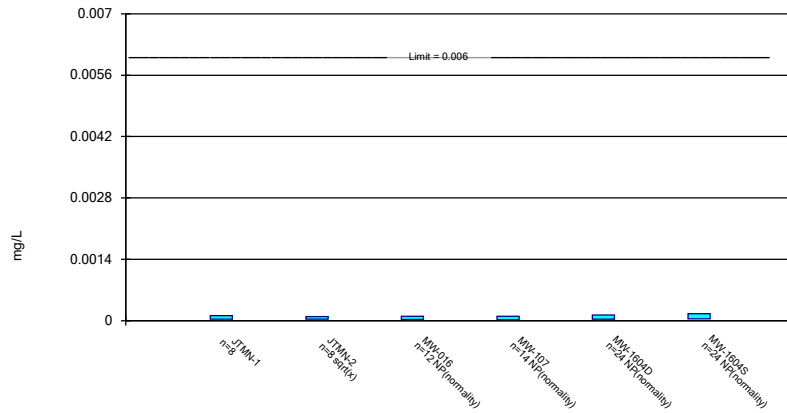
Confidence Interval - Assessment Monitoring- All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/27/2023, 5:11 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Thallium, total (mg/L)	MW-1606D	0.000123	0.00007	0.002	No	24	20.83	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1606S	0.000112	0.00006	0.002	No	24	20.83	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1607D	0.0002	0.00004	0.002	No	24	58.33	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1607S	0.00015	0.000058	0.002	No	24	25	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1922S	0.0002	0.00005	0.002	No	14	78.57	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1923	0.0002	0.00003	0.002	No	14	92.86	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1926	0.0002	0.00009	0.002	No	14	85.71	None	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

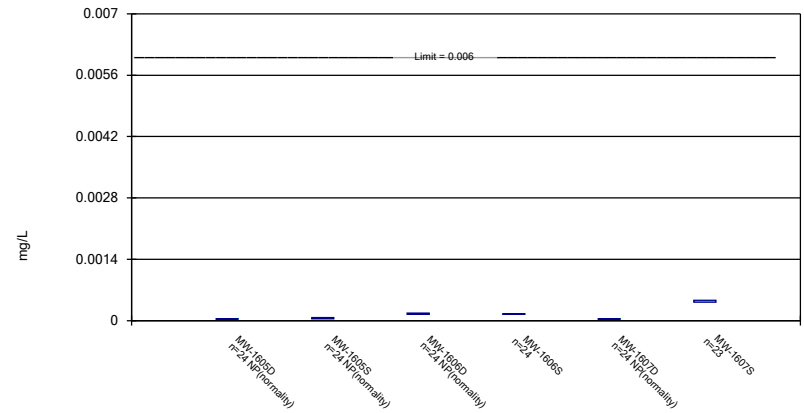
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Constituent: Antimony, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

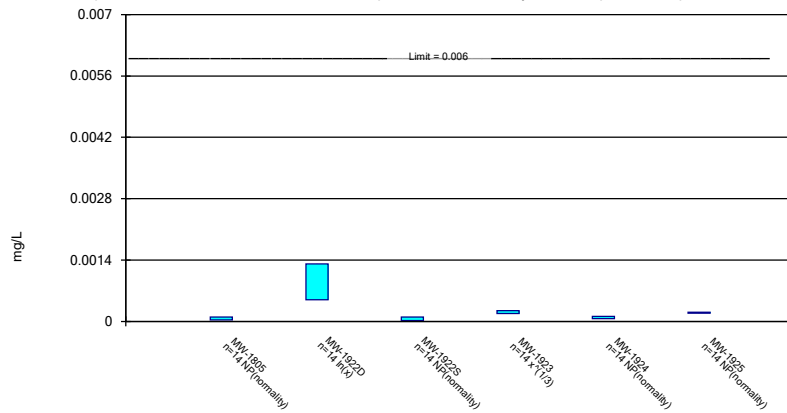
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Constituent: Antimony, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

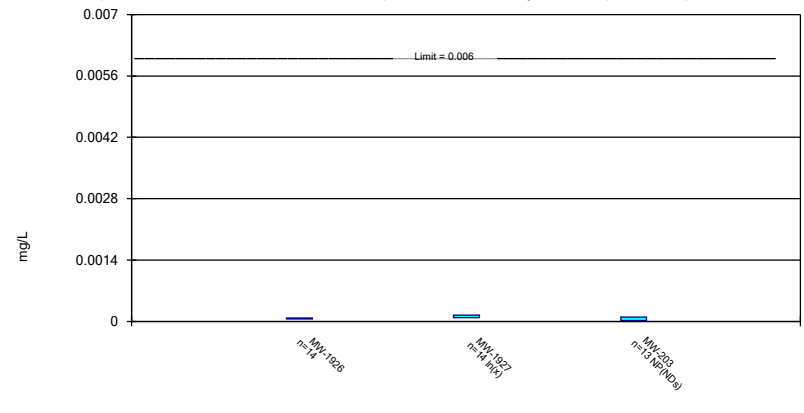
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Constituent: Antimony, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

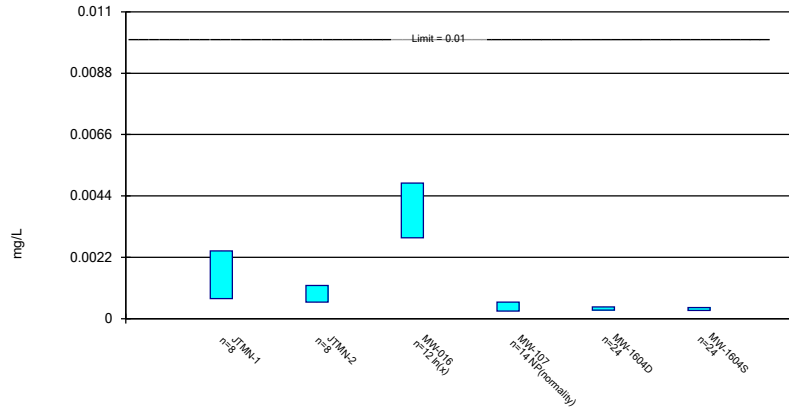
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Constituent: Antimony, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

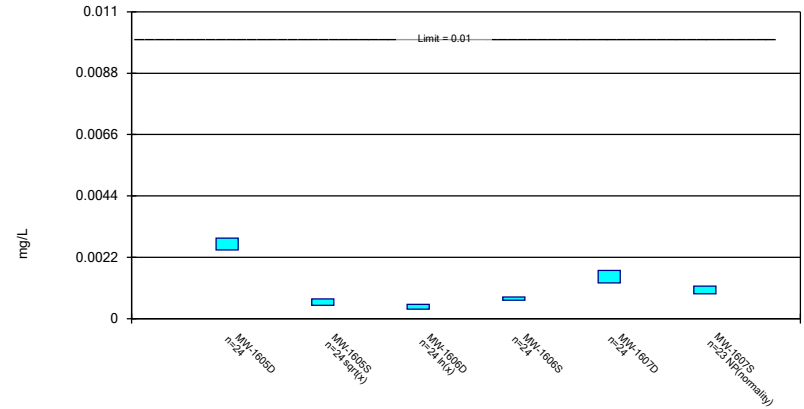
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Constituent: Arsenic, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

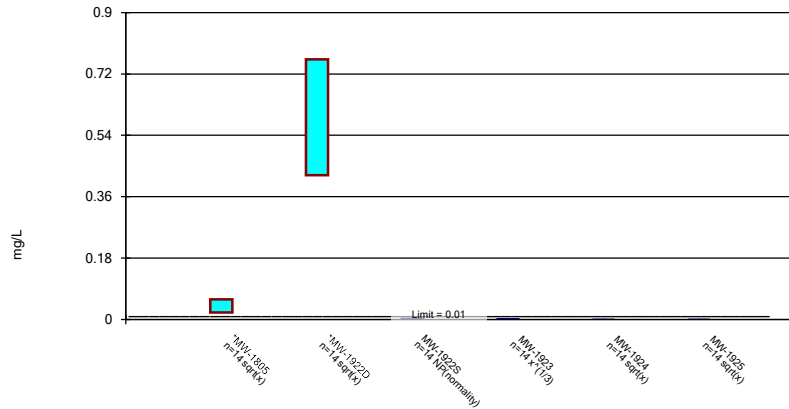
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Constituent: Arsenic, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

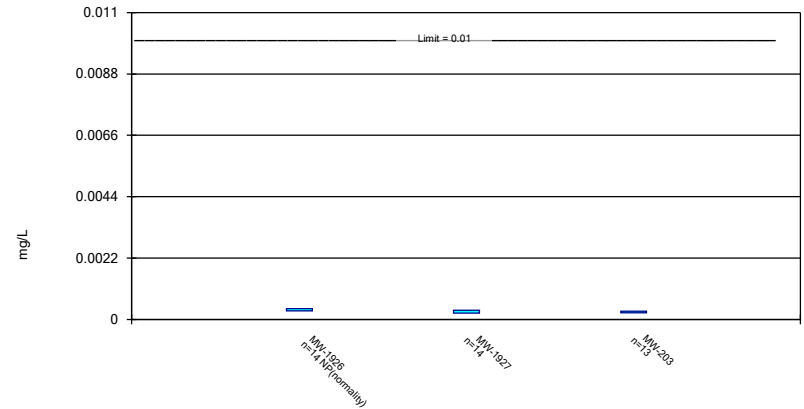
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Constituent: Arsenic, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

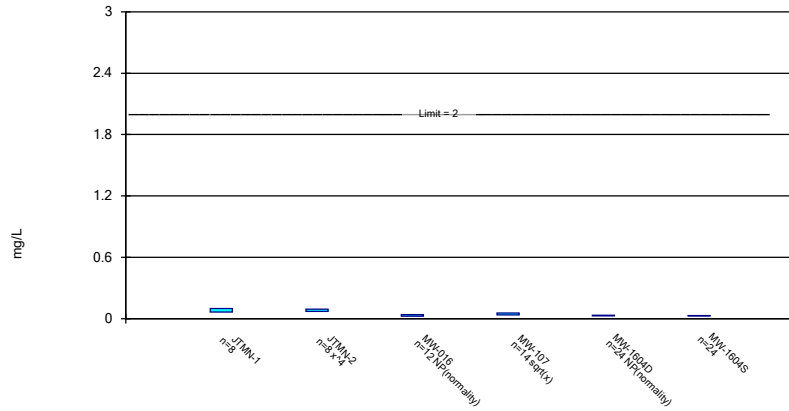
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Constituent: Arsenic, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

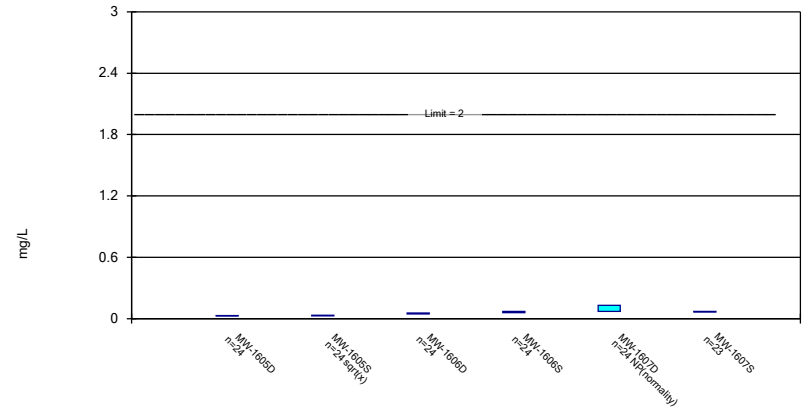
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Constituent: Barium, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

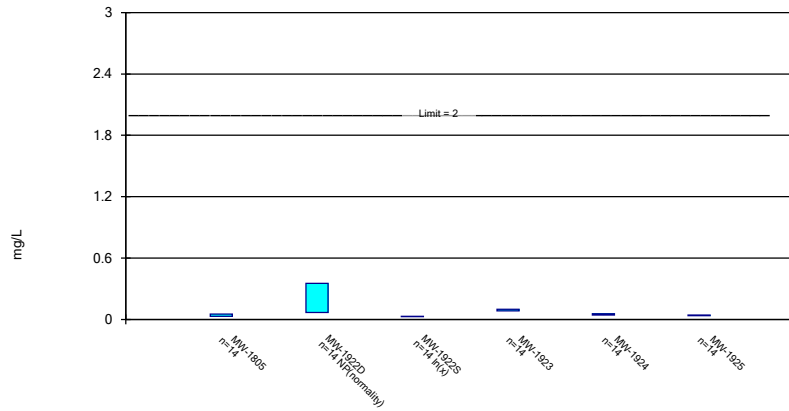
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Constituent: Barium, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

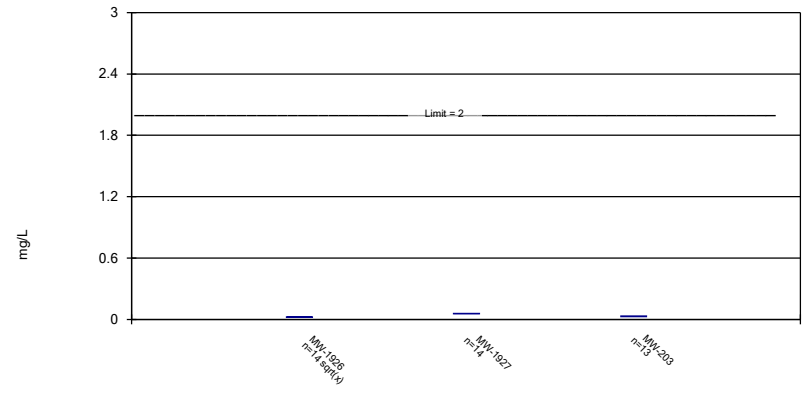
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Constituent: Barium, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

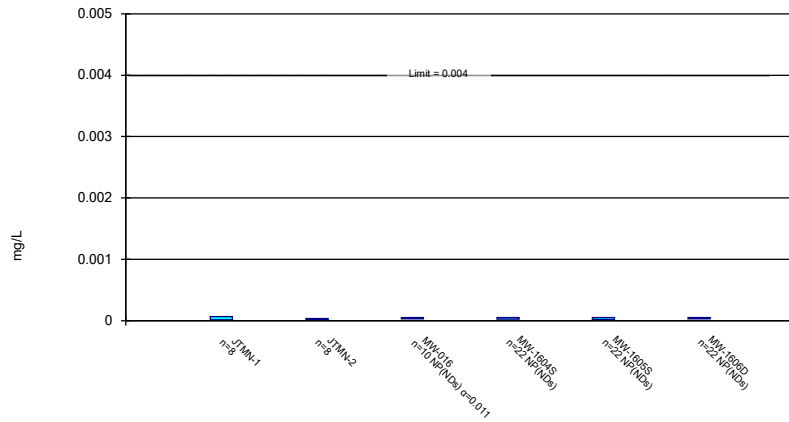
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Constituent: Barium, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

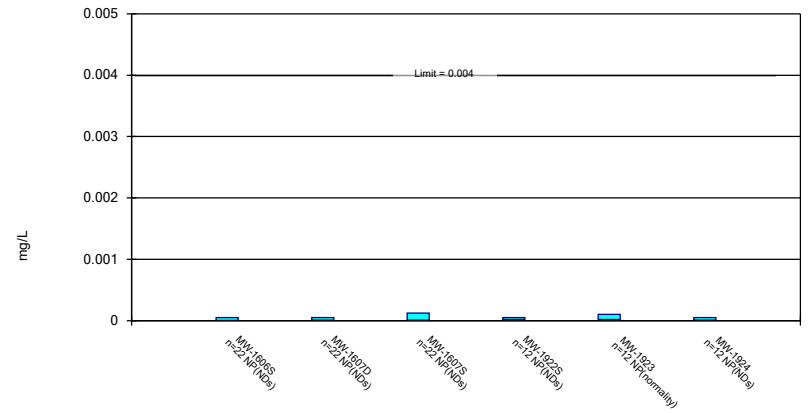
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Constituent: Beryllium, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

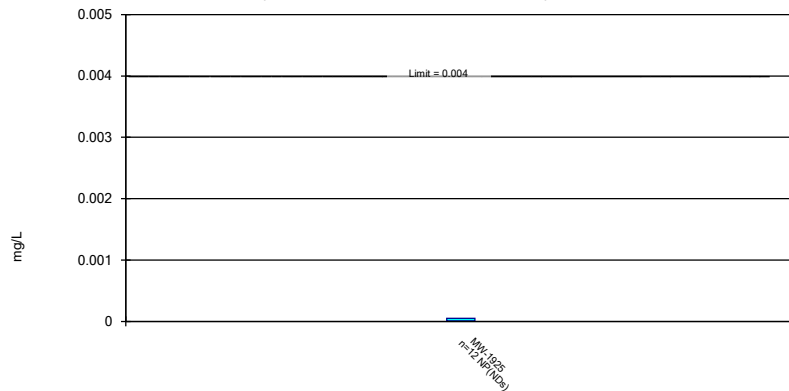
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Constituent: Beryllium, total Analysis Run 6/27/2023 5:09 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

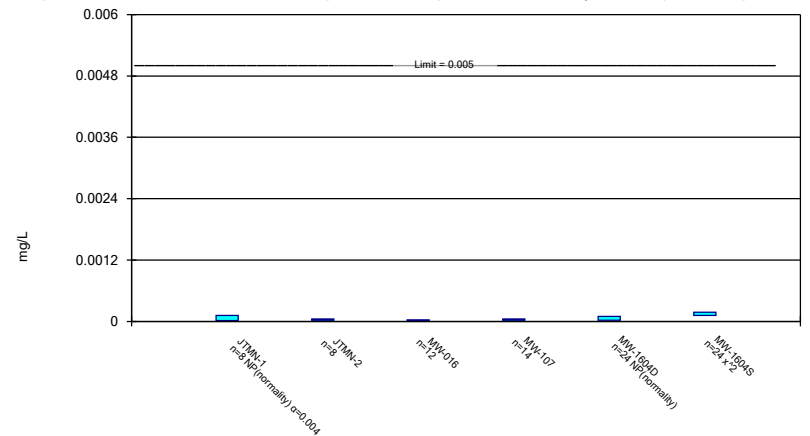
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Constituent: Beryllium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

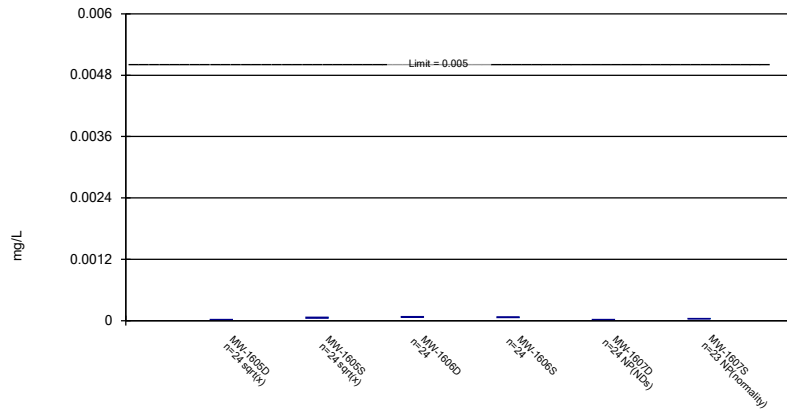
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

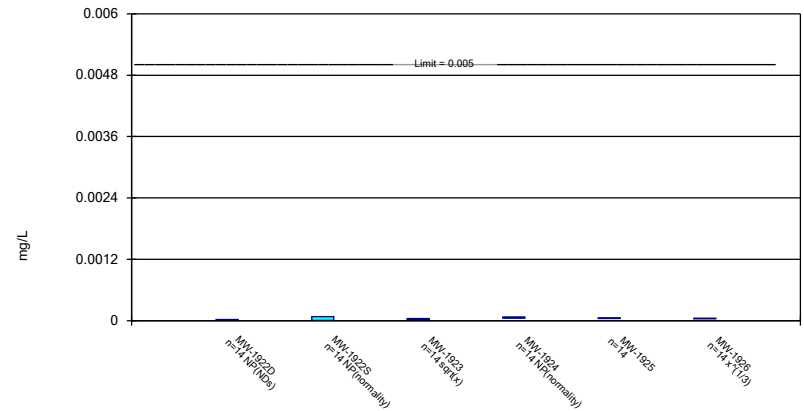
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Constituent: Cadmium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

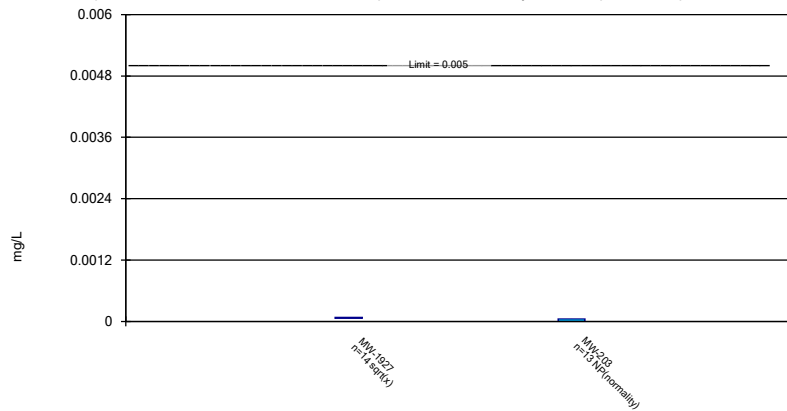
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

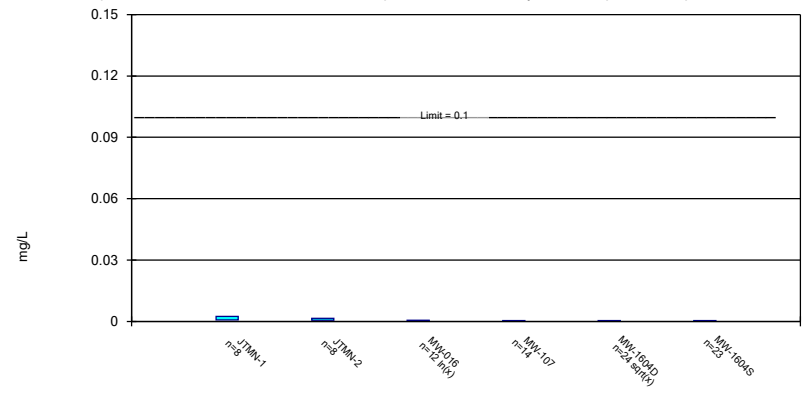
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Constituent: Cadmium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

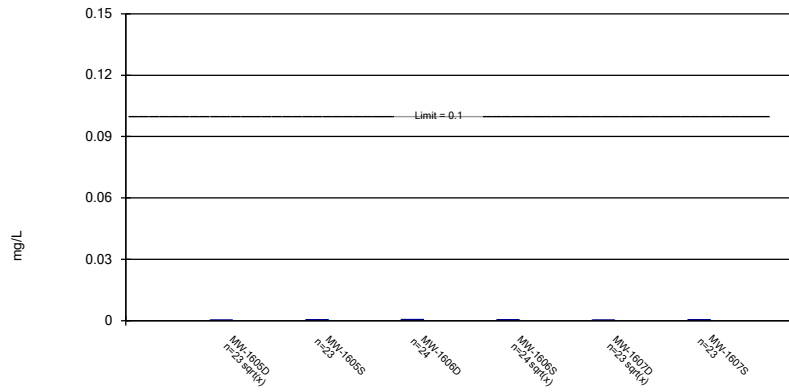
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

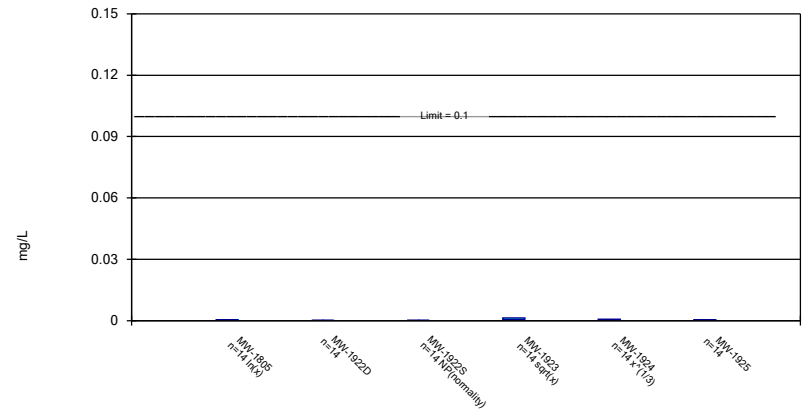
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

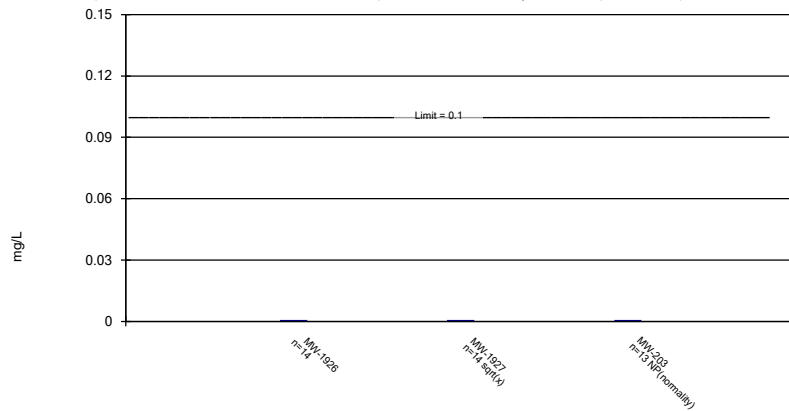
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

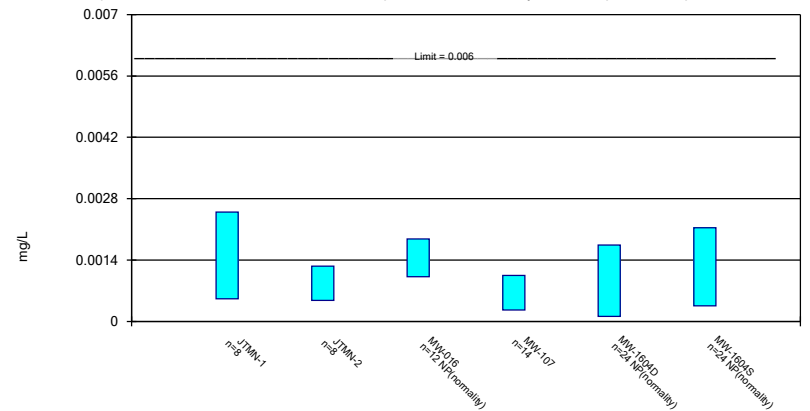
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

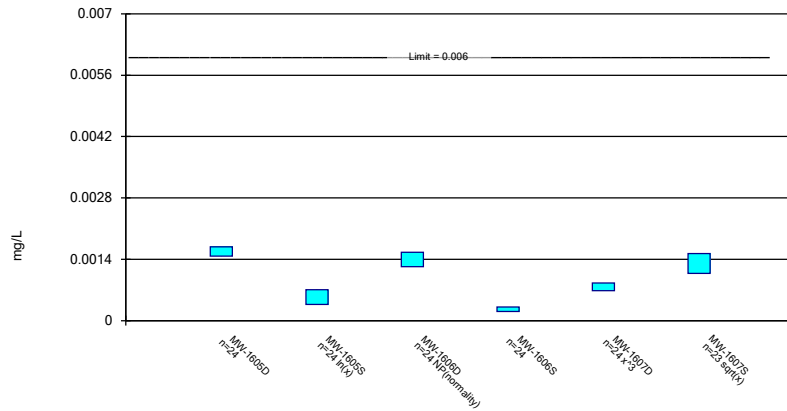
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

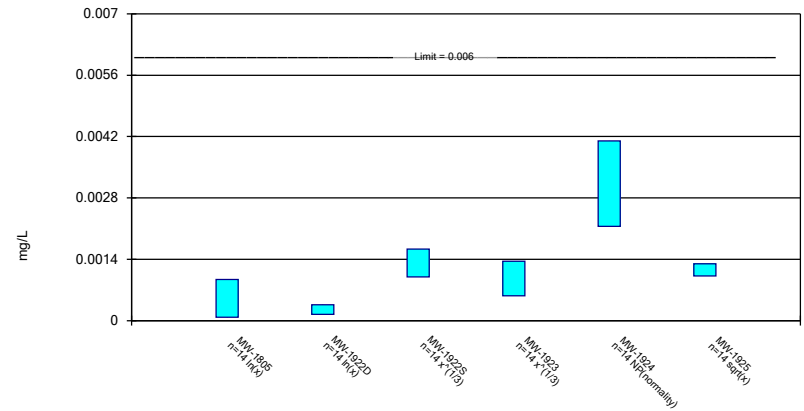
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

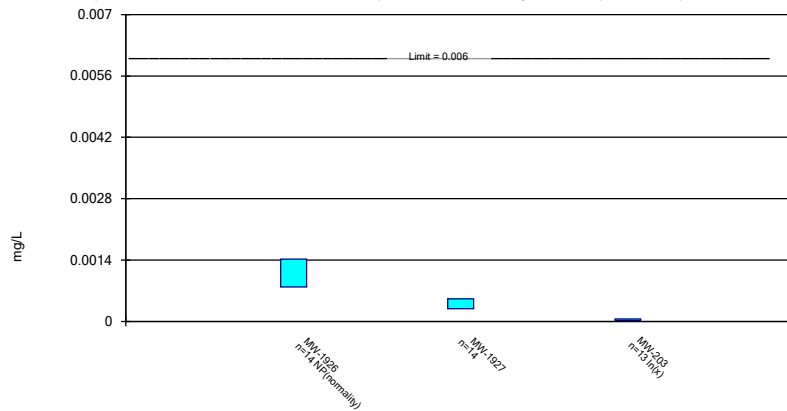
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

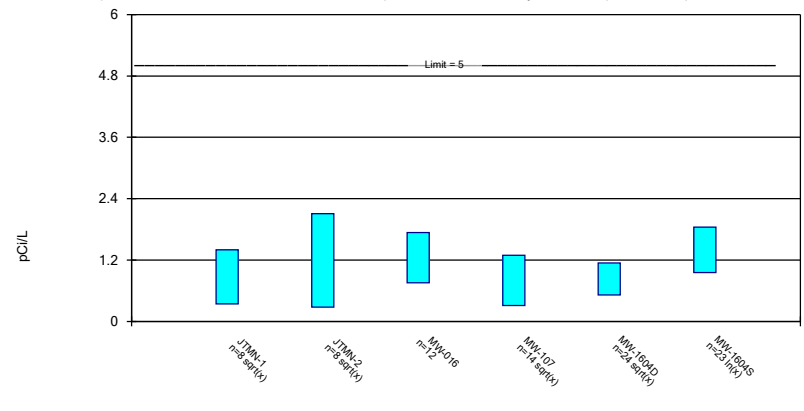
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

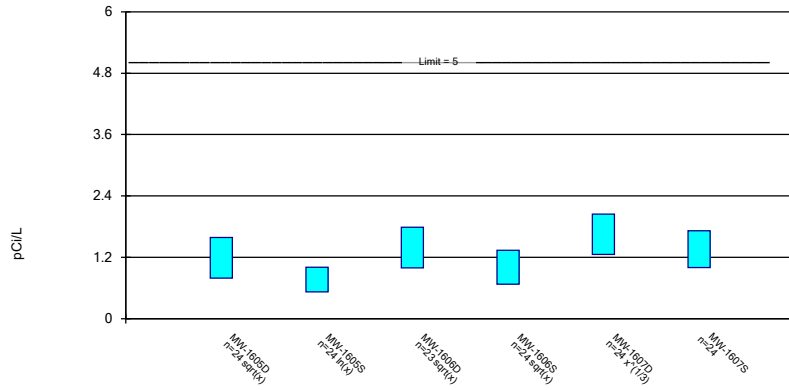
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

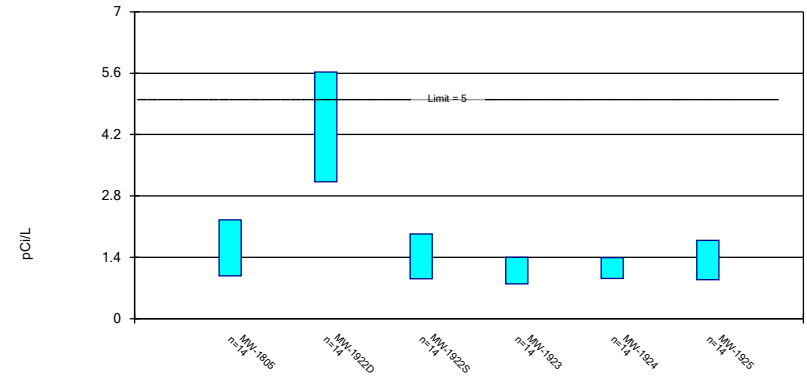
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

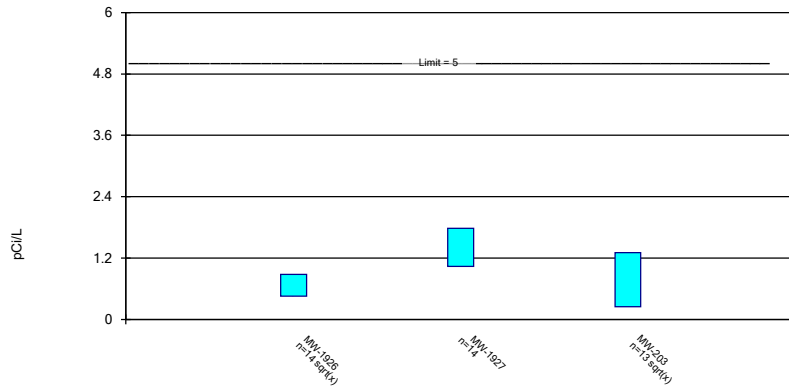
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

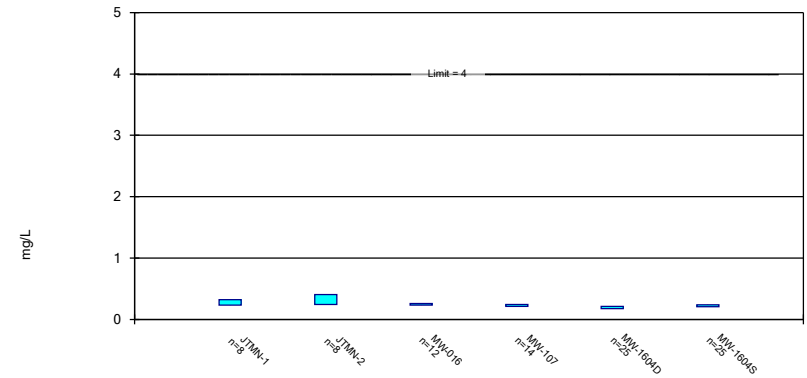
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

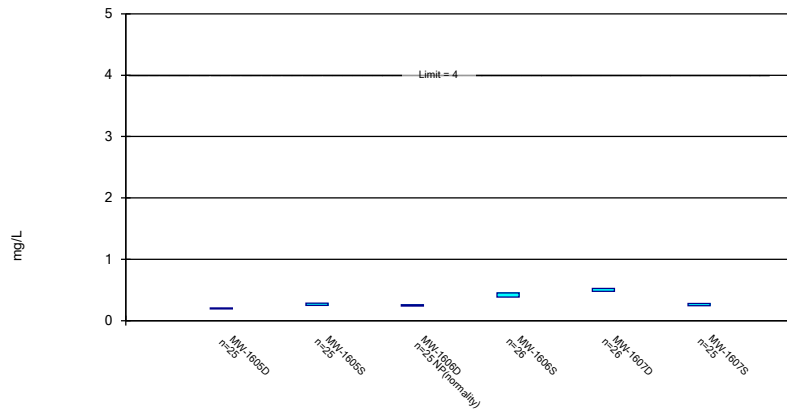
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

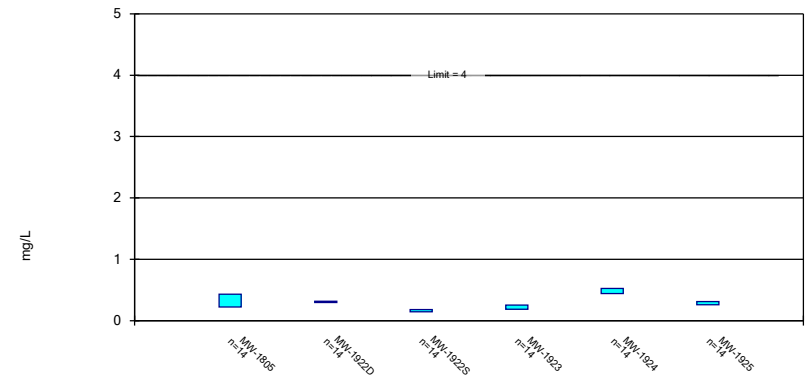
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

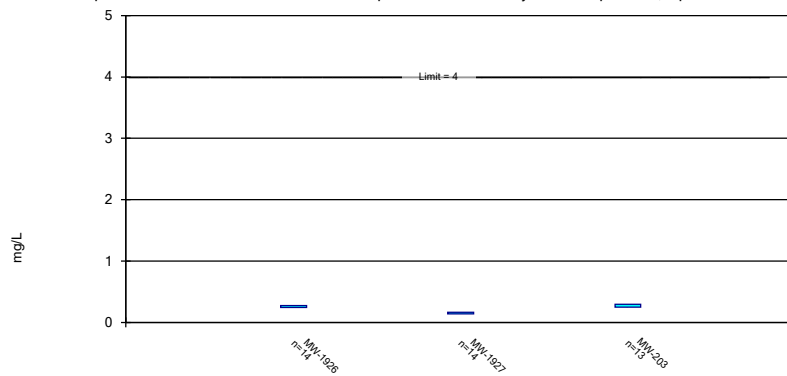
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

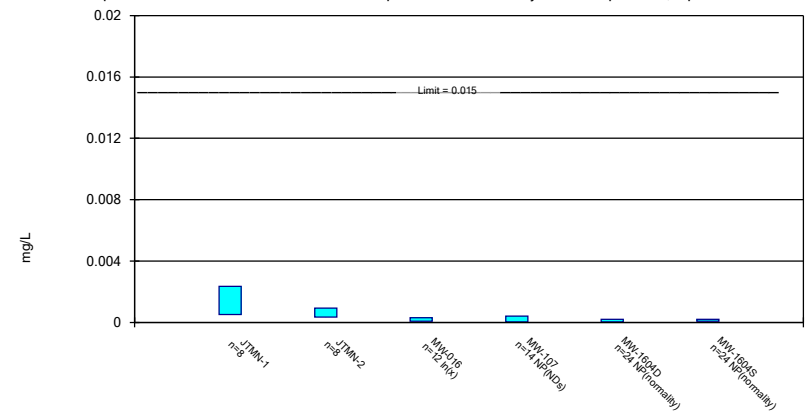
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

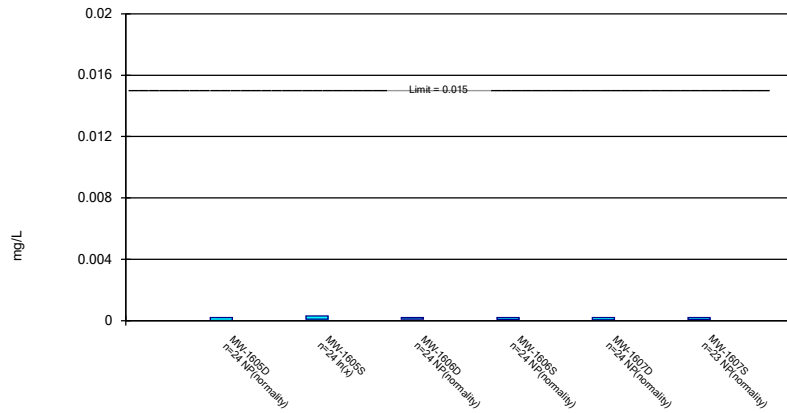
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

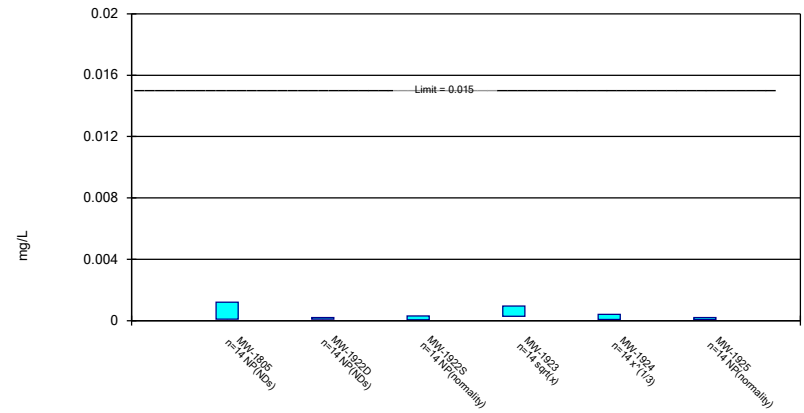
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

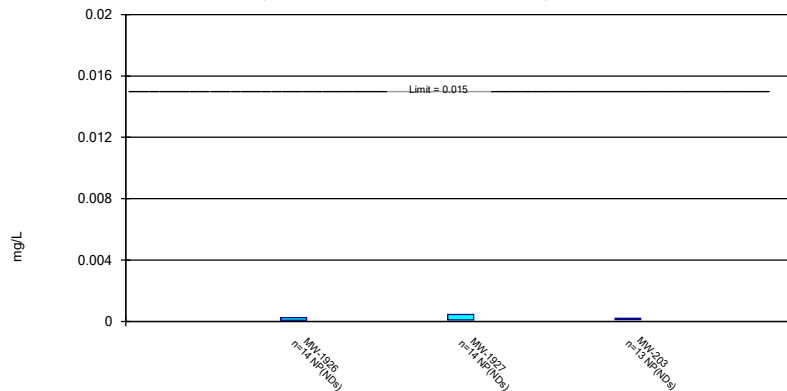
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

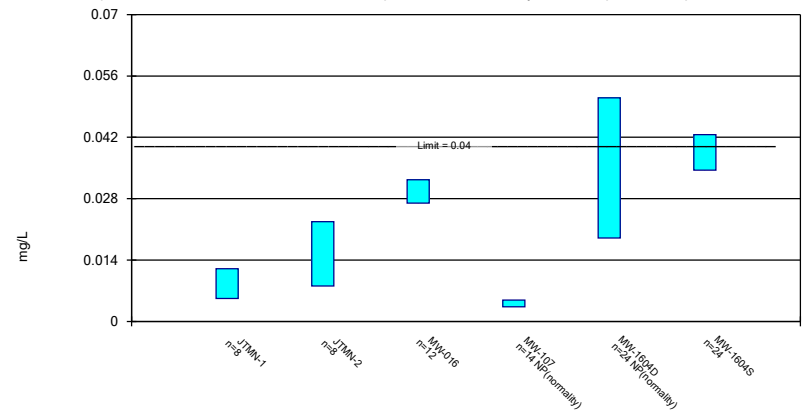
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

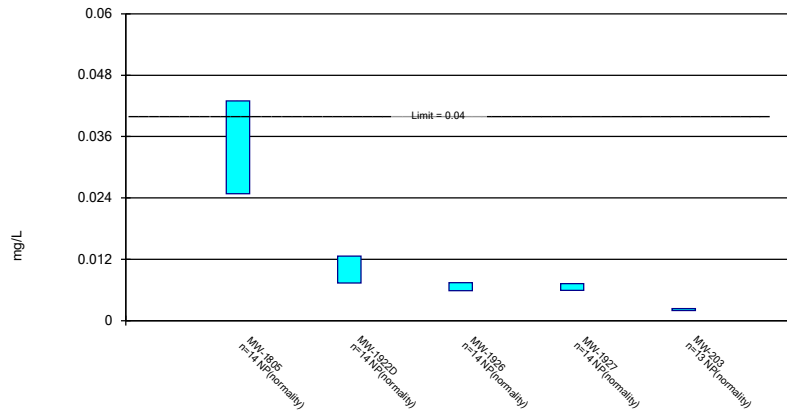
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

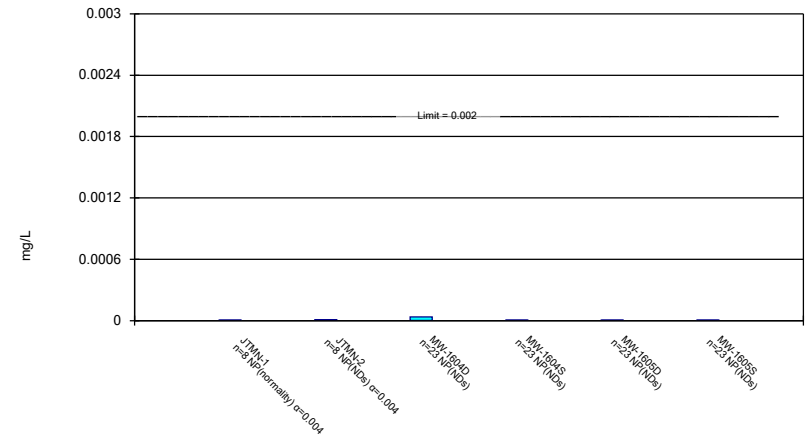
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lithium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

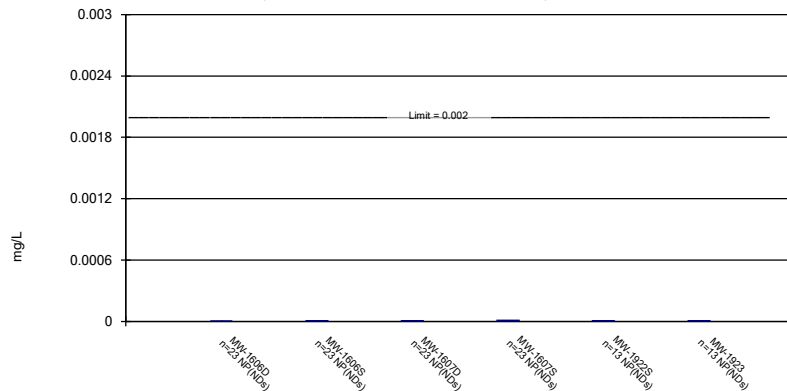
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Mercury, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

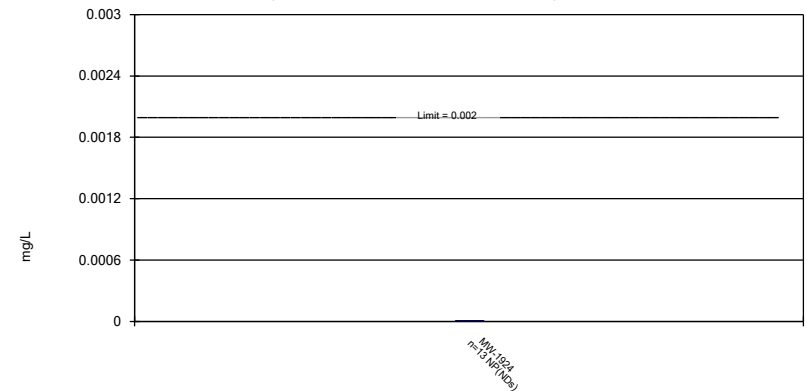
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

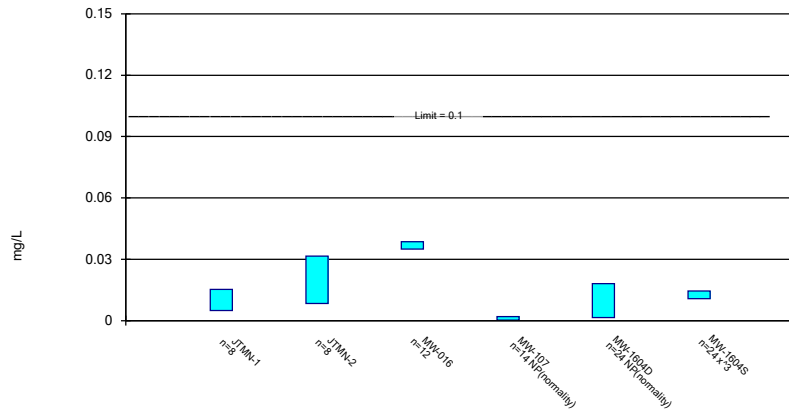
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

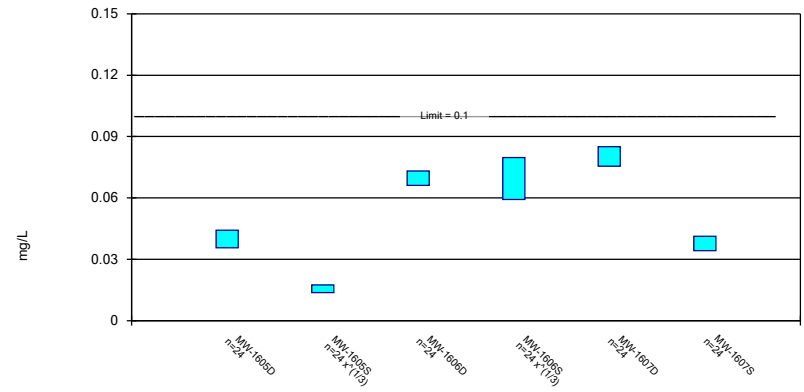
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

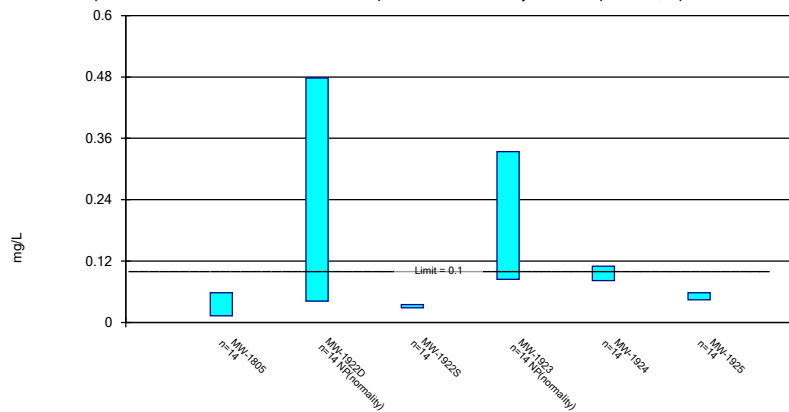
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

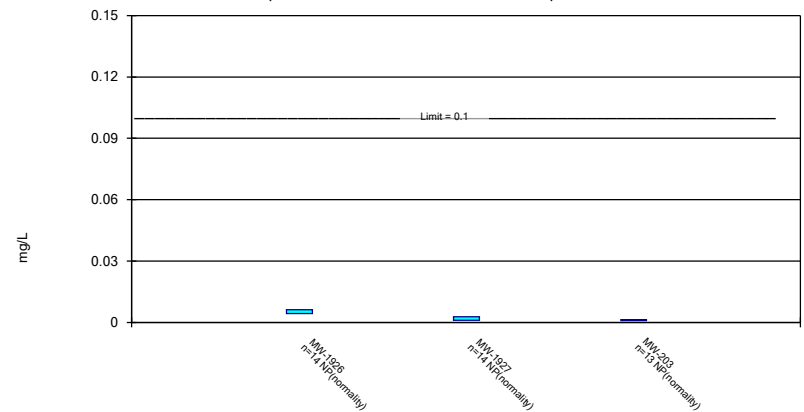
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

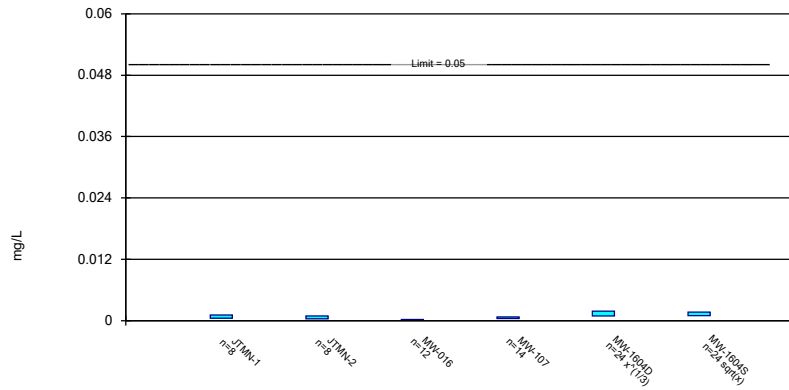
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

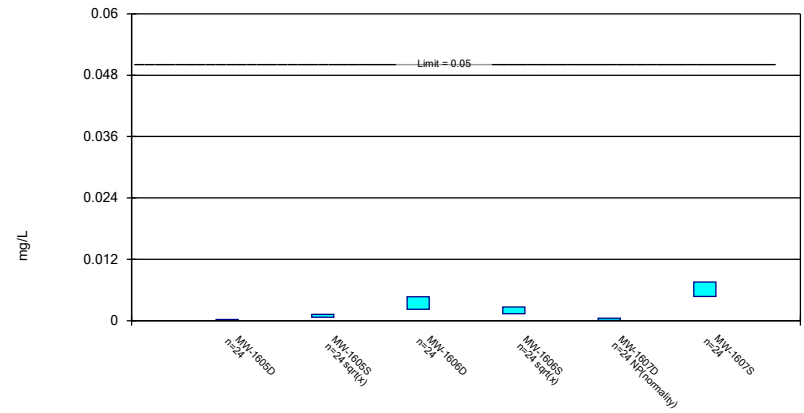
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

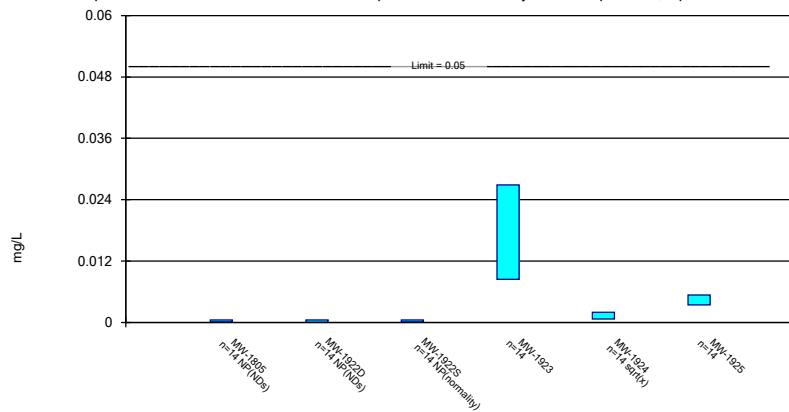
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric and Non-Parametric (NP) Confidence Interval

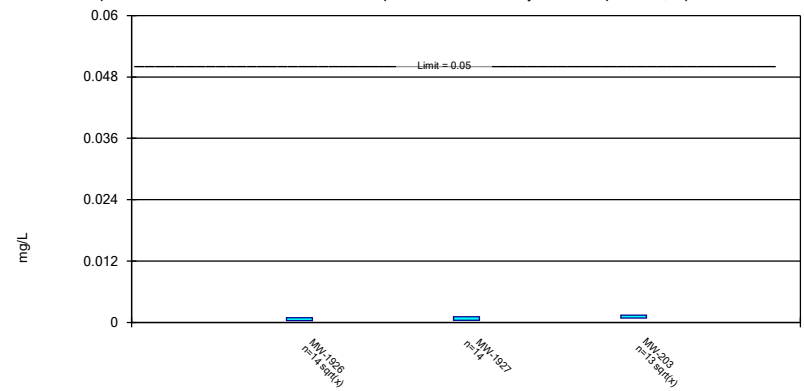
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

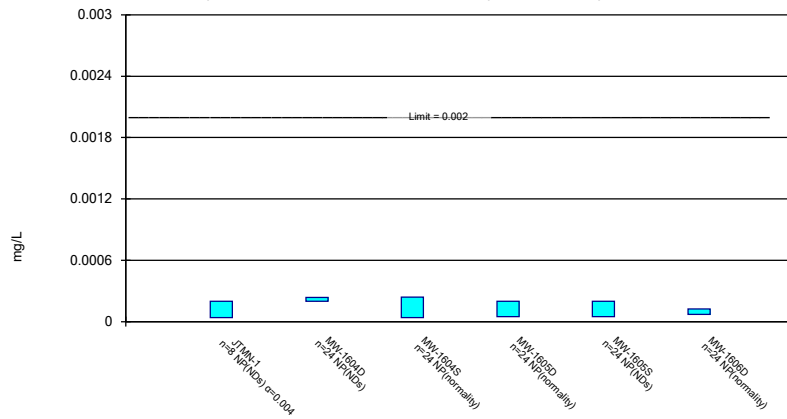
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

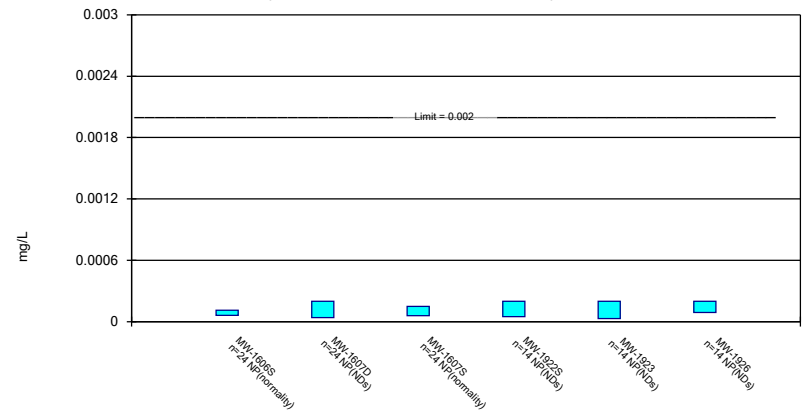
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Thallium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 6/27/2023 5:10 PM View: Confidence Interval
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE G
Confidence Interval (Corrective)

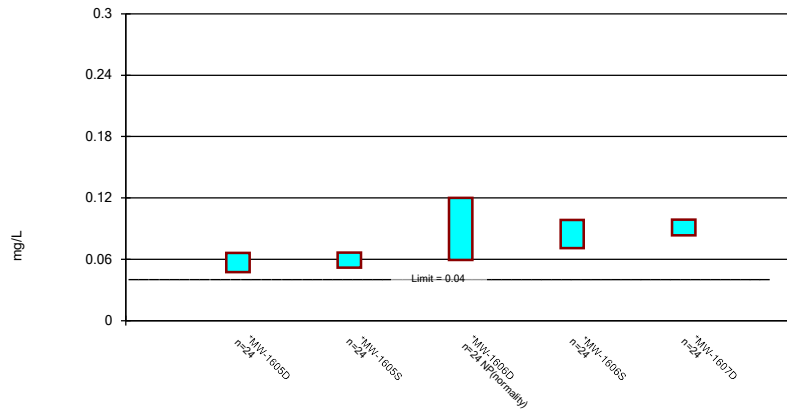
Confidence Interval - Corrective Action - All Results (All Significant)

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/21/2023, 5:35 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Lithium, total (mg/L)	MW-1605D	0.06609	0.04743	0.04	Yes	24	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1605S	0.06641	0.05184	0.04	Yes	24	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1606D	0.12	0.0594	0.04	Yes	24	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1606S	0.09831	0.07103	0.04	Yes	24	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1607D	0.09865	0.08333	0.04	Yes	24	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1607S	0.1067	0.09347	0.04	Yes	24	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1922S	0.0594	0.04147	0.04	Yes	14	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1923	0.1997	0.1453	0.04	Yes	14	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1924	0.1074	0.07346	0.04	Yes	14	0	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1925	0.08592	0.06518	0.04	Yes	14	0	None	No	0.01	Param.

Parametric and Non-Parametric (NP) Confidence Interval, Corrective Action Mode

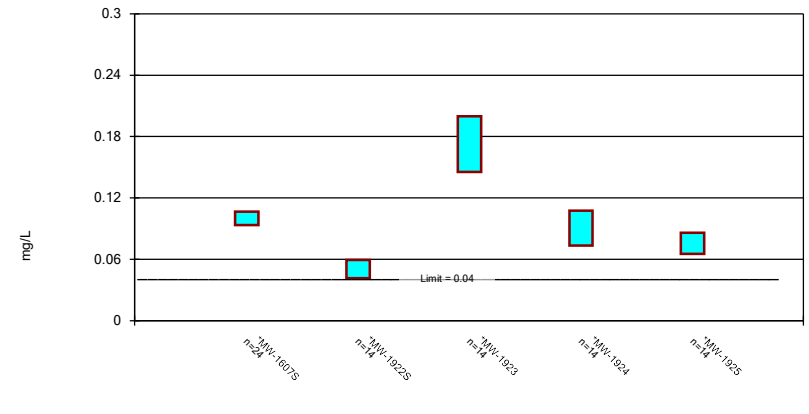
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 6/21/2023 5:34 PM View: Confidence Intervals - Corrective Action
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval, Corrective Action Mode

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



Constituent: Lithium, total Analysis Run 6/21/2023 5:34 PM View: Confidence Intervals - Corrective Action
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE H
Lithium Trend Tests with Confidence Bands

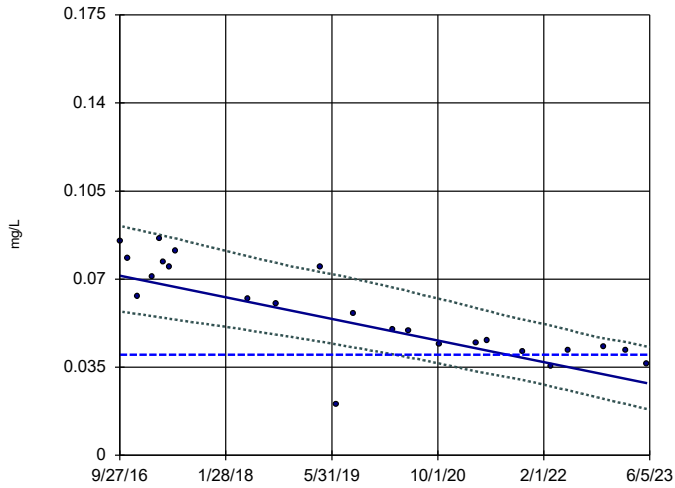
Corrective Action Trend Tests - All/Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 7/5/2023, 2:19 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Lithium, total (mg/L)	MW-1605D	-0.006424	-191	-81	Yes	24	0	n/a	n/a	0.05	NP
Lithium, total (mg/L)	MW-1605S	-0.005085	-169	-81	Yes	24	0	n/a	n/a	0.05	NP
Lithium, total (mg/L)	MW-1606D	-0.01171	-195	-81	Yes	24	0	n/a	n/a	0.05	NP
Lithium, total (mg/L)	MW-1606S	-0.01031	-189	-81	Yes	24	0	n/a	n/a	0.05	NP
Lithium, total (mg/L)	MW-1922S	-0.005929	-53	-37	Yes	14	0	n/a	n/a	0.05	NP
Lithium, total (mg/L)	MW-1924	-0.01346	-53	-37	Yes	14	0	n/a	n/a	0.05	NP
Lithium, total (mg/L)	MW-1925	-0.008489	-59	-37	Yes	14	0	n/a	n/a	0.05	NP

Sen's Slope and 95% Confidence Band

MW-1605D

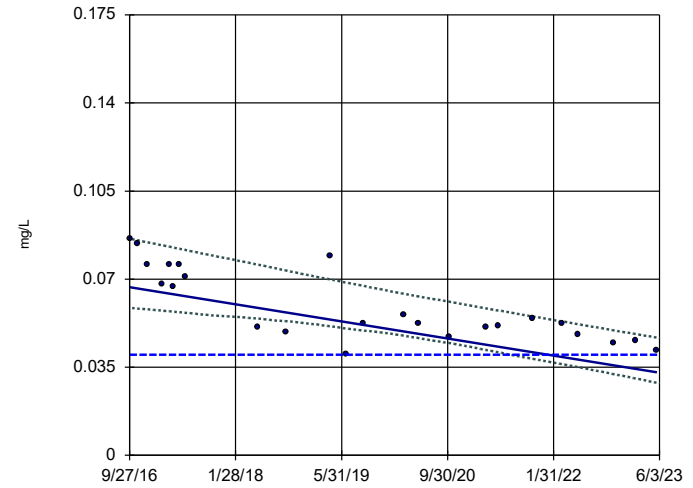


n = 24
 Slope = -0.006424 units per year.
 Mann-Kendall statistic = -191
 critical = -81
 Decreasing trend significant at 95% confidence level (α = 0.025 per tail).
 Confidence band intersects GWPS (0.04) on 03/25/20.

Constituent: Lithium, total Analysis Run 7/5/2023 2:14 PM View: Confidence Intervals - CA
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope and 95% Confidence Band

MW-1605S

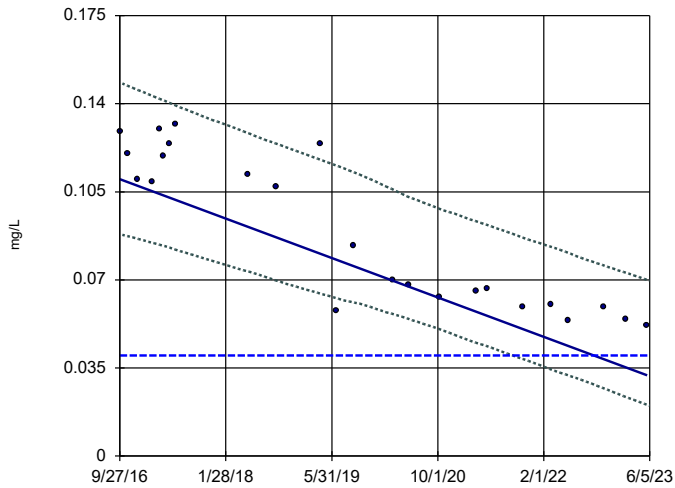


n = 24
 Slope = -0.005085 units per year.
 Mann-Kendall statistic = -169
 critical = -81
 Decreasing trend significant at 95% confidence level (α = 0.025 per tail).
 Confidence band intersects GWPS (0.04) on 07/23/21.

Constituent: Lithium, total Analysis Run 7/5/2023 2:14 PM View: Confidence Intervals - CA
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope and 95% Confidence Band

MW-1606D

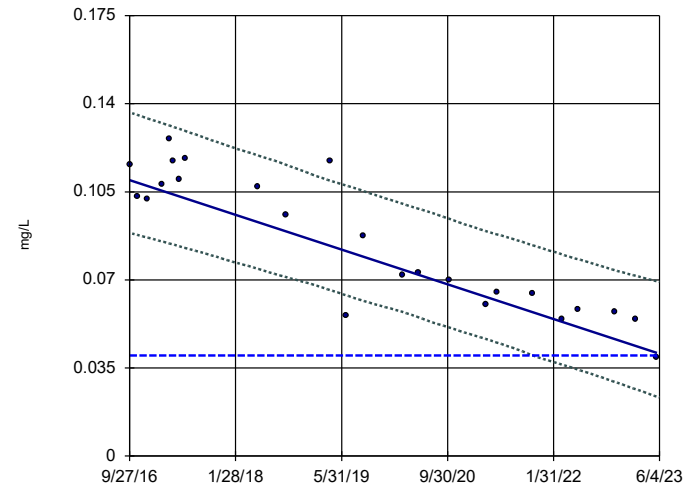


n = 24
 Slope = -0.01171 units per year.
 Mann-Kendall statistic = -195
 critical = -81
 Decreasing trend significant at 95% confidence level (α = 0.025 per tail).
 Confidence band intersects GWPS (0.04) on 09/11/21.

Constituent: Lithium, total Analysis Run 7/5/2023 2:14 PM View: Confidence Intervals - CA
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope and 95% Confidence Band

MW-1606S

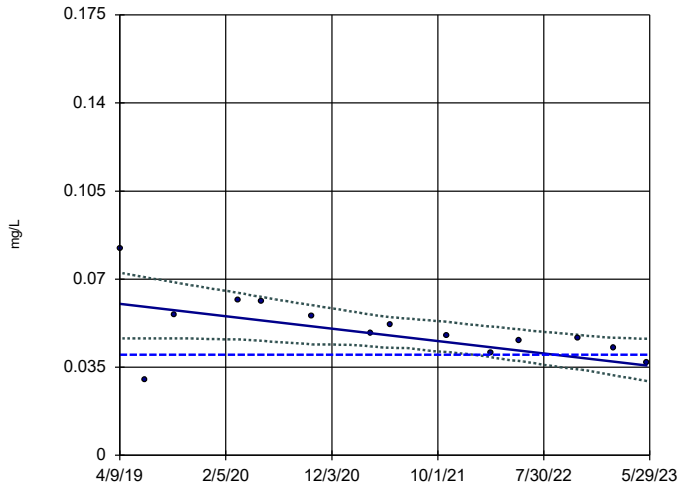


n = 24
 Slope = -0.01031 units per year.
 Mann-Kendall statistic = -189
 critical = -81
 Decreasing trend significant at 95% confidence level (α = 0.025 per tail).
 Confidence band intersects GWPS (0.04) on 10/29/21.

Constituent: Lithium, total Analysis Run 7/5/2023 2:14 PM View: Confidence Intervals - CA
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope and 95% Confidence Band

MW-1922S

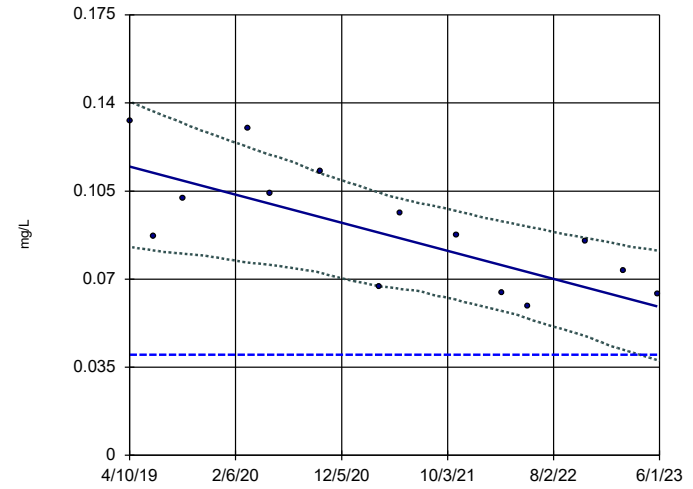


n = 14
 Slope = -0.005929
 units per year.
 Mann-Kendall
 statistic = -53
 critical = -37
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).
 Confidence band intersects
 GWPS (0.04) on 01/18/22.

Constituent: Lithium, total Analysis Run 7/5/2023 2:18 PM View: Confidence Intervals - CA
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope and 95% Confidence Band

MW-1924

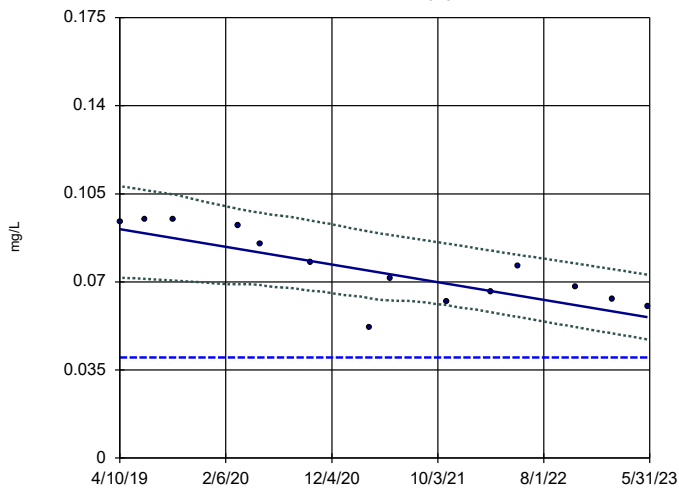


n = 14
 Slope = -0.01346
 units per year.
 Mann-Kendall
 statistic = -53
 critical = -37
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).
 Confidence band intersects
 GWPS (0.04) on 04/17/23.

Constituent: Lithium, total Analysis Run 7/5/2023 2:19 PM View: Confidence Intervals - CA
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Sen's Slope and 95% Confidence Band

MW-1925



n = 14
 Slope = -0.008489
 units per year.
 Mann-Kendall
 statistic = -59
 critical = -37
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).
 Confidence band is
 above GWPS (0.04).

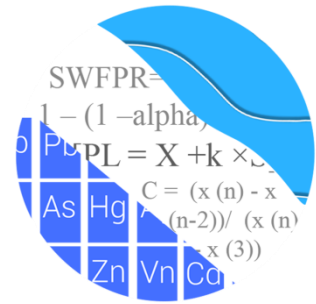
Constituent: Lithium, total Analysis Run 7/5/2023 2:19 PM View: Confidence Intervals - CA
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

ATTACHMENT C
MW-1921 Statistical Analysis Output

GROUNDWATER STATS CONSULTING

July 6, 2023

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
500 W. Wilson Bridge Road, Suite 250
Worthington, OH 43085



Re: Mountaineer Bottom Ash Pond
Assessment Monitoring Report & Corrective Action – 2023
Well MW-1921

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the Assessment Monitoring and Corrective Action statistical analysis of groundwater data for Nature and Extent well MW-1921 through May 2023 at American Electric Power Company’s Mountaineer Bottom Ash Pond. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009). Sampling began at this well in 2019.

Data were sent electronically, and the statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC. This analysis was reviewed by Andrew Collins, Project Manager of Groundwater Stats Consulting.

The CCR program consists of the following constituents listed below. The terms “constituent” and “parameter” are interchangeable.

- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Time series and box plots for Appendix IV parameters are provided for all wells and constituents and are used to evaluate concentrations over the entire record (Figures A and B, respectively). Values in background which have previously been flagged as outliers may be seen in a lighter font and disconnected symbol on the graphs. While the reporting limits may vary from well to well, a single reporting limit substitution is used across all wells for a given parameter in the time series plots since the wells are plotted as a group.

Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. Since all wells contained less than 100% non-detects, all constituents were analyzed for nature and extent well MW-1921. For all constituents, a substitution of the most recent reporting limit is used for non-detect data. When calculating confidence intervals, the substitution is performed for individual wells and may differ across wells. This generally gives the most conservative limit in each case.

Summary of Statistical Methods – Appendix IV Parameters

Interwell upper tolerance limits (UTLs) are used to establish background limits for both Assessment Monitoring and Corrective Action Monitoring. A Groundwater Protection Standard (GWPS) for each Appendix IV constituent is then established using the higher of the background limit or a regulatory limit. A confidence interval for each downgradient well/constituent is compared against the corresponding GWPS. More details for both Assessment and Corrective Action monitoring are given below.

Parametric tolerance limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (USEPA, 2009), data are analyzed using either parametric or non-parametric tolerance limits as appropriate. Non-detects are handled as follows:

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.

- Nonparametric tolerance limits are used on data containing greater than 50% non-detects.

Summary of Appendix IV Background Update – Conducted in January 2023

Outlier Analysis

Prior to evaluating Appendix IV parameters, background (upgradient) data were screened through visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. High outliers are also 'cautiously' flagged in the downgradient wells when they are clearly much different from the rest of the data. This is intended to be a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals; although it will also reduce the mean and thus lower the entire interval. The intent is to better represent the actual downgradient mean. For the January 2023 update, Tukey's outlier test on pooled upgradient well data did not identify any outliers for nature and extent well MW-1921; therefore, no values were flagged as outliers.

Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data during the Fall 2022 statistical analysis using data through November 2022 for Appendix IV parameters (Figure C). Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were constructed using the highest background measurement. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. These limits are updated annually and will be updated again after the Fall 2023 sample event.

Groundwater Protection Standards

Interwell upper tolerance limits were compared to the Maximum Contaminant Levels (MCLs) and CCR-Rule specified levels in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure D).

Evaluation of Appendix IV Parameters – Well MW-1921 – May 2023

Assessment Monitoring

Confidence intervals were constructed for all Appendix IV parameters under assessment monitoring protocols, except for lithium which was evaluated under corrective action protocols, and compared to the GWPS described above (Figures E and F, respectively). These intervals were constructed as either parametric or nonparametric confidence intervals depending on the data distribution and percentage of non-detects. When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. Nonparametric confidence intervals were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

As discussed above, the highest limit of the MCL, CCR-Rule specified level, or background limit was used to establish the GWPS. A statistically significant level (SSL) is declared only when the entire confidence interval is above a GWPS. Complete graphical results of the confidence intervals follow this letter. An exceedance was identified for the following constituent:

- Molybdenum: MW-1921

Corrective Action

In 2022, Mountaineer BAP entered Corrective Action protocols for lithium due to previously identified SSLs. Confidence intervals were constructed using data through May 2023 for this constituent at nature and extent well MW-1921. These confidence intervals are then compared to the same GWPS used in Assessment Monitoring to evaluate the effectiveness of remedial efforts over time. Only when the entire confidence interval is below the GWPS for a period of 3 years is the well/constituent pair declared to be in compliance with its respective standard.

Lithium will continue to be evaluated under Corrective Action protocols using confidence intervals for these well/constituent pairs during the Monitoring and Natural Attenuation program. In future analyses, if confidence interval exceedances are identified for lithium at additional wells during Assessment Monitoring, data from these wells will also be evaluated only within the Corrective Action protocols until compliance is achieved.

Complete graphical results of the confidence intervals follow this letter. An exceedance was identified for the following constituent:

- Lithium: MW-1921

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Mountaineer Bottom Ash Pond. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



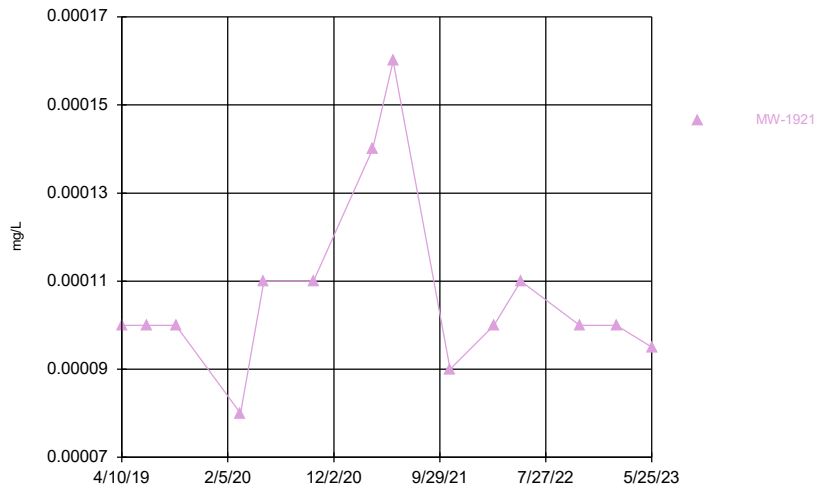
Tristan Clark
Groundwater Analyst



Andrew Collins
Project Manager

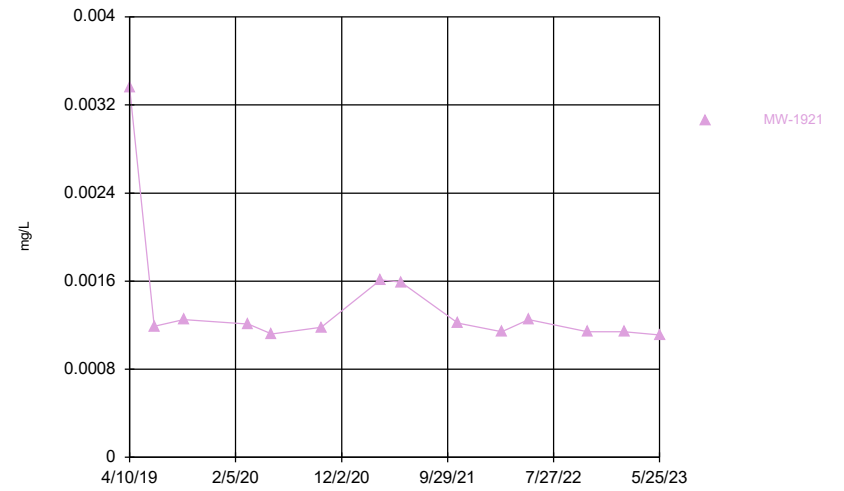
FIGURE A
Time Series

Time Series



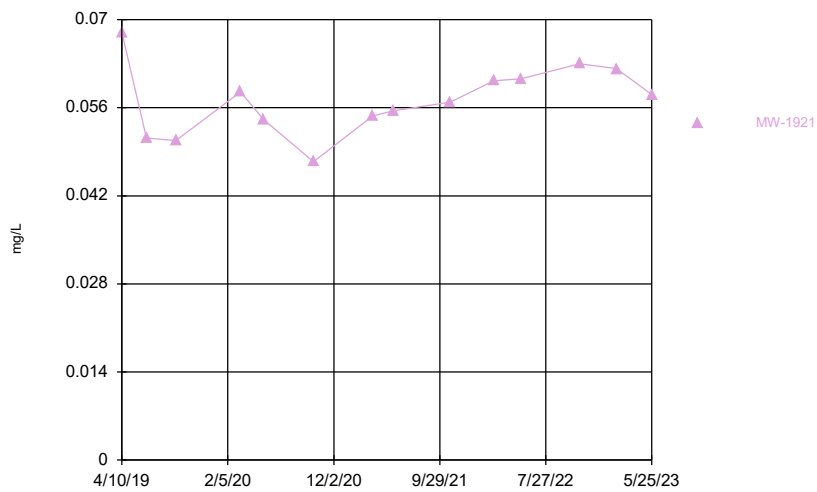
Constituent: Antimony, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



Constituent: Arsenic, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

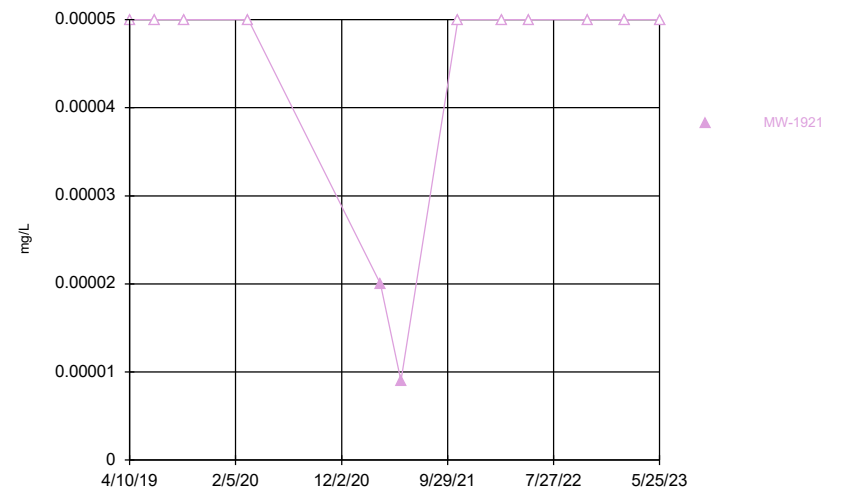
Time Series



Constituent: Barium, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

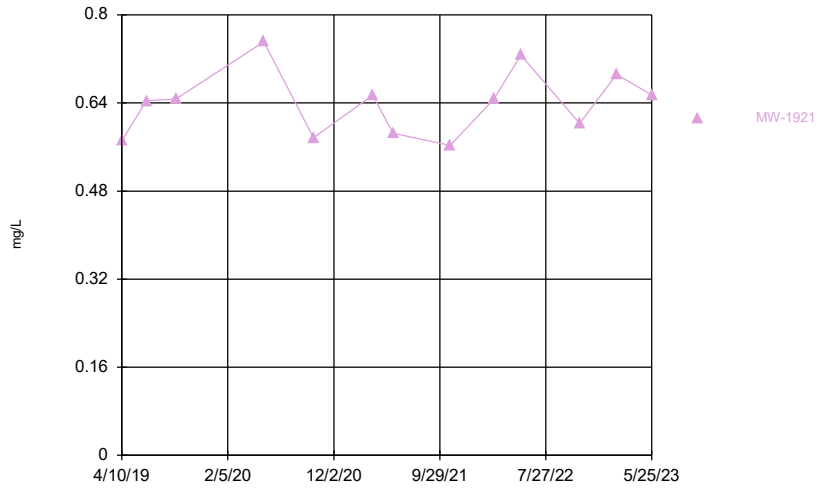
Hollow symbols indicate censored values.

Time Series



Constituent: Beryllium, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

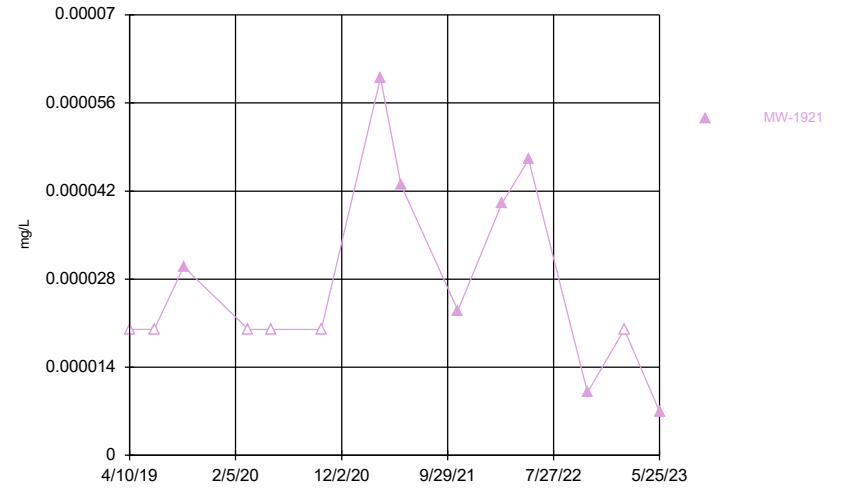
Time Series



Constituent: Boron, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

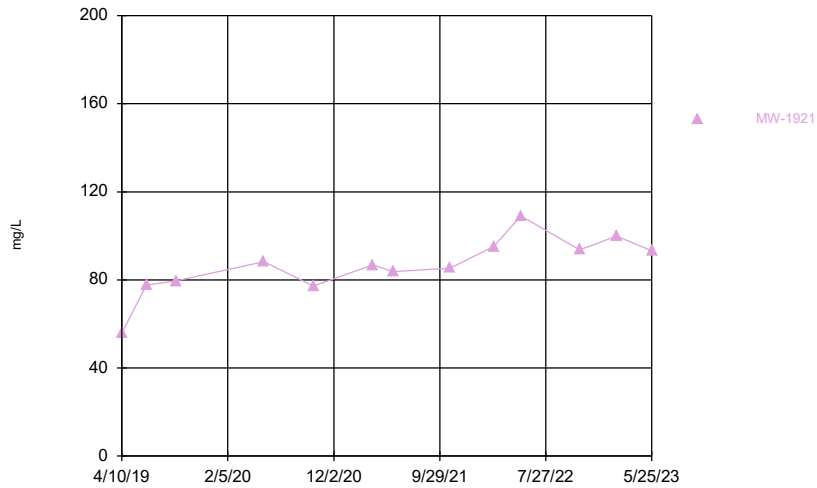
Hollow symbols indicate censored values.

Time Series



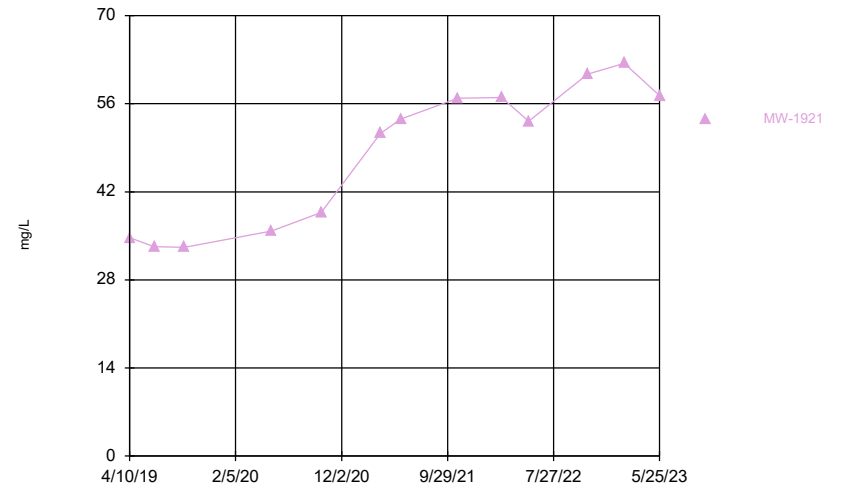
Constituent: Cadmium, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



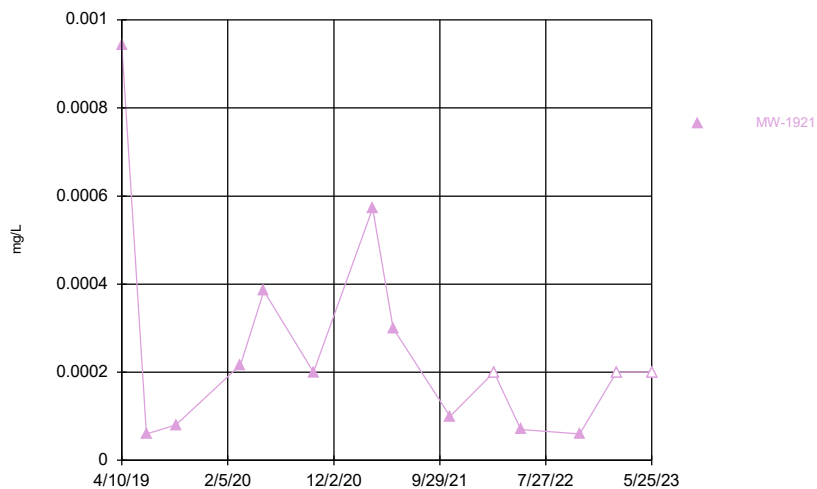
Constituent: Calcium, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



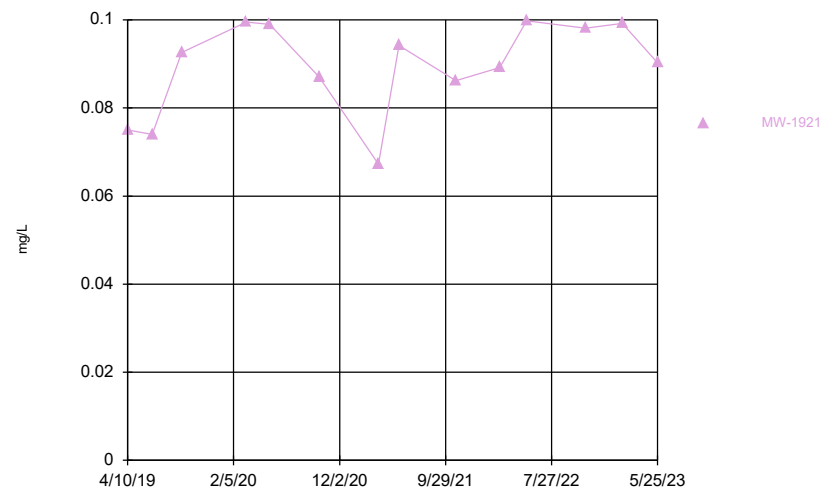
Constituent: Chloride, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



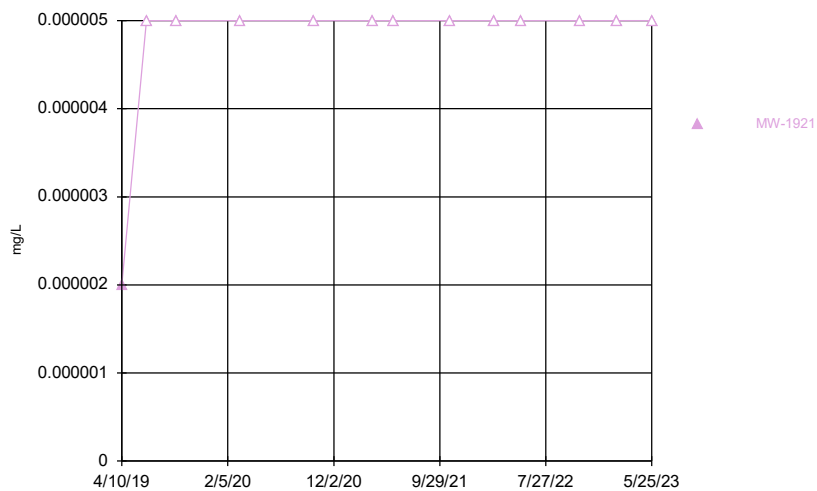
Constituent: Lead, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



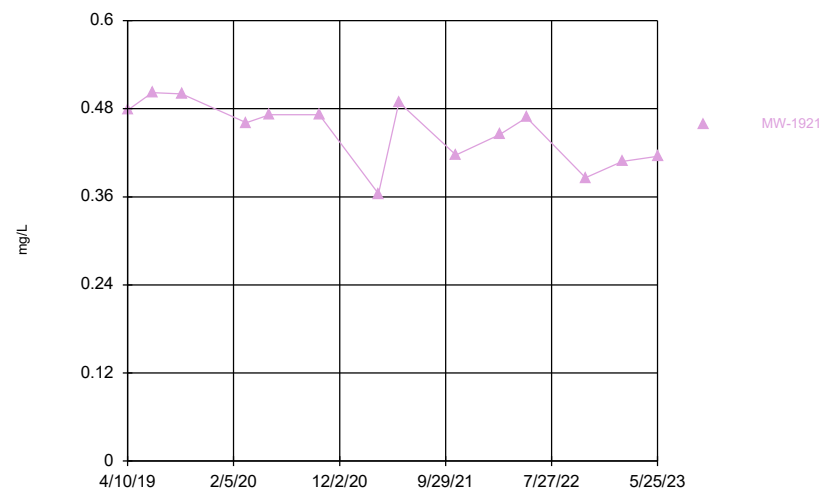
Constituent: Lithium, total Analysis Run 6/21/2023 5:20 PM View: Time Series & Box Plot (Well 1921)
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



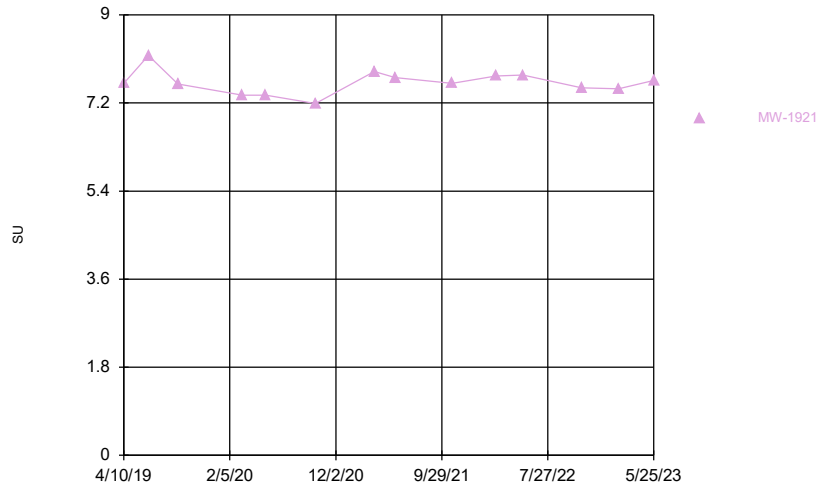
Constituent: Mercury, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Time Series



Constituent: Molybdenum, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
 Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

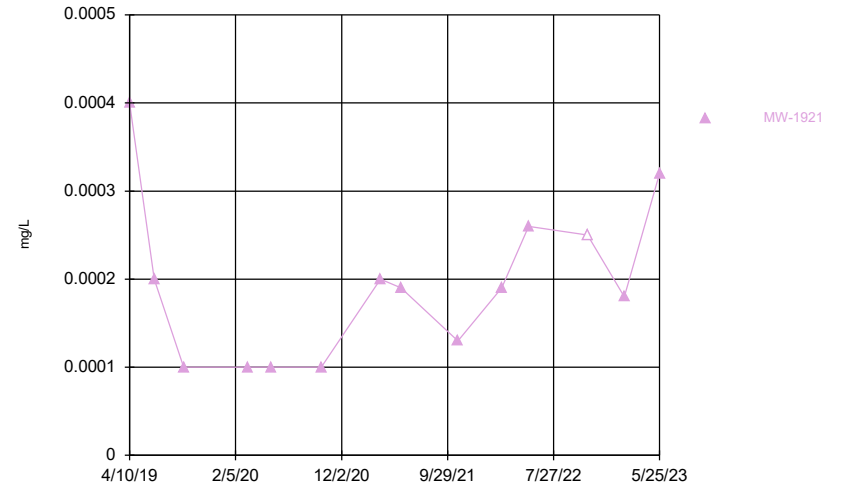
Time Series



Constituent: pH, field Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

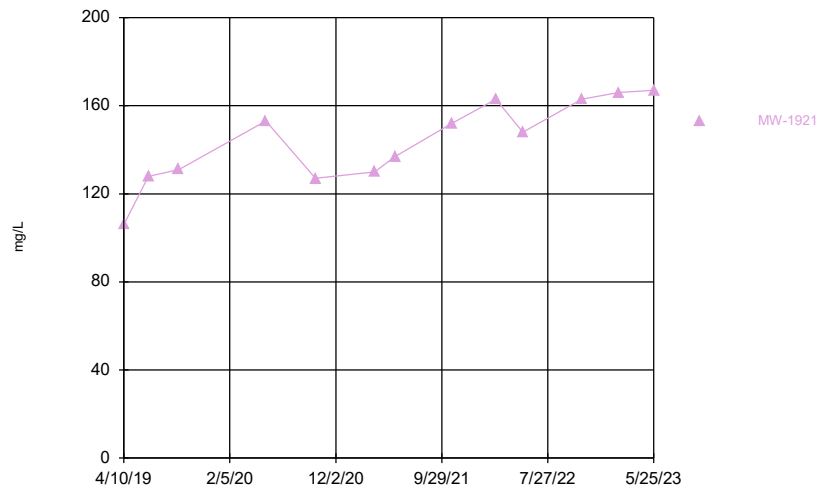
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

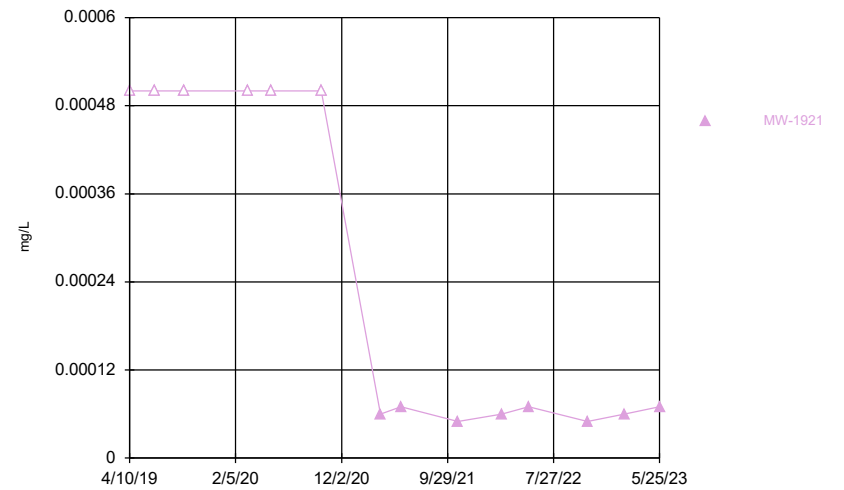
Time Series



Constituent: Sulfate, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

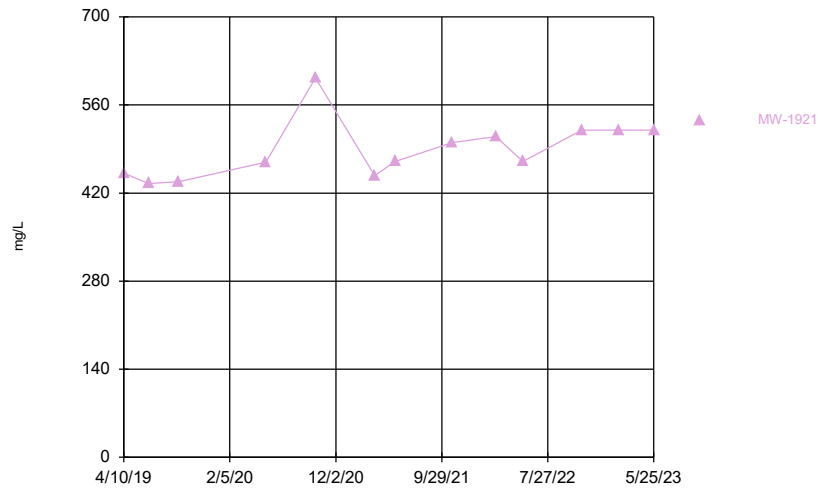
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

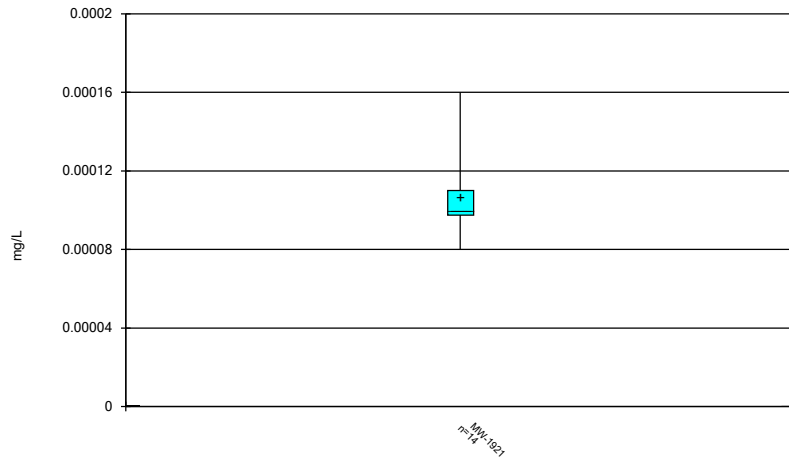
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

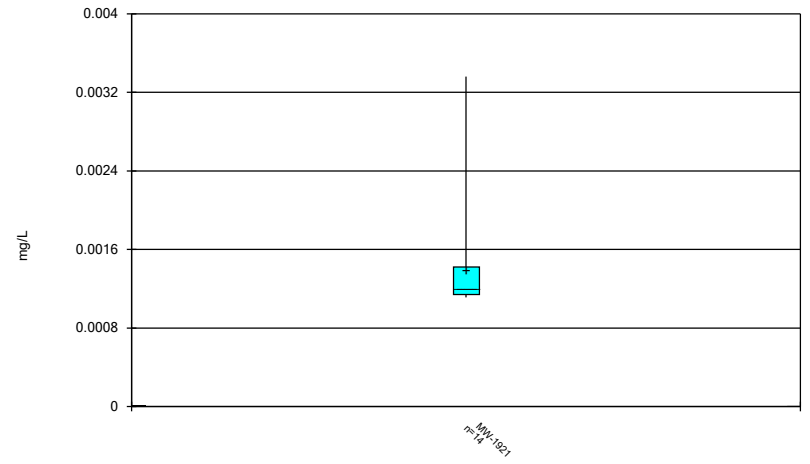
FIGURE B
Box Plots

Box & Whiskers Plot



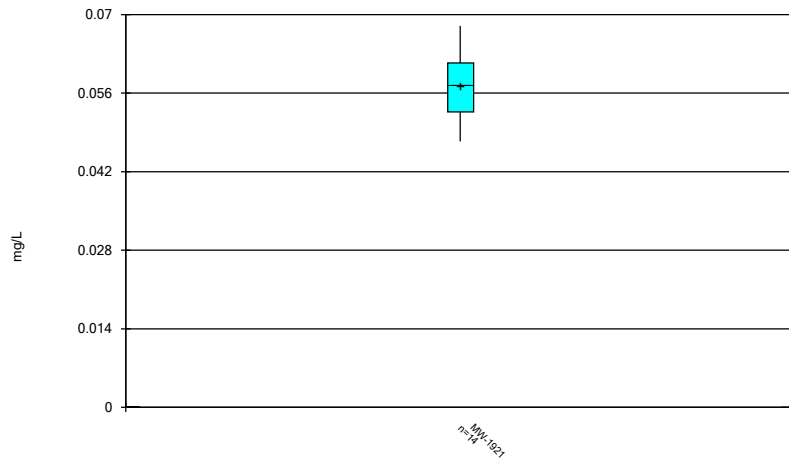
Constituent: Antimony, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



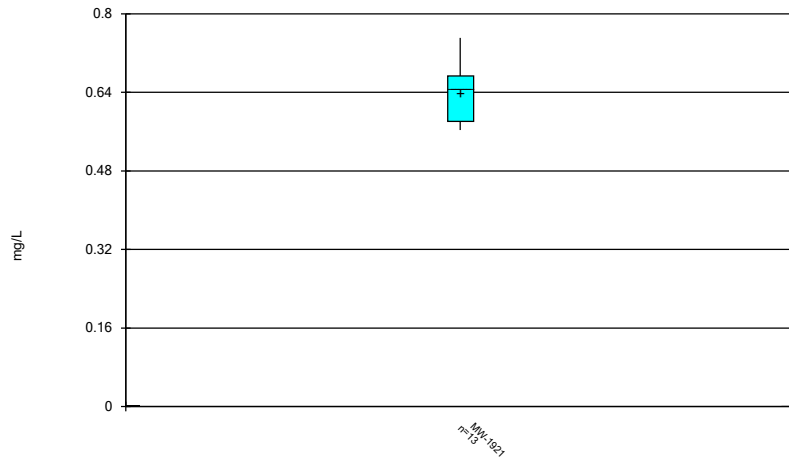
Constituent: Barium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



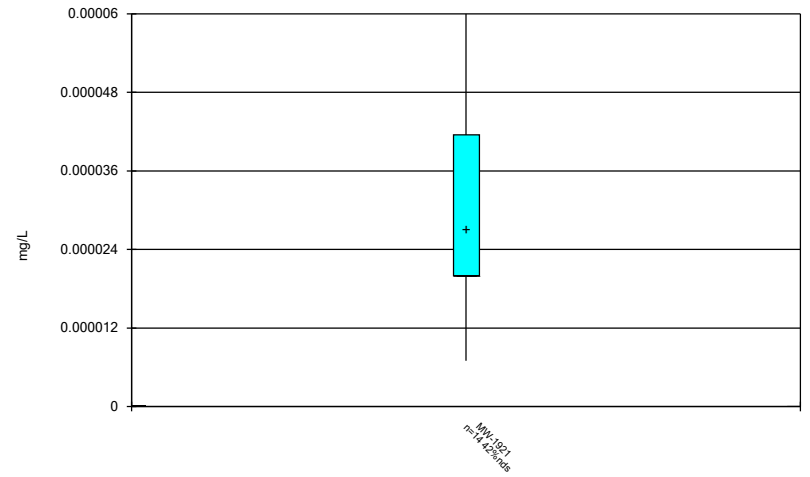
Constituent: Beryllium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



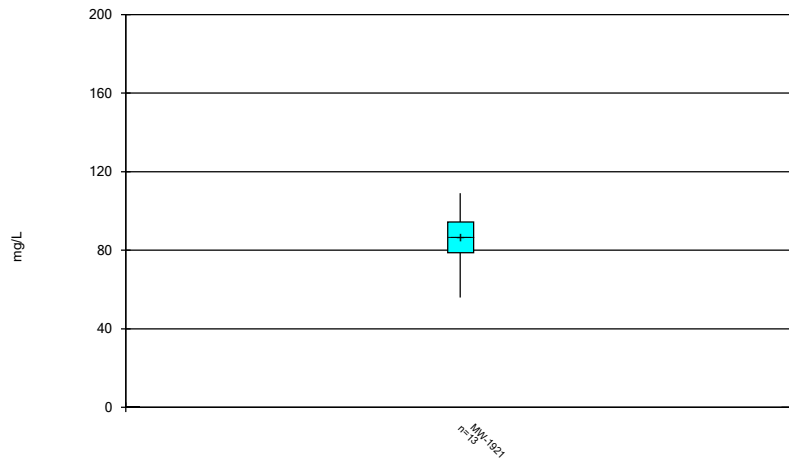
Constituent: Boron, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



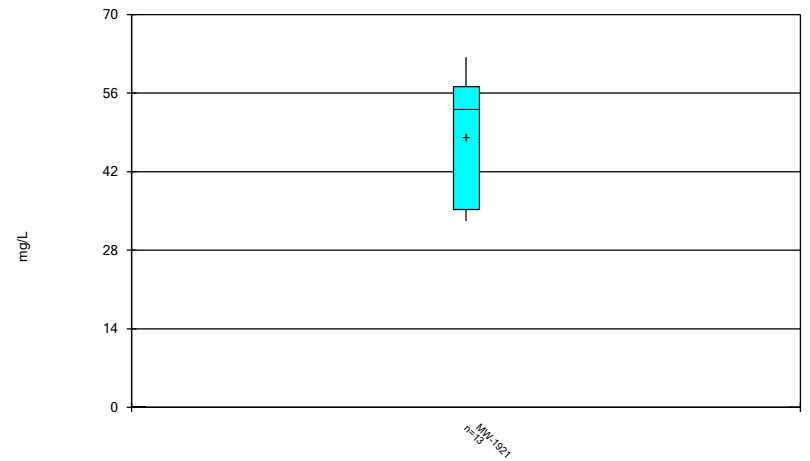
Constituent: Cadmium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



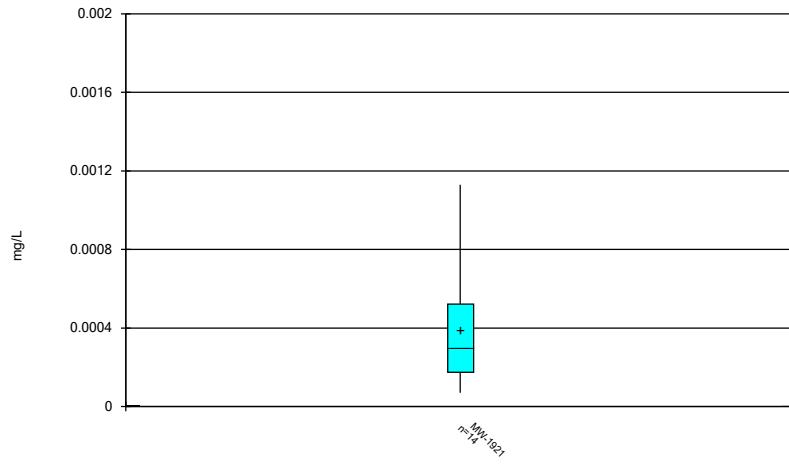
Constituent: Calcium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



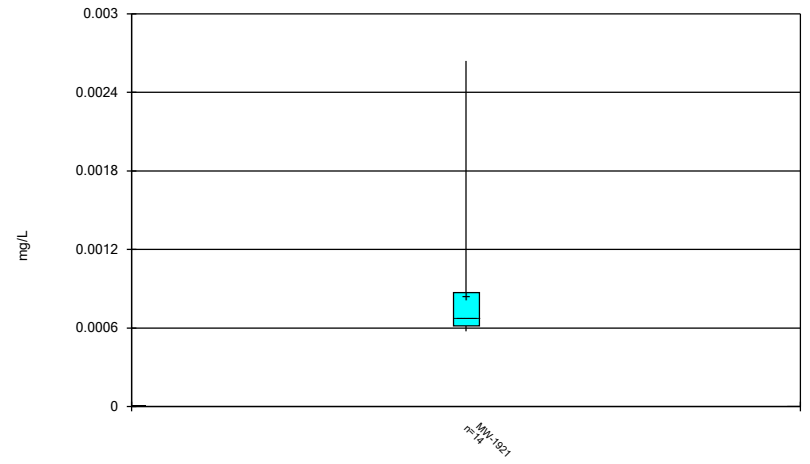
Constituent: Chloride, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



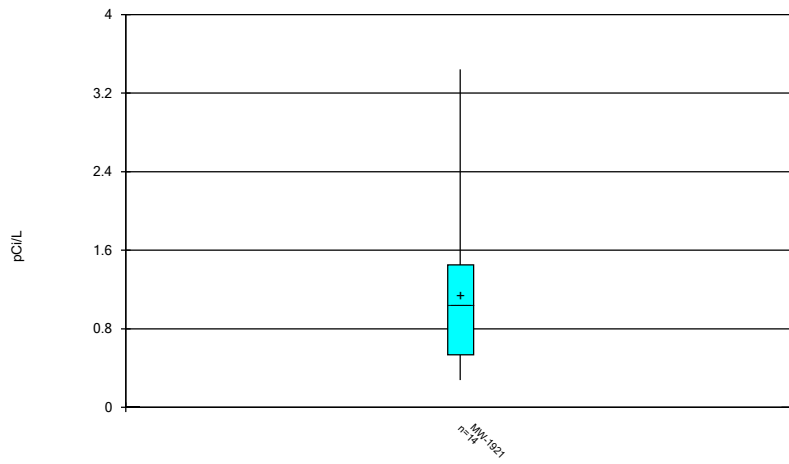
Constituent: Chromium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



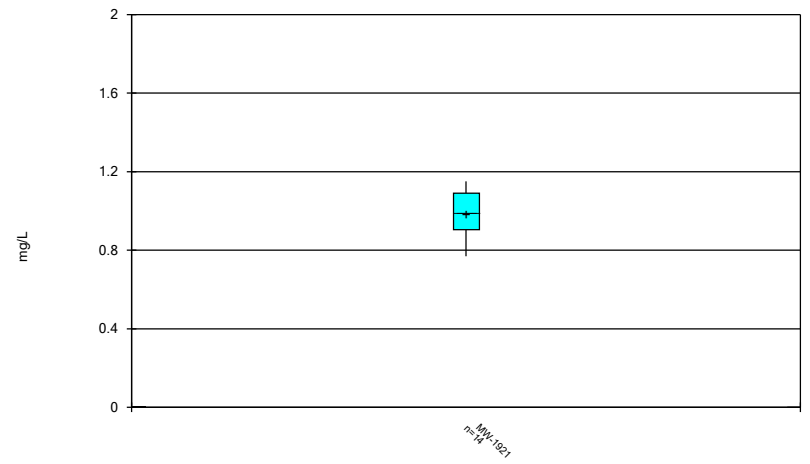
Constituent: Cobalt, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



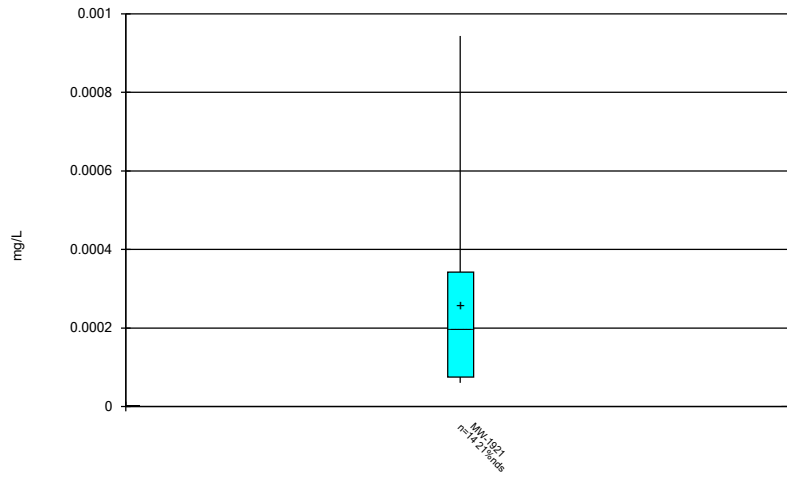
Constituent: Combined Radium 226 + 228 Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



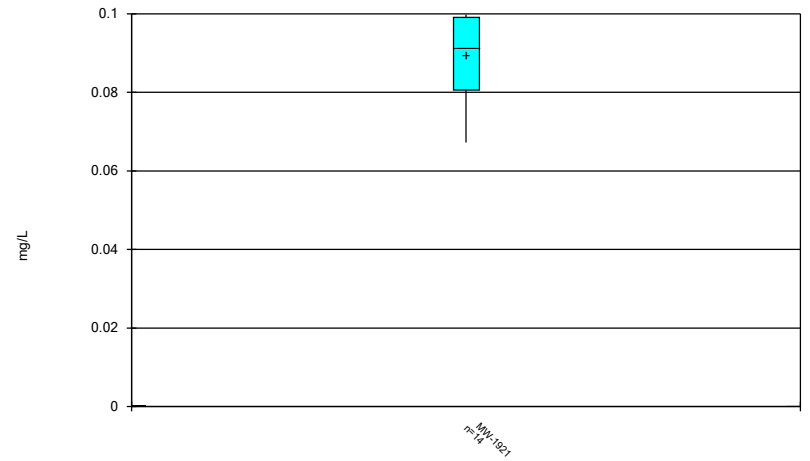
Constituent: Fluoride, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



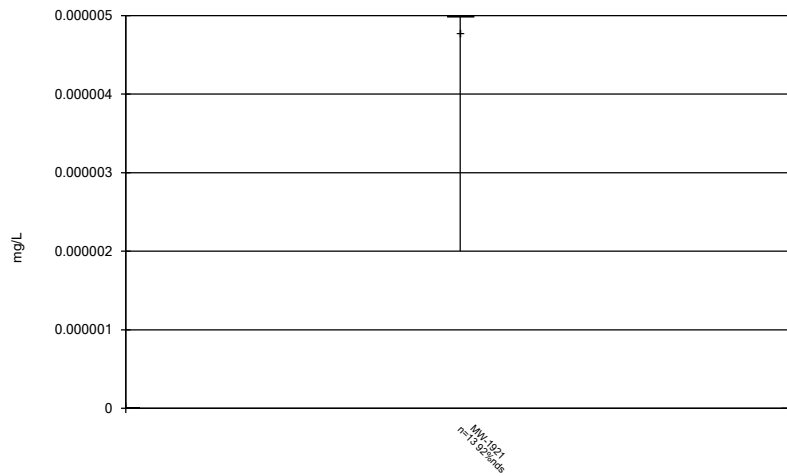
Constituent: Lead, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



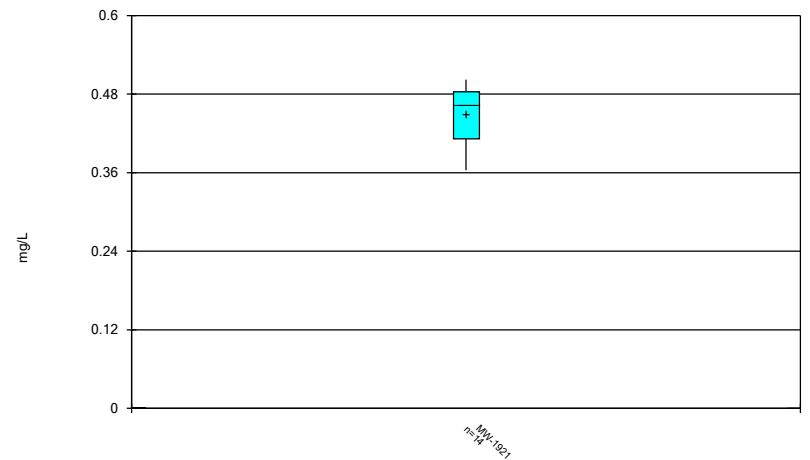
Constituent: Lithium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



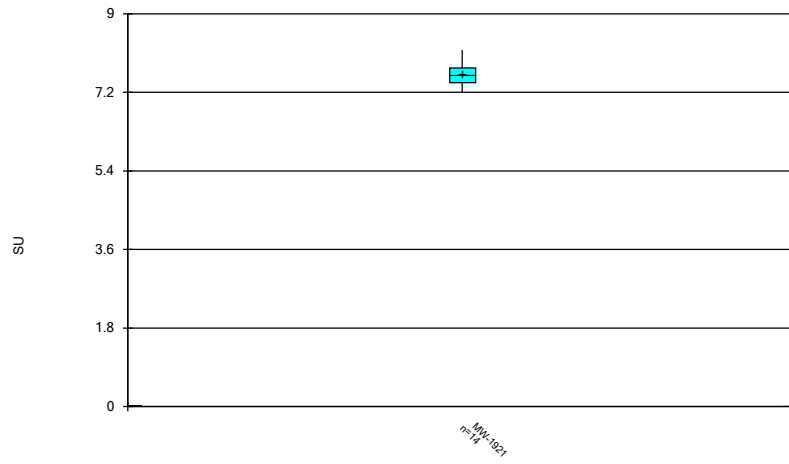
Constituent: Mercury, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



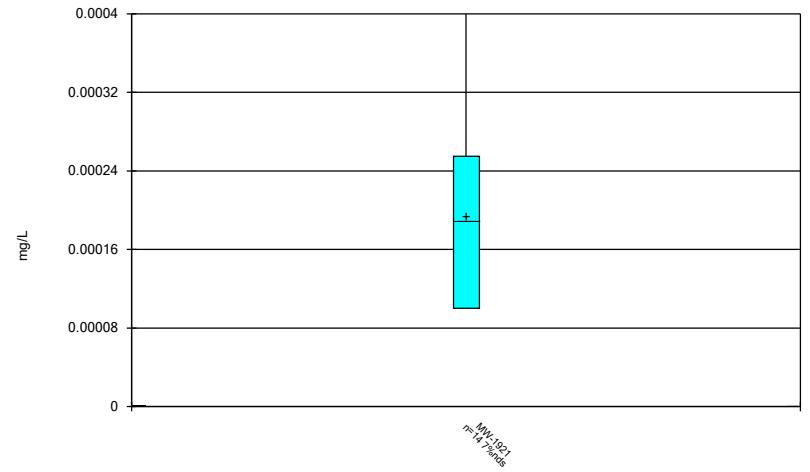
Constituent: Molybdenum, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



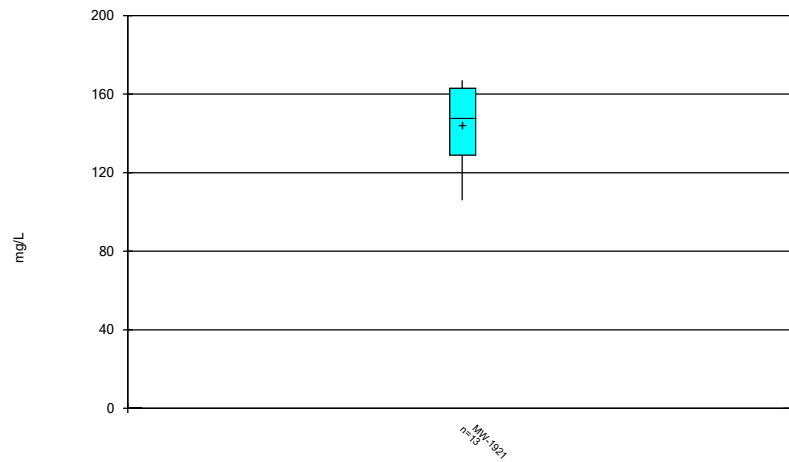
Constituent: pH, field Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



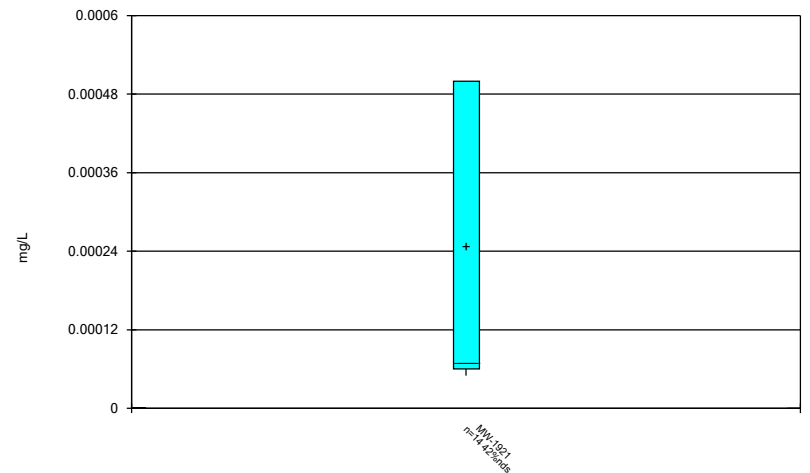
Constituent: Selenium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



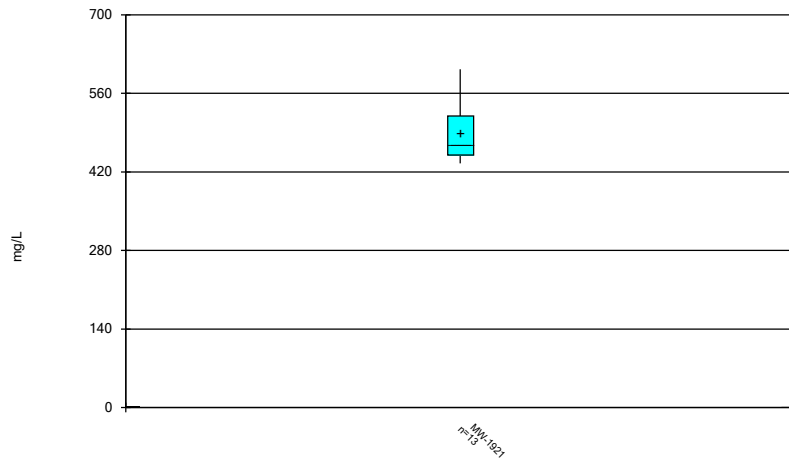
Constituent: Sulfate, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 6/21/2023 5:21 PM View: Time Series & Box Plot (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 6/21/2023 5:22 PM View: Time Series & Box Plot (
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE C

UTLs

Upper Tolerance Limits

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 1/20/2023, 3:32 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg.N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.00052	n/a	n/a	n/a	88	14.77	n/a	0.01096	NP Inter(normality)
Arsenic, total (mg/L)	n/a	0.0007143	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Barium, total (mg/L)	n/a	0.0678	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Beryllium, total (mg/L)	n/a	0.00005	n/a	n/a	n/a	80	91.25	n/a	0.01652	NP Inter(NDs)
Cadmium, total (mg/L)	n/a	0.00005	n/a	n/a	n/a	88	6.818	n/a	0.01096	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.0007382	n/a	n/a	n/a	84	1.19	sqrt(x)	0.05	Inter
Cobalt, total (mg/L)	n/a	0.0005696	n/a	n/a	n/a	88	4.545	ln(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	2.383	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	n/a	0.3	n/a	n/a	n/a	92	0	n/a	0.008924	NP Inter(normality)
Lead, total (mg/L)	n/a	0.000881	n/a	n/a	n/a	88	25	n/a	0.01096	NP Inter(normality)
Lithium, total (mg/L)	n/a	0.03	n/a	n/a	n/a	88	6.818	n/a	0.01096	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.000005	n/a	n/a	n/a	84	95.24	n/a	0.01345	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.002728	n/a	n/a	n/a	88	5.682	sqrt(x)	0.05	Inter
Selenium, total (mg/L)	n/a	0.0043	n/a	n/a	n/a	88	2.273	n/a	0.01096	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.0002	n/a	n/a	n/a	88	55.68	n/a	0.01096	NP Inter(NDs)

FIGURE D
GWPS

MOUNTAINEER BAP GWPS				
Constituent Name	MCL	CCR Rule-Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00052	0.006
Arsenic, Total (mg/L)	0.01		0.00071	0.01
Barium, Total (mg/L)	2		0.068	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00005	0.005
Chromium, Total (mg/L)	0.1		0.00074	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.00057	0.006
Combined Radium, Total (pCi/L)	5		2.38	5
Fluoride, Total (mg/L)	4		0.3	4
Lead, Total (mg/L)	0.015		0.00088	0.015
Lithium, Total (mg/L)	n/a	0.04	0.03	0.04
Mercury, Total (mg/L)	0.002		0.000005	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0028	0.1
Selenium, Total (mg/L)	0.05		0.0043	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**GWPS = Groundwater Protection Standard*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

FIGURE E
Confidence Interval (Assessment)

Confidence Interval - Assessment Monitoring - Significant Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/21/2023, 5:33 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Molybdenum, total (mg/L)	MW-1921	0.4791	0.4176	0.1	Yes	14	0	None	No	0.01	Param.

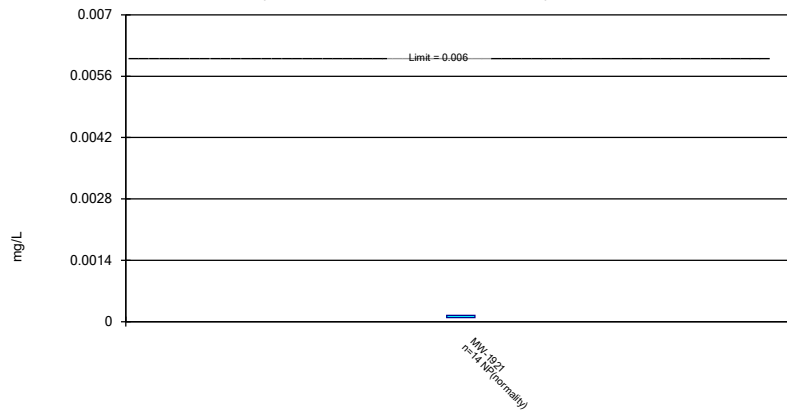
Confidence Interval - Assessment Monitoring - All Results

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/21/2023, 5:33 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	MW-1921	0.00014	0.000095	0.006	No	14	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1921	0.00159	0.00112	0.01	No	14	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	MW-1921	0.06112	0.05335	2	No	14	0	None	No	0.01	Param.
Beryllium, total (mg/L)	MW-1921	0.00005	0.00002	0.004	No	12	83.33	None	No	0.01	NP (NDs)
Cadmium, total (mg/L)	MW-1921	0.00004091	0.00001644	0.005	No	14	42.86	Kaplan-Meier	No	0.01	Param.
Chromium, total (mg/L)	MW-1921	0.0005929	0.0001874	0.1	No	14	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1921	0.000879	0.000604	0.006	No	14	0	None	No	0.01	NP (normality)
Combined Radium 226 + 228 (pCi/L)	MW-1921	1.586	0.6001	5	No	14	0	None	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	MW-1921	1.069	0.9041	4	No	14	0	None	No	0.01	Param.
Lead, total (mg/L)	MW-1921	0.0003255	0.00006644	0.015	No	14	21.43	Kaplan-Meier	sqrt(x)	0.01	Param.
Mercury, total (mg/L)	MW-1921	0.000005	0.000002	0.002	No	13	92.31	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	MW-1921	0.4791	0.4176	0.1	Yes	14	0	None	No	0.01	Param.
Selenium, total (mg/L)	MW-1921	0.0002581	0.0001305	0.05	No	14	7.143	None	No	0.01	Param.
Thallium, total (mg/L)	MW-1921	0.0005	0.00005	0.002	No	14	42.86	None	No	0.01	NP (normality)

Non-Parametric Confidence Interval

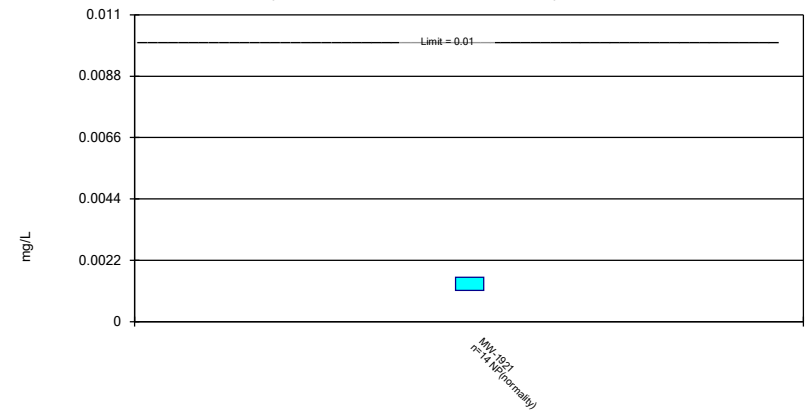
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

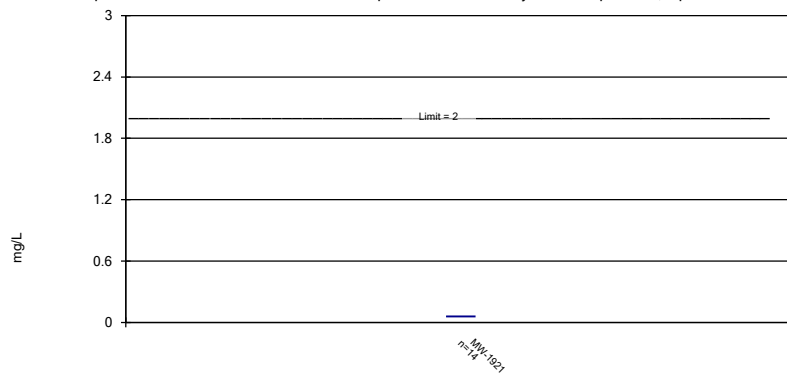
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

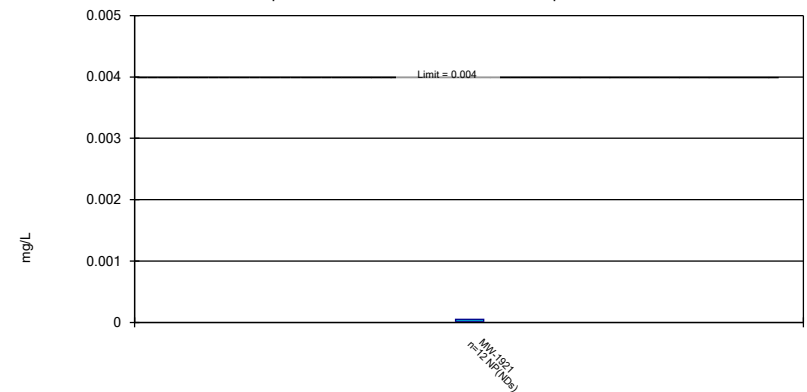
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

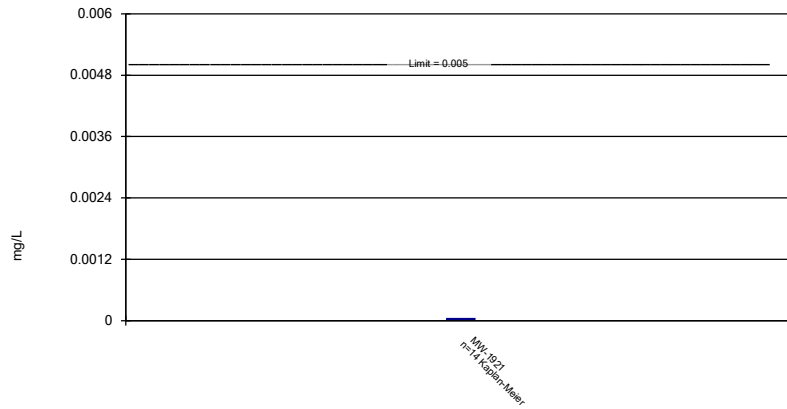
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

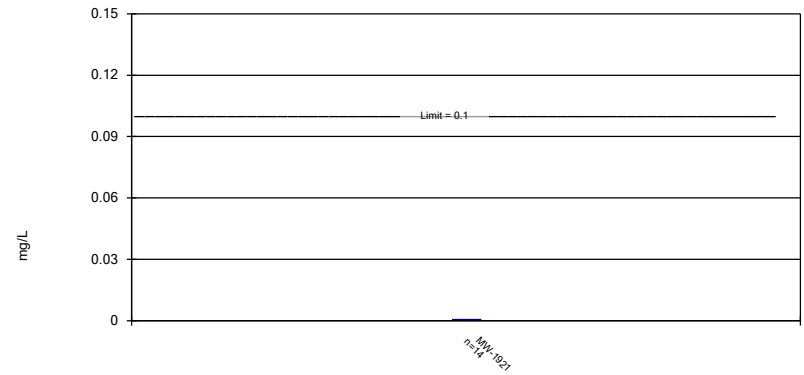
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

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



Constituent: Chromium, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

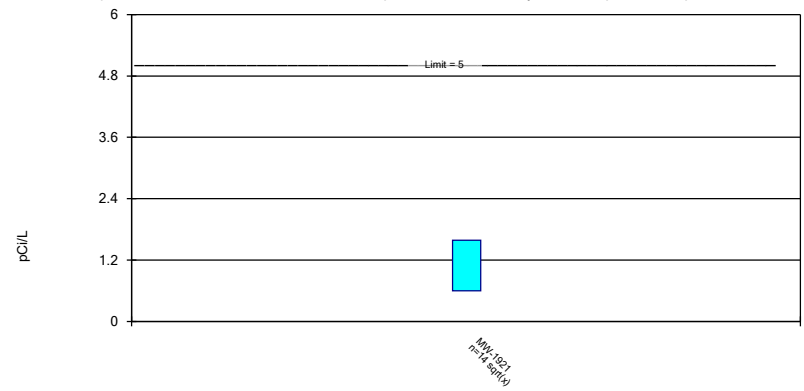
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cobalt, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

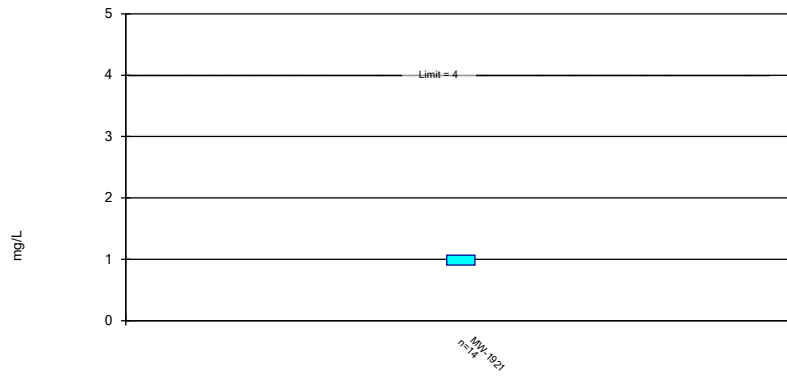
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (W
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

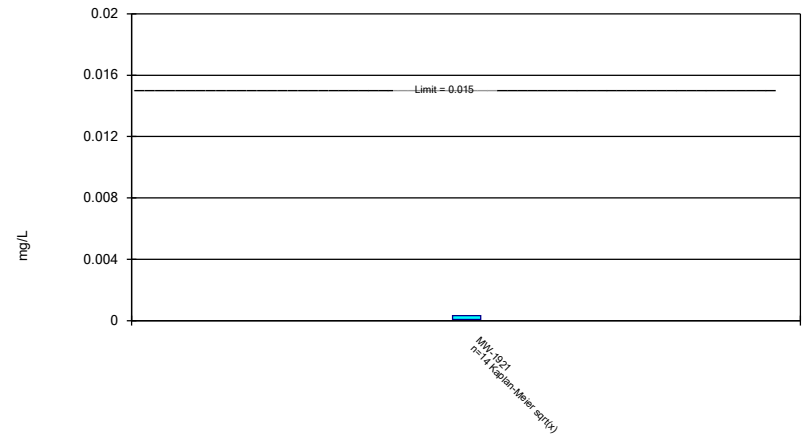
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

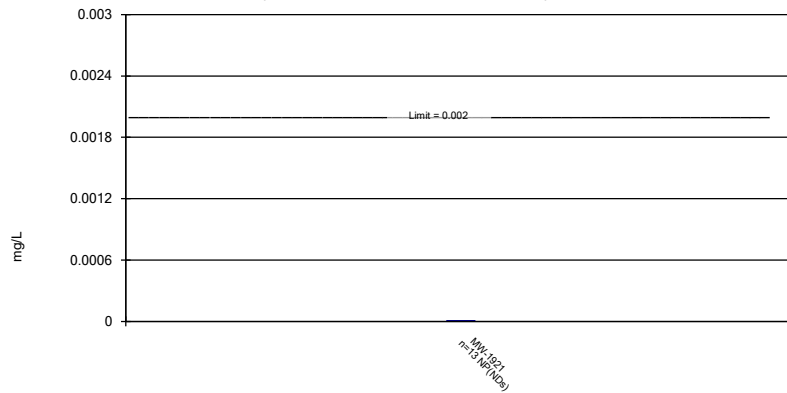
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

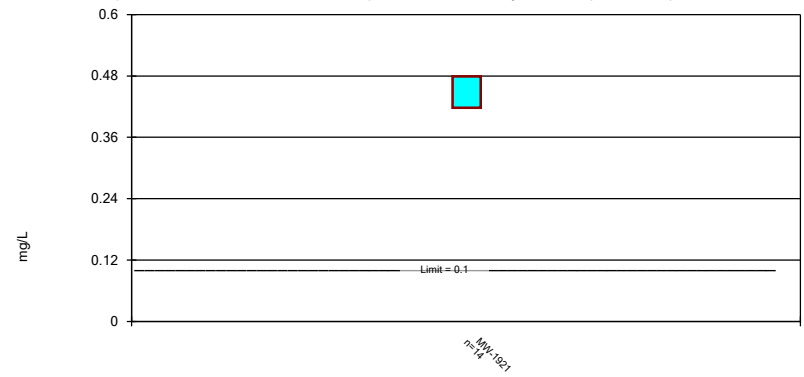
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

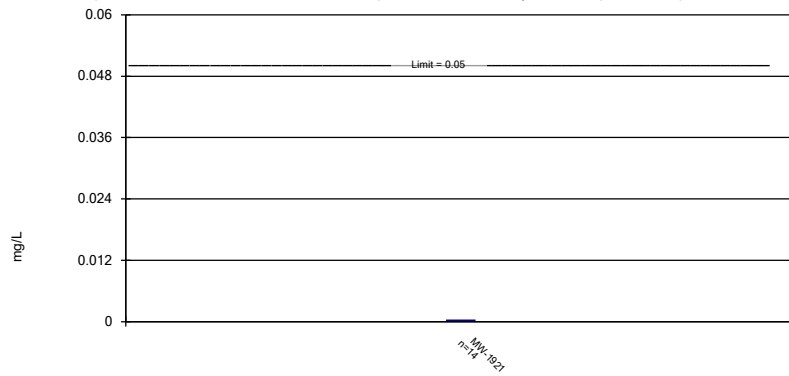
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Parametric Confidence Interval

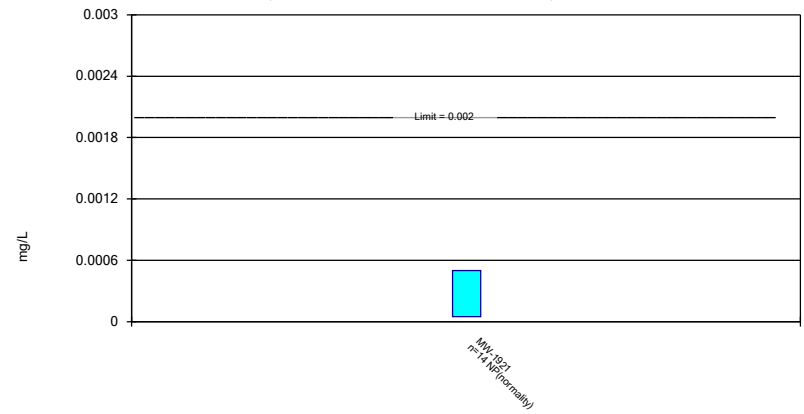
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 6/21/2023 5:32 PM View: Confidence Interval (Well 1921)
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

FIGURE F
Confidence Interval (Corrective)

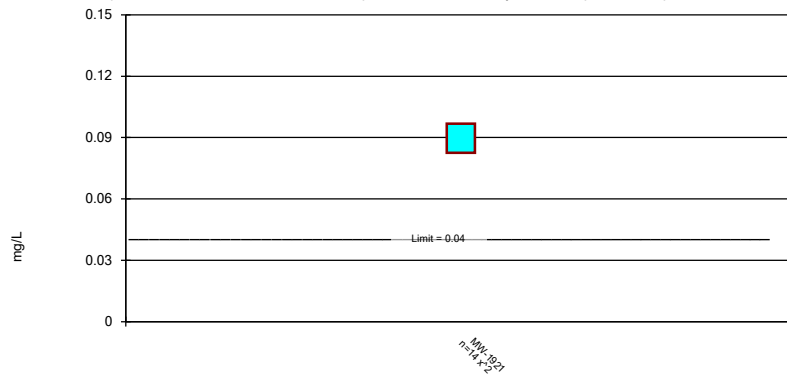
Confidence Interval - Corrective Action - All Results (All Significant)

Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP Printed 6/21/2023, 5:36 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Lithium, total (mg/L)	MW-1921	0.09681	0.08255	0.04	Yes	14	0	None	x^2	0.01	Param.

Parametric Confidence Interval, Corrective Action Mode

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



Constituent: Lithium, total Analysis Run 6/21/2023 5:36 PM View: Confidence Interval - Corrective Action ()
Mountaineer BAP Client: Geosyntec Data: Mountaineer BAP

Appendix 3

Alternate Source Demonstration completed this reporting period follows.

ALTERNATIVE SOURCE DEMONSTRATION REPORT

AEP Mountaineer Plant Bottom Ash Ponds New Haven, West Virginia

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio, 43215-2372

Prepared by

Geosyntec Consultants, Inc.
500 W. Wilson Bridge Rd, Suite 250
Worthington, Ohio 43085

Project: CHA8495B

May 31, 2023

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- Attachment A: MW-1805, MW-1922D, and MW-1921 Boring Logs
- Attachment B: Groundwater Flow Modeling Output
- Attachment C: Bedrock Sampling Analytical Report – Eurofins
- Attachment D: Bedrock Sampling Analytical Report – Mineralogy, Inc.
- Attachment E: Molybdenum Statistical Evaluation
- Attachment F: Certification by a Qualified Professional Engineer

ACRONYMS AND ABBREVIATIONS

ASD	Alternative Source Demonstration
BAP	bottom ash pond
bgs	below ground surface
CCR	coal combustion residuals
CFR	Code of Federal Regulations
EDX	energy-dispersive X-ray spectroscopy
ft	feet
gpm	gallons per minute
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/kg	milligrams per kilogram
µg/L	micrograms per liter
ORP	oxidation-reduction potential
QA/QC	quality assurance / quality control
redox	oxidation-reduction
SEM	scanning electron microscopy
SSL	statistically significant level
USEPA	United States Environmental Protection Agency
UTL	upper tolerance limit
XRD	X-ray diffraction
XRF	X-ray fluorescence

1. INTRODUCTION AND SUMMARY

This Alternative Source Demonstration (ASD) report has been prepared to address statistically significant levels (SSLs) of arsenic and molybdenum in the groundwater monitoring network at the Mountaineer Power Plant's bottom ash ponds (BAPs) in New Haven, West Virginia.

This ASD follows the second semiannual corrective action monitoring event of 2022, which was conducted in November at the BAPs in accordance with Title 40, Section 257.98(a)(1) of the Code of Federal Regulations (CFR). The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. A confidence interval was constructed for each Appendix IV parameter at each compliance well, nature-and-extent well, and sentinel well. An SSL was attributed to a parameter if its lower confidence limit (LCL) exceeded the groundwater protection standard (GWPS) (i.e., if the entire confidence interval exceeded the GWPS).

The GWPS was established as whichever was greater of: (1) the background concentration (determined via calculation of an upper tolerance limit [UTL]), or (2) the maximum contaminant level (MCL) and risk-based level specified in 40 CFR 257.95(h)(2). The following SSLs were identified at the Mountaineer BAPs (Geosyntec 2023):

- Arsenic at MW-1805 and MW-1922D, both of which are screened in the underlying Monongahela bedrock Formation
- Lithium at MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S, MW-1921, MW-1922S, MW-1923, MW-1924, and MW-1925, all of which are screened in the sand and gravel aquifer
- Molybdenum at MW-1921, which is also screened in the sand and gravel aquifer

Corrective measures are currently being completed at the BAPs for previously identified lithium SSLs. Source removal and hydraulic containment was selected as the remedy for groundwater impacts of lithium associated with the BAPs (Sanborn Head 2021). Therefore, alternative sources were not evaluated for lithium in this demonstration.

1.1 CCR Rule Requirements

In accordance with the United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments, 40 CFR 257.95(g)(3)(ii) states the following:

The owner or operator may demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified by a qualified professional engineer.

Pursuant to 40 CFR 257.95(g)(3)(ii), Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report to document whether the SSLs identified for arsenic and molybdenum are from a source other than the BAPs.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources of arsenic and molybdenum to which identified SSLs could be attributed. Alternative sources were identified among the following five types:

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Alternative Sources

A demonstration was conducted to assess whether the SSLs of arsenic at MW-1805 and MW-1922D and molybdenum at MW-1921 were based on Type IV (Natural Variation) or Type V (Alternative Sources) causes and not caused by a release from the BAPs.

2. SUMMARY OF SITE CONDITIONS

Brief descriptions of the site construction, geology, and hydrogeology are provided below.

2.1 Site Construction and Location

The BAP CCR unit consist of two ponds of roughly equal size (BAP East and BAP West) with a combined surface area of approximately 28 acres. The BAP West has a normal pool area of 14.1 acres and the BAP East has a normal pool area of 13.9 acres (Arcadis 2016). The BAPs were constructed between 1978 and 1980 with a 3-foot-thick clay liner.

Several non-CCR-regulated ponds are located immediately south of the BAPs and, together with the BAPs, form the Site Pond Complex (**Figure 1**). An electrical substation is located northwest of the BAPs. A former Philip Sporn (Sporn) bituminous coal mining facility is located to the west of the BAPs. A 60-acre fly ash pond associated with the former Sporn Power Plant is located to the northeast of the BAPs (**Figure 1**).

The Sporn Power Plant was a generating facility that operated from the early 1950s until 2015. The Sporn fly ash pond received wet fly ash sluiced from Sporn's coal-fired steam electric generation Unit 5, runoff from the coal storage yard, water from the sump in the Sporn Mine, and wastewater from the boiler room sumps (EPRI 1999).

2.2 Regional Geology

Beneath the clay liner, the BAPs are immediately underlain by Quaternary alluvial deposits consisting of clay, silt, sand, and gravel. The unconsolidated alluvial deposits consist of the following two units (Sanborn Head 2020):

- Alternating horizons of clay and clayey silt, with thicknesses ranging from 0 to 30 feet (ft) below ground surface (bgs)
- Sand, generally medium- to coarse-grained, with some gravel horizons, which generally coarsens with depth from about 15 to 100 ft bgs

The unconsolidated alluvial sand and gravel deposits are underlain by bedrock consisting of Pennsylvanian sandstones, shales, limestones, and coal of the Monongahela group (Arcadis 2016). All wells within the corrective action monitoring network are screened in the unconsolidated sand and gravel aquifer, except MW-1805 and MW-1922D, which are both screened in the underlying Monongahela group, as shown in the boring logs as a combination of sandstone, coal, and shale (**Attachment A**).

2.3 Regional Hydrogeology

Five groundwater pumping wells were installed at the site in 2008 and are currently active (**Figure 1**). The groundwater pumping wells are screened within the unconsolidated sand and gravel aquifer unit. Wells West 1 and East 1 provide cooling water and process water for the site and have pumping capacities of approximately 930 to 950 gallons per minute (gpm) and 550 to 575 gpm, respectively. Historically, wells 4, 5, and 6 are pumped at lower flow rates than West 1 and East 1 and are operated on an intermittent, as-needed basis.

The groundwater flow direction at the site is influenced by operation of the pumping wells. Extraction of groundwater from the production wells depresses groundwater elevations near the wells in the unconsolidated sand and gravel unit and affects the groundwater flow patterns in the vicinity of the BAPs. A groundwater modeling study, included as Appendix C of the Groundwater Monitoring Well Network Evaluation (Arcadis 2016), was completed to better understand the effect of the pumping wells on groundwater flow under normal conditions (i.e., consistent pumping at wells West 1 and East 1). A potentiometric map generated using these simulated conditions shows that flow is naturally directed toward the Ohio River but is influenced by a cone of depression resulting from operation of the pumping wells (**Attachment B**). Groundwater migrating from the downgradient, northeast side of the BAPs would be predicted to migrate beneath the former Sporn fly ash pond and toward West 1 and East 1.

3. ALTERNATIVE SOURCE DEMONSTRATION

The proposed alternative sources for arsenic and molybdenum are described below.

3.1 Proposed Alternative Source

Described below are the ASD evaluation methods, the proposed alternative source of arsenic at MW-1805 and MW-1922D, the proposed alternative source of molybdenum at MW-1921, and the future groundwater sampling requirements.

3.1.1 Arsenic

An initial review of site geochemistry, site historical data, and laboratory quality assurance / quality control (QA/QC) data did not identify alternative sources for arsenic due to Type I (sampling), Type II (laboratory), or Type III (statistical evaluation) issues. A preliminary review of site geochemistry did not identify any Type V (anthropogenic) causes. Therefore, an evaluation was conducted to assess whether the arsenic SSLs can be attributed to natural variation, which is a Type IV cause.

3.1.1.1 Evidence: Arsenic Distribution

If concentrations of arsenic were higher at the BAPs than in groundwater, it would indicate that the BAPs could be the source. However, the BAP liquids contain lower concentrations of arsenic than the groundwater at the wells of interest, making the BAPs an unlikely source. Reported concentrations of arsenic in surface water samples collected from the pond in 2016 and 2021 were lower than any concentrations reported in groundwater at MW-1805 and MW-1922D (**Table 1**). In fact, the average BAP arsenic concentrations are two orders of magnitude lower than the average concentration observed at MW-1922D and approximately one order of magnitude lower than the average concentration observed at MW-1805.

Downgradient sand and gravel aquifer wells MW-1604S, MW-1604D, and MW-1922S are located in the immediate vicinity of bedrock wells MW-1805 and MW-1922D (**Figure 1**). Reported arsenic concentrations in groundwater from these locations are consistently lower than they are in MW-1805 and MW-1922D groundwater (**Figure 2**). If elevated arsenic concentrations were a result of a release from the BAPs, we would expect arsenic concentrations to be higher at wells screened in the more permeable sand and gravel lithology below the BAPs than in the underlying bedrock (**Figure 3**). This assumption is supported by downward vertical gradients that are periodically observed from the sand and gravel aquifer into the underlying bedrock, which could permit groundwater flow from the unconsolidated material into the bedrock under downward gradient conditions (**Table 2**). The lack of elevated arsenic in shallow sand and gravel aquifer monitoring wells suggests that an alternative source of arsenic is impacting deeper bedrock wells MW-1805 and MW-1922D.

3.1.1.2 Evidence: Bedrock Sampling and Analyses

Analyses of bedrock samples from MW-1805 and MW-1922D indicate that arsenic is present in the solid phase of the screened interval of both wells. Mineralogical analyses of these samples revealed the presence of a suite of minerals and compounds known to be associated with arsenic. These aquifer solid components constitute an alternative natural source of arsenic to groundwater,

because groundwater must pass through and interact with these aquifer solids before entering the monitoring wells of interest.

Bedrock samples were collected on December 21, 2022, from cores collected during the prior installation of MW-1805 and MW-1922D. Four samples were collected from the screened interval of MW-1805 and two samples were collected from the screened interval of MW-1922D. The sample depths and associated lithologies, as documented in the boring logs (**Attachment A**) for each bedrock sample, are provided on **Table 3**. The samples were submitted for analyses of total arsenic; mineralogy analysis via X-ray diffraction (XRD); bulk geochemistry analysis via X-ray fluorescence (XRF); and scanning electron microscopy (SEM) analysis with energy-dispersive X-ray spectroscopy (EDX). The laboratory report for total arsenic analyses is provided as **Attachment C**. The laboratory analytical report for the XRD, XRF, and SEM-EDX analyses is provided as **Attachment D**.

Arsenic was detected in all bedrock samples analyzed, with reported concentrations ranging from 2.9 milligrams of arsenic per kilogram of rock (mg/kg) to 56 mg/kg (**Table 3**). Arsenic concentrations exceeding 50 mg/kg were found to be associated with shale and coal lithologies observed within the screened interval of MW-1805 (122 and 128 ft bgs, respectively). All samples analyzed were collected from rock core taken from the screened interval of both monitoring wells; therefore, groundwater samples from MW-1805 and MW-1922D enter these wells through aquifer material that contains appreciable arsenic concentrations within the solid phase.

Elevated arsenic concentrations in MW-1805 bedrock can be readily attributed to the presence of coal- and iron-bearing minerals that were identified within the bedrock solids via XRD and SEM analyses (**Table 4**). Arsenic is often associated with coal (Yudovich and Ketris 2005). Based on lithologic descriptions (**Attachment A**), coal comprises the amorphous component (84 percentage by weight [wt.%] of the total sample) of the MW-1805 sample collected from 128 ft bgs. Ferrous (Fe^{2+}) iron minerals pyrite and siderite were also observed in MW-1805 samples (**Table 4**). Pyrite is an iron-sulfide mineral known to be commonly associated with arsenic via co-precipitation processes (Brannon and Patrick 1987, Moore et al. 1988, O'Day et al. 2004). Pyrite was detected in every sample collected from MW-1805, at abundances up to 4 wt.% (**Table 4; Figure 4**). Siderite, an iron-carbonate mineral, was reported in three of the four samples collected from MW-1805 (**Table 4; Figure 5**).

A previous ASD completed for arsenic at MW-1805 and MW-1922D proposed iron mineral thermodynamic instability and dissolution as a likely mechanism for elevated aqueous arsenic concentrations (Geosyntec 2022). Ferrous (Fe^{2+}) iron minerals such as sulfides (pyrite) and carbonates (siderite) are capable of sequestering arsenic through sorption and/or co-precipitation (Gross and Low 2013). Dissolution or alteration of these minerals due to changing oxidation-reduction (redox) conditions would trigger dissolution of adsorbed and/or co-precipitated arsenic. This hypothesis is supported by thermodynamic modeling, which indicates that MW-1805 groundwater plots near the stability boundaries between soluble iron and insoluble iron oxide ($\text{Fe}(\text{OH})_3$), siderite, and pyrite (**Figure 6**). XRD and SEM-EDX findings verify the presence of both siderite and pyrite in MW-1805 samples, supporting the conclusion that dynamic equilibrium conditions exist within MW-1805 groundwater.

Under the dynamic equilibrium conditions described above, arsenic concentrations in MW-1805 groundwater would be expected to correlate strongly with dissolved iron concentrations because

arsenic would mobilize from iron minerals as they dissolve or alter. Total arsenic concentrations and dissolved iron concentrations fluctuate in a similar manner, suggesting that this arsenic-iron relationship occurs at MW-1805 (**Figure 7**), and the correlation between these parameters is very strong (R^2 value of 0.91) (**Figure 8**). Further, the arsenic concentration changes correlate strongly with changes in oxidation-reduction potential (ORP) (**Figure 9**). These relationships indicate that aqueous arsenic concentrations at MW-1805 are strongly linked to redox changes, and they support the proposed mechanism of arsenic association with iron minerals and subsequent mobilization of arsenic as iron minerals dissolve or alter.

While coal, pyrite, and siderite were not detected in the XRD or SEM analyses for MW-1922D, arsenic in MW-1922D bedrock is attributable to the presence of mica/clay minerals and iron oxyhydroxide minerals.

A potential source of arsenic to groundwater within the screened interval of MW-1922D is the chemical weathering of mica grains to clay minerals. Previous studies have shown that mica separates from sandstone samples can contain up to five times the amount of solid-phase arsenic as the remainder of the bulk sample (Dowling et al. 2002). Chemical weathering of mica grains to secondary clay mineral cements (a common diagenetic reaction in sandstones) would result in dissolution of arsenic from the crystal structure of micas and/or from sorption sites on mica surfaces.

These mechanisms have been invoked as processes responsible for high concentrations of aqueous arsenic sources in some aquifers (Dowling et al. 2002, Raju 2022). SEM imaging of the 104.5 ft bgs sample revealed the presence of mica grains that appear to be frayed and experiencing exfoliation along layer planes (**Figure 10**), two common indicators of chemical weathering in micas.

Further support of chemically weathered mica is provided by the presence of secondary clay minerals (kaolinite), which are abundant throughout the sample and appear to be precipitating immediately adjacent to mica grains (**Figure 10**). Kaolinite is a known weathering product of mica and frequently precipitates immediately adjacent to mica grains (Singh and Gilkes 1991, Robertson and Eggleton 1991).

Another potential source of arsenic in MW-1922D bedrock is iron oxyhydroxide minerals. Iron-oxide and oxyhydroxide minerals hematite and goethite were both detected in the MW-1922D sample collected from 111 ft bgs (**Table 4**). Arsenic association with iron-oxide and oxyhydroxide minerals is well documented (Welch et al. 2000).

3.1.2 Molybdenum

An initial review of site geochemistry, site historical data, and laboratory QA/QC data did not identify alternative sources for molybdenum due to Type I (sampling), Type II (laboratory), or Type III (statistical evaluation) issues. A preliminary review of site geochemistry did not identify any Type IV (natural variation) causes. Therefore, an evaluation was conducted to assess whether the molybdenum SSL can be attributed to an anthropogenic alternative source, which is a Type V cause.

3.1.2.1 Evidence: Limited Molybdenum in the BAPs

If concentrations of molybdenum were higher at the BAP than in groundwater at MW-1921, it would indicate that the BAP could be the source. However, the BAP surface waters contain lower concentrations of molybdenum than groundwater does at the well of interest, making the BAP an unlikely source. Surface water samples collected from both BAPs in 2016 and 2021 contained lower concentrations of molybdenum than all samples collected from MW-1921 (**Table 5**).

3.1.2.2 Evidence: Molybdenum Distribution

MW-1921 had the highest reported molybdenum concentration of any well during the November 2022 groundwater sampling event, including the groundwater monitoring network wells located upgradient of MW-1921 and immediately downgradient of BAP East (**Figure 11**). MW-1921 is located approximately 2,000 ft downgradient of the waste boundary of BAP East.

These results are consistent with prior sampling events (**Figure 12**). If the molybdenum exceedance at MW-1921 were a result of a release from the BAPs, elevated concentrations would be expected at wells immediately downgradient of the waste boundary, between the BAP East and MW-1921. However, groundwater monitoring network wells located immediately downgradient of the BAPs do not display elevated concentrations and have never had SSLs of molybdenum (Geosyntec 2023).

Groundwater on the northeast side of the BAPs is predicted to migrate beneath the former Sporn fly ash pond and toward production wells West 1 and East 1 during regular operational conditions (**Attachment B**). The difference in molybdenum concentrations between monitoring wells at the immediate downgradient waste boundary of the BAPs (MW-1605S/D, MW-1606S/D, and MW-1607S/D) and further downgradient well MW-1921 suggests that the former Sporn fly ash pond is the alternative source of molybdenum to groundwater at MW-1921.

To test this hypothesis, a statistical evaluation (**Attachment E**) was completed that compared molybdenum concentrations at MW-1921, located downgradient of the Sporn fly ash pond, to molybdenum concentrations at wells upgradient of the Sporn fly ash ponds and downgradient of the BAPs (MW-1605S/D, MW-1606S/D, and MW-1607S/D) (**Figure 11**). This statistical evaluation included monitoring results through the November 2022 sampling event. Molybdenum results from wells immediately downgradient of the BAPs (MW-1605S/D, MW-1606S/D, and MW-1607S/D) were pooled to generate a UTL of 101.7 micrograms per liter ($\mu\text{g/L}$), which is representative of groundwater conditions immediately downgradient of the Mountaineer BAPs and upgradient of the Sporn fly ash pond. The calculated LCL for MW-1921 was 420 $\mu\text{g/L}$, which exceeded the calculated molybdenum UTL for wells downgradient of the Mountaineer BAPs (**Figure 13**). Because the calculated LCL for MW-1921 (downgradient of the Sporn fly ash pond) exceeded the UTL calculated from wells immediately downgradient of the Mountaineer BAPs and upgradient of the Sporn fly ash pond, an SSL would be triggered in a hypothetical system where MW-1921 is a downgradient monitoring well for the Sporn fly ash pond. This statistically significant result provides further evidence that the former Sporn fly ash pond is the alternative source of molybdenum to groundwater at MW-1921.

3.2 Sampling Requirements

This ASD indicates that the arsenic and molybdenum SSLs are not due to a release from the Mountaineer BAPs. Therefore, a corrective measures assessment for arsenic and molybdenum is not necessary.

The former Sporn fly ash pond has impacted groundwater samples from MW-1921, and the samples from MW-1921 cannot be used to assess the effectiveness of the remedy for lithium from the BAPs, as required in 40 CFR 257.98(a)(1)(ii). Therefore, MW-1921, which was identified as a nature-and-extent well in the Corrective Action Monitoring Plan (Sanborn Head 2022), should be removed from the corrective action groundwater monitoring network.

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 40 CFR 257.95(g)(3)(ii) and supports the position that the SSLs for arsenic and molybdenum identified during corrective action monitoring in November 2022 were not due to a release from the BAPs. Instead, the following conclusions are made:

- The arsenic SSLs should be attributed to natural variation in the underlying geology.
- The molybdenum SSL should be attributed to impacts to groundwater from an adjacent anthropogenic source.

Therefore, no further action for arsenic and molybdenum is warranted and the BAPs will continue corrective action groundwater monitoring due to the presence of elevated lithium concentrations, in accordance with 40 CFR 257.98(a)(1). Certification of this ASD by a qualified professional engineer is provided in **Attachment F**.

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TABLES

Table 1 - Arsenic Groundwater and Pond Water Summary Table
Alternative Source Demonstration Report
Mountaineer Bottom Ash Ponds

Location	Sample ID	Sample Date	Total Arsenic (µg/L)	Average Arsenic (µg/L)
BAP (East)	EBAP	6/15/2016	1.69	1.8
	EBAP	6/21/2016	2.35	
	EBAP	8/24/2016	2.86	
	EBAP	12/7/2016	2.44	
	BAP (East)-20210329	3/29/2021	0.67	
	BAP (East)-20210518	5/18/2021	0.79	
BAP (West)	WBAP IN	6/15/2016	8.6	6.65
	WBAP MID	6/15/2016	5.49	
	WBAP Out	6/15/2016	5.27	
	WBAP IN	6/21/2016	8.47	
	WBAP MID	6/21/2016	5.9	
	WBAP OUT	6/21/2016	5.45	
	WBAP IN	8/24/2016	7.65	
	WBAP MID	8/24/2016	6.73	
	WBAP OUT	8/24/2016	5.81	
	WBAP IN	12/7/2016	8.43	
	WBAP MID	12/7/2016	8.25	
	WBAP OUT	12/7/2016	7.86	
	BAP (West)-20210329	3/29/2021	4.39	
BAP (West)-20210518	5/18/2021	4.85		
MW-1805	MW-1805-20190410	4/10/2019	20.3	46.4
	MW-1805-20190619	6/19/2019	66.3	
	MW-1805-20190910	9/10/2019	70.4	
	MW-1805-20200310	3/10/2020	11.4	
	MW-1805-20200514	5/14/2020	56	
	MW-1805-20201009	10/9/2020	80.9	
	MW-1805-20210325	3/25/2021	74.2	
	MW-1805-20210519	5/19/2021	69.5	
	MW-1805-20211026	10/26/2021	37.3	
	MW-1805-20220302	3/2/2022	19.4	
	MW-1805-20220520	5/20/2022	10.9	
MW-1805-20221104	11/4/2022	40.2		
MW-1922D	MW-1922D-20190409	4/9/2019	323	633
	MW-1922D-20190619	6/19/2019	716	
	MW-1922D-20190910	9/10/2019	839	
	MW-1922D-20200311	3/11/2020	1240	
	MW-1922D-20200519	5/19/2020	522	
	MW-1922D-20201008	10/8/2020	1040	
	MW-1922D-20210325	3/25/2021	546	
	MW-1922D-20210520	5/20/2021	494	
	MW-1922D-20211027	10/27/2021	456	
	MW-1922D-20220303	3/3/2022	478	
	MW-1922D-20220523	5/23/2022	562	
MW-1922D-20221104	11/4/2022	384		

Notes:

1. All results are shown in micrograms per liter (µg/L).

BAP: Bottom Ash Pond

**Table 2 - Vertical Gradient Calculations
Alternative Source Demonstration Report
Mountaineer Bottom Ash Ponds**

Date	Groundwater Elevation			MW-1922S to MW-1922D			MW-1922S to MW-1805		
	MW-1805	MW-1922D	MW-1922S	Head Change (ft)	Vertical Gradient		Head Change (ft)	Vertical Gradient	
4/8/2019	-	547.7	547.89	0.19	0.00634	down	-	-	-
6/17/2019	546.45	549	547.86	-1.14	-0.0381	up	1.41	0.0272	down
9/9/2019	545.02	477.42	507.82	-	-	-	-	-	-
3/9/2020	-	545.57	545.52	-0.05	-0.00167	up	-	-	-
5/12/2020	546.88	546.98	546.96	-0.02	-0.00067	up	0.08	0.0015	down
10/5/2020	544.85	544.96	544.99	0.03	0.00100	down	0.14	0.0027	down
3/18/2021	543.38	543.48	543.42	-0.06	-0.00200	up	0.04	0.0008	down
5/12/2021	533.27	543.31	543.31	0.00	0.00000	-	-	-	-
10/25/2021	542.33	542.21	542.3	0.09	0.00300	down	-0.03	-0.0006	up
2/28/2022	542.63	542.71	542.62	-0.09	-0.00300	up	-0.01	-0.0002	up
5/16/2022	544.53	544.57	544.44	-0.13	-0.00434	up	-0.09	-0.0017	up
10/31/2022	543.18	543.29	543.22	-0.07	-0.00234	up	0.04	0.0008	down
Top of Screen Elevation	469.049	491.016	520.972						
Middle of Screen Elevation	464.05	486.02	515.97						
Bottom of Screen Elevation	459.05	481.02	510.97						
Length to MW-1922S Screen	51.92	29.95	-						

Notes:

1. Anomalous groundwater elevations were excluded from calculations: MW-1922D and MW-1922S from September 2019, MW-1805 from May 2021.
 2. Groundwater elevation data was generated by Arcadis and provided to Geosyntec.
- ft: feet

**Table 3 - Bedrock Details and Arsenic Concentrations
Alternative Source Demonstration Report
Mountaineer Bottom Ash Ponds**

Monitoring Well	Depth of Well	Screened Interval	Sample Depth	Arsenic (mg/kg)	Geologic Material Sampled
MW-1805	133.5	123.5-133.5	122	55 B	Dark grey laminated silty clay shale
			124.5	4.6 B	Light grey sandstone
			128	56 B	Black coal with pyritic clay-rich zones
			130.5	2.9 B	Dark grey fractured silty clay shale
MW-1922D	113.5	103.5-113.5	104.5	4.5 B	Grey sandstone
			111	5.2 B	Grey sandstone

Notes:

Samples were collected on December 21, 2022 from previously drilled core associated with monitoring well installation

All depths are shown in units of feet below ground surface

Geologic descriptions included in the table were taken from field boring logs and verified during sample collection in December 2022

B: Compound was found in the blank and sample. Method blank detections were less than 10% of the reported sample values and are not expected to affect data quality.

mg/kg: milligram of arsenic per kilogram of rock

**Table 4 - Summary of X-Ray Diffraction Results
Alternative Source Demonstration Report
Mountaineer Bottom Ash Ponds**

Well ID			MW-1805	MW-1805	MW-1805	MW-1805	MW-1922D	MW-1922D
Depth (ft bgs)			122	124.5	128	130.5	104.5	111
Boring Log Description			Silty Clay Shale	Sandstone	Coal with clay-rich zones	Silty Clay Shale	Sandstone	Sandstone
Mineral/Compound	Formula	Mineral Type	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)
Quartz	SiO ₂	Silicate	24.0	73.0	4.0	32.0	86.0	85.0
Plagioclase	(Na,Ca)AlSi ₃ O ₈	Feldspar	5.0	7.0	-	7.0	4.0	3.0
Potassium-Feldspar	KAlSi ₃ O ₈	Feldspar	1.0	8.0	-	1.0	1.0	2.0
Calcite	CaCO ₃	Carbonate	<0.5	<0.5	-	-	0.5	-
Siderite	FeCO ₃	Carbonate	2.0	<0.5	-	1.5	-	-
Pyrite	FeS ₂	Sulfide	2.0	<0.5	4.0	0.5	-	-
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄	Clay	11.0	7.5	6.0	10.0	6.0	6.0
Chlorite	(Fe,(Mg,Mn) ₅ ,Al)(Si ₃ Al)O ₁₀ (OH) ₈	Clay	16.0	0.5	-	14.0	-	<0.5
Illite/Mica	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂	Clay/Mica	39.0	4.0	1.0	33.0	2.5	3.0
Mixed-Layer Illite/Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂	Clay	2.0	-	1.0	1.0	<0.5	-
Goethite	FeO(OH)	Oxyhydroxide	-	-	-	-	-	0.5
Hematite	Fe ₂ O ₃	Oxide	-	-	-	-	-	0.5
Amorphous Material			-	-	84.0	-	-	-
Clay & Mica Total			68	12	8	58	9	10

Notes

1. The weight percent quantities indicated have been normalized to a sum of 100%
 2. Sample depths are shown in feet below ground surface (ft bgs).
- : Mineral was not detected above the detection limit
 <X: Mineral was detected below quantification limit
 wt %: Weight percentage

Table 5 - Molybdenum Groundwater and Pond Water Summary Table *Geosyntec Consultants*
Alternative Source Demonstration Report
Mountaineer Bottom Ash Ponds

Location	Sample ID	Sample Date	Total Molybdenum (µg/L)	Average Molybdenum (µg/L)
BAP (East)	EBAP	6/15/2016	279	204
	EBAP	6/21/2016	296	
	EBAP	8/24/2016	285	
	EBAP	12/7/2016	362	
	BAP (East)-20210329	3/29/2021	2	
	BAP (East)-20210518	5/18/2021	2.1	
BAP (West)	WBAP IN	6/15/2016	19.1	30.0
	WBAP MID	6/15/2016	15.1	
	WBAP Out	6/15/2016	15.5	
	WBAP IN	6/21/2016	29.8	
	WBAP MID	6/21/2016	26.1	
	WBAP OUT	6/21/2016	22.2	
	WBAP IN	8/24/2016	27.2	
	WBAP MID	8/24/2016	26.4	
	WBAP OUT	8/24/2016	24.1	
	WBAP IN	12/7/2016	21.1	
	WBAP MID	12/7/2016	20.6	
	WBAP OUT	12/7/2016	18.4	
	BAP (West)-20210329	3/29/2021	117	
	BAP (West)-20210518	5/18/2021	37.8	
MW-1921	MW-1921-20190410	4/10/2019	478	461
	MW-1921-20190619	6/19/2019	502	
	MW-1921-20190911	9/11/2019	500	
	MW-1921-20200312	3/12/2020	461	
	MW-1921-20200518	5/18/2020	472	
	MW-1921-20201006	10/6/2020	472	
	MW-1921-20210323	3/23/2021	364	
	MW-1921-20210520	5/20/2021	489	
	MW-1921-20211029	10/29/2021	417	
	MW-1921-20220302	3/2/2022	445	
	MW-1921-20220518	5/18/2022	468	
	MW-1921-20221101	11/1/2022	373	

Notes:

1. All results are shown in micrograms per liter (µg/L).

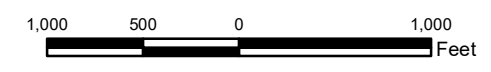
BAP: Bottom Ash Pond

FIGURES



- Legend**
- CCR Network Monitoring Wells
 - Nature and Extent Monitoring Wells
 - Piezometer
 - AEP-Owned Pumping Well
 - Groundwater Elevation Contour
 - Approximate Groundwater Flow Direction

- Notes**
- Monitoring well coordinates and water level data (collected on October 31, 2022) provided by AEP.
 - Site features based on information available in Ash Pond System-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
 - Groundwater elevation units are feet above mean sea level.
 - Only monitoring wells were used to generate groundwater contours. Water elevations were not collected for the pumping wells.
 - No groundwater was present at MW-1928 and MW-112 during the October 2022 sampling event.
 - Normal lower pool elevation of the Ohio River at Racine Lock and Dam is 539.5 ft amsl (USACE).
 - Intermittent use of AEP-owned pumping wells for plant activities impact water levels in the vicinity. In general, shallow groundwater beneath the plant flows northeast toward the Ohio River.
 - CCR: Coal combustion residuals
 - USACE: United States Army Core of Engineers



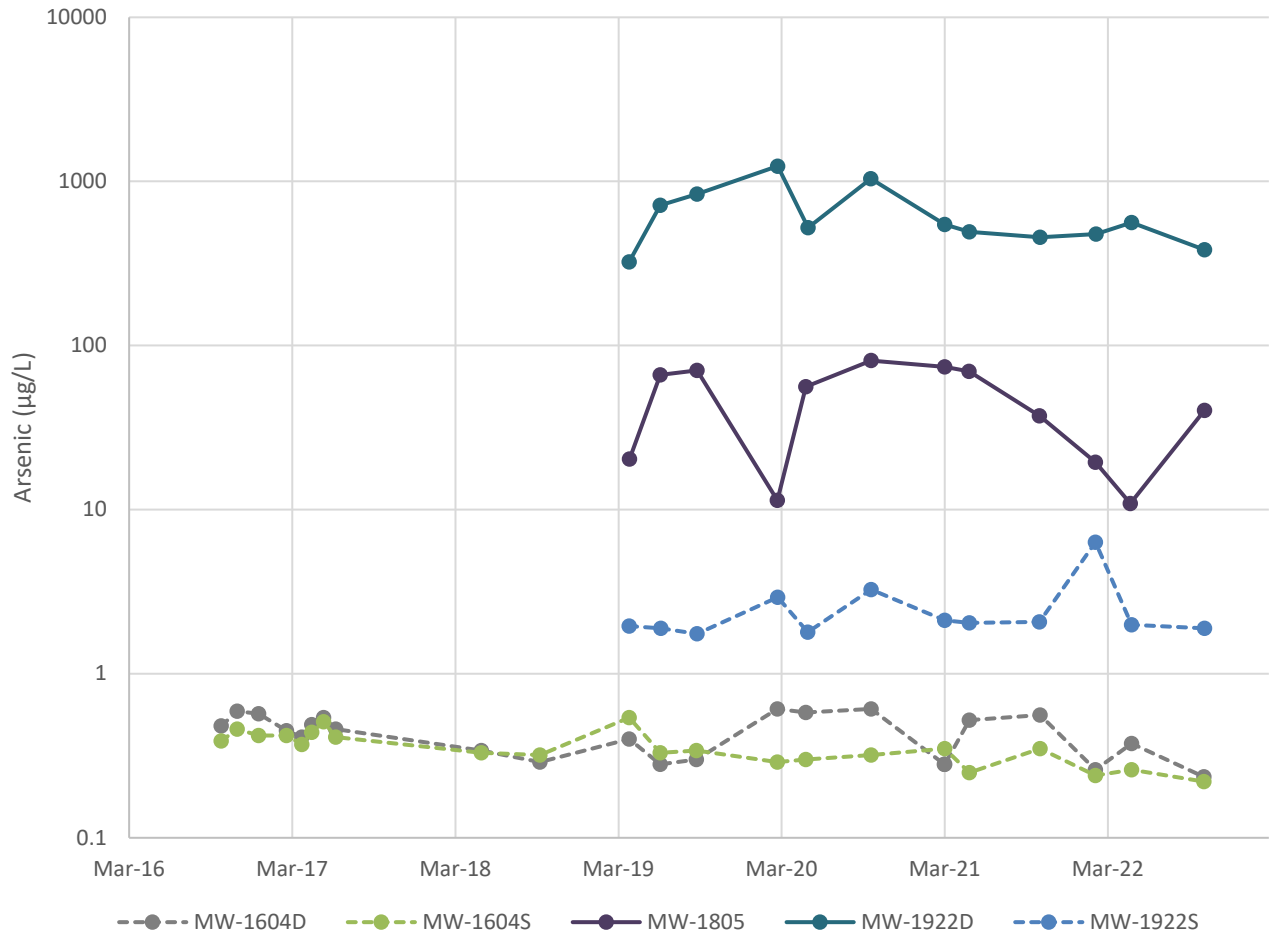
**Potentiometric Surface Map - Uppermost Aquifer
October 2022**

Mountaineer Bottom Ash Ponds

Columbus, Ohio

Figure
1

May 2023



Notes: Wells screened in the unconsolidated sand and gravel lithology are shown with dashed lines. Wells screened in bedrock are shown with solid lines. Arsenic concentrations in micrograms per liter ($\mu\text{g/L}$) are shown on a log scale.

Arsenic Time Series Graph

Mountaineer Bottom Ash Ponds

Geosyntec
consultants



Figure
2

Columbus, Ohio

May 2023

MW1603

897 ft

MW1604S/D

212 ft

MW1805
MW1922S/D

726 ft

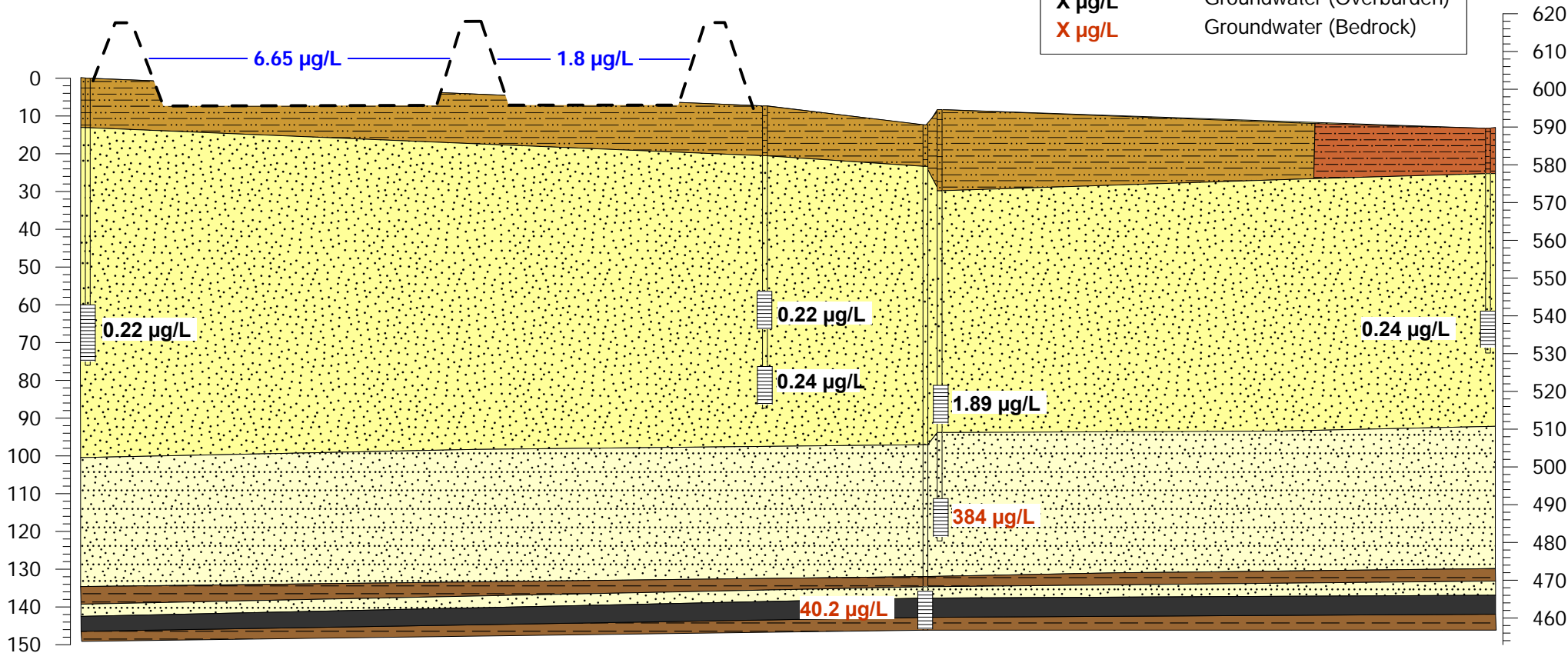
MW1925

Bottom Ash Pond West

Bottom Ash Pond East

Key: (Analytical Data)

- X µg/L Pond Water
- X µg/L Groundwater (Overburden)
- X µg/L Groundwater (Bedrock)



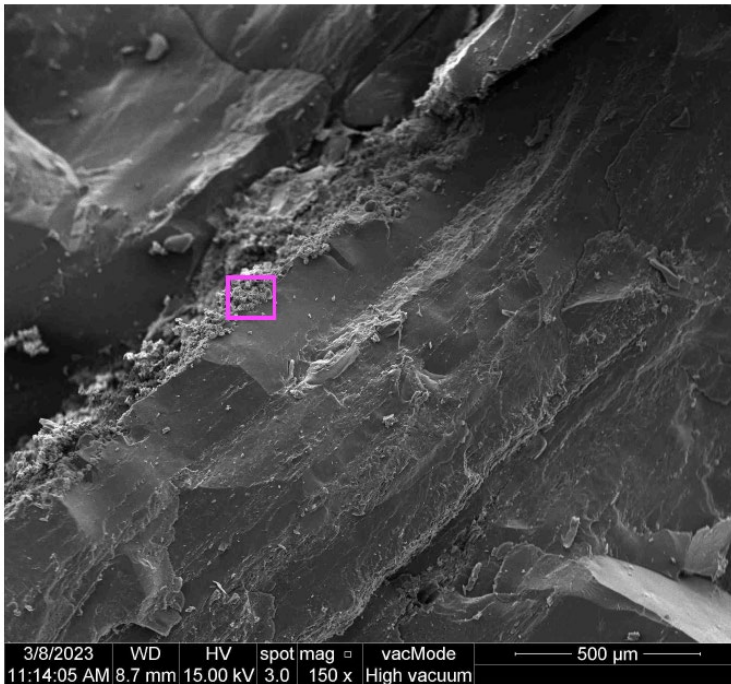
Lithology	
Overburden	Bedrock
	CLAY
	GRAVEL
	COAL
	SHALE
	SANDSTONE
	SILT
	SAND

Well Construction	
	Screen
	Ash Pond Extent
	Ash Pond Water Level

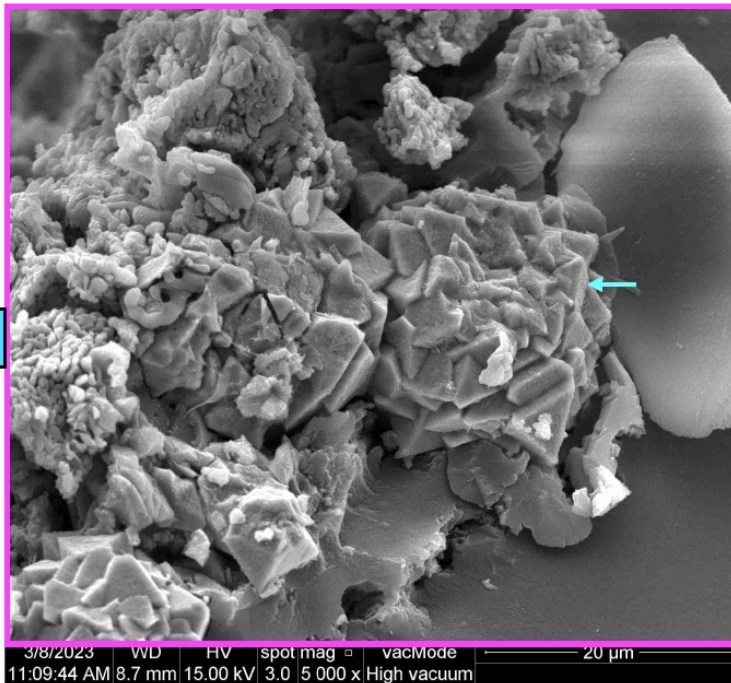
- Notes:
1. Scale is approximate; all units of length are in feet.
 2. Vertical exaggeration is 5x.
 3. This section was created using widely spaced boreholes; thus, all interpretation away from borehole locations should be considered an approximate representation.
 4. Groundwater arsenic concentration values are from samples collected in November of 2022.
 5. Ash pond extents and depths are approximate and projected from out of the plane of section. Extents do not represent constructed dimensions.
 6. Pond water results are averaged from samples collected in 2016 and 2021.

Cross Section With Arsenic Concentrations
Mountaineer Bottom Ash Ponds

23009-03C 150X



23009-03D 5000X



Notes: Sample was collected from a depth of 128 feet below ground surface from MW-1805 core. Scanning electron microscope (SEM) instrument settings are indicated at the bottom of each micrograph. The lower micrograph displays a magnified image of the area within the purple box on the top micrograph. Pyrite is denoted by the blue 'P' and blue arrow on the bottom micrograph.

Pyrite Occurrence in MW-1805 Bedrock
Mountaineer Bottom Ash Ponds

Geosyntec
consultants

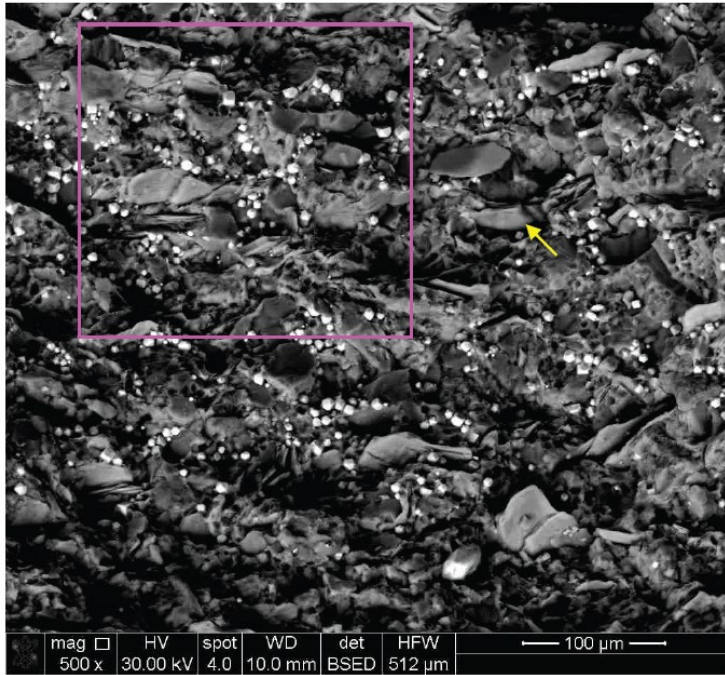


Figure
4

Columbus, Ohio

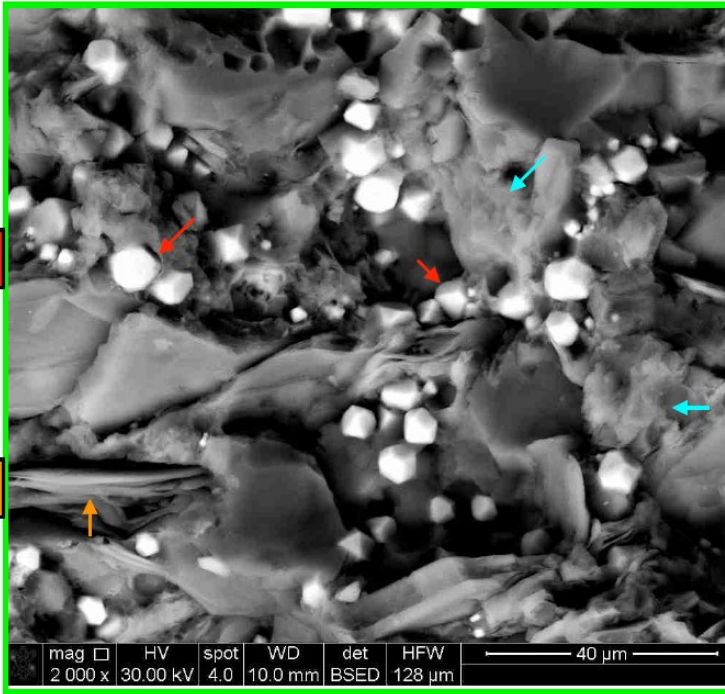
May 2023

23009-04B 500X



Q

23009-04D 1000X



S

M

DM

Notes: Sample was collected from a depth of 130.5 feet below ground surface from MW-1805 core. Scanning electron microscope (SEM) instrument settings are indicated at the bottom of each micrograph. Siderite is denoted by the red 'S' and red arrows in the bottom micrograph and is evident in the top micrograph as high-contrast 'bright' crystals interspersed throughout the sample. Mica is denoted by the orange 'M,' detrital clay matrix material is denoted by the green 'DM,' and quartz is denoted by the yellow 'Q.'

Siderite Occurrence in MW-1805 Bedrock
Mountaineer Bottom Ash Ponds

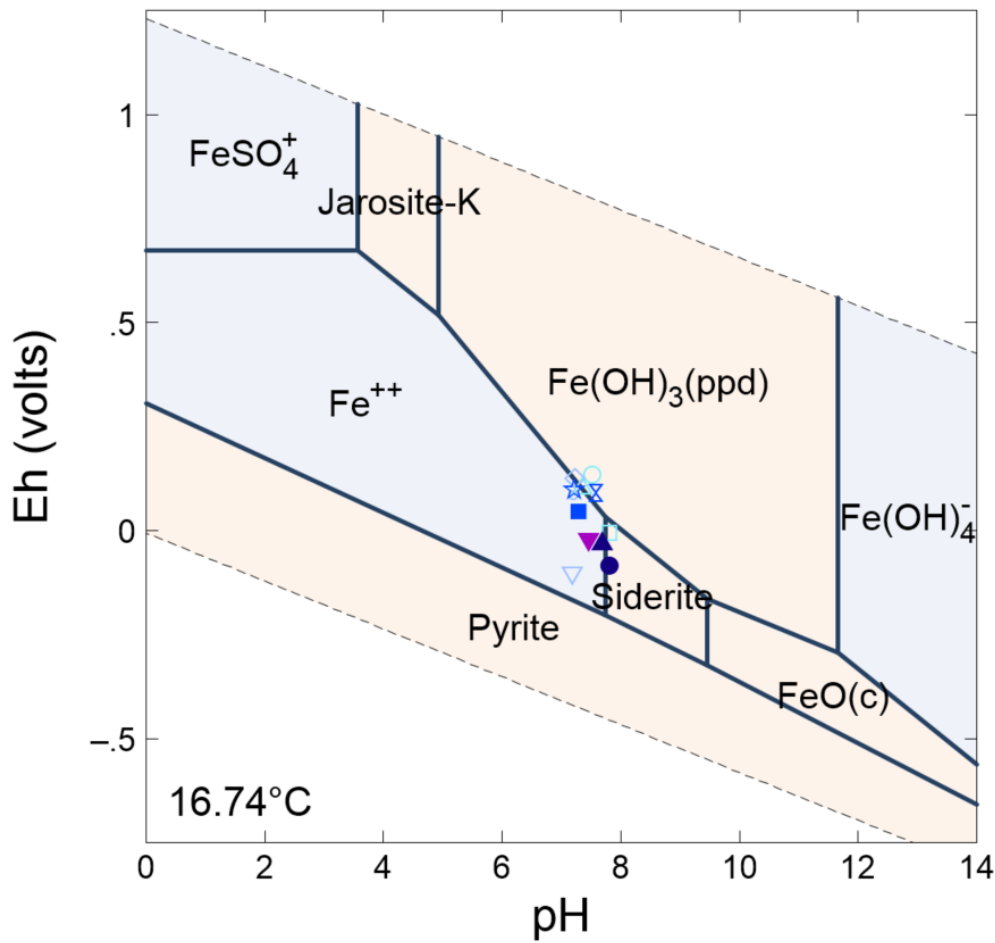
Geosyntec
consultants



Figure
5

Columbus, Ohio

May 2023



- 10-Apr-19
- 19-Jun-19
- △ 10-Sep-19
- ▽ 10-Mar-20
- ◇ 14-May-20
- 09-Oct-20
- × 25-Mar-21
- ☆ 19-May-21
- 26-Oct-21
- 02-Mar-22
- ▲ 20-May-22
- ▼ 04-Nov-22

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Notes: Eh-pH diagram generated with averaged data from all MW-1805 sampling events.

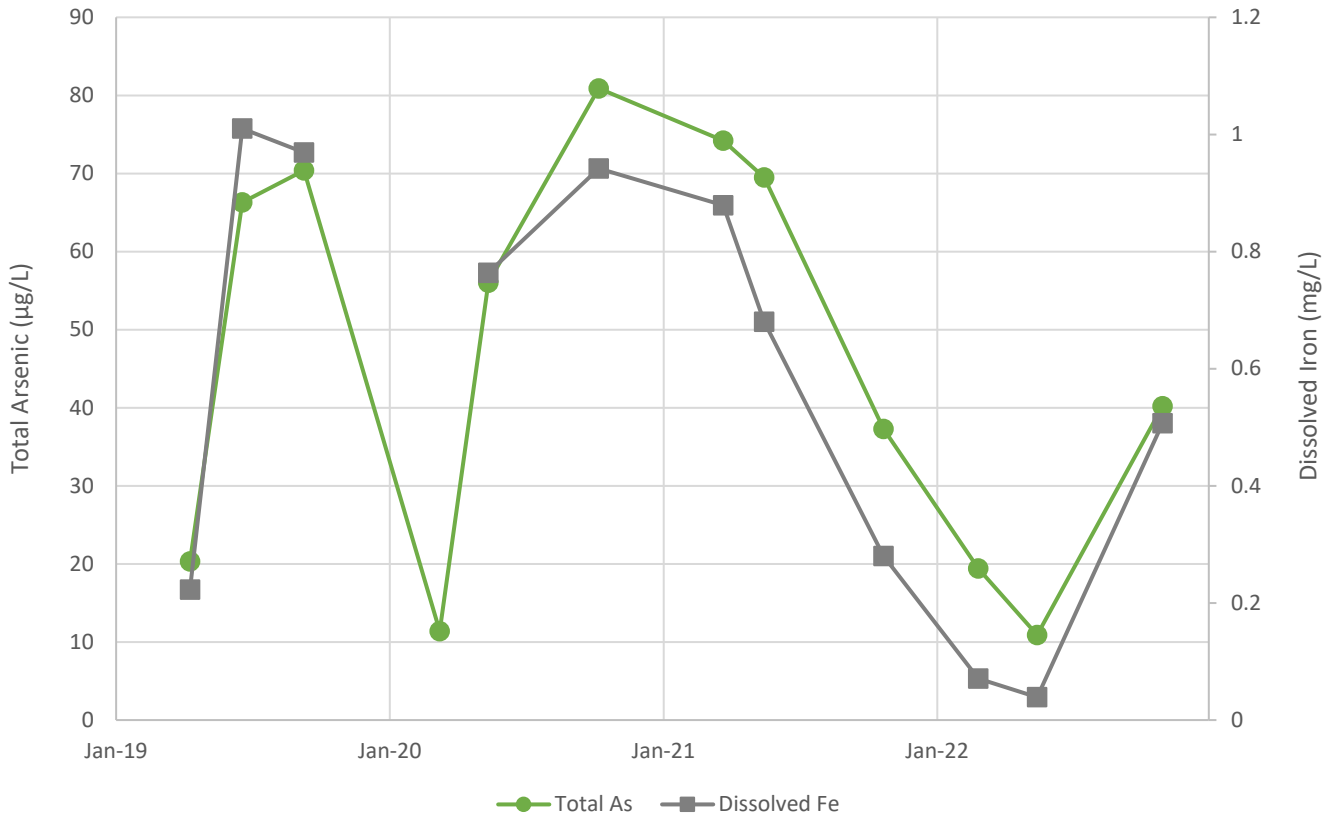
MW-1805 Iron Eh-pH Diagram
 Mountaineer Bottom Ash Ponds



Figure
6

Columbus, Ohio

May 2023



Notes: Samples submitted for arsenic analyses were not filtered. Samples submitted for dissolved iron analyses were field filtered prior to sample collection. Arsenic is shown in units of micrograms per liter (µg/L). Dissolved iron is shown in units of milligrams per liter (mg/L).

MW-1805 Arsenic and Dissolved Iron Time Series Graph

Mountaineer Bottom Ash Ponds

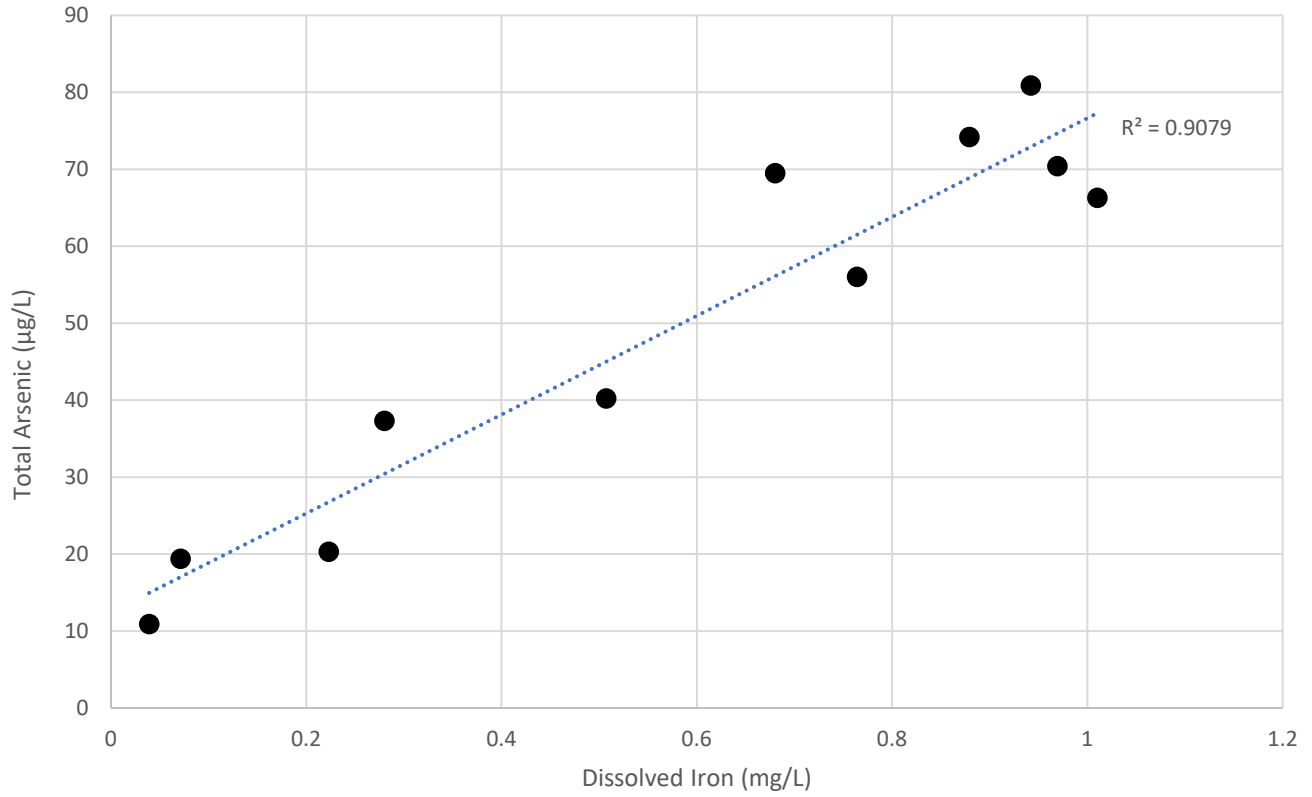
Geosyntec
consultants



Figure
7

Columbus, Ohio

May 2023



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Notes: Samples submitted for arsenic analyses were not filtered. Samples submitted for dissolved iron analyses were field filtered prior to sample collection. Arsenic is shown in units of micrograms per liter (µg/L). Dissolved iron is shown in units of milligrams per liter (mg/L).

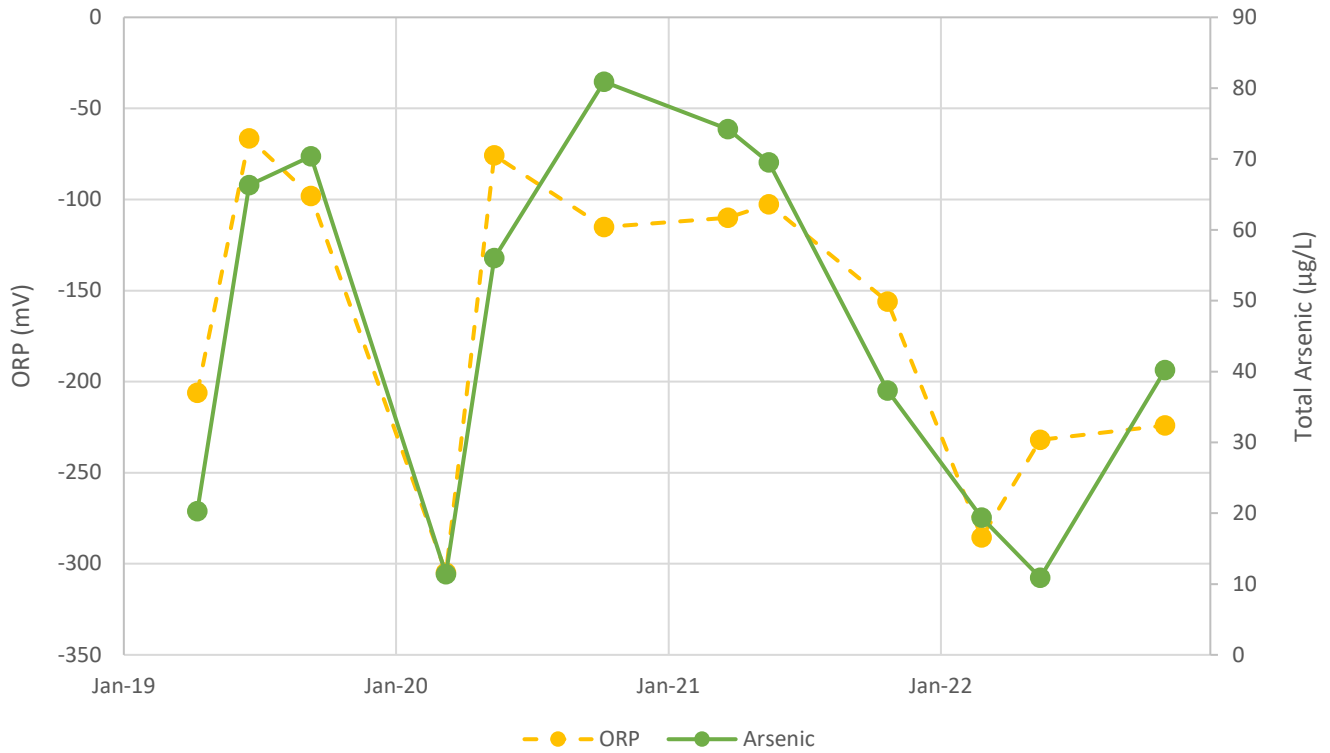
MW-1805 Arsenic and Dissolved Iron Scatterplot
 Mountaineer Bottom Ash Ponds



Figure
8

Columbus, Ohio

May 2023



Notes: Oxidation-reduction potential (ORP) was measured in the field during sample collection. Samples submitted for arsenic analyses were not filtered. ORP is shown in units of millivolts (mV). Arsenic concentrations are shown in units of micrograms per liter (µg/L).

MW-1805 Arsenic and ORP Time Series Graph

Mountaineer Bottom Ash Ponds

Geosyntec
consultants

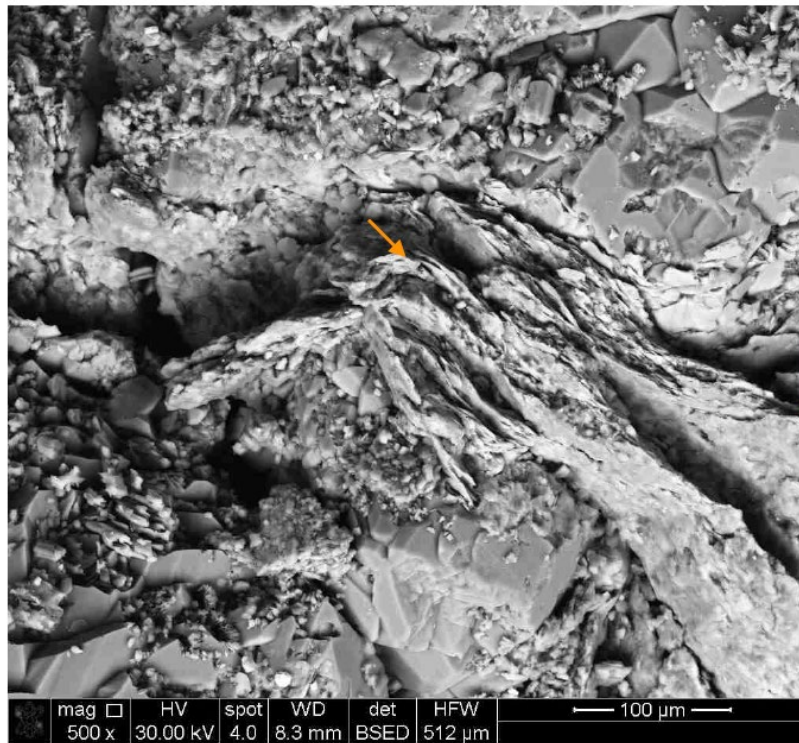


Figure
9

Columbus, Ohio

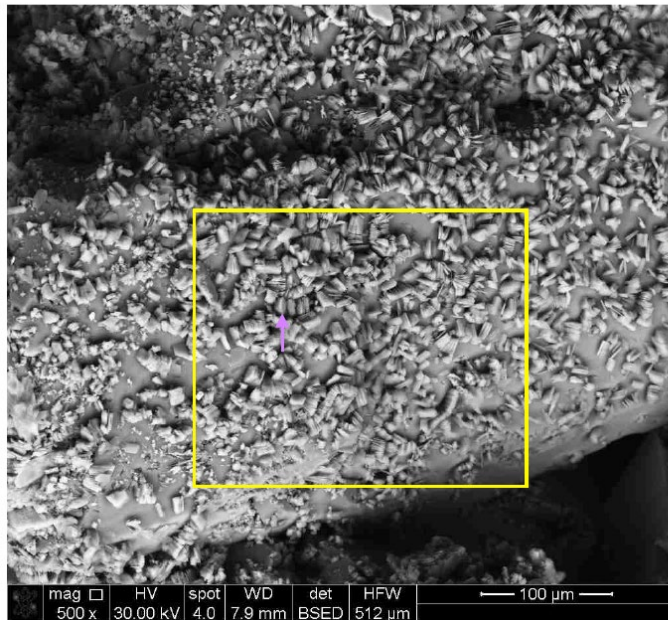
May 2023

23009-05C 500X



M

23009-05E 500X



K

Notes: Sample was collected from a depth of 104.5 feet below ground surface from MW-1922D core. Scanning electron microscope (SEM) instrument settings are indicated at the bottom of each micrograph. Micaceous shale is indicated by the orange 'M' and orange arrow. Partial exfoliation of the mica sheets as well as secondary clay mineral formation immediately adjacent to mica sheets suggests chemical weathering of mica to clays. The bottom micrograph shows prevalent secondary clay mineral formation (kaolinite) within open pore space.

Mica Weathering in MW-1922D Bedrock
Mountaineer Bottom Ash Ponds

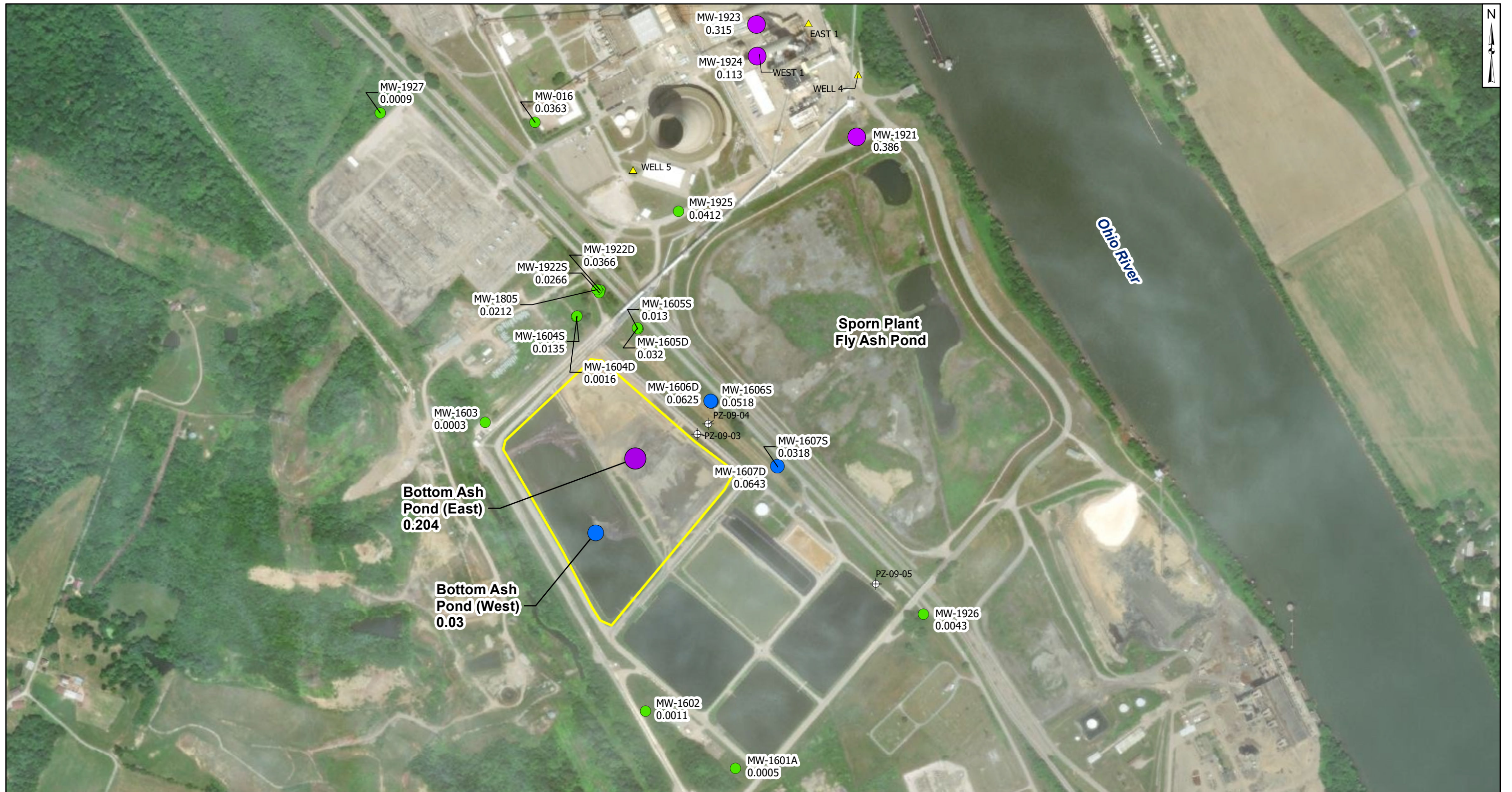
Geosyntec
consultants



Figure
10

Columbus, Ohio

May 2023



Legend

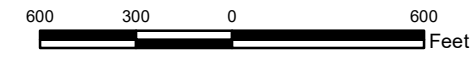
- ⊕ Piezometer
- ▲ AEP-Owned Pumping Well
- ▭ CCR Unit Boundary

Molybdenum Concentration (mg/L)

- < 0.05
- 0.05 - 0.1
- 0.1 - 0.5

Notes

- Bottom Ash Pond molybdenum concentrations represent average of 2016 and 2021 samples.
- Molybdenum concentrations are shown in mg/L.
- Molybdenum concentrations greater than the Groundwater Protection Standard (0.100 mg/L) are shown in purple.
- Site features based on information available in Ash Pond System-CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016) provided by AEP.
- CCR: Coal Combustion Residuals
- mg/L: milligrams per liter

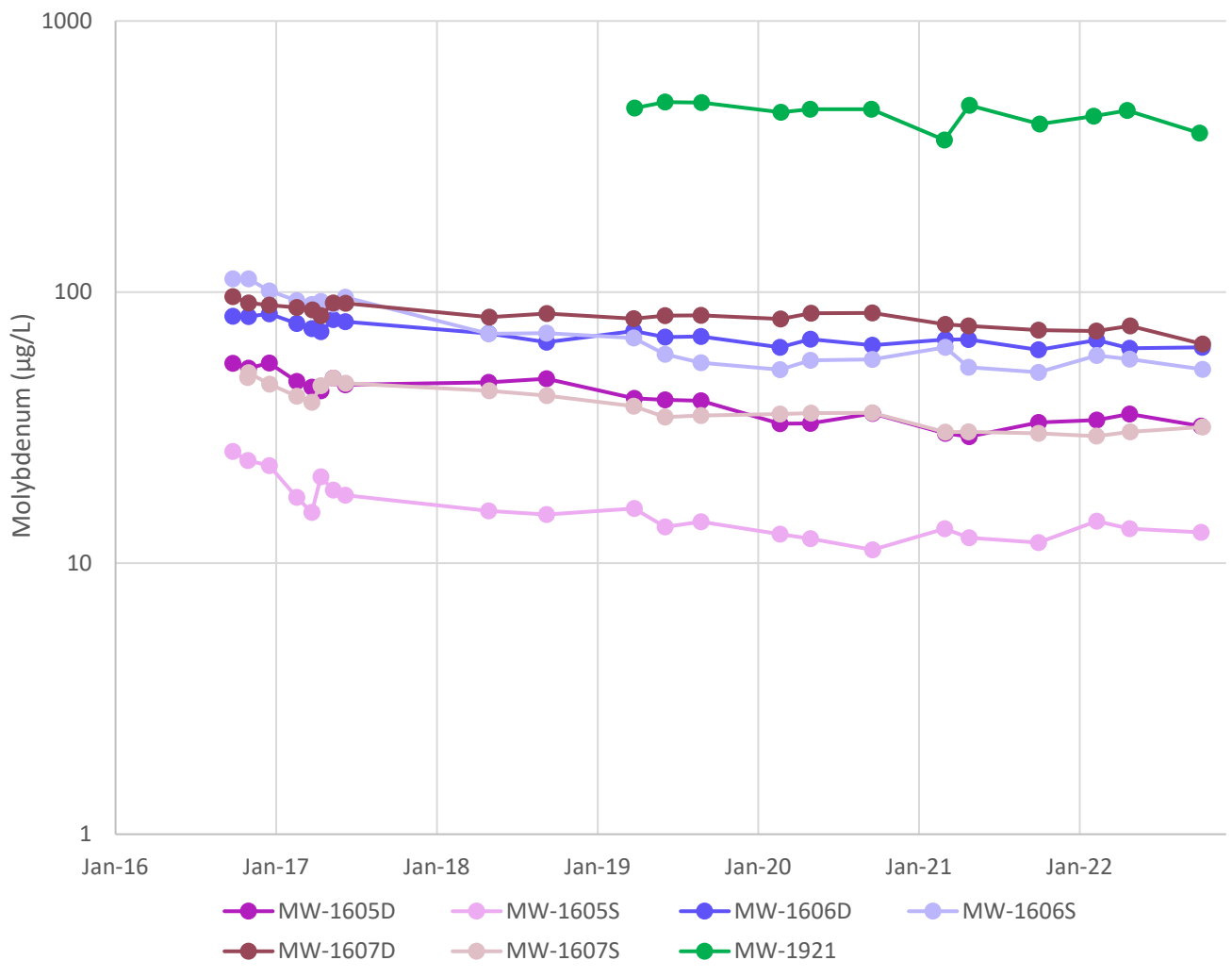


Molybdenum Analytical Results Spatial Distribution
Mountaineer Bottom Ash Ponds

Geosyntec
consultants

Columbus, Ohio May 2023

Figure 11



Notes: Groundwater data collected as part of federal groundwater monitoring requirements. Molybdenum concentrations in micrograms per liter (µg/L) are shown on a log scale. MW-1605S/D, MW-1606S/D, and MW-1607S/D are located immediately downgradient of the Mountaineer bottom ash ponds (BAPs).

Molybdenum Time Series Graph

Mountaineer Bottom Ash Ponds



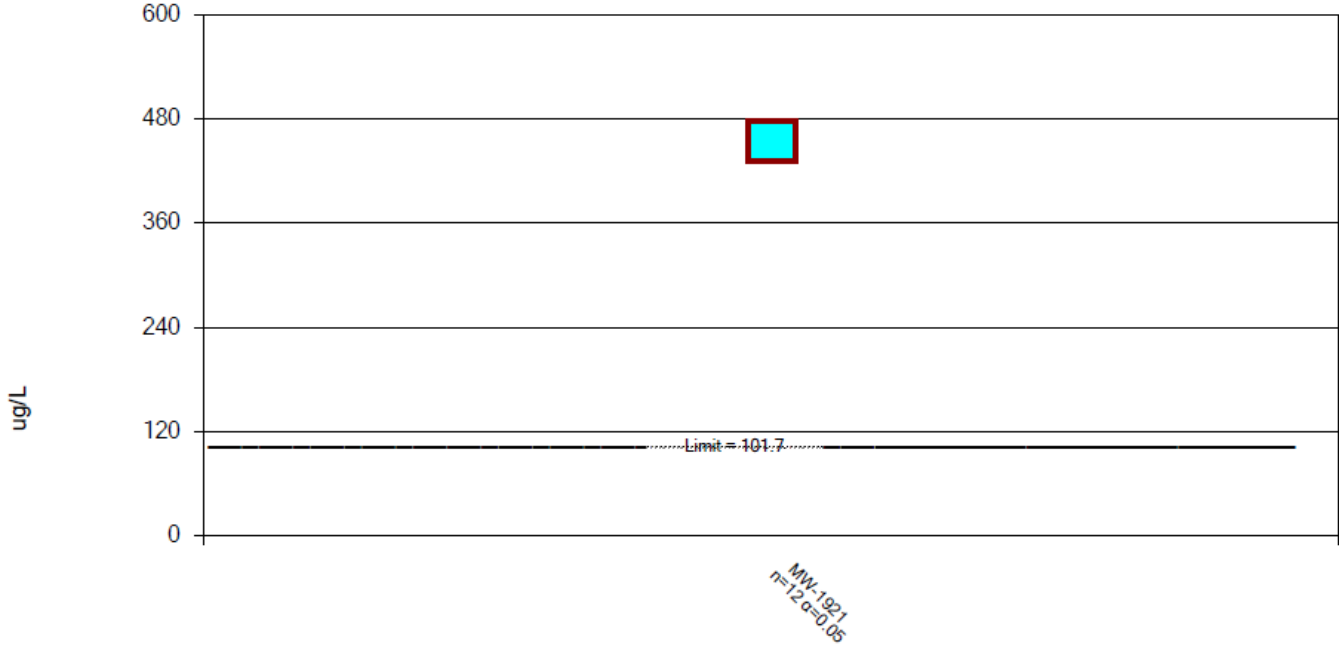
Figure 12

Columbus, Ohio

May 2023

Parametric Confidence Interval

Compliance limit is exceeded. Normality Test: Shapiro Wilk, alpha based on n.



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Notes: The parametric lower confidence limit (LCL) for total molybdenum at MW-1921 was compared to the upper tolerance limit (UTL) calculated using data from bottom ash ponds (BAPs) downgradient monitoring wells MW-1606S/D, MW-1606S/D, and MW-1607S/D. These wells are located upgradient of MW-1921. Total molybdenum concentrations are shown in micrograms per liter ($\mu\text{g/L}$).

Downgradient Well UTL and MW-1921 LCL Comparison

Mountaineer Bottom Ash Ponds

Geosyntec
consultants



Figure
13

Columbus, Ohio

May 2023

ATTACHMENT A
MW-1805, MW-1922D, and MW-1921
Boring Logs



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthel

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	36.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\4300S\4345.00\WORK\LOGS\4345.00 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1 GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log		
0									
2									
4									
5 - 6.5		S-01	5 - 6.5	2 2 3	18/18	PID: NM	SILT & CLAY	S-01 (5 to 6.5'): Medium stiff, reddish brown, SILT & CLAY, seam of fine Sand. Moist.	
10									
10 - 11.5		S-02	10 - 11.5	2 2 4	18/18	PID: NM	CLAYEY SILT	S-02A (10 to 11'): Medium stiff, reddish brown, Clayey SILT. Moist. S-02B (11 to 11.5'): Loose, reddish brown, fine to coarse SAND, some Silt. Moist.	
12									
14									
15 - 16.5		S-03	15 - 16.5	2 2 2	18/14	PID: NM	FINE TO COARSE SAND	S-03 (15 to 16.5'): Very loose, brown, fine SAND, little Silt. Moist. Stratified at approximately 16 feet.	
18									
20									
20 - 21.5		S-04	20 - 21.5	8 12 12	18/12	PID: NM		S-04 (20 to 21.5'): Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
22									
24									



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings		Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
Date	Time					
06/22/18	07:00	38.7'	Ground Surface	0'	133.8'	- 14 hours

BORING LOG P:\4300S\4345.00\WORK\LOGS\M345.00 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log Description		
26		S-05	25 - 26.5	4 7 8	18/10	PID: NM		S-05 (25 to 26.5'): Medium dense, brown fine to coarse SAND, little Gravel, trace Silt. Moist.	
30		S-06	30 - 31.5	4 15 10	18/11	PID: NM		S-06 (30 to 31.5'): Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
36		S-07	35 - 36.5	4 4 7	18/9	PID: NM		S-07 (35 to 36.5'): Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
38		S-08	36.5 - 38.5	4 6 8 8	24/11	PID: NM	FINE TO COARSE SAND	S-08 (36.5 to 38.5'): Medium dense, brown/black, fine to coarse SAND, trace Silt. Moist.	
40		S-09	38.5 - 40.5	3 5 5 7	24/12	PID: NM		S-09 (38.5 to 40.5'): Loose, brown/black, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
42		S-10	40.5 - 42.5	3 6 5 7	24/13	PID: NM		S-10 (40.5 to 42.5'): Medium dense, brown/black, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
44		S-11	42.5 - 44.5	3 4 8 7	24/0	PID: NM		S-11 (42.5 to 44.5'): No recovery.	
46		S-12	44.5 - 46.5	7 8 3 8	24/4	PID: NM		S-12 (44.5 to 46.5'): Loose, brown, fine to medium SAND, trace Silt. Wet.	
48		S-13	46.5 - 48.5	2 3 6 8	24/11	PID: NM		S-13 (46.5 to 48.5'): Loose, brown, fine to coarse SAND, trace Silt. Wet.	
50		S-14	48.5 - 50.5	1 3 5 7	24/11	PID: NM		S-14 (48.5 to 50.5'): Loose, brown, fine to medium SAND, trace Silt. Wet.	



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	38.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\4300S\4345.00\WORK\LOGS\4345 00 LOGS GP.J 2017 SANBORN HEAD V1 GLB 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information					Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description		
50		S-15	50.5 - 52	3 5 7	18/9	PID: NM			S-15 (50.5 to 52'): Medium dense, brown, fine to coarse SAND, little Silt. Wet.	At S-15 switch to 3 inch split spoon (18 inches long) from 2 inch split spoon (24 inches long) to increase sample volume.
52		S-16	52 - 53.5	1 3 5	18/0	PID: NM			S-16 (52 to 53.5'): No recovery.	
54		S-17	53.5 - 55	1 6 10	18/6	PID: NM			S-17 (53.5 to 55'): Medium dense, brown, fine to coarse SAND, trace Silt. Wet.	
56		S-18	55 - 56.5	2 4 7	18/7	PID: NM			S-18 (55 to 56.5'): Medium dense, grayish brown, fine to coarse SAND, trace Silt. Wet.	
58		S-19	56.5 - 58	1 3 7	18/0	PID: NM			S-19 (56.5 to 58'): No recovery.	
58		S-20	58 - 59	NM	12/18	PID: NM			S-20 (58 to 59'): Brown, fine to coarse SAND, little Silt, trace Gravel. Wet.	S-20 sampled by Shelby tube, no recovery and refusal after 1 foot Then collected with 2 inch split spoon and switch to 2 inch split spoon after S-20.
60		S-21	59 - 60.5	3 8 6	18/14	PID: NM			S-21 (59 to 60.5'): Medium dense, brown, fine to coarse SAND, little Silt, trace Gravel. Wet. Seam black fine to medium SAND at 60 feet.	
62		S-22	60.5 - 62	6 7 11	18/22	PID: NM			S-22 (60.5 to 62'): Medium dense, brown, fine to coarse SAND, little Silt, trace Gravel. Wet.	
64		S-23	62 - 63.5	2 6 9	18/13	PID: NM	FINE TO COARSE SAND		S-23 (62 to 63.5'): Medium dense, brown, fine to coarse SAND, trace Silt, trace Gravel. Wet.	
66		S-24	63.5 - 65	3 5 7	18/12	PID: NM			S-24 (63.5 to 65'): Medium dense, brown, fine to coarse SAND, some Silt. Wet.	
68		S-25	65 - 66.5	3 6 7	18/18	PID: NM			S-25 (65 to 66.5'): Medium dense, brown, fine to medium SAND, little Silt. Wet.	Start introducing Bentonite/water mix due to heaving sands
70		S-26	66.5 - 68	8 11 9	18/18	PID: NM			S-26 (66.5 to 68'): Medium dense, gray/brown, fine to coarse SAND, little Silt, trace Gravel. Wet.	
72		S-27	68 - 69.5	3 6 9	18/14	PID: NM			S-27 (68 to 69.5'): Medium dense, gray, fine to coarse SAND, little Silt, trace Gravel. Wet.	
74		S-28	69.5 - 71	10 11 15	18/15	PID: NM			S-28 (69.5 to 71'): Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt. Wet.	
76		S-29	71 - 72.5	10 13 19	18/11	PID: NM			S-29 (71 to 72.5'): Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt. Wet.	
78		S-30	72.5 - 74	8 12 10	18/11	PID: NM			S-30 (72.5 to 74'): Medium dense, gray, fine to coarse SAND, trace Gravel, trace Silt. Wet.	
80		S-31	74 - 75.5	11 13 14	18/10	PID: NM			S-31 (74 to 75.5'): Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt. Wet.	



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	36.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\43005\4345.00\WORK\LOGS\4345 00 LOGS GP-J 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information					Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (In)	Field Testing Data	Log	Description		
76		S-32	75.5 - 77	8 12 15	18/13	PID: NM	FINE TO COARSE SAND	S-32 (75.5 to 77'): Medium dense, gray/brown, fine to coarse SAND, trace Gravel, trace Silt. Wet.		
78		S-33	77 - 78.5	7 10 14	18/11	PID: NM		S-33 (77 to 78.5'): Medium dense, gray/brown, fine to coarse SAND, trace Gravel, trace Silt. Wet.		
		S-34	78.5 - 80	7 9 10	18/0	PID: NM		S-34 (78.5 to 80'): No recovery.		
80		S-35	80 - 81.5	4 5 12	18/0	PID: NM		S-35 (80 to 81.5'): No recovery.		
82		S-36	81.5 - 83	19 18 17	18/10	PID: NM		S-36 (81.5 to 83'): Dense, brown, fine to coarse SAND, some Gravel, trace Silt. Wet.		
84		S-37	83 - 83.9	17 50/5"	11/10	PID: NM		S-37 (83 to 83.9'): Very dense, brown, fine to coarse SAND, some Gravel, little Silt. Wet. Sandstone in tip.		
	NM	S-38 C-01	84.5 - 84.7 84.7 - 89.3	50/2"	2/7 55/39	PID: NM	84.7'	S-38 (84.5 to 84.7'): Very dense, gray, fine to medium SAND. Wet.	Auger refusal at 84.7 ft. Begin PWL coring.	
86							C-01 (84.7 to 89.3'): Medium hard, medium gray, fine to medium-grained, slightly micaceous Sandstone, with very thin to thin horizontal partings spaced 2 to 3 inches apart. Thin horizontal black lenses fine to medium grained carbonaceous Sandstone between 86 and 86.4 feet. Brown fine grained sandstone cobble in upper 0.2 feet. Moderately fractured. REC=71%. RQD=0%.			
90	8	C-02	89.3 - 94.3		60/27		C-02 (89.3 to 94.3'): Medium hard to very soft, medium gray, fine to medium-grained, slightly micaceous Sandstone, with very thin to thin horizontal partings spaced 2 to 3 inches apart. Very soft, medium spaced Sandstone layers are 2 to 4 inches. Soft, medium spaced horizontal Silty Clay inclusions. Extremely fractured to sound. REC=45%. RQD=45%.			
92							SANDSTONE			
94	7	C-03	94.3 - 99.3		60/60			C-03 (94.3 to 99.3'): Medium hard to very soft, medium gray, fine to medium-grained, slightly micaceous Sandstone, with thin to medium partings spaced 1 inch to 13 inches apart. Thin horizontal layers of very soft fine to medium grained Sandstone from 94.3 to 96.9 feet. Moderately fractured. REC=100%. RQD=62%.		
96										
98										
100	6	C-04	99.3 - 104.3		60/60			C-04 (99.3 to 104.3'): Medium hard to very soft, gray, fine to medium-grained,		



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthall

Checked By: A. Ashton

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/22/18	07:00	38.7'	Ground Surface	0'	133.8'	- 14 hours

BORING LOG P:\430054345\00\WORK\LOGS\4345.00 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information					Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description		
100									SANDSTONE, with very thin to thin partings spaced 1 inch to 11 inches apart. Thin horizontal layers of very soft fine to medium grained Sandstone between 100.5 and 101.5 feet. Extremely fractured to sound. REC=100%. RQD=38%.	
102										
104	3	C-05	104.3 - 109.3		60/60				C-05 (104.3 to 109.3'): Medium hard to hard, gray, very fine to fine-grained, SANDSTONE, Medium spaced moderately dipping to low angle to low angle black fine grained Sandstone lenses from 104.3 to 108.3 feet. Very soft gray fine to medium-grained very thin to thin horizontal partings spaced 2 to 4 inches apart from 108.3 to 109.3 feet. Broken platy dark gray zone at 108.3 feet. Moderately fractured to sound. REC=100%. RQD=80%.	
106										
108										
110	NM	C-06	109.3 - 114.3		60/60			SANDSTONE	C-06 (109.3 to 114.3'): Medium hard to soft, gray, very fine to medium-grained, SANDSTONE, very thin to thin horizontal low angle partings spaced less than 1 inch to 3 inches apart. Black fine to medium-grained very thin to medium spaced sandstone lenses from 109.3 to 109.9.. Extremely fractured. REC=100%. RQD=0%.	
112										
114	5	C-07	114.3 - 119.3		60/60				C-07 (114.3 to 119.3'): Medium hard to soft, light medium gray, very fine to medium-grained, SANDSTONE, very thin to medium horizontal partings spaced 1 to 6 inches apart. Black fine to medium-grained very thin to medium spaced sandstone lenses from 114.3 to 117 feet. Extremely fractured to sound. REC=100%. RQD=52%.	
116										
118										
120	4	C-08	119.3 - 124.3		60/60			119.6' SHALE	C-08 (119.3 to 124.3'): Medium hard to soft, light gray, very fine to medium-grained, SANDSTONE, with thin horizontal partings spaced 2 to 5 inches apart and very thin spaced black horizontal lenses. Bed of very soft to soft, dark gray, very fine grained Silty clay Shale with very thin to thin partings spaced less than 1 inch to 5 inches apart. Shale from 119.6 to 122.3 feet.. Extremely fractured to slightly fractured. REC=100%. RQD=38%.	
122								122.3' SANDSTONE		
124	8	C-09	124.3 - 129.3		60/53				C-09A (124.3 to 125.3'): Medium hard, light gray, very fine to medium-grained,	

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	38.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\430054345 00\WORK\LOGS\4345 00 LOGS GPJ 2017 SANBORN HEAD V1 GLB 2017 SANBORN HEAD V1 GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log Description		
126							SANDSTONE	SANDSTONE, with very thin to thin black lenses. Sound. REC=88%. RQD=65%.	
128							COAL	C-09B (125.3 to 129.3'): Very soft to soft, black, very fine grained, COAL, with thinly spaced horizontal partings, very soft gray very fine grained horizontal Clay-rich zone from 125.5 to 125.8 feet, very thin to thin Clay lenses with Pyrite throughout. Vertical crack with calcite mineralization from 127.6 to 129.8 feet. Extremely to moderately fractured.	
130	NM	C-10	129.3 - 131.8		30/30			C-10A (129.3 to 130.4'): Very soft to soft, black, very fine grained, COAL, with thin to very thin horizontal partings. Vertical cracks with calcite mineralization from 129.2 to 129.8 feet and 130.0 to 130.3 feet. Extremely to moderately fractured. REC=100%. RQD=37%.	
132	NM	C-11	131.8 - 133.8		24/20		SHALE	C-10B (130.4 to 131.8'): Very soft to medium hard, dark gray, very fine grained, SILTY CLAY SHALE, with very thin to thin horizontal partings. Clay rich zone from 130.4 to 130.8 feet. Slight Organic sheen. Extremely fractured. C-11 (131.8 to 133.8'): Very soft to medium hard, dark gray, very fine grained, SILTY CLAY SHALE, with very thin horizontal, bedding, slight Organic sheen. Extremely to moderately fractured. REC=83%. RQD=0%.	
134								Boring terminated at 133.8 feet. No refusal encountered.	
136								NOTES:	
138								1. Approximately 5200 gallons of potable water was introduced during drilling upon completion of coring (approximately 3,200 gallons was used to advance to top of bedrock from a combination of potable wells and the plant fire suppression system; approximately 2,000 gallons of water from the plant fire suppression system was used during bedrock coring).	
140								2. Continuous sampling started approximately 5 ft above the water table based on a water level measurement collected by Sanborn Head on 6/18/2018 at 15:20 at MW-1605S of 44.84 ft below Top of PVC Riser and at 15:34 at MW-1604S of 51.99 ft below Top of PVC Riser.	
142								3. Advanced HWT casing to 29 ft bgs. Due to damage to casing advancer at 29 ft, advanced 3 1/4" ID hollow stem augers to 30 ft bgs to auger refusal at 84.7 ft bgs. Advanced HWT casing with roller bit advancer to 84.7 ft and began PWL coring at 84.7 ft.	
144								4. Approximately 1 week following completion of sample collection, the borehole was completed as a monitoring well by Terracon Consultants, Inc. Monitoring well installation was not observed by Sanborn Head personnel.	
146									
148									
150									

**State of West Virginia
Department of Environmental Protection**

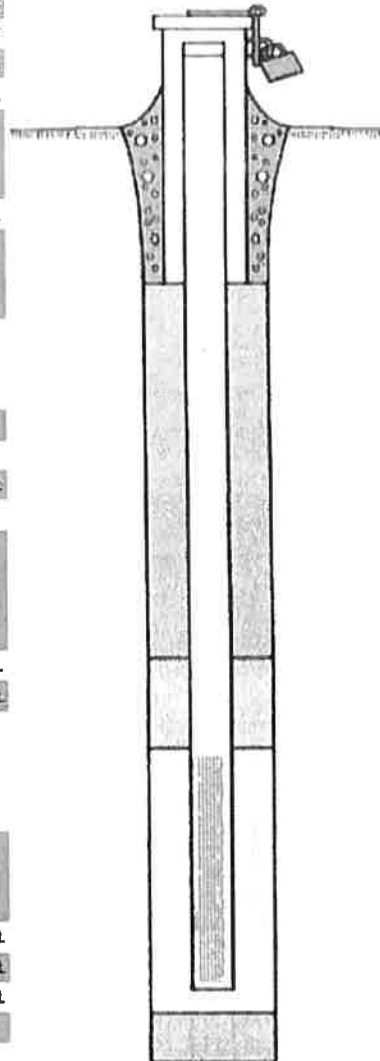
**Monitoring Well Construction
Well Number: WV00540-1805-18
Approved**

Site Name/Physical Address: Site: AEP Mountaineer Plant Line 1: 1347 Graham Station Road Line 2: City: Letart State: WV Zip: 25253- County: Mason	Well Registration No. WV00540-1805-18 Grid Location: a. Latitude: 38 58 29 .0 b. Longitude: 81 58 18 .0 c. Method Used: Computer Mapped/Generated Coordinates Company/Project Well No.: MW-1805	Purpose of Monitoring Well: to monitor the hydrologic conditions of a coal seam.
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Well Owner (Name, Firm, Address): Owner: Randall Brown Line 1: American Electric Power - Mountaineer Plant Line 2: 1347 Graham Station Road City: Letart State: WV Zip: 25253- Phone: 304-882-4024	Installed By (Name, Firm, Address): Installer: Kenn Fowler Line 1: Terracon Consultants, Inc. Line 2: 912 Morris Street City: Charleston State: WV Zip: 25301- Phone: 304-344-0821	Date Well Installed: 07/09/2018 Driller's WY Cert No. WV00540
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Section B: (all number fields must be in decimal format)

1. Gap and Lock:	YES
2. Protective Cover:	Protective Cover Pipe
3. Monitoring Well Reference Point:	591 ft.
4. Borehole Diameter:	5 inches.
5. Ground Surface Seal:	
a. Material: concrete	
b. Installation Procedure: ASTM D5082	
6. Surface Seal Bottom/Annular Space Top:	3 ft.
7. Well Riser: a. OD Well Riser: 2.38 inches. b. ID Well Riser: 2.05 inches.	
c. Material: PVC	
d. Installation Procedure: ASTM D5002	
8. Annular Space Seal:	
a. Material: high solids grout -	
b. Installation Procedure: tremie pipe-pumped	
9. Well Development Procedure: overpump -	
10. Drilling Method Used: mud rotary -	
11. Annular Space Seal Bottom/Filter Seal Top:	117.5 ft.
12. Drilling Fluid Used: Yes Source: Mud	
13. Filter Pack Seal:	
a. Material: bentonite pellet	
b. Installation Procedure: Gravity Fed	
c. Volume Added: 0.24 cubic feet	
14. Bottom of Bentonite Seal/Filter Pack Top:	120.6 ft.
15. Depth to Top of Screen:	123.6 ft.
16. Screen:	
a. Material: PVC	
b. Installation Procedure: ASTM D5092	
c. Slot Size: 0.01 inches. d. Screen Length: 10 ft.	
17. Filter Pack:	
a. Material: medium sand	
b. Installation Procedure: gravity fed	
18. Well Depth:	133.5 ft.
19. Bottom of Filter Pack:	134 ft.
20. Bottom of Borehole:	134 ft.
21. Backfill Material (below filter pack): medium sand	
22. Decontamination Procedures: water	
23. Special Circumstances and Exceptions: No Variance Number:	
24. WV Contractor License No.	



Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT					SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)	N Value			
0									(0') Large stones.	Advanced hollow stem auger	0.0
4				SS01			4		(1') Medium stiff to stiff, gray, CLAYEY SILT (ML); dry, low plasticity, few fine gravel, nonuniform.		
7							7	1.3			
8							8		(2.5') Changes to dense and red-brown.		
6.5				SS02			2		(6.5') Changes to damp, cohesive, trace fine sand.		
3							3	1.3			
4							4				
11.5				SS03			2		(11.5') Loose, red-brown, SANDY SILT (ML); damp, nonplastic, noncohesive, trace clay, uniform.		
4							4	0.8			
4							4				
16.5				SS04			2		(16.5') Loose to medium dense, red-brown, SANDY SILT (ML); damp, low plasticity, cohesive, with some clay, uniform.		
2							2	1.2			
2							2				
2							2				

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft.
Well was constructed with approximately 3ft of casing stick up and well cover.
The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)	
				Sample Type	Date & Time	Blow Counts	Recovery (ft)				N Value
20										20.0	
				SS05			3 10 13	0.9	(21.5') Loose, brown SAND (SP); medium- to fine-grained, with trace coarse sand & gravel.		
				SS06			7 9 12	1.3	(26.5') Medium dense, gray-brown, CLAYEY SILT (ML); lens. (27') Loose, brown SAND (SP); damp, noncohesive, medium-grained sand, with few coarse sand and trace fine gravel.		
				SS07			5 6 7	0.3	(31.5') Loose, dark brown, SILTY and CLAYEY SAND (SM); damp, noncohesive, medium-grained sand with some fine rounded gravel, nonuniform.		
				SS08			4 5 8	1.3	(36.5') Loose, brown, SILTY CLAY (CL); damp, low plasticity, cohesive, lens. (37') Loose, brown SAND (SP); damp, noncohesive, medium-grained sand with few fine sand and gravel.		
40										40.0	

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft.
Well was constructed with approximately 3ft of casing stick up and well cover.
The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT					SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)	N Value RQD (%)			
40											40.0
				SS09			4			(41.5') Loose, brown, SILTY CLAY (CL); damp, low plasticity, cohesive, trace sand.	
							5	1.3			
							8			(42') Loose, brown SAND (SP); damp, nonplastic, noncohesive, fine- to medium-grained sand, uniform.	
				SS10			4			(46.5') Changes to wet with few coarse sand and trace fine gravel.	
							6	1.5			
							7				
				SS11			6			(48.5') 2 inch dark gray clay lens at 48.5 feet.	
							8	1.3			
							9				
				SS12			9			(49.5') Medium dense, brown SAND (SP); wet, nonplastic, noncohesive, medium- to fine-grained, uniform, with black partings throughout.	
							9	1.5			
							10				
				SS13			4				
							6	1.3			
							9				
				SS14			4			(52.5') With few fine to coarse gravel.	
							7	1.2			
							8				
							3				
				SS15			5				
							5	1.1			
							10				
							6				
				SS16			8				
							8	0.9			
							9				
							4				
				SS17			7				
							8	1.0			
							8				
							4				
				SS18			5				
							5	1.0			
							4				
60							4				60.0

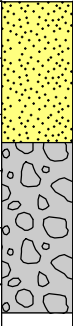
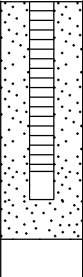
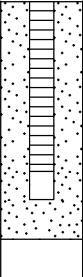
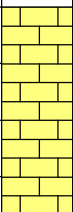
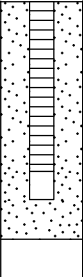
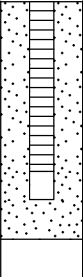
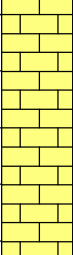
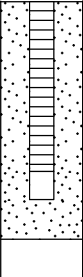
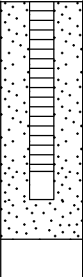
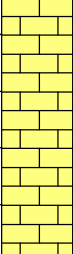
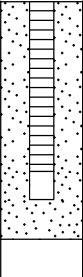
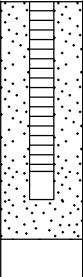
NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft.
Well was constructed with approximately 3ft of casing stick up and well cover.
The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)			
60				SS19			8		(60') Loose to medium dense, brown SAND (SP); wet, some coarse sand, uniform.	60.0
				SS20			13	0.9		
				SS21			8		(61.5') Loose, gray-brown SAND (SP); wet, medium- to coarse-grained with few fine rounded gravel, nonuniform.	
				SS22			12	1.1		
				SS23			13		(63') Medium dense, gray-brown, SANDY SILT (ML); wet.	
				SS24			8		(63.3') Medium dense, tan gray SAND (SP); wet, fine- to medium-grained, with some coarse sand, several black partings.	
65				SS25			14			
				SS26			8	0.8		
				SS27			13		(67.5') Trace fine gravel.	
				SS28			18			
				SS29			6			
				SS30			7	1.2		
				SS31			10			
				SS32			8		(75') Some medium sand.	
							16	1.1		
							12			
							15			
							7			
							16	1.1		
							22			
							13			
							14	0.9		
							11			
							13	1.1		
							20			
							20		(77') Medium dense, gray SAND (SP); wet, nonplastic, noncohesive, uniform.	
							12			
							11	1.2		
							13			
							10			
							13	1.1		
							15			
							20	1.3		
80									Silty sand at 79.5'	80.0

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft. Well was constructed with approximately 3ft of casing stick up and well cover. The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
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Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT					SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)		
				Sample Type	Date & Time	Blow Counts	Recovery (ft)	N Value				RQD (%)	
80				SS32			18			(80') Medium dense, gray SAND with gravel (SP); wet, noncohesive, coarse-grained sand and fine-grained gravel with some coarse gravel and medium sand, nonuniform.	Advanced using water rotary drilling	80.0	
				SS33			14	1.3					
				SS34			12	1.0					
				SS35			19						
							24	1.1					
85				SS35			38			(82.5') Dense, gray GRAVEL with sand (GP); wet, noncohesive, some coarse gravel and coarse sand and few medium sand, nonuniform.	Advanced using water rotary drilling	85.0	
						20							
						50/5	1.0						
				CB 1						(84') Medium dense, brown gray GRAVEL with sand (GP); wet, fine-grained gravel and coarse-grained sand with some coarse gravel and clay lens at 84.0 feet.			
										(85.5') Auger refusal at 85.0 feet.			
90										(86') Moderately hard, fine- to medium-grained, light gray SANDSTONE with thin dark gray partings less that 1 inch apart, moderately fractured and fine-grained between 86.0-88.0 feet.	Advanced using water rotary drilling	90.0	
				CB 2						(88') Sound and medium-grained below 88.0 feet.			
95										(94.2') Moderately hard to moderately soft, light to medium gray, fine- to medium-grained SANDSTONE (very thin); dark gray, horizontal partings approximately 12 to 14 inches apart, lightly fractured to sound.	Advanced using water rotary drilling	95.0	
100												100.0	

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft. Well was constructed with approximately 3ft of casing stick up and well cover. The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)			
100	[Yellow brick pattern]			CB 2			9.6	98	(104.2') Moderately hard to moderately soft, medium gray, medium- to fine-grained SANDSTONE (thin to horizontal); dark gray partings every 4 to 6 inches, lightly fractured, sound.	100.0
105				CB 3			9.8	100		105.0
110									110.0	
115								(114.2') Boring terminated.	115.0	

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft. Well was constructed with approximately 3ft of casing stick up and well cover. The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/22/2019	Boring Depth (ft): 91.3	Well Depth (ft): 87.5
Drilling End Date: 1/24/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 595.639	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 598.659	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,703,415.81, 721,382.16	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT					SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)	N Value RQD (%)			
0									(0') Medium dense, light brown to red, CLAYEY SILT (ML); dry, low to medium plasticity, cohesive, trace fine gravel and coal fragments, fill.		0.0
				SS01			2	1.0			
				SS02			4	1.4			
				SS03			2	1.3			
				SS04			8	1.4			
				SS05			7	1.5			
				SS06			3	1.5			
				SS07			5	1.5			
				SS08			6	1.5			
				SS09			13	1.0	(12') Brown SAND (SP); saturated, fine to medium, rounded gravel inclusions >30%.	Soil becomes wet at ~12'	
				SS10			2	1.2			
				SS11			8	0.9	(15') GRAVEL with sand (GP); rounded to sub rounded coarse to fine gravel, fine to medium sand.		
				SS12			3	1.2			
				SS13			3	1.4			
				SS14			10	1.2			
							8	1.4			
							7	1.2			
20							2	1.2			20.0

NOTES: Boring sampled with 2 in OD split spoon.
Well was constructed with approximately 3ft of casing stick up and well cover.

Drilling Start Date: 1/22/2019	Boring Depth (ft): 91.3	Well Depth (ft): 87.5
Drilling End Date: 1/24/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 595.639	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 598.659	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,703,415.81, 721,382.16	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)	
				Sample Type	Date & Time	Blow Counts	Recovery (ft)				N Value
20				SS14			4	1.2			20.0
				SS15			13	1.2	(20.5') Gray, SILTY CLAY (CL); moist, medium plasticity, cohesive.		
				SS16			9	1.2	(21.2') SAND (SP); saturated, some rounded gravel inclusions.		
				SS17			15	1.3	(21.8') Gray/tan, CLAYEY SILT (ML); dry, low plasticity, noncohesive.		
				SS18			8	1.5	(22.5') SAND (SP); saturated, fine-grained, grades to medium gravel.		
				SS19			3	1.5	(23.2') Tan to brown gray, SILTY CLAY (CL); damp, medium to high plasticity, cohesive, some rounded gravel inclusions.		
				SS20			5	1.9	(25.5') Gray, CLAY (CL); damp, medium plasticity, cohesive, with brown/orange mottles 1/2 inch to 1 inch.		
				SS21			6	2.0	(27.5') Gray, CLAY (CL); dry, medium plasticity, cohesive, with brown large mottles and silt.		
				SS22			8	1.8	(28.3') Red, SILTY CLAY (CL); damp, medium to high plasticity, cohesive.		
				SS23			4	1.7	(30.8') Red, CLAYEY SILT (ML); dry to damp, medium to low plasticity.		
				SS24			6	1.7	(35') Red, SANDY SILT (ML); wet, nonplastic, noncohesive, fine-grained.		
				SS25			3	1.0	(37') Red-brown SAND (SP); saturated, medium- to fine-grained with some medium to coarse gravel inclusions, nonuniform.		
				SS26			15	0.8			
				SS27			24				
40							15				40.0

NOTES: Boring sampled with 2 in OD split spoon.
Well was constructed with approximately 3ft of casing stick up and well cover.

Drilling Start Date: 1/22/2019	Boring Depth (ft): 91.3	Well Depth (ft): 87.5
Drilling End Date: 1/24/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 595.639	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 598.659	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,703,415.81, 721,382.16	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)			
40				SS27		21	0.8			40.0
				SS28		19	1.0			
				SS29		5				
				SS30		6				
				SS31		12				
				SS32		16	0.9			
				SS33		23				
				SS34		2				
				SS35		17	0.9			
				SS36		19				
45				SS37		15		(45') Medium dense, brown GRAVEL with sand (GP); saturated, fine-grained gravel and medium- to coarse-grained sand, trace coarse gravel and fine sand, nonuniform.		45.0
				SS38		32	1.3			
				SS39		31				
				SS40		27				
						24	1.1			
						15				
						15	1.0			
						15				
						13				
						21	0.9			
						20				
						11				
						13	0.8			
						17				
						16				
						12	0.8			
						8				
						8				
						10	0.7			
						11				
						17				
						9	1.0			
						11				
						7				
						9	0.5			
						11				
						7				
						8	1.3	(59') 2 inch crumbly organic seem at 59.0 feet.		
						8				
60						8				60.0

NOTES: Boring sampled with 2 in OD split spoon.
Well was constructed with approximately 3ft of casing stick up and well cover.

Drilling Start Date: 1/22/2019	Boring Depth (ft): 91.3	Well Depth (ft): 87.5
Drilling End Date: 1/24/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 595.639	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 598.659	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,703,415.81, 721,382.16	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)	
				Sample Type	Date & Time	Blow Counts	Recovery (ft)				N Value
60	[Yellow dotted pattern]	[Grey vertical line]	[Grey vertical line]	SS41		6			(59.2') Loose, brown SAND (SP); saturated, fine- to medium-grained, few coarse sand and fine gravel, trace silt.		60.0
					5	0.8					
					12						
					10						
					11	1.1					
					9						
					9	1.3					
					10						
65					13						
					8	1.3					
					9						
					8						
					8	1.5					
					11						
		8									
		18	1.5								
		13									
		8									
		9	1.5								
70		10									
		7									
		10	1.0								
		7									
		14									
		7									
		9	1.0								
		11									
		9									
		18	1.4								
75		25									
		14									
		19	1.1								
		23									
		14									
		14	1.0								
		23									
		14									
		14	1.3								
		19									
		16	1.1								
80											

NOTES: Boring sampled with 2 in OD split spoon.
Well was constructed with approximately 3ft of casing stick up and well cover.

Drilling Start Date: 1/22/2019	Boring Depth (ft): 91.3	Well Depth (ft): 87.5
Drilling End Date: 1/24/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 595.639	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 598.659	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,703,415.81, 721,382.16	Filter Pack: #5 Sand

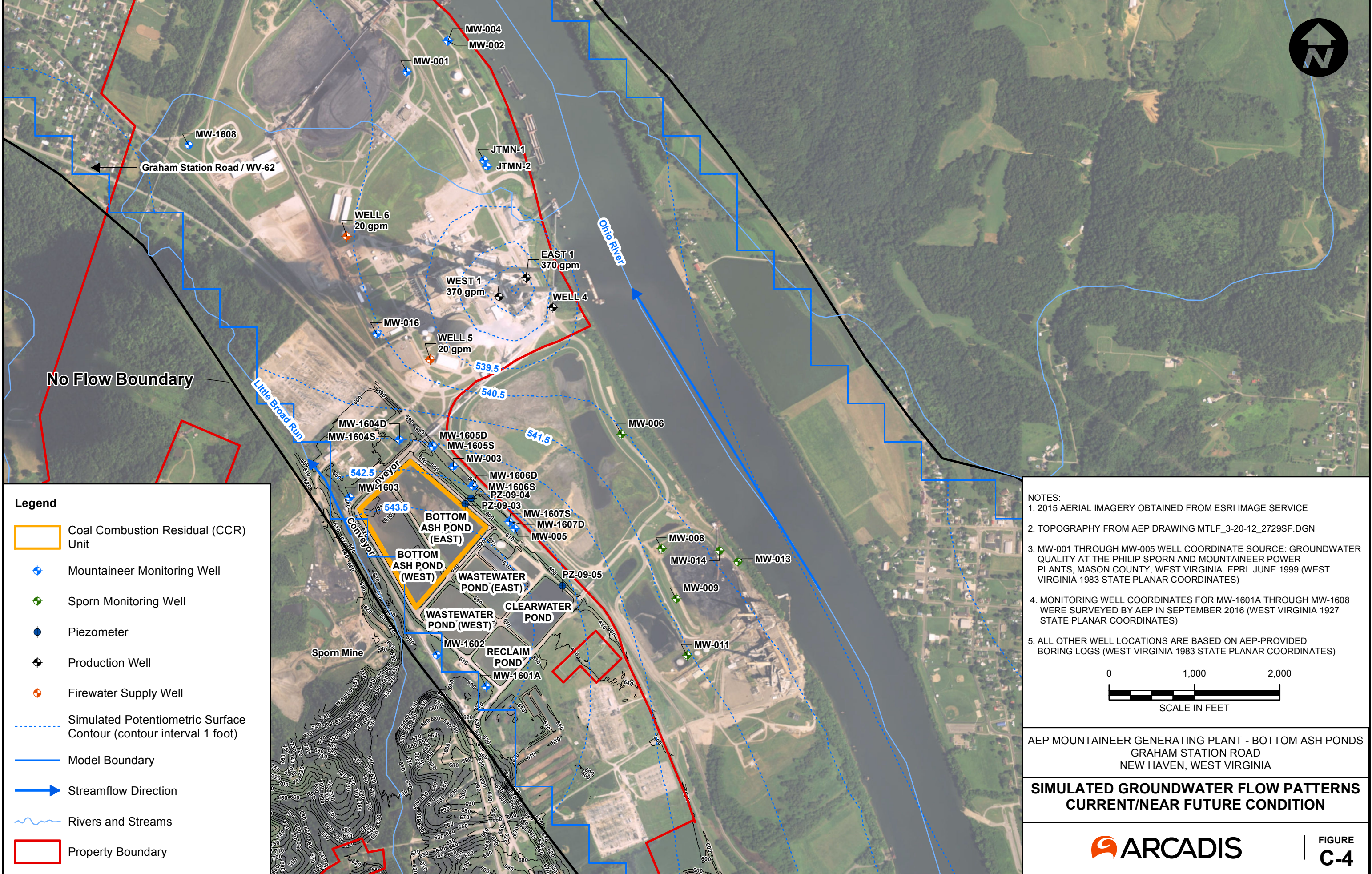
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)			
80				SS54		20	1.1		(81') Medium dense, brown SAND with gravel (SP); saturated, coarse-grained sand and fine-grained gravel with few coarse gravel and medium sand, nonuniform.	80.0
				SS55		29	1.1			
				SS56		17	1.1			
				SS57		20	1.1			
				SS58		17	1.1			
				SS59		14	1.1			
				SS60		19	1.2			
				SS61		17	1.2			
						21	1.3			
						23	1.4			
						22	1.4			
85			17	0.6			(87') Lens of fine loose sand at 87.0-87.5 feet.	85.0		
			19	0.6						
			27	0.6						
			16	0.6						
			35	0.6						
			50/2	0.6						
90			50/3	0.6					90.0	
								(91.3') Boring terminated.		
95									95.0	

NOTES: Boring sampled with 2 in OD split spoon.
Well was constructed with approximately 3ft of casing stick up and well cover.

ATTACHMENT B

Groundwater Flow Modeling Output

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
 OH:015976.0009.00001 (Mountaineer Ash Pond)
 Z:\GIS\PROJECTS_ENV\AEP\Mountaineer\MXD\Ash Pond Report\Updated September 2016\C-4_Mr Ash Pond Simulated GW Flow Patterns_Current_Future.mxd 10/7/2016 2:55:30 PM

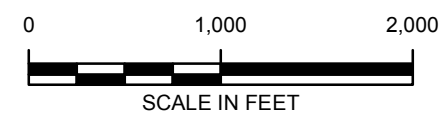


Legend

- Coal Combustion Residual (CCR) Unit
- ◆ Mountaineer Monitoring Well
- ◆ Sporn Monitoring Well
- Piezometer
- ◆ Production Well
- ◆ Firewater Supply Well
- Simulated Potentiometric Surface Contour (contour interval 1 foot)
- Model Boundary
- ➔ Streamflow Direction
- ~ Rivers and Streams
- Property Boundary

NOTES:

1. 2015 AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE
2. TOPOGRAPHY FROM AEP DRAWING MTLF_3-20-12_2729SF.DGN
3. MW-001 THROUGH MW-005 WELL COORDINATE SOURCE: GROUNDWATER QUALITY AT THE PHILIP SPORN AND MOUNTAINEER POWER PLANTS, MASON COUNTY, WEST VIRGINIA. EPRI. JUNE 1999 (WEST VIRGINIA 1983 STATE PLANAR COORDINATES)
4. MONITORING WELL COORDINATES FOR MW-1601A THROUGH MW-1608 WERE SURVEYED BY AEP IN SEPTEMBER 2016 (WEST VIRGINIA 1927 STATE PLANAR COORDINATES)
5. ALL OTHER WELL LOCATIONS ARE BASED ON AEP-PROVIDED BORING LOGS (WEST VIRGINIA 1983 STATE PLANAR COORDINATES)



AEP MOUNTAINEER GENERATING PLANT - BOTTOM ASH PONDS
 GRAHAM STATION ROAD
 NEW HAVEN, WEST VIRGINIA

**SIMULATED GROUNDWATER FLOW PATTERNS
CURRENT/NEAR FUTURE CONDITION**

ATTACHMENT C

Bedrock Sampling Analytical Report – Eurofins

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Allison Kreinberg
Geosyntec Consultants Inc
500 West Wilson Bridge Road
Suite 250
Worthington, Ohio 43085
Generated 4/18/2023 12:16:08 PM

JOB DESCRIPTION

MTR BAP

JOB NUMBER

240-183413-1

Eurofins Canton

Job Notes

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

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

Authorization

Roxanne Cisneros Generated
4/18/2023 12:16:08 PM

Authorized for release by
Roxanne Cisneros, Senior Project Manager
roxanne.cisneros@et.eurofinsus.com
(615)301-5761



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Sample Summary	7
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Definitions/Glossary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Job ID: 240-183413-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-183413-1

Comments

Run Total Metals - no leaching - per client email request.

Receipt

The samples were received on 4/12/2023 9:45 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 19.6° C.

Metals

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

Organic Prep

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

- 1
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Method Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET CAN
3050B	Preparation, Metals	SW846	EET CAN
Part Size Red	Particle Size Reduction Preparation	None	EET CAN

Protocol References:

None = None

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

Laboratory References:

EET CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396



Sample Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-183413-1	MW-1805-122	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-2	MW-1805-124.5	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-3	MW-1805-128	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-4	MW-1805-130.5	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-5	MW-1922D-104.5	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-6	MW-1922D-111	Solid	12/21/22 00:00	04/12/23 09:45

1

2

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Detection Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-122

Lab Sample ID: 240-183413-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	55	B	0.81	0.048	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1805-124.5

Lab Sample ID: 240-183413-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.6	B	0.71	0.043	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1805-128

Lab Sample ID: 240-183413-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	56	B	9.6	0.58	mg/Kg	20		6020B	Total/NA

Client Sample ID: MW-1805-130.5

Lab Sample ID: 240-183413-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	2.9	B	0.87	0.052	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1922D-104.5

Lab Sample ID: 240-183413-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.5	B	0.88	0.053	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1922D-111

Lab Sample ID: 240-183413-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	5.2	B	0.77	0.046	mg/Kg	2		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Canton

Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-122

Lab Sample ID: 240-183413-1

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	55	B	0.81	0.048	mg/Kg		04/13/23 14:00	04/14/23 16:54	2

- 1
- 2
- 3
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- 10
- 11
- 12
- 13

Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-124.5

Lab Sample ID: 240-183413-2

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.6	B	0.71	0.043	mg/Kg		04/13/23 14:00	04/14/23 16:57	2

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-128

Lab Sample ID: 240-183413-3

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	56	B	9.6	0.58	mg/Kg		04/13/23 14:00	04/14/23 17:00	20

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
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- 10
- 11
- 12
- 13

Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-130.5

Lab Sample ID: 240-183413-4

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.9	B	0.87	0.052	mg/Kg		04/13/23 14:00	04/14/23 17:02	2

- 1
- 2
- 3
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- 11
- 12
- 13

Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1922D-104.5

Lab Sample ID: 240-183413-5

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.5	B	0.88	0.053	mg/Kg		04/13/23 14:00	04/14/23 17:05	2

- 1
- 2
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- 12
- 13

Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1922D-111

Lab Sample ID: 240-183413-6

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.2	B	0.77	0.046	mg/Kg		04/13/23 14:00	04/14/23 17:08	2

- 1
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QC Sample Results

Client: Geosyntec Consultants Inc
 Project/Site: MTR BAP

Job ID: 240-183413-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 240-569247/1-A ^2
Matrix: Solid
Analysis Batch: 569539

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 569247

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0634	J	1.0	0.060	mg/Kg		04/13/23 14:00	04/14/23 15:49	2

Lab Sample ID: LCS 240-569247/2-A ^2
Matrix: Solid
Analysis Batch: 569539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 569247

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	90.1		mg/Kg		90	80 - 120

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QC Association Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Metals

Processed Batch: 569171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-183413-1	MW-1805-122	Total/NA	Solid	Part Size Red	
240-183413-2	MW-1805-124.5	Total/NA	Solid	Part Size Red	
240-183413-3	MW-1805-128	Total/NA	Solid	Part Size Red	
240-183413-4	MW-1805-130.5	Total/NA	Solid	Part Size Red	
240-183413-5	MW-1922D-104.5	Total/NA	Solid	Part Size Red	
240-183413-6	MW-1922D-111	Total/NA	Solid	Part Size Red	

Prep Batch: 569247

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-183413-1	MW-1805-122	Total/NA	Solid	3050B	569171
240-183413-2	MW-1805-124.5	Total/NA	Solid	3050B	569171
240-183413-3	MW-1805-128	Total/NA	Solid	3050B	569171
240-183413-4	MW-1805-130.5	Total/NA	Solid	3050B	569171
240-183413-5	MW-1922D-104.5	Total/NA	Solid	3050B	569171
240-183413-6	MW-1922D-111	Total/NA	Solid	3050B	569171
MB 240-569247/1-A ^2	Method Blank	Total/NA	Solid	3050B	
LCS 240-569247/2-A ^2	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 569539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-183413-1	MW-1805-122	Total/NA	Solid	6020B	569247
240-183413-2	MW-1805-124.5	Total/NA	Solid	6020B	569247
240-183413-3	MW-1805-128	Total/NA	Solid	6020B	569247
240-183413-4	MW-1805-130.5	Total/NA	Solid	6020B	569247
240-183413-5	MW-1922D-104.5	Total/NA	Solid	6020B	569247
240-183413-6	MW-1922D-111	Total/NA	Solid	6020B	569247
MB 240-569247/1-A ^2	Method Blank	Total/NA	Solid	6020B	569247
LCS 240-569247/2-A ^2	Lab Control Sample	Total/NA	Solid	6020B	569247

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-122

Lab Sample ID: 240-183413-1

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 16:54

Client Sample ID: MW-1805-124.5

Lab Sample ID: 240-183413-2

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 16:57

Client Sample ID: MW-1805-128

Lab Sample ID: 240-183413-3

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		20	569539	RKT	EET CAN	04/14/23 17:00

Client Sample ID: MW-1805-130.5

Lab Sample ID: 240-183413-4

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 17:02

Client Sample ID: MW-1922D-104.5

Lab Sample ID: 240-183413-5

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 17:05

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1922D-111

Lab Sample ID: 240-183413-6

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Analyst</u>	<u>Lab</u>	<u>Prepared or Analyzed</u>
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 17:08

Laboratory References:

EET CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

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Accreditation/Certification Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Laboratory: Eurofins Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-27-23 *
Connecticut	State	PH-0590	06-29-23
Florida	NELAP	E87225	06-30-23
Georgia	State	4062	02-28-24
Illinois	NELAP	200004	07-31-23
Iowa	State	421	06-01-23
Kentucky (UST)	State	112225	02-27-23 *
Kentucky (WW)	State	KY98016	12-31-23
Michigan	State	9135	02-27-23 *
Minnesota	NELAP	039-999-348	12-31-23
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-23
New York	NELAP	10975	04-01-24
Ohio	State	8303	02-27-24
Ohio VAP	State	ORELAP 4062	02-27-24
Oregon	NELAP	4062	02-28-24
Pennsylvania	NELAP	68-00340	08-31-23
Texas	NELAP	T104704517-22-17	08-31-23
Virginia	NELAP	460175	09-14-23
West Virginia DEP	State	210	12-31-23

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


Eurofins Canton

Chain of Custody Record

19.4/19.6

eurolins Canton
10 S. Van Buren Ave
Canton, OH 44203-3543
Phone 330.497.9396 fax 330.497.0772

Regulatory Program: Allison Kreinberg <small>Email: Allison.Kreinberg@eurolins.com</small> Tel/Fax: 614-468-0421		Site Contact: _____ Lab Contact: _____		Date: 4/6/2023 Carrier: _____		COC No.: _____ 1 of 1 COCs	
Client Contact eosyntec Consultants 10 West Wilson Bridge Road, Suite 250 Worthington, OH 43085 614-468-0421 (xx) xxx-xxxx FAX Object Name: MTR BAP Inter: MTR O # CHA8495B/07		Project Manager: Allison Kreinberg Analysis Turnaround Time TAT if different from Below _____		Sampler: _____ For Lab Use Only: _____ Walk-in Client: _____ Lab Sampling: _____ Job / SDG No.: _____		Sample Specific Notes: Please complete DI water leach on all samples prior to analysis	
Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Am / Mal Arset	
MW-1805-122	12/21/22		G	Rock	1	X	
MW-1805-124.5	12/21/22		G	Rock	1	X	
MW-1805-128	12/21/22		G	Rock	1	X	
MW-1805-130.5	12/21/22		G	Rock	1	X	
MW-1922D-104.5	12/21/22		G	Rock	1	X	
MW-1922D-111	12/21/22		G	Rock	1	X	



240-183413 Chain of Custody

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Custody Seal No.: _____ Company: _____	Received by: <i>Ronelle</i> Date/Time: 1/6/23 Company: MINERALOGY	Received in Laboratory by: _____ Date/Time: _____ Company: _____
Therm ID No.: _____ Date/Time: _____ Company: _____	Received by: <i>Ronelle</i> Date/Time: 1/6/23 Company: MINERALOGY	Received in Laboratory by: _____ Date/Time: _____ Company: _____

Eurofins - Canton Sample Receipt Form/Narrative
Barberton Facility

Login # : _____

Client Geosyntec

Site Name _____

Cooler unpacked by:

Rockelle Haidet

Cooler Received on 4/12/23

Opened on 4/12/23

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off Eurofins Courier Other _____

Receipt After-hours: Drop-off Date/Time _____

Storage Location _____

Eurofins Cooler # EE Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form

IR GUN # 13 (CF +2 °C) Observed Cooler Temp. 19.4 °C Corrected Cooler Temp. 19.6 °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____ Yes No

-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA

-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No

-Were tamper/custody seals intact and uncompromised? Yes No NA

3. Shippers' packing slip attached to the cooler(s)? Yes No

4. Did custody papers accompany the sample(s)? Yes No

5. Were the custody papers relinquished & signed in the appropriate place? Yes No

6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No

7. Did all bottles arrive in good condition (Unbroken)? Yes No

8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No

9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?

10. Were correct bottle(s) used for the test(s) indicated? Yes No

11. Sufficient quantity received to perform indicated analyses? Yes No

12. Are these work share samples and all listed on the COC? Yes No

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

14. Were VOAs on the COC? Yes No

15. Were air bubbles >6 mm in any VOA vials? Yes No NA



16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No

17. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page

Samples processed by: _____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____


ATTACHMENT D
Bedrock Sampling Analytical Report –
Mineralogy, Inc.



Test Report

Client:	Geosyntec Consultants	MI#:	23009
Project:	Mountaineer ASD	Date:	03/16/23
Location:	New Haven, WV	P.O.#:	CHA0495/07/02

Client	Geosyntec		
	Attn: Allison Kreinberg		
Email	akreinberg@geosyntec.com	Phone	614-468-0421

Method(s)	Timothy B. Murphy
X-ray Diffraction (XRD) X-ray Fluorescence (XRF) Scanning Electron Microscopy (SEM)	

- [Conditions & Qualifications](#)
- [X-ray Diffraction](#)
- [X-ray Fluorescence](#)
- [MW-1805-122](#)
- [MW-1805-124.5](#)
- [MW-1805-128](#)
- [MW-1805-130](#)
- [MW-1922D-104.5](#)
- [MW-1922D-111](#)



CONDITIONS AND QUALIFICATIONS

Mineralogy, Inc. will endeavor to provide accurate and reliable laboratory measurements of the samples provided by the client. The results of any x-ray diffraction, petrographic or core analysis test are necessarily influenced by the condition and selection of the samples to be analyzed. It should be recognized that geological samples are commonly heterogeneous and lack uniform properties. Mineralogical, geochemical and/or petrographic data obtained for a specific sample provides compositional data pertinent to that specific sampling location. Such “site-specific data” may fail to provide adequate characterization of the range of compositional variability possible within a given project area, thus the “projection” of these laboratory findings and values to adjoining, “untested” areas of the formation or project area is inherently risky, and exceeds the scope of the laboratory work request. Hence, Mineralogy, Inc. shall not assume any liability risk or responsibility for any loss or potential failure associated with the application of “site or sample-specific laboratory data” to “untested” areas of the formation or project area. Unless otherwise directed, the samples selected for analysis will be chosen to reflect a visually representative portion of the bulk sample submitted for analysis. Where provided, the interpretation of x-ray diffraction, petrographic or core analysis results constitutes the best geological judgment of Mineralogy, Inc., and is subject to the sampling limitations described above, and the detection limits inherent to semi-quantitative and/or qualitative mineralogical and microscopic analysis. Mineralogy, Inc. assumes no responsibility nor offers any guarantee of the productivity, suitability or performance of any oil or gas well, hydrocarbon recovery process, dimension stone, and/or ore material based upon the data or conclusions presented in this report.

This report is to only be replicated in its entirety.

Sample Retention: Samples will be stored for a period of 30 days and thereafter discarded. If additional sample storage time and/or return shipping is required, appropriate charges will be billed to the client.



X-ray Diffraction

Table I.1

Client:	Geosyntec Consultants	MI#:	23009
Project:	Mountaineer ASD	P.O.#:	CHA0495/07/02
Location:	New Haven, WV	Method:	X-ray Diffraction

Mineral Constituent	Lab ID:	23009-01	23009-02	23009-03	23009-04
	Sample ID:	MW-1805 122'	MW-1805 124.5'	MW-1805 128'	MW-1805 130.5'
	Chemical Formula	Relative Abundance (%)			
Quartz	SiO ₂	24	73	4	32
Plagioclase Feldspar	(Na,Ca)AlSi ₃ O ₈	5	7		7
K-Feldspar	KAlSi ₃ O ₈	1	8		1
Calcite	CaCO ₃	<0.5	<0.5		
Siderite	FeCO ₃	2	<0.5		1.5
Pyrite	FeS ₂		<0.5	4	0.5
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄	11	7.5	6	10
Chlorite	(Mg,Al) ₆ (Si,Al) ₄ O ₁₀ (OH) ₈	16	0.5		14
Illite / Mica	KAl ₂ (Si ₃ AlO ₁₀)(OH) ₂	39	4	1	33
Mixed-Layered Illite/Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂ • 2H ₂ O	2		1	1
Amorphous				84	
Total		100	100	100	100
% Illite in ML I/S		90%		BDL*	80%

*BDL = Below Detection Limit



X-ray Diffraction

Table I.2

Client:	Geosyntec Consultants	MI#:	23009
Project:	Mountaineer ASD	P.O.#:	CHA0495/07/02
Location:	New Haven, WV	Method:	X-ray Diffraction

Mineral Constituent	Lab ID:	23009-05	23009-06
	Sample ID:	MW-1922D 104.5'	MW-1922D 111'
	Chemical Formula	Relative Abundance (%)	
Quartz	SiO ₂	86	85
Plagioclase Feldspar	(Na,Ca)AlSi ₃ O ₈	4	3
K-Feldspar	KAlSi ₃ O ₈	1	2
Calcite	CaCO ₃	0.5	
Goethite	alpha-FeOOH		0.5
Siderite	FeCO ₃		
Pyrite	FeS ₂		
Hematite	alpha-Fe ₂ O ₃		0.5
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄	6	6
Chlorite	(Mg,Al) ₆ (Si,Al) ₄ O ₁₀ (OH) ₈		<0.5
Illite / Mica	KAl ₂ (Si ₃ AlO ₁₀)(OH) ₂	2.5	3
Mixed-Layered Illite/ Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂ · 2H ₂ O	<0.5	
Total		100	100
% Illite in ML I/S		80%	

*BDL = Below Detection Limit



X-ray Fluorescence

Table II

Client:	Geosyntec Consultants			MI#:	23009	
Project:	Mountaineer ASD			P.O.#:	CHA0495/07/02	
Location:	New Haven, WV			Method:	X-ray Fluorescence	
Lab ID:	23009-01	23009-02	23009-03	23009-04	23009-05	23009-06
Sample ID:	MW-1805 122'	MW-1805 124.5'	MW-1805 128'	MW-1805 130.5'	MW-1922D 104.5'	MW-1922D 111'
Elemental Phase	Results (Mass %)					
Na ₂ O	0.6707	0.5154	0.1887	0.695	0.3969	0.515
MgO	1.9617	0.2376	0.1567	1.6714	0.2043	0.2466
Al ₂ O ₃	25.3368	8.1773	12.5199	22.3427	6.1898	7.5659
SiO ₂	54.4381	86.849	20.9049	58.5764	90.4786	88.2277
P ₂ O ₅	0.0935	0.0205	0.0895	0.0615	0.0277	0.0572
S	0.6678	0.181	14.7595	1.0398	0.1592	0.2296
Cl	0.0036	0.0038	0.1484	0.0132	0.0138	0.0055
K ₂ O	4.3886	1.828	1.3919	3.4114	0.6282	1.0262
CaO	0.2795	0.0537	1.2244	0.1757	0.2123	0.1336
TiO ₂	1.6125	0.2621	1.0809	1.1403	0.1182	0.1589
Cr	0.0181	ND	ND	ND	ND	ND
MnO	0.0635	0.0115	0.0234	0.0461	0.0063	0.0065
Fe ₂ O ₃	9.1735	1.5038	24.8472	9.0787	1.2773	1.4397
Zn	0.021	ND	ND	0.0205	ND	ND
As	ND	ND	0.1825	ND	ND	ND
Rb	0.0213	0.0071	ND	0.016	ND	ND
Sr	0.0189	0.0062	0.0952	0.0143	ND	ND
Y	0.005	ND	ND	0.0029	ND	ND
Zr	0.0607	0.0164	ND	0.0376	0.0115	0.011
BaO	0.1239	0.0483	0.217	0.077	0.0337	0.029

ND = Not Detected



Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-122

MI#23009-01 - SEM

Summary: This core sample is characterized as a medium gray (N5), compact parallel-bedded, non-porous, micaceous, silty shale. The shale mineralogy is dominated by clay minerals and mica which together account for ~ 68% of the sample mass. The clay mineral suite is enriched with respect to illite/mica (~39%), chlorite (~16%), and kaolinite (~11%), coupled with relatively minor amounts of mixed-layered illite/smectite (~2%). The detrital silt and sand grains are moderately to poorly sorted, sub-rounded, and matrix-supported. The detrital grain assemblage includes quartz (~24%) plagioclase feldspar (~5%) and minor amounts of k-feldspar (~1%). Minor amounts of siderite (~2%) are also present in the silty shale. SEM Figures 1A through 1C provide backscatter & scanning electron views of a typical bedding plane surface. Traces of microporosity are locally present flanking the silt and sand grains. Figures 1D through 1F provide images of the shale fabric in cross section. The SEM images reveal the presence of scattered, lens-shaped macropores & micropores, preserved and sheltered by the propping effect of randomly distributed silt and sand grains.

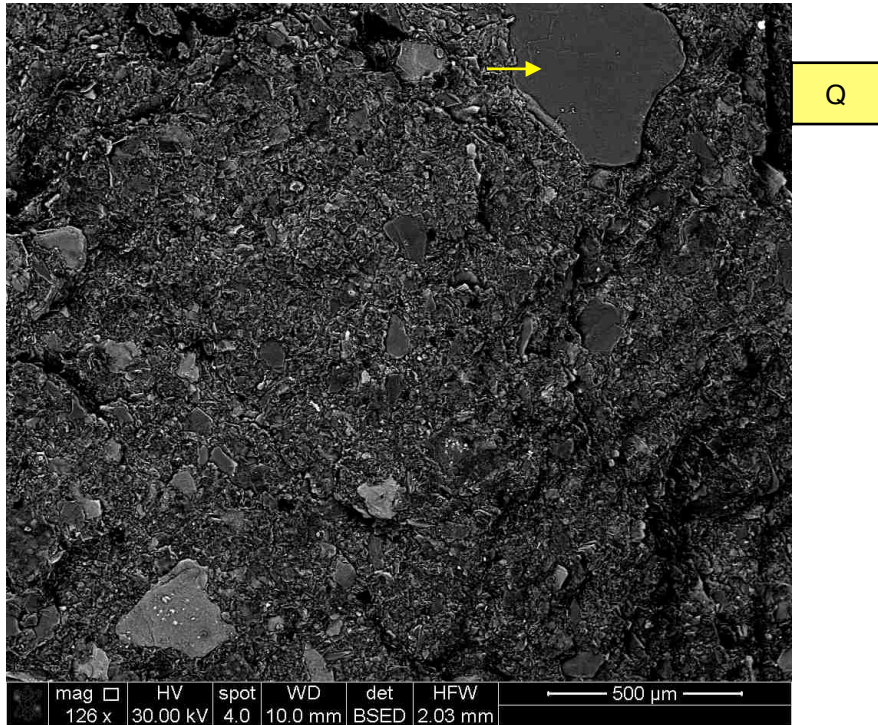
23009-01 Photo Index:

Sample ID	Magnification
23009-01A	126X
23009-01B	126X
23009-01C	500X
23009-01D	126X
23009-01E	1500X
23009-01F	6000X

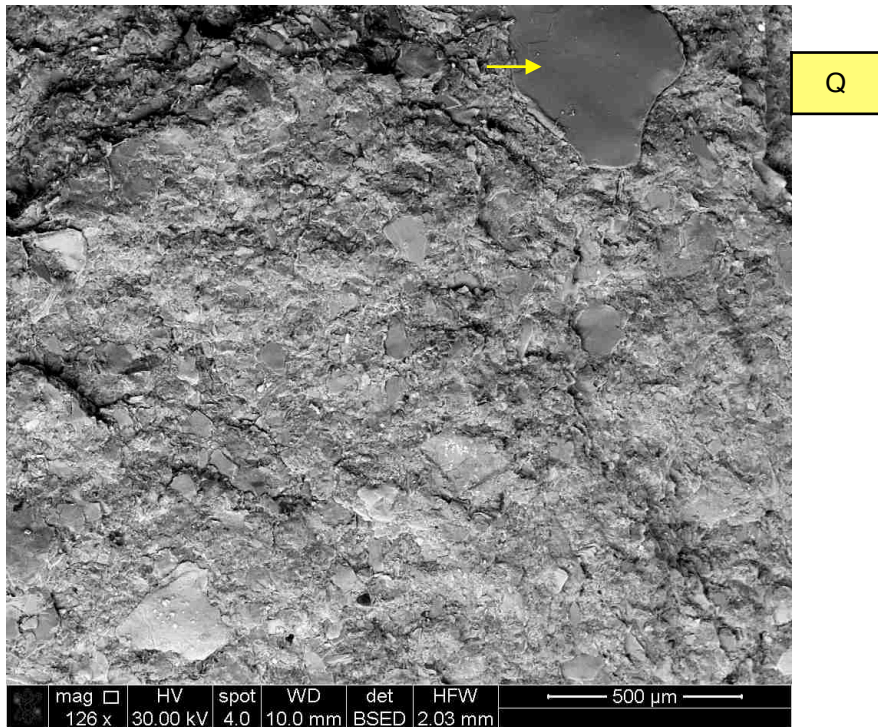
Sheltered macro-porosity	BP
Detrital clay matrix	DM
Detrital quartz	Q
Intercrystalline microporosity	uP



23009-01A 126X

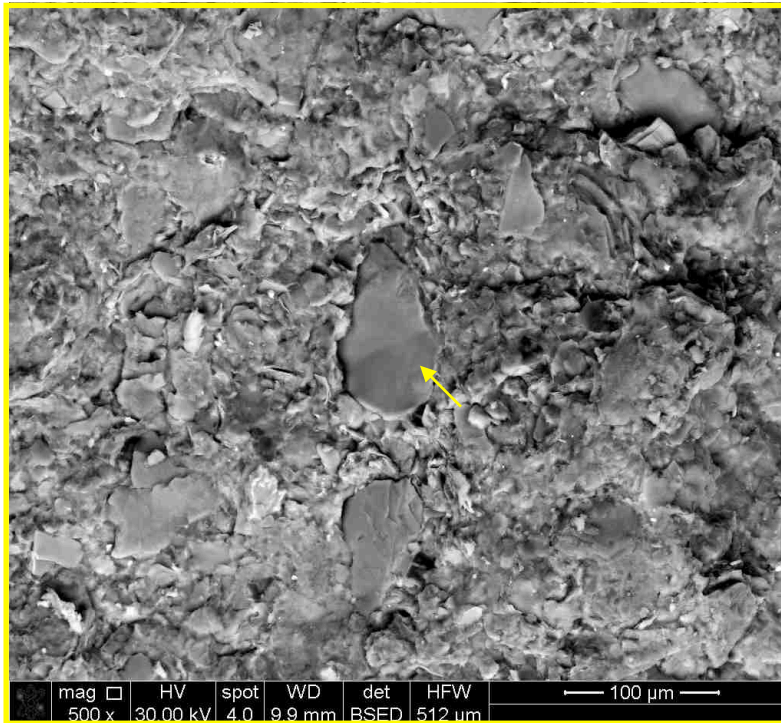


23009-01B 126X



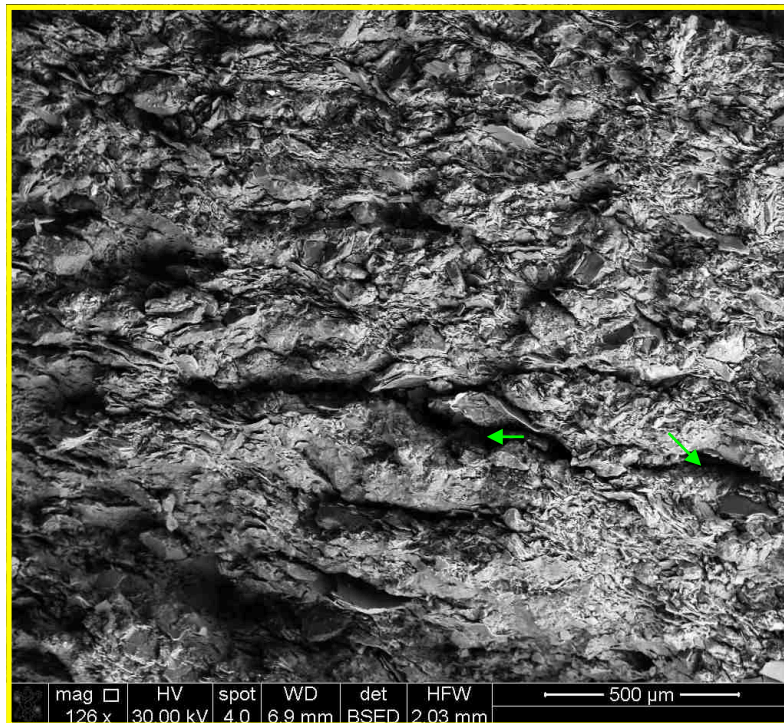


23009-01C 500X



Q

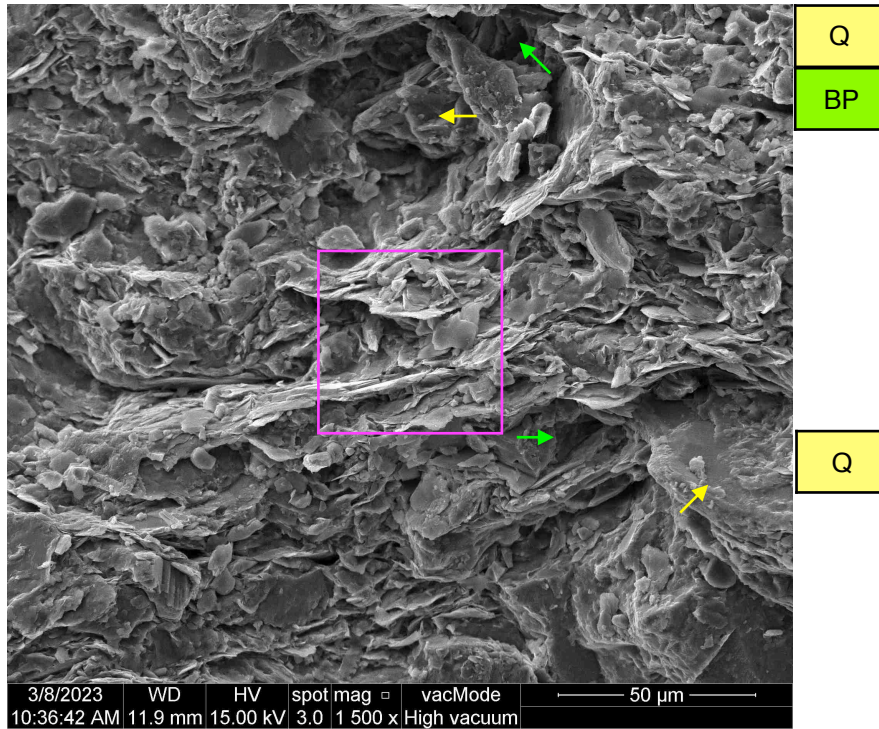
23009-01D 126X



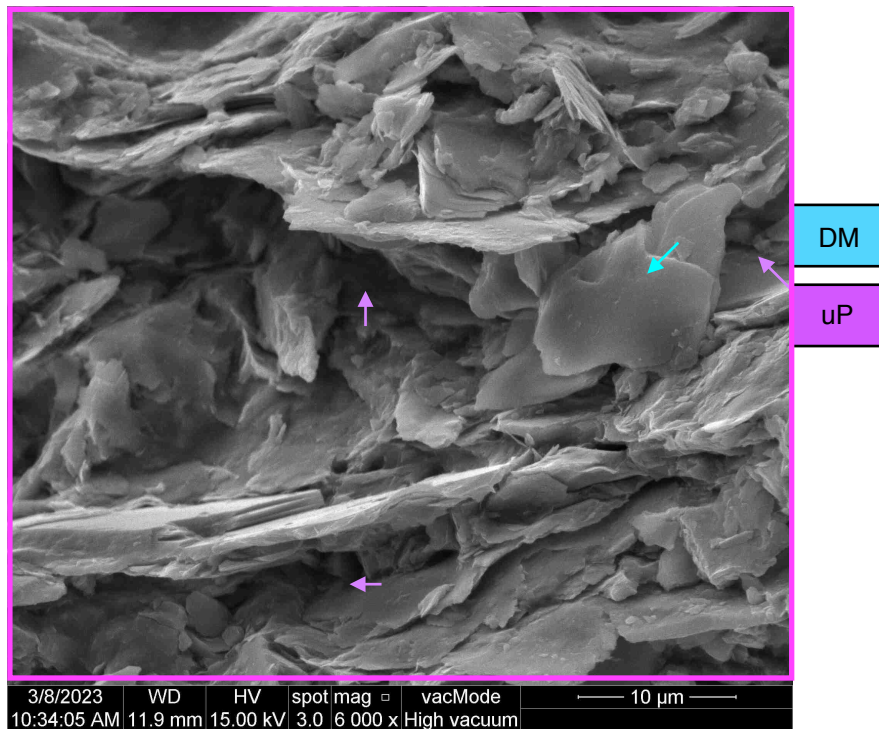
BP



23009-01E 1500X



23009-01F 6000X





Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-124.5

MI#23009-02 - SEM

Summary: This core interval is comprised of light gray (N8), cross-bedded, medium-grained, well sorted, quartz-cemented, sub-arkosic sandstone. The sandstone fabric is well-cemented & moderately porous, with scattered intergranular macropores. Pore-filling authigenic kaolinite clay is scattered throughout the sandstone framework, occurring as vermicular stacks of clay platelets (see Figures 2E & 2F). The quartz-rich framework is well-cemented with authigenic quartz overgrowths. Total macroporosity for this sandstone is estimated to comprise ~ 6-9% of the sandstone bulk volume. The mineralogy of the sandstone is dominated by quartz (73%), feldspar [including plagioclase (7%) and k-feldspar (8%)], kaolinite (7.5%), illite / mica (4%), and scattered traces (i.e., <0.5%) of siderite, calcite, and pyrite.

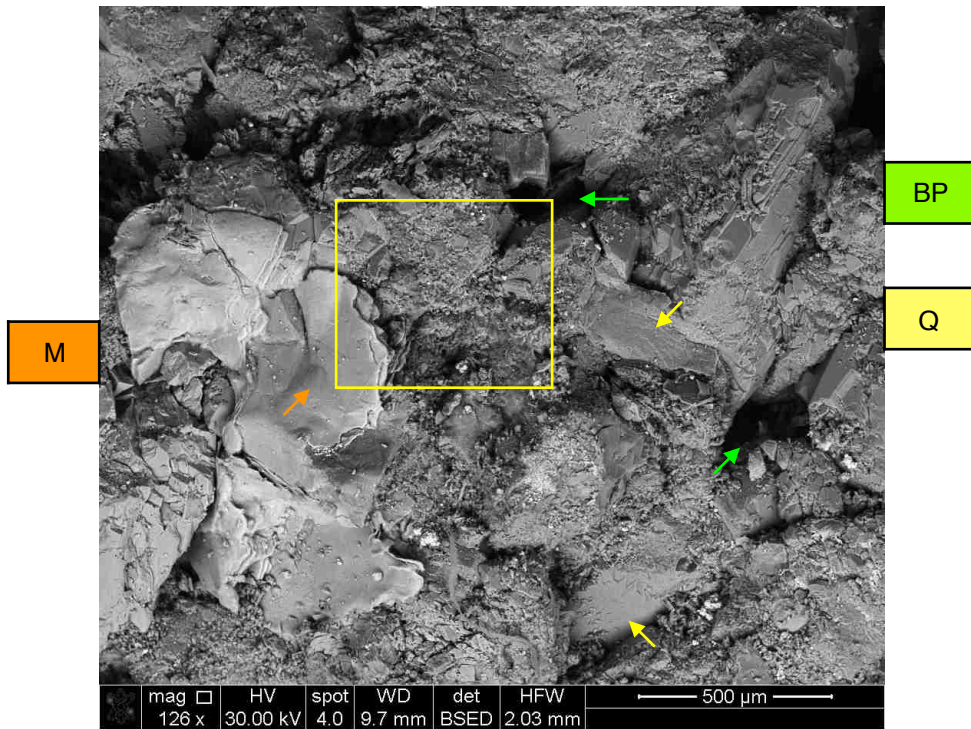
23009-02 Photo Index:

Sample ID	Magnification
23009-02A	126X
23009-02B	500X
23009-02C	500X
23009-02D	126X
23009-02E	1000X
23009-02F	8000X

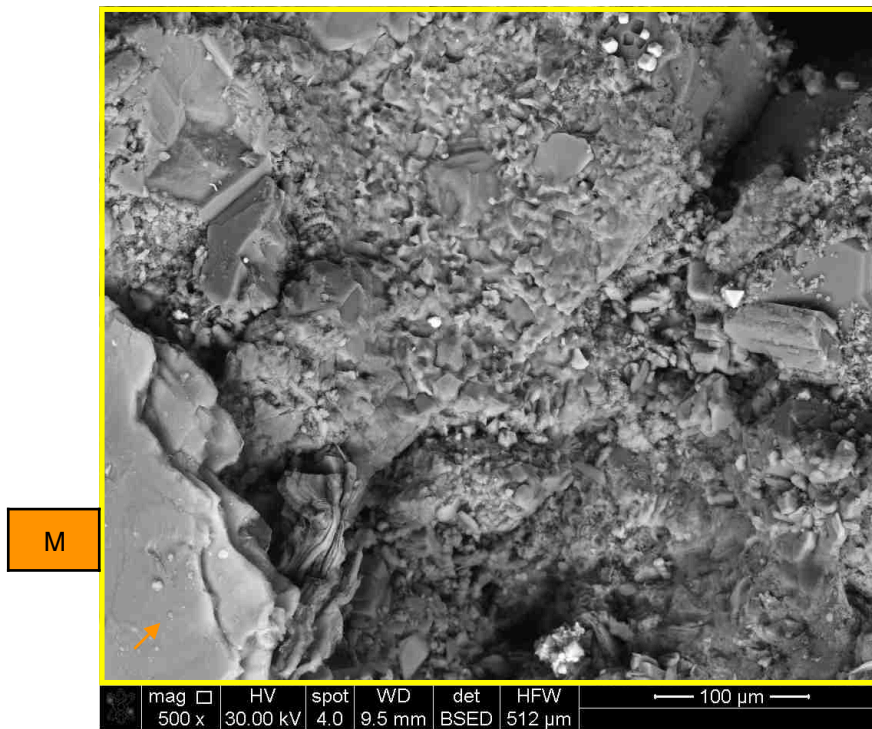
Intergranular macro-porosity	BP
Detrital quartz	Q
Quartz overgrowth cement	OG
Authigenic Kaolinite	K
Mica	M



23009-02A 126X

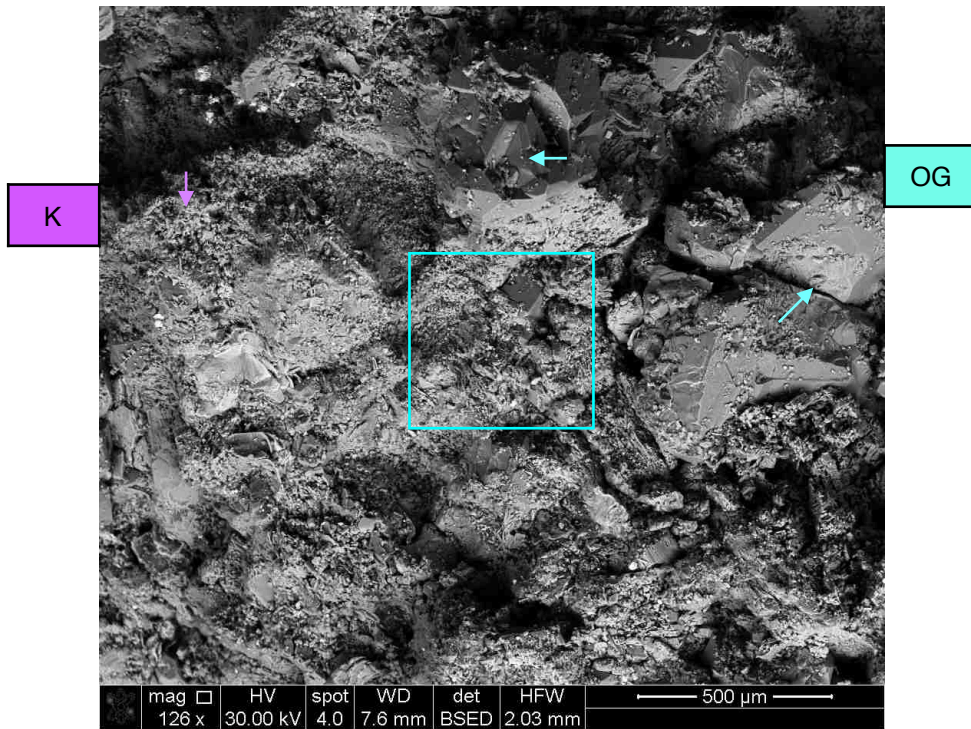


23009-02B 500X

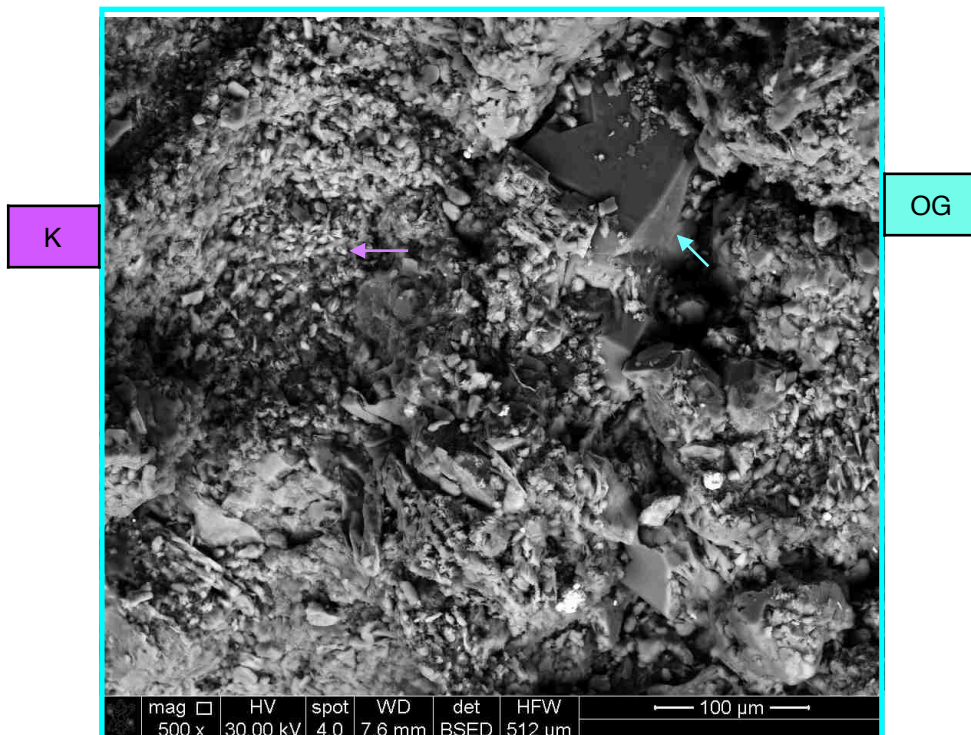




23009-02C 500X

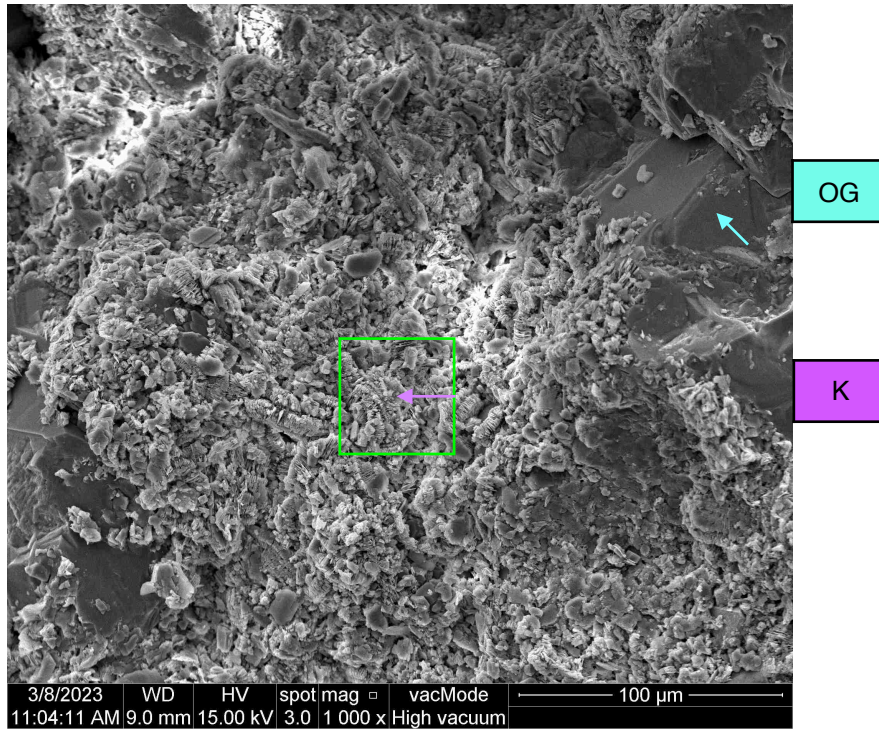


23009-02D 126X

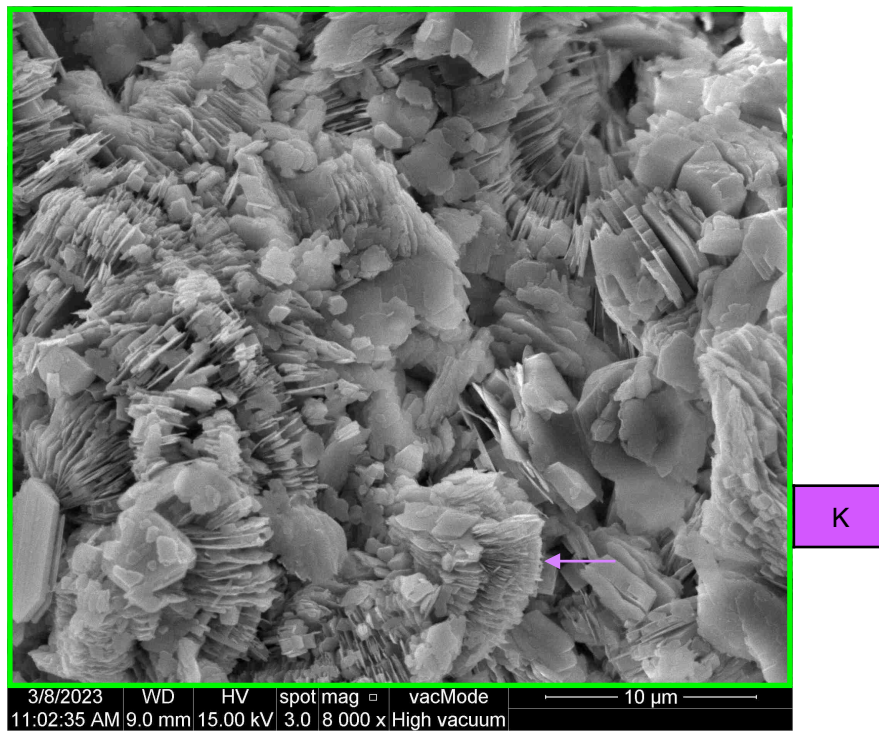




23009-02E 1000X



23009-02F 8000X





Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-128

MI#23009-03 - SEM

Summary: A compact, parallel bedded seam of coal is present at core depth 128'. Based on the x-ray diffraction pattern collected for this material, the organic matter is estimated to exhibit a maximum rank of medium to low volatile bituminous coal. The mineralogical analysis indicates that thermally altered organic matter (coal) comprises ~84% of the sample mass. The inorganic mineral fraction includes a mixture of clay matrix minerals (~8%), quartz (~4%), and pyrite (~4%). The clay mineral fraction is comprised of kaolinite coupled with minor amounts of illite & mixed-layered illite/smectite. The pyrite & clay minerals are typically present as authigenic minerals that have crystallized within fractures and dissolution voids contained within the coal.

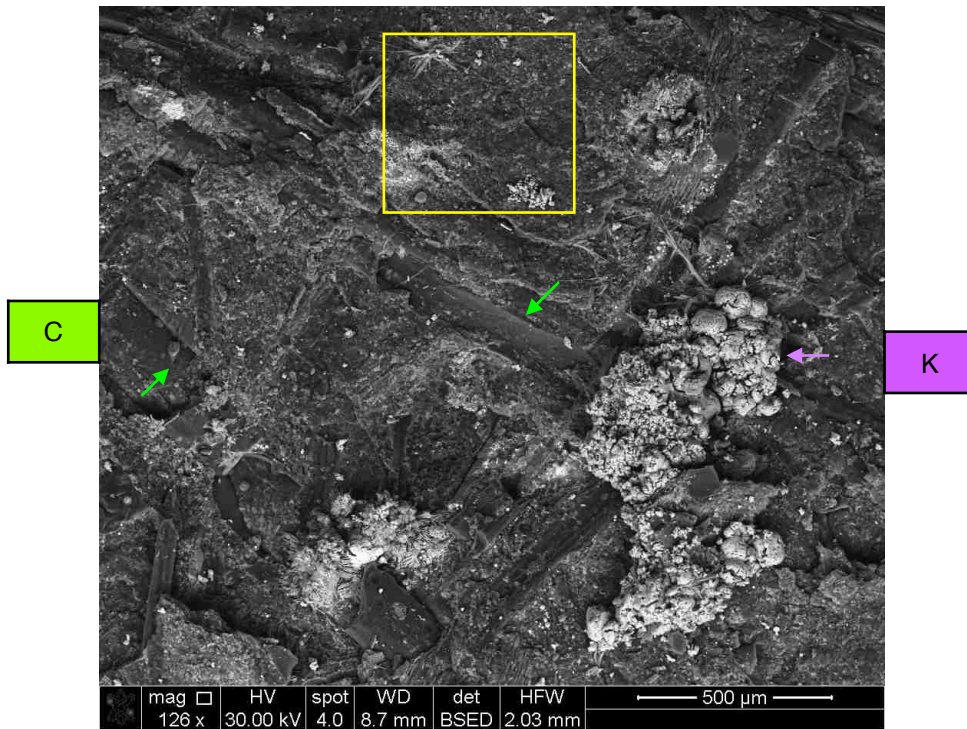
23009-03 Photo Index:

Sample ID	Magnification
23009-03A	126X
23009-03B	500X
23009-03C	150X
23009-03D	5000X

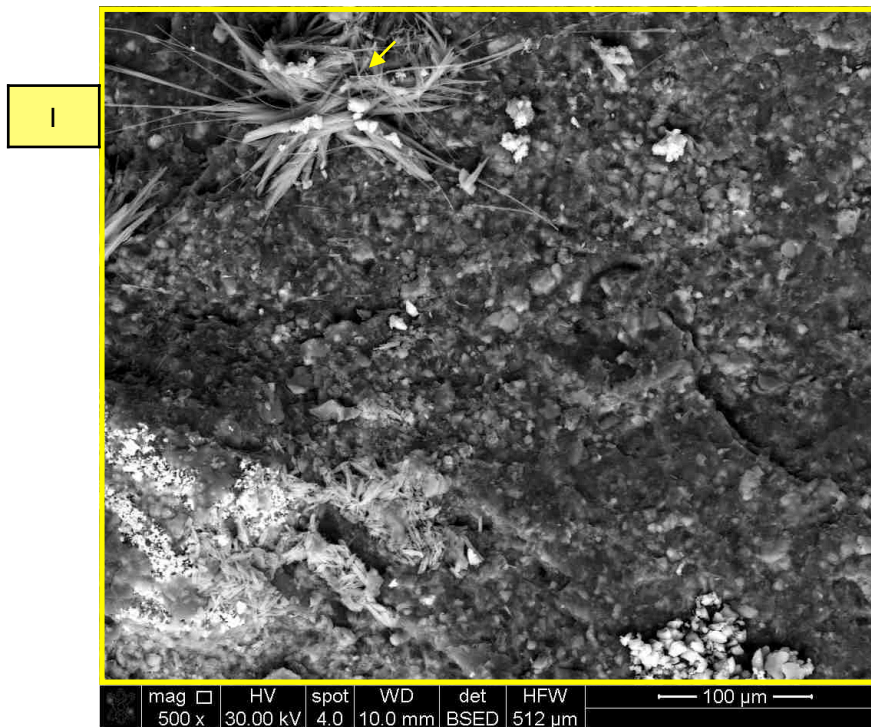
Coal maceral	C
Pyrite	P
Illite	I
Kaolinite	K



23009-03A 126X

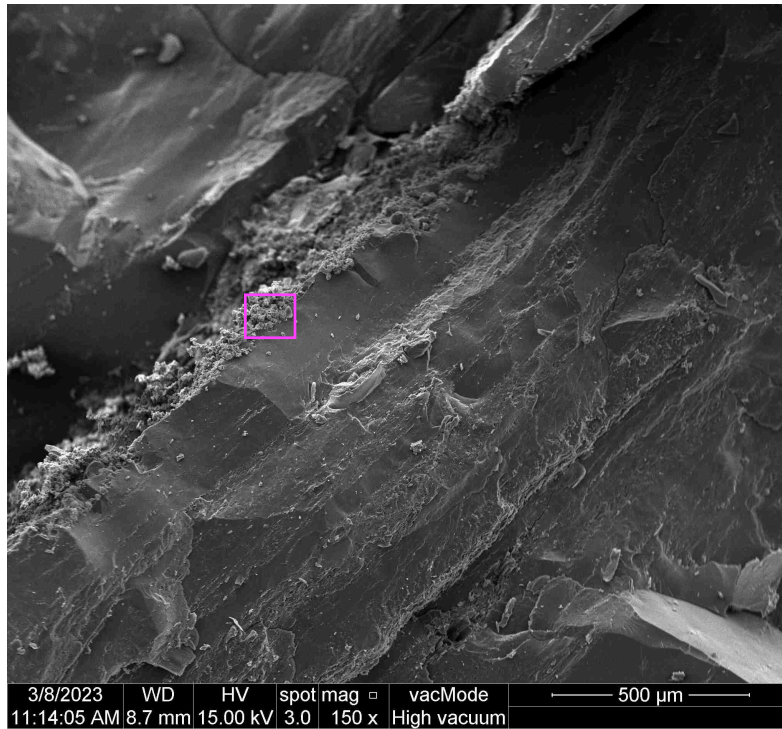


23009-03B 500X

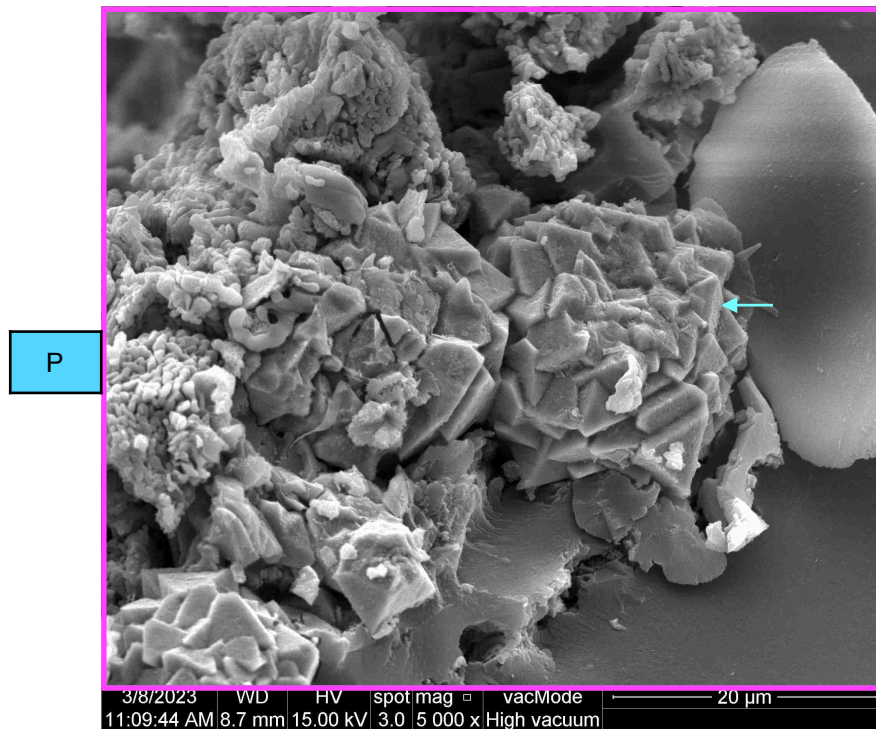




23009-03C 150X



23009-03D 5000X





Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-130.5

MI#23009-04 - SEM

Summary: This core interval is comprised of medium light gray (N6), compact, parallel-bedded, non-porous, micaceous, silty shale / clay-rich siltstone. The silt-rich grain fraction is sub-arkosic, moderately sorted, and sub-rounded to sub-angular. The relative proportion of silt & clay matrix / mica is variable between individual bedding layers, with some interbeds characterized as clay-rich (grain-supported) siltstones. Minute mica laths are abundant throughout the sedimentary fabric. Based on the XRD mineralogical analysis, clay minerals account for ~ 58% of the mineral mass. The clay mineral suite includes illite / mica (~33%), chlorite (~14%), kaolinite (~10%), and mixed-layered illite/smectite (~1%). Silt grain materials are dominated by quartz (~32%) and feldspar [including plagioclase (~7%) and k-feldspar (~1%)]. Minor amounts of siderite cement (~1.5%) and pyrite (~0.5%) are also present, distributed as minute (~1-5 um diameter) crystals dispersed throughout the clay-rich groundmass. Total void space is estimated to account for <2% of the bulk volume. The sedimentary fabric includes small amounts of residual macroporosity & microporosity. The sheltered interparticle voids are locally preserved as minute, lens-shaped voids that appear isolated due to the pervasive distributions of detrital clay matrix.

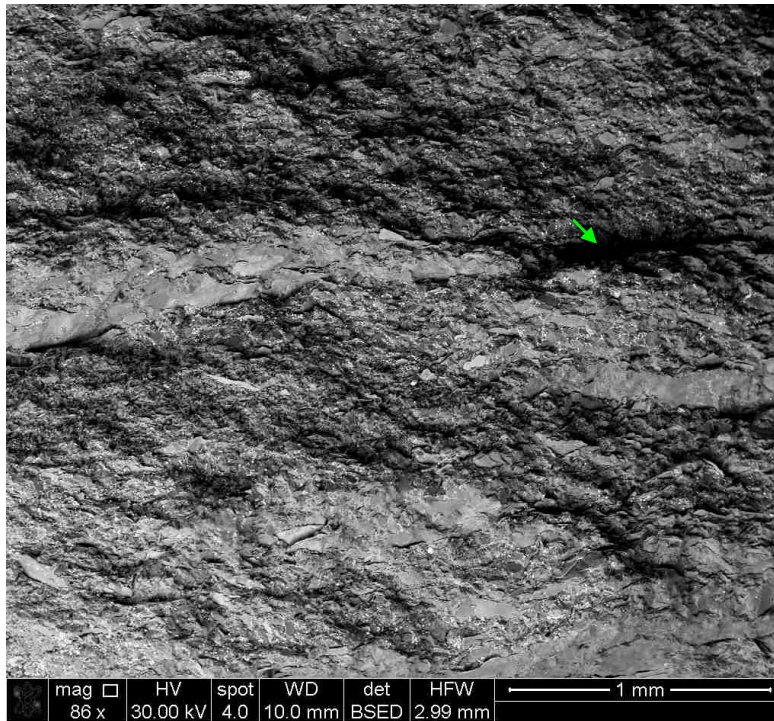
23009-04 Photo Index:

Sample ID	Magnification
23009-04A	86X
23009-04B	500X
23009-04C	2000X
23009-04D	1000X
23009-04E	126X

Intergranular micro + macro-porosity	BP
Siderite	S
Detrital clay matrix	DM
Quartz	Q
Mica	M

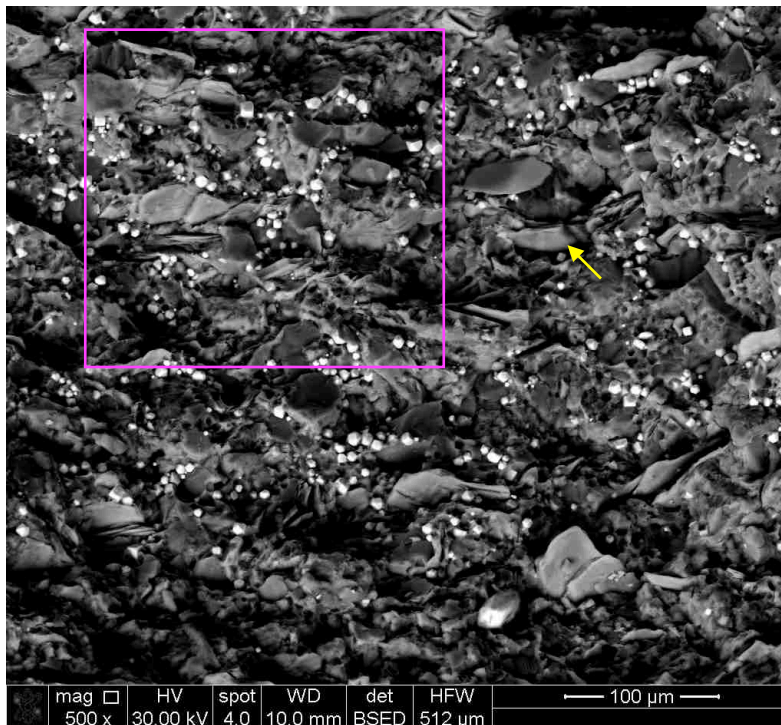


23009-04A 86X



BP

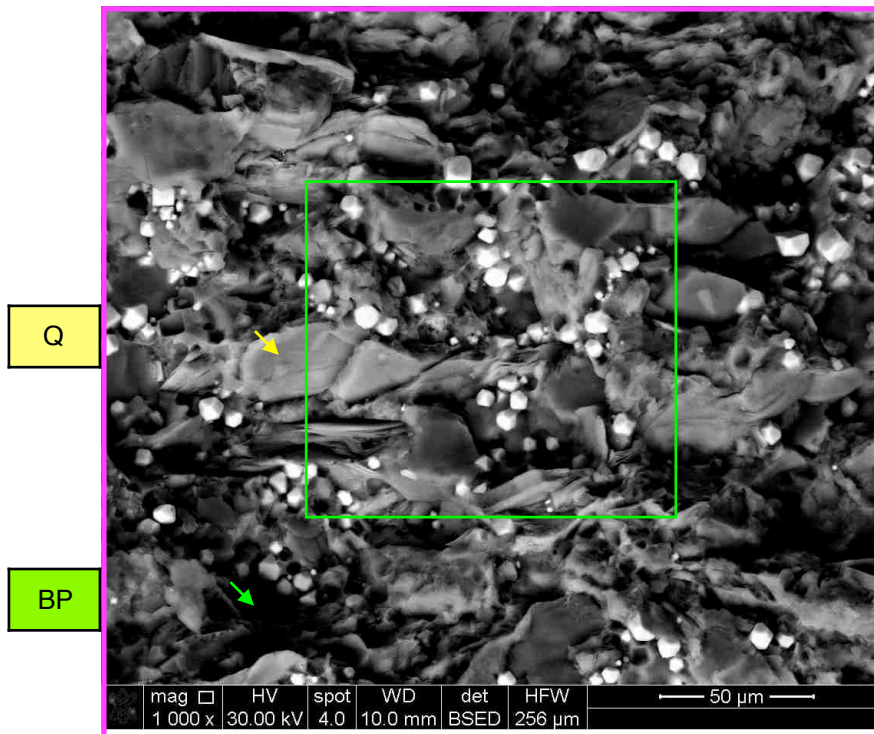
23009-04B 500X



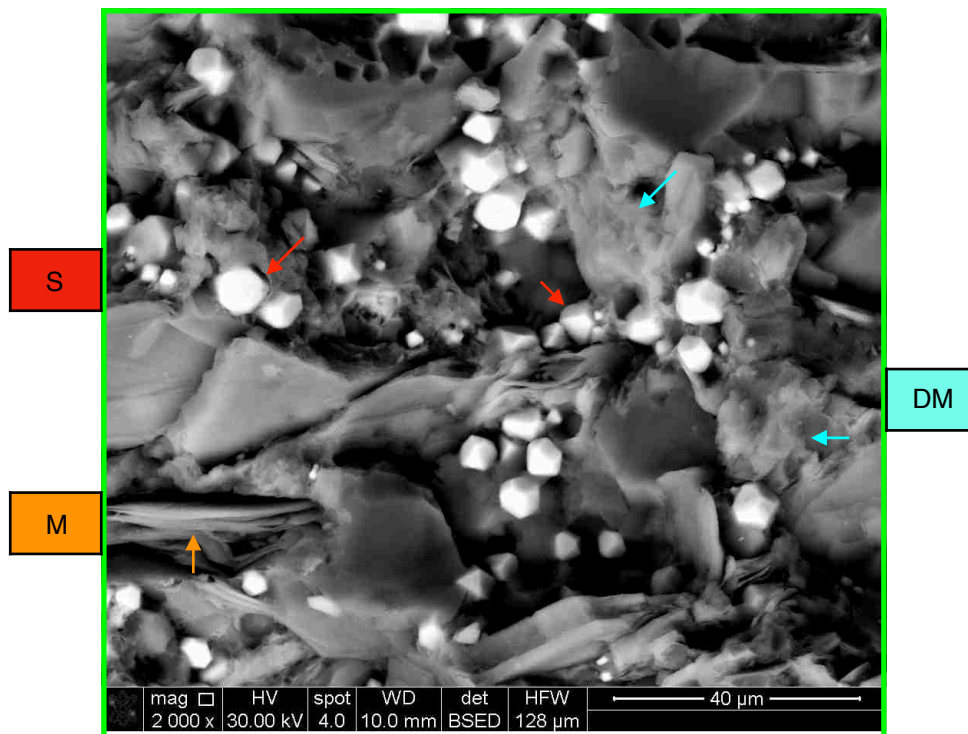
Q



23009-04C 2000X



23009-04D 1000X





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Mountaineer | New Haven, WV

MW-1922D-104.5

MI#23009-05 - SEM

Summary: This core sample is characterized as a cross-bedded, medium-grained, well-sorted, quartz-cemented, moderately porous, sub-arkosic sandstone. The framework is compact and exhibits common point-to-point & elongated intergranular contacts. Rims of syntaxial quartz overgrowth cement are locally inter grown along contacts shared by adjoining quartz grains. Scattered feldspar grains exhibit indications of intra-particle corrosion and localized replacement with authigenic kaolinite. The mineralogy of the sandstone is comprised of quartz (~86%), plagioclase feldspar (~4%), k-feldspar (~1%), kaolinite (~6%), illite / mica (~2.5%), and traces of calcite (0.5%), and mixed-layered illite/smectite (<0.5%) [see Table I]. Macroporosity is visually estimated to comprise ~ 8-10% of the sandstone bulk volume.

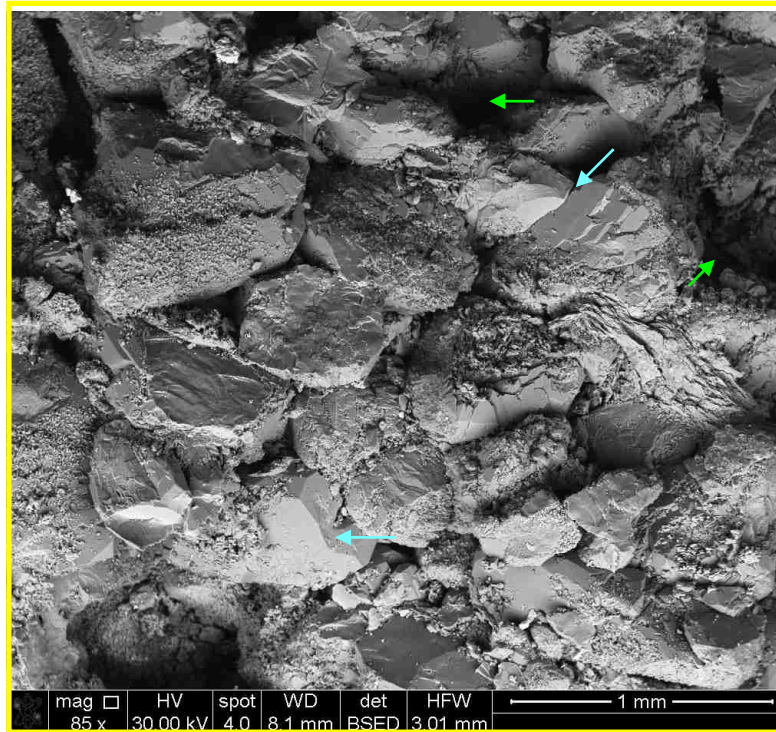
23009-05 Photo Index:

Sample ID	Magnification
23009-05A	126X
23009-05B	85X
23009-05C	500X
23009-05D	500X
23009-05E	500X
23009-05F	1000X

Intergranular macro-porosity	BP
Detrital quartz	Q
Quartz overgrowth cement	OG
Authigenic Kaolinite	K
Leached Feldspar	F
Micaceous shale RF	M

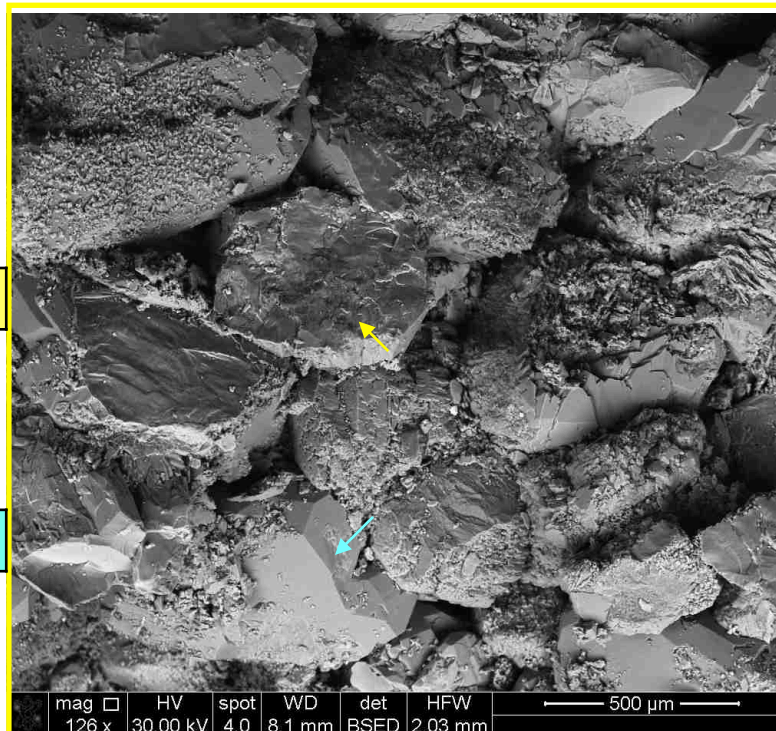


23009-05A 126X



OG
BP

23009-05B 85X

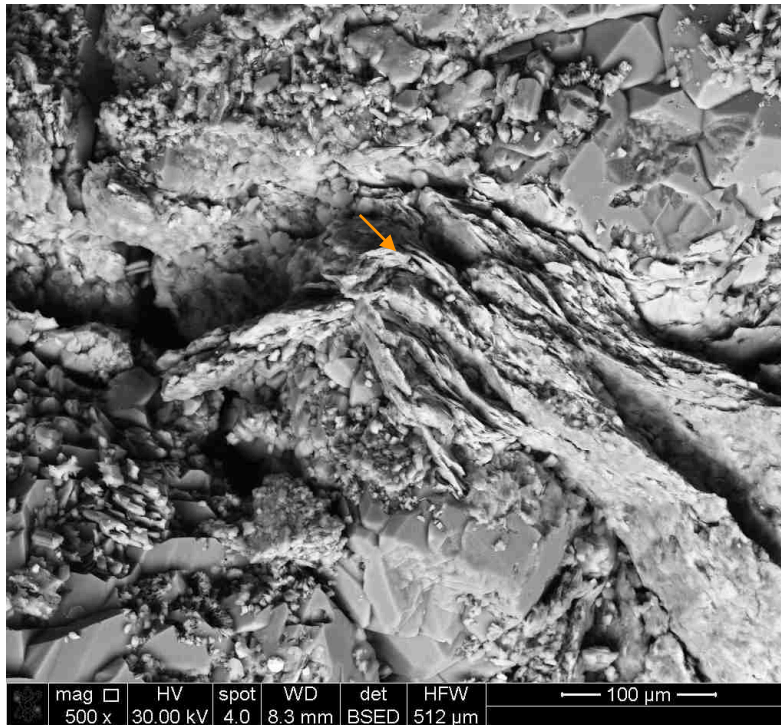


Q

OG

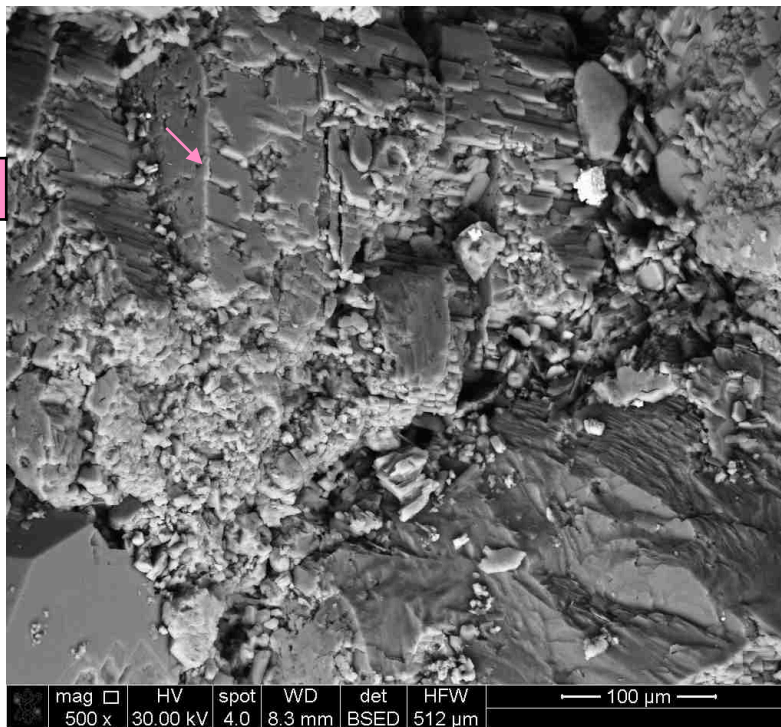


23009-05C 500X



M

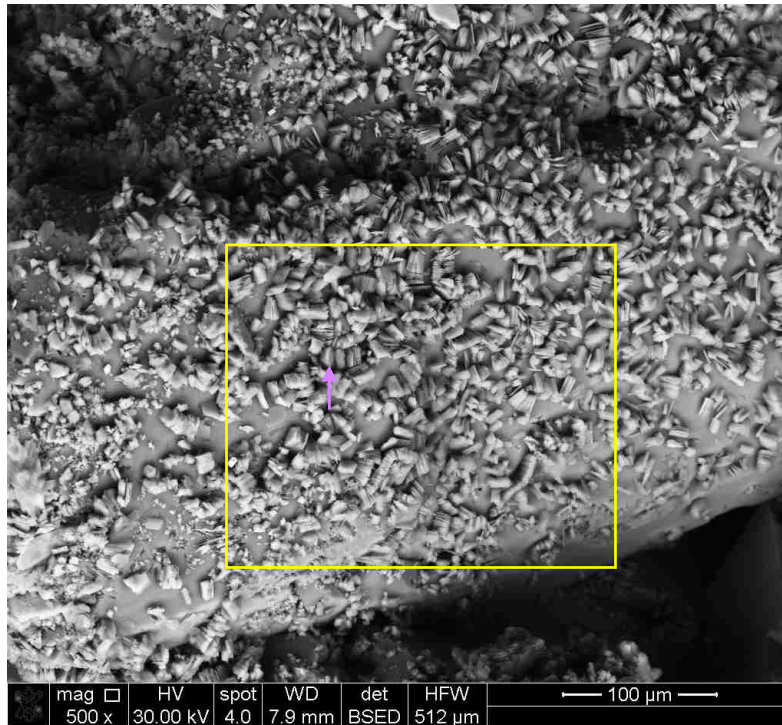
23009-05D 500X



F

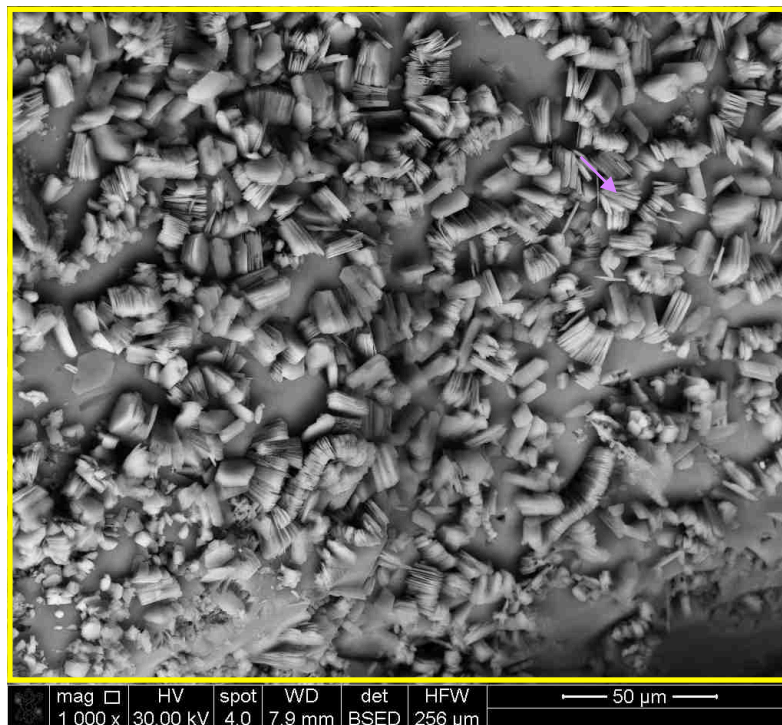


23009-05E 500X



K

23009-05F 1000X



K



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Mountaineer | New Haven, WV

MW-1922D-111

MI#23009-06 - SEM

Summary: This core sample is similar to the core interval @ 104.5' (MI#23009-05) & is characterized as a cross-bedded, medium-grained, moderately-sorted, quartz-cemented, moderately porous, sub-arkosic sandstone. The framework is compact and exhibits common point-to-point & elongated intergranular contacts. Rims of syntaxial quartz overgrowth cement are locally inter grown along contacts shared by adjoining quartz grains. Scattered feldspar grains exhibit indications of intra-particle corrosion and localized replacement with authigenic kaolinite. The mineralogy of the sandstone is comprised of quartz (~85%), plagioclase feldspar (~3%), k-feldspar (~2%), kaolinite (~6%), illite / mica (~3%), and traces of goethite (0.5%), hematite (~0.5%) and chlorite (<0.5%) [see Table I]. Macroporosity is visually estimated to comprise ~ 5-7% of the sandstone bulk volume.

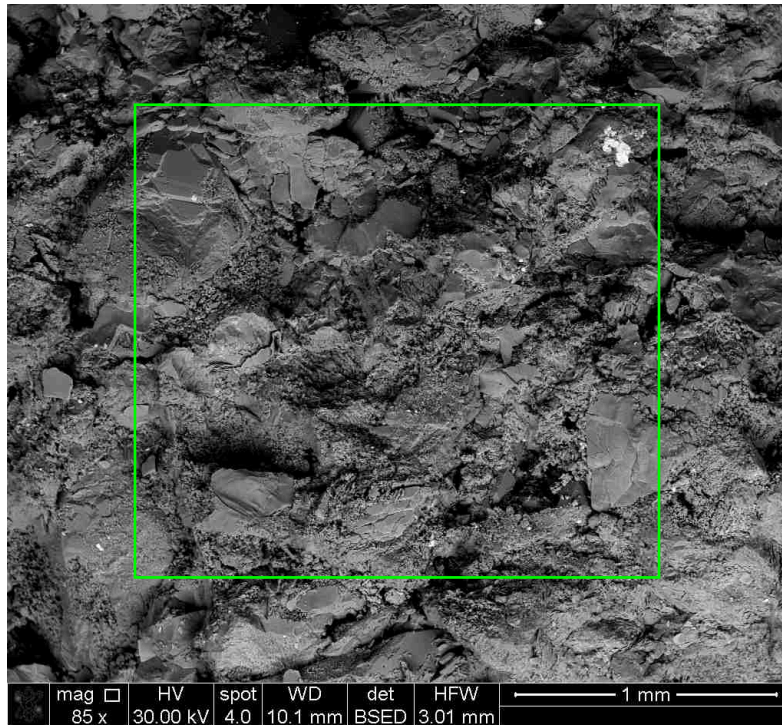
23009-06 Photo Index:

Sample ID	Magnification
23009-06A	85X
23009-06B	126X
23009-06C	1000X
23009-06D	8000X
23009-06E	1300X
23009-06F	5000X

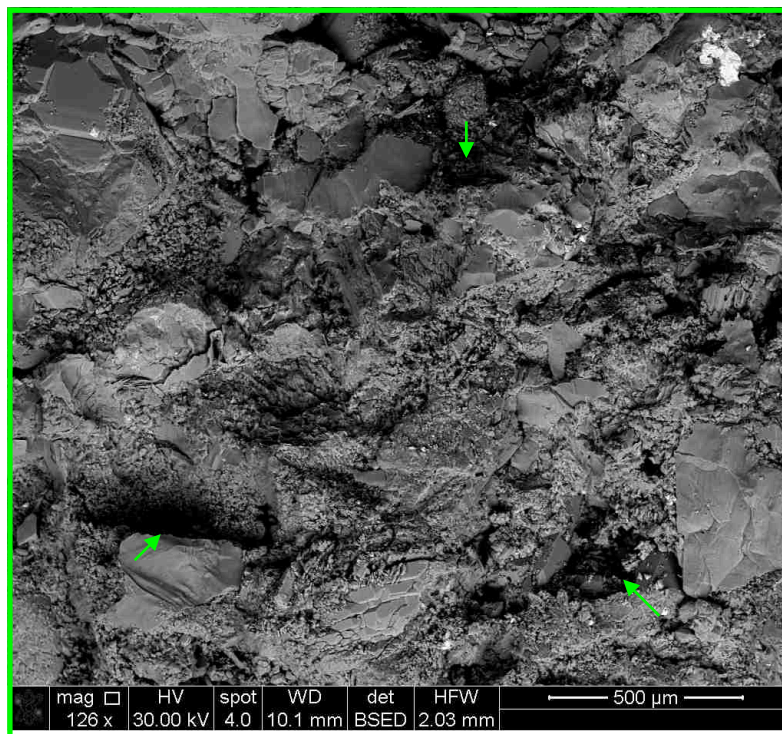
Intergranular macro-porosity	BP
Detrital quartz	Q
Quartz overgrowth cement	OG
Authigenic Kaolinite	K
Leached Feldspar	F
Micaceous shale RF	M



23009-06A 85X



23009-06B 126X



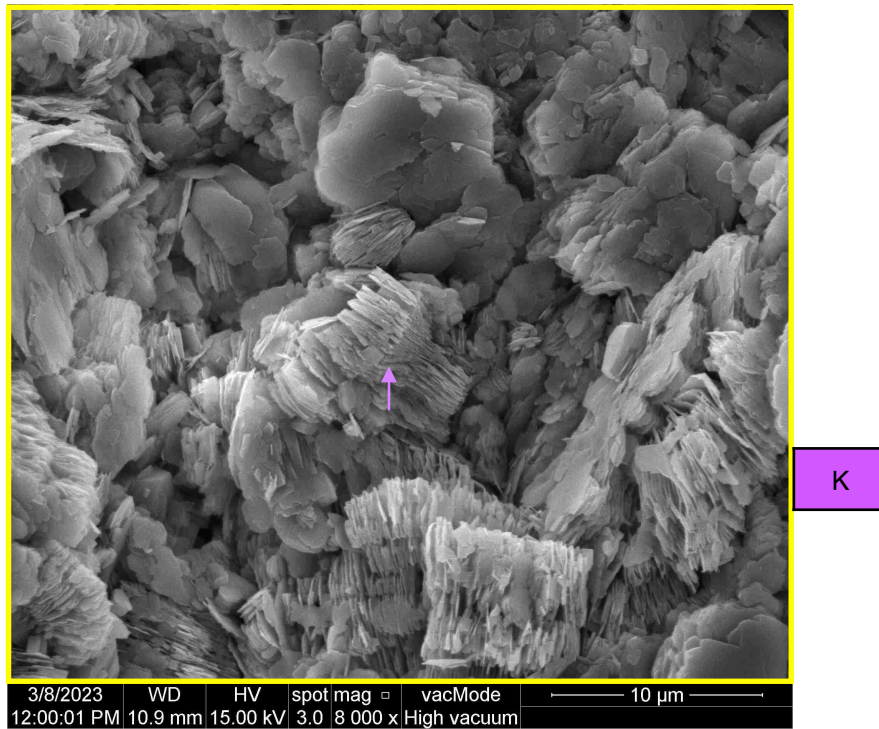
BP



23009-06C 1000X

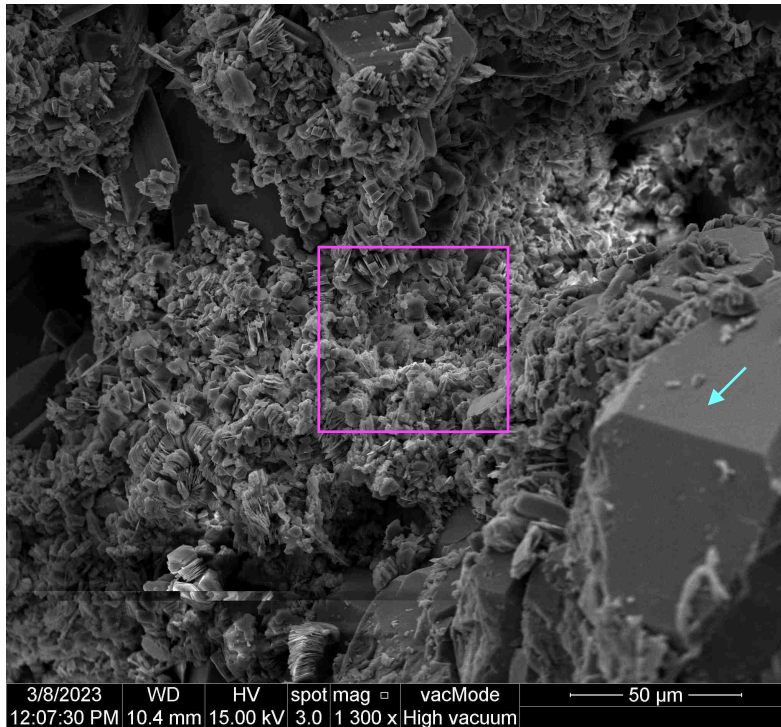


23009-06D 8000X



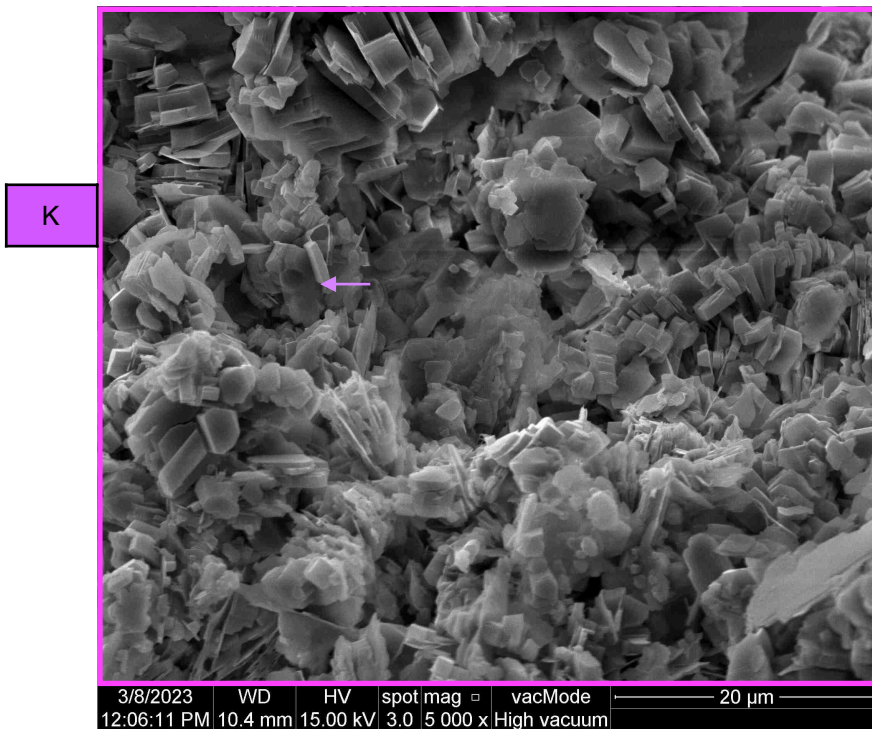


23009-06E 1300X



OG

23009-06F 5000X



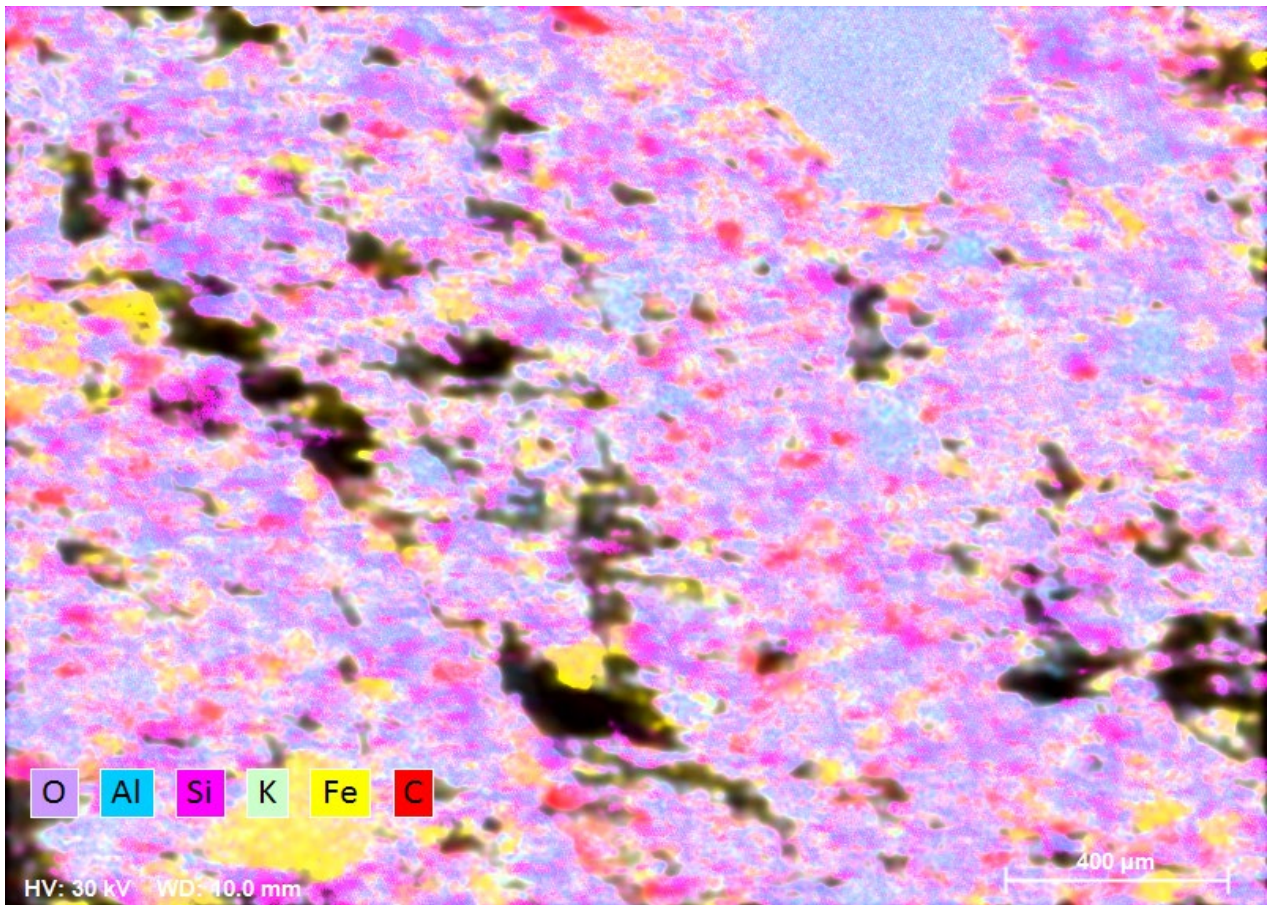
K

23009-01 Report



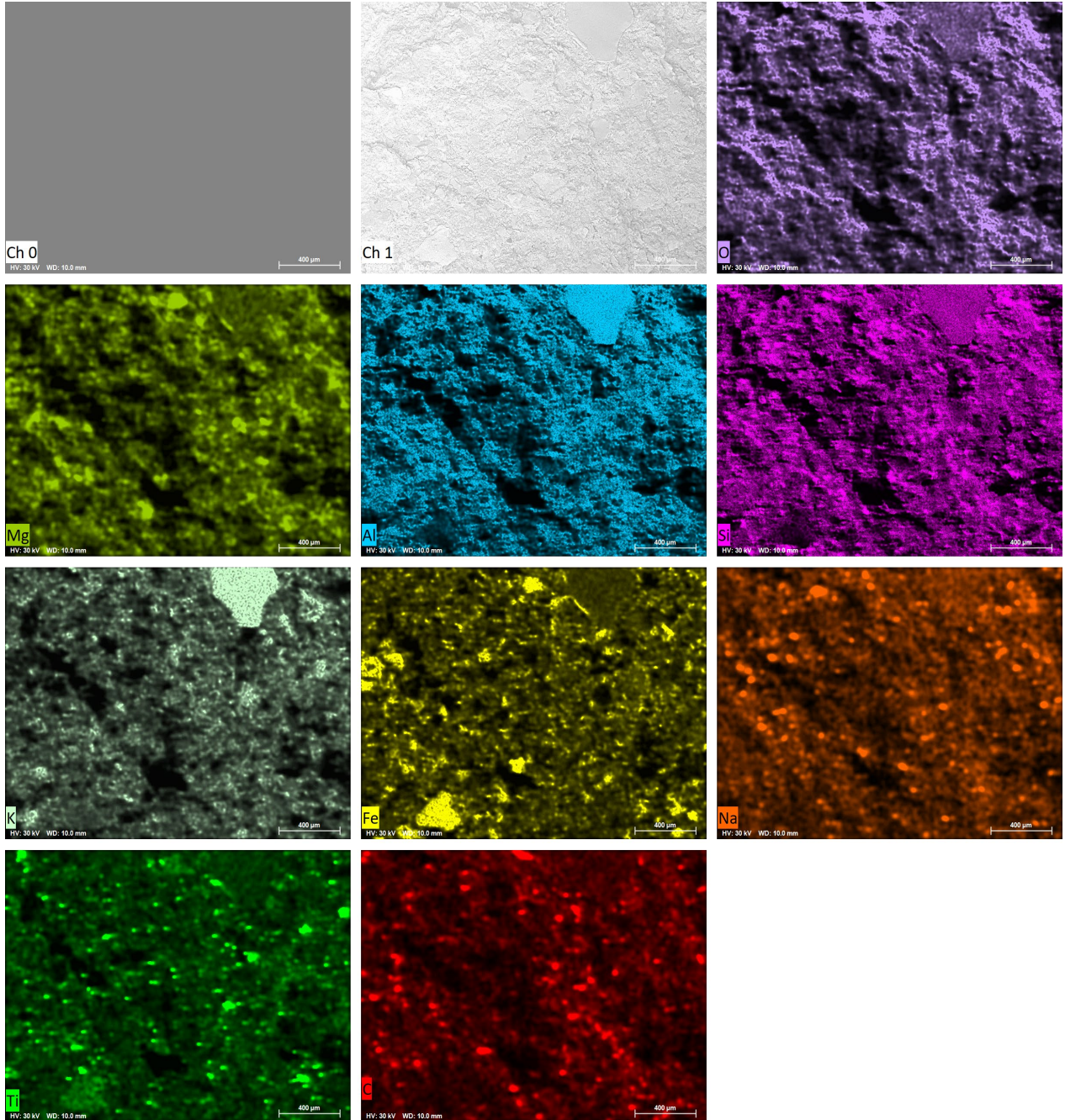
MAG: 126x HV: 30 kV WD: 10.0 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/7/2023	3:34:57 PM	30.0 keV	126x	10.0 mm



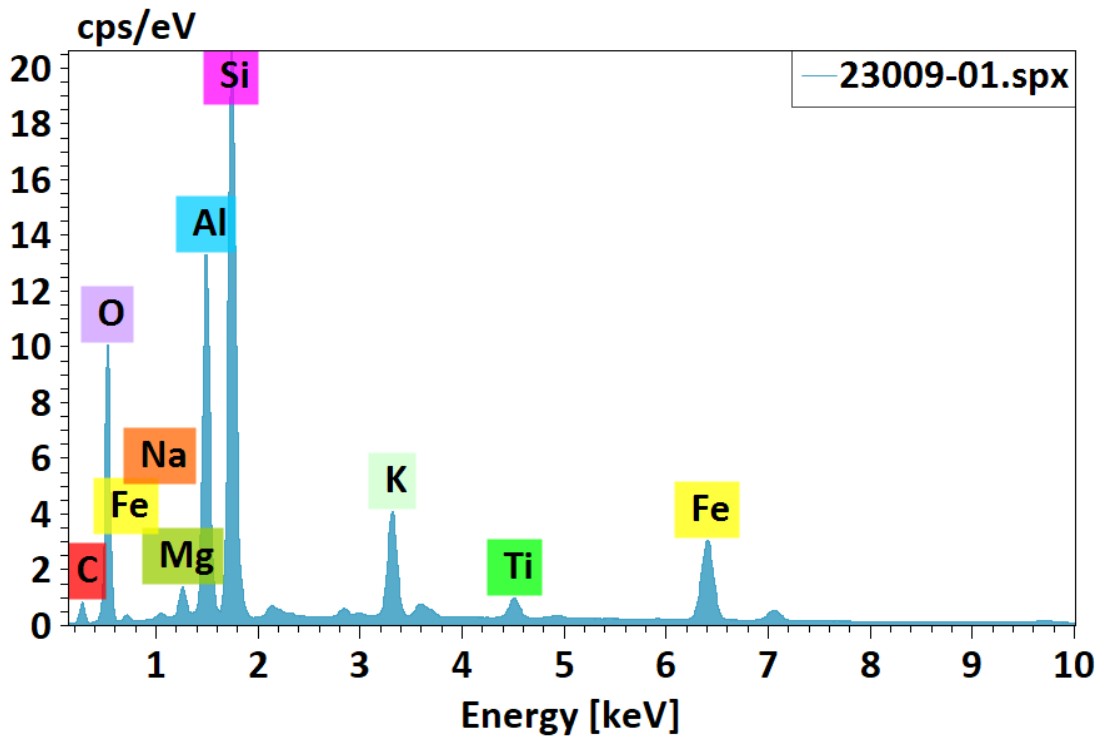
HV: 30 kV WD: 10.0 mm

Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:27:43 PM	30.0 keV	126x	10.0 mm



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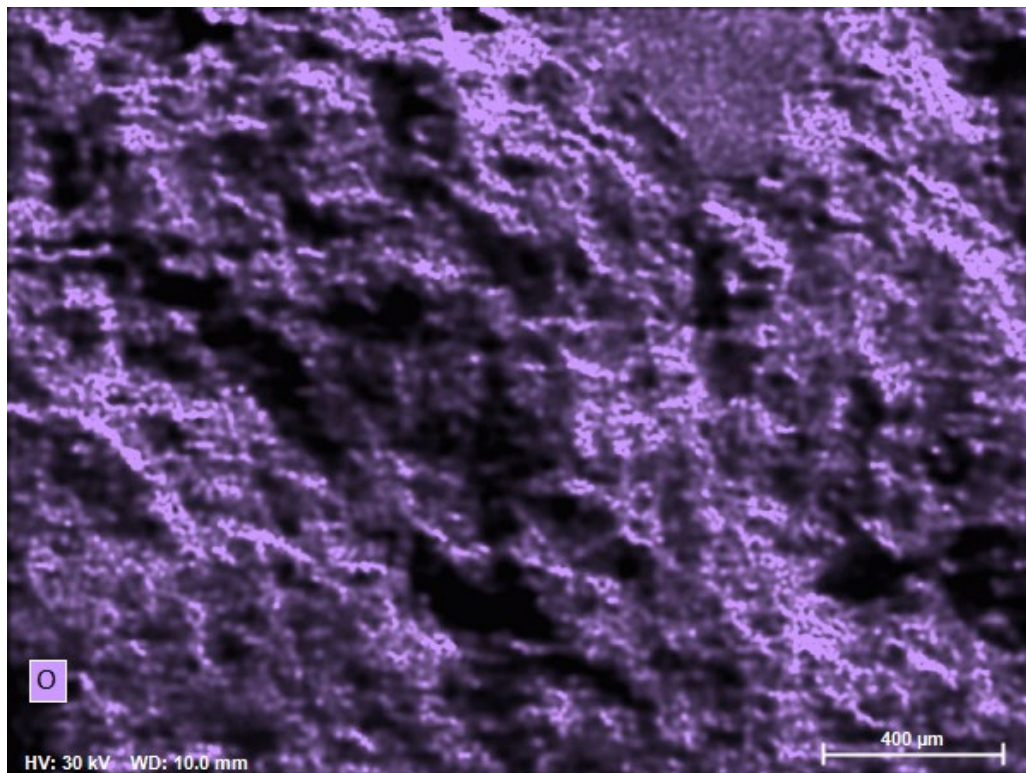


23009-01.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	10.68	10.23	16.40
Oxygen	8	48.79	46.75	56.28
Sodium	11	0.53	0.51	0.42
Magnesium	12	1.33	1.28	1.01
Aluminium	13	12.15	11.65	8.31
Silicon	14	20.71	19.84	13.61
Potassium	19	3.86	3.70	1.82
Titanium	22	0.96	0.92	0.37
Iron	26	5.36	5.14	1.77
		104.37	100.00	100.00

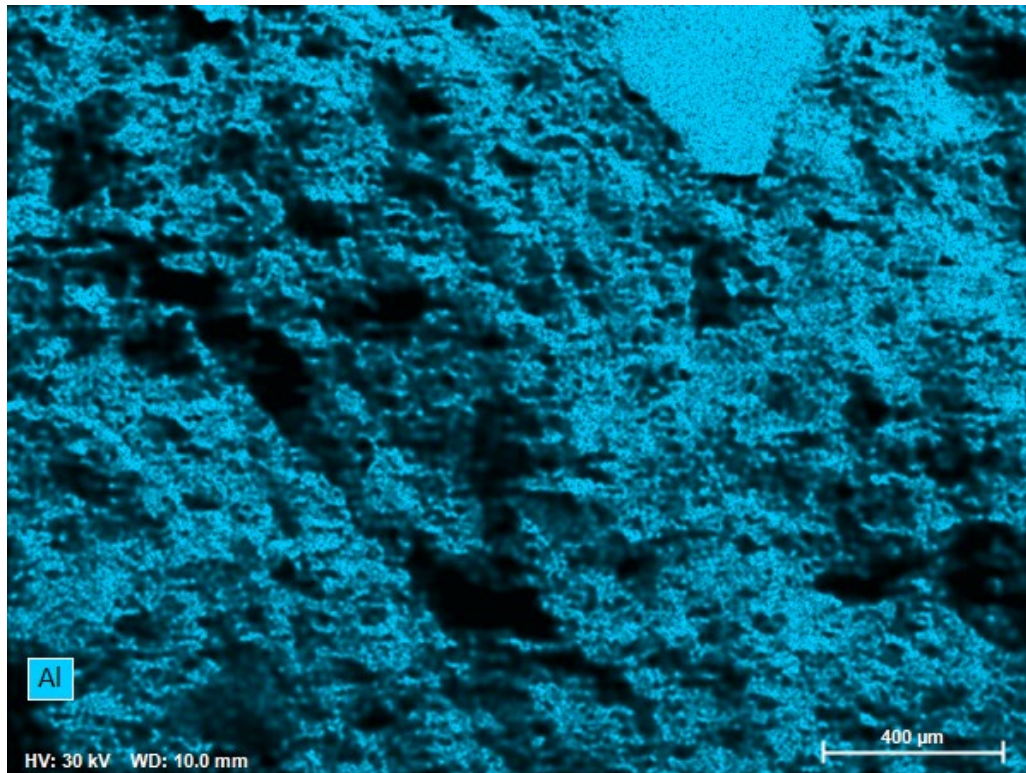
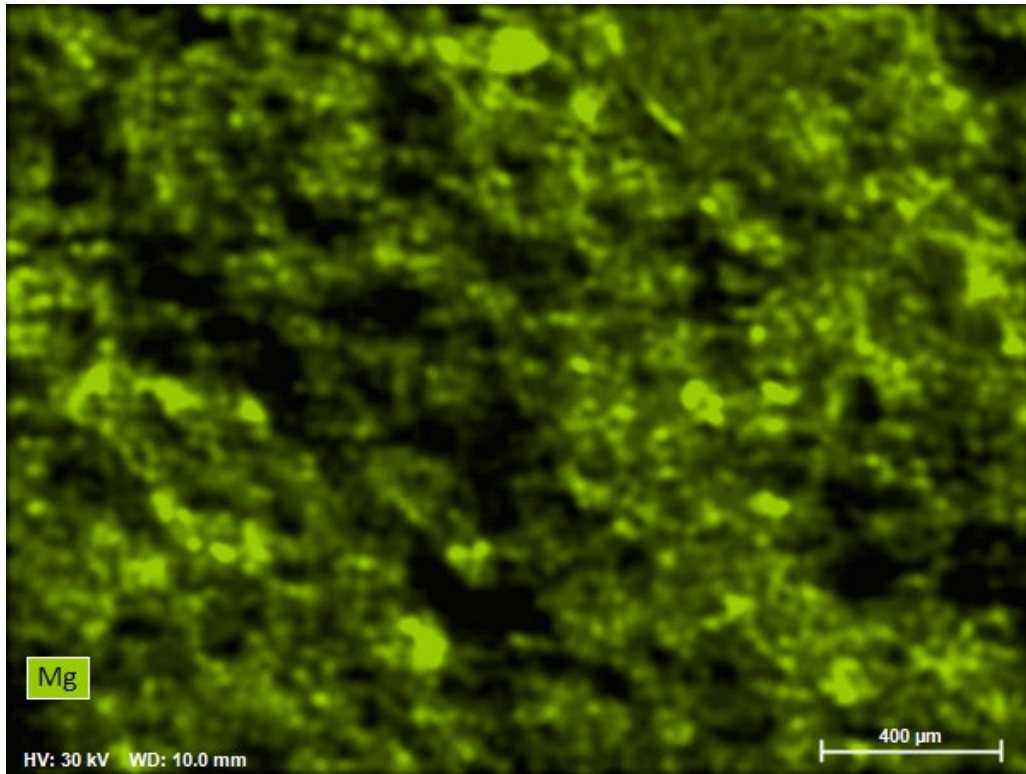
EDS Report

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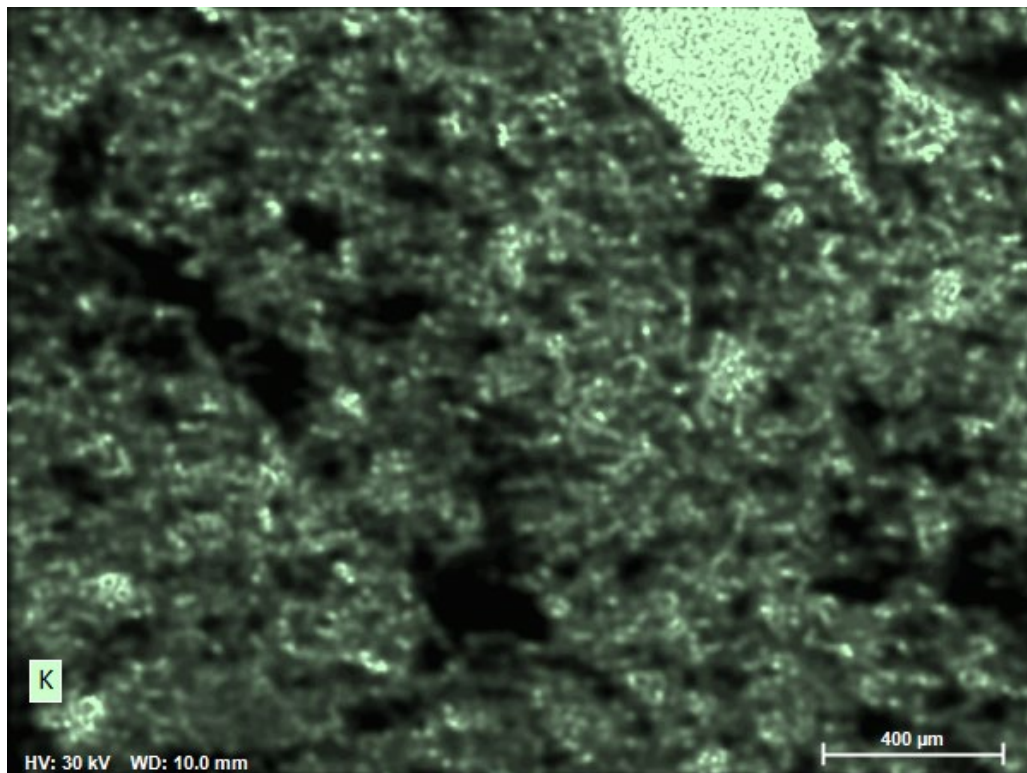
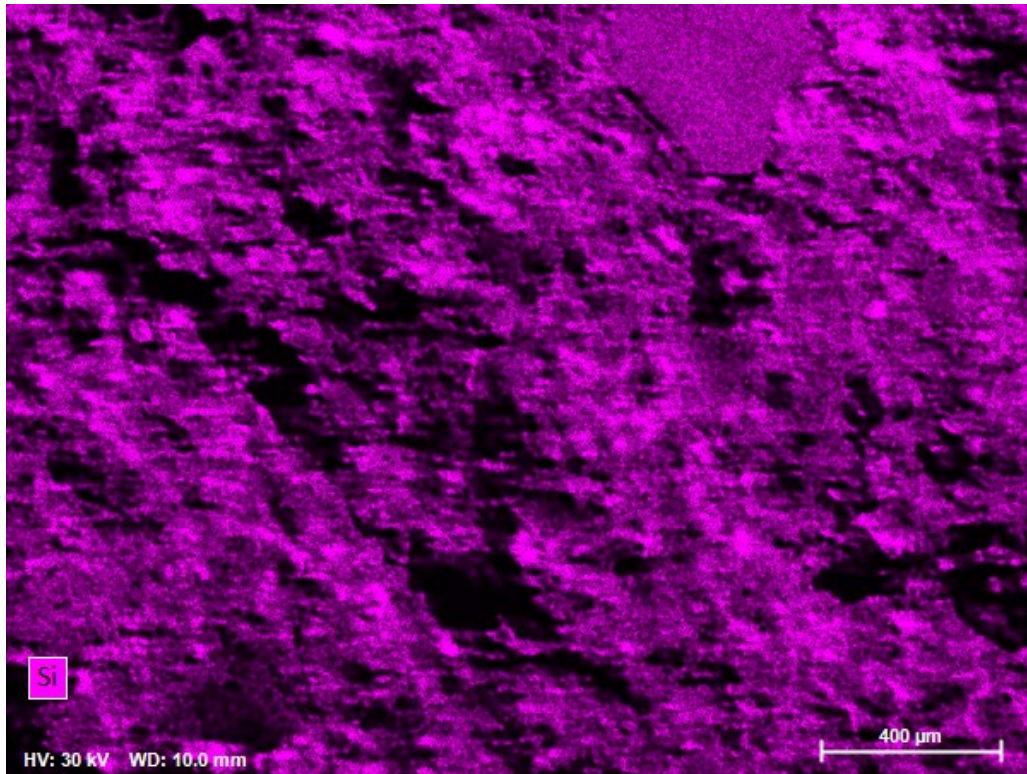
EDS Report

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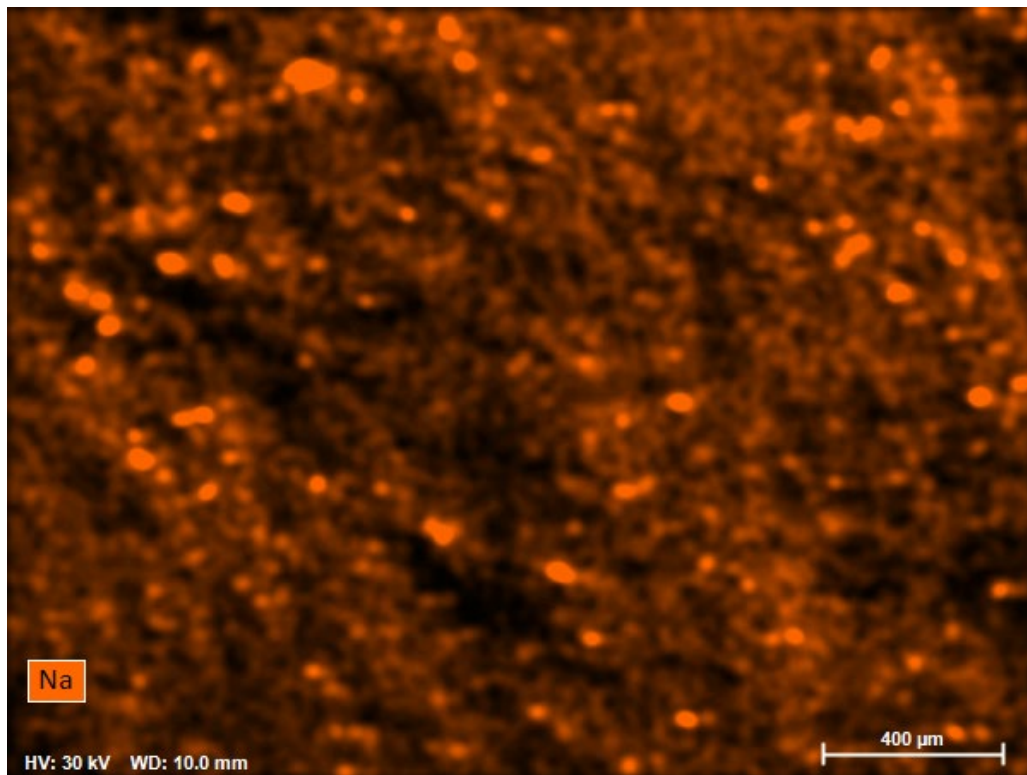
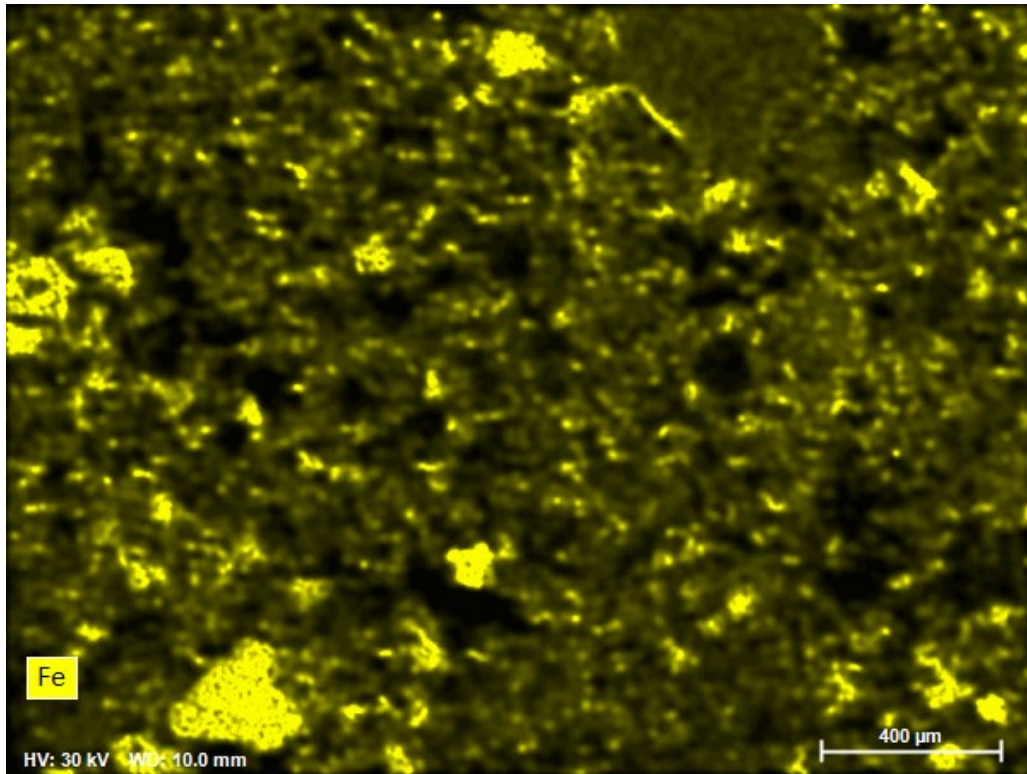
EDS Report

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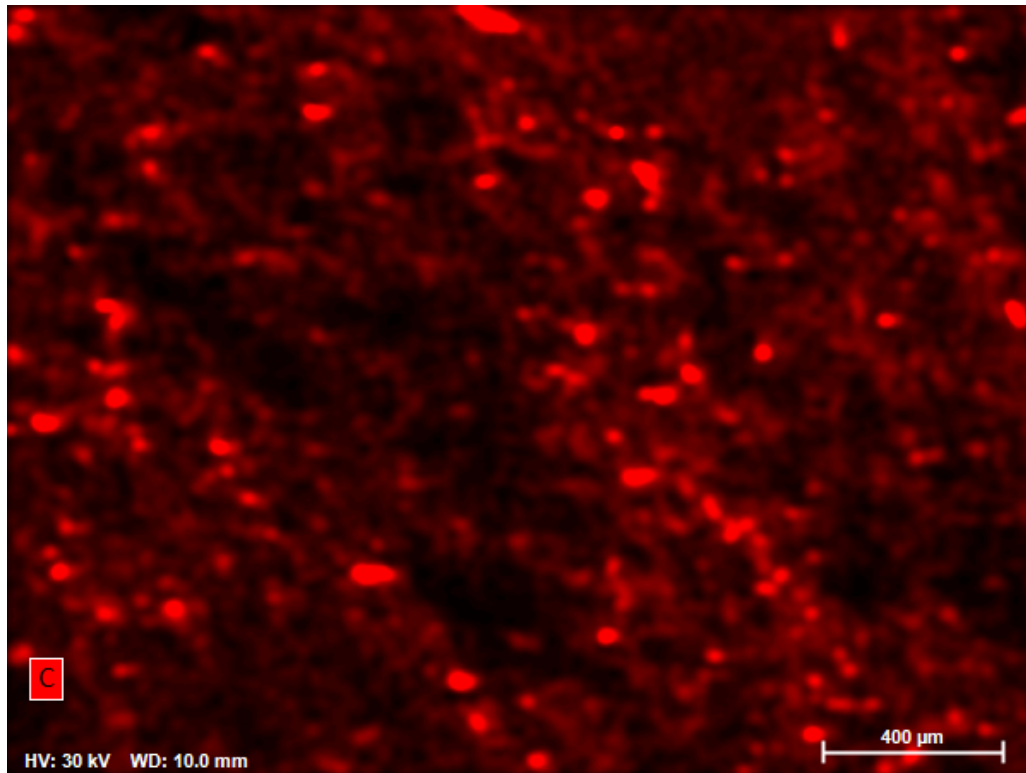
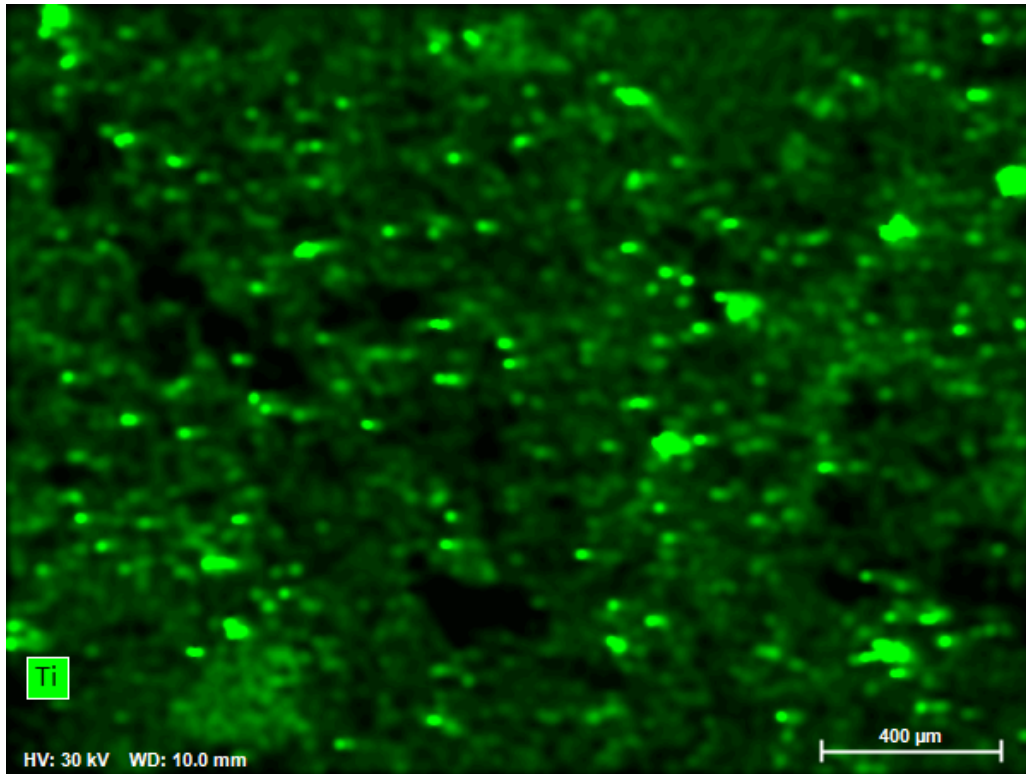
EDS Report

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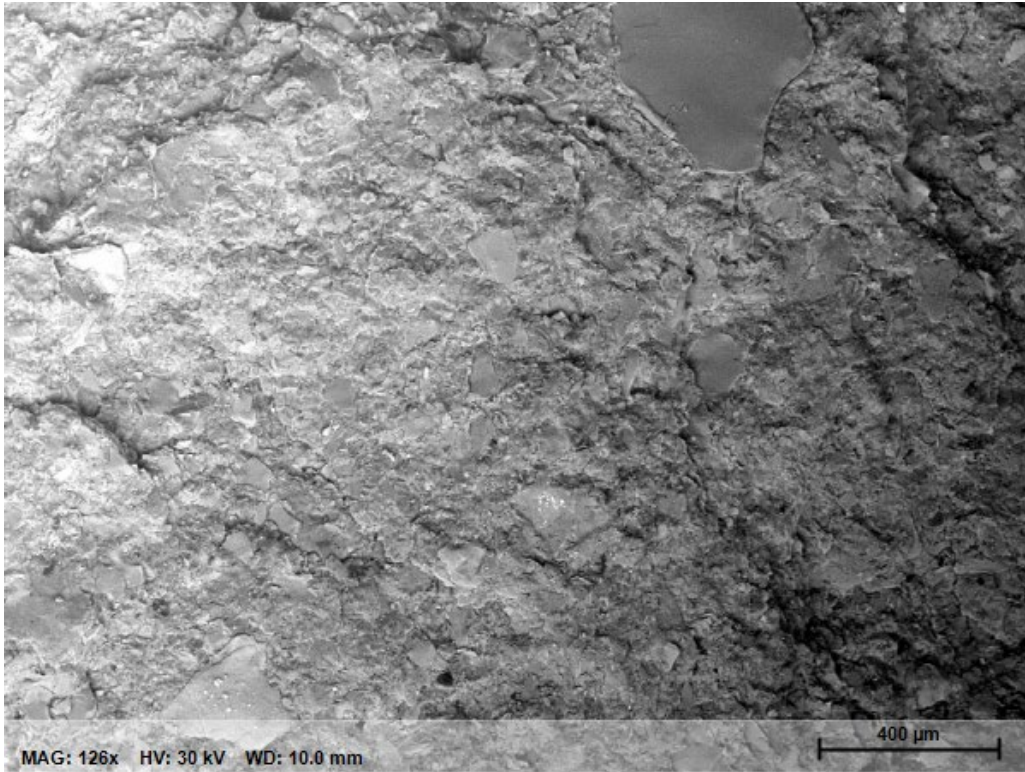
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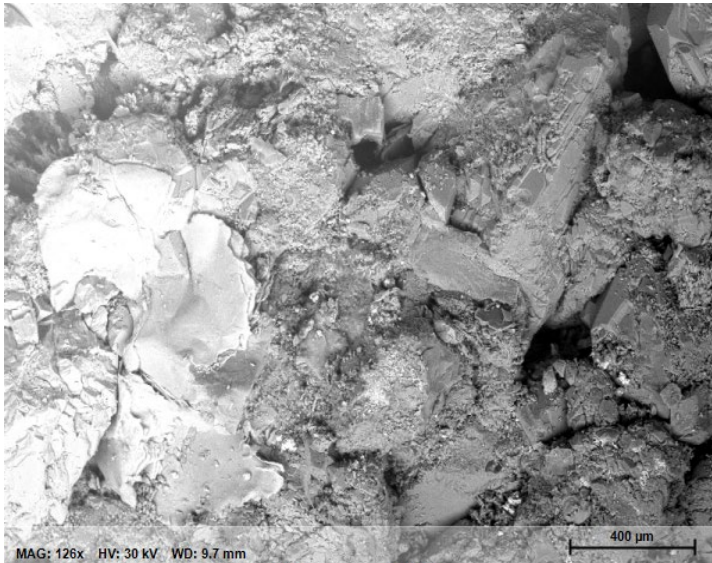


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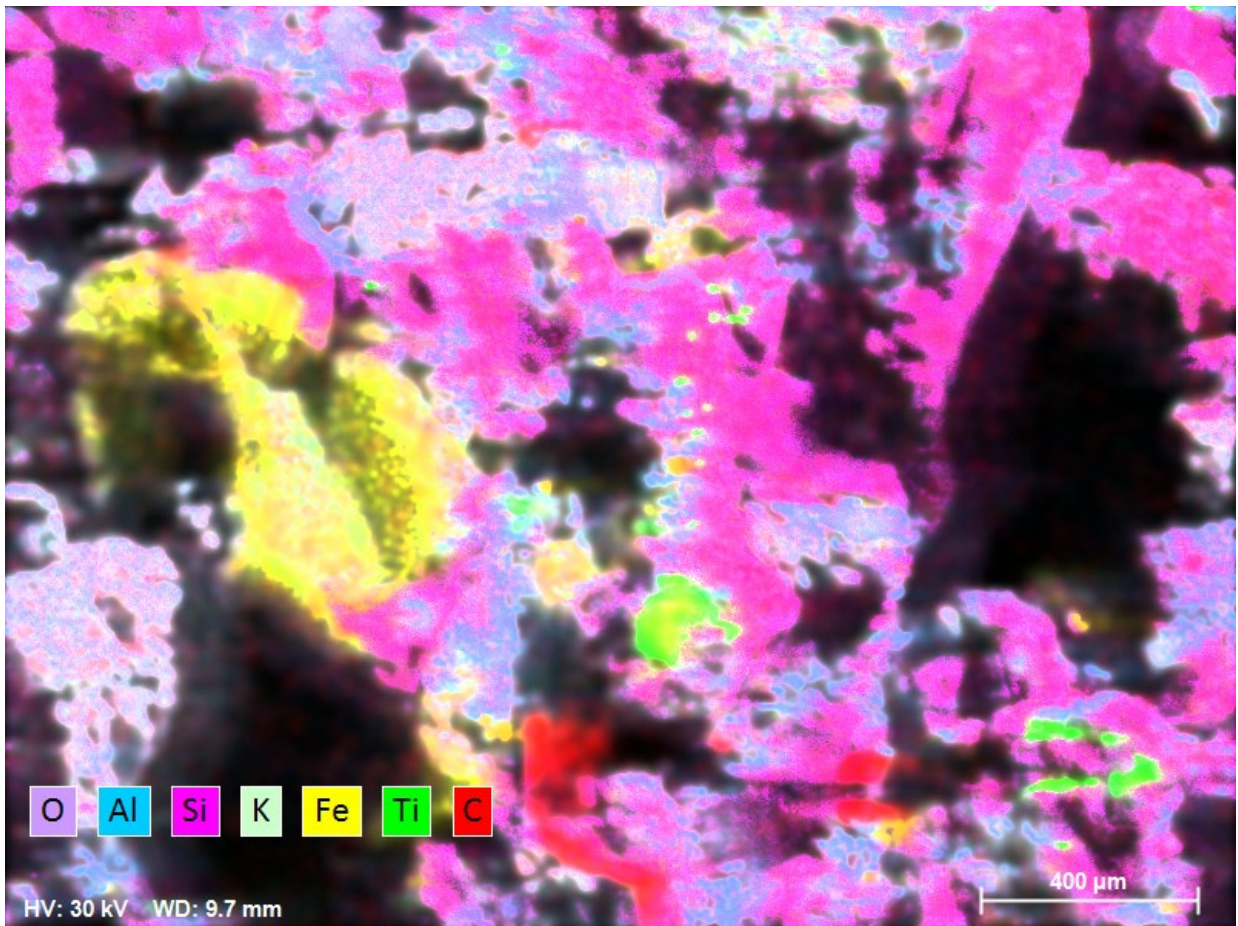


23009-02 Report



MAG: 126x HV: 30 kV WD: 9.7 mm

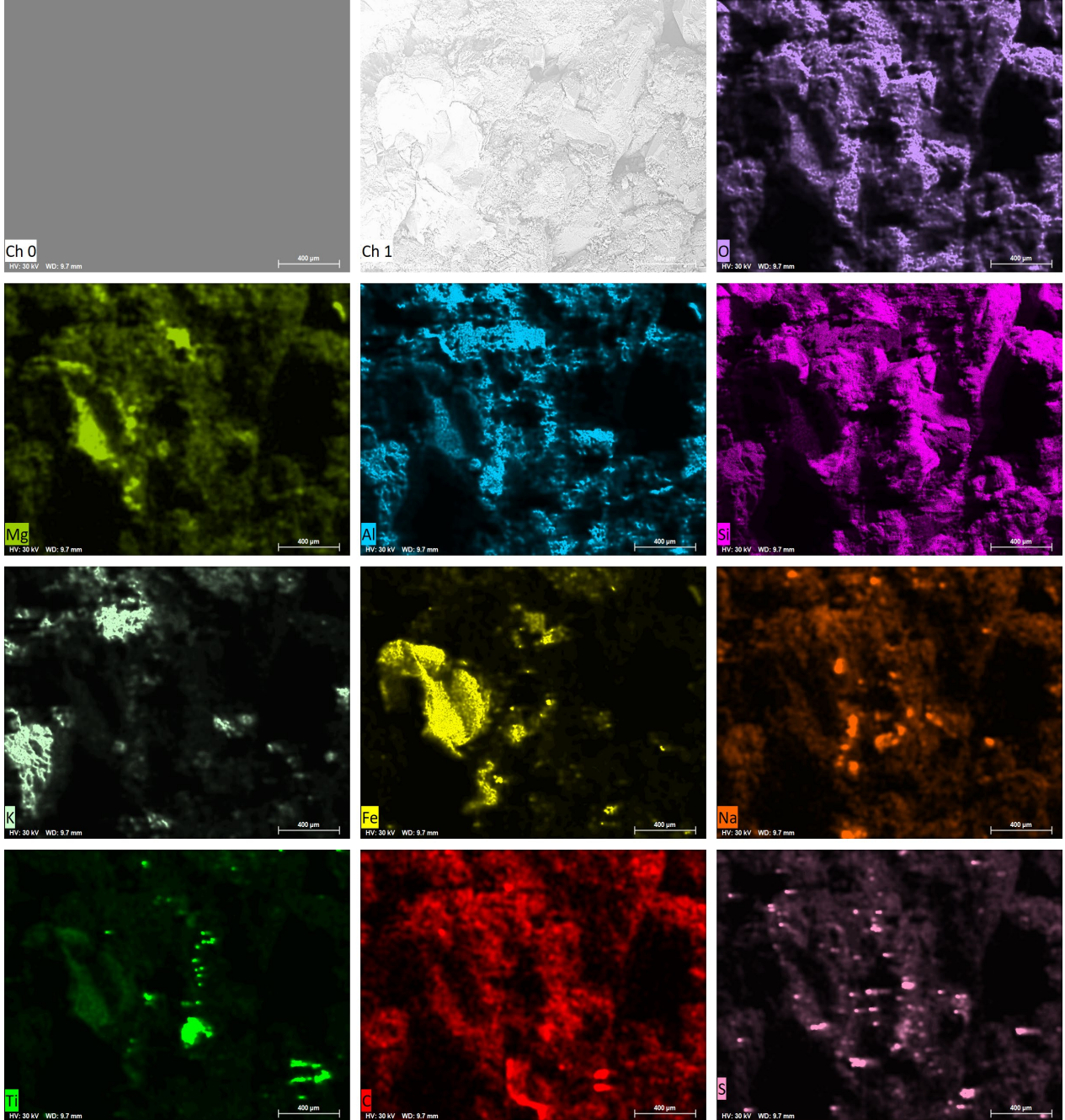
Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/7/2023	4:17:17 PM	30.0 keV	126x	9.7 mm



HV: 30 kV WD: 9.7 mm

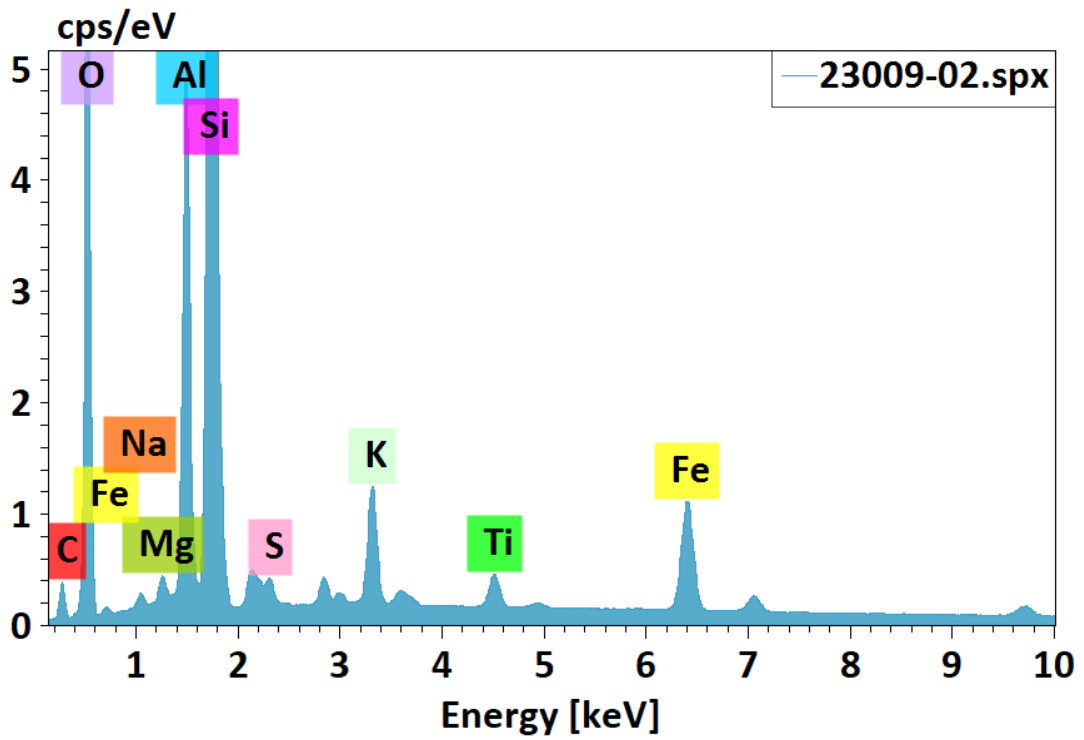
Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:36:58 PM	30.0 keV	126x	9.7 mm

3/8/2023



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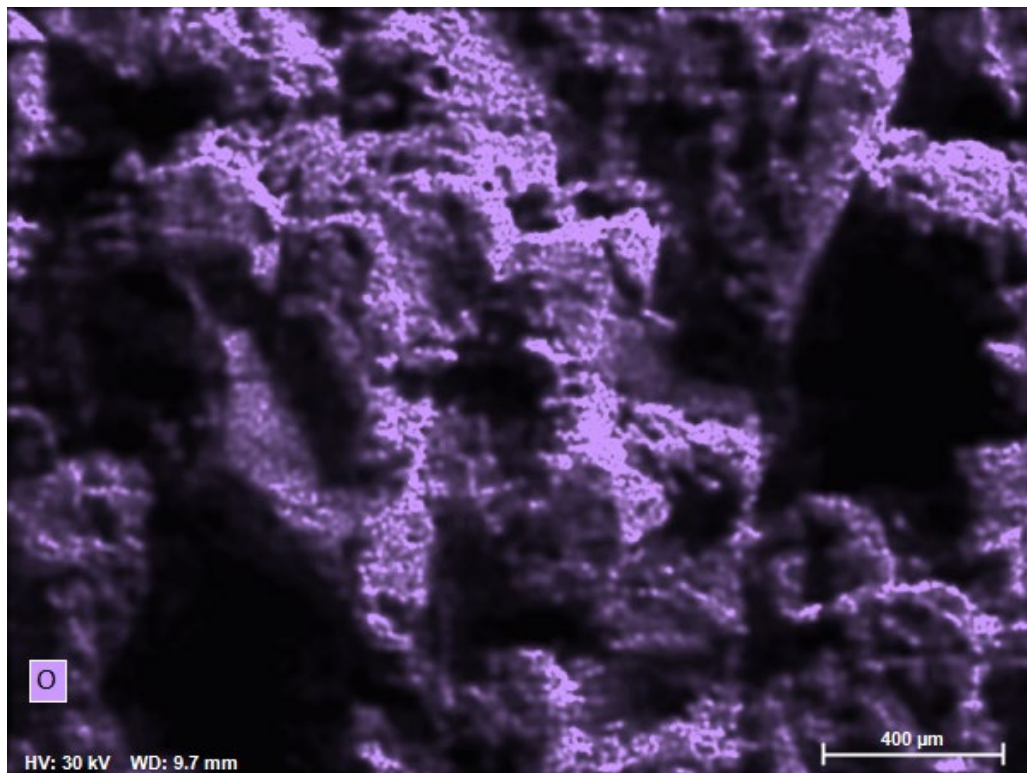


23009-02.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	7.69	8.00	12.75
Oxygen	8	48.06	49.98	59.82
Sodium	11	0.42	0.43	0.36
Magnesium	12	0.39	0.40	0.32
Aluminium	13	6.02	6.26	4.45
Silicon	14	28.19	29.31	19.98
Sulfur	16	0.39	0.40	0.24
Potassium	19	1.71	1.78	0.87
Titanium	22	0.64	0.67	0.27
Iron	26	2.65	2.75	0.94
		96.16	100.00	100.00

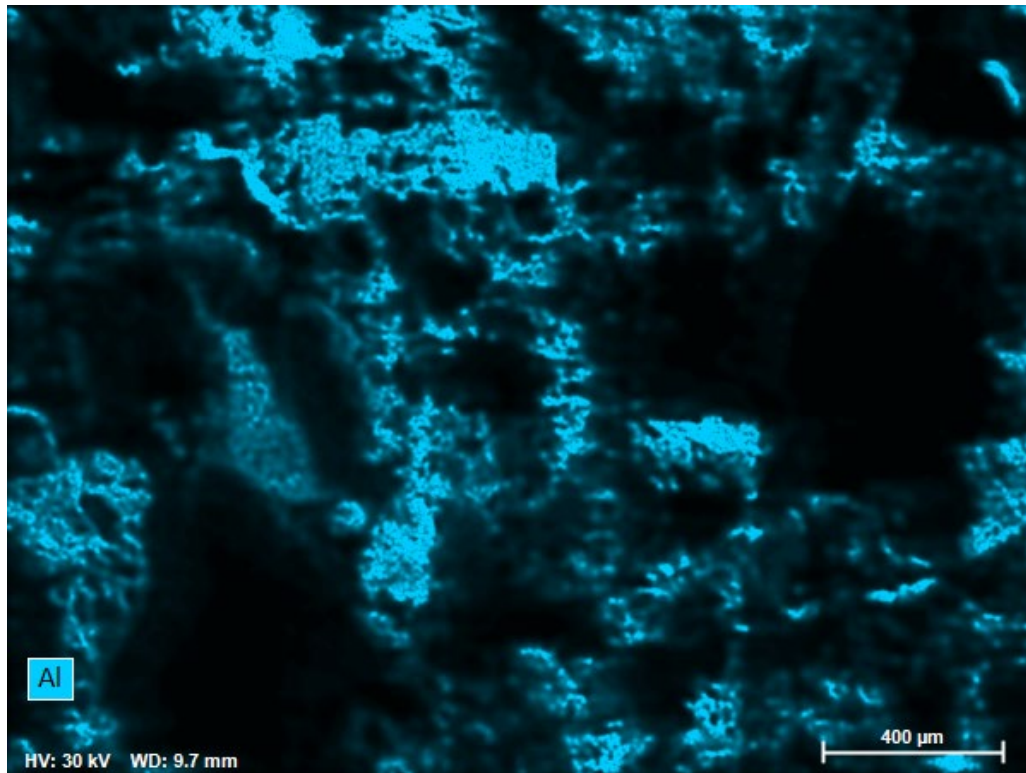
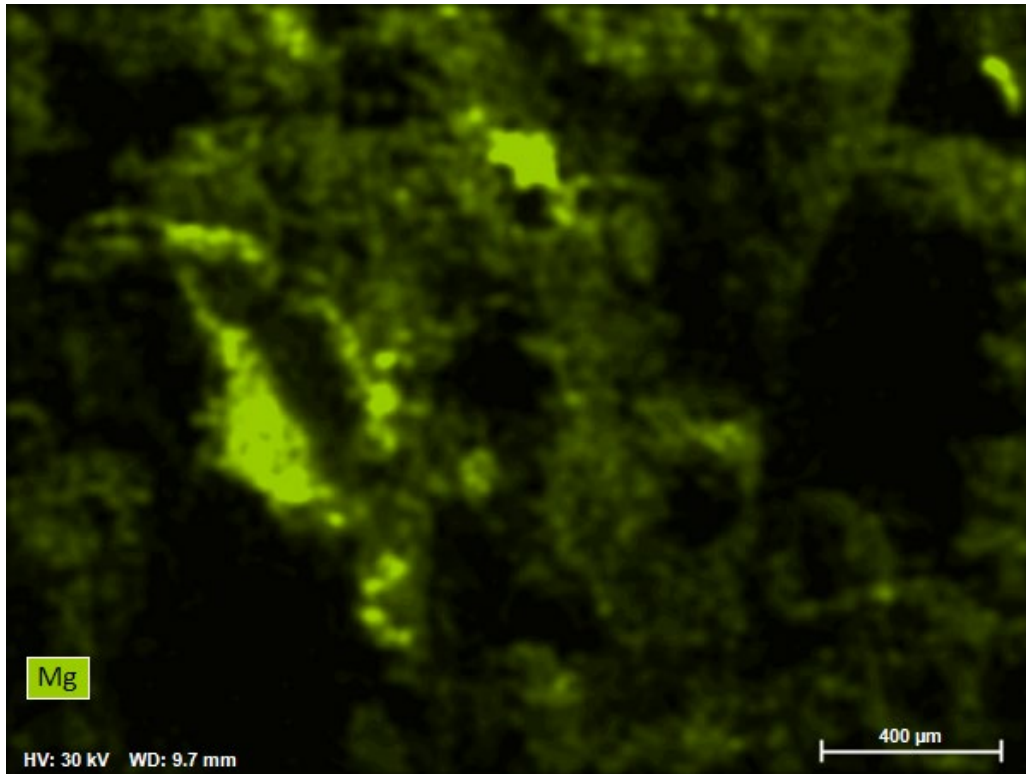
EDS Report

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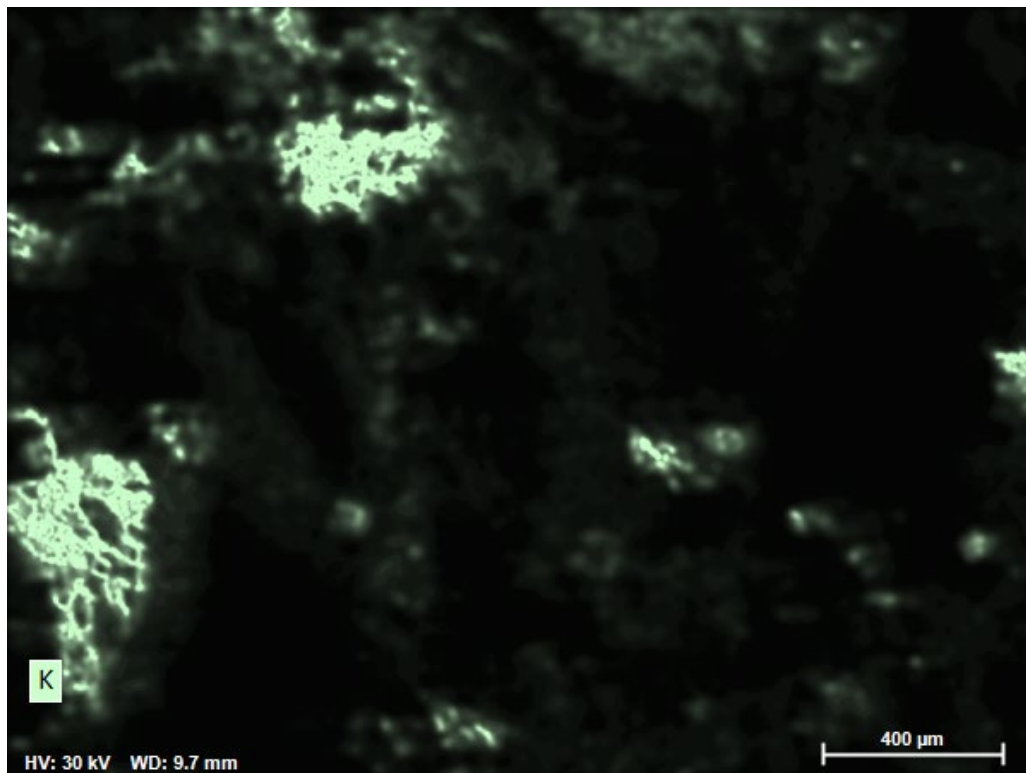
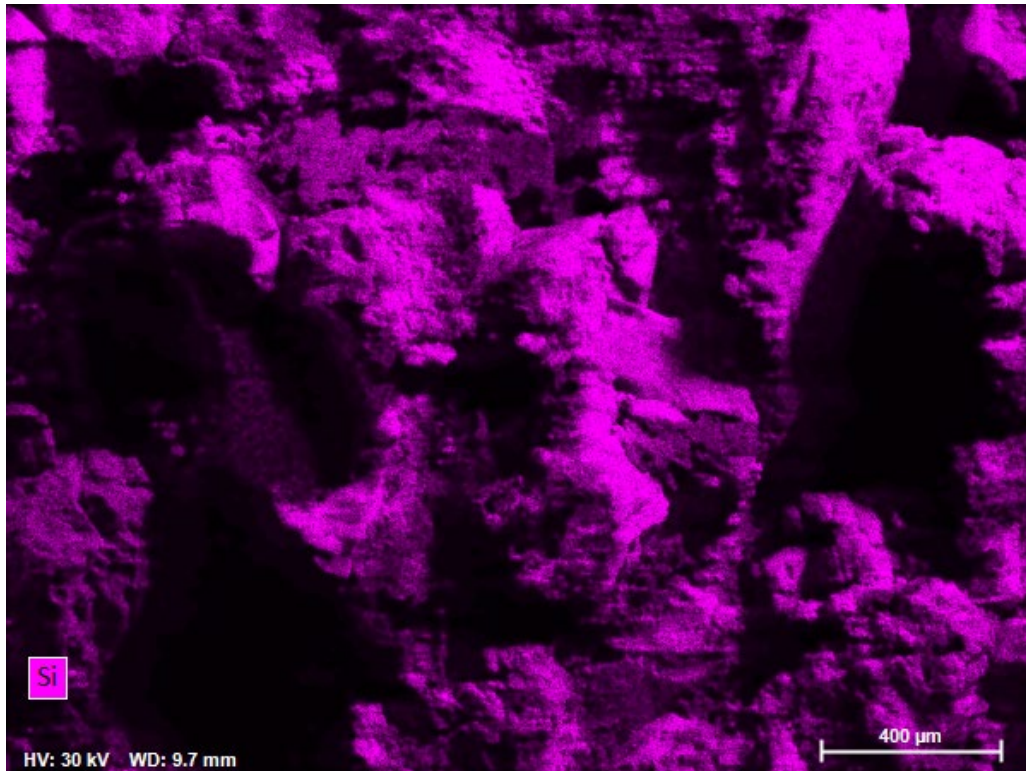
EDS Report

Company / Department



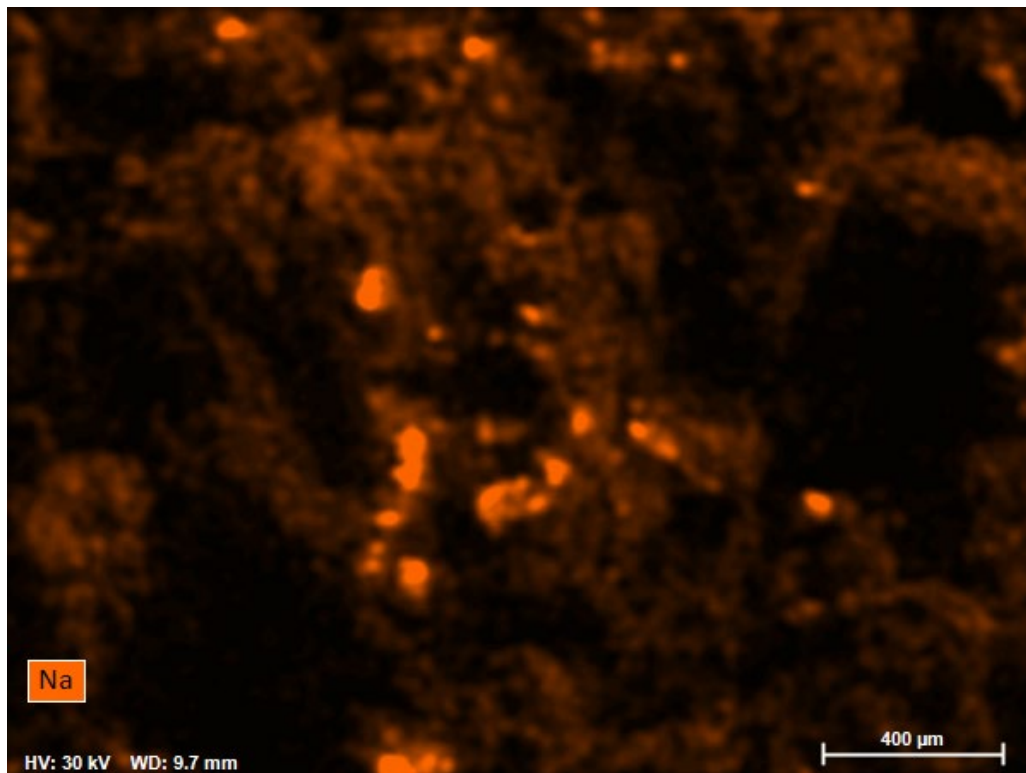
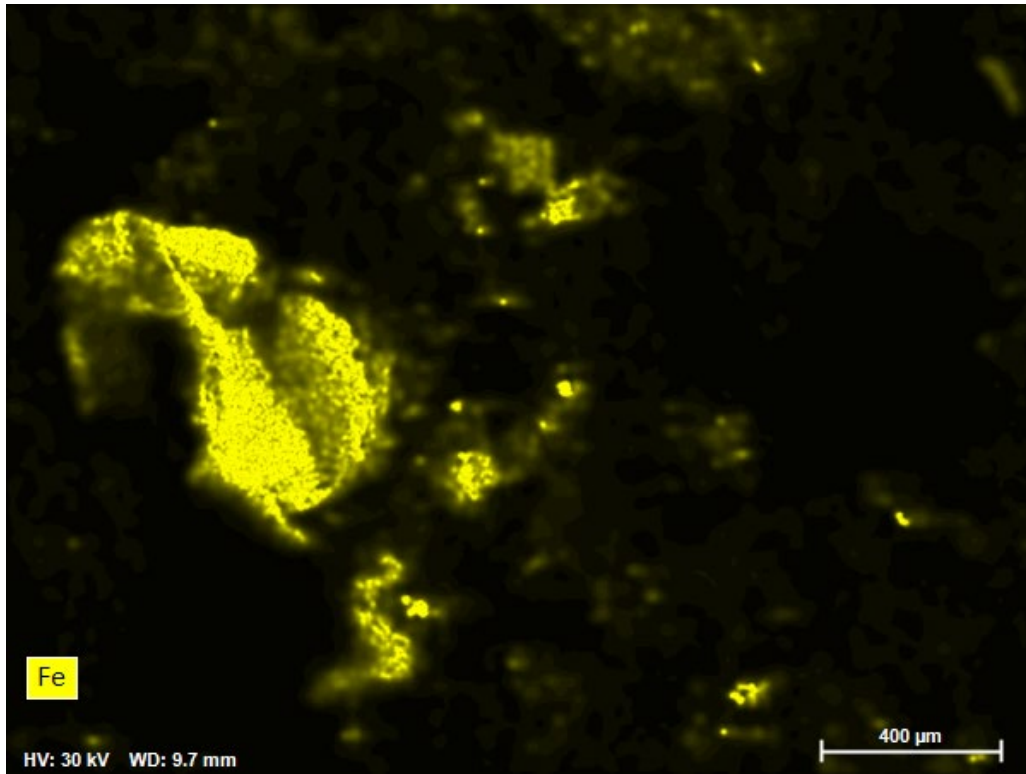
EDS Report

Company / Department



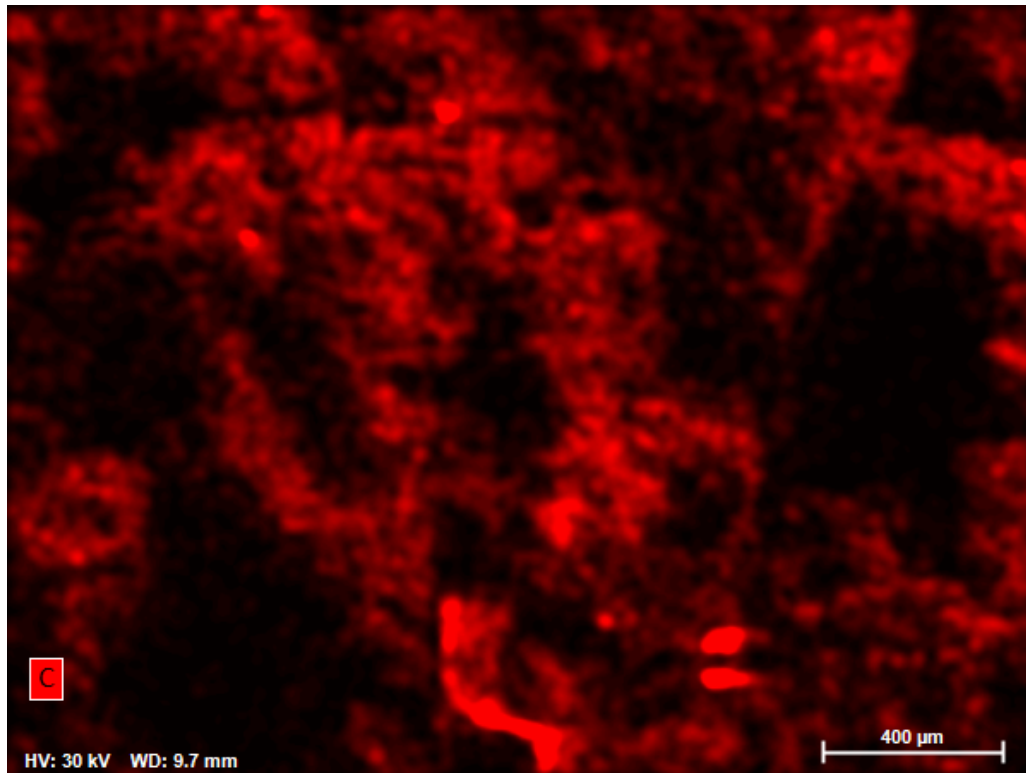
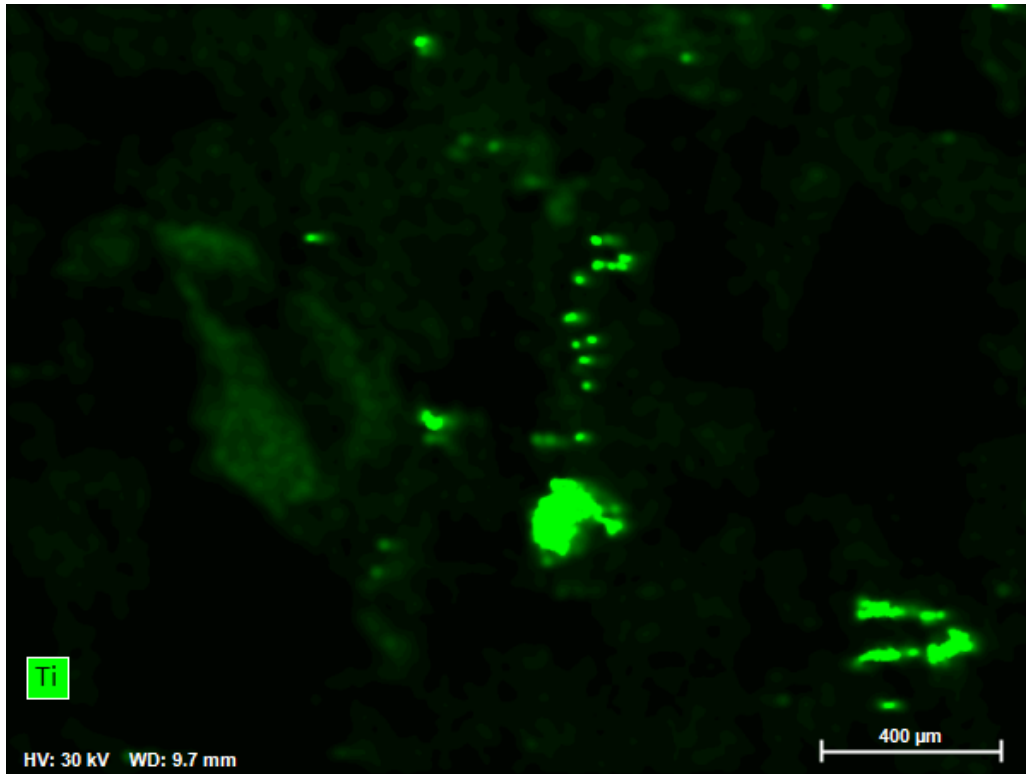
EDS Report

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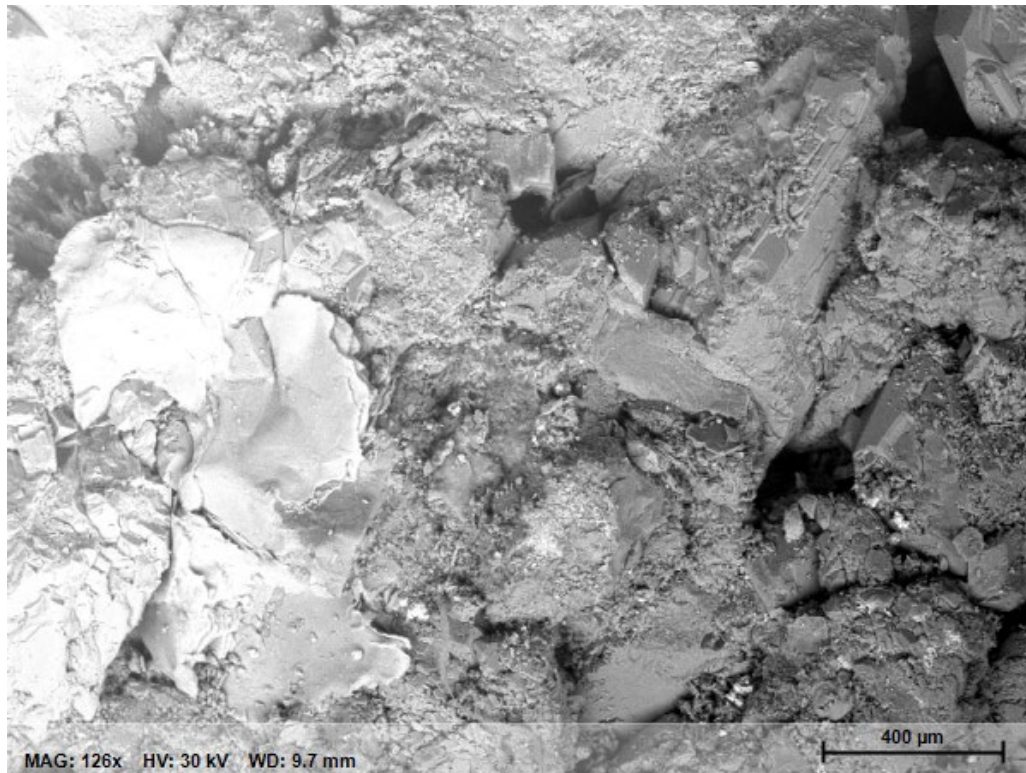
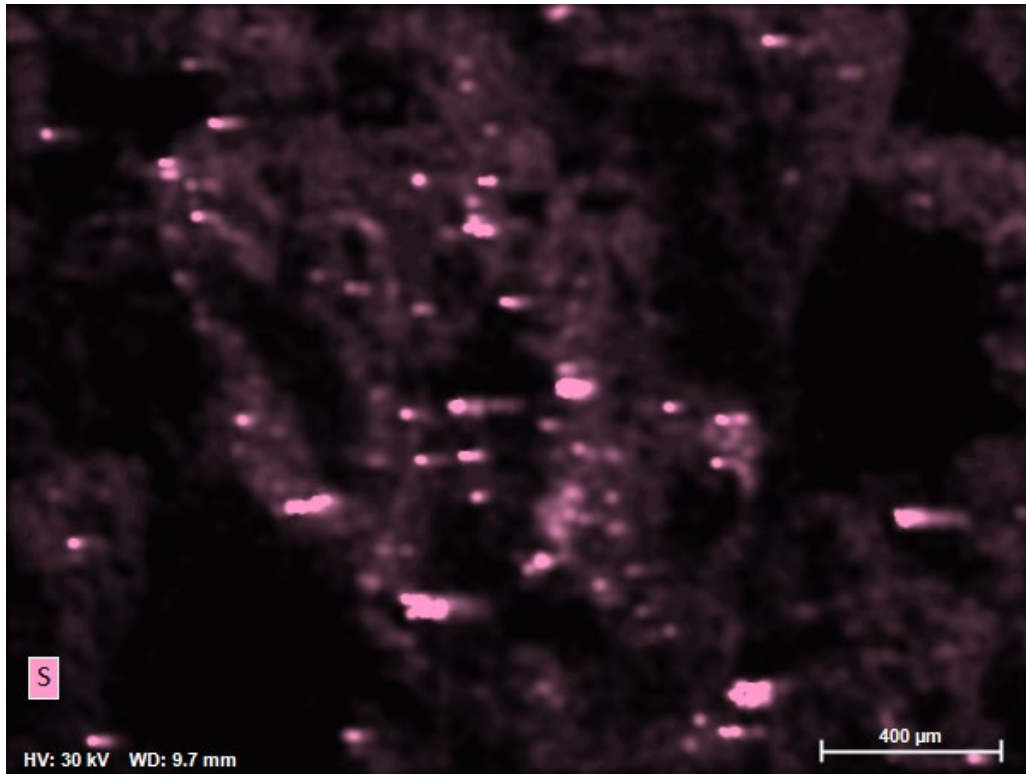
EDS Report

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EDS Report

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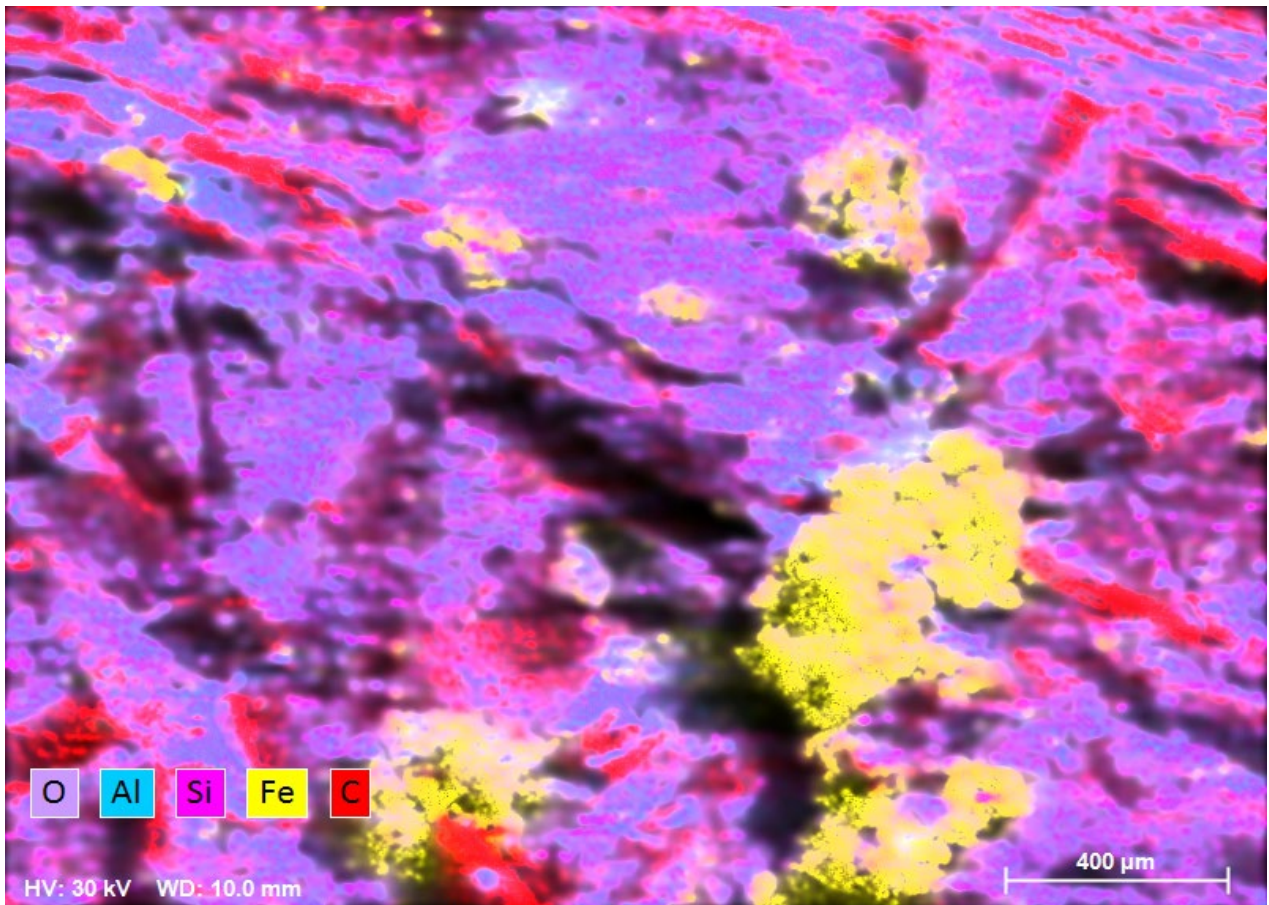


23009-03 Report



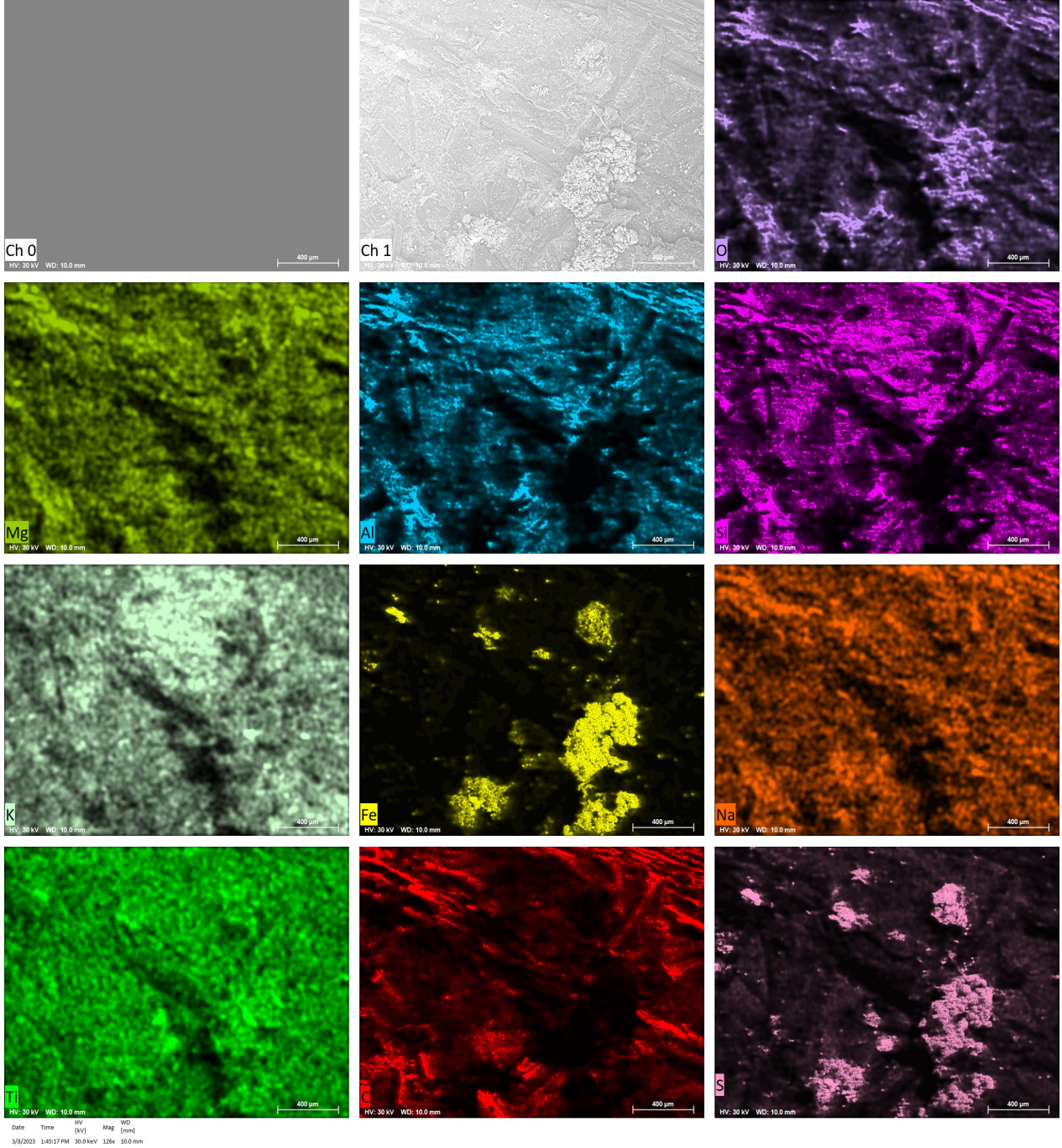
MAG: 126x HV: 30 kV WD: 10.0 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	9:09:21 AM	30.0 keV	126x	10.0 mm



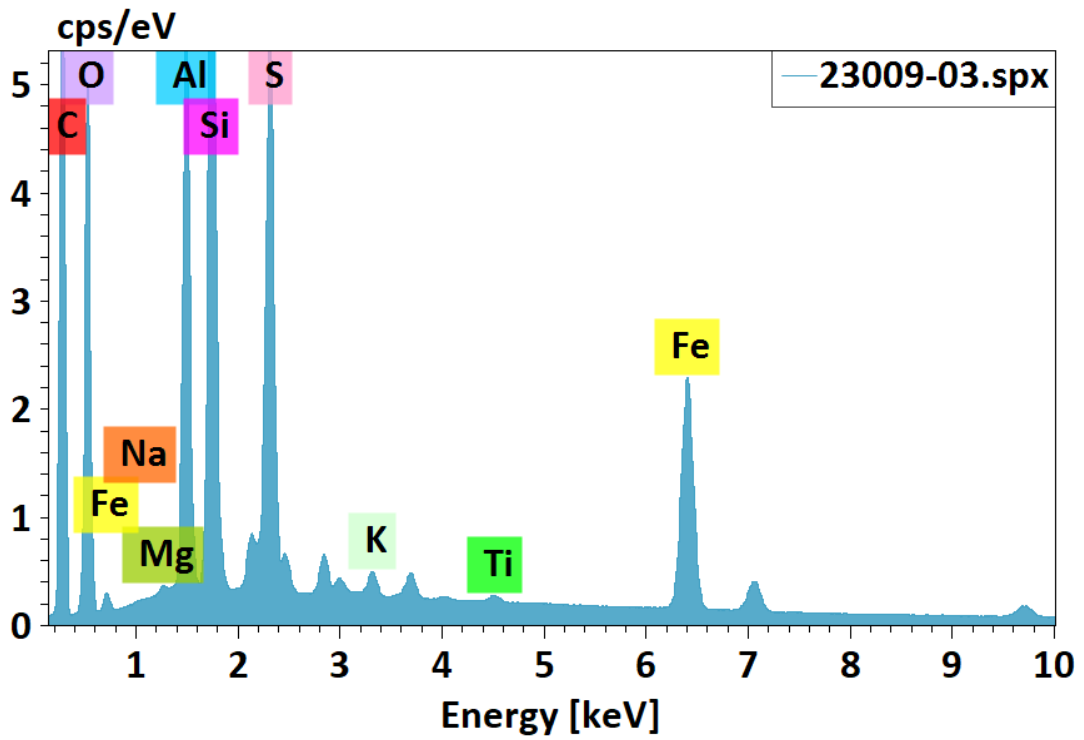
HV: 30 kV WD: 10.0 mm

Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:45:17 PM	30.0 keV	126x	10.0 mm



EDS Report

Company / Department

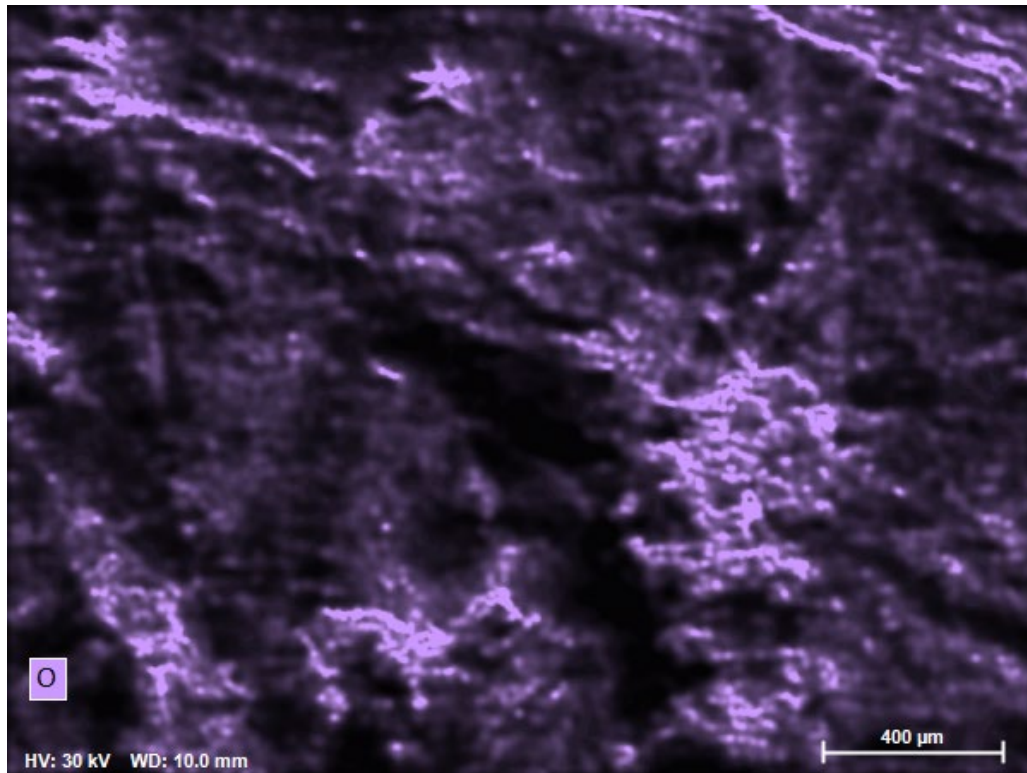
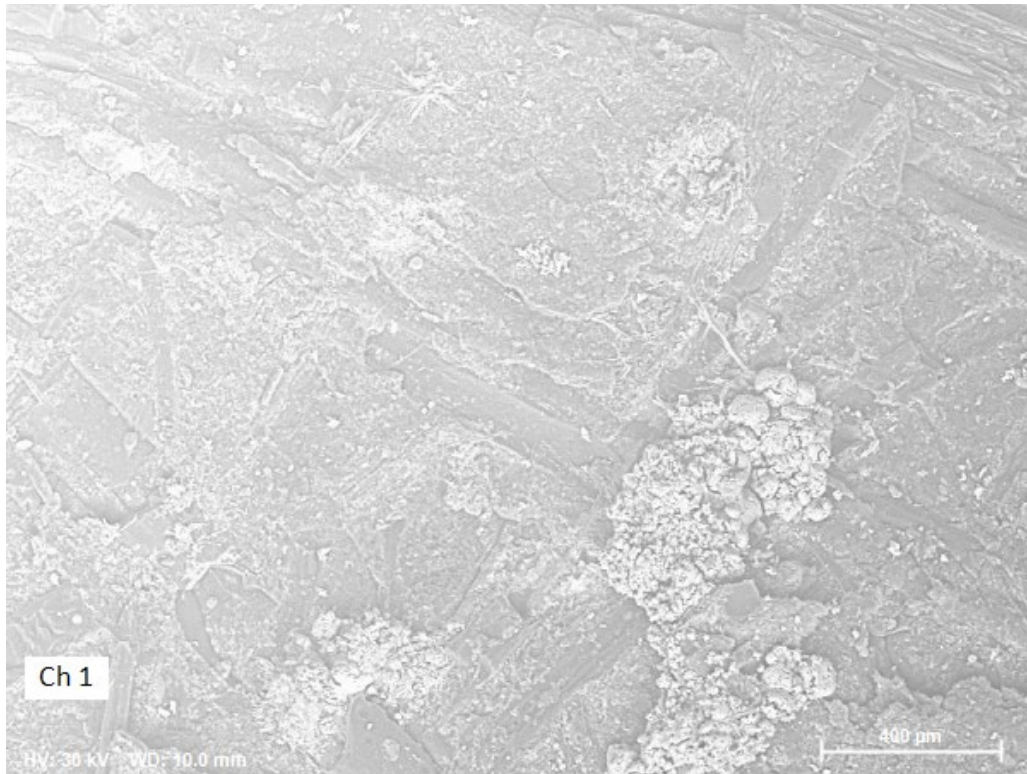


23009-03.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	52.76	50.55	61.86
Oxygen	8	35.41	33.92	31.16
Sodium	11	0.06	0.05	0.03
Magnesium	12	0.04	0.04	0.03
Aluminium	13	3.81	3.65	1.99
Silicon	14	4.75	4.55	2.38
Sulfur	16	3.37	3.23	1.48
Potassium	19	0.13	0.12	0.05
Titanium	22	0.06	0.06	0.02
Iron	26	4.00	3.84	1.01
		104.38	100.00	100.00

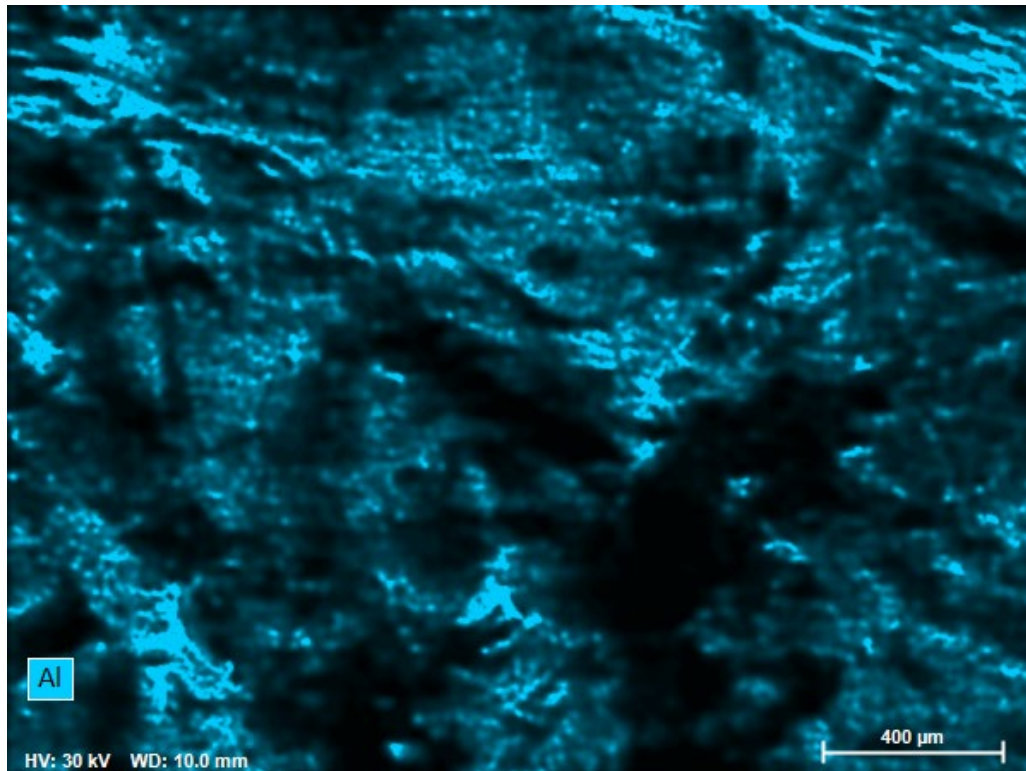
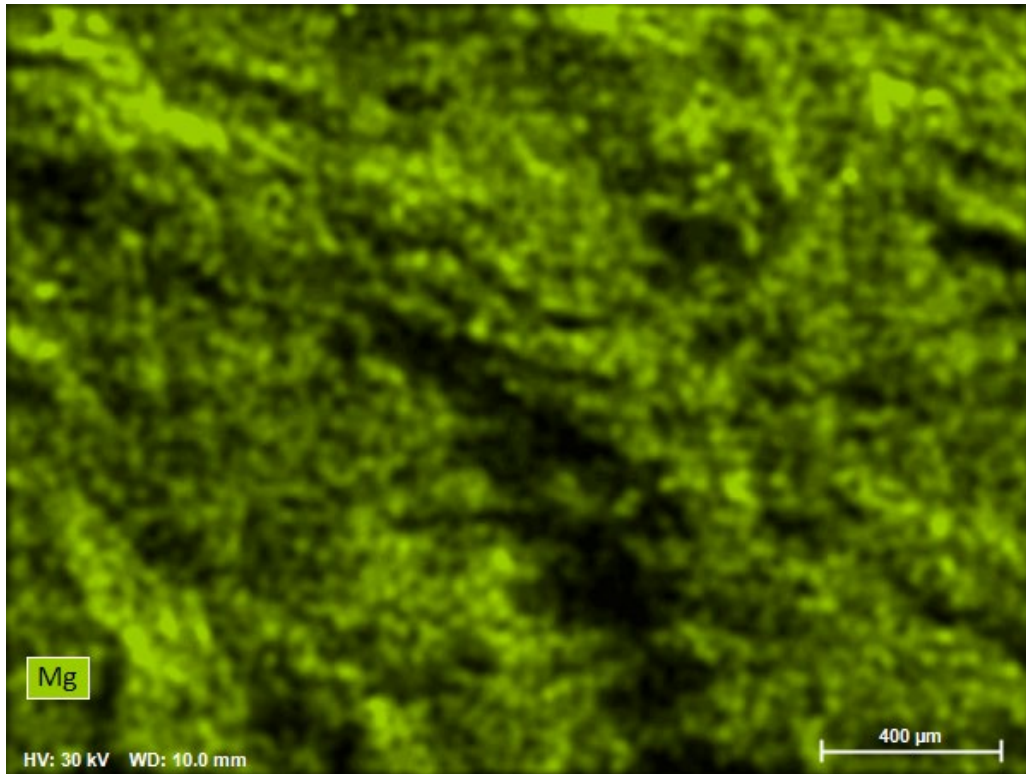
EDS Report

Company / Department



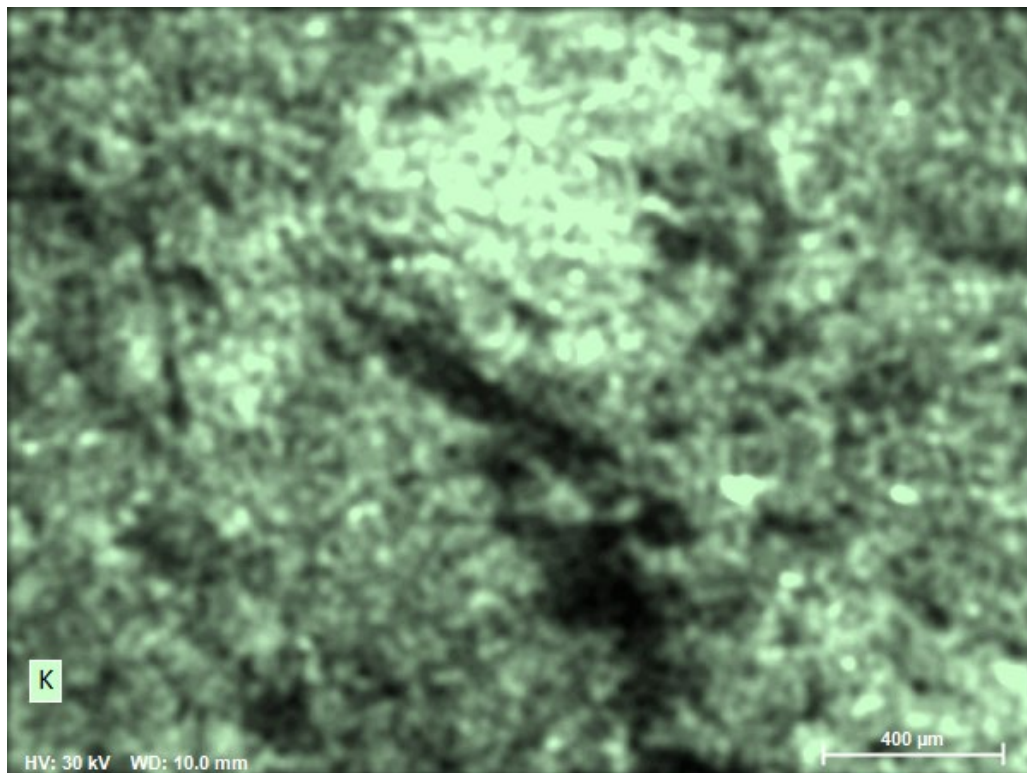
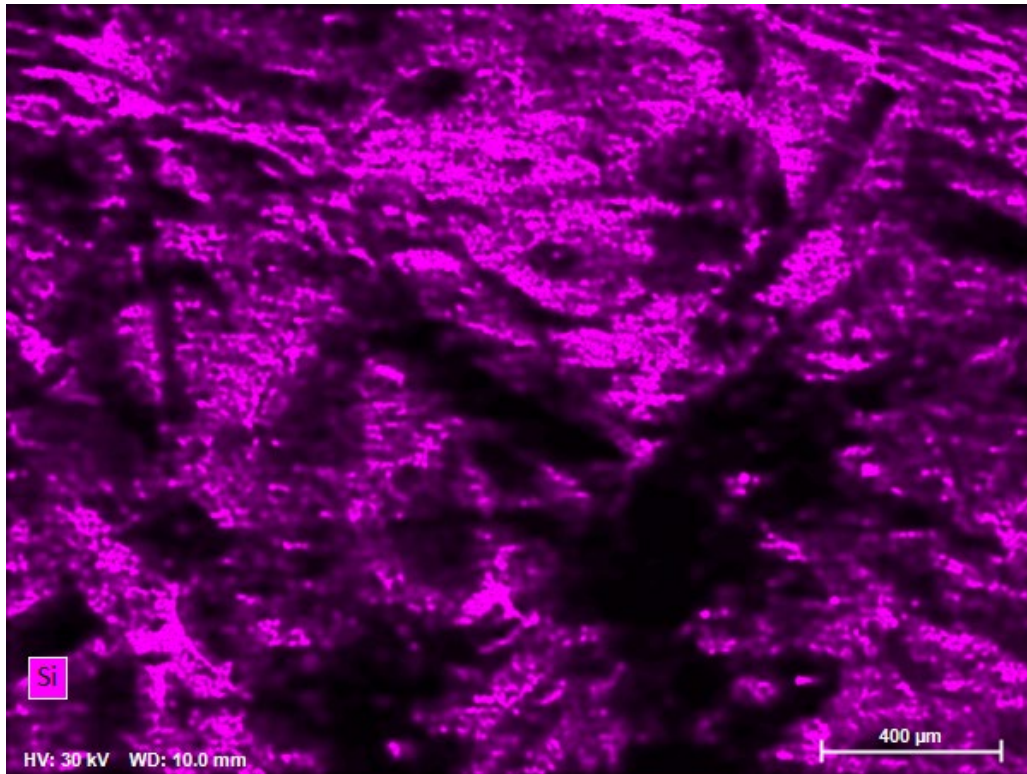
EDS Report

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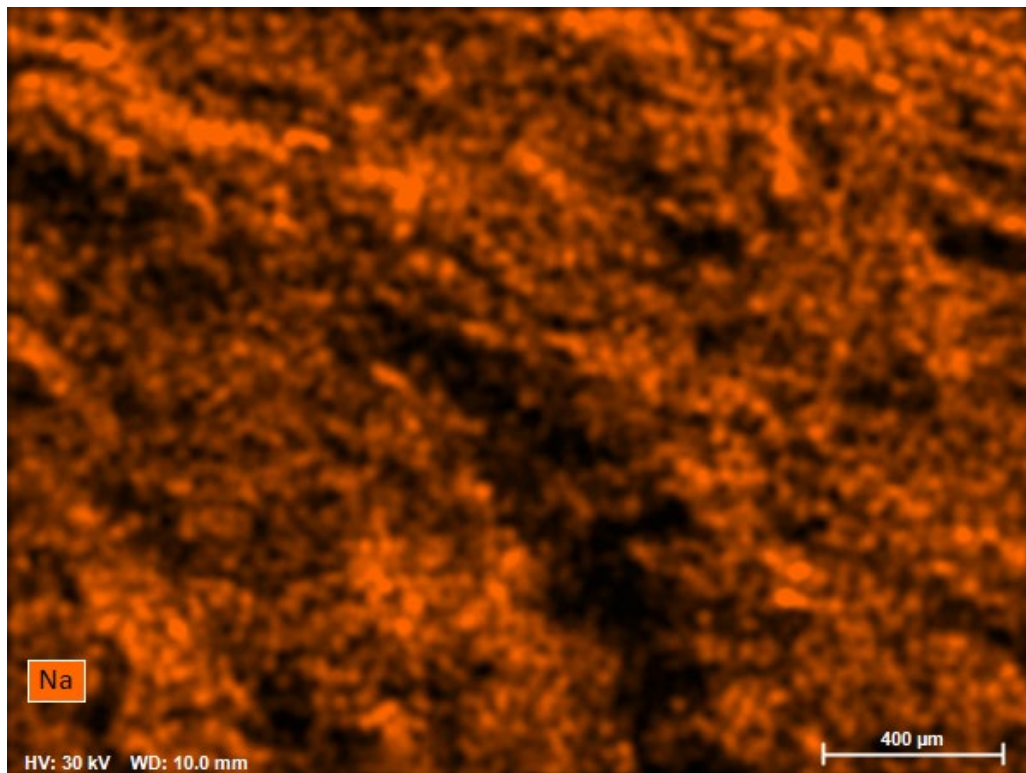
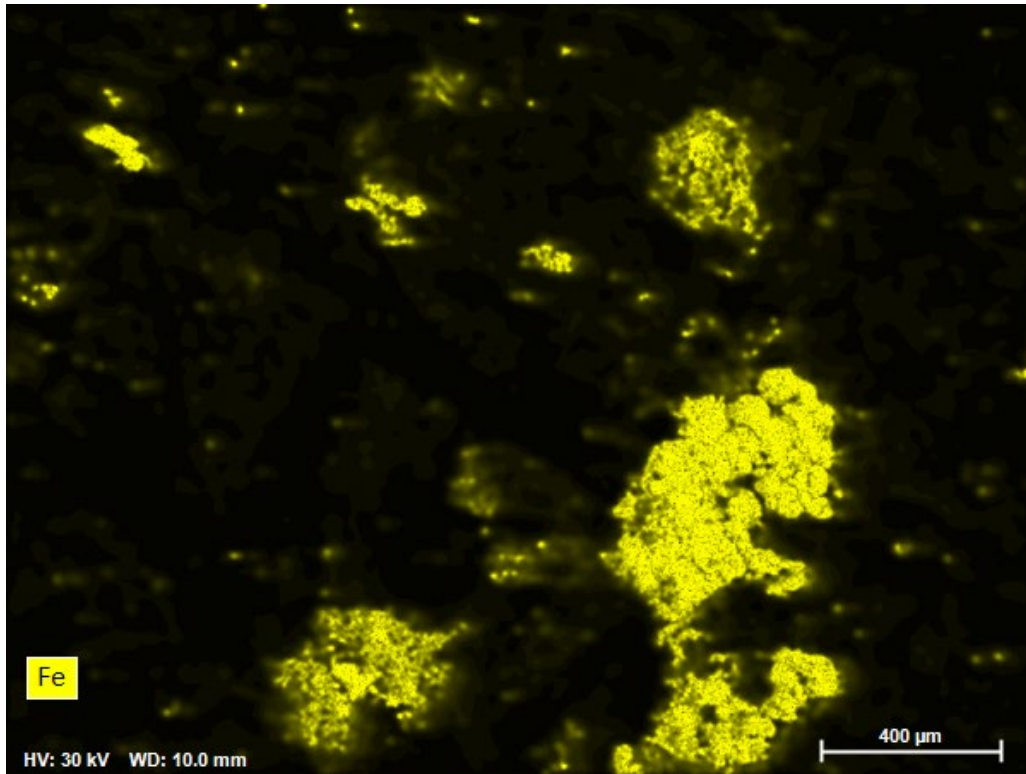
EDS Report

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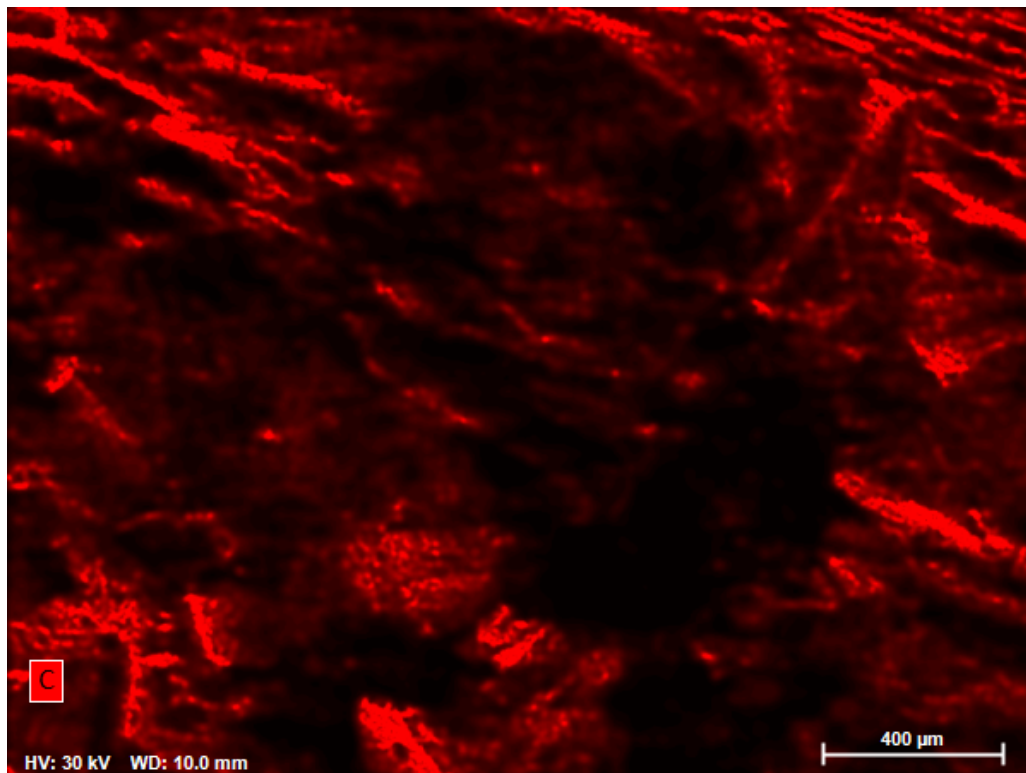
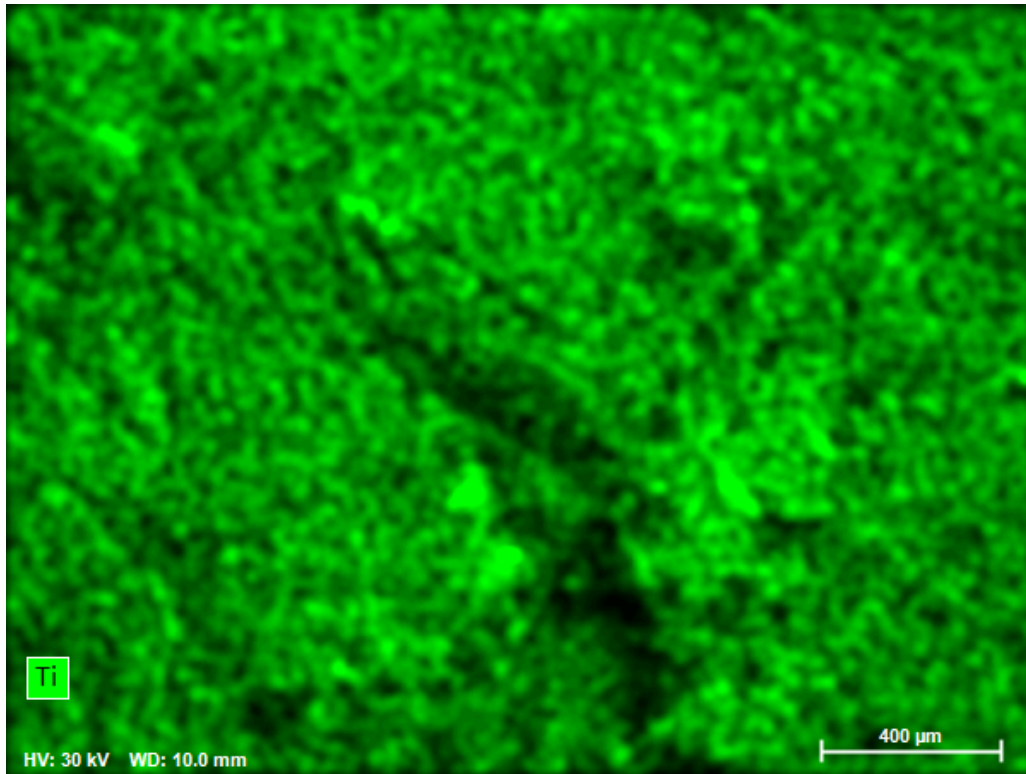
EDS Report

Company / Department



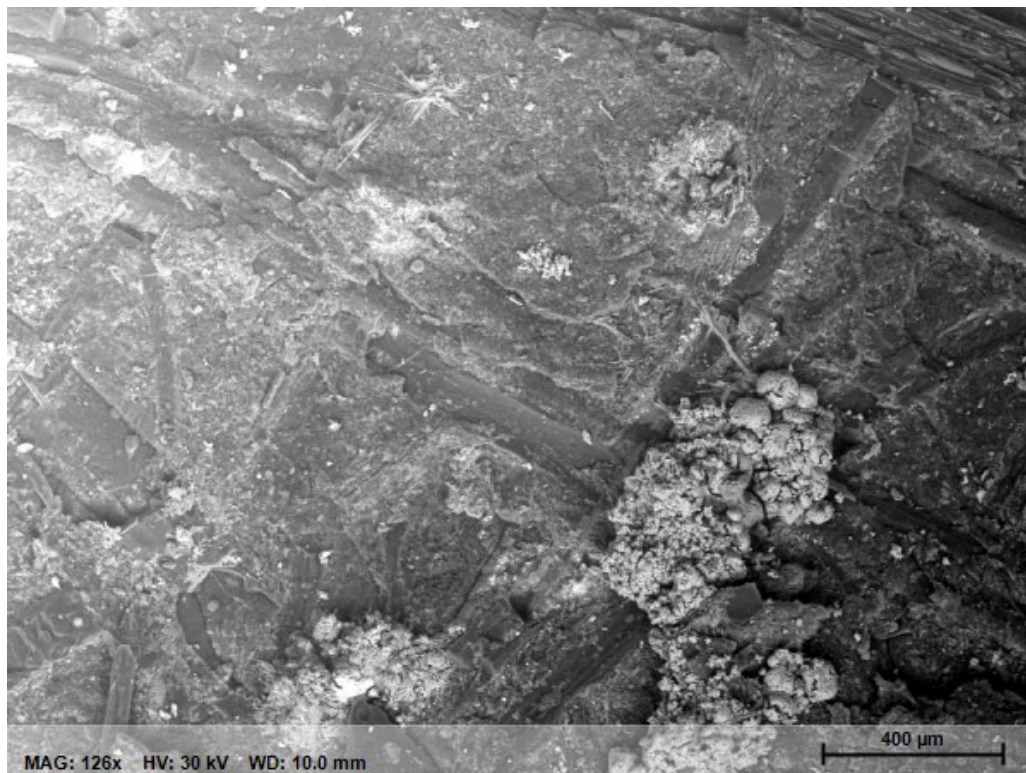
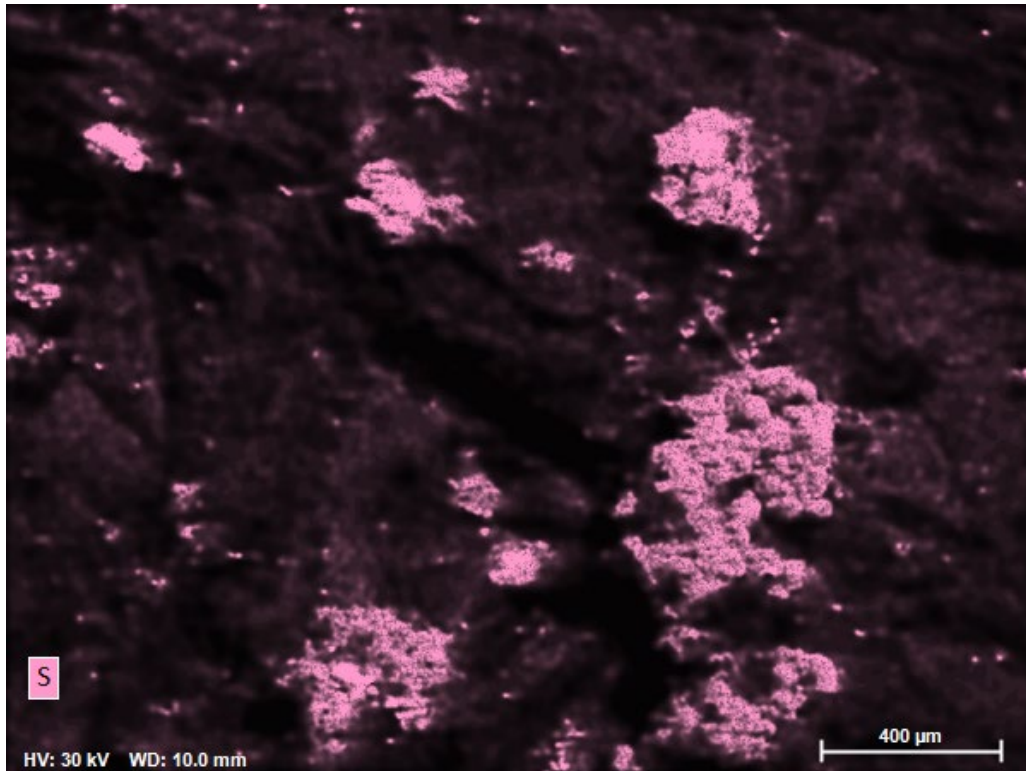
EDS Report

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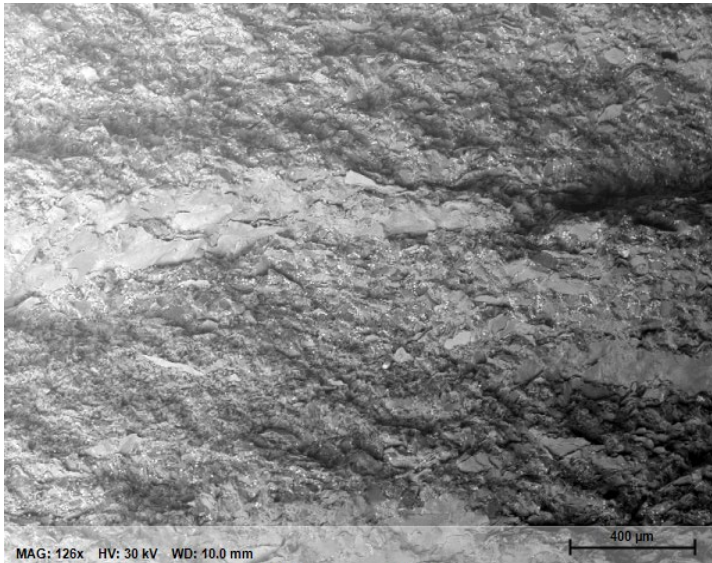


EDS Report

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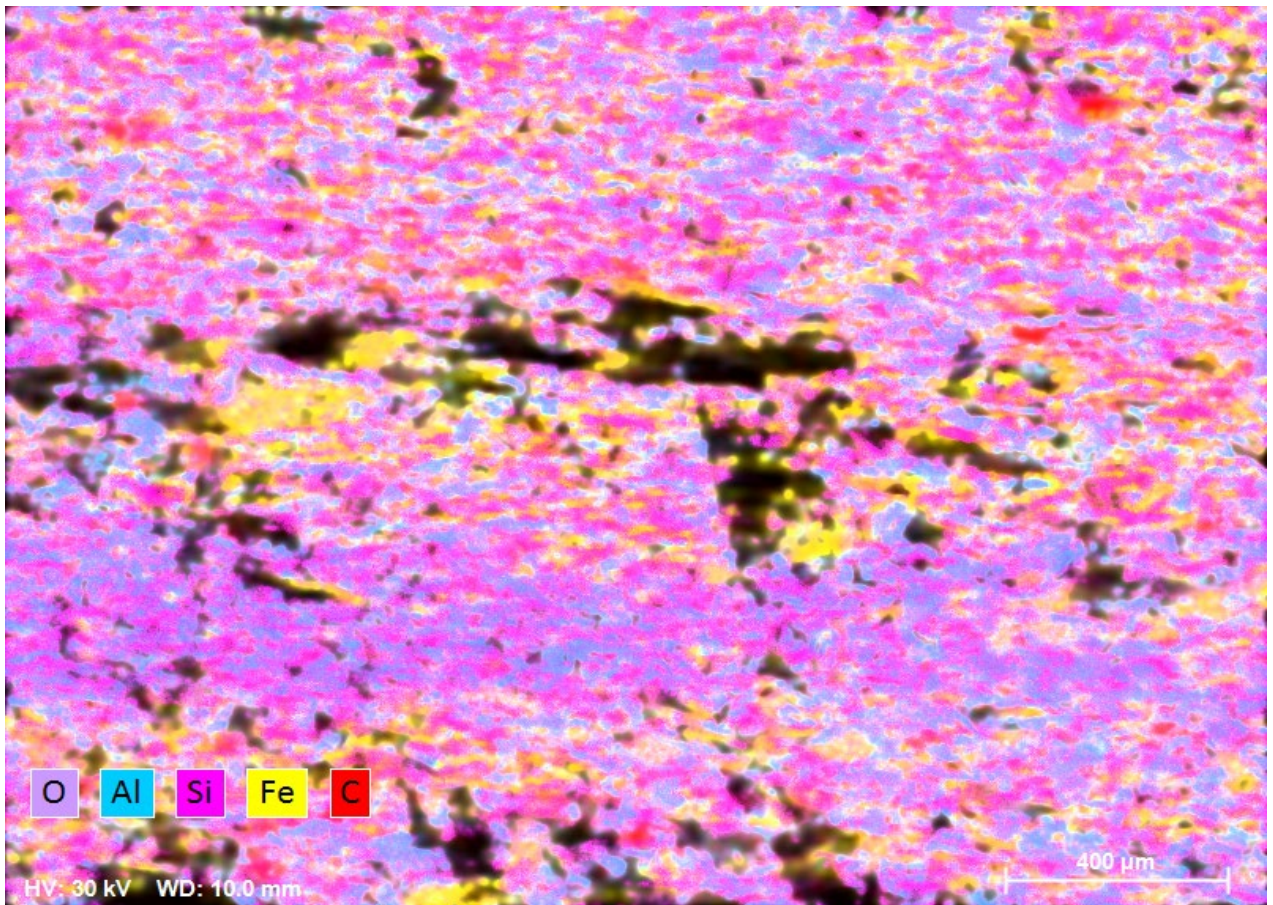


23009-04 Report



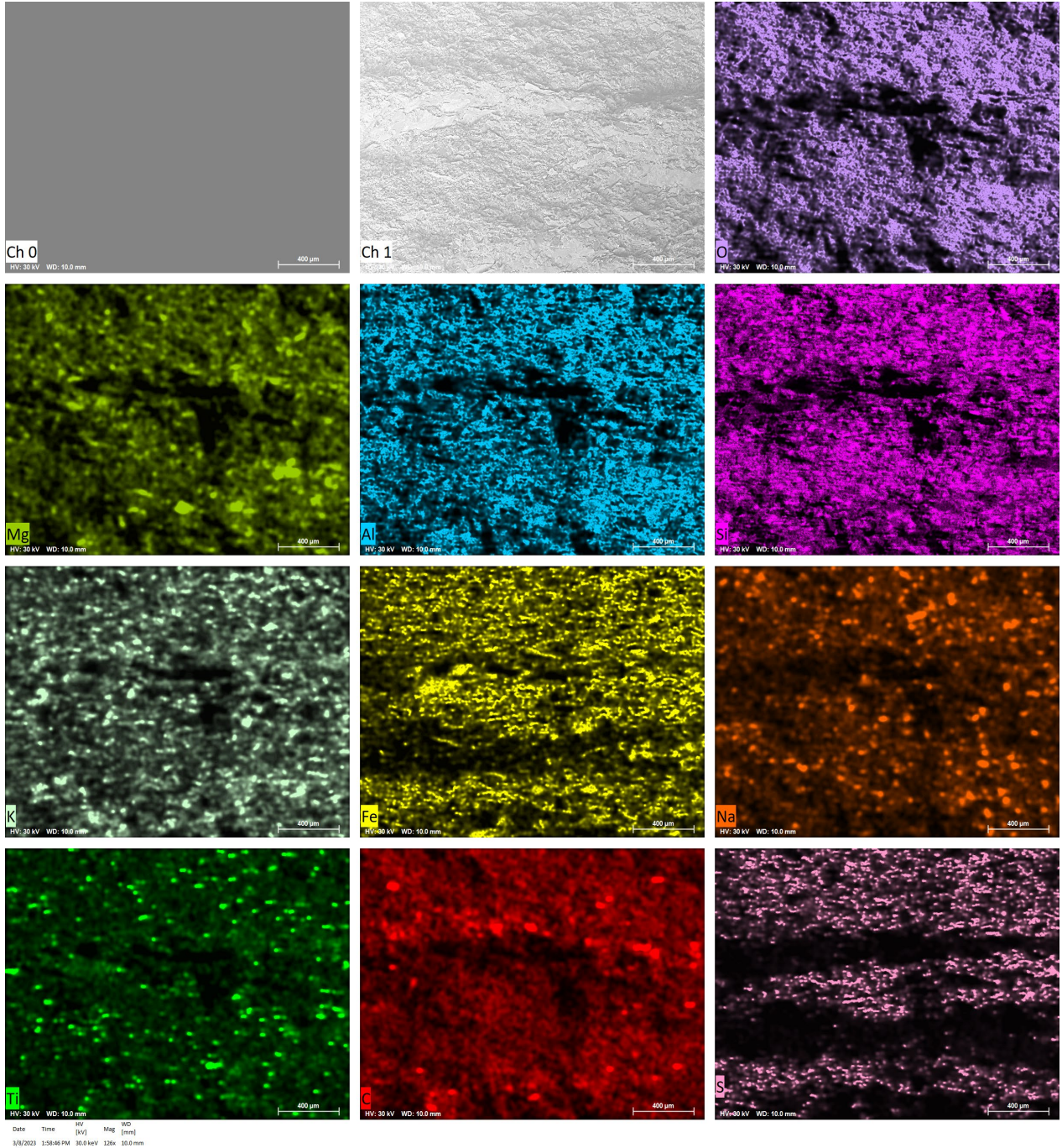
MAG: 126x HV: 30 kV WD: 10.0 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	9:56:20 AM	30.0 keV	126x	10.0 mm



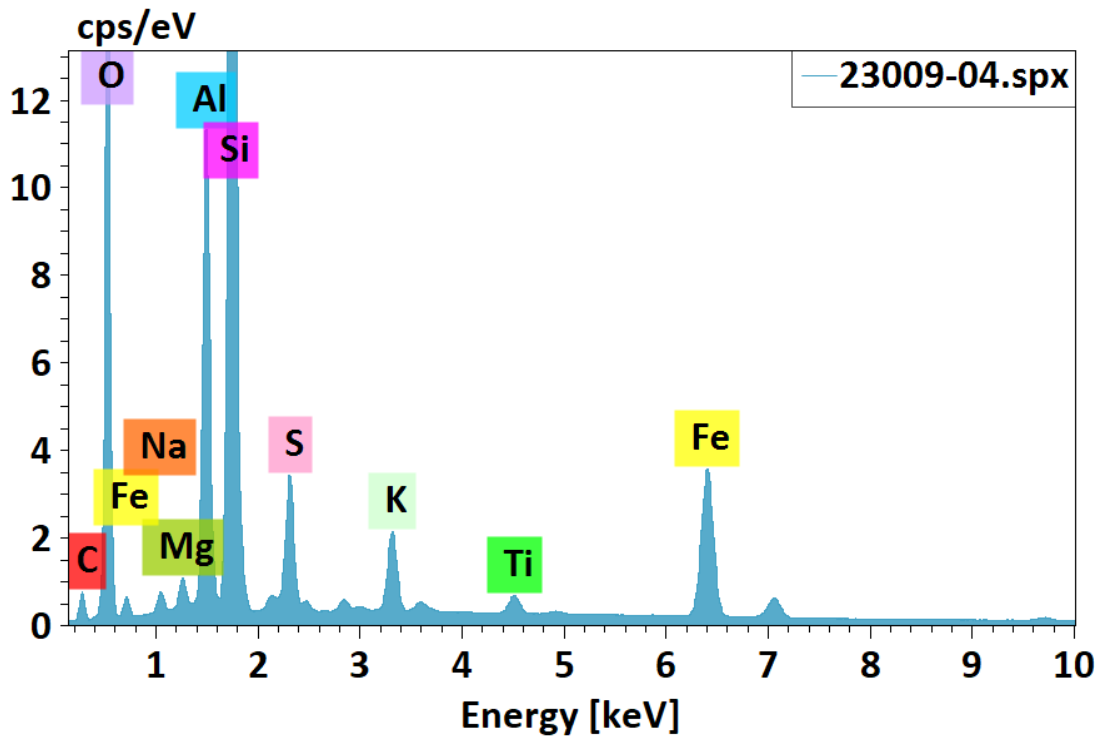
HV: 30 kV WD: 10.0 mm

Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:58:46 PM	30.0 keV	126x	10.0 mm



EDS Report

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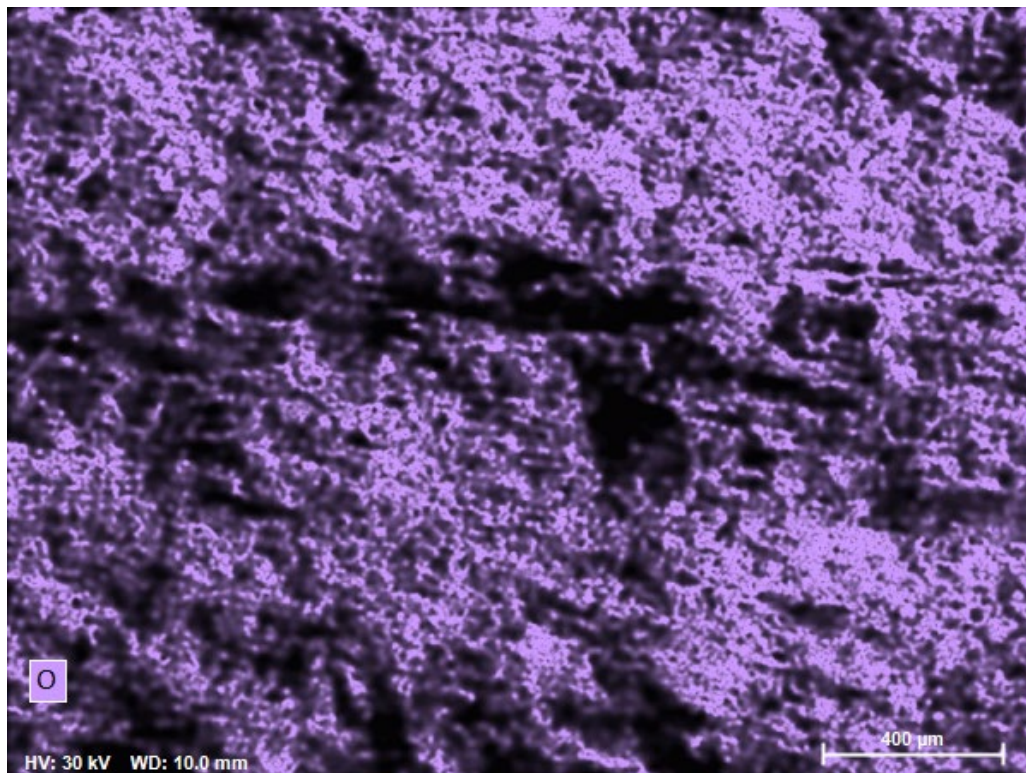


23009-04.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	9.05	7.82	12.53
Oxygen	8	58.88	50.88	61.18
Sodium	11	1.07	0.93	0.78
Magnesium	12	0.86	0.74	0.59
Aluminium	13	9.16	7.92	5.65
Silicon	14	25.39	21.93	15.03
Sulfur	16	2.89	2.50	1.50
Potassium	19	1.76	1.52	0.75
Titanium	22	0.55	0.47	0.19
Iron	26	6.12	5.29	1.82
		115.73	100.00	100.00

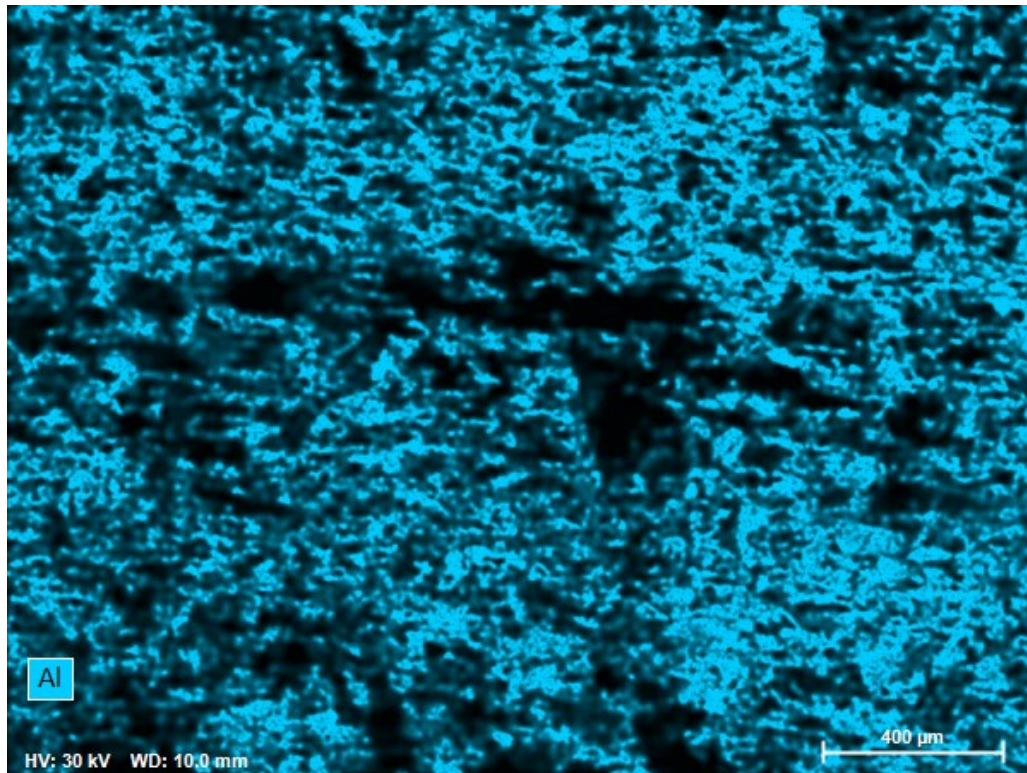
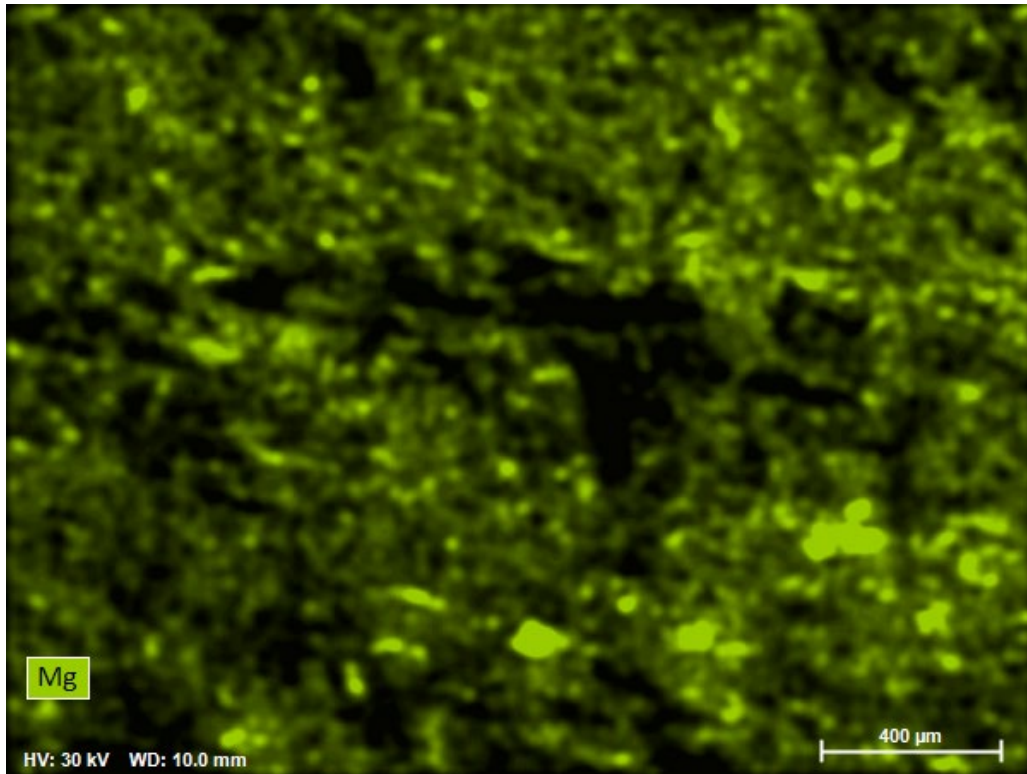
EDS Report

Company / Department



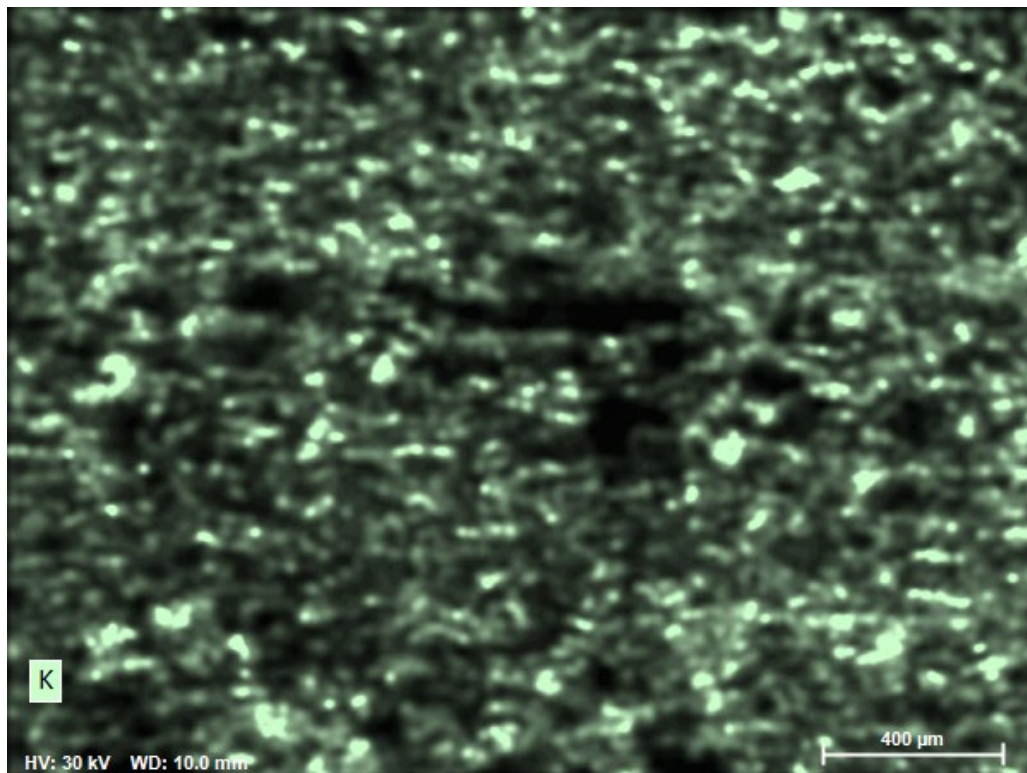
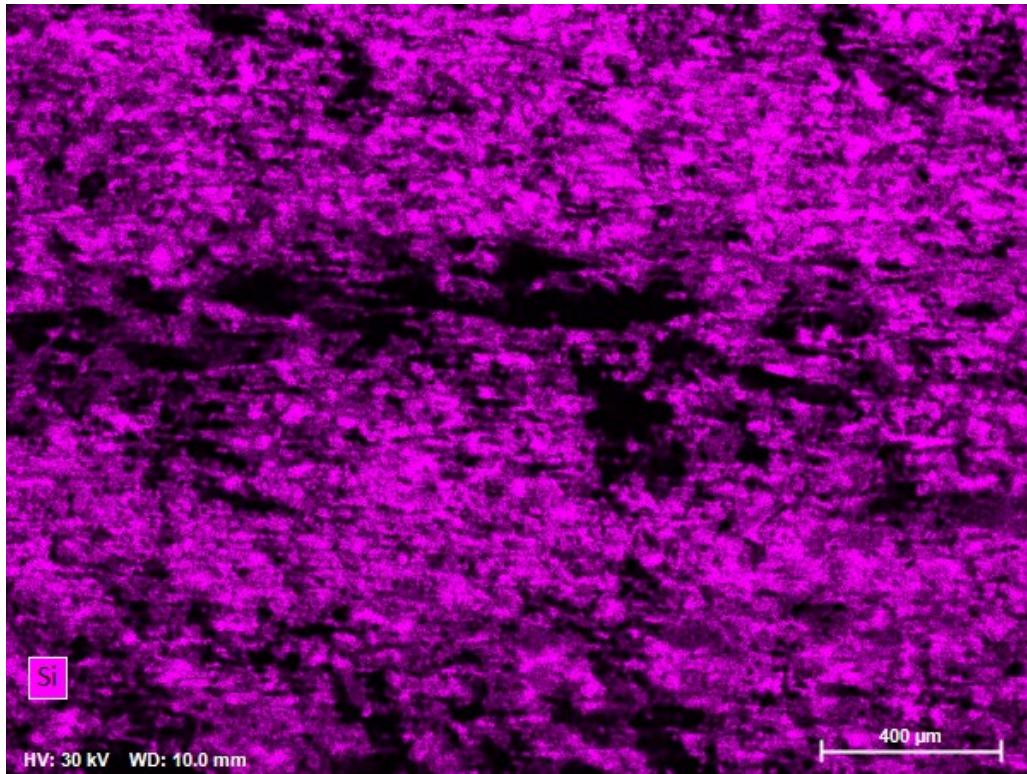
EDS Report

Company / Department



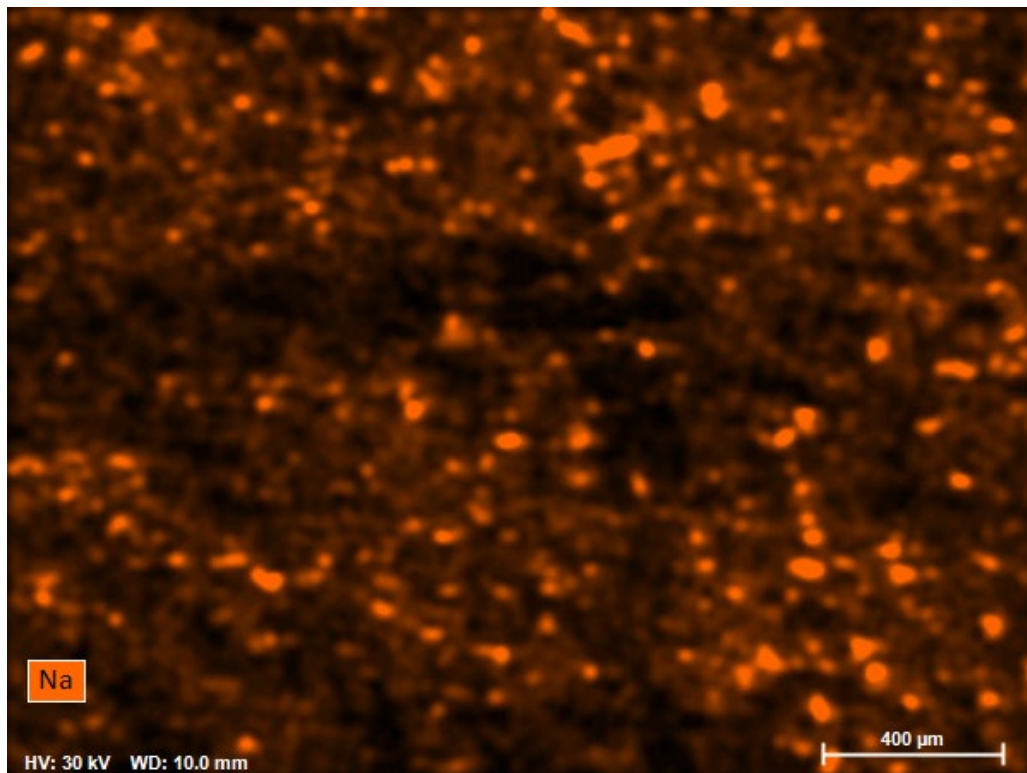
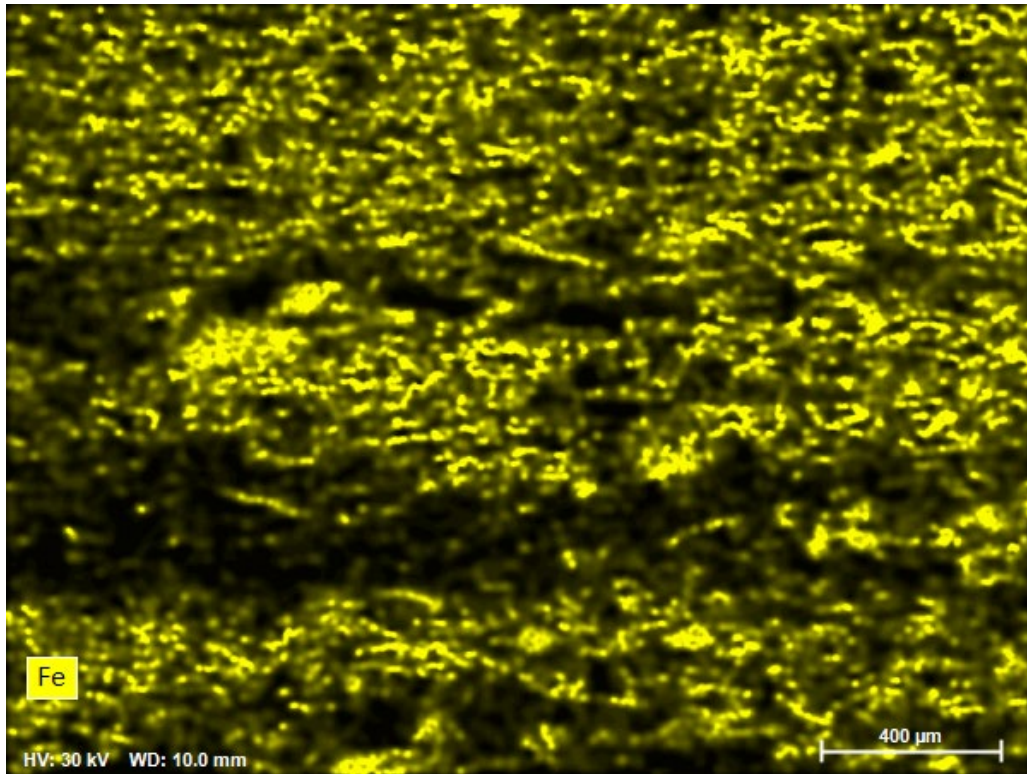
EDS Report

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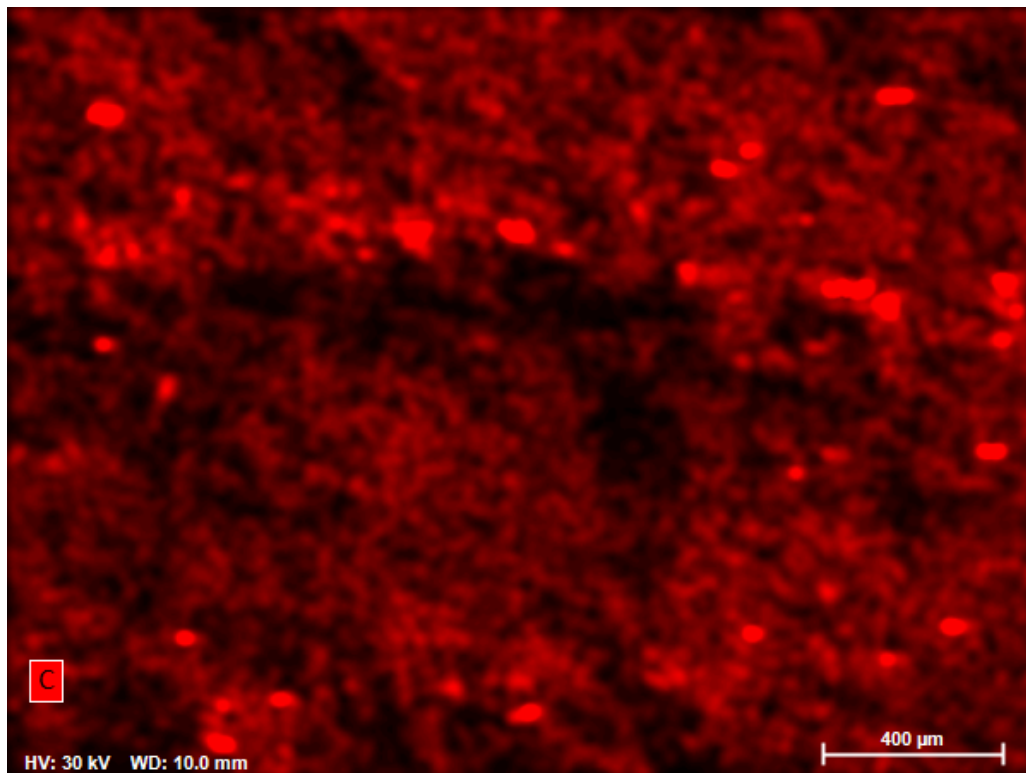
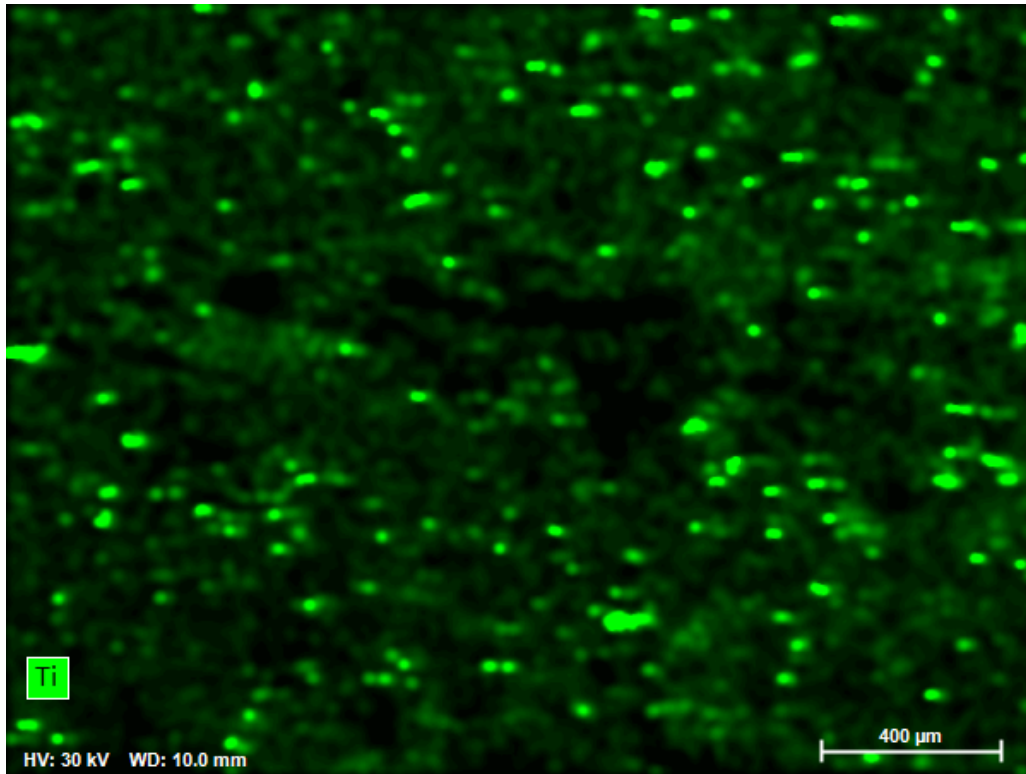
EDS Report

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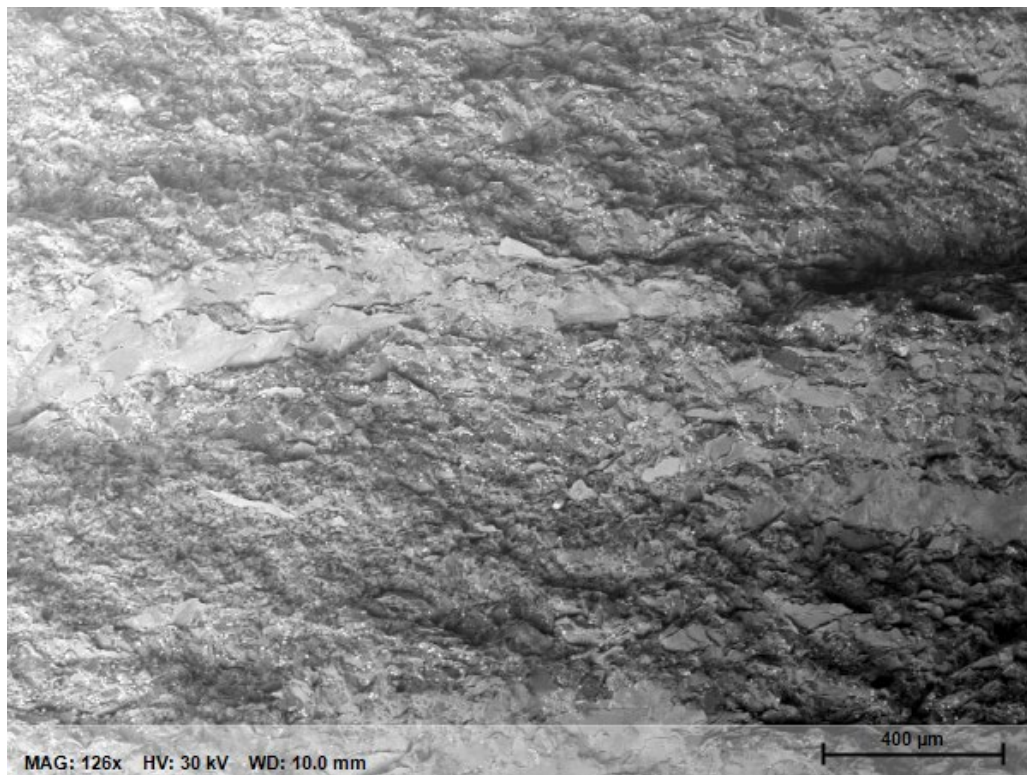
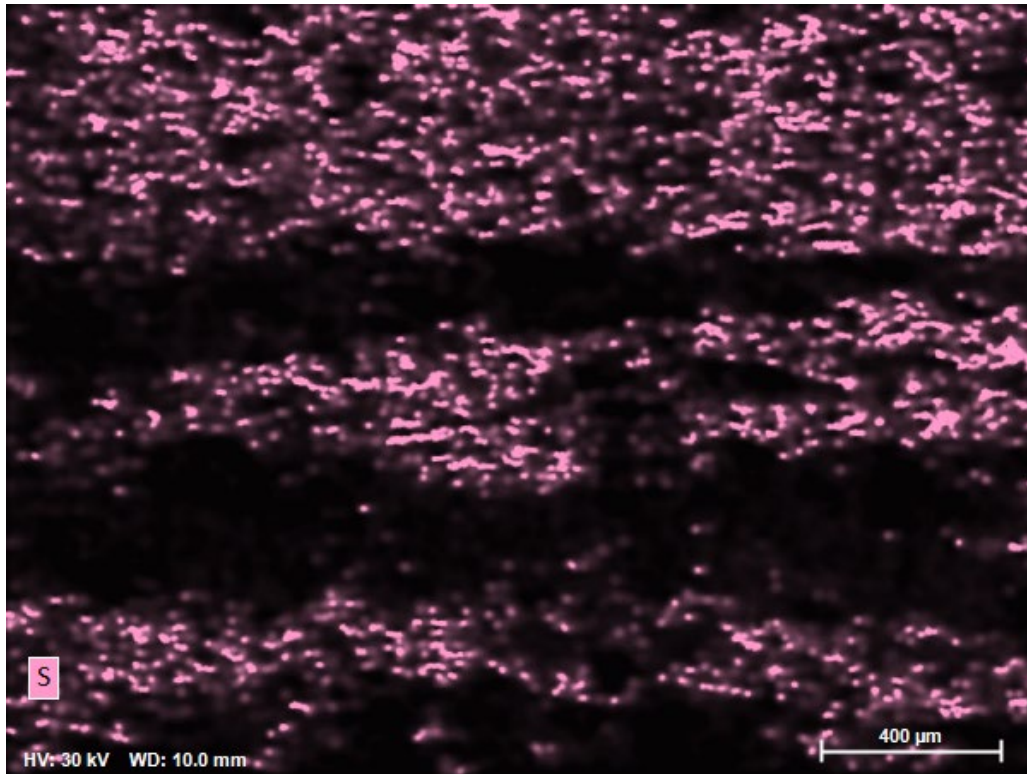
EDS Report

Company / Department

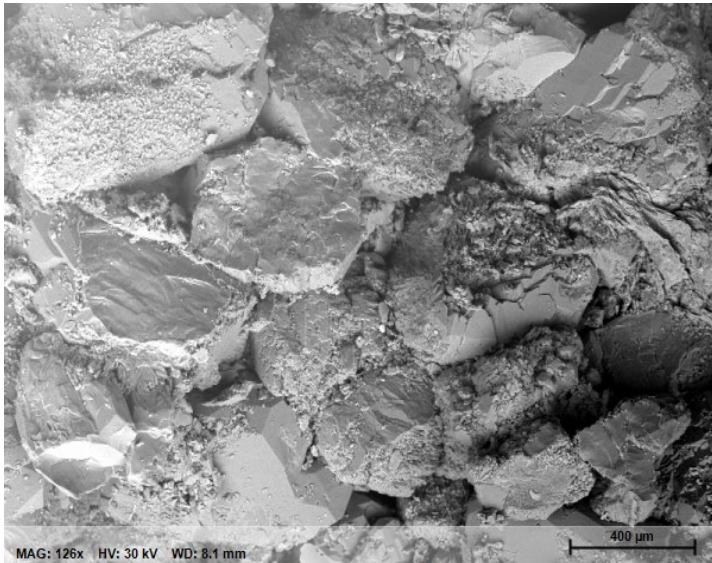


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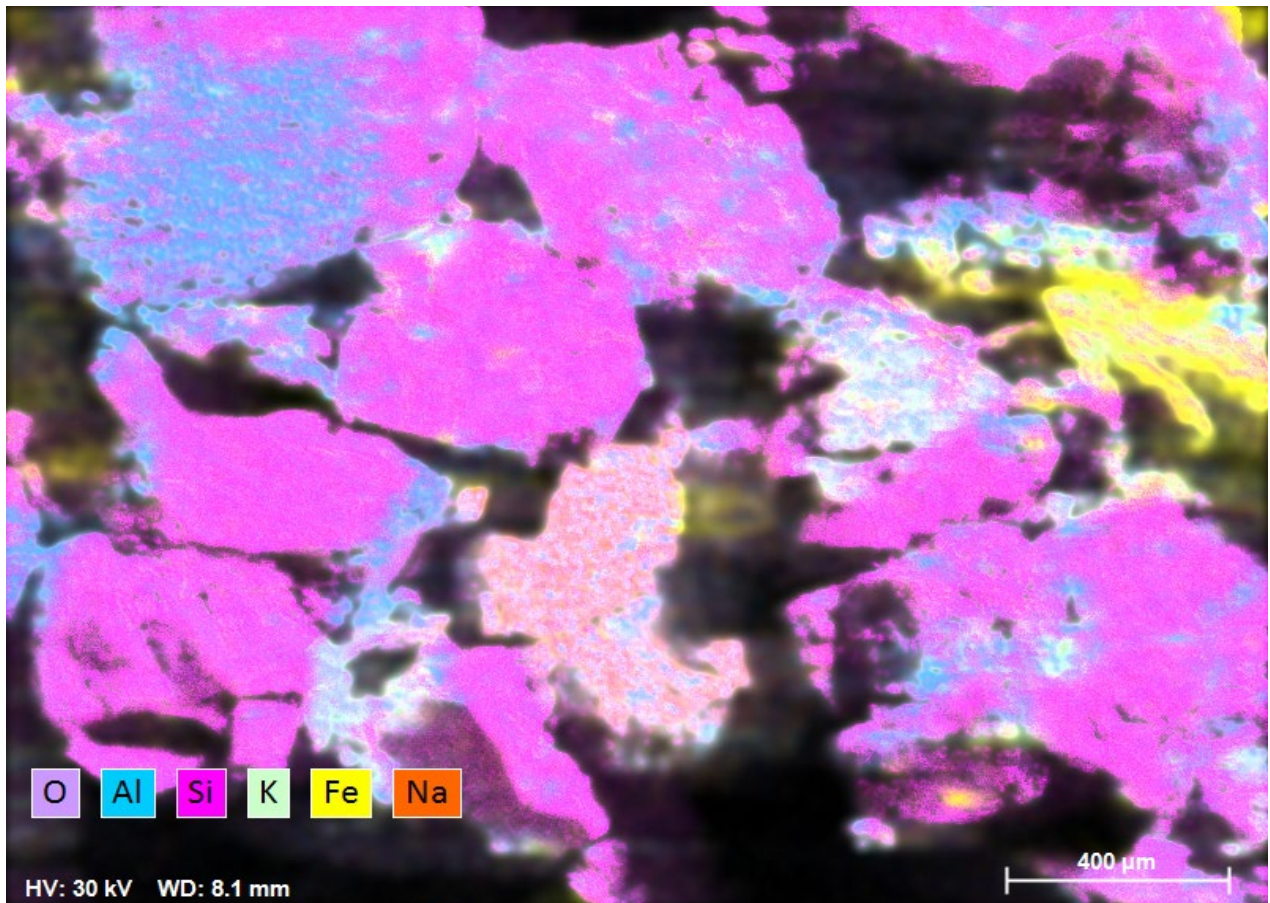


23009-05 Report



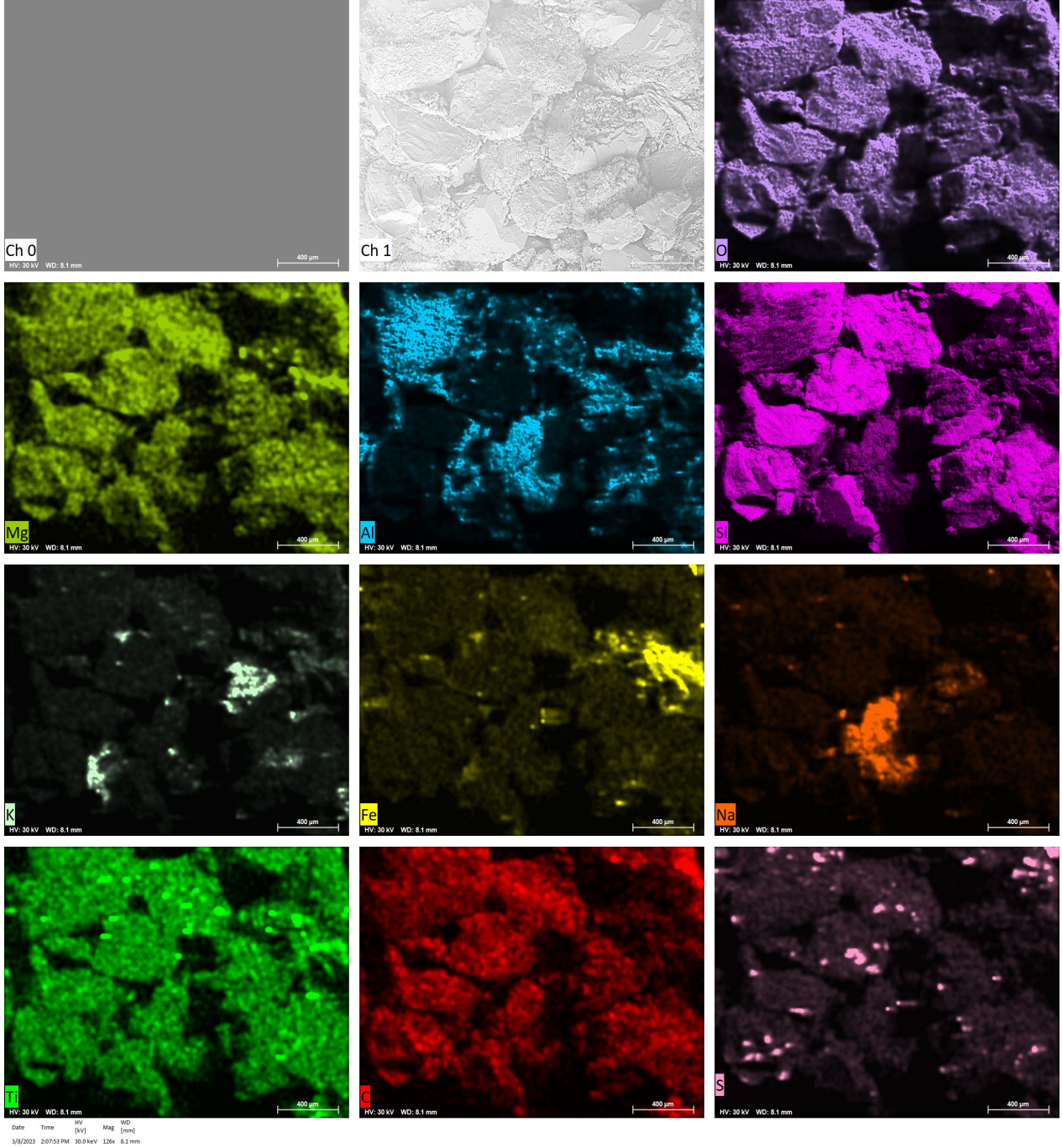
MAG: 126x HV: 30 kV WD: 8.1 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	10:34:09 AM	30.0 keV	126x	8.1 mm



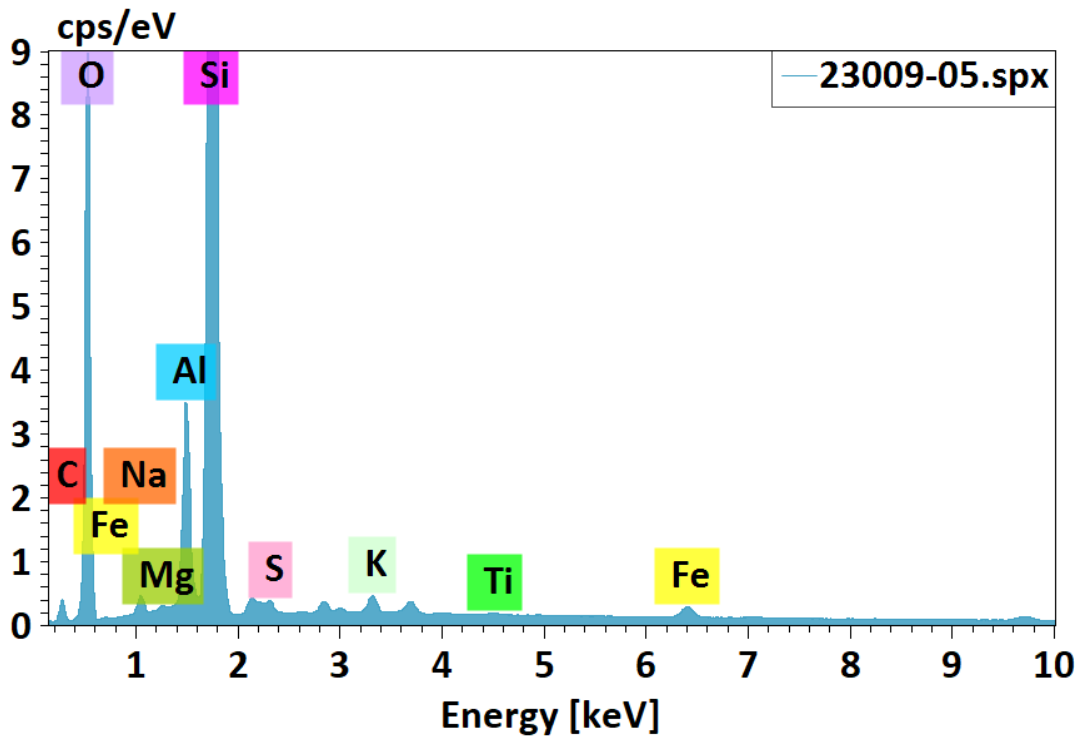
HV: 30 kV WD: 8.1 mm

Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	2:07:53 PM	30.0 keV	126x	8.1 mm



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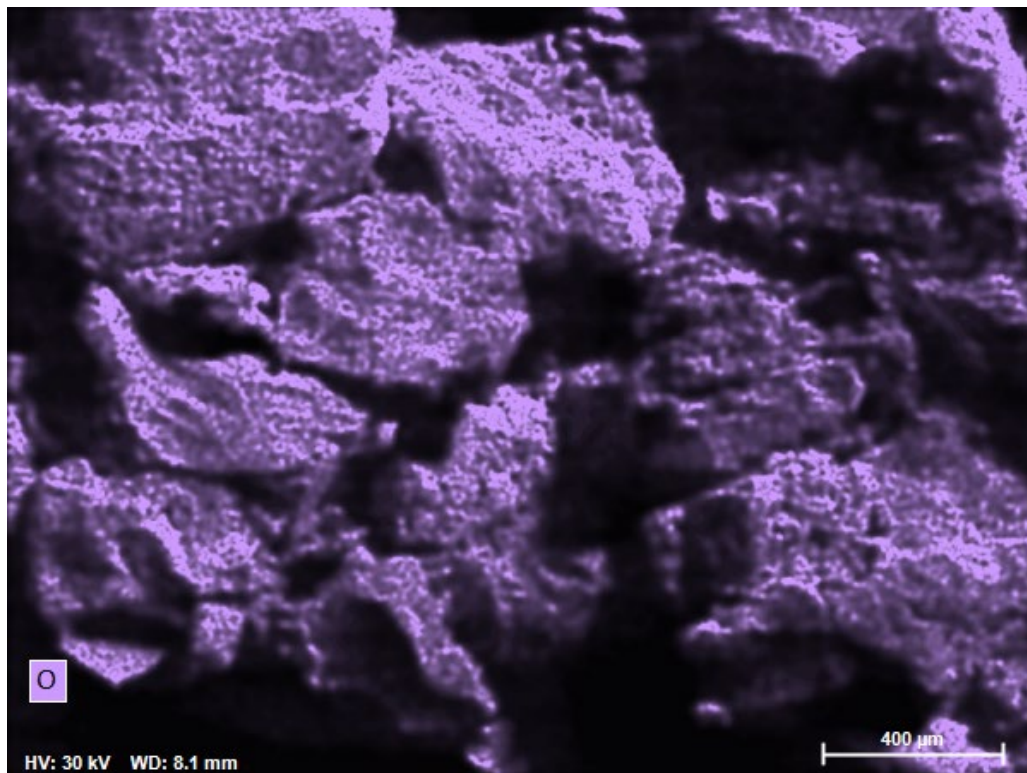


23009-05.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	7.34	7.92	12.30
Oxygen	8	49.03	52.85	61.66
Sodium	11	0.69	0.74	0.60
Magnesium	12	0.05	0.06	0.04
Aluminium	13	3.31	3.57	2.47
Silicon	14	31.35	33.79	22.46
Sulfur	16	0.24	0.25	0.15
Potassium	19	0.31	0.33	0.16
Titanium	22	0.04	0.04	0.02
Iron	26	0.42	0.46	0.15
		92.78	100.00	100.00

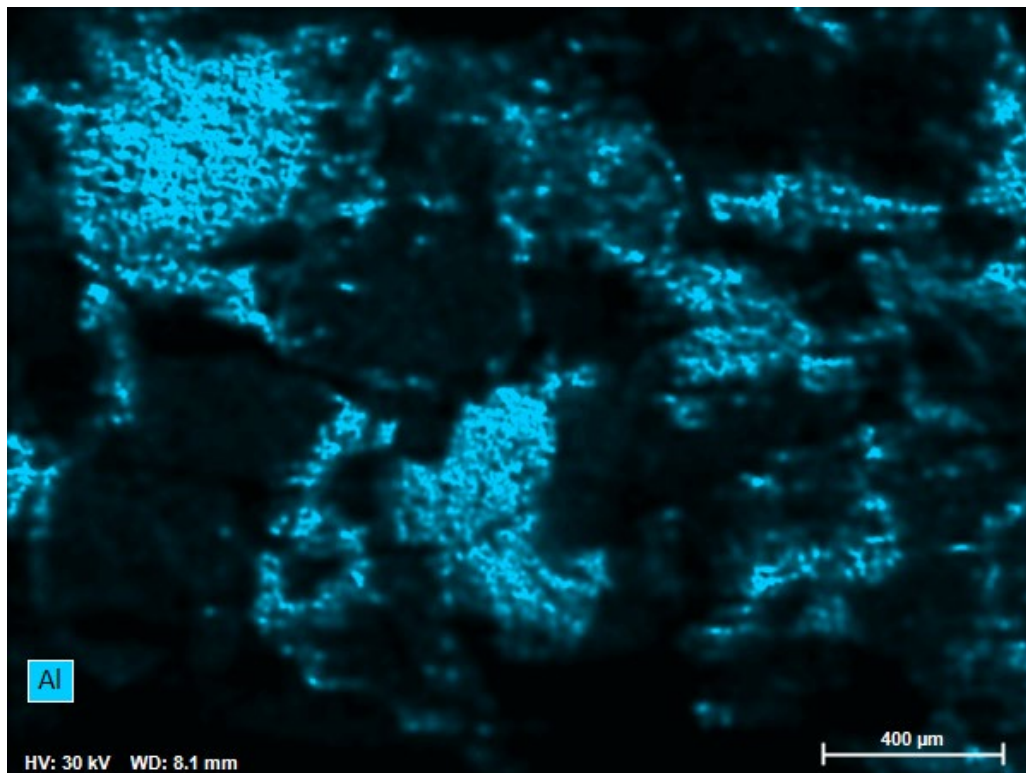
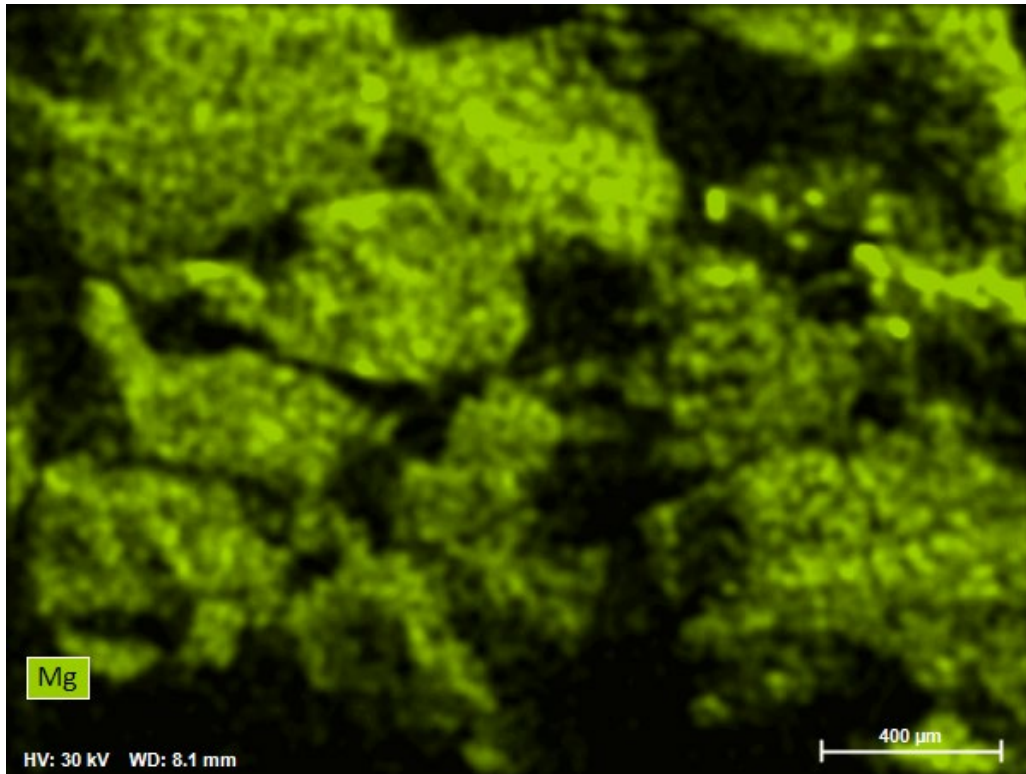
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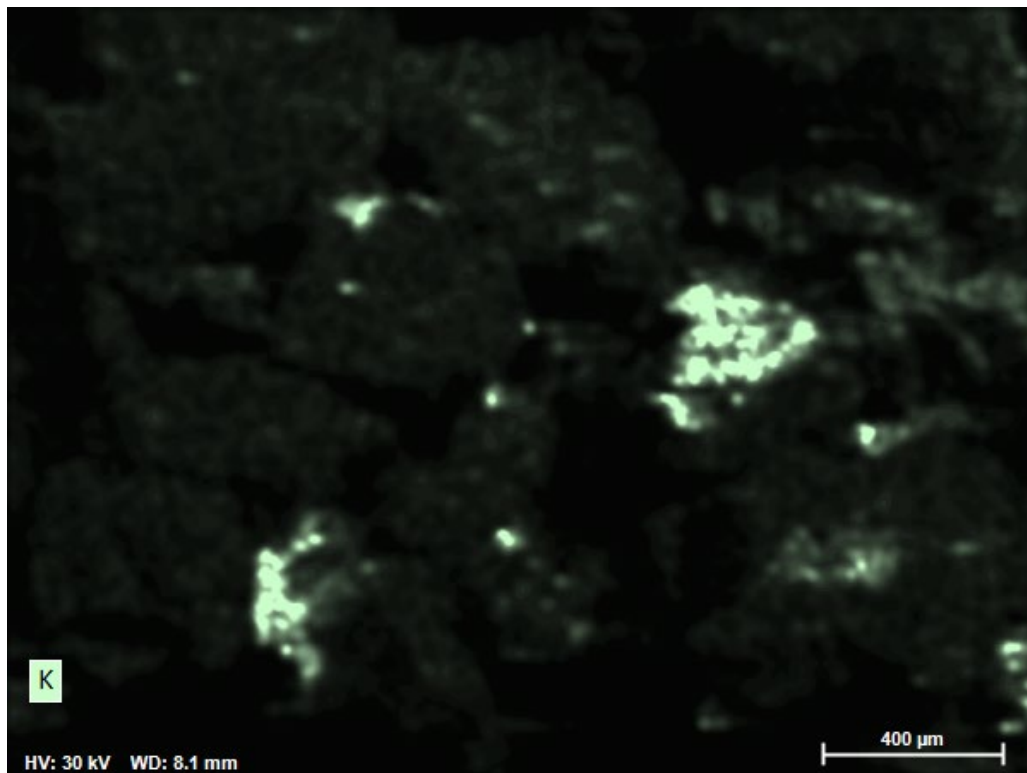
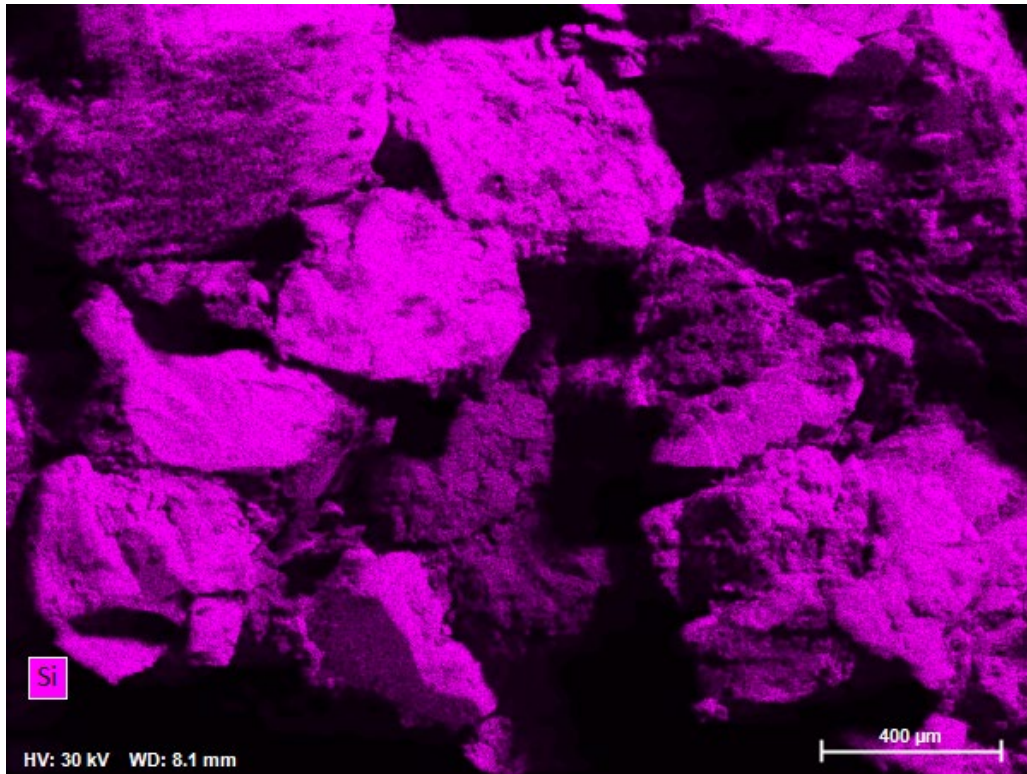
EDS Report

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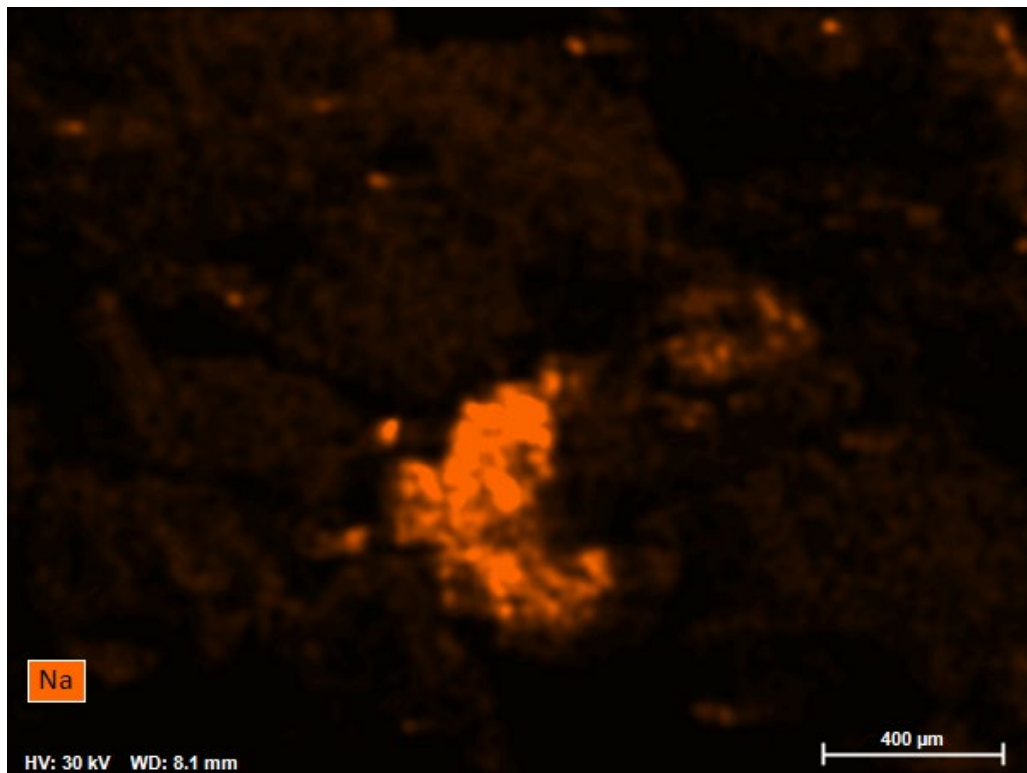
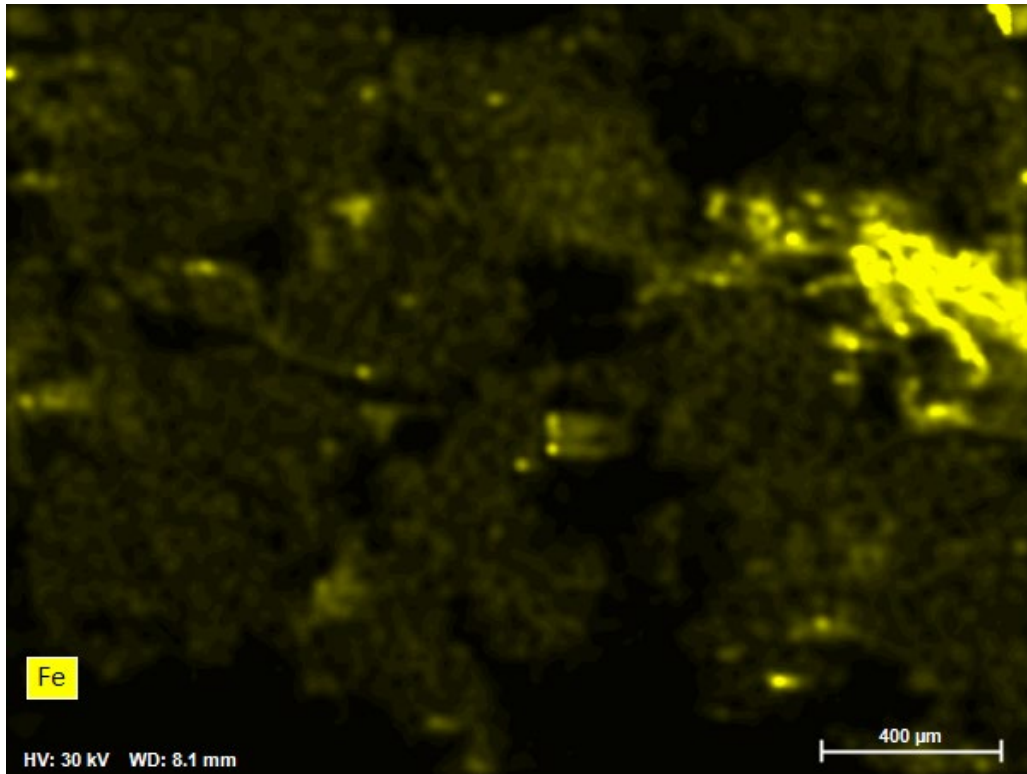
EDS Report

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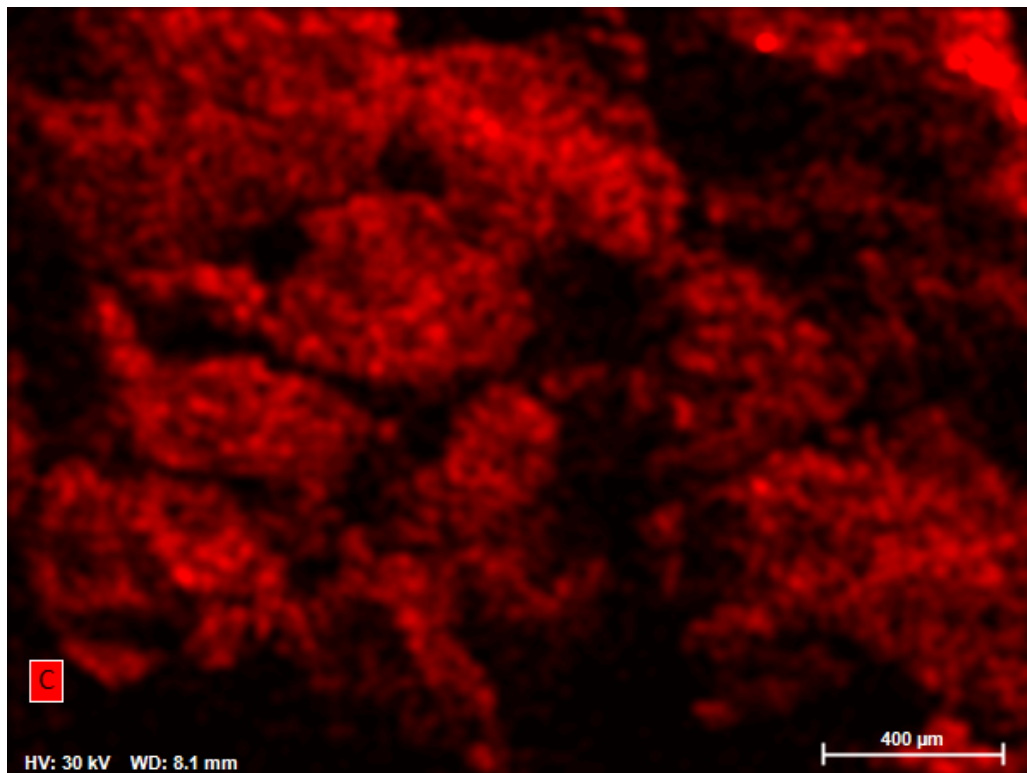
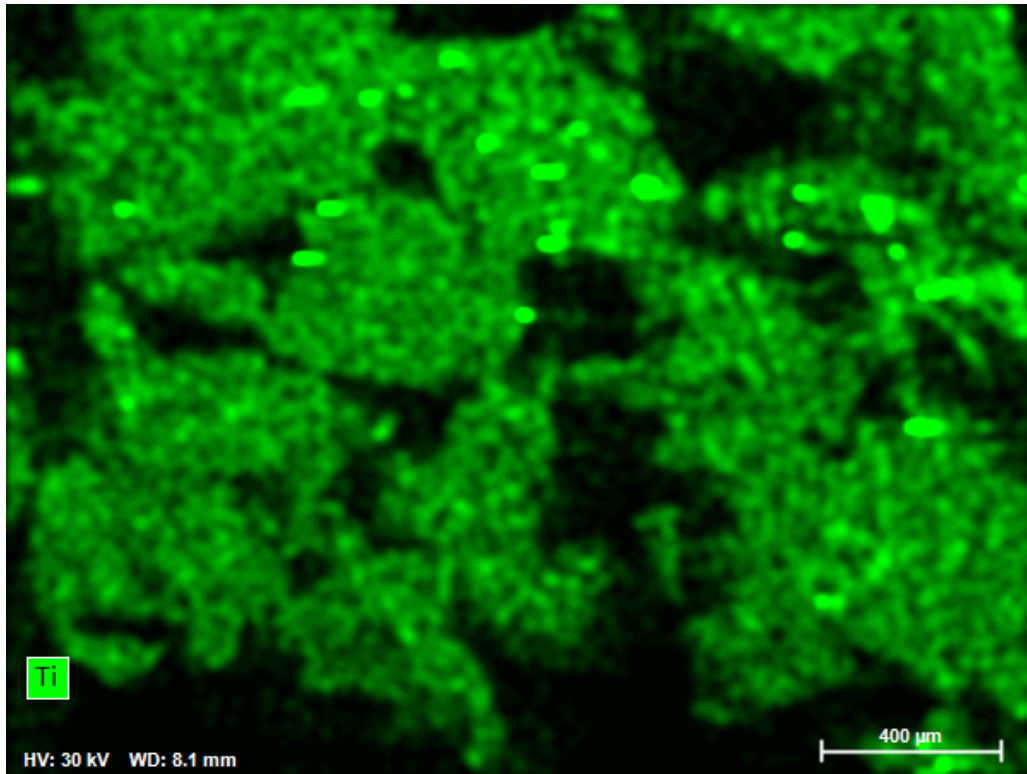
EDS Report

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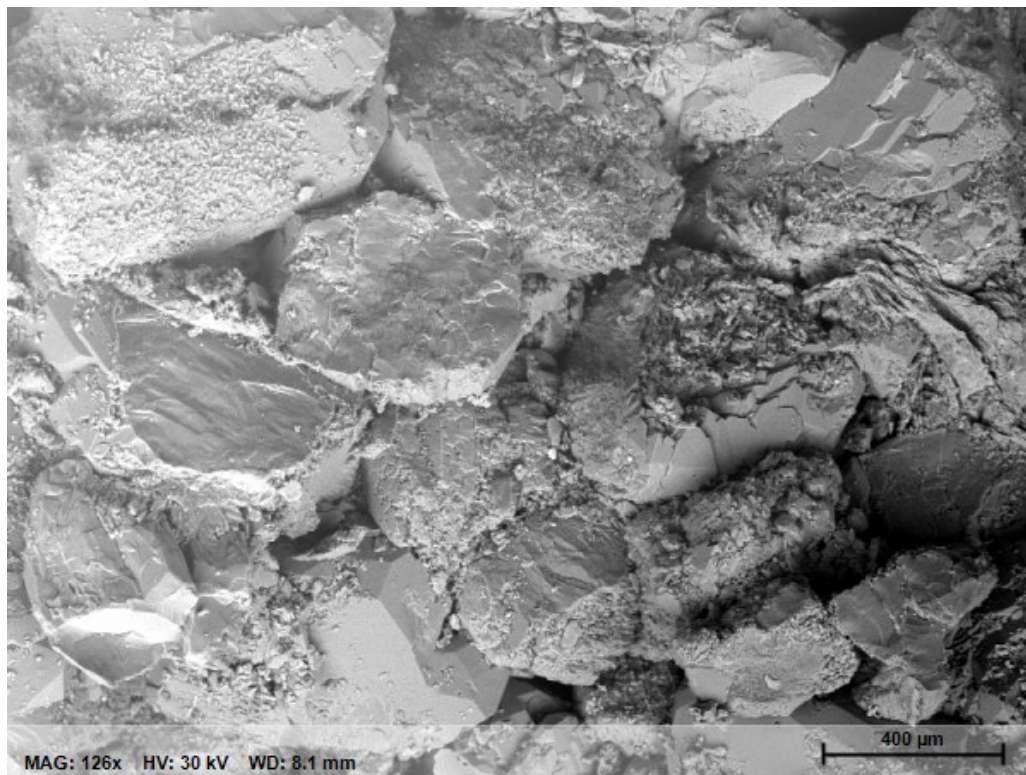
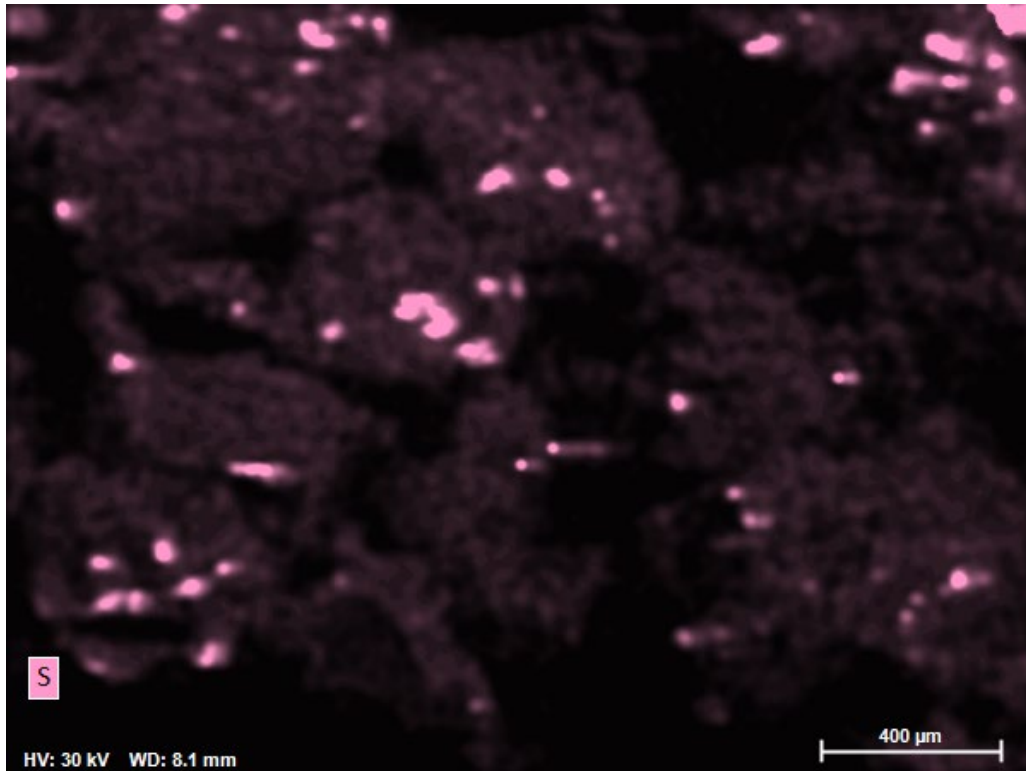
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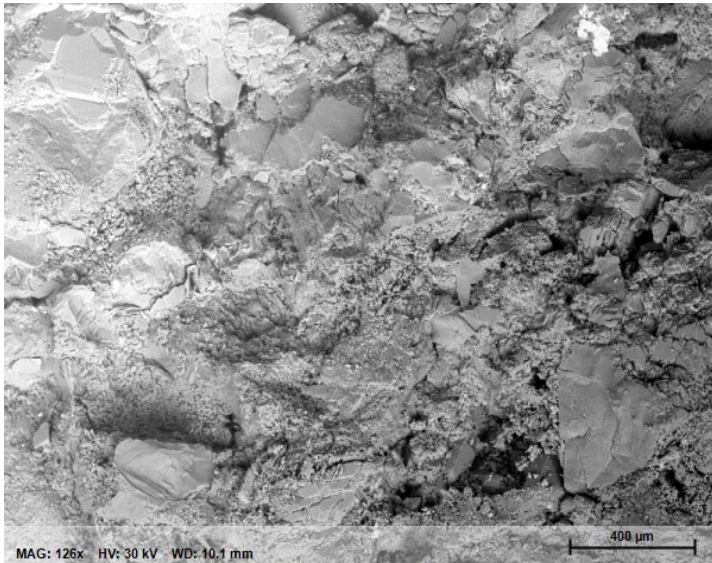


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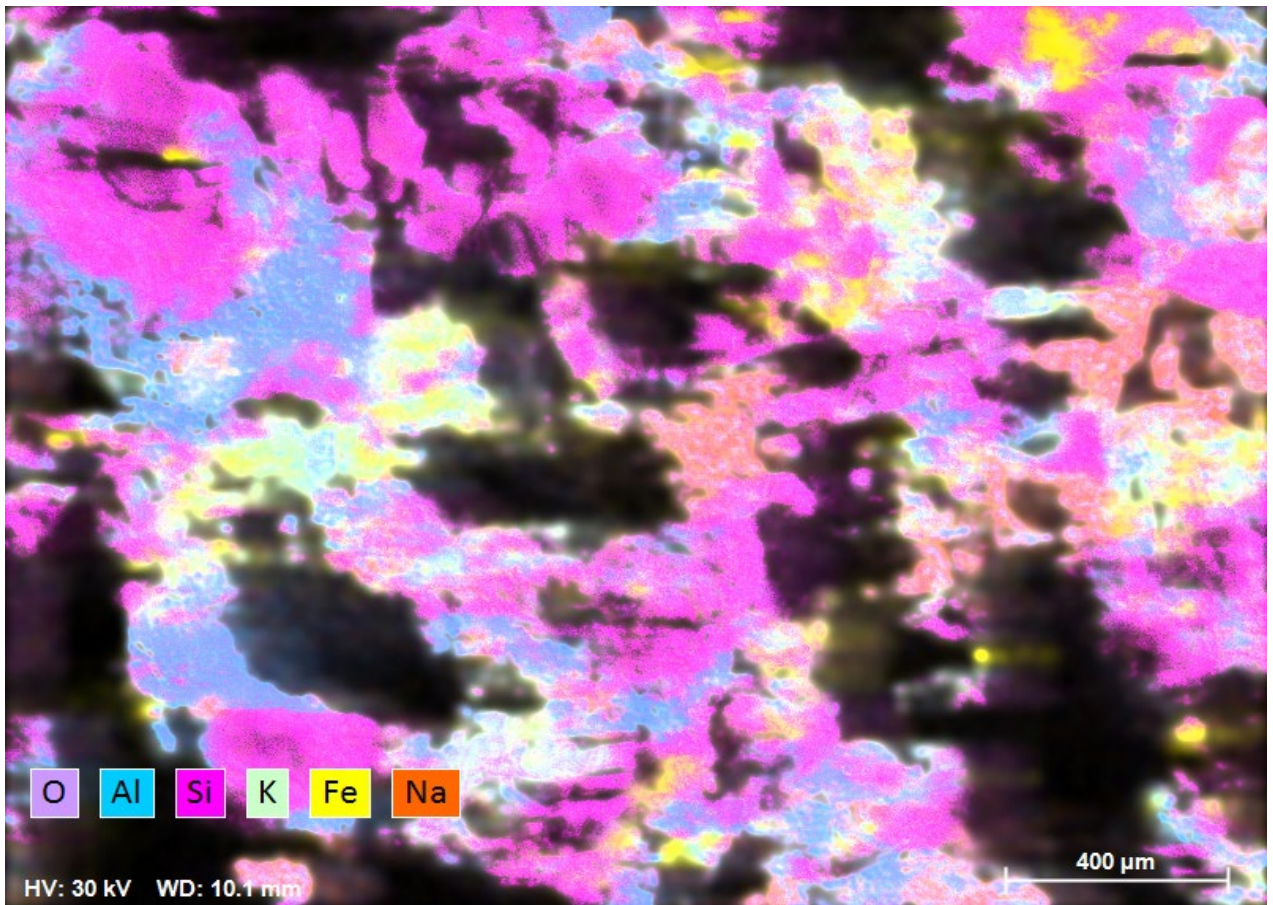


23009-06 Report



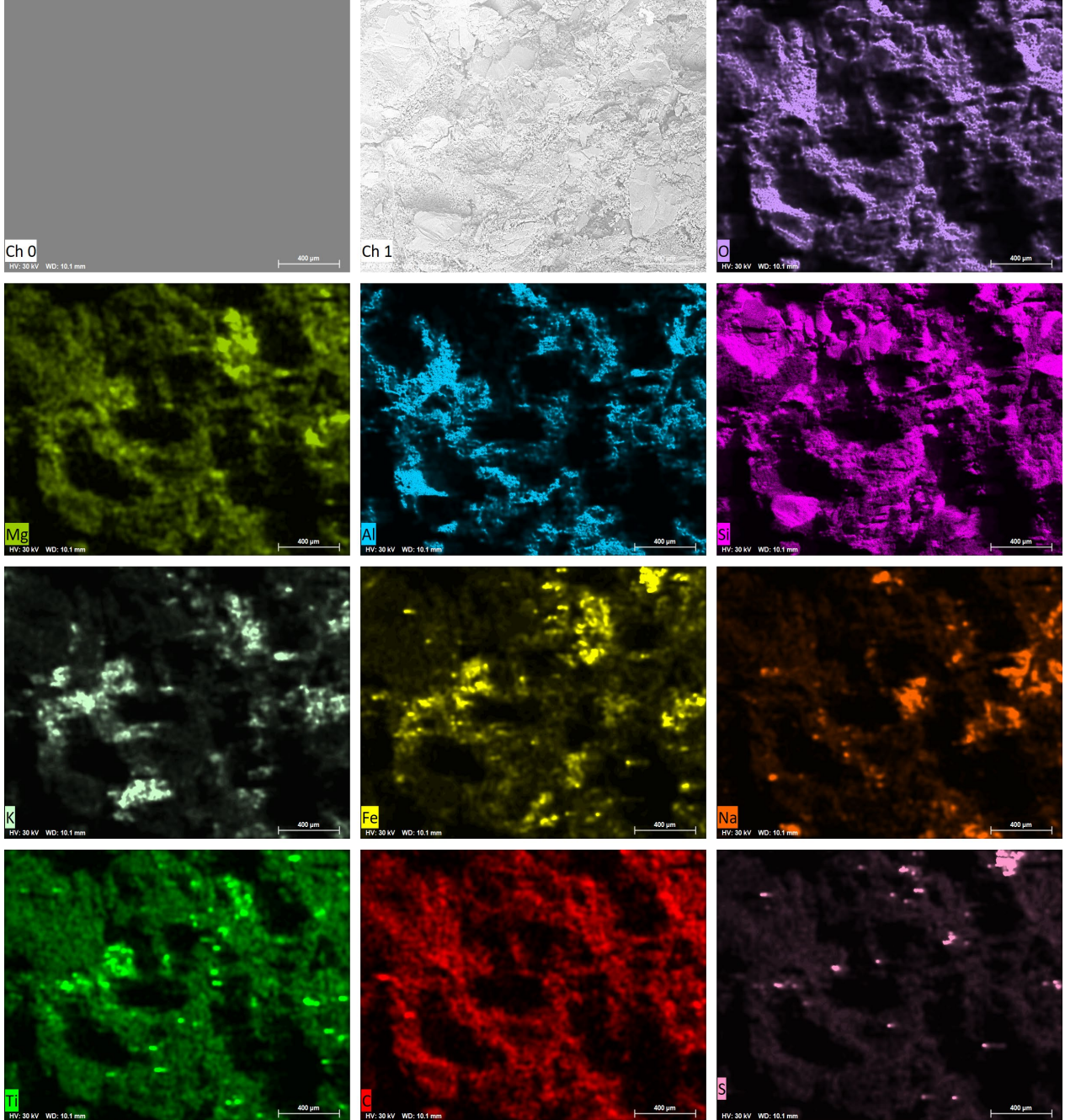
MAG: 126x HV: 30 kV WD: 10.1 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	11:40:56 AM	30.0 keV	126x	10.1 mm



HV: 30 kV WD: 10.1 mm

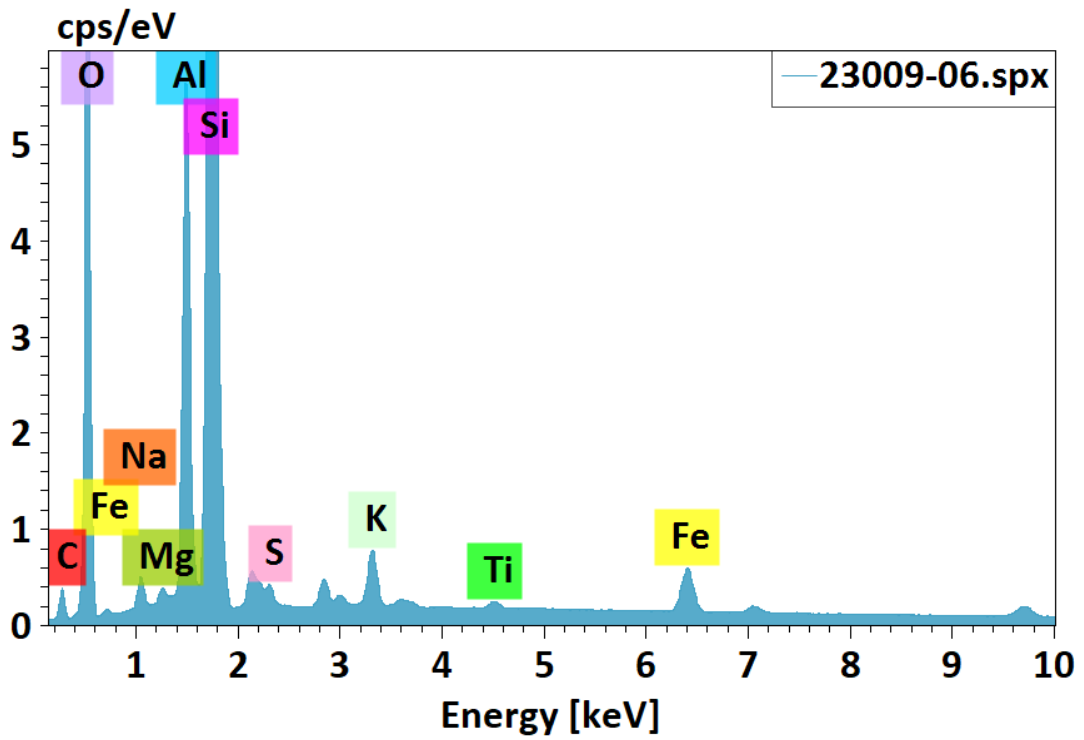
Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	2:14:31 PM	30.0 keV	126x	10.1 mm



Date	Time	HV (kV)	Mag	WD (mm)
3/8/2023	2:14:31 PM	30.0 keV	126x	10.1 mm

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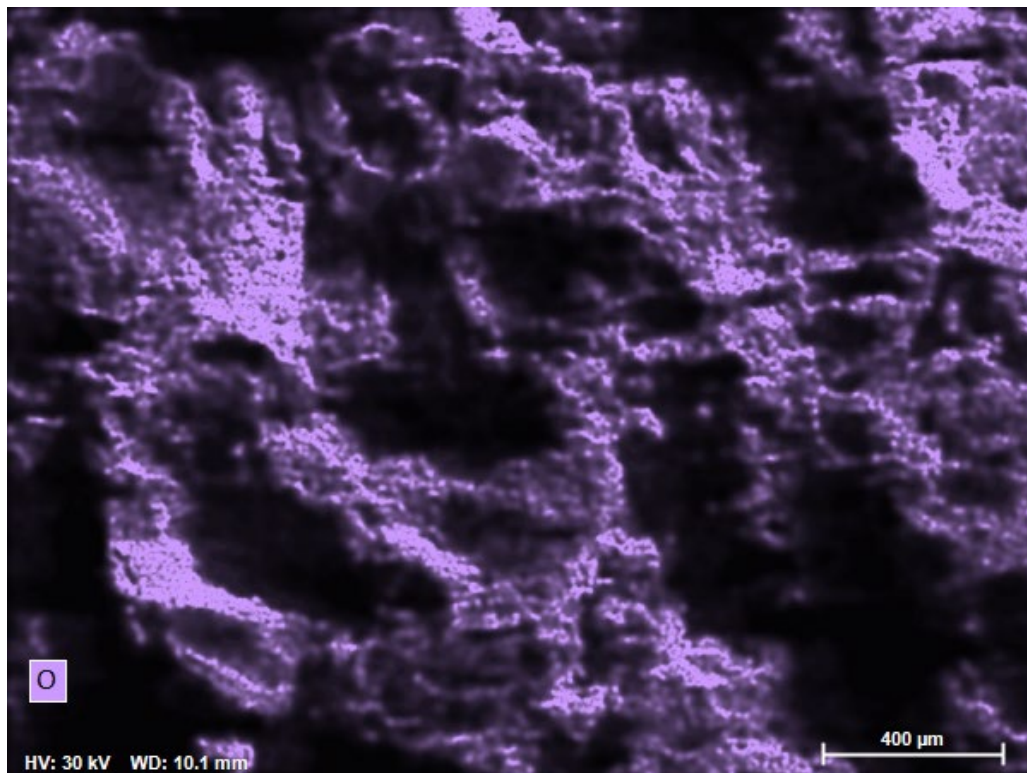


23009-06.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	7.22	7.64	12.07
Oxygen	8	47.75	50.50	59.93
Sodium	11	0.87	0.92	0.76
Magnesium	12	0.22	0.23	0.18
Aluminium	13	6.19	6.55	4.61
Silicon	14	29.84	31.57	21.34
Sulfur	16	0.35	0.37	0.22
Potassium	19	0.86	0.91	0.44
Titanium	22	0.15	0.16	0.06
Iron	26	1.09	1.15	0.39
		94.54	100.00	100.00

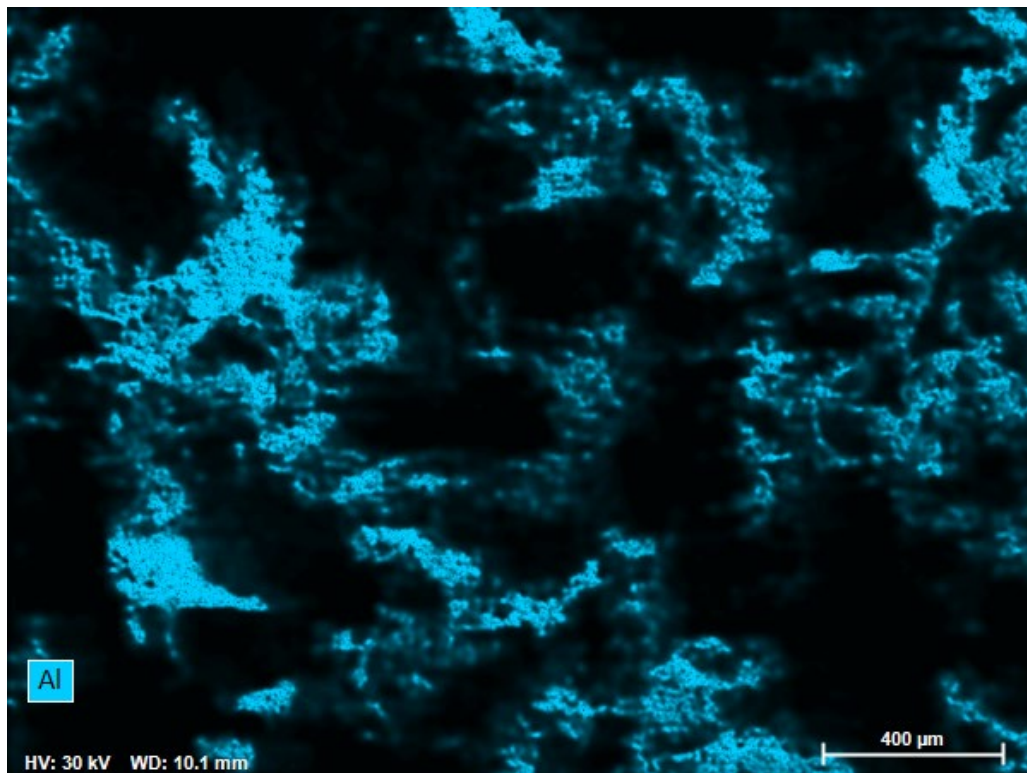
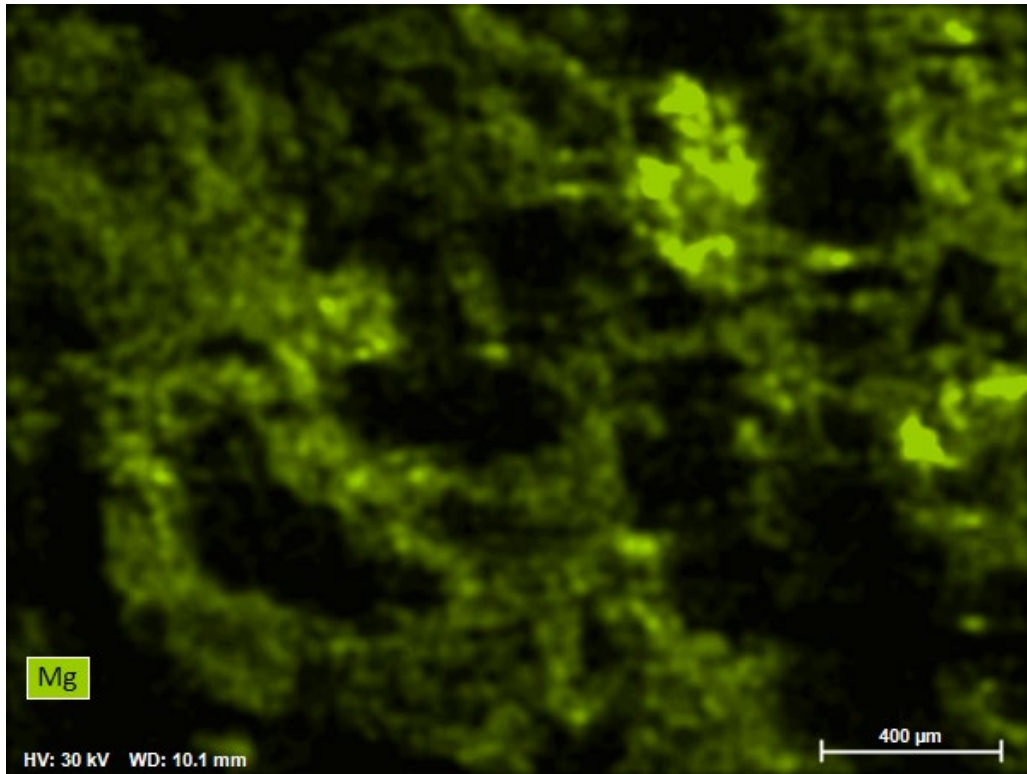
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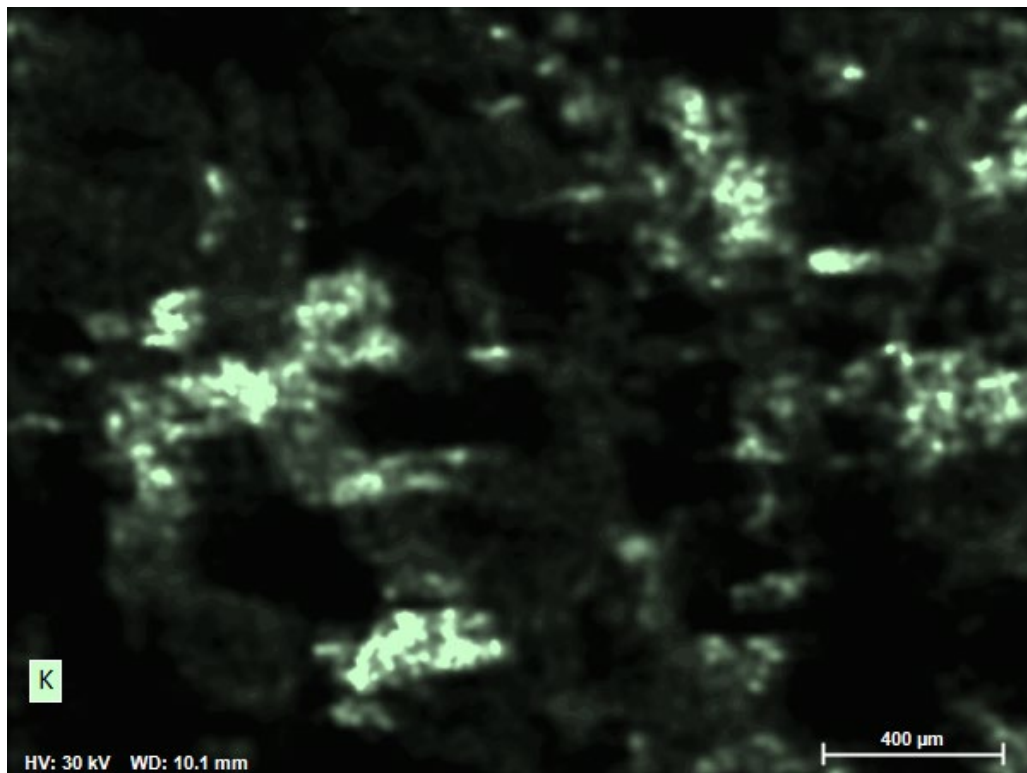
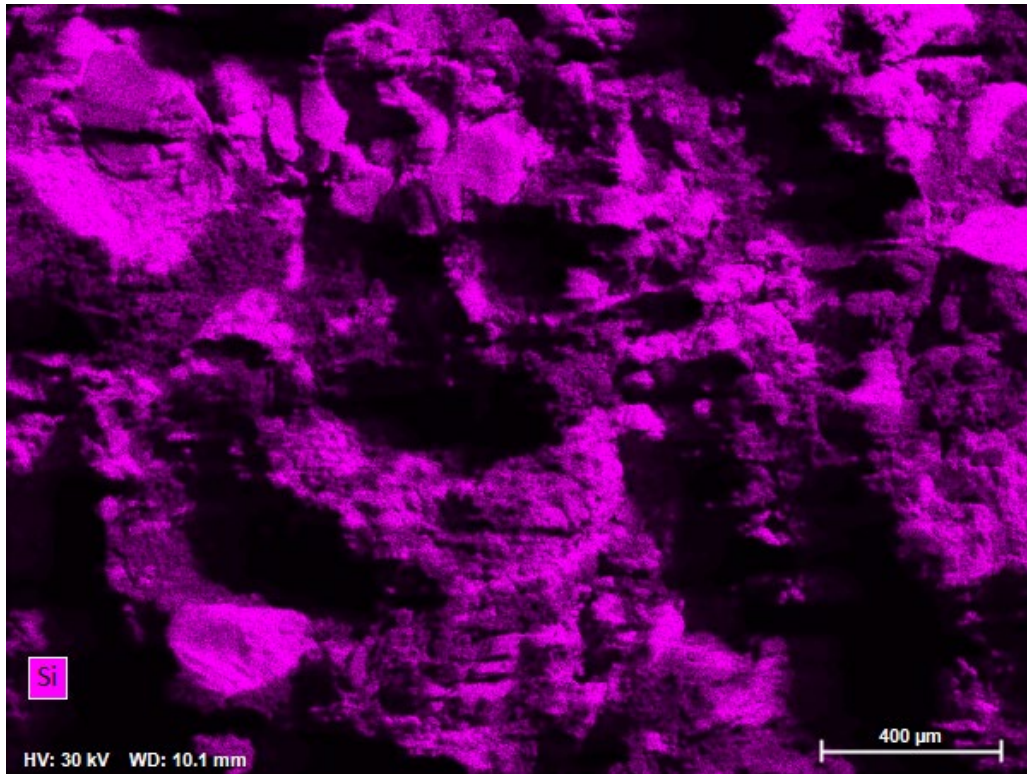
EDS Report

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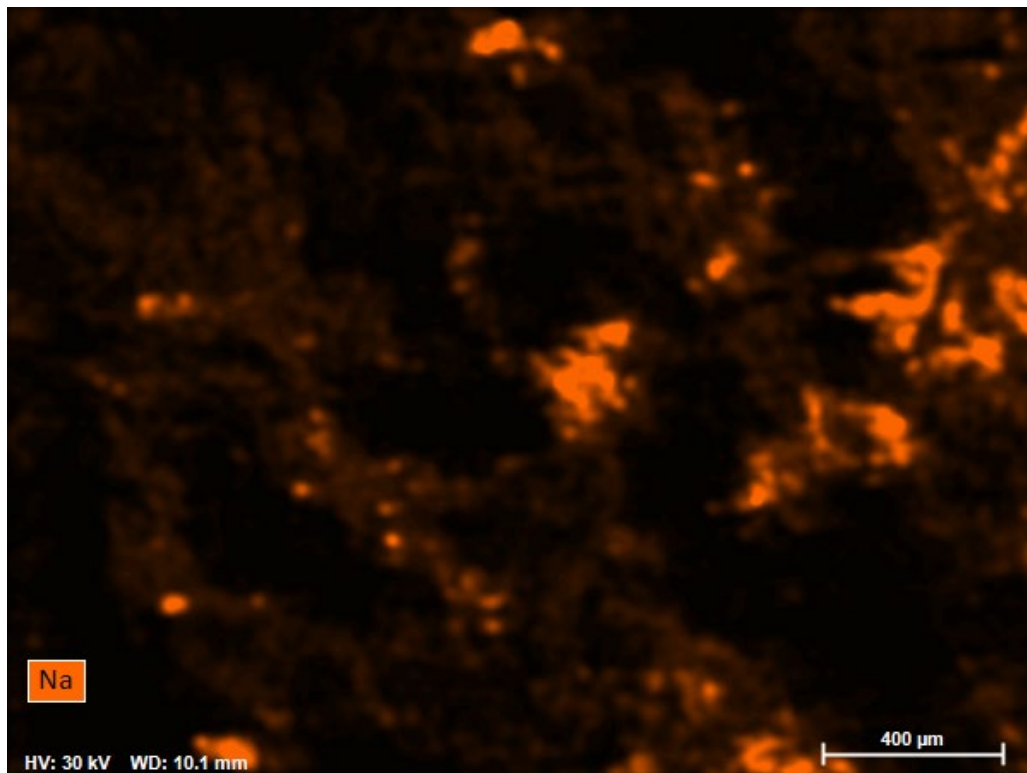
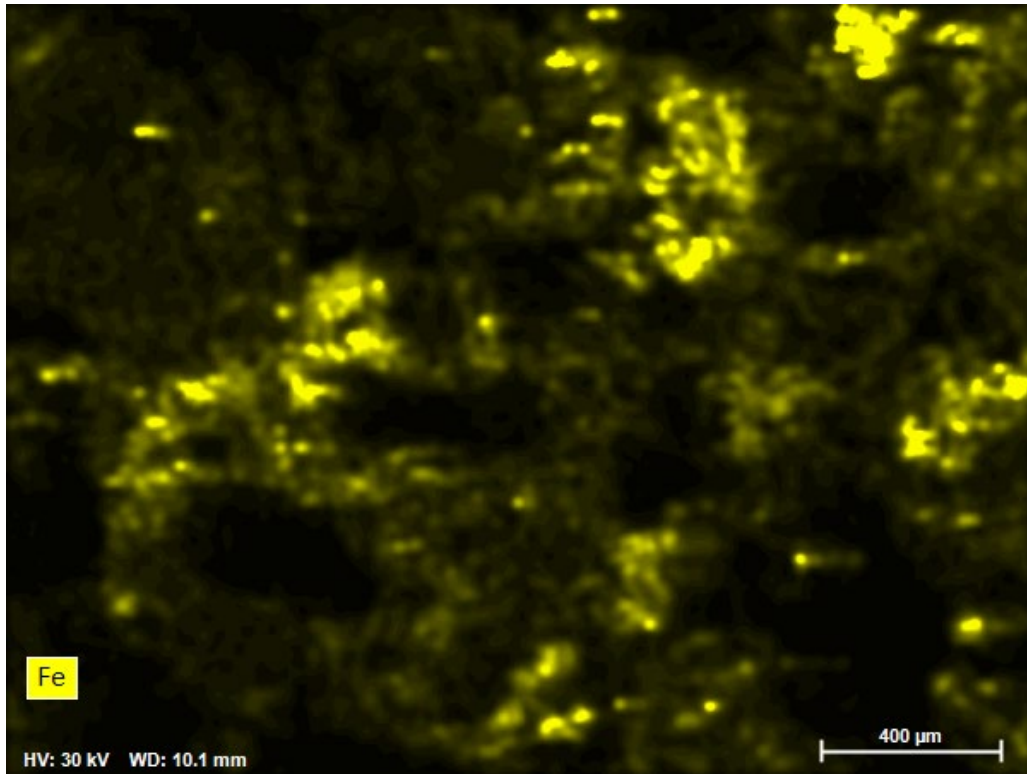
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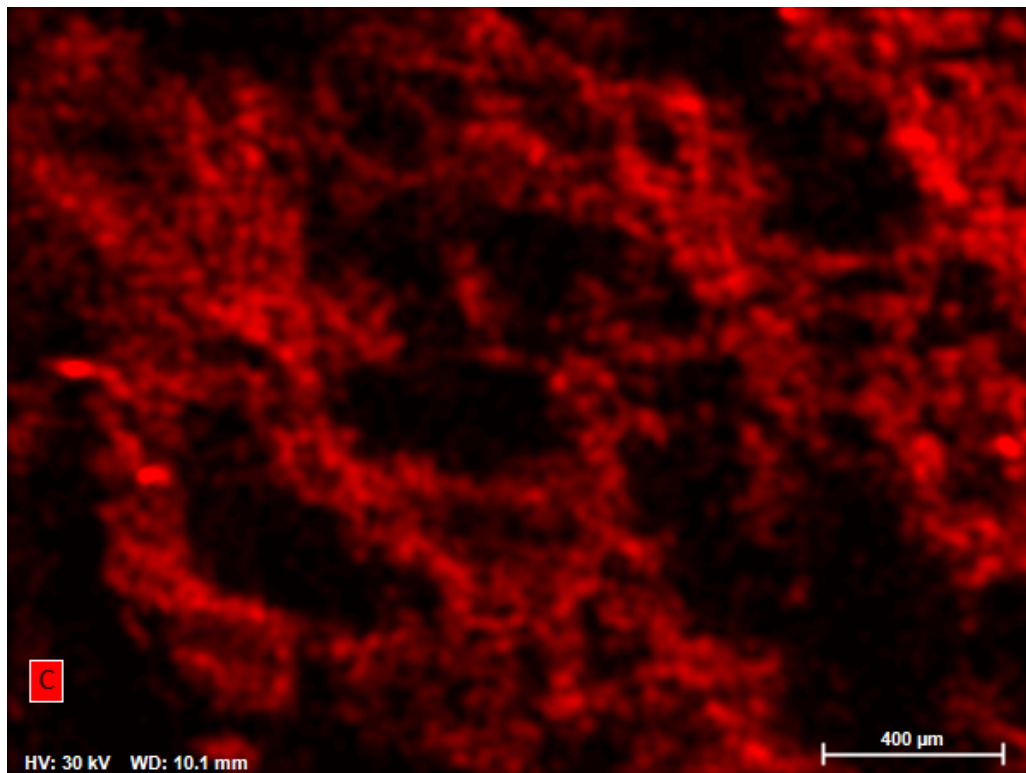
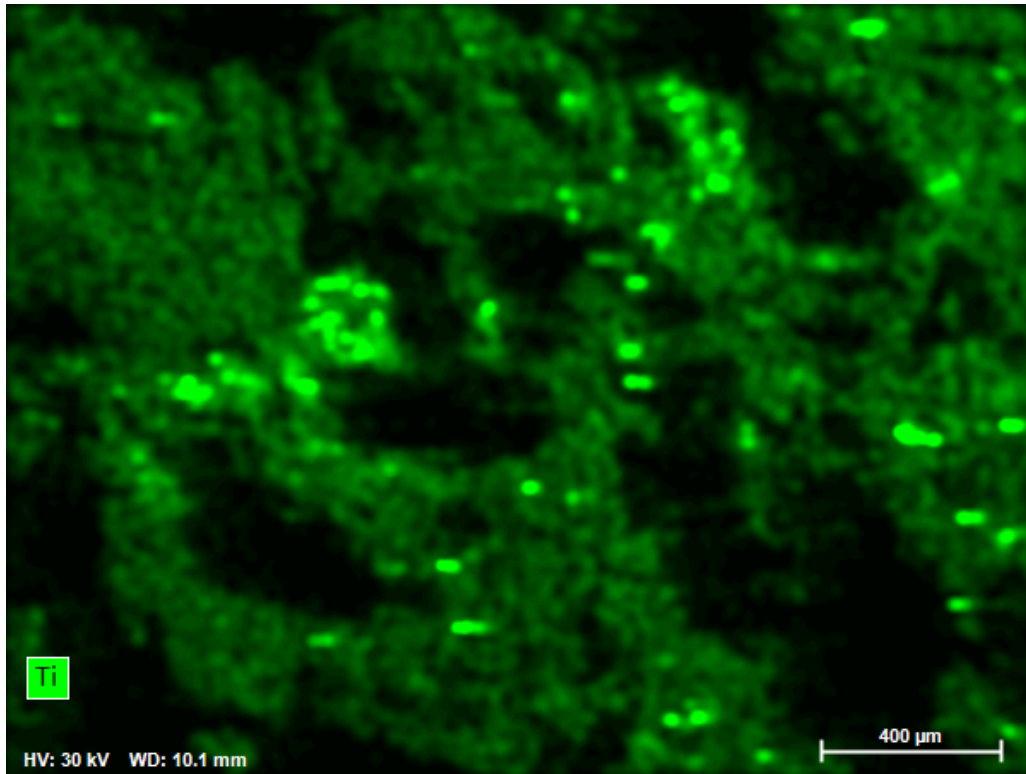
EDS Report

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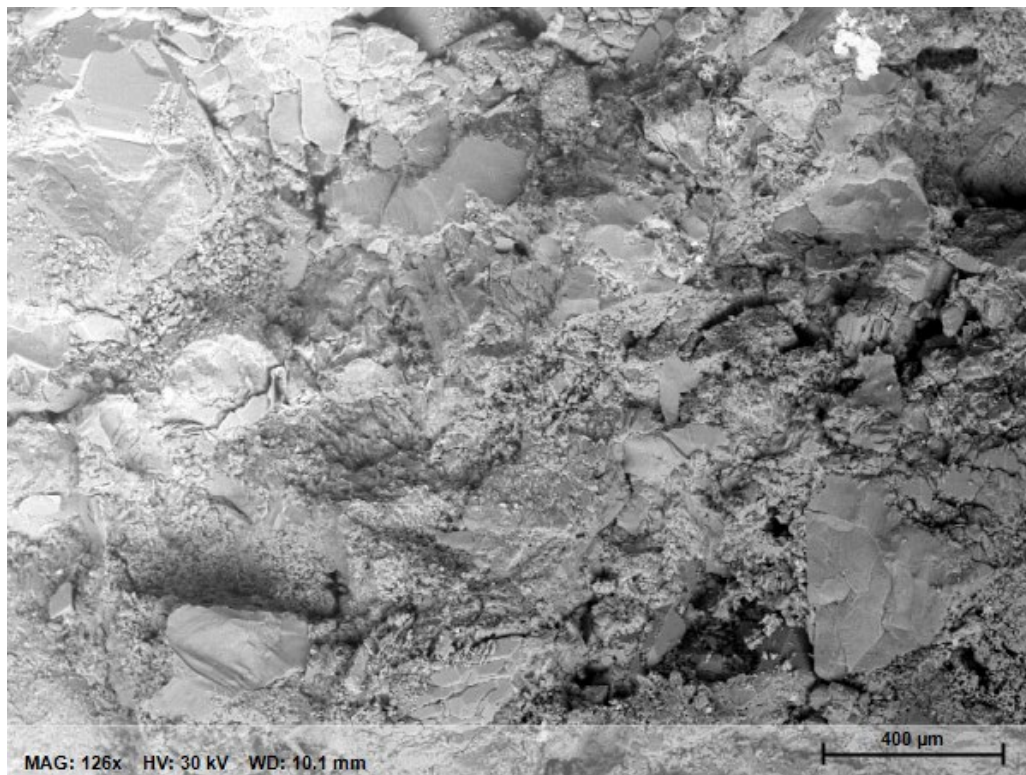
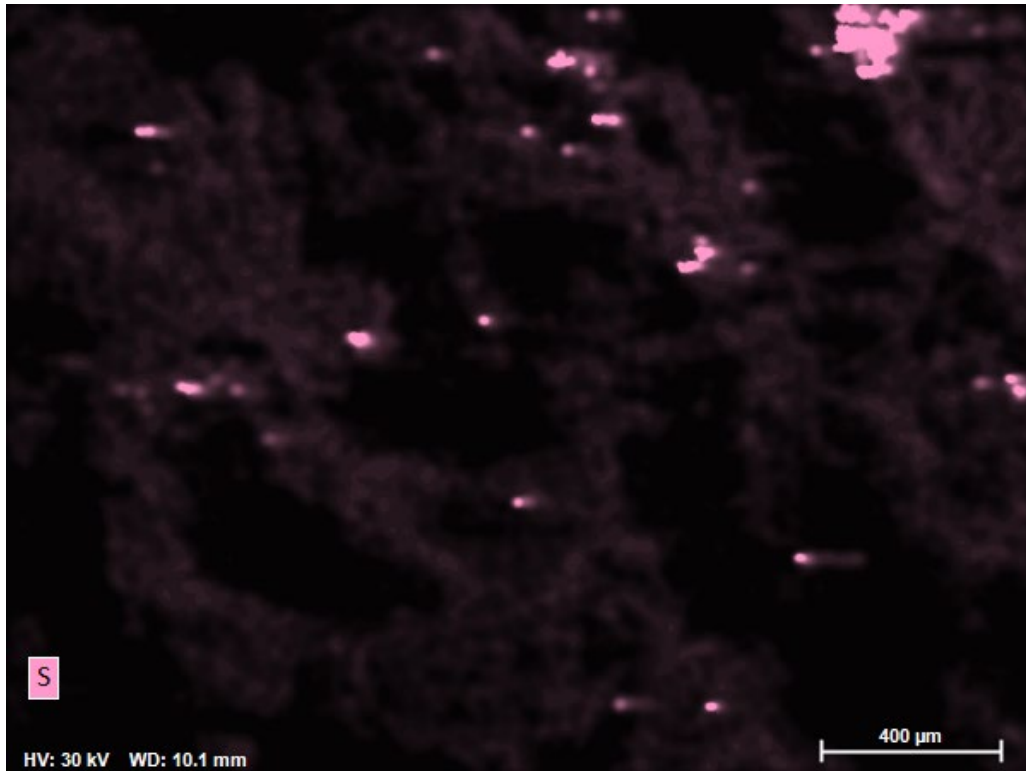
EDS Report

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EDS Report

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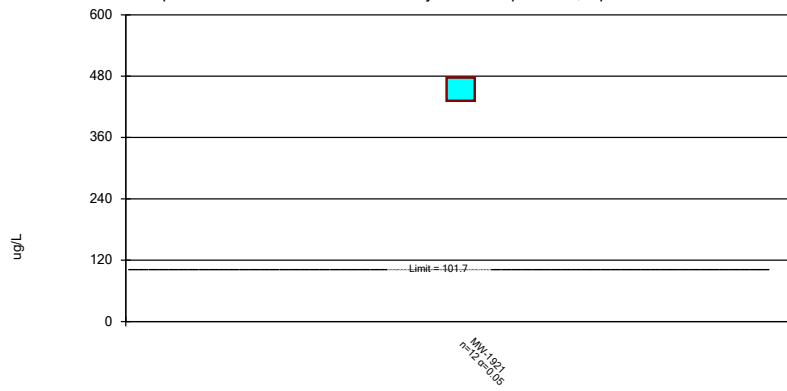


ATTACHMENT E

Molybdenum Statistical Evaluation

Parametric Confidence Interval

Compliance limit is exceeded. Normality Test: Shapiro Wilk, alpha based on n.



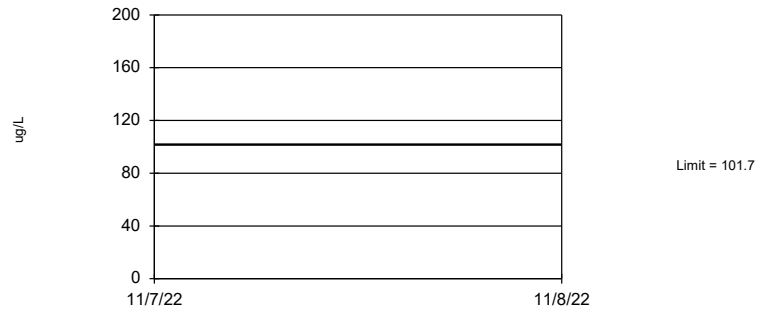
Constituent: Molybdenum Analysis Run 5/16/2023 9:35 AM
Mountaineer Plant Client: AEP Data: Mountaineer BAP Mo

Confidence Interval

Mountaineer Plant Client: AEP Data: Mountaineer BAP Mo Printed 5/16/2023, 9:35 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Molybdenum (ug/L)	MW-1921	477.3	431.7	101.7	Yes	12	0	No	0.05	Param.

Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=53.44, Std. Dev.=25.62, n=132. Normality test: Chi Squared @alpha = 0.05, calculated = 9.364, critical = 14.07. Report alpha = 0.05.

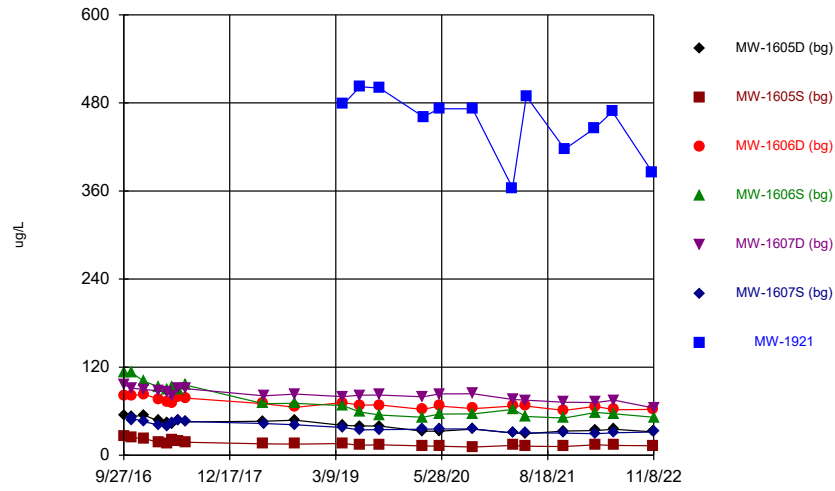
Constituent: Molybdenum Analysis Run 5/16/2023 9:33 AM
Mountaineer Plant Client: AEP Data: Mountaineer BAP Mo

Tolerance Limit

Mountaineer Plant Client: AEP Data: Mountaineer BAP Mo Printed 5/16/2023, 9:34 AM

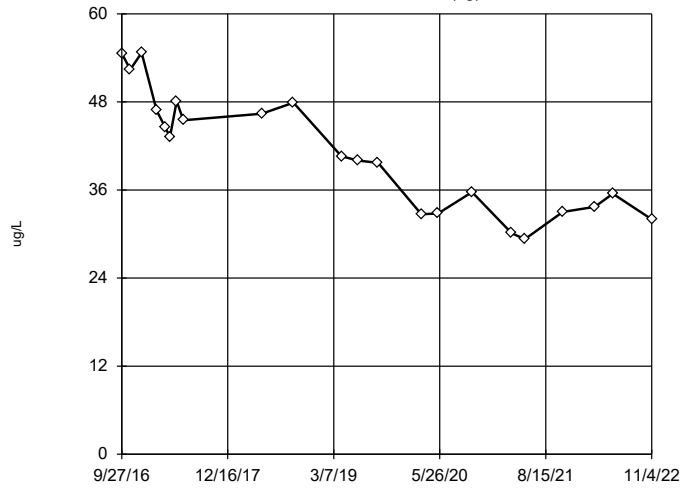
<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Molybdenum (ug/L)	n/a	101.7	n/a	n/a	n/a	n/a	132	0	No	0.05	Inter

Time Series



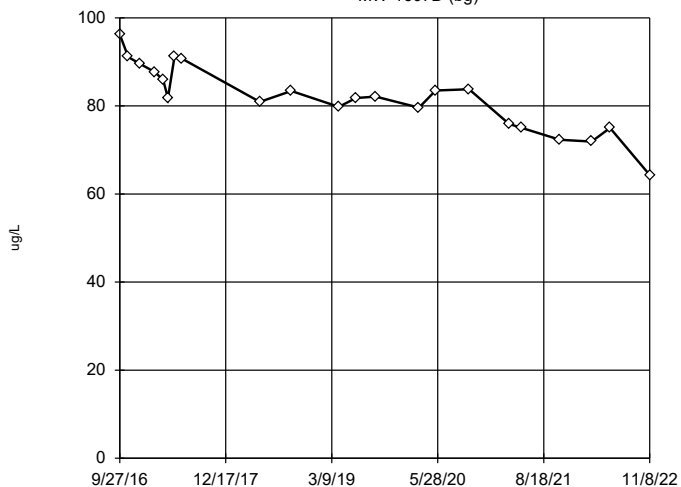
Constituent: Molybdenum Analysis Run 5/16/2023 9:32 AM
Mountaineer Plant Client: AEP Data: Mountaineer BAP Mo

Tukey's Outlier Screening
MW-1605D (bg)



Tukey's Outlier Screening

MW-1607D (bg)



Outlier Analysis

Mountaineer Plant Client: AEP Data: Mountaineer BAP Mo Printed 5/16/2023, 9:32 AM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Molybdenum (ug/L)	MW-1605D ...	No	n/a	n/a	NP	NaN	22	40.88	8.025	ln(x)	ShapiroWilk
Molybdenum (ug/L)	MW-1605S ...	No	n/a	n/a	NP	NaN	22	15.99	4.105	ln(x)	ShapiroWilk
Molybdenum (ug/L)	MW-1606D ...	No	n/a	n/a	NP	NaN	22	70.34	6.878	ln(x)	ShapiroWilk
Molybdenum (ug/L)	MW-1606S ...	No	n/a	n/a	NP	NaN	22	72.98	20.99	ln(x)	ShapiroWilk
Molybdenum (ug/L)	MW-1607D ...	No	n/a	n/a	NP	NaN	22	81.98	7.609	x^2	ShapiroWilk
Molybdenum (ug/L)	MW-1607S ...	No	n/a	n/a	NP	NaN	22	38.47	6.786	ln(x)	ShapiroWilk
Molybdenum (ug/L)	MW-1921	No	n/a	n/a	NP	NaN	12	454.5	43.99	x^6	ShapiroWilk

ATTACHMENT F

Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that this alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Mountaineer BAPs CCR management unit and that the requirements of 40 CFR 257.95(g)(3)(ii) have been met.

John Seymour
Printed Name of Licensed Professional Engineer

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ALTERNATIVE SOURCE DEMONSTRATION REPORT

AEP Mountaineer Plant Bottom Ash Ponds New Haven, West Virginia

Prepared for

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ACRONYMS AND ABBREVIATIONS

ASD	Alternative Source Demonstration
BAP	bottom ash pond
bgs	below ground surface
CCR	coal combustion residuals
CFR	Code of Federal Regulations
EDX	energy-dispersive X-ray spectroscopy
ft	feet
gpm	gallons per minute
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/kg	milligrams per kilogram
µg/L	micrograms per liter
ORP	oxidation-reduction potential
QA/QC	quality assurance / quality control
redox	oxidation-reduction
SEM	scanning electron microscopy
SSL	statistically significant level
USEPA	United States Environmental Protection Agency
UTL	upper tolerance limit
XRD	X-ray diffraction
XRF	X-ray fluorescence

1. INTRODUCTION AND SUMMARY

This Alternative Source Demonstration (ASD) report has been prepared to address statistically significant levels (SSLs) of arsenic in the groundwater monitoring network at the Mountaineer Power Plant's bottom ash ponds (BAPs) in New Haven, West Virginia.

This ASD follows the first semiannual corrective action monitoring event of 2023, which was conducted in May at the BAPs in accordance with Title 40, Section 257.98(a)(1) of the Code of Federal Regulations (CFR). The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. A confidence interval was constructed for each Appendix IV parameter at each compliance well, nature-and-extent well, and sentinel well. An SSL was attributed to a parameter if its lower confidence limit (LCL) exceeded the groundwater protection standard (GWPS) (i.e., if the entire confidence interval exceeded the GWPS).

The GWPS was established as whichever was greater of: (1) the background concentration (determined via calculation of an upper tolerance limit [UTL]), or (2) the maximum contaminant level (MCL) and risk-based level specified in 40 CFR 257.95(h)(2). The following SSLs were identified at the Mountaineer BAPs (Geosyntec 2023a):

- Arsenic at MW-1805 and MW-1922D, both of which are screened in the underlying Monongahela Formation bedrock
- Lithium at MW-1605D, MW-1605S, MW-1606D, MW-1606S, MW-1607D, MW-1607S, MW-1922S, MW-1923, MW-1924, and MW-1925, all of which are screened in the sand and gravel aquifer

Corrective measures are currently being completed at the BAPs for identified lithium SSLs. Source removal and hydraulic containment was selected as the remedy for groundwater impacts of lithium associated with the BAPs (Sanborn Head 2021). Therefore, alternative sources were not evaluated for lithium in this demonstration. While a molybdenum SSL was identified at nature and extent monitoring well MW-1921, this location was evaluated to support corrective action monitoring and alternative sources were not evaluated for molybdenum in this demonstration.

1.1 CCR Rule Requirements

In accordance with the United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments, 40 CFR 257.95(g)(3)(ii) states the following:

The owner or operator may demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified by a qualified professional engineer.

Pursuant to 40 CFR 257.95(g)(3)(ii), Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report to document whether the SSLs identified for arsenic are from a source other than the BAPs.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources of arsenic to which identified SSLs could be attributed. Alternative sources were identified among the following five types:

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Alternative Sources

A demonstration was conducted to assess whether the SSLs of arsenic at MW-1805 and MW-1922D were based on Type IV (Natural Variation) causes and not caused by a release from the BAPs.

2. SUMMARY OF SITE CONDITIONS

Brief descriptions of the site construction, geology, and hydrogeology are provided below.

2.1 Site Construction and Location

The BAP CCR unit consisted of two ponds of roughly equal size (BAP East and BAP West) with a combined surface area of approximately 28 acres. The BAP West had a normal pool area of 14.1 acres and the BAP East had a normal pool area of 13.9 acres (Arcadis 2016). The BAPs were constructed between 1978 and 1980 with a 3-foot-thick clay liner. Removal of CCR and potentially impacted underlying soil from the BAPs to support closure was completed in May 2023. The selected groundwater remedy was initiated in 2023.

Several non-CCR-regulated ponds are located immediately south of the BAPs and, together with the BAPs, form the Site Pond Complex (**Figure 1**). An electrical substation is located northwest of the BAPs. A former Philip Sporn (Sporn) bituminous coal mining facility is located to the west of the BAPs. A 60-acre fly ash pond associated with the former Sporn Power Plant is located to the northeast of the BAPs (**Figure 1**).

2.2 Regional Geology

Beneath the clay liner, the former BAPs are immediately underlain by Quaternary alluvial deposits consisting of clay, silt, sand, and gravel. The unconsolidated alluvial deposits consist of the following two units (Sanborn Head 2020):

- Alternating horizons of clay and clayey silt, with thicknesses ranging from 0 to 30 feet (ft) below ground surface (bgs)
- Sand, generally medium- to coarse-grained, with some gravel horizons, which generally coarsens with depth from about 15 to 100 ft bgs

The unconsolidated alluvial sand and gravel deposits are underlain by bedrock consisting of Pennsylvanian sandstones, shales, limestones, and coal of the Monongahela group (Arcadis 2016). The wells within the corrective action monitoring network are screened in the unconsolidated sand and gravel aquifer, except MW-1805 and MW-1922D, which are both screened in the underlying Monongahela group, which is shown in the boring logs as a combination of sandstone, coal, and shale (**Attachment A**).

2.3 Regional Hydrogeology

Five groundwater pumping wells were installed at the site in 2008 and are currently active (**Figure 1**). The groundwater pumping wells are screened within the unconsolidated sand and gravel aquifer unit. Wells West 1 and East 1 provide cooling water and process water for the site and have pumping capacities of approximately 930 to 950 gallons per minute (gpm) and 550 to 575 gpm, respectively. Historically, wells 4, 5, and 6 are pumped at lower flow rates than West 1 and East 1 and are operated on an intermittent, as-needed basis.

The groundwater flow direction at the site is influenced by operation of the pumping wells. Extraction of groundwater from the production wells depresses groundwater elevations near the wells in the unconsolidated sand and gravel unit and affects the groundwater flow patterns in the vicinity of the BAPs. A groundwater modeling study, included as Appendix C of the Groundwater

Monitoring Well Network Evaluation (Arcadis 2016), was completed to better understand the effect of the pumping wells on groundwater flow under normal conditions (i.e., consistent pumping at wells West 1 and East 1). A potentiometric map generated using these simulated conditions shows that flow is naturally directed toward the Ohio River but is influenced by a cone of depression resulting from operation of the pumping wells (**Attachment B**).

3. ALTERNATIVE SOURCE DEMONSTRATION

The proposed alternative sources for arsenic are described below.

3.1 Proposed Alternative Source

Described below are the ASD evaluation methods, the proposed alternative source of arsenic at MW-1805 and MW-1922D, and the future groundwater sampling requirements.

An initial review of site geochemistry, site historical data, and laboratory quality assurance / quality control (QA/QC) data did not identify alternative sources for arsenic due to Type I (sampling), Type II (laboratory), or Type III (statistical evaluation) issues. A preliminary review of site geochemistry did not identify any Type V (anthropogenic) causes. Therefore, an evaluation was conducted to assess whether the arsenic SSLs can be attributed to natural variation, which is a Type IV cause.

3.1.1 Evidence: Arsenic Distribution

If concentrations of arsenic were higher at the former BAPs than in the wells of interest, it would indicate that the BAPs could be the source. However, the BAP liquids contain lower concentrations of arsenic than the groundwater at the wells of interest, making the former BAPs an unlikely source. Reported concentrations of arsenic in surface water samples collected from the pond in 2016 and 2021 were lower than any concentrations reported in groundwater at MW-1805 and MW-1922D (**Table 1**). In fact, the average BAP arsenic concentrations are two orders of magnitude lower than the average concentration observed at MW-1922D and approximately one order of magnitude lower than the average concentration observed at MW-1805. These observed arsenic distributions indicate that a source other than the BAPs is responsible for the observed concentrations at the wells of interest.

Downgradient sand and gravel aquifer wells MW-1604S, MW-1604D, and MW-1922S are located in the immediate vicinity of bedrock wells MW-1805 and MW-1922D (**Figure 1**). Reported arsenic concentrations in groundwater from these locations are consistently lower than they are in MW-1805 and MW-1922D groundwater (**Figure 2**). If elevated arsenic concentrations were a result of a release from the BAPs, we would expect arsenic concentrations to be higher at wells screened in the more permeable sand and gravel lithology below the BAPs than in the underlying bedrock (**Figure 3**). This assumption is supported by downward vertical gradients that are periodically observed from the sand and gravel aquifer into the underlying bedrock, which could permit groundwater flow from the unconsolidated material into the bedrock under downward gradient conditions (**Table 2**). The lack of elevated arsenic in shallow sand and gravel aquifer monitoring wells suggests that an alternative source of arsenic is impacting deeper bedrock wells MW-1805 and MW-1922D.

3.1.2 Evidence: Bedrock Sampling and Analyses

Analyses of bedrock samples from MW-1805 and MW-1922D indicate that arsenic is present in the solid phase of the screened interval of both wells. Mineralogical analyses of these samples revealed the presence of a suite of minerals known to be associated with arsenic. These aquifer materials represent an alternative natural source of arsenic to groundwater, because groundwater must interact with these aquifer solids before entering the monitoring wells of interest.

Bedrock samples were collected on December 21, 2022, from cores collected during the prior installation of MW-1805 and MW-1922D. Four samples were collected from the screened interval of MW-1805 and two samples were collected from the screened interval of MW-1922D. The sample depths and associated lithologies, as documented in the boring logs (**Attachment A**) for each bedrock sample, are provided on **Table 3**. The samples were submitted for analyses of total arsenic; mineralogy analysis via X-ray diffraction (XRD); bulk geochemistry analysis via X-ray fluorescence (XRF); and scanning electron microscopy (SEM) analysis with energy-dispersive X-ray spectroscopy (EDX). The laboratory report for total arsenic analyses is provided as **Attachment C**. The laboratory analytical report for the XRD, XRF, and SEM-EDX analyses is provided as **Attachment D**.

Arsenic was detected in all bedrock samples analyzed, with reported concentrations ranging from 2.9 milligrams of arsenic per kilogram of rock (mg/kg) to 56 mg/kg (**Table 3**). Arsenic concentrations exceeding 50 mg/kg were found to be associated with shale and coal lithologies observed within the screened interval of MW-1805 (122 and 128 ft bgs, respectively). All samples analyzed were collected from rock core taken from the screened interval of both monitoring wells; therefore, groundwater samples from MW-1805 and MW-1922D enter these wells through aquifer material that contains appreciable arsenic concentrations within the solid phase.

Elevated arsenic concentrations in MW-1805 bedrock is attributed to the presence of coal- and iron-bearing minerals that were identified within the bedrock solids via XRD and SEM analyses (**Table 4**). Arsenic is often associated with coal (Yudovich and Ketris 2005). Based on lithologic descriptions (**Attachment A**), coal comprises the amorphous component (84 percentage by weight [wt.%] of the total sample) of the MW-1805 sample collected from 128 ft bgs. Ferrous (Fe^{2+}) iron minerals pyrite and siderite were also observed in MW-1805 samples (**Table 4**). Pyrite is an iron-sulfide mineral known to be commonly associated with arsenic via co-precipitation processes (Brannon and Patrick 1987, Moore et al. 1988, O'Day et al. 2004). Pyrite was detected in every sample collected from MW-1805, at abundances up to 4 wt.% (**Table 4; Figure 4**). Siderite, an iron-carbonate mineral, was reported in three of the four samples collected from MW-1805 (**Table 4; Figure 5**).

Previous ASDs completed for arsenic at MW-1805 and MW-1922D proposed iron mineral thermodynamic instability and dissolution as a likely mechanism for elevated aqueous arsenic concentrations (Geosyntec 2022, Geosyntec 2023b). Ferrous (Fe^{2+}) iron minerals such as sulfides (pyrite) and carbonates (siderite) are capable of sequestering arsenic through sorption and/or co-precipitation (Gross and Low 2013). Dissolution or alteration of these minerals due to changing oxidation-reduction (redox) conditions would trigger dissolution of adsorbed and/or co-precipitated arsenic. This hypothesis is supported by thermodynamic modeling, which indicates that MW-1805 groundwater typically plots near the stability boundaries between soluble iron and insoluble iron oxide ($\text{Fe}(\text{OH})_3$), siderite, and pyrite (**Figure 6**). XRD and SEM-EDX findings verify the presence of both siderite and pyrite in MW-1805 samples, supporting the conclusion that dynamic equilibrium conditions exist within MW-1805 groundwater.

Under the dynamic equilibrium conditions described above, arsenic concentrations in MW-1805 groundwater would be expected to correlate strongly with dissolved iron concentrations because arsenic would mobilize from iron minerals as they dissolve or alter. Total arsenic concentrations and dissolved iron concentrations fluctuate in a similar manner, suggesting that this arsenic-iron relationship occurs at MW-1805 (**Figure 7**), and the correlation between these parameters is very

strong (R^2 value of 0.93) (**Figure 8**). Further, the arsenic concentration changes correlate strongly with changes in oxidation-reduction potential (ORP) (**Figure 9**). These relationships indicate that aqueous arsenic concentrations at MW-1805 are strongly linked to redox changes, and they support the proposed mechanism of arsenic association with iron minerals and subsequent mobilization of arsenic as iron minerals dissolve or alter.

While coal, pyrite, and siderite were not detected in the XRD or SEM analyses for MW-1922D, arsenic in MW-1922D bedrock is attributable to the presence of mica/clay minerals and iron oxyhydroxide minerals.

A potential source of arsenic to groundwater within the screened interval of MW-1922D is the chemical weathering of mica grains to clay minerals. Previous studies have shown that mica separates from sandstone samples can contain up to five times the amount of solid-phase arsenic as the remainder of the bulk sample (Dowling et al. 2002). Chemical weathering of mica grains to secondary clay mineral cements (a common diagenetic reaction in sandstones) would result in dissolution of arsenic from the crystal structure of micas and/or from sorption sites on mica surfaces.

These mechanisms have been invoked as processes responsible for high concentrations of aqueous arsenic sources in some aquifers (Dowling et al. 2002, Raju 2022). SEM imaging of the 104.5 ft bgs sample from MW-1922D revealed the presence of mica grains that appear to be frayed and experiencing exfoliation along layer planes (**Figure 10**), two common indicators of chemical weathering in micas.

Further support of chemically weathered mica is provided by the presence of secondary clay minerals (kaolinite), which are abundant throughout the sample and appear to be precipitating immediately adjacent to mica grains (**Figure 10**). Kaolinite is a known weathering product of mica and frequently precipitates immediately adjacent to mica grains (Singh and Gilkes 1991, Robertson and Eggleton 1991).

Another potential source of arsenic in MW-1922D bedrock is iron oxyhydroxide minerals. Iron-oxide and oxyhydroxide minerals hematite and goethite were both detected in the MW-1922D sample collected from 111 ft bgs (**Table 4**). Arsenic association with iron-oxide and oxyhydroxide minerals is well documented (Welch et al. 2000).

3.2 Sampling Requirements

This ASD indicates that the arsenic SSLs are not due to a release from the Mountaineer BAPs. Therefore, a corrective measures assessment for arsenic is not necessary. Groundwater monitoring at the unit will continue in accordance with the Corrective Action Monitoring Plan (Sanborn Head 2022).

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 40 CFR 257.95(g)(3)(ii) and supports the position that the SSLs for arsenic identified during corrective action monitoring in May 2023 were not due to a release from the BAPs. Instead, the arsenic SSLs should be attributed to natural variation in the underlying geology. Therefore, no further action for arsenic is warranted and the BAPs will continue corrective action groundwater monitoring due to the presence of elevated lithium concentrations, in accordance with 40 CFR 257.98(a)(1). Certification of this ASD by a qualified professional engineer is provided in **Attachment E**.

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TABLES

**Table 1 - Arsenic Groundwater and Pond Water Summary Table
Mountaineer Bottom Ash Ponds**

Location	Sample ID	Sample Date	Total Arsenic (µg/L)	Average Arsenic (µg/L)
BAP (East)	EBAP	6/15/2016	1.69	1.8
	EBAP	6/21/2016	2.35	
	EBAP	8/24/2016	2.86	
	EBAP	12/7/2016	2.44	
	BAP (East)-20210329	3/29/2021	0.67	
	BAP (East)-20210518	5/18/2021	0.79	
BAP (West)	WBAP IN	6/15/2016	8.6	6.65
	WBAP MID	6/15/2016	5.49	
	WBAP Out	6/15/2016	5.27	
	WBAP IN	6/21/2016	8.47	
	WBAP MID	6/21/2016	5.9	
	WBAP OUT	6/21/2016	5.45	
	WBAP IN	8/24/2016	7.65	
	WBAP MID	8/24/2016	6.73	
	WBAP OUT	8/24/2016	5.81	
	WBAP IN	12/7/2016	8.43	
	WBAP MID	12/7/2016	8.25	
	WBAP OUT	12/7/2016	7.86	
	BAP (West)-20210329	3/29/2021	4.39	
	BAP (West)-20210518	5/18/2021	4.85	
MW-1805	MW-1805-20190410	4/10/2019	20.3	41.5
	MW-1805-20190619	6/19/2019	66.3	
	MW-1805-20190910	9/10/2019	70.4	
	MW-1805-20200310	3/10/2020	11.4	
	MW-1805-20200514	5/14/2020	56	
	MW-1805-20201009	10/9/2020	80.9	
	MW-1805-20210325	3/25/2021	74.2	
	MW-1805-20210519	5/19/2021	69.5	
	MW-1805-20211026	10/26/2021	37.3	
	MW-1805-20220302	3/2/2022	19.4	
	MW-1805-20220520	5/20/2022	10.9	
	MW-1805-20221104	11/4/2022	40.2	
	MW-1805-20230214	2/14/2023	15.2	
	MW-1805-20230522	5/22/2023	8.77	
MW-1922D	MW-1922D-20190409	4/9/2019	323	604
	MW-1922D-20190619	6/19/2019	716	
	MW-1922D-20190910	9/10/2019	839	
	MW-1922D-20200311	3/11/2020	1240	
	MW-1922D-20200519	5/19/2020	522	
	MW-1922D-20201008	10/8/2020	1040	
	MW-1922D-20210325	3/25/2021	546	
	MW-1922D-20210520	5/20/2021	494	
	MW-1922D-20211027	10/27/2021	456	
	MW-1922D-20220303	3/3/2022	478	
	MW-1922D-20220523	5/23/2022	562	
	MW-1922D-20221104	11/4/2022	384	
	MW-1922D-20230215	2/15/2023	443	
	MW-1922D-20230522	5/22/2023	408	

Notes:

All results are shown in micrograms per liter (µg/L).

BAP - Bottom Ash Pond

**Table 2 - Vertical Gradient Calculations
Mountaineer Bottom Ash Ponds**

Geosyntec Consultants

Date	Groundwater Elevation			MW-1922S to MW-1922D			MW-1922S to MW-1805		
	MW-1805	MW-1922D	MW-1922S	Head Change (ft)	Vertical Gradient		Head Change (ft)	Vertical Gradient	
4/8/2019	-	547.7	547.89	0.19	0.00634	down	-	-	-
6/17/2019	546.45	549	547.86	-1.14	-0.0381	up	1.41	0.0272	down
9/9/2019	545.02	477.42	507.82	-	-	-	-	-	-
3/9/2020	-	545.57	545.52	-0.05	-0.00167	up	-	-	-
5/12/2020	546.88	546.98	546.96	-0.02	-0.00067	up	0.08	0.0015	down
10/5/2020	544.85	544.96	544.99	0.03	0.00100	down	0.14	0.0027	down
3/18/2021	543.38	543.48	543.42	-0.06	-0.00200	up	0.04	0.0008	down
5/12/2021	533.27	543.31	543.31	0.00	0.00000	-	-	-	-
10/25/2021	542.33	542.21	542.3	0.09	0.00300	down	-0.03	-0.0006	up
2/28/2022	542.63	542.71	542.62	-0.09	-0.00300	up	-0.01	-0.0002	up
5/16/2022	544.53	544.57	544.44	-0.13	-0.00434	up	-0.09	-0.0017	up
10/31/2022	543.18	543.29	543.22	-0.07	-0.00234	up	0.04	0.0008	down
5/19/2023	542.92	542.96	542.83	-0.13	-0.00434	up	-0.09	-0.0017	up
Top of Screen Elevation	469.049	491.016	520.972						
Middle of Screen Elevation	464.05	486.02	515.97						
Bottom of Screen Elevation	459.05	481.02	510.97						
Length to MW-1922S Screen	51.92	29.95	-						

Notes:

Anomalous groundwater elevations were excluded from calculations - MW-1922D and MW-1922S from September 2019, MW-1805 from May 2021. Groundwater elevation data was generated by Arcadis and provided to Geosyntec.

**Table 3 - Bedrock Sampling Details and Arsenic Concentrations
Mountaineer Bottom Ash Ponds**

Monitoring Well	Depth of Well	Screened Interval	Sample Depth	Arsenic (mg/Kg)	Geologic Material Sampled
MW-1805	133.5	123.5-133.5	122	55 B	Dark grey laminated silty clay shale
			124.5	4.6 B	Light grey sandstone
			128	56 B	Black coal with pyritic clay-rich zones
			130.5	2.9 B	Dark grey fractured silty clay shale
MW-1922D	113.5	103.5-113.5	104.5	4.5 B	Grey sandstone
			111	5.2 B	Grey sandstone

Notes:

Samples were collected on December 21, 2022 from previously drilled core associated with monitoring well installation

All depths are shown in units of feet below ground surface

Geologic descriptions included in the table were taken from field boring logs and verified during sample collection in December 2022

B: Compound was found in the blank and sample. Method blank detections were less than 10% of the reported sample values and are not expected to affect data quality.

Table 4 - Summary of X-Ray Diffraction Results
Alternative Source Demonstration Report
Mountaineer Bottom Ash Ponds

Well ID			MW-1805	MW-1805	MW-1805	MW-1805	MW-1922D	MW-1922D
Depth (ft bgs)			122	124.5	128	130.5	104.5	111
Boring Log Description			Silty Clay Shale	Sandstone	Coal with clay-rich zones	Silty Clay Shale	Sandstone	Sandstone
Mineral/Compound	Formula	Mineral Type	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)
Quartz	SiO ₂	Silicate	24.0	73.0	4.0	32.0	86.0	85.0
Plagioclase	(Na,Ca)AlSi ₃ O ₈	Feldspar	5.0	7.0	-	7.0	4.0	3.0
Potassium-Feldspar	KAlSi ₃ O ₈	Feldspar	1.0	8.0	-	1.0	1.0	2.0
Calcite	CaCO ₃	Carbonate	<0.5	<0.5	-	-	0.5	-
Siderite	FeCO ₃	Carbonate	2.0	<0.5	-	1.5	-	-
Pyrite	FeS ₂	Sulfide	2.0	<0.5	4.0	0.5	-	-
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄	Clay	11.0	7.5	6.0	10.0	6.0	6.0
Chlorite	(Fe,(Mg,Mn) ₅ ,Al)(Si ₃ Al)O ₁₀ (OH) ₈	Clay	16.0	0.5	-	14.0	-	<0.5
Illite/Mica	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂	Clay/Mica	39.0	4.0	1.0	33.0	2.5	3.0
Mixed-Layer Illite/Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂	Clay	2.0	-	1.0	1.0	<0.5	-
Goethite	FeO(OH)	Oxyhydroxide	-	-	-	-	-	0.5
Hematite	Fe ₂ O ₃	Oxide	-	-	-	-	-	0.5
Amorphous Material			-	-	84.0	-	-	-
Clay & Mica Total			68	12	8	58	9	10

Notes

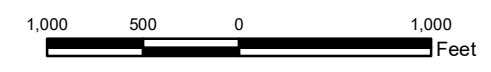
1. The weight percent quantities indicated have been normalized to a sum of 100%
 2. Sample depths are shown in feet below ground surface (ft bgs).
- : Mineral was not detected above the detection limit
<X: Mineral was detected below quantification limit
wt %: Weight percentage

FIGURES

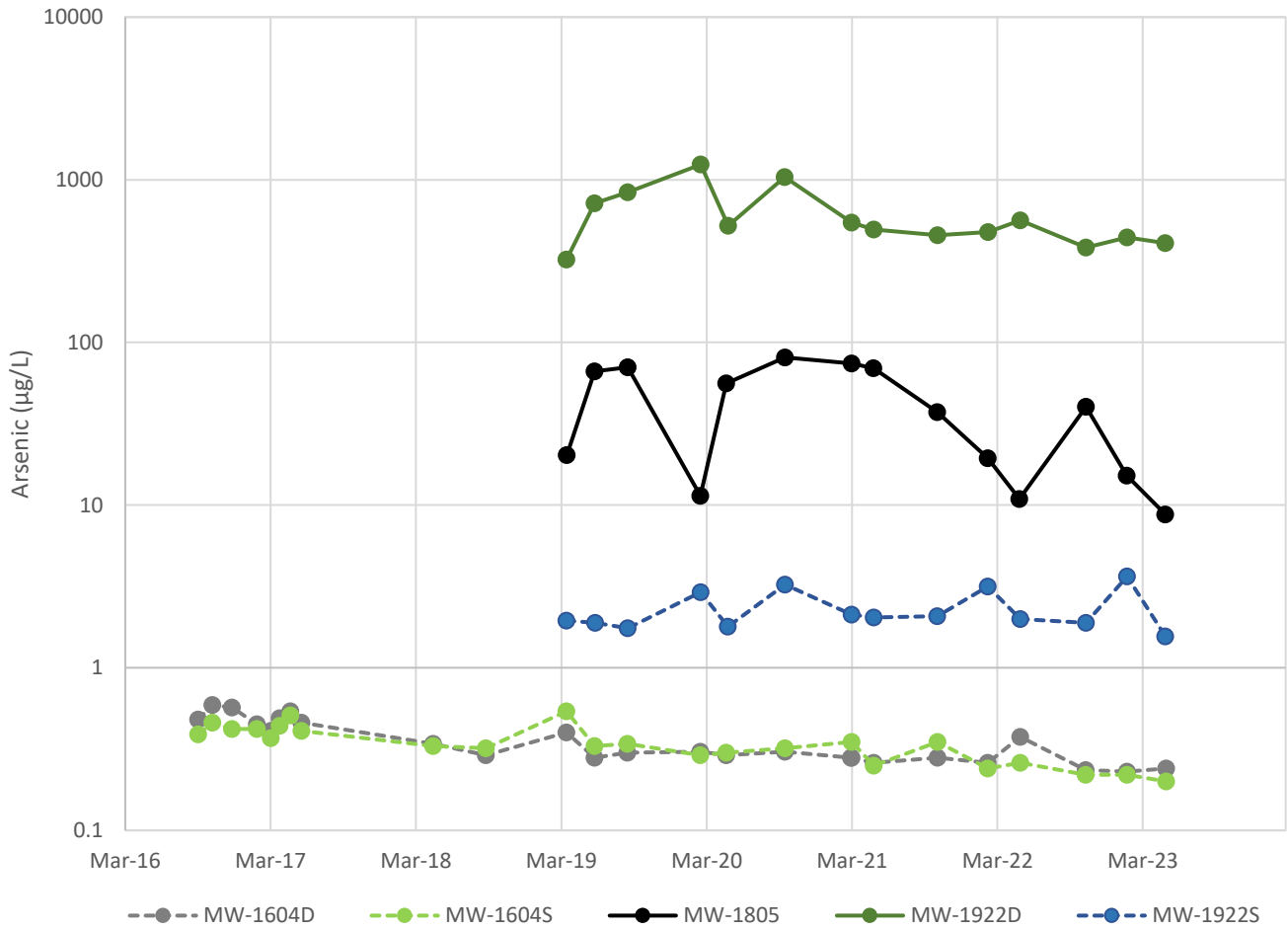


- Legend**
- ◆ CCR Network Monitoring Wells
 - ◆ Nature and Extent Monitoring Wells
 - ⊕ Piezometer
 - ▲ AEP-Owned Pumping Well
 - Groundwater Elevation Contour
 - - - Groundwater Elevation Contour (Inferred)
 - ➔ Approximate Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on May 19, 2023) provided by AEP.
 2. Site features based on information available in Ash Pond System-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
 3. Groundwater elevation units are feet above mean sea level.
 4. Only monitoring wells were used to generate groundwater contours. Water elevations were not collected for the pumping wells.
 5. No groundwater was present at MW-1928 and MW-112 during the May 2023 sampling event.
 6. Normal lower pool elevation of the Ohio River at Racine Lock and Dam is 539.5 ft amsl (USACE).
 6. Intermittent use of AEP-owned pumping wells for plant activities impact water levels in the vicinity. In general, shallow groundwater beneath the plant flows northeast toward the Ohio River.
- CCR: Coal combustion residuals
 USACE: United States Army Core of Engineers



Potentiometric Surface Map - Uppermost Aquifer May 2023	
Mountaineer Bottom Ash Ponds	
	Figure 1
Columbus, Ohio	May 2023



Notes: Wells screened in the unconsolidated sand and gravel lithology are shown with dashed lines. Wells screened in bedrock are shown with solid lines. Arsenic concentrations in micrograms per liter (µg/L) are shown on a log scale.

Arsenic Time Series Graph

Mountaineer Bottom Ash Ponds

Geosyntec
consultants



Figure
2

Columbus, Ohio

November 2023

MW1603

897 ft

MW1604S/D

212 ft

MW1805
MW1922S/D

726 ft

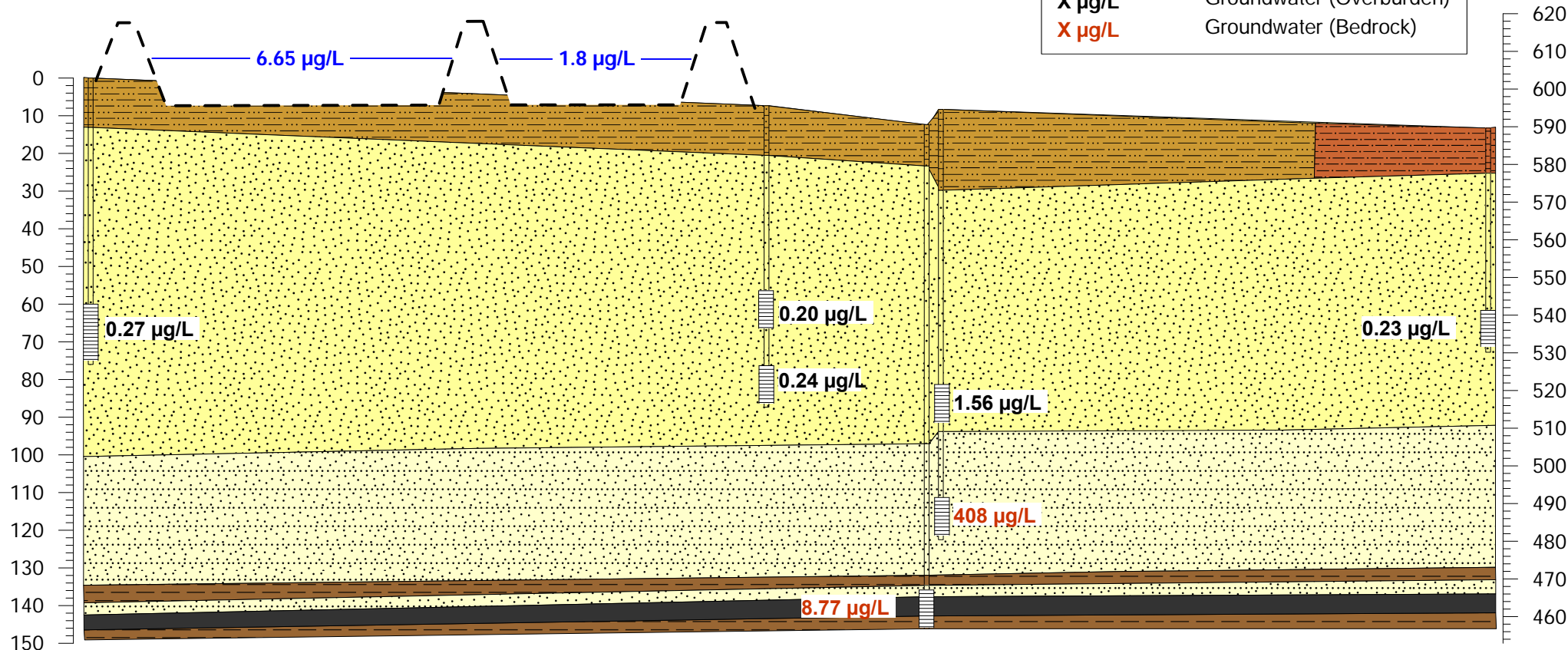
MW1925

Bottom Ash Pond West

Bottom Ash Pond East

Key: (Analytical Data)

- X µg/L Pond Water
- X µg/L Groundwater (Overburden)
- X µg/L Groundwater (Bedrock)



Lithology

Overburden		Bedrock	
	CLAY		SANDSTONE
	GRAVEL		SILT
	COAL		SAND
	SHALE		

Well Construction

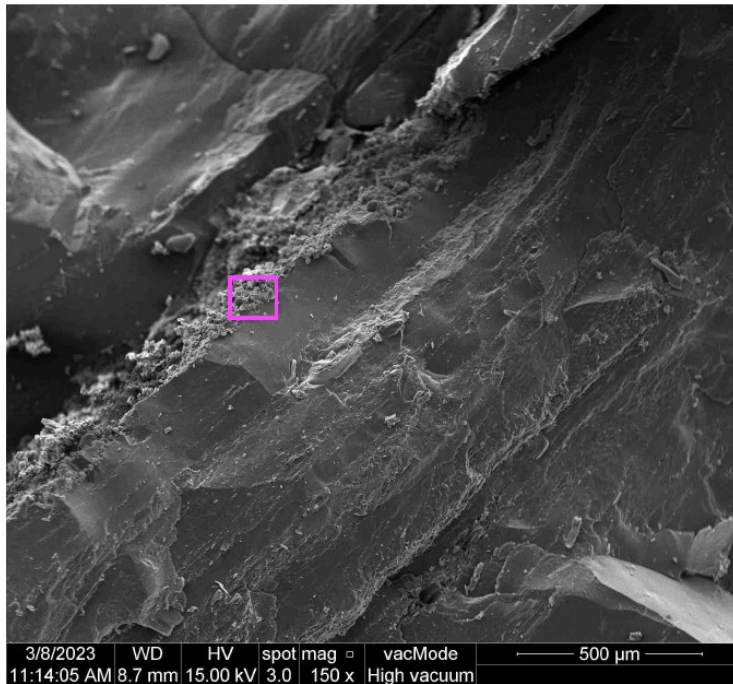
- Screen
- Ash Pond Extent
- Ash Pond Water Level

- Notes:
- Scale is approximate; all units of length are in feet.
 - Vertical exaggeration is 5x.
 - This section was created using widely spaced boreholes; thus, all interpretation away from borehole locations should be considered an approximate representation.
 - Groundwater arsenic concentration values are from samples collected in May of 2023.
 - Ash pond extents and depths are approximate and projected from out of the plane of section. Extents do not represent constructed dimensions.
 - Pond water results are averaged from samples collected in 2016 and 2021.

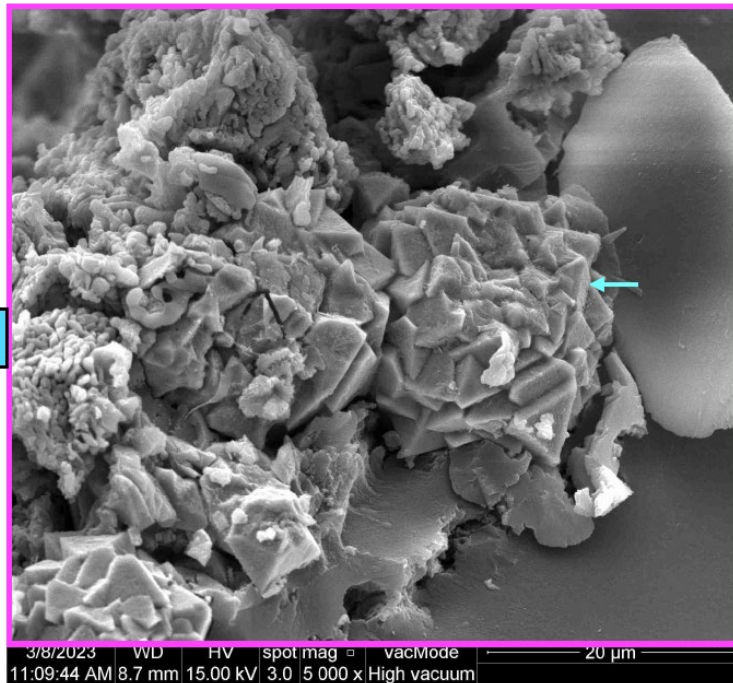
Cross Section With Arsenic Concentrations
Mountaineer Bottom Ash Ponds



23009-03C 150X



23009-03D 5000X



Notes: Sample was collected from a depth of 128 feet below ground surface from MW-1805 core. Scanning electron microscope (SEM) instrument settings are indicated at the bottom of each micrograph. The lower micrograph displays a magnified image of the area within the purple box on the top micrograph. Pyrite is denoted by the blue 'P' and blue arrow on the bottom micrograph.

Pyrite Occurrence in MW-1805 Bedrock
Mountaineer Bottom Ash Ponds

Geosyntec
consultants

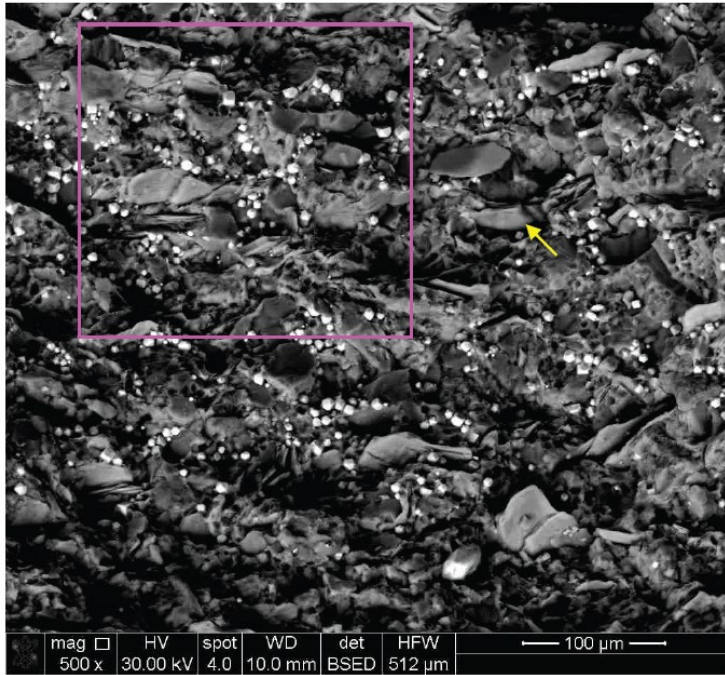


Figure
4

Columbus, Ohio

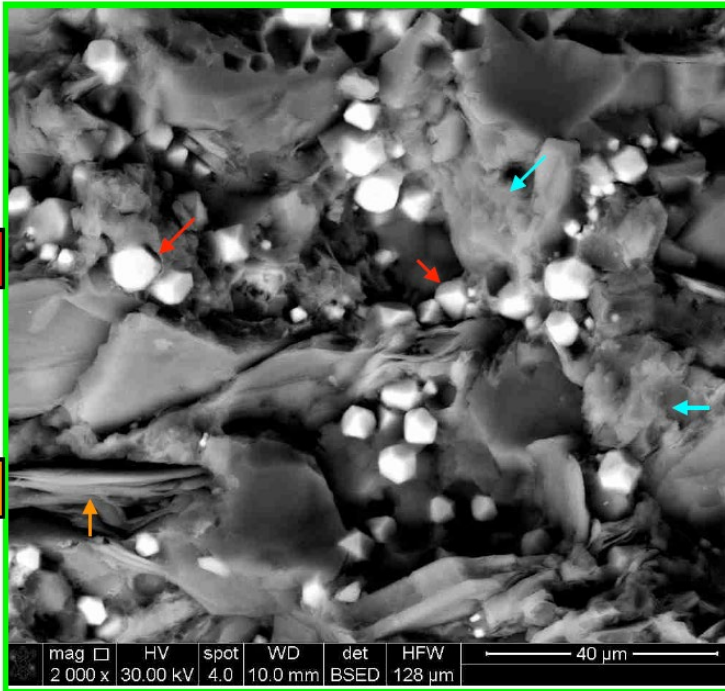
November 2023

23009-04B 500X



Q

23009-04D 1000X



S

M

DM

Notes: Sample was collected from a depth of 130.5 feet below ground surface from MW-1805 core. Scanning electron microscope (SEM) instrument settings are indicated at the bottom of each micrograph. Siderite is denoted by the red 'S' and red arrows in the bottom micrograph and is evident in the top micrograph as high-contrast 'bright' crystals interspersed throughout the sample. Mica is denoted by the orange 'M,' detrital clay matrix material is denoted by the green 'DM,' and quartz is denoted by the yellow 'Q.'

Siderite Occurrence in MW-1805 Bedrock
Mountaineer Bottom Ash Ponds

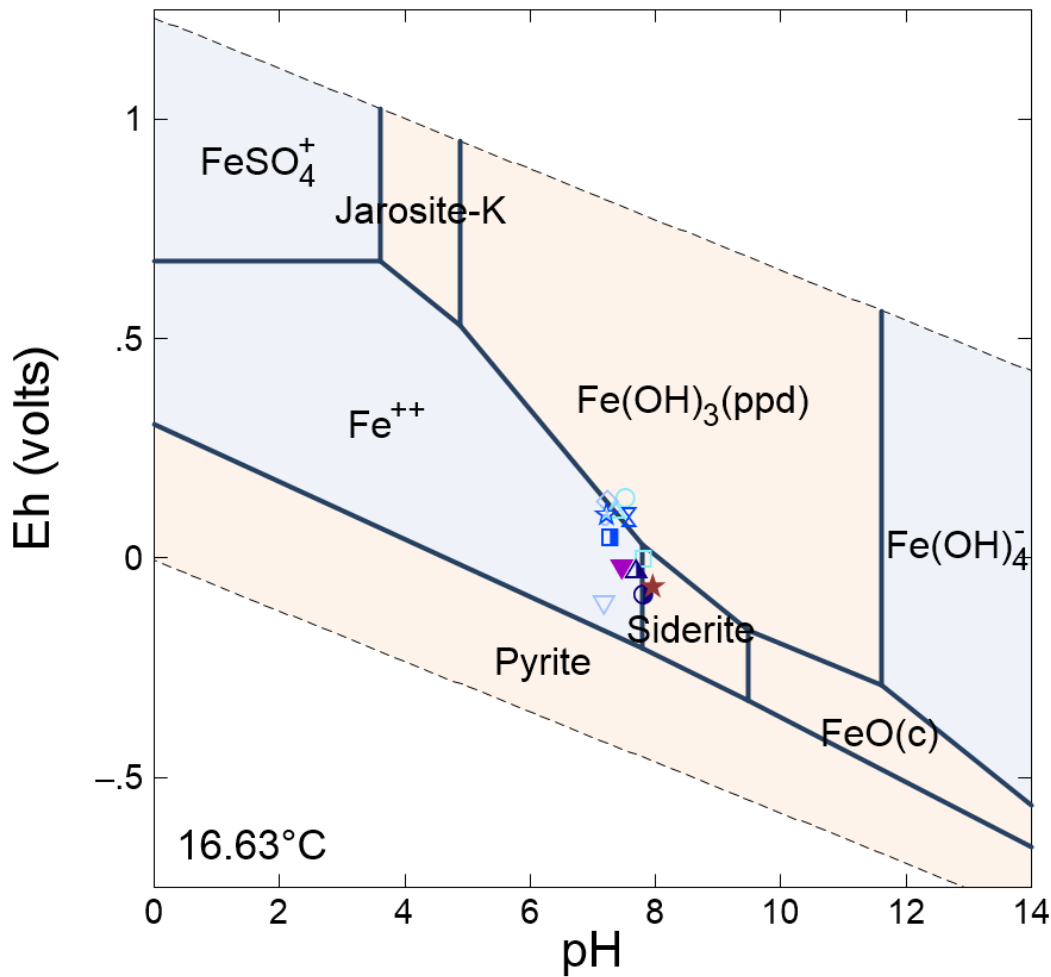
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consultants



Figure
5

Columbus, Ohio

November 2023



- 10-Apr-19
- 19-Jun-19
- △ 10-Sep-19
- ▽ 10-Mar-20
- ◇ 14-May-20
- 09-Oct-20
- ⊗ 25-Mar-21
- ☆ 19-May-21
- 26-Oct-21
- 02-Mar-22
- ▲ 20-May-22
- ▼ 04-Nov-22
- ★ 14-Feb-23

Notes: Eh-pH diagram generated with averaged data from all MW-1805 sampling events. The May 2023 sampling event was excluded from the plot as an outlier due to a field-measured oxidation-reduction potential value of 122.9 millivolts, which corresponds to an Eh value of 0.33 volts.

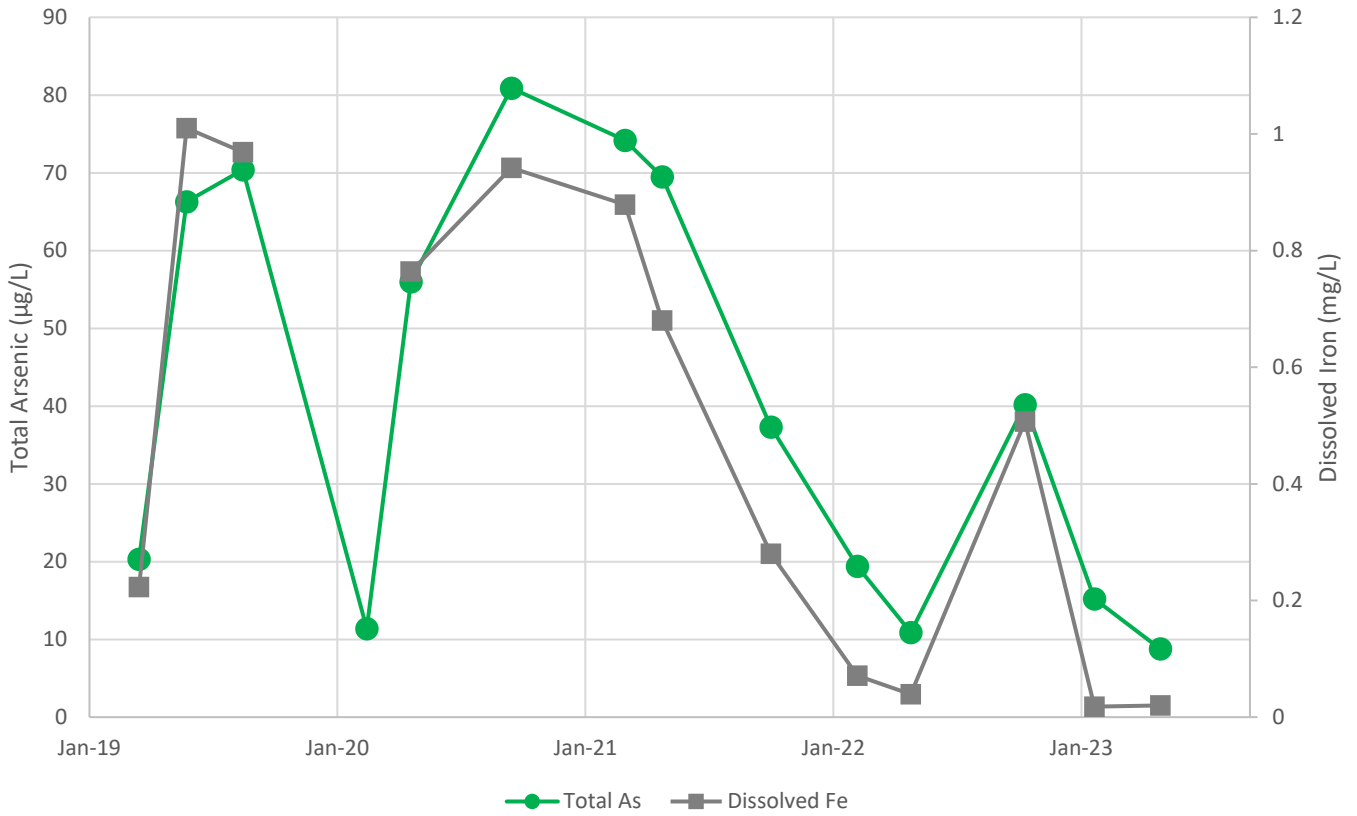
MW-1805 Iron Eh-pH Diagram
 Mountaineer Bottom Ash Ponds



Figure
6

Columbus, Ohio

November 2023



Notes: Samples submitted for arsenic analyses were not filtered. Samples submitted for dissolved iron analyses were field filtered prior to sample collection. Arsenic is shown in units of micrograms per liter (µg/L). Dissolved iron is shown in units of milligrams per liter (mg/L).

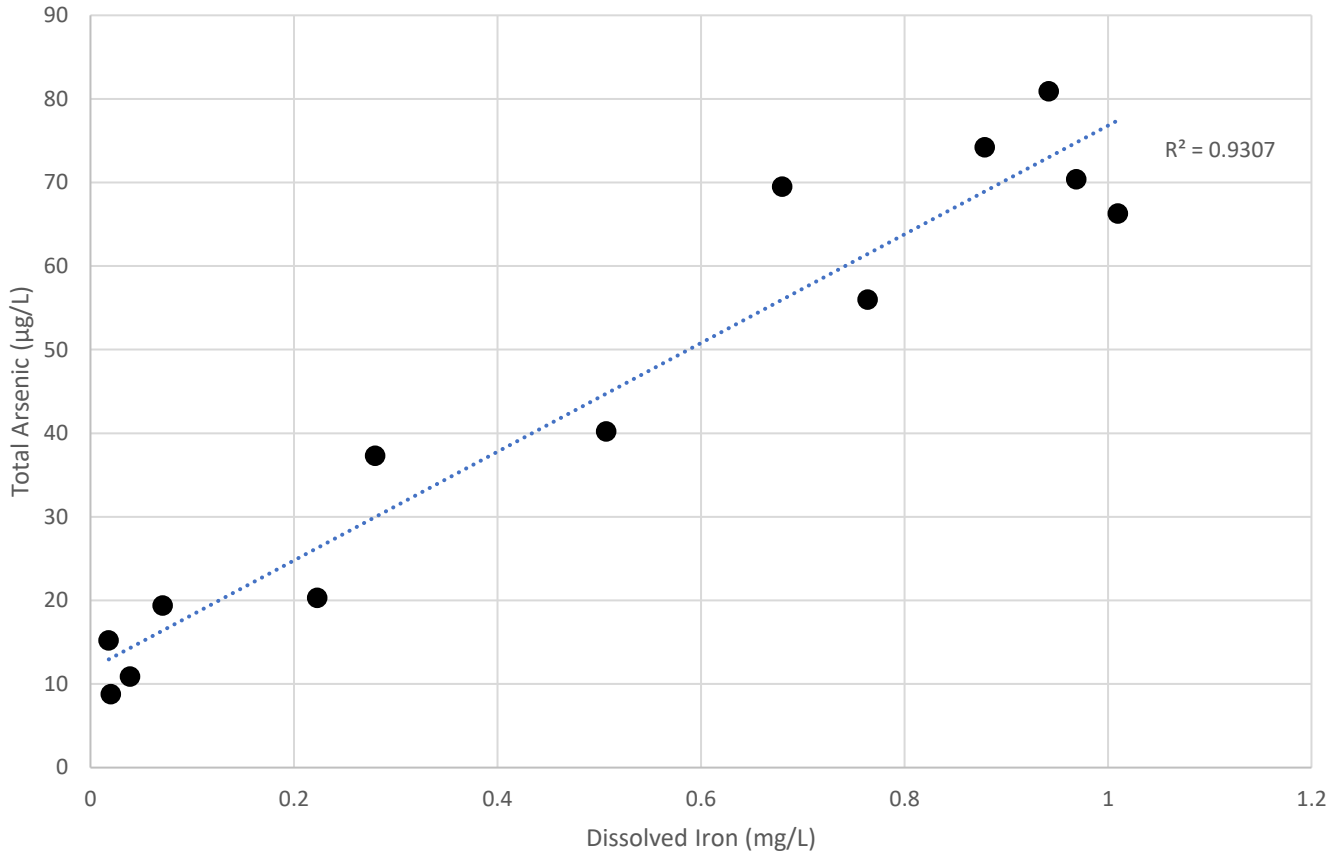
MW-1805 Arsenic and Dissolved Iron Time Series Graph
Mountaineer Bottom Ash Ponds



Figure
7

Columbus, Ohio

November 2023



Notes: Samples submitted for arsenic analyses were not filtered. Samples submitted for dissolved iron analyses were field filtered prior to sample collection. Arsenic is shown in units of micrograms per liter (µg/L). Dissolved iron is shown in units of milligrams per liter (mg/L).

MW-1805 Arsenic and Dissolved Iron Scatterplot

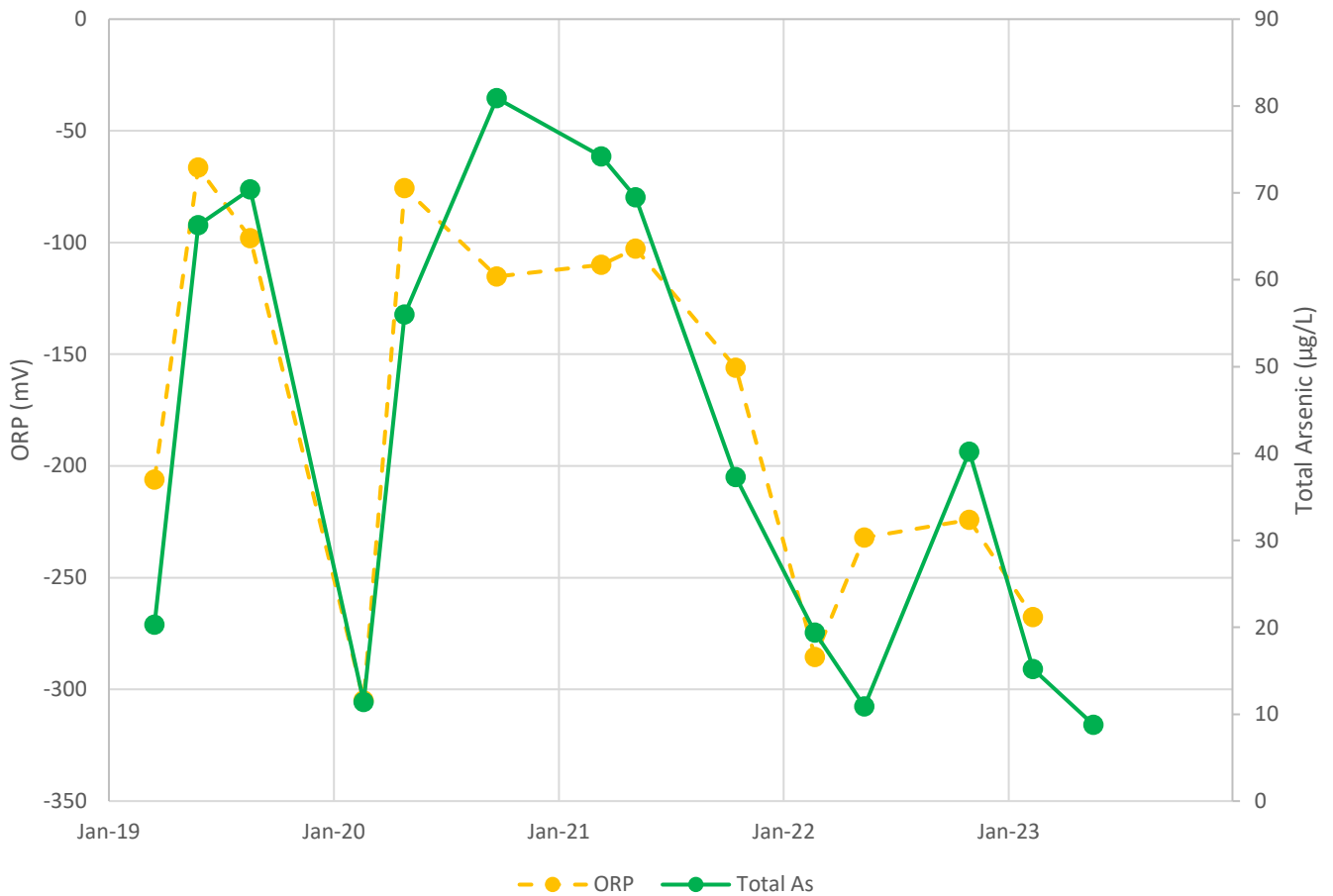
Mountaineer Bottom Ash Ponds



Figure 8

Columbus, Ohio

November 2023



Notes: Oxidation-reduction potential (ORP) was measured in the field during sample collection. Samples submitted for arsenic analyses were not filtered. ORP is shown in units of millivolts (mV). Arsenic concentrations are shown in units of micrograms per liter (µg/L). May 2023 ORP value of 122.9 was excluded as an outlier.

MW-1805 Arsenic and ORP Time Series Graph

Mountaineer Bottom Ash Ponds

Geosyntec
consultants

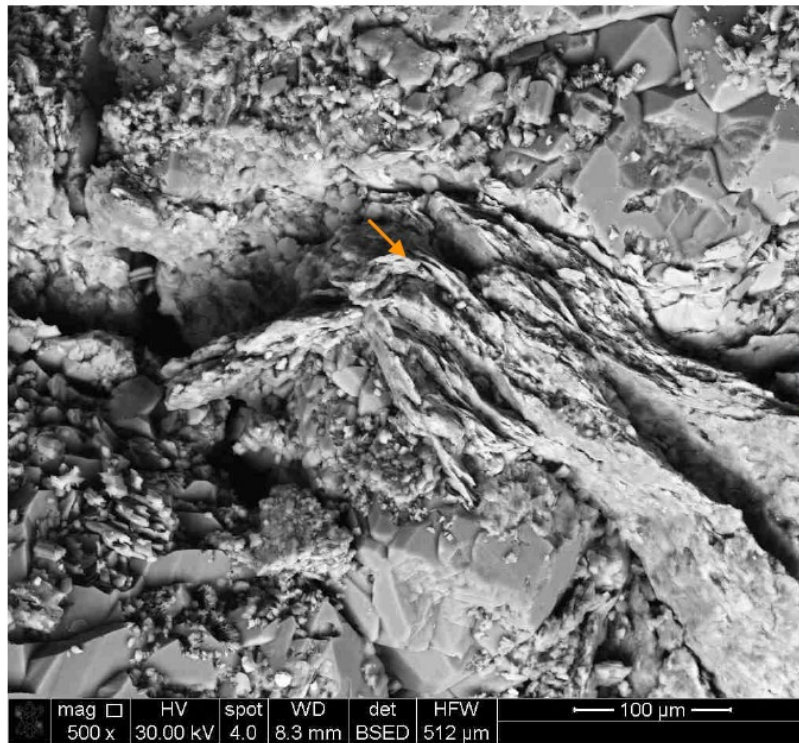


Figure
9

Columbus, Ohio

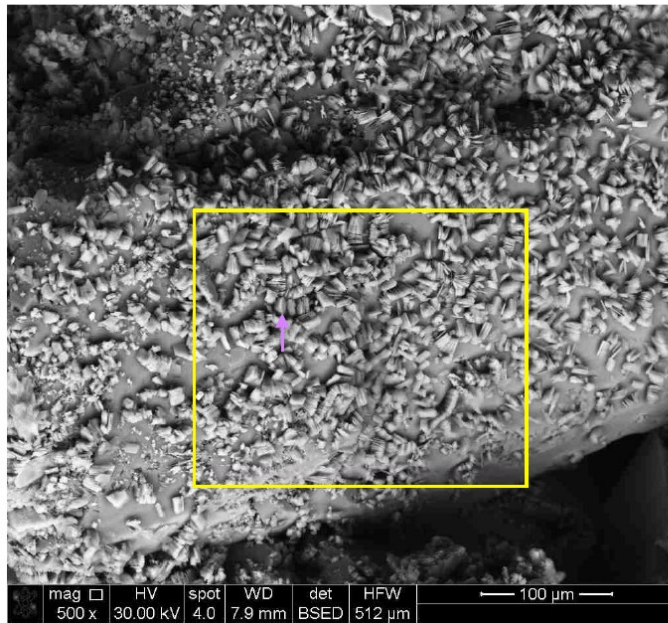
November 2023

23009-05C 500X



M

23009-05E 500X



K

Notes: Sample was collected from a depth of 104.5 feet below ground surface from MW-1922D core. Scanning electron microscope (SEM) instrument settings are indicated at the bottom of each micrograph. Micaceous shale is indicated by the orange 'M' and orange arrow. Partial exfoliation of the mica sheets as well as secondary clay mineral formation immediately adjacent to mica sheets suggests chemical weathering of mica to clays. The bottom micrograph shows prevalent secondary clay mineral formation (kaolinite) within open pore space.

Mica Weathering in MW-1922D Bedrock
Mountaineer Bottom Ash Ponds

Geosyntec
consultants



Figure
10

Columbus, Ohio

November 2023

ATTACHMENT A

MW-1805 and MW-1922D Boring Logs



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	36.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\4300S\4345.00\WORK\LOGS\4345.00 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1 GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log		
0									
2									
4									
5 - 6.5		S-01	5 - 6.5	2 2 3	18/18	PID: NM	SILT & CLAY	S-01 (5 to 6.5'): Medium stiff, reddish brown, SILT & CLAY, seam of fine Sand. Moist.	
10									
10 - 11.5		S-02	10 - 11.5	2 2 4	18/18	PID: NM	CLAYEY SILT	S-02A (10 to 11'): Medium stiff, reddish brown, Clayey SILT. Moist. S-02B (11 to 11.5'): Loose, reddish brown, fine to coarse SAND, some Silt. Moist.	
12									
14									
15 - 16.5		S-03	15 - 16.5	2 2 2	18/14	PID: NM	FINE TO COARSE SAND	S-03 (15 to 16.5'): Very loose, brown, fine SAND, little Silt. Moist. Stratified at approximately 16 feet.	
18									
20									
20 - 21.5		S-04	20 - 21.5	8 12 12	18/12	PID: NM		S-04 (20 to 21.5'): Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
22									
24									



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings		Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
Date	Time					
06/22/18	07:00	38.7'	Ground Surface	0'	133.8'	- 14 hours

BORING LOG P:\4300S\4345.00\WORK\LOGS\M345.00 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log Description		
26		S-05	25 - 26.5	4 7 8	18/10	PID: NM		S-05 (25 to 26.5'): Medium dense, brown fine to coarse SAND, little Gravel, trace Silt. Moist.	
30		S-06	30 - 31.5	4 15 10	18/11	PID: NM		S-06 (30 to 31.5'): Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
36		S-07	35 - 36.5	4 4 7	18/9	PID: NM		S-07 (35 to 36.5'): Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
38		S-08	36.5 - 38.5	4 6 8 8	24/11	PID: NM	FINE TO COARSE SAND	S-08 (36.5 to 38.5'): Medium dense, brown/black, fine to coarse SAND, trace Silt. Moist.	
40		S-09	38.5 - 40.5	3 5 5 7	24/12	PID: NM		S-09 (38.5 to 40.5'): Loose, brown/black, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
42		S-10	40.5 - 42.5	3 6 5 7	24/13	PID: NM		S-10 (40.5 to 42.5'): Medium dense, brown/black, fine to coarse SAND, trace Gravel, trace Silt. Moist.	
44		S-11	42.5 - 44.5	3 4 8 7	24/0	PID: NM		S-11 (42.5 to 44.5'): No recovery.	
46		S-12	44.5 - 46.5	7 8 3 8	24/4	PID: NM		S-12 (44.5 to 46.5'): Loose, brown, fine to medium SAND, trace Silt. Wet.	
48		S-13	46.5 - 48.5	2 3 6 8	24/11	PID: NM		S-13 (46.5 to 48.5'): Loose, brown, fine to coarse SAND, trace Silt. Wet.	
50		S-14	48.5 - 50.5	1 3 5 7	24/11	PID: NM		S-14 (48.5 to 50.5'): Loose, brown, fine to medium SAND, trace Silt. Wet.	



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	38.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\4300S\4345.00\WORK\LOGS\M4345 00 LOGS GP.J 2017 SANBORN HEAD V1 GLB 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information					Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description		
50		S-15	50.5 - 52	3 5 7	18/9	PID: NM			S-15 (50.5 to 52'): Medium dense, brown, fine to coarse SAND, little Silt. Wet.	At S-15 switch to 3 inch split spoon (18 inches long) from 2 inch split spoon (24 inches long) to increase sample volume.
52		S-16	52 - 53.5	1 3 5	18/0	PID: NM		S-16 (52 to 53.5'): No recovery.		
54		S-17	53.5 - 55	1 6 10	18/6	PID: NM		S-17 (53.5 to 55'): Medium dense, brown, fine to coarse SAND, trace Silt. Wet.		
56		S-18	55 - 56.5	2 4 7	18/7	PID: NM			S-18 (55 to 56.5'): Medium dense, grayish brown, fine to coarse SAND, trace Silt. Wet.	
58		S-19	56.5 - 58	1 3 7	18/0	PID: NM			S-19 (56.5 to 58'): No recovery.	
60		S-20	58 - 59	NM	12/18	PID: NM			S-20 (58 to 59'): Brown, fine to coarse SAND, little Silt, trace Gravel. Wet.	S-20 sampled by Shelby tube, no recovery and refusal after 1 foot Then collected with 2 inch split spoon and switch to 2 inch split spoon after S-20.
62		S-21	59 - 60.5	3 8 6	18/14	PID: NM			S-21 (59 to 60.5'): Medium dense, brown, fine to coarse SAND, little Silt, trace Gravel. Wet. Seam black fine to medium SAND at 60 feet.	
64		S-22	60.5 - 62	6 7 11	18/22	PID: NM			S-22 (60.5 to 62'): Medium dense, brown, fine to coarse SAND, little Silt, trace Gravel. Wet.	
66		S-23	62 - 63.5	2 6 9	18/13	PID: NM	FINE TO COARSE SAND		S-23 (62 to 63.5'): Medium dense, brown, fine to coarse SAND, trace Silt, trace Gravel. Wet.	
68		S-24	63.5 - 65	3 5 7	18/12	PID: NM			S-24 (63.5 to 65'): Medium dense, brown, fine to coarse SAND, some Silt. Wet.	
70		S-25	65 - 66.5	3 6 7	18/18	PID: NM			S-25 (65 to 66.5'): Medium dense, brown, fine to medium SAND, little Silt. Wet.	Start introducing Bentonite/water mix due to heaving sands
72		S-26	66.5 - 68	8 11 9	18/18	PID: NM			S-26 (66.5 to 68'): Medium dense, gray/brown, fine to coarse SAND, little Silt, trace Gravel. Wet.	
74		S-27	68 - 69.5	3 6 9	18/14	PID: NM			S-27 (68 to 69.5'): Medium dense, gray, fine to coarse SAND, little Silt, trace Gravel. Wet.	
76		S-28	69.5 - 71	10 11 15	18/15	PID: NM			S-28 (69.5 to 71'): Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt. Wet.	
78		S-29	71 - 72.5	10 13 19	18/11	PID: NM			S-29 (71 to 72.5'): Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt. Wet.	
80		S-30	72.5 - 74	8 12 10	18/11	PID: NM			S-30 (72.5 to 74'): Medium dense, gray, fine to coarse SAND, trace Gravel, trace Silt. Wet.	
82		S-31	74 - 75.5	11 13 14	18/10	PID: NM			S-31 (74 to 75.5'): Medium dense, gray, fine to coarse SAND, little Gravel, trace Silt. Wet.	



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	36.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\43005\4345.00\WORK\LOGS\4345 00 LOGS GP-J 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information					Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (In)	Field Testing Data	Log	Description		
76		S-32	75.5 - 77	8 12 15	18/13	PID: NM	FINE TO COARSE SAND	S-32 (75.5 to 77'): Medium dense, gray/brown, fine to coarse SAND, trace Gravel, trace Silt. Wet.		
78		S-33	77 - 78.5	7 10 14	18/11	PID: NM		S-33 (77 to 78.5'): Medium dense, gray/brown, fine to coarse SAND, trace Gravel, trace Silt. Wet.		
		S-34	78.5 - 80	7 9 10	18/0	PID: NM		S-34 (78.5 to 80'): No recovery.		
80		S-35	80 - 81.5	4 5 12	18/0	PID: NM		S-35 (80 to 81.5'): No recovery.		
82		S-36	81.5 - 83	19 18 17	18/10	PID: NM		S-36 (81.5 to 83'): Dense, brown, fine to coarse SAND, some Gravel, trace Silt. Wet.		
84		S-37	83 - 83.9	17 50/5"	11/10	PID: NM		S-37 (83 to 83.9'): Very dense, brown, fine to coarse SAND, some Gravel, little Silt. Wet. Sandstone in tip.		
	NM	S-38 C-01	84.5 - 84.7 84.7 - 89.3	50/2"	2/7 55/39	PID: NM		84.7'	S-38 (84.5 to 84.7'): Very dense, gray, fine to medium SAND. Wet.	Auger refusal at 84.7 ft. Begin PWL coring.
86								C-01 (84.7 to 89.3'): Medium hard, medium gray, fine to medium-grained, slightly micaceous Sandstone, with very thin to thin horizontal partings spaced 2 to 3 inches apart. Thin horizontal black lenses fine to medium grained carbonaceous Sandstone between 86 and 86.4 feet. Brown fine grained sandstone cobble in upper 0.2 feet. Moderately fractured. REC=71%. RQD=0%.		
90	8	C-02	89.3 - 94.3		60/27		SANDSTONE	C-02 (89.3 to 94.3'): Medium hard to very soft, medium gray, fine to medium-grained, slightly micaceous Sandstone, with very thin to thin horizontal partings spaced 2 to 3 inches apart. Very soft, medium spaced Sandstone layers are 2 to 4 inches. Soft, medium spaced horizontal Silty Clay inclusions. Extremely fractured to sound. REC=45%. RQD=45%.		
94	7	C-03	94.3 - 99.3		60/60			C-03 (94.3 to 99.3'): Medium hard to very soft, medium gray, fine to medium-grained, slightly micaceous Sandstone, with thin to medium partings spaced 1 inch to 13 inches apart. Thin horizontal layers of very soft fine to medium grained Sandstone from 94.3 to 96.9 feet. Moderately fractured. REC=100%. RQD=62%.		
100	6	C-04	99.3 - 104.3		60/60			C-04 (99.3 to 104.3'): Medium hard to very soft, gray, fine to medium-grained,		



Project: AEP Mountaineer
 Location: New Haven, WV
 Project No.: 4345.00

Log of Boring SB-1805

Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
06/22/18	07:00	36.7'	Ground Surface	0'	133.8'	- 14 hours

BORING LOG P:\430054345\00\WORK\LOGS\4345.00 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information					Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log	Description		
100									SANDSTONE, with very thin to thin partings spaced 1 inch to 11 inches apart. Thin horizontal layers of very soft fine to medium grained Sandstone between 100.5 and 101.5 feet. Extremely fractured to sound. REC=100%. RQD=38%.	
102										
104	3	C-05	104.3 - 109.3		60/60				C-05 (104.3 to 109.3'): Medium hard to hard, gray, very fine to fine-grained, SANDSTONE, Medium spaced moderately dipping to low angle to low angle black fine grained Sandstone lenses from 104.3 to 108.3 feet. Very soft gray fine to medium-grained very thin to thin horizontal partings spaced 2 to 4 inches apart from 108.3 to 109.3 feet. Broken platy dark gray zone at 108.3 feet. Moderately fractured to sound. REC=100%. RQD=80%.	
106										
108										
110	NM	C-06	109.3 - 114.3		60/60			SANDSTONE	C-06 (109.3 to 114.3'): Medium hard to soft, gray, very fine to medium-grained, SANDSTONE, very thin to thin horizontal low angle partings spaced less than 1 inch to 3 inches apart. Black fine to medium-grained very thin to medium spaced sandstone lenses from 109.3 to 109.9.. Extremely fractured. REC=100%. RQD=0%.	
112										
114	5	C-07	114.3 - 119.3		60/60				C-07 (114.3 to 119.3'): Medium hard to soft, light medium gray, very fine to medium-grained, SANDSTONE, very thin to medium horizontal partings spaced 1 to 6 inches apart. Black fine to medium-grained very thin to medium spaced sandstone lenses from 114.3 to 117 feet. Extremely fractured to sound. REC=100%. RQD=52%.	
116										
118										
120	4	C-08	119.3 - 124.3		60/60			119.6' SHALE	C-08 (119.3 to 124.3'): Medium hard to soft, light gray, very fine to medium-grained, SANDSTONE, with thin horizontal partings spaced 2 to 5 inches apart and very thin to medium spaced clack horizontal lenses. Bed of very soft to soft, dark gray, very fine grained Silty clay Shale with very thin to thin partings spaced less than 1 inch to 5 inches apart. Shale from 119.6 to 122.3 feet.. Extremely fractured to slightly fractured. REC=100%. RQD=38%.	
122								122.3' SANDSTONE		
124	8	C-09	124.3 - 129.3		60/53				C-09A (124.3 to 125.3'): Medium hard, light gray, very fine to medium-grained,	

Sanborn, Head & Associates, Inc.

Drilling Method: HWT Casing with advancer, 3 1/4" ID HSA, PWL Coring

Sampling Method: 2" O.D and 3" O.D. Split Spoon with automatic hammer; 2" OD Shelby tube; NQ2 5-ft long core barrel

Drilling Company: Terracon Consultants, Inc.

Foreman: N. Francis/K. Fowler

Date Started: 06/18/18

Date Finished: 06/21/18

Logged By: L. Corenthal

Checked By: A. Ashton

Groundwater Readings			Ref. Pt	Depth of Casing	Depth of Hole	Stab. Time
Date	Time	Depth to Water				
06/22/18	07:00	38.7'	Ground Surface	0'	133.8'	~ 14 hours

BORING LOG P:\430054345 00\WORK\LOGS\4345 00 LOGS GPJ 2017 SANBORN HEAD V1 GLB 2017 SANBORN HEAD V1 GDT 12/7/18

Depth (ft)	Drill Rate (min/ft)	Sample Information				Stratum		Geologic Description	Remarks
		Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Log Description		
126							SANDSTONE	SANDSTONE, with very thin to thin black lenses. Sound. REC=88%. RQD=65%.	
128							COAL	C-09B (125.3 to 129.3'): Very soft to soft, black, very fine grained, COAL, with thinly spaced horizontal partings, very soft gray very fine grained horizontal Clay-rich zone from 125.5 to 125.8 feet, very thin to thin Clay lenses with Pyrite throughout. Vertical crack with calcite mineralization from 127.6 to 129.8 feet. Extremely to moderately fractured.	
130	NM	C-10	129.3 - 131.8		30/30			C-10A (129.3 to 130.4'): Very soft to soft, black, very fine grained, COAL, with thin to very thin horizontal partings. Vertical cracks with calcite mineralization from 129.2 to 129.8 feet and 130.0 to 130.3 feet. Extremely to moderately fractured. REC=100%. RQD=37%.	
132	NM	C-11	131.8 - 133.8		24/20		SHALE	C-10B (130.4 to 131.8'): Very soft to medium hard, dark gray, very fine grained, SILTY CLAY SHALE, with very thin to thin horizontal partings. Clay rich zone from 130.4 to 130.8 feet. Slight Organic sheen. Extremely fractured. C-11 (131.8 to 133.8'): Very soft to medium hard, dark gray, very fine grained, SILTY CLAY SHALE, with very thin horizontal, bedding, slight Organic sheen. Extremely to moderately fractured. REC=83%. RQD=0%.	
134								Boring terminated at 133.8 feet. No refusal encountered.	
136								NOTES: 1. Approximately 5200 gallons of potable water was introduced during drilling upon completion of coring (approximately 3,200 gallons was used to advance to top of bedrock from a combination of potable wells and the plant fire suppression system; approximately 2,000 gallons of water from the plant fire suppression system was used during bedrock coring). 2. Continuous sampling started approximately 5 ft above the water table based on a water level measurement collected by Sanborn Head on 6/18/2018 at 15:20 at MW-1605S of 44.84 ft below Top of PVC Riser and at 15:34 at MW-1604S of 51.99 ft below Top of PVC Riser. 3. Advanced HWT casing to 29 ft bgs. Due to damage to casing advancer at 29 ft, advanced 3 1/4" ID hollow stem augers to 30 ft bgs to auger refusal at 84.7 ft bgs. Advanced HWT casing with roller bit advancer to 84.7 ft and began PWL coring at 84.7 ft. 4. Approximately 1 week following completion of sample collection, the borehole was completed as a monitoring well by Terracon Consultants, Inc. Monitoring well installation was not observed by Sanborn Head personnel.	
138									
140									
142									
144									
146									
148									
150									

**State of West Virginia
Department of Environmental Protection**

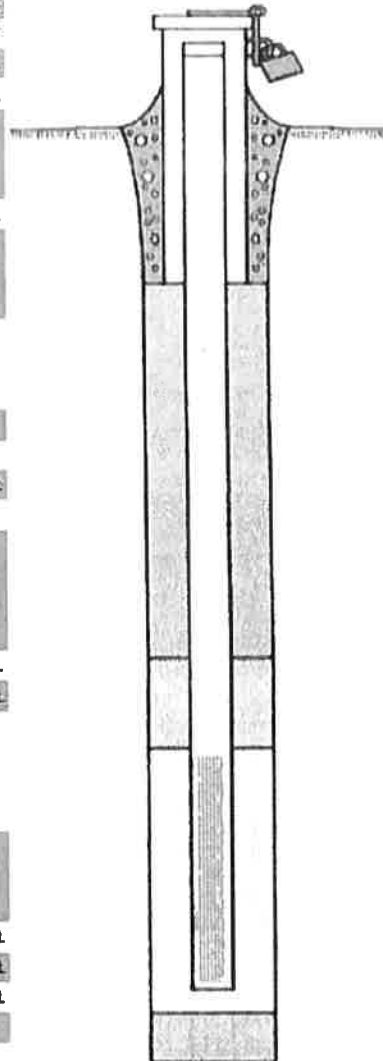
**Monitoring Well Construction
Well Number: WV00540-1805-18
Approved**

Site Name/Physical Address: Site: AEP Mountaineer Plant Line 1: 1347 Graham Station Road Line 2: City: Letart State: WV Zip: 25253- County: Mason	Well Registration No. WV00540-1805-18 Grid Location: a. Latitude: 38 58 29 .0 b. Longitude: 81 58 18 .0 c. Method Used: Computer Mapped/Generated Coordinates Company/Project Well No.: MW-1805	Purpose of Monitoring Well: to monitor the hydrologic conditions of a coal seam.
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------

Well Owner (Name, Firm, Address): Owner: Randall Brown Line 1: American Electric Power - Mountaineer Plant Line 2: 1347 Graham Station Road City: Letart State: WV Zip: 25253- Phone: 304-882-4024	Installed By (Name, Firm, Address): Installer: Kenn Fowler Line 1: Terracon Consultants, Inc. Line 2: 912 Morris Street City: Charleston State: WV Zip: 25301- Phone: 304-344-0821	Date Well Installed: 07/09/2018 Driller's WY Cert No. WV00540
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------

Section B: (all number fields must be in decimal format)

1. Gap and Lock:	YES
2. Protective Cover:	Protective Cover Pipe
3. Monitoring Well Reference Point:	591 ft.
4. Borehole Diameter:	5 inches.
5. Ground Surface Seal:	
a. Material: concrete	
b. Installation Procedure: ASTM D5082	
6. Surface Seal Bottom/Annular Space Top:	3 ft.
7. Well Riser: a. OD Well Riser: 2.38 inches. b. ID Well Riser: 2.05 inches.	
c. Material: PVC	
d. Installation Procedure: ASTM D5002	
8. Annular Space Seal:	
a. Material: high solids grout -	
b. Installation Procedure: tremie pipe-pumped	
9. Well Development Procedure: overpump -	
10. Drilling Method Used: mud rotary -	
11. Annular Space Seal Bottom/Filter Seal Top:	117.5 ft.
12. Drilling Fluid Used: Yes Source: Mud	
13. Filter Pack Seal:	
a. Material: bentonite pellet	
b. Installation Procedure: Gravity Fed	
c. Volume Added: 0.24 cubic feet	
14. Bottom of Bentonite Seal/Filter Pack Top:	120.6 ft.
15. Depth to Top of Screen:	123.6 ft.
16. Screen:	
a. Material: PVC	
b. Installation Procedure: ASTM D5092	
c. Slot Size: 0.01 inches. d. Screen Length: 10 ft.	
17. Filter Pack:	
a. Material: medium sand	
b. Installation Procedure: gravity fed	
18. Well Depth:	133.5 ft.
19. Bottom of Filter Pack:	134 ft.
20. Bottom of Borehole:	134 ft.
21. Backfill Material (below filter pack): medium sand	
22. Decontamination Procedures: water	
23. Special Circumstances and Exceptions: No Variance Number:	
24. WV Contractor License No.	



Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT					SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)	N Value			
0									(0') Large stones.	Advanced hollow stem auger	0.0
4				SS01			4		(1') Medium stiff to stiff, gray, CLAYEY SILT (ML); dry, low plasticity, few fine gravel, nonuniform.		
7							7	1.3			
8							8		(2.5') Changes to dense and red-brown.		
6.5				SS02			2		(6.5') Changes to damp, cohesive, trace fine sand.		
3							3	1.3			
4							4				
11.5				SS03			2		(11.5') Loose, red-brown, SANDY SILT (ML); damp, nonplastic, noncohesive, trace clay, uniform.		
4							4	0.8			
4							4				
16.5				SS04			2		(16.5') Loose to medium dense, red-brown, SANDY SILT (ML); damp, low plasticity, cohesive, with some clay, uniform.		
2							2	1.2			
2							2				
2							2				

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft.
Well was constructed with approximately 3ft of casing stick up and well cover.
The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)	
				Sample Type	Date & Time	Blow Counts	Recovery (ft)				N Value
20										20.0	
				SS05			3 10 13	0.9	(21.5') Loose, brown SAND (SP); medium- to fine-grained, with trace coarse sand & gravel.		
				SS06			7 9 12	1.3	(26.5') Medium dense, gray-brown, CLAYEY SILT (ML); lens. (27') Loose, brown SAND (SP); damp, noncohesive, medium-grained sand, with few coarse sand and trace fine gravel.		
				SS07			5 6 7	0.3	(31.5') Loose, dark brown, SILTY and CLAYEY SAND (SM); damp, noncohesive, medium-grained sand with some fine rounded gravel, nonuniform.		
				SS08			4 5 8	1.3	(36.5') Loose, brown, SILTY CLAY (CL); damp, low plasticity, cohesive, lens. (37') Loose, brown SAND (SP); damp, noncohesive, medium-grained sand with few fine sand and gravel.		
40										40.0	

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft.
Well was constructed with approximately 3ft of casing stick up and well cover.
The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT					SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)	N Value RQD (%)			
40											40.0
				SS09			4			(41.5') Loose, brown, SILTY CLAY (CL); damp, low plasticity, cohesive, trace sand.	
							5	1.3			
							8			(42') Loose, brown SAND (SP); damp, nonplastic, noncohesive, fine- to medium-grained sand, uniform.	
				SS10			4			(46.5') Changes to wet with few coarse sand and trace fine gravel.	
							6	1.5			
							7				
				SS11			6			(48.5') 2 inch dark gray clay lens at 48.5 feet.	
							8	1.3			
							9				
				SS12			9			(49.5') Medium dense, brown SAND (SP); wet, nonplastic, noncohesive, medium- to fine-grained, uniform, with black partings throughout.	
							9	1.5			
							10				
				SS13			4				
							6	1.3			
							9				
				SS14			4			(52.5') With few fine to coarse gravel.	
							7	1.2			
							8				
							3				
				SS15			5				
							5	1.1			
							10				
							6				
				SS16			8				
							8	0.9			
							9				
							4				
				SS17			7				
							8	1.0			
							8				
							4				
				SS18			5				
							5	1.0			
							4				
60							4				60.0

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft.
Well was constructed with approximately 3ft of casing stick up and well cover.
The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)	
				Sample Type	Date & Time	Blow Counts	Recovery (ft)				N Value
60				SS19		8	0.9	(60') Loose to medium dense, brown SAND (SP); wet, some coarse sand, uniform.		60.0	
13				SS20		8	1.1	(61.5') Loose, gray-brown SAND (SP); wet, medium- to coarse-grained with few fine rounded gravel, nonuniform.			
16				SS21		12	1.3	(63') Medium dense, gray-brown, SANDY SILT (ML); wet.			
8				SS22		12	0.8	(63.3') Medium dense, tan gray SAND (SP); wet, fine- to medium-grained, with some coarse sand, several black partings.			
13				SS23		13	1.2				
14				SS24		8	1.1	(67.5') Trace fine gravel.			
18				SS25		11	1.0				
6				SS26		16	1.1				
7				SS27		12	0.9				
10				SS28		14	1.1				
8				SS29		13	1.2	(75') Some medium sand.			
16				SS30		20	1.2	(77') Medium dense, gray SAND (SP); wet, nonplastic, noncohesive, uniform.			
11				SS31		13	1.1				
13				SS32		10	1.1				
15						13	1.1				
20						15	1.3				
80						20	1.3			Silty sand at 79.5'	80.0

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft. Well was constructed with approximately 3ft of casing stick up and well cover. The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

Drilling Start Date: 1/28/2019	Boring Depth (ft): 114.2	Well Depth (ft): 83.5
Drilling End Date: 1/29/2019	Boring Diameter (in): 8.25	Well Diameter (in): 2
Drilling Company: AEP	Sampling Method(s): SPT; Core Barrel	Screen Slot (in): 0.010
Drilling Method: Hollow Stem Auger	DTW After Drilling (ft):	Riser Material: Sch 40 PVC
Drilling Equipment: Truck-mounted rotary	Ground Surface Elev. (ft): 591.006	Screen Material: Sch 40 PVC Slotted
Driller: ZR/BH	Top of Casing Elev. (ft): 594.016	Seal Material(s): Grout, Bentonite
Logged By: C. Christenson	Location (X,Y): 1,701,767.67, 720,390.93	Filter Pack: #5 Sand

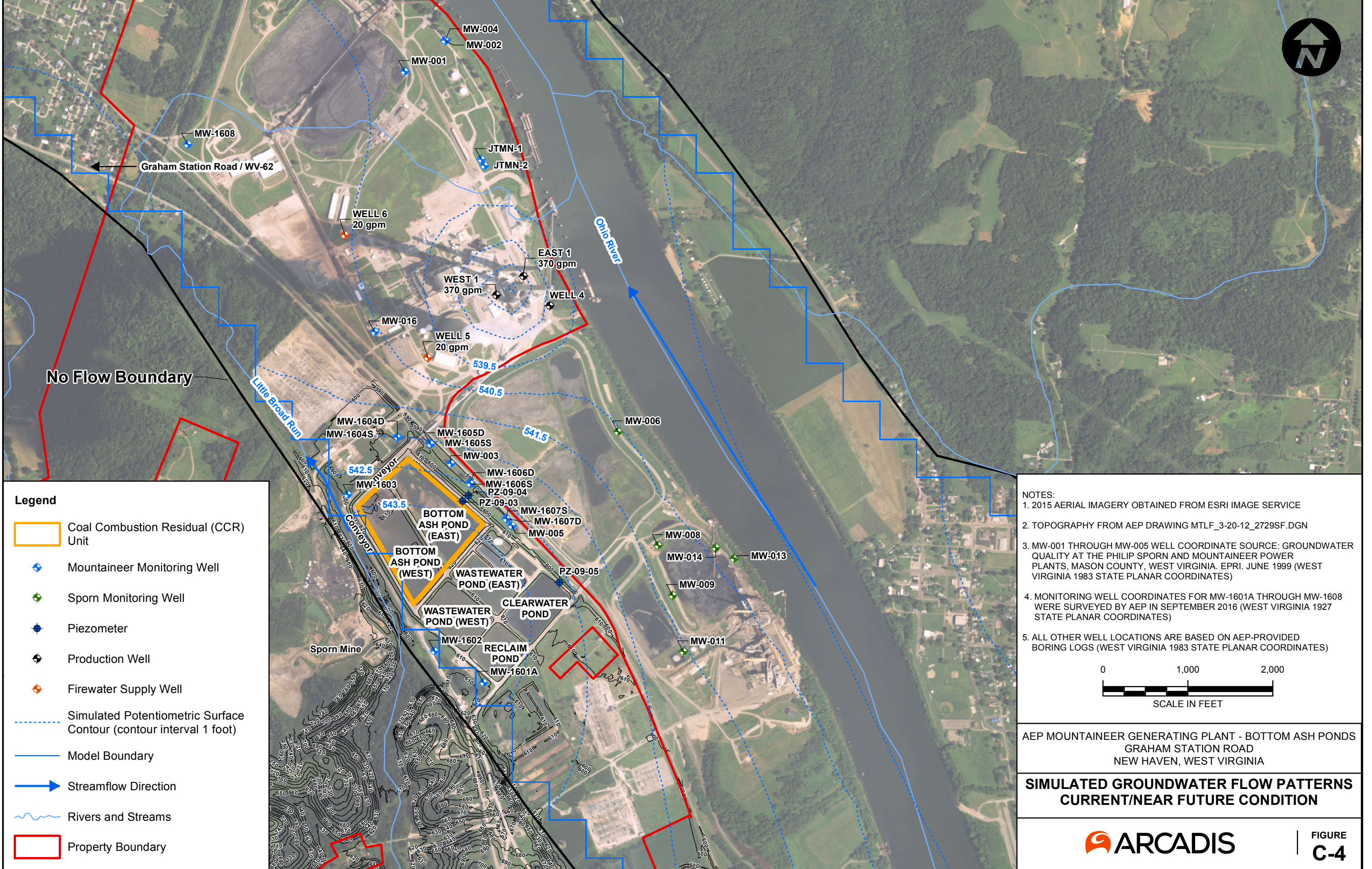
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	REMARKS	DEPTH (ft)
				Sample Type	Date & Time	Blow Counts	Recovery (ft)			
100	[Yellow brick pattern]			CB 2			9.6	98	(104.2') Moderately hard to moderately soft, medium gray, medium- to fine-grained SANDSTONE (thin to horizontal); dark gray partings every 4 to 6 inches, lightly fractured, sound.	100.0
105			CB 3			9.8	100	105.0		
110										110.0
115								(114.2') Boring terminated.	115.0	

NOTES: Boring sampled with 2 in OD split spoon to 85 ft and wireline NQ to 115 ft. Well was constructed with approximately 3ft of casing stick up and well cover. The monitoring well screened interval is shown for MW-1922S. MW-1922D is screened from 103.5 ft to 113.5 ft.

ATTACHMENT B

Groundwater Flow Modeling Output

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
 OH:015976.0009.00001 (Mountaineer Ash Pond)
 Z:\GIS\PROJECTS_ENV\AEP\Mountaineer\MXD\Ash Pond Report\Updated September 2016\C-4_Mr Ash Pond Simulated GW Flow Patterns_Current_Future.mxd 10/7/2016 2:55:30 PM

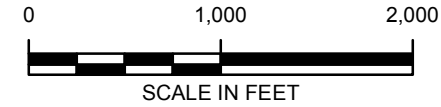


Legend

- Coal Combustion Residual (CCR) Unit
- ◆ Mountaineer Monitoring Well
- ◆ Sporn Monitoring Well
- Piezometer
- ◆ Production Well
- ◆ Firewater Supply Well
- Simulated Potentiometric Surface Contour (contour interval 1 foot)
- Model Boundary
- Streamflow Direction
- ~ Rivers and Streams
- Property Boundary

NOTES:

1. 2015 AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE
2. TOPOGRAPHY FROM AEP DRAWING MTLF_3-20-12_2729SF.DGN
3. MW-001 THROUGH MW-005 WELL COORDINATE SOURCE: GROUNDWATER QUALITY AT THE PHILIP SPORN AND MOUNTAINEER POWER PLANTS, MASON COUNTY, WEST VIRGINIA. EPRI. JUNE 1999 (WEST VIRGINIA 1983 STATE PLANAR COORDINATES)
4. MONITORING WELL COORDINATES FOR MW-1601A THROUGH MW-1608 WERE SURVEYED BY AEP IN SEPTEMBER 2016 (WEST VIRGINIA 1927 STATE PLANAR COORDINATES)
5. ALL OTHER WELL LOCATIONS ARE BASED ON AEP-PROVIDED BORING LOGS (WEST VIRGINIA 1983 STATE PLANAR COORDINATES)



AEP MOUNTAINEER GENERATING PLANT - BOTTOM ASH PONDS
 GRAHAM STATION ROAD
 NEW HAVEN, WEST VIRGINIA

**SIMULATED GROUNDWATER FLOW PATTERNS
 CURRENT/NEAR FUTURE CONDITION**

ATTACHMENT C


Bedrock Sampling Analytical Report – Eurofins



Test Report

Client:	Geosyntec Consultants	MI#:	23009
Project:	Mountaineer ASD	Date:	03/16/23
Location:	New Haven, WV	P.O.#:	CHA0495/07/02

Client	Geosyntec		
	Attn: Allison Kreinberg		
Email	akreinberg@geosyntec.com	Phone	614-468-0421

Method(s)	Timothy B. Murphy
X-ray Diffraction (XRD) X-ray Fluorescence (XRF) Scanning Electron Microscopy (SEM)	

- [Conditions & Qualifications](#)
- [X-ray Diffraction](#)
- [X-ray Fluorescence](#)
- [MW-1805-122](#)
- [MW-1805-124.5](#)
- [MW-1805-128](#)
- [MW-1805-130](#)
- [MW-1922D-104.5](#)
- [MW-1922D-111](#)



CONDITIONS AND QUALIFICATIONS

Mineralogy, Inc. will endeavor to provide accurate and reliable laboratory measurements of the samples provided by the client. The results of any x-ray diffraction, petrographic or core analysis test are necessarily influenced by the condition and selection of the samples to be analyzed. It should be recognized that geological samples are commonly heterogeneous and lack uniform properties. Mineralogical, geochemical and/or petrographic data obtained for a specific sample provides compositional data pertinent to that specific sampling location. Such “site-specific data” may fail to provide adequate characterization of the range of compositional variability possible within a given project area, thus the “projection” of these laboratory findings and values to adjoining, “untested” areas of the formation or project area is inherently risky, and exceeds the scope of the laboratory work request. Hence, Mineralogy, Inc. shall not assume any liability risk or responsibility for any loss or potential failure associated with the application of “site or sample-specific laboratory data” to “untested” areas of the formation or project area. Unless otherwise directed, the samples selected for analysis will be chosen to reflect a visually representative portion of the bulk sample submitted for analysis. Where provided, the interpretation of x-ray diffraction, petrographic or core analysis results constitutes the best geological judgment of Mineralogy, Inc., and is subject to the sampling limitations described above, and the detection limits inherent to semi-quantitative and/or qualitative mineralogical and microscopic analysis. Mineralogy, Inc. assumes no responsibility nor offers any guarantee of the productivity, suitability or performance of any oil or gas well, hydrocarbon recovery process, dimension stone, and/or ore material based upon the data or conclusions presented in this report.

This report is to only be replicated in its entirety.

Sample Retention: Samples will be stored for a period of 30 days and thereafter discarded. If additional sample storage time and/or return shipping is required, appropriate charges will be billed to the client.



X-ray Diffraction

Table I.1

Client:	Geosyntec Consultants	MI#:	23009
Project:	Mountaineer ASD	P.O.#:	CHA0495/07/02
Location:	New Haven, WV	Method:	X-ray Diffraction

Mineral Constituent	Lab ID:	23009-01	23009-02	23009-03	23009-04
	Sample ID:	MW-1805 122'	MW-1805 124.5'	MW-1805 128'	MW-1805 130.5'
	Chemical Formula	Relative Abundance (%)			
Quartz	SiO ₂	24	73	4	32
Plagioclase Feldspar	(Na,Ca)AlSi ₃ O ₈	5	7		7
K-Feldspar	KAlSi ₃ O ₈	1	8		1
Calcite	CaCO ₃	<0.5	<0.5		
Siderite	FeCO ₃	2	<0.5		1.5
Pyrite	FeS ₂		<0.5	4	0.5
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄	11	7.5	6	10
Chlorite	(Mg,Al) ₆ (Si,Al) ₄ O ₁₀ (OH) ₈	16	0.5		14
Illite / Mica	KAl ₂ (Si ₃ AlO ₁₀)(OH) ₂	39	4	1	33
Mixed-Layered Illite/Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂ • 2H ₂ O	2		1	1
Amorphous				84	
Total		100	100	100	100
% Illite in ML I/S		90%		BDL*	80%

*BDL = Below Detection Limit



X-ray Diffraction

Table I.2

Client:	Geosyntec Consultants	MI#:	23009
Project:	Mountaineer ASD	P.O.#:	CHA0495/07/02
Location:	New Haven, WV	Method:	X-ray Diffraction

Mineral Constituent	Lab ID:	23009-05	23009-06
	Sample ID:	MW-1922D 104.5'	MW-1922D 111'
	Chemical Formula	Relative Abundance (%)	
Quartz	SiO ₂	86	85
Plagioclase Feldspar	(Na,Ca)AlSi ₃ O ₈	4	3
K-Feldspar	KAlSi ₃ O ₈	1	2
Calcite	CaCO ₃	0.5	
Goethite	alpha-FeOOH		0.5
Siderite	FeCO ₃		
Pyrite	FeS ₂		
Hematite	alpha-Fe ₂ O ₃		0.5
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄	6	6
Chlorite	(Mg,Al) ₆ (Si,Al) ₄ O ₁₀ (OH) ₈		<0.5
Illite / Mica	KAl ₂ (Si ₃ AlO ₁₀)(OH) ₂	2.5	3
Mixed-Layered Illite/ Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂ · 2H ₂ O	<0.5	
Total		100	100
% Illite in ML I/S		80%	

*BDL = Below Detection Limit



X-ray Fluorescence

Table II

Client:	Geosyntec Consultants			MI#:	23009	
Project:	Mountaineer ASD			P.O.#:	CHA0495/07/02	
Location:	New Haven, WV			Method:	X-ray Fluorescence	
Lab ID:	23009-01	23009-02	23009-03	23009-04	23009-05	23009-06
Sample ID:	MW-1805 122'	MW-1805 124.5'	MW-1805 128'	MW-1805 130.5'	MW-1922D 104.5'	MW-1922D 111'
Elemental Phase	Results (Mass %)					
Na ₂ O	0.6707	0.5154	0.1887	0.695	0.3969	0.515
MgO	1.9617	0.2376	0.1567	1.6714	0.2043	0.2466
Al ₂ O ₃	25.3368	8.1773	12.5199	22.3427	6.1898	7.5659
SiO ₂	54.4381	86.849	20.9049	58.5764	90.4786	88.2277
P ₂ O ₅	0.0935	0.0205	0.0895	0.0615	0.0277	0.0572
S	0.6678	0.181	14.7595	1.0398	0.1592	0.2296
Cl	0.0036	0.0038	0.1484	0.0132	0.0138	0.0055
K ₂ O	4.3886	1.828	1.3919	3.4114	0.6282	1.0262
CaO	0.2795	0.0537	1.2244	0.1757	0.2123	0.1336
TiO ₂	1.6125	0.2621	1.0809	1.1403	0.1182	0.1589
Cr	0.0181	ND	ND	ND	ND	ND
MnO	0.0635	0.0115	0.0234	0.0461	0.0063	0.0065
Fe ₂ O ₃	9.1735	1.5038	24.8472	9.0787	1.2773	1.4397
Zn	0.021	ND	ND	0.0205	ND	ND
As	ND	ND	0.1825	ND	ND	ND
Rb	0.0213	0.0071	ND	0.016	ND	ND
Sr	0.0189	0.0062	0.0952	0.0143	ND	ND
Y	0.005	ND	ND	0.0029	ND	ND
Zr	0.0607	0.0164	ND	0.0376	0.0115	0.011
BaO	0.1239	0.0483	0.217	0.077	0.0337	0.029

ND = Not Detected



Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-122

MI#23009-01 - SEM

Summary: This core sample is characterized as a medium gray (N5), compact parallel-bedded, non-porous, micaceous, silty shale. The shale mineralogy is dominated by clay minerals and mica which together account for ~ 68% of the sample mass. The clay mineral suite is enriched with respect to illite/mica (~39%), chlorite (~16%), and kaolinite (~11%), coupled with relatively minor amounts of mixed-layered illite/smectite (~2%). The detrital silt and sand grains are moderately to poorly sorted, sub-rounded, and matrix-supported. The detrital grain assemblage includes quartz (~24%) plagioclase feldspar (~5%) and minor amounts of k-feldspar (~1%). Minor amounts of siderite (~2%) are also present in the silty shale. SEM Figures 1A through 1C provide backscatter & scanning electron views of a typical bedding plane surface. Traces of microporosity are locally present flanking the silt and sand grains. Figures 1D through 1F provide images of the shale fabric in cross section. The SEM images reveal the presence of scattered, lens-shaped macropores & micropores, preserved and sheltered by the propping effect of randomly distributed silt and sand grains.

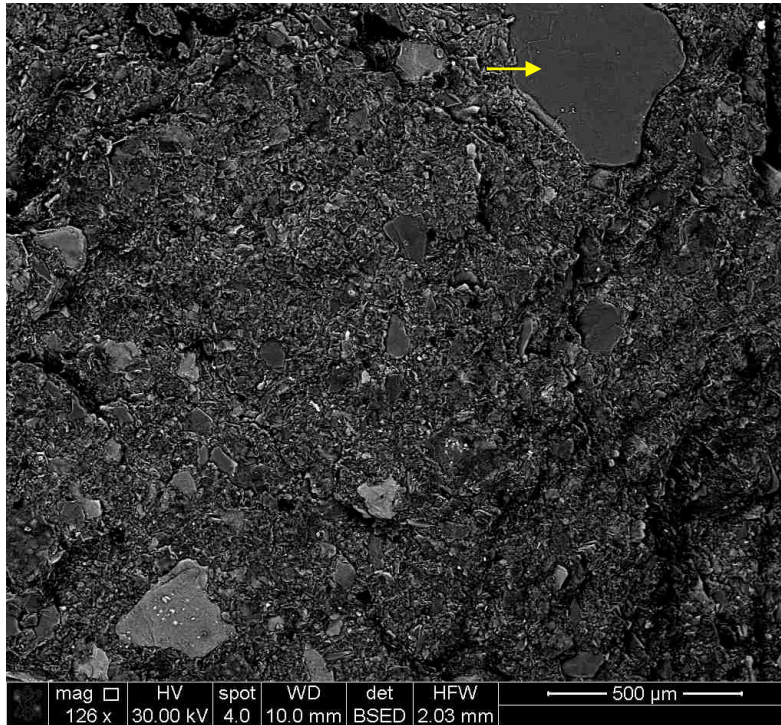
23009-01 Photo Index:

Sample ID	Magnification
23009-01A	126X
23009-01B	126X
23009-01C	500X
23009-01D	126X
23009-01E	1500X
23009-01F	6000X

Sheltered macro-porosity	BP
Detrital clay matrix	DM
Detrital quartz	Q
Intercrystalline microporosity	uP

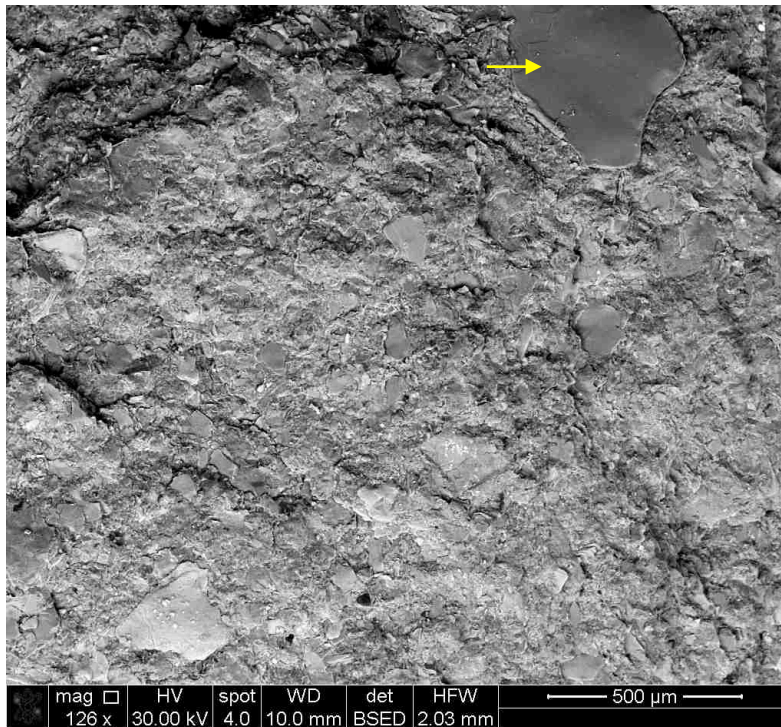


23009-01A 126X



Q

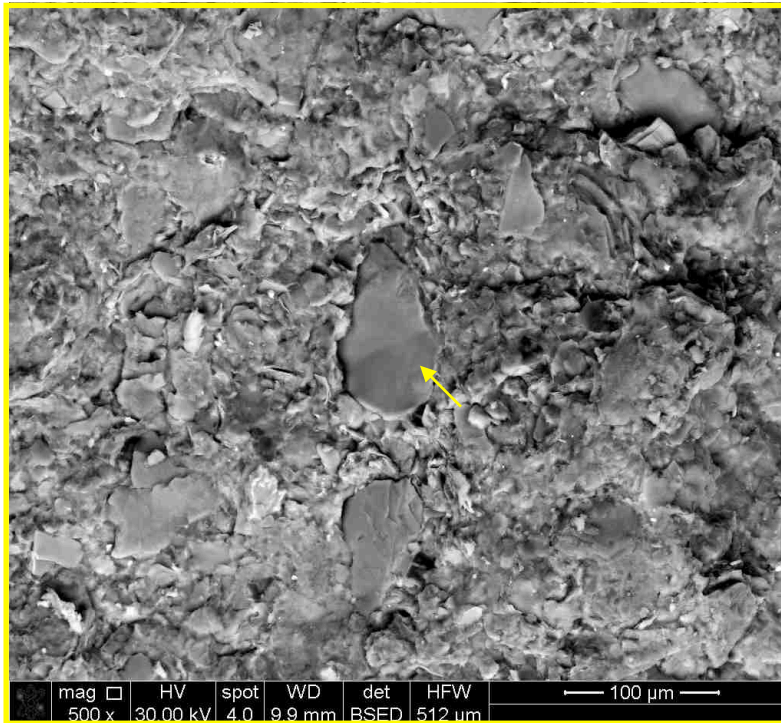
23009-01B 126X



Q

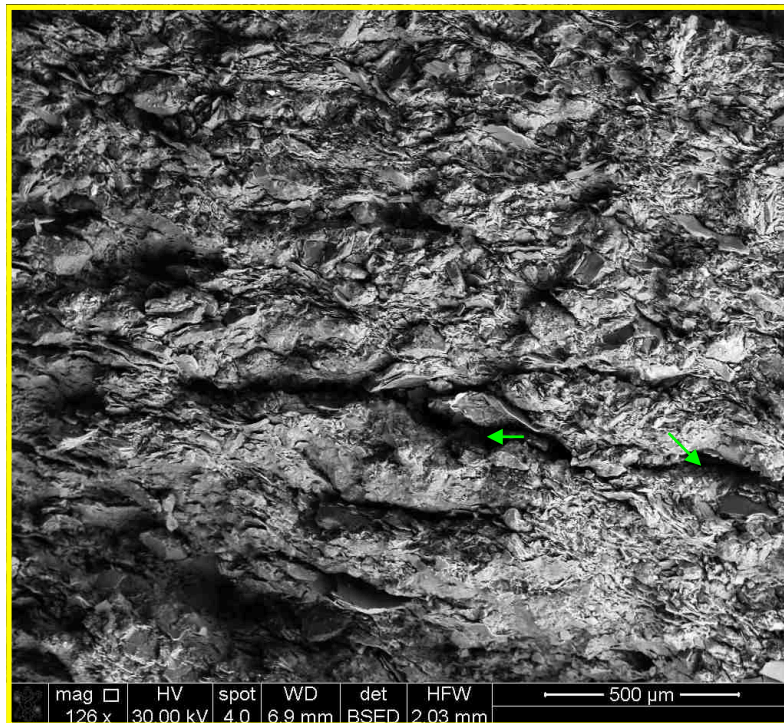


23009-01C 500X



Q

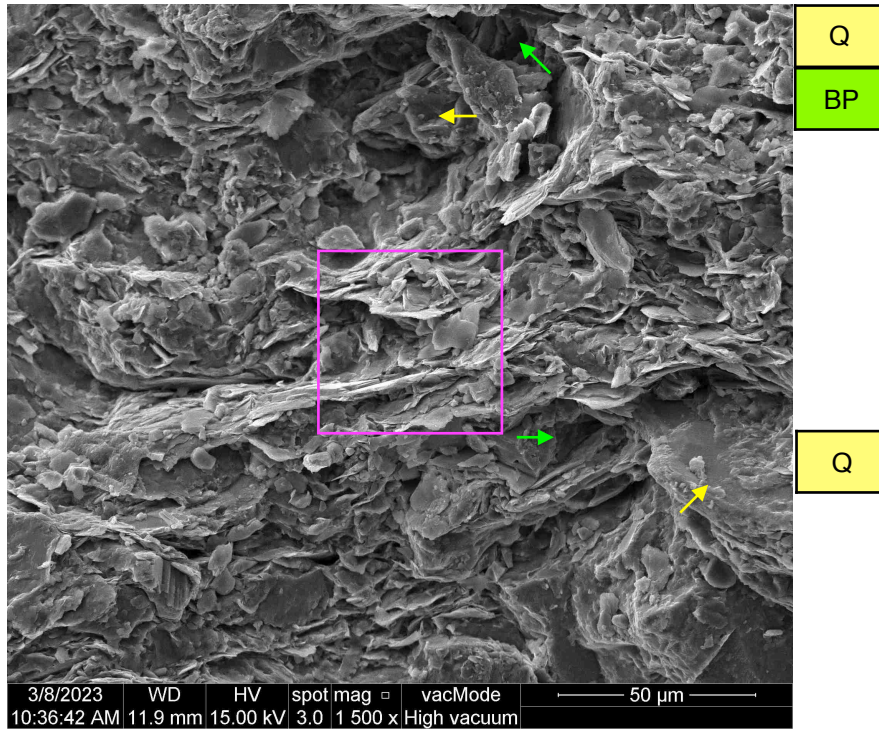
23009-01D 126X



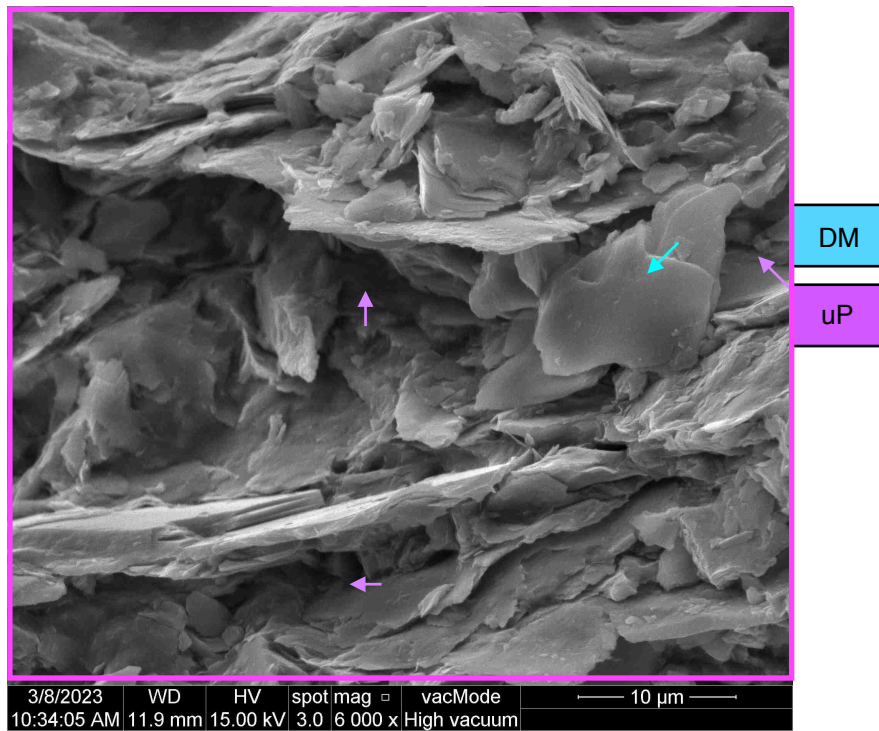
BP



23009-01E 1500X



23009-01F 6000X





Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-124.5

MI#23009-02 - SEM

Summary: This core interval is comprised of light gray (N8), cross-bedded, medium-grained, well sorted, quartz-cemented, sub-arkosic sandstone. The sandstone fabric is well-cemented & moderately porous, with scattered intergranular macropores. Pore-filling authigenic kaolinite clay is scattered throughout the sandstone framework, occurring as vermicular stacks of clay platelets (see Figures 2E & 2F). The quartz-rich framework is well-cemented with authigenic quartz overgrowths. Total macroporosity for this sandstone is estimated to comprise ~ 6-9% of the sandstone bulk volume. The mineralogy of the sandstone is dominated by quartz (73%), feldspar [including plagioclase (7%) and k-feldspar (8%)], kaolinite (7.5%), illite / mica (4%), and scattered traces (i.e., <0.5%) of siderite, calcite, and pyrite.

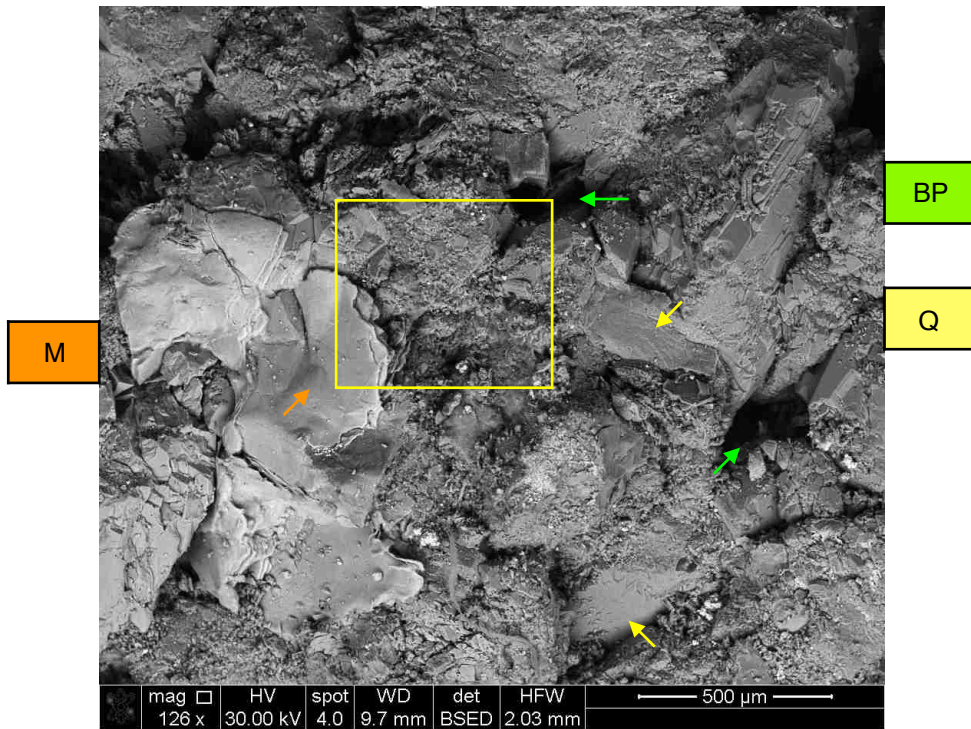
23009-02 Photo Index:

Sample ID	Magnification
23009-02A	126X
23009-02B	500X
23009-02C	500X
23009-02D	126X
23009-02E	1000X
23009-02F	8000X

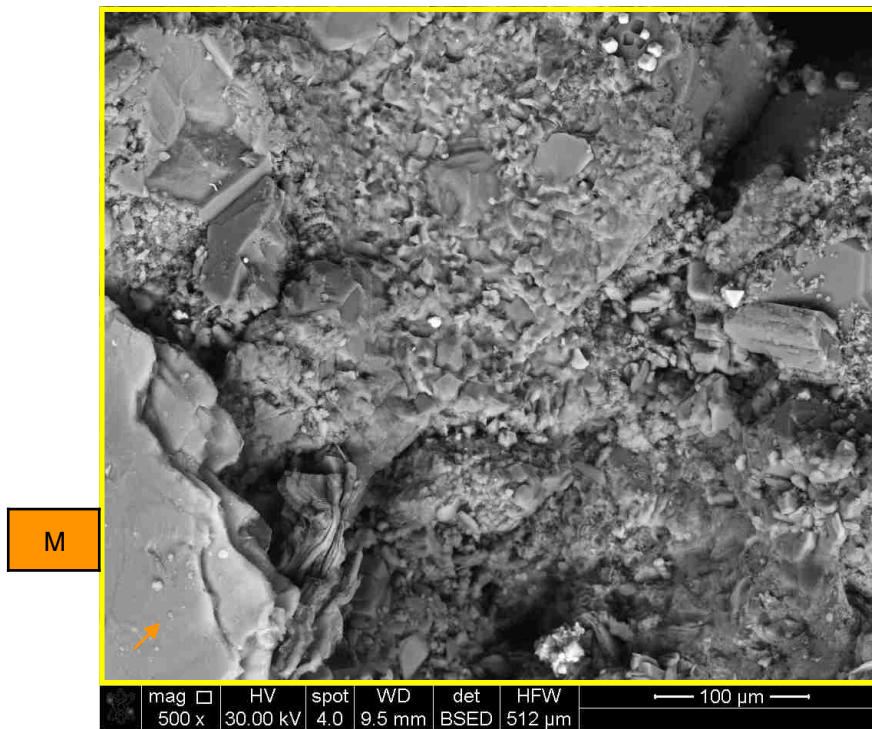
Intergranular macro-porosity	BP
Detrital quartz	Q
Quartz overgrowth cement	OG
Authigenic Kaolinite	K
Mica	M



23009-02A 126X

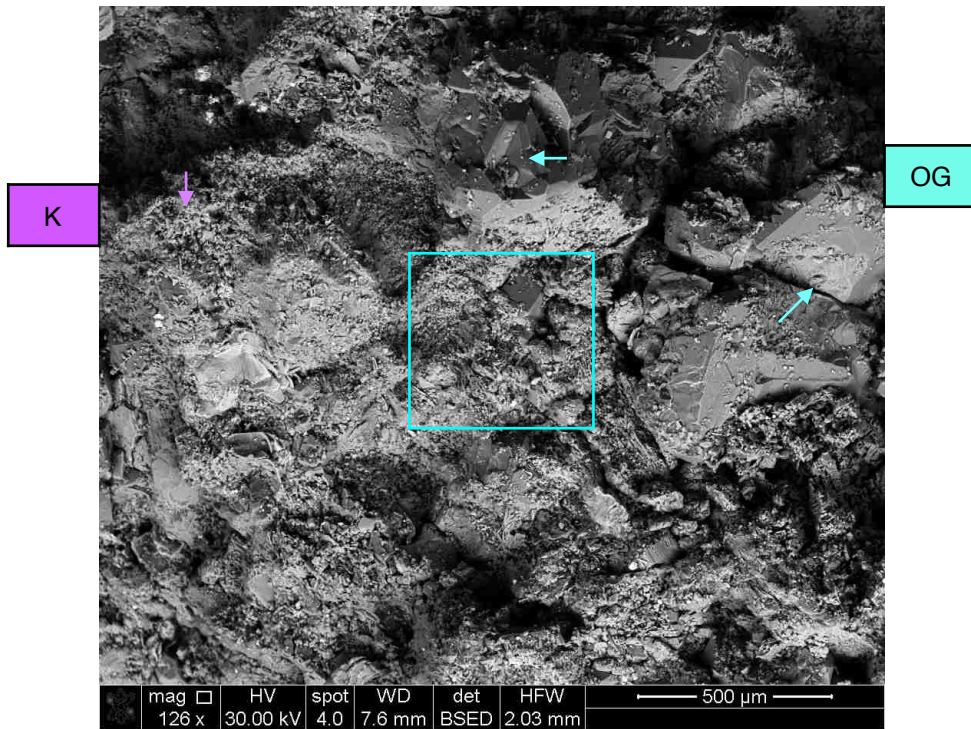


23009-02B 500X

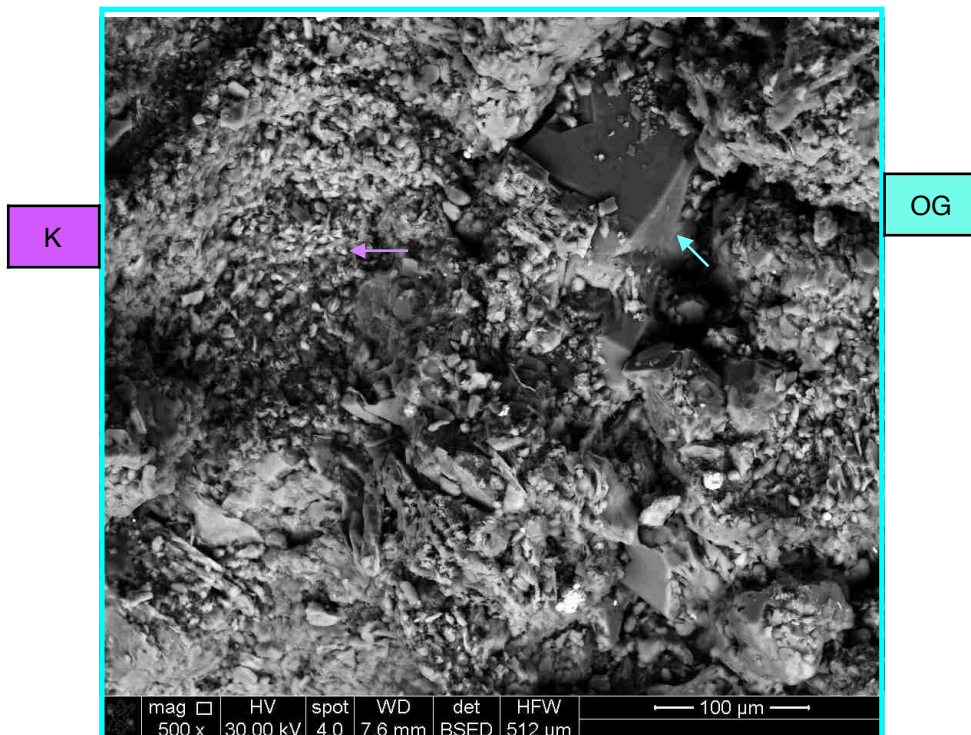




23009-02C 500X

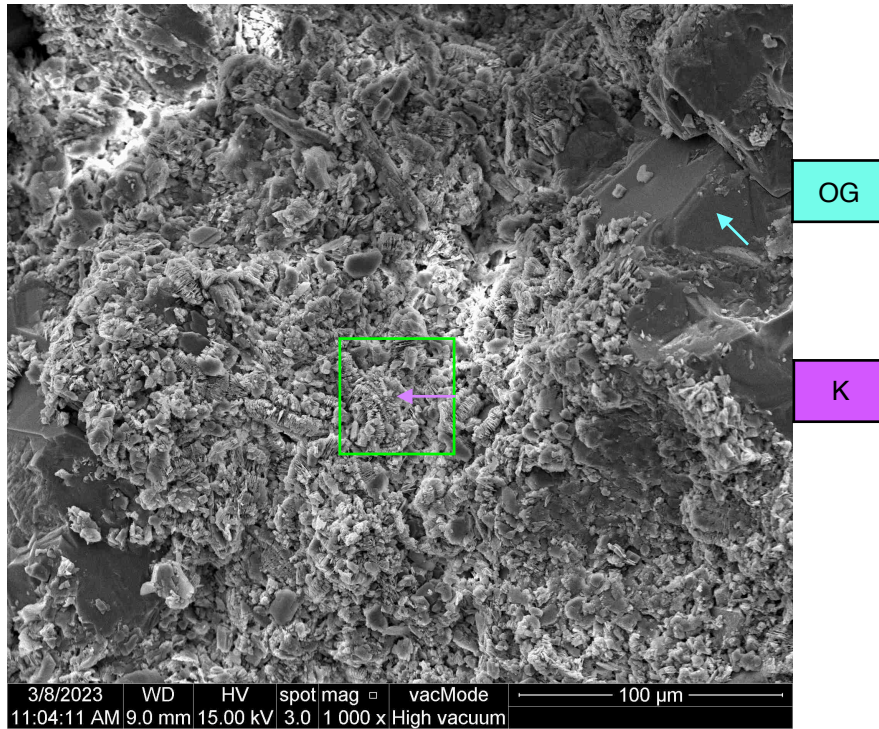


23009-02D 126X

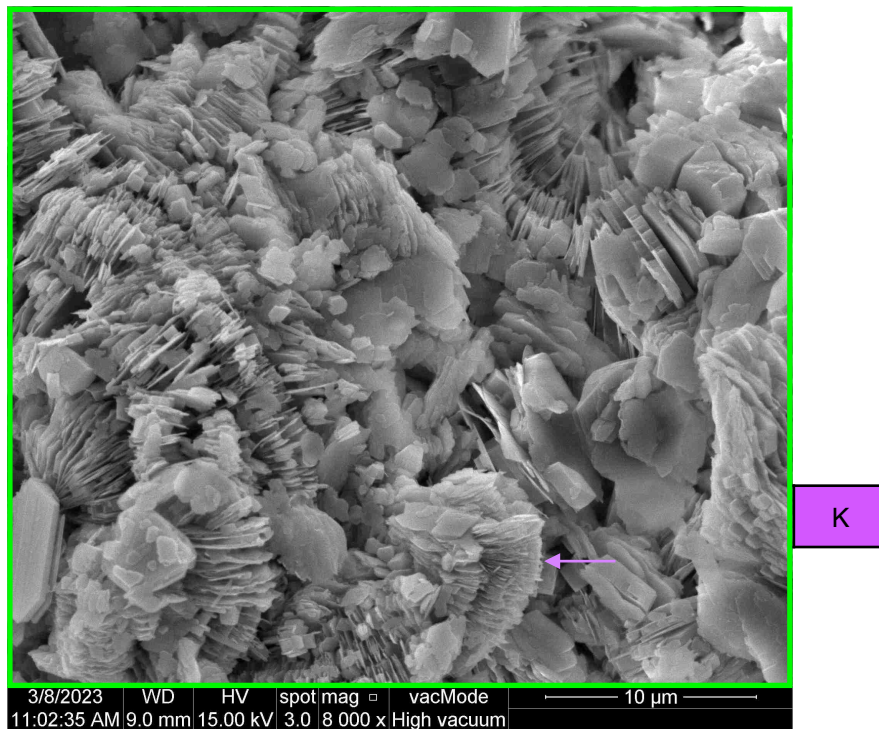




23009-02E 1000X



23009-02F 8000X





Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-128

MI#23009-03 - SEM

Summary: A compact, parallel bedded seam of coal is present at core depth 128'. Based on the x-ray diffraction pattern collected for this material, the organic matter is estimated to exhibit a maximum rank of medium to low volatile bituminous coal. The mineralogical analysis indicates that thermally altered organic matter (coal) comprises ~84% of the sample mass. The inorganic mineral fraction includes a mixture of clay matrix minerals (~8%), quartz (~4%), and pyrite (~4%). The clay mineral fraction is comprised of kaolinite coupled with minor amounts of illite & mixed-layered illite/smectite. The pyrite & clay minerals are typically present as authigenic minerals that have crystallized within fractures and dissolution voids contained within the coal.

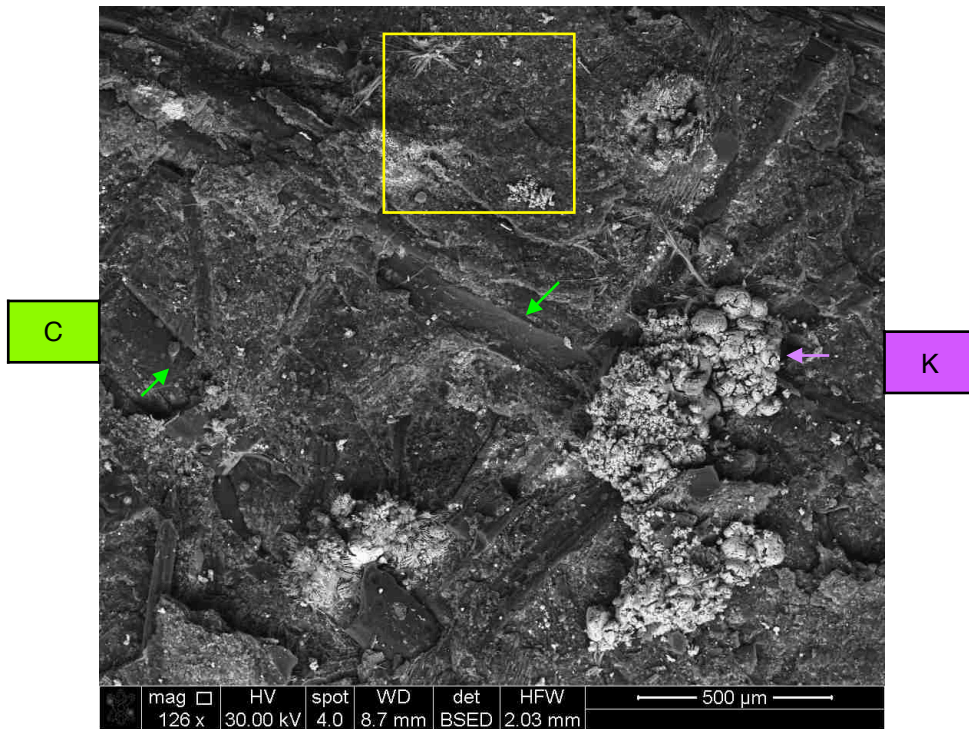
23009-03 Photo Index:

Sample ID	Magnification
23009-03A	126X
23009-03B	500X
23009-03C	150X
23009-03D	5000X

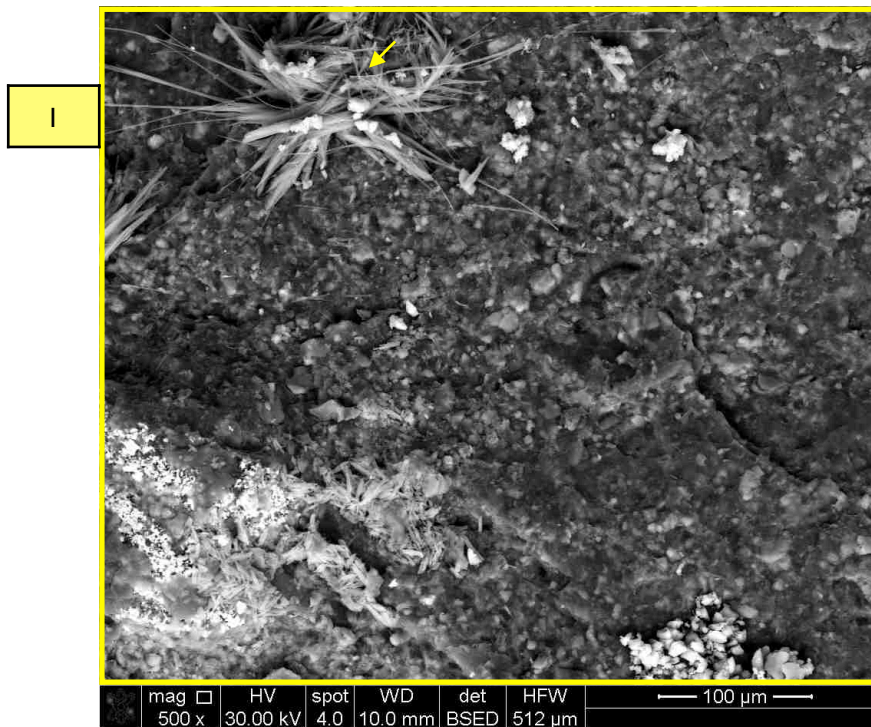
Coal maceral	C
Pyrite	P
Illite	I
Kaolinite	K



23009-03A 126X

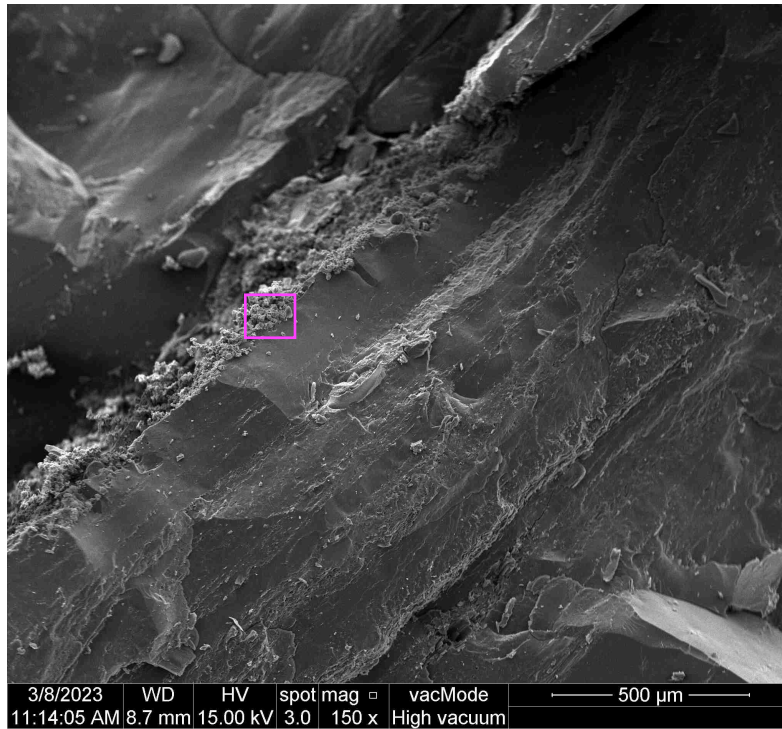


23009-03B 500X

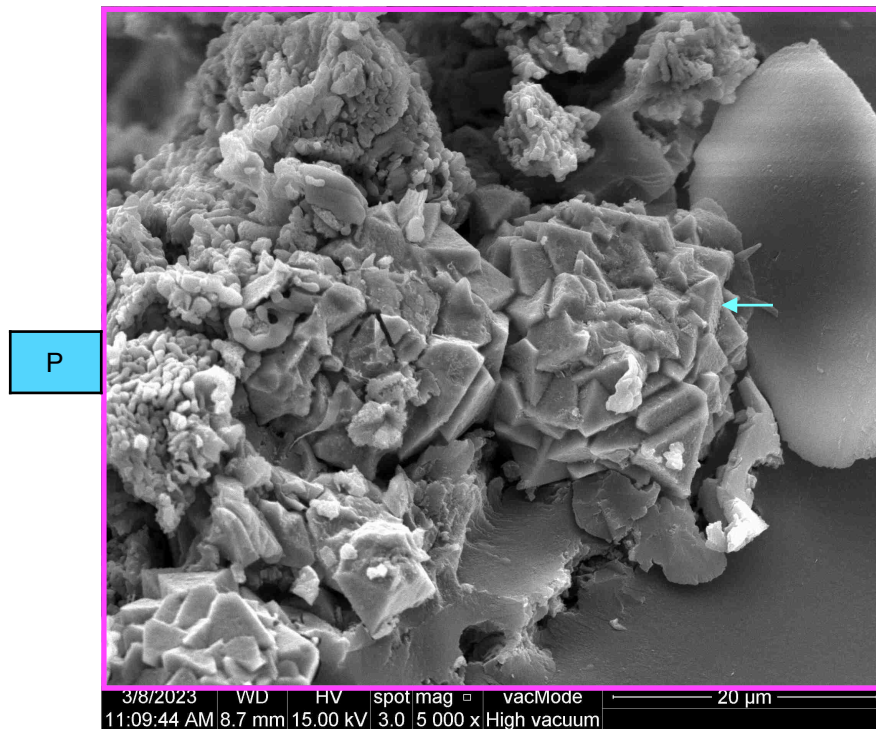




23009-03C 150X



23009-03D 5000X





Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1805-130.5

MI#23009-04 - SEM

Summary: This core interval is comprised of medium light gray (N6), compact, parallel-bedded, non-porous, micaceous, silty shale / clay-rich siltstone. The silt-rich grain fraction is sub-arkosic, moderately sorted, and sub-rounded to sub-angular. The relative proportion of silt & clay matrix / mica is variable between individual bedding layers, with some interbeds characterized as clay-rich (grain-supported) siltstones. Minute mica laths are abundant throughout the sedimentary fabric. Based on the XRD mineralogical analysis, clay minerals account for ~ 58% of the mineral mass. The clay mineral suite includes illite / mica (~33%), chlorite (~14%), kaolinite (~10%), and mixed-layered illite/smectite (~1%). Silt grain materials are dominated by quartz (~32%) and feldspar [including plagioclase (~7%) and k-feldspar (~1%)]. Minor amounts of siderite cement (~1.5%) and pyrite (~0.5%) are also present, distributed as minute (~1-5 um diameter) crystals dispersed throughout the clay-rich groundmass. Total void space is estimated to account for <2% of the bulk volume. The sedimentary fabric includes small amounts of residual macroporosity & microporosity. The sheltered interparticle voids are locally preserved as minute, lens-shaped voids that appear isolated due to the pervasive distributions of detrital clay matrix.

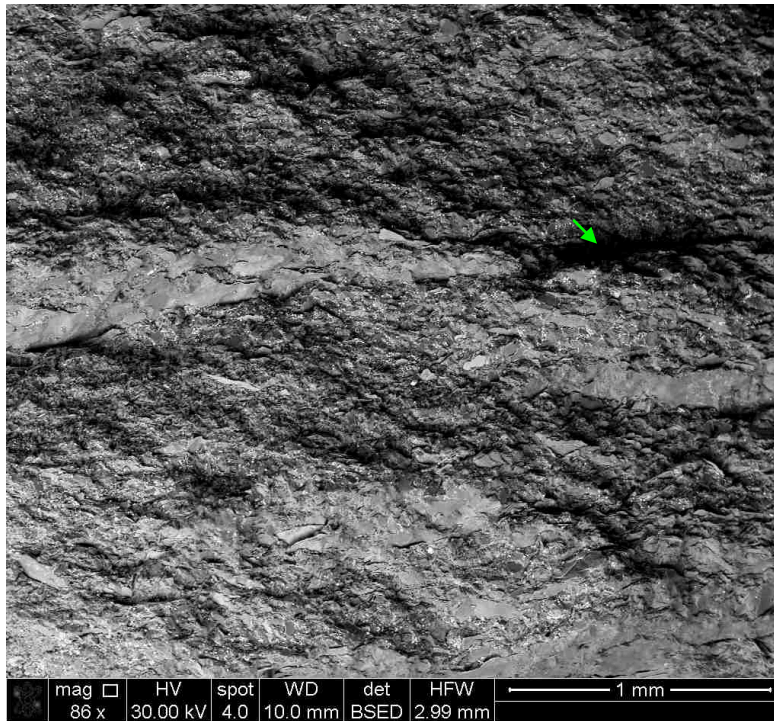
23009-04 Photo Index:

Sample ID	Magnification
23009-04A	86X
23009-04B	500X
23009-04C	2000X
23009-04D	1000X
23009-04E	126X

Intergranular micro + macro-porosity	BP
Siderite	S
Detrital clay matrix	DM
Quartz	Q
Mica	M

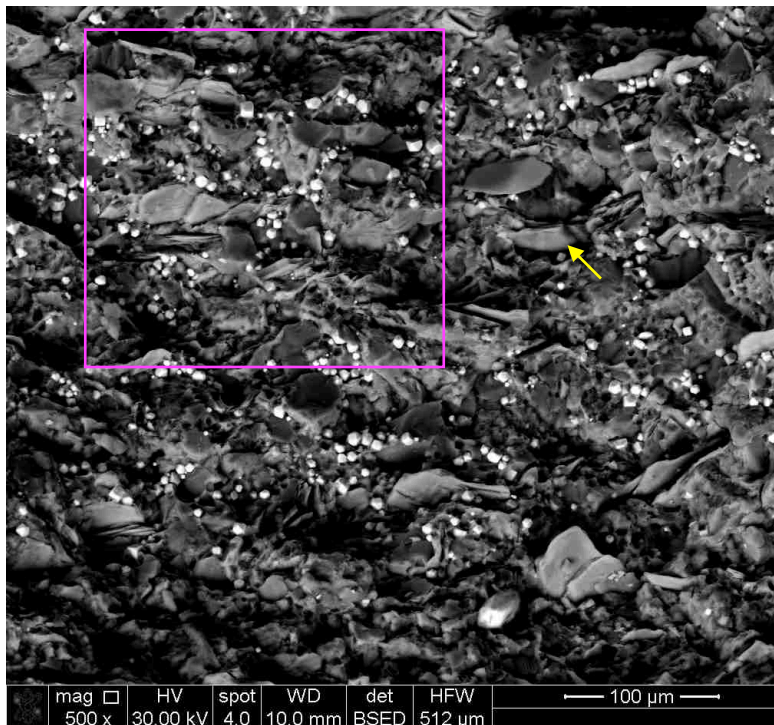


23009-04A 86X



BP

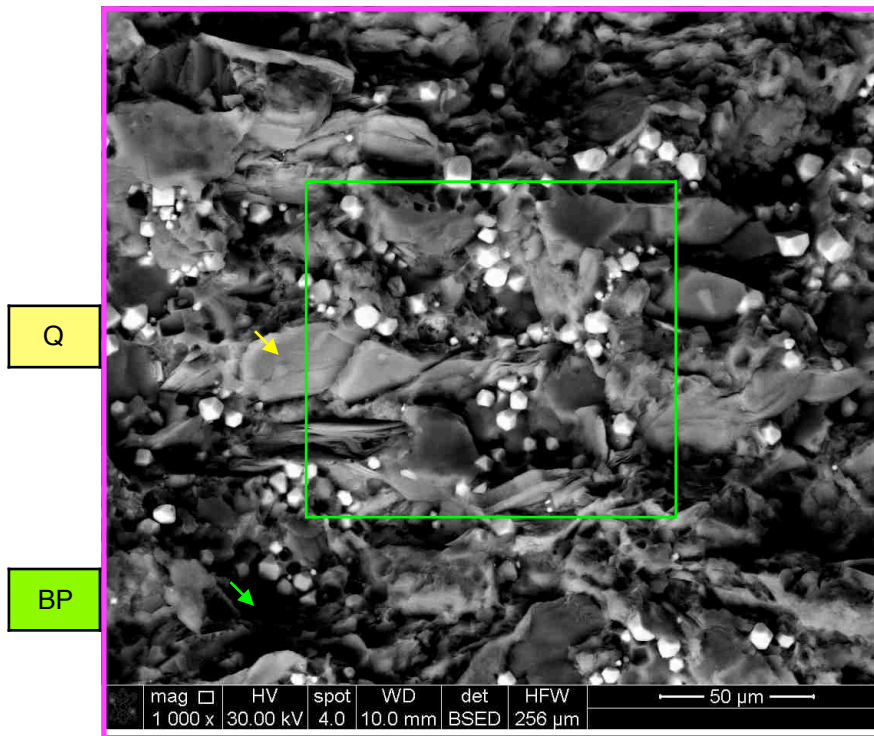
23009-04B 500X



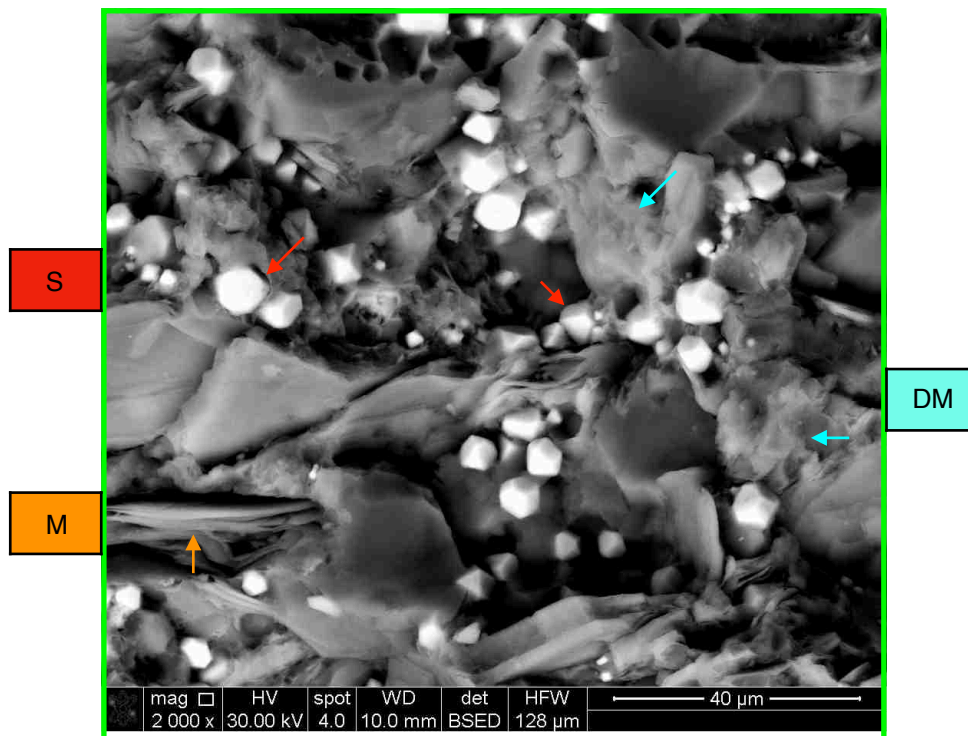
Q



23009-04C 2000X



23009-04D 1000X





Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1922D-104.5

MI#23009-05 - SEM

Summary: This core sample is characterized as a cross-bedded, medium-grained, well-sorted, quartz-cemented, moderately porous, sub-arkosic sandstone. The framework is compact and exhibits common point-to-point & elongated intergranular contacts. Rims of syntaxial quartz overgrowth cement are locally inter grown along contacts shared by adjoining quartz grains. Scattered feldspar grains exhibit indications of intra-particle corrosion and localized replacement with authigenic kaolinite. The mineralogy of the sandstone is comprised of quartz (~86%), plagioclase feldspar (~4%), k-feldspar (~1%), kaolinite (~6%), illite / mica (~2.5%), and traces of calcite (0.5%), and mixed-layered illite/smectite (<0.5%) [see Table I]. Macroporosity is visually estimated to comprise ~ 8-10% of the sandstone bulk volume.

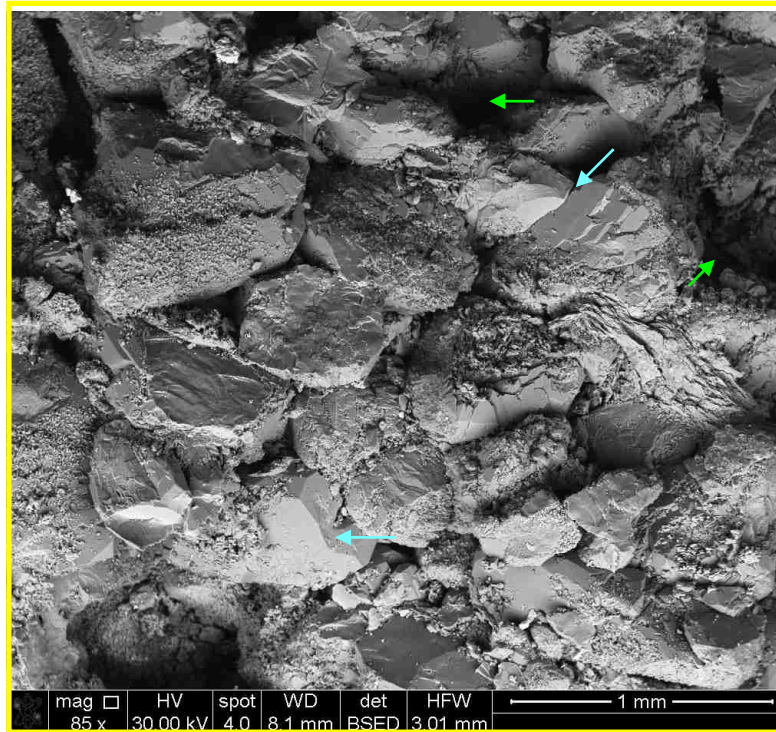
23009-05 Photo Index:

Sample ID	Magnification
23009-05A	126X
23009-05B	85X
23009-05C	500X
23009-05D	500X
23009-05E	500X
23009-05F	1000X

Intergranular macro-porosity	BP
Detrital quartz	Q
Quartz overgrowth cement	OG
Authigenic Kaolinite	K
Leached Feldspar	F
Micaceous shale RF	M

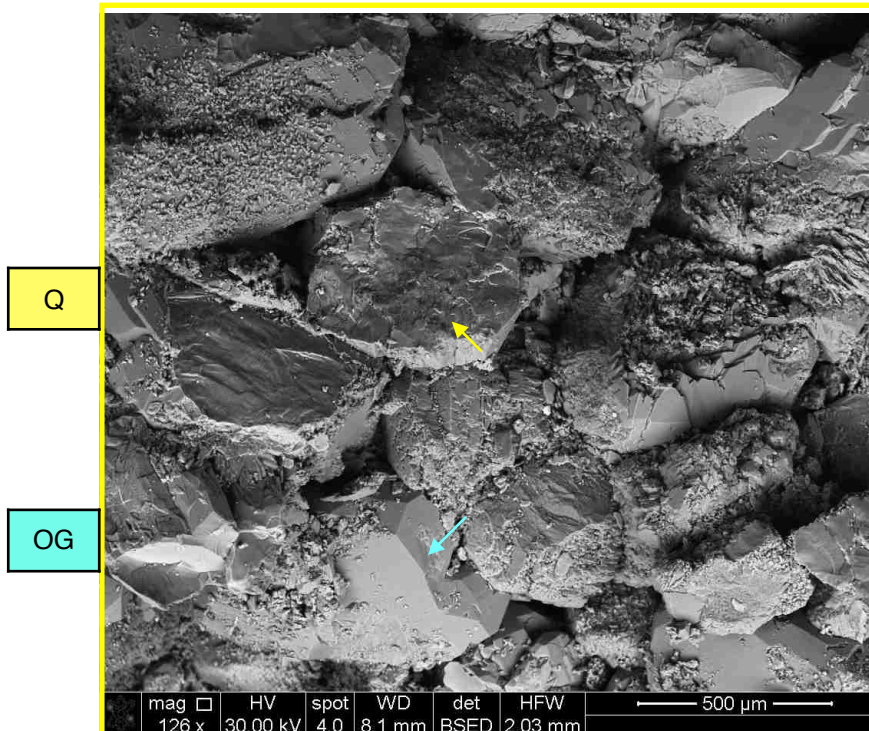


23009-05A 126X



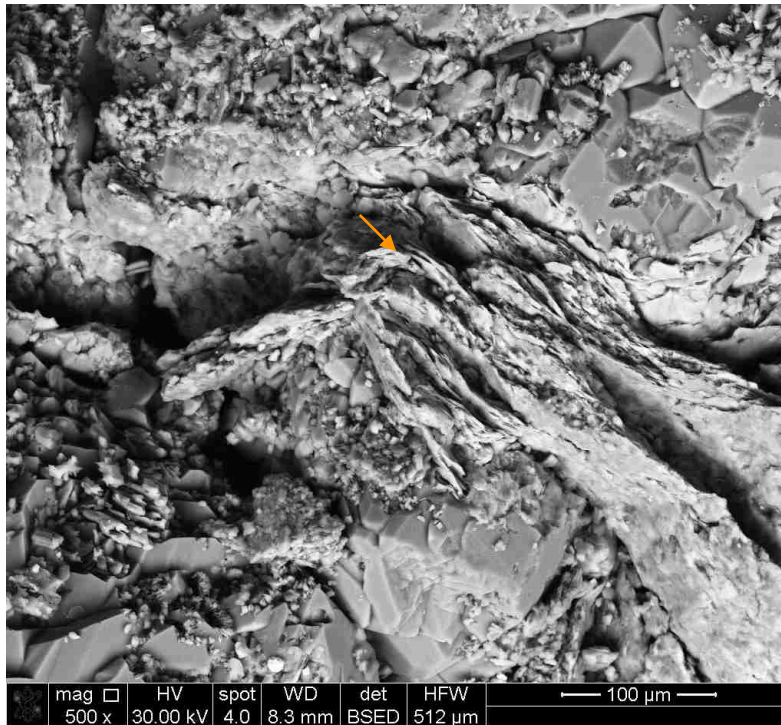
OG
BP

23009-05B 85X



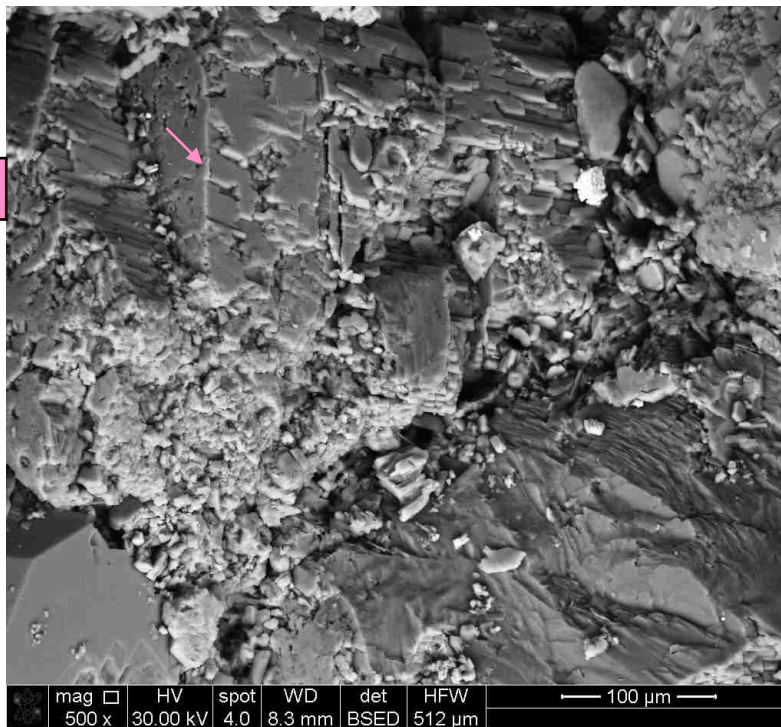


23009-05C 500X



M

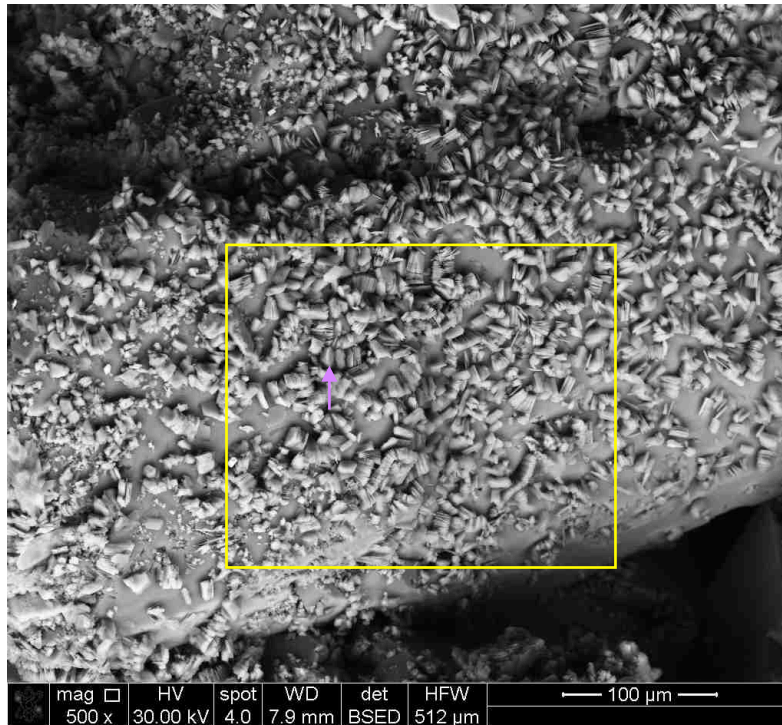
23009-05D 500X



F

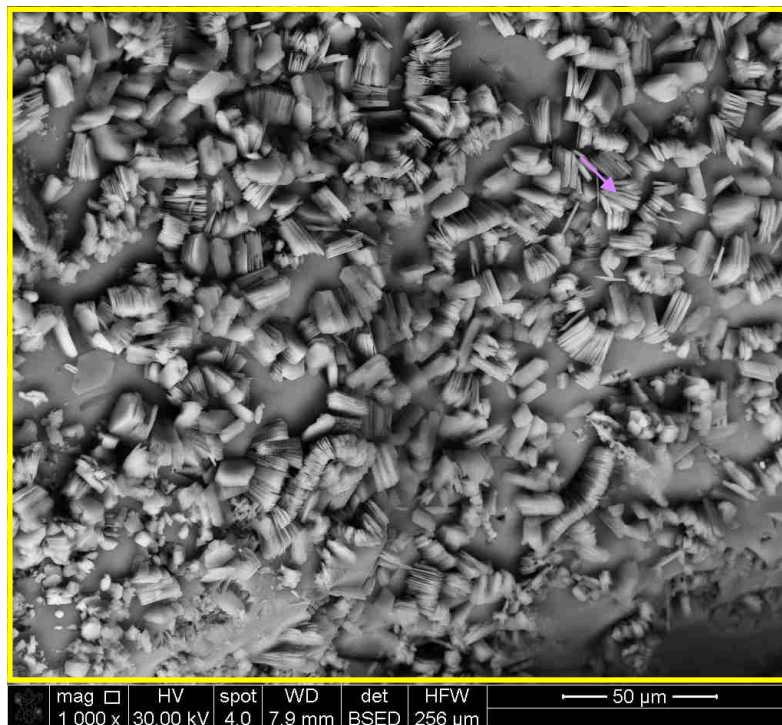


23009-05E 500X



K

23009-05F 1000X



K



Geosyntec Consultants

Mountaineer | New Haven, WV

MW-1922D-111

MI#23009-06 - SEM

Summary: This core sample is similar to the core interval @ 104.5' (MI#23009-05) & is characterized as a cross-bedded, medium-grained, moderately-sorted, quartz-cemented, moderately porous, sub-arkosic sandstone. The framework is compact and exhibits common point-to-point & elongated intergranular contacts. Rims of syntaxial quartz overgrowth cement are locally inter grown along contacts shared by adjoining quartz grains. Scattered feldspar grains exhibit indications of intra-particle corrosion and localized replacement with authigenic kaolinite. The mineralogy of the sandstone is comprised of quartz (~85%), plagioclase feldspar (~3%), k-feldspar (~2%), kaolinite (~6%), illite / mica (~3%), and traces of goethite (0.5%), hematite (~0.5%) and chlorite (<0.5%) [see Table I]. Macroporosity is visually estimated to comprise ~ 5-7% of the sandstone bulk volume.

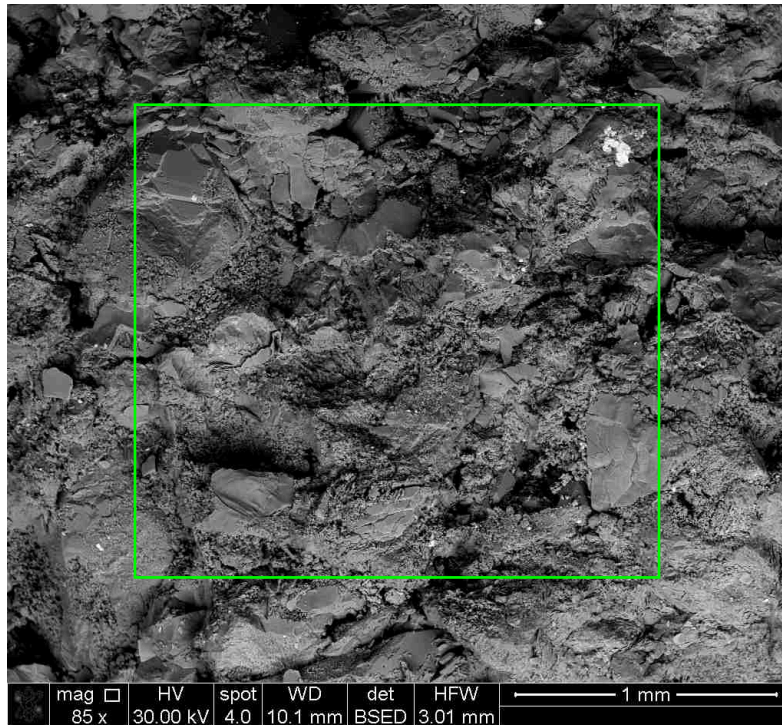
23009-06 Photo Index:

Sample ID	Magnification
23009-06A	85X
23009-06B	126X
23009-06C	1000X
23009-06D	8000X
23009-06E	1300X
23009-06F	5000X

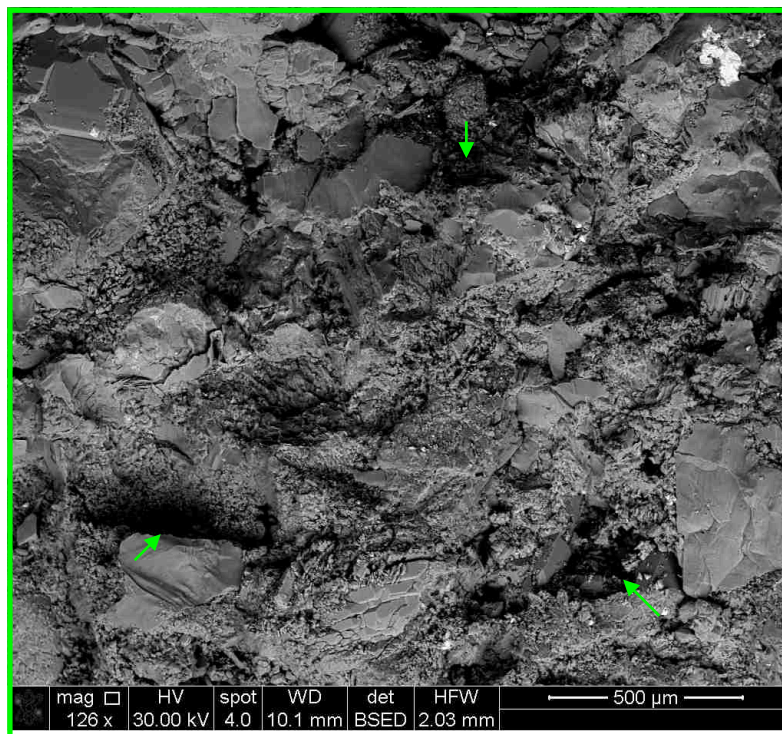
Intergranular macro-porosity	BP
Detrital quartz	Q
Quartz overgrowth cement	OG
Authigenic Kaolinite	K
Leached Feldspar	F
Micaceous shale RF	M



23009-06A 85X



23009-06B 126X



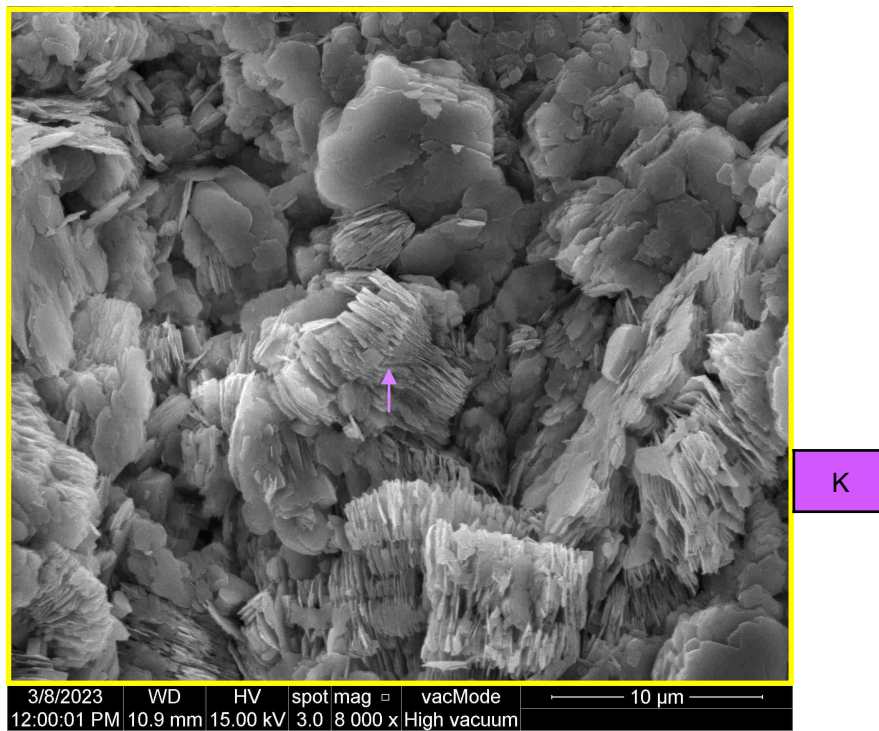
BP



23009-06C 1000X

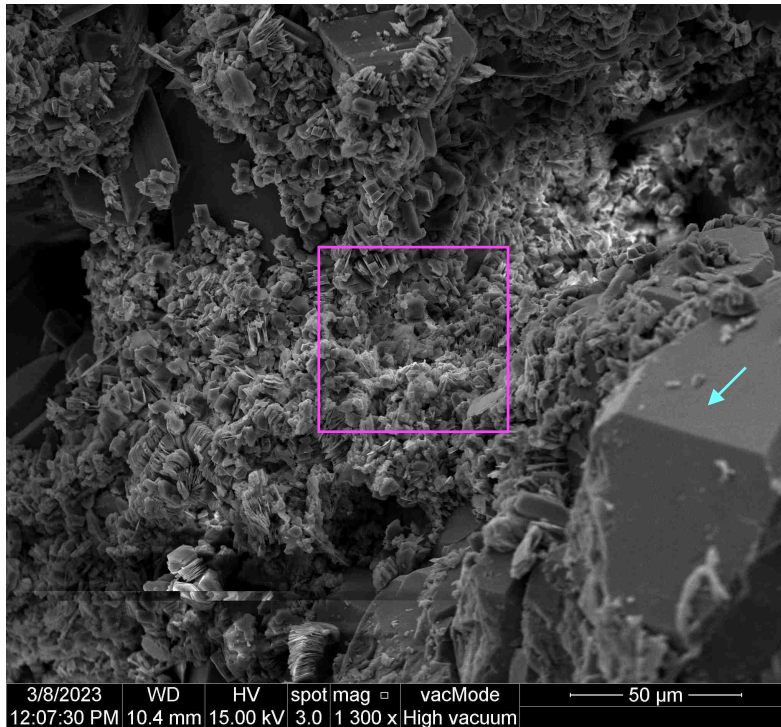


23009-06D 8000X



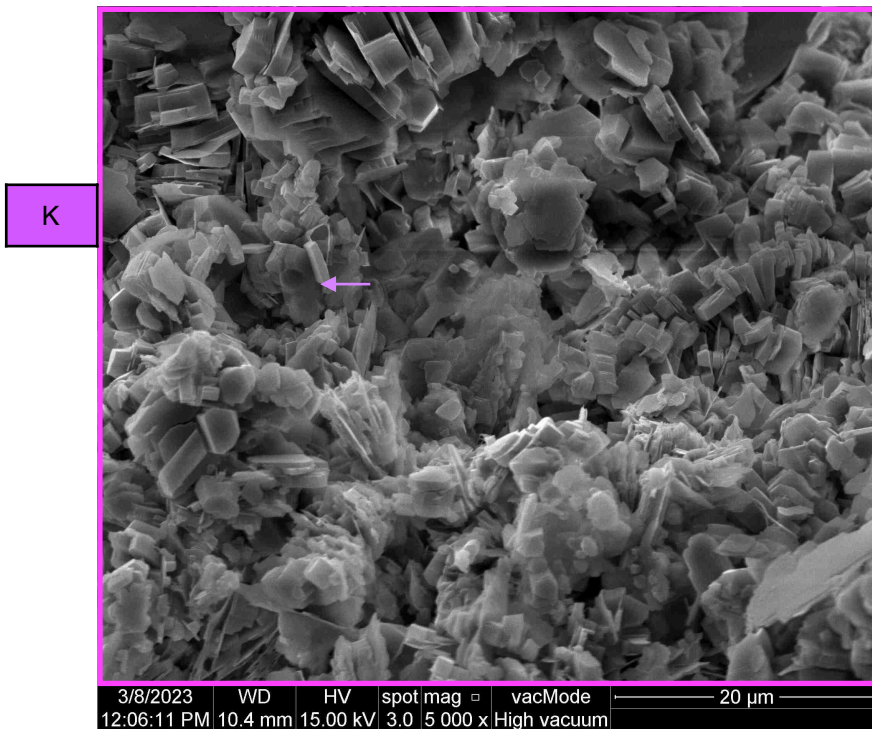


23009-06E 1300X



OG

23009-06F 5000X



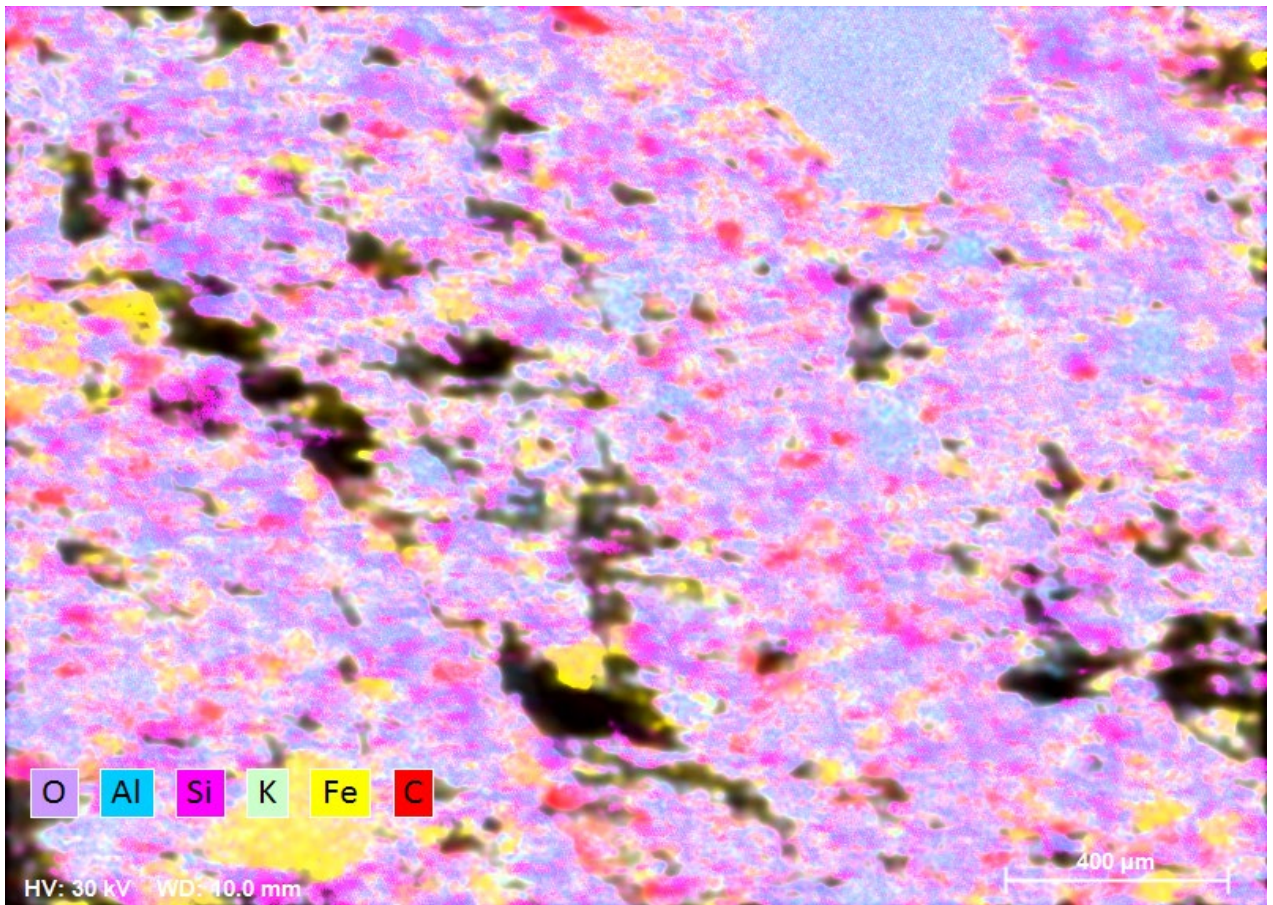
K

23009-01 Report



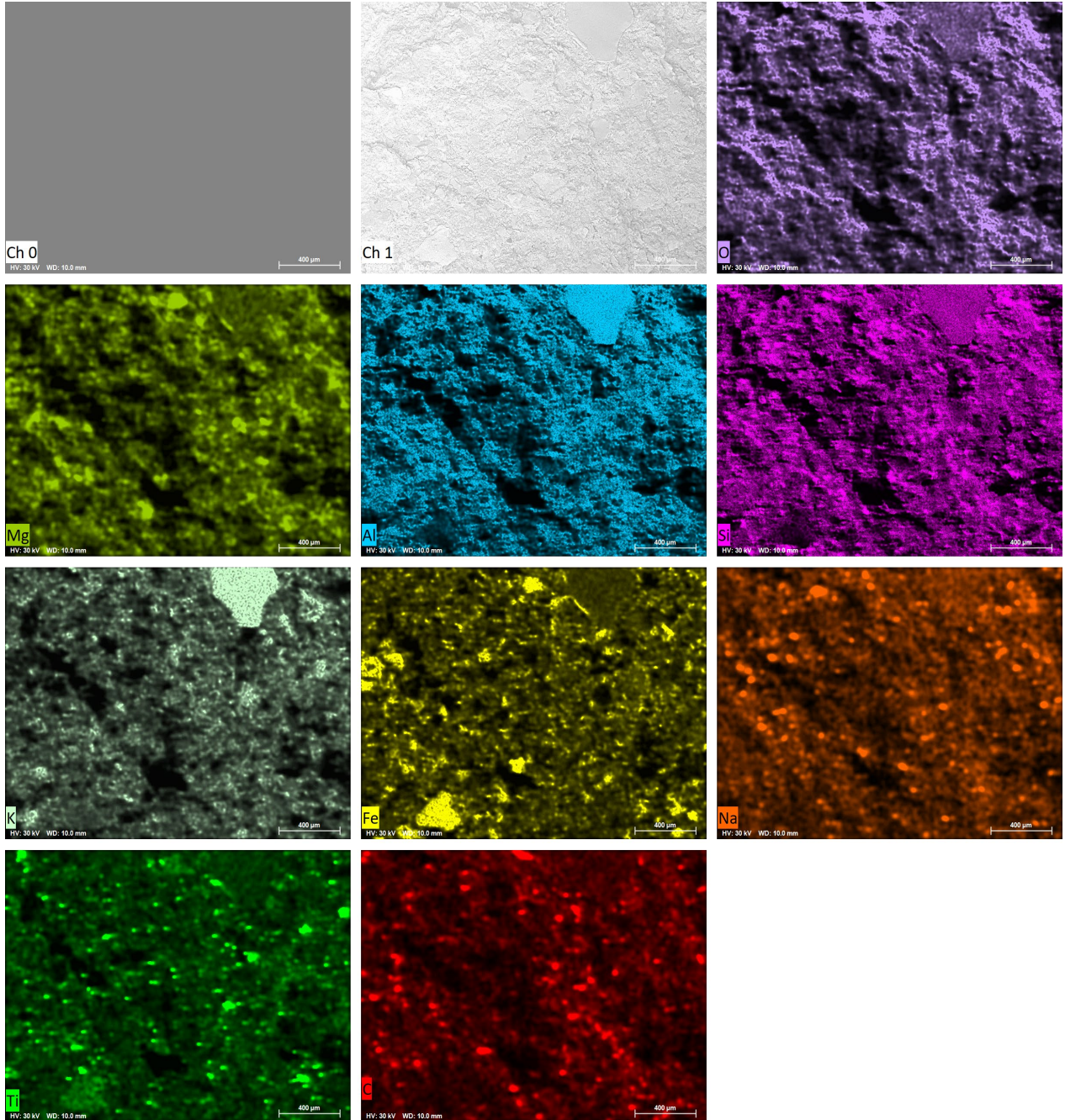
MAG: 126x HV: 30 kV WD: 10.0 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/7/2023	3:34:57 PM	30.0 keV	126x	10.0 mm



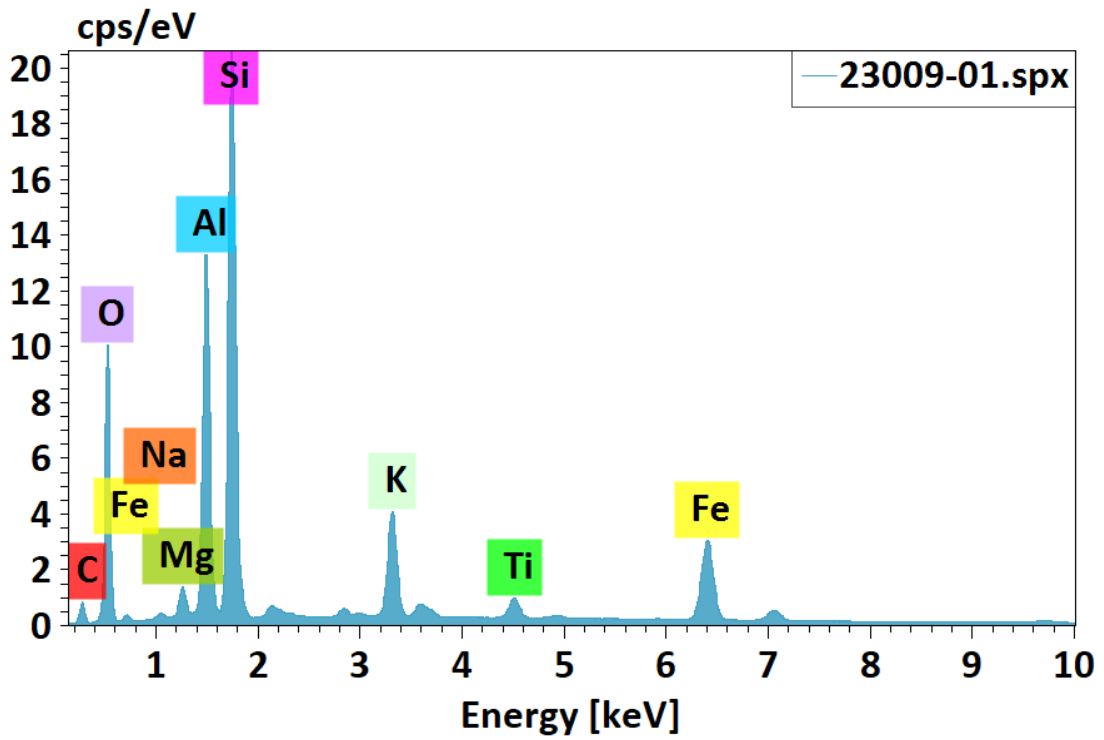
HV: 30 kV WD: 10.0 mm

Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:27:43 PM	30.0 keV	126x	10.0 mm



EDS Report

Company / Department

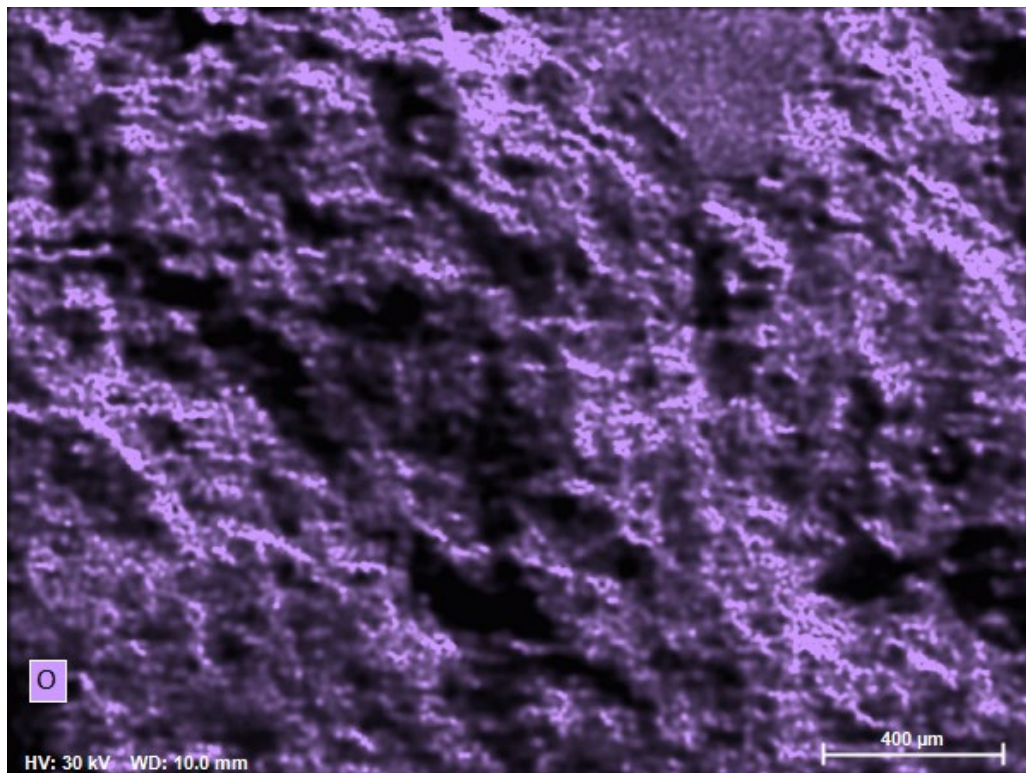


23009-01.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	10.68	10.23	16.40
Oxygen	8	48.79	46.75	56.28
Sodium	11	0.53	0.51	0.42
Magnesium	12	1.33	1.28	1.01
Aluminium	13	12.15	11.65	8.31
Silicon	14	20.71	19.84	13.61
Potassium	19	3.86	3.70	1.82
Titanium	22	0.96	0.92	0.37
Iron	26	5.36	5.14	1.77
		104.37	100.00	100.00

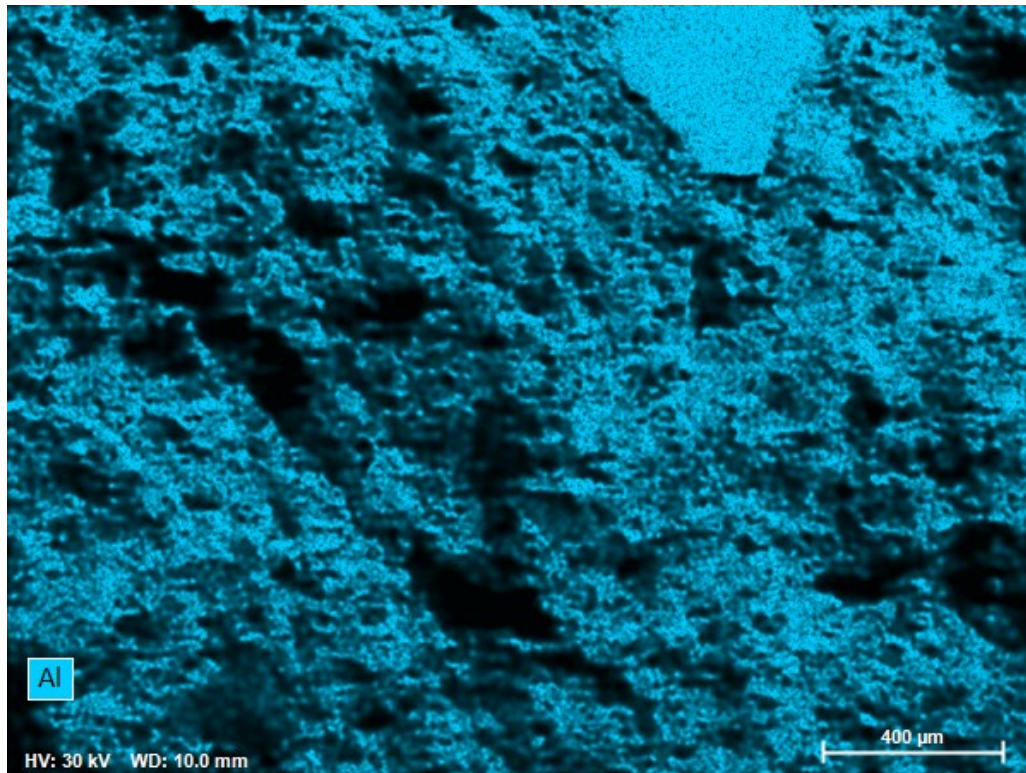
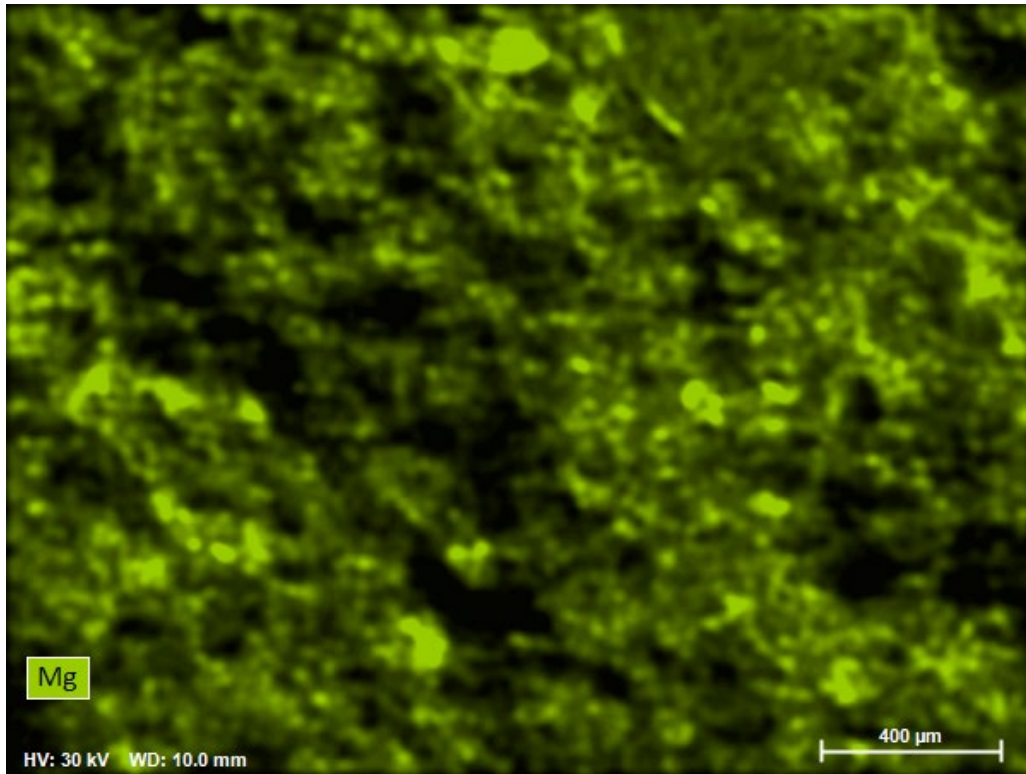
EDS Report

Company / Department



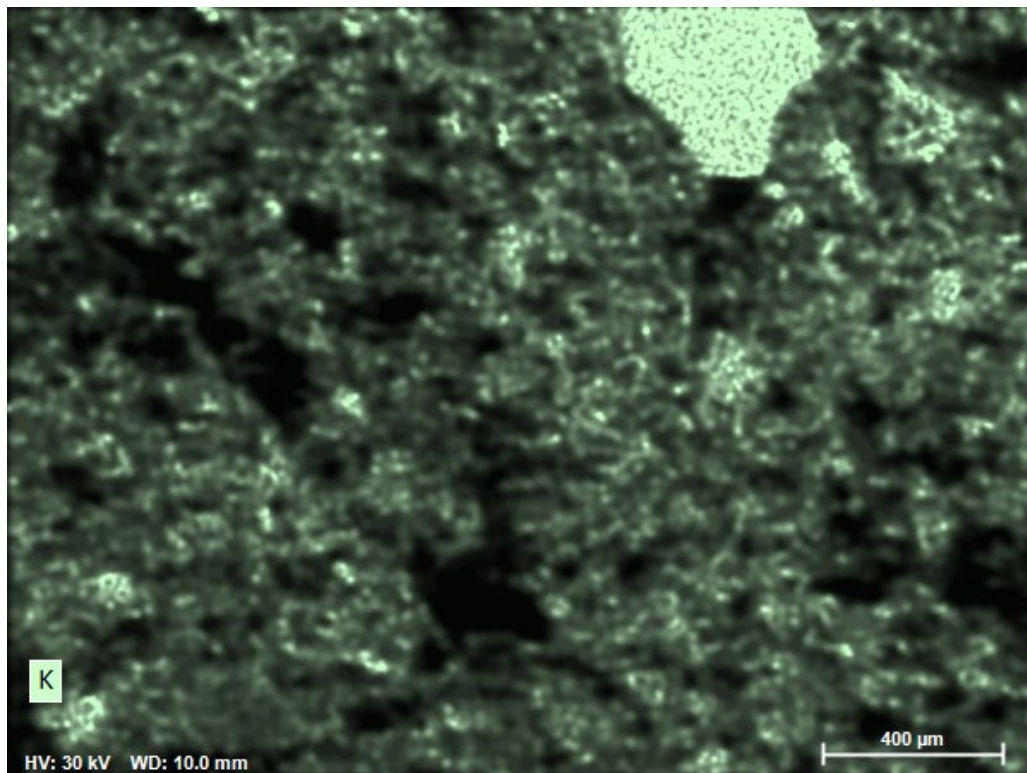
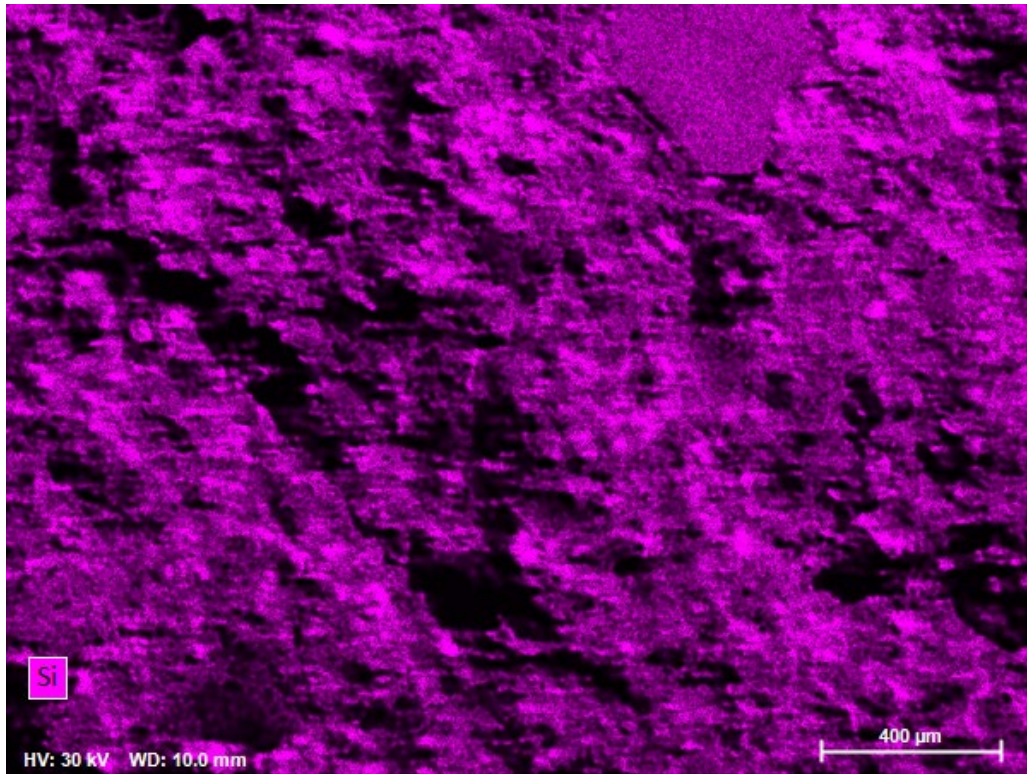
EDS Report

Company / Department



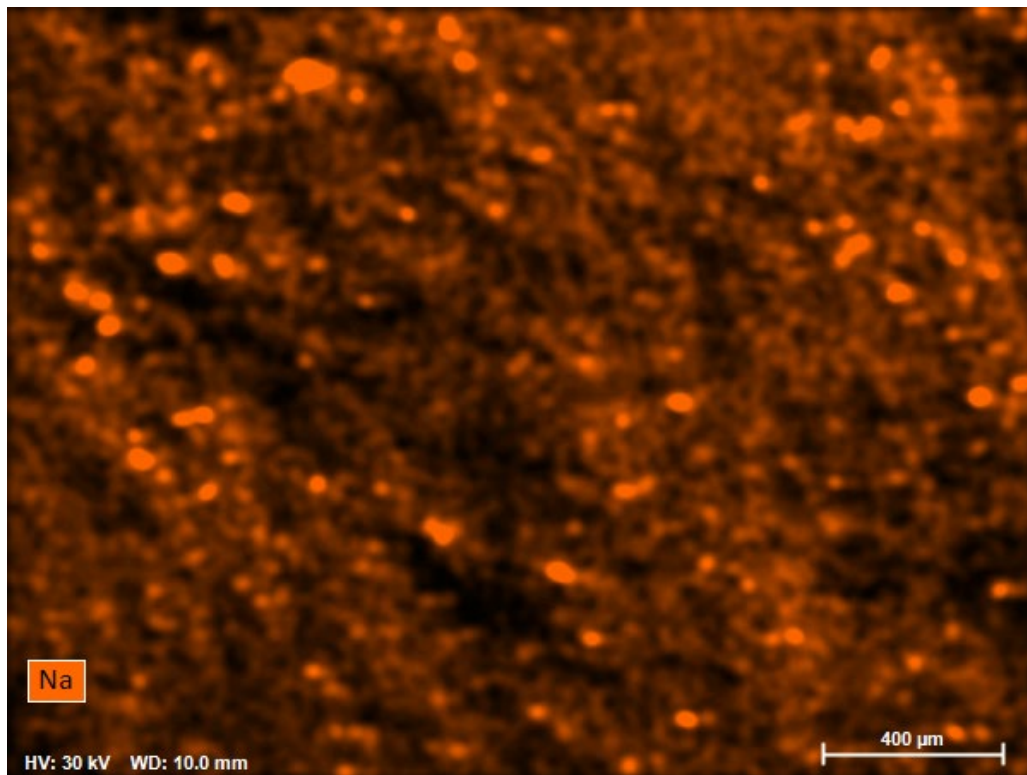
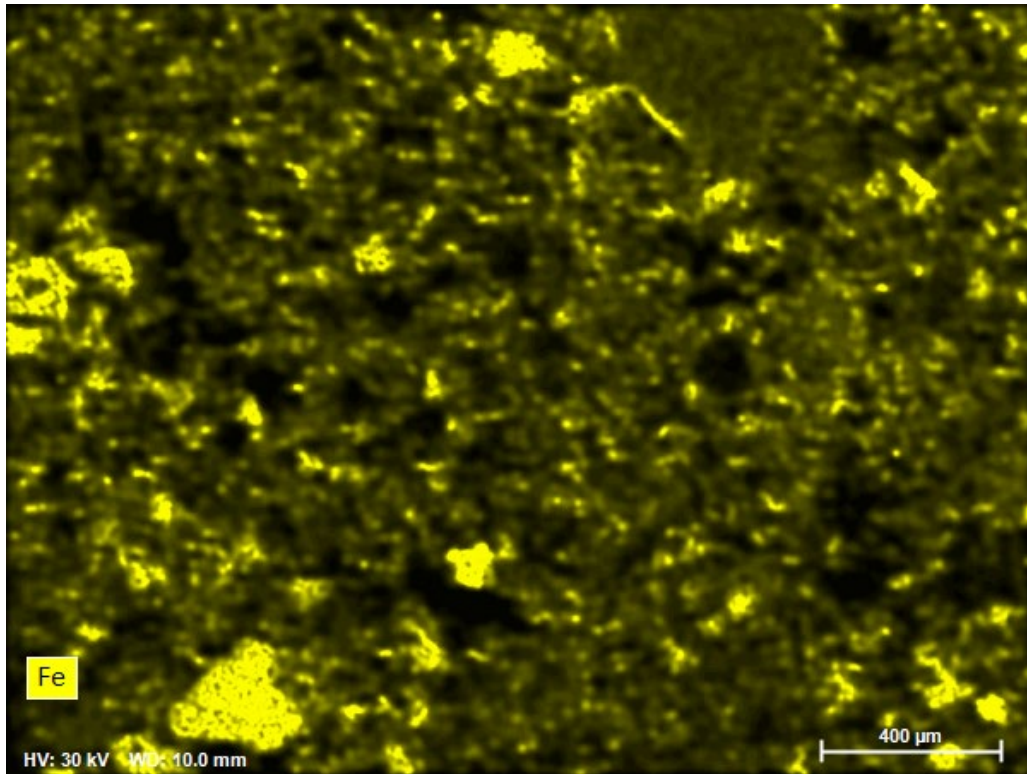
EDS Report

Company / Department



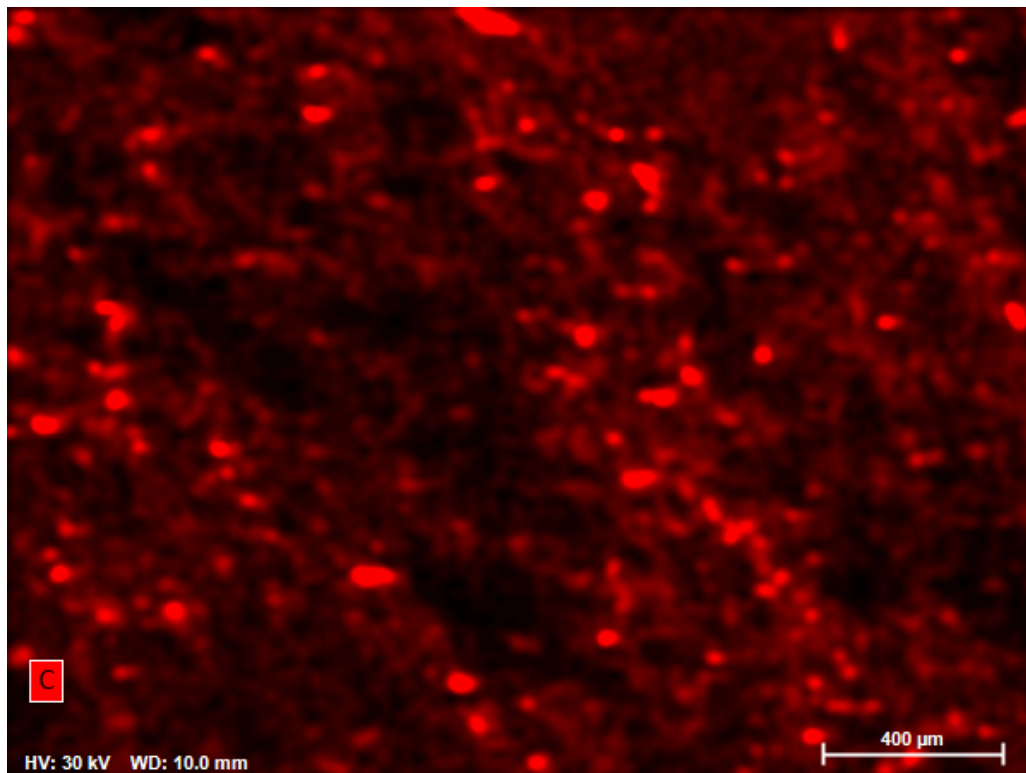
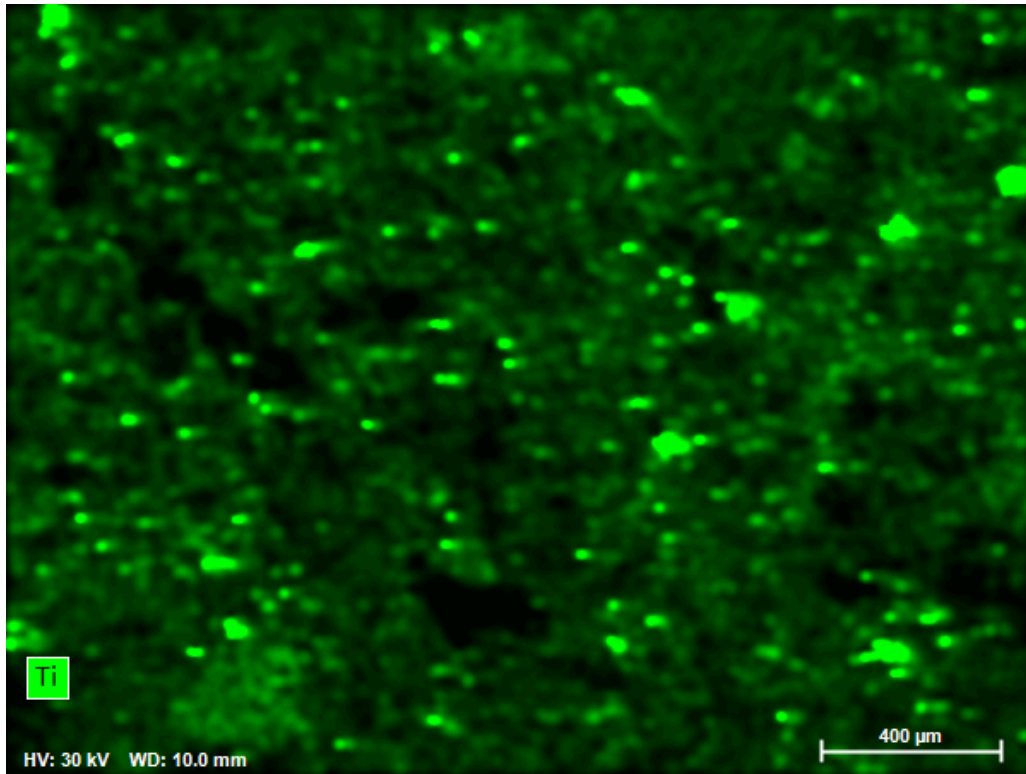
EDS Report

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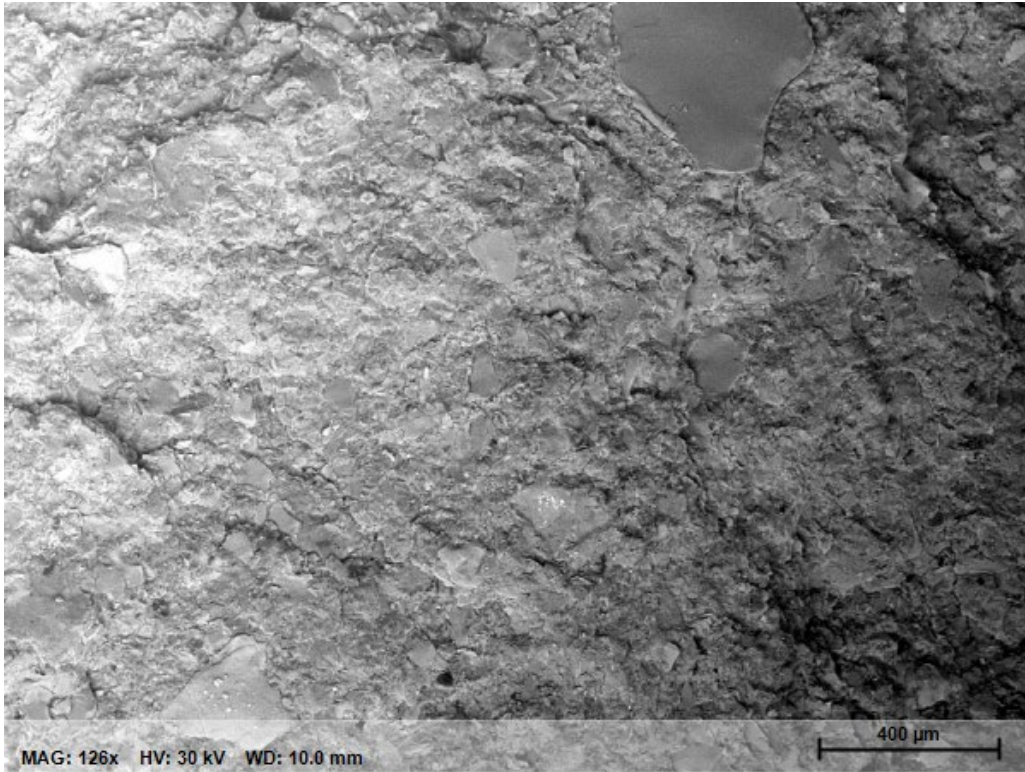
EDS Report

Company / Department

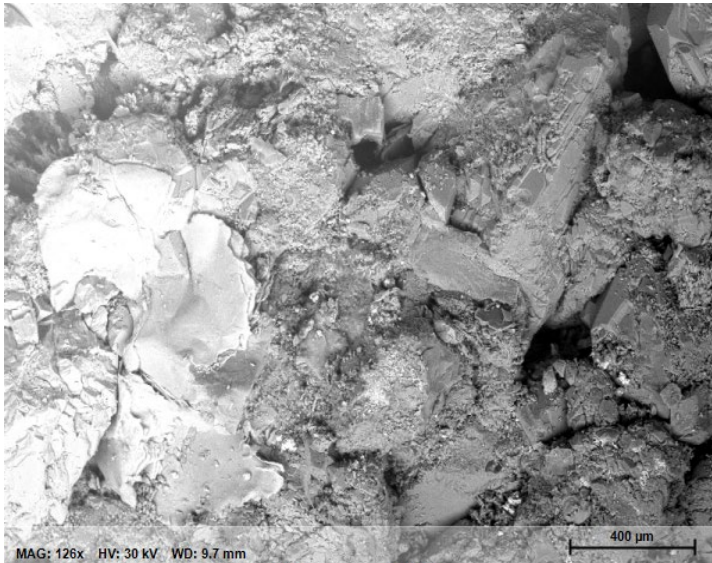


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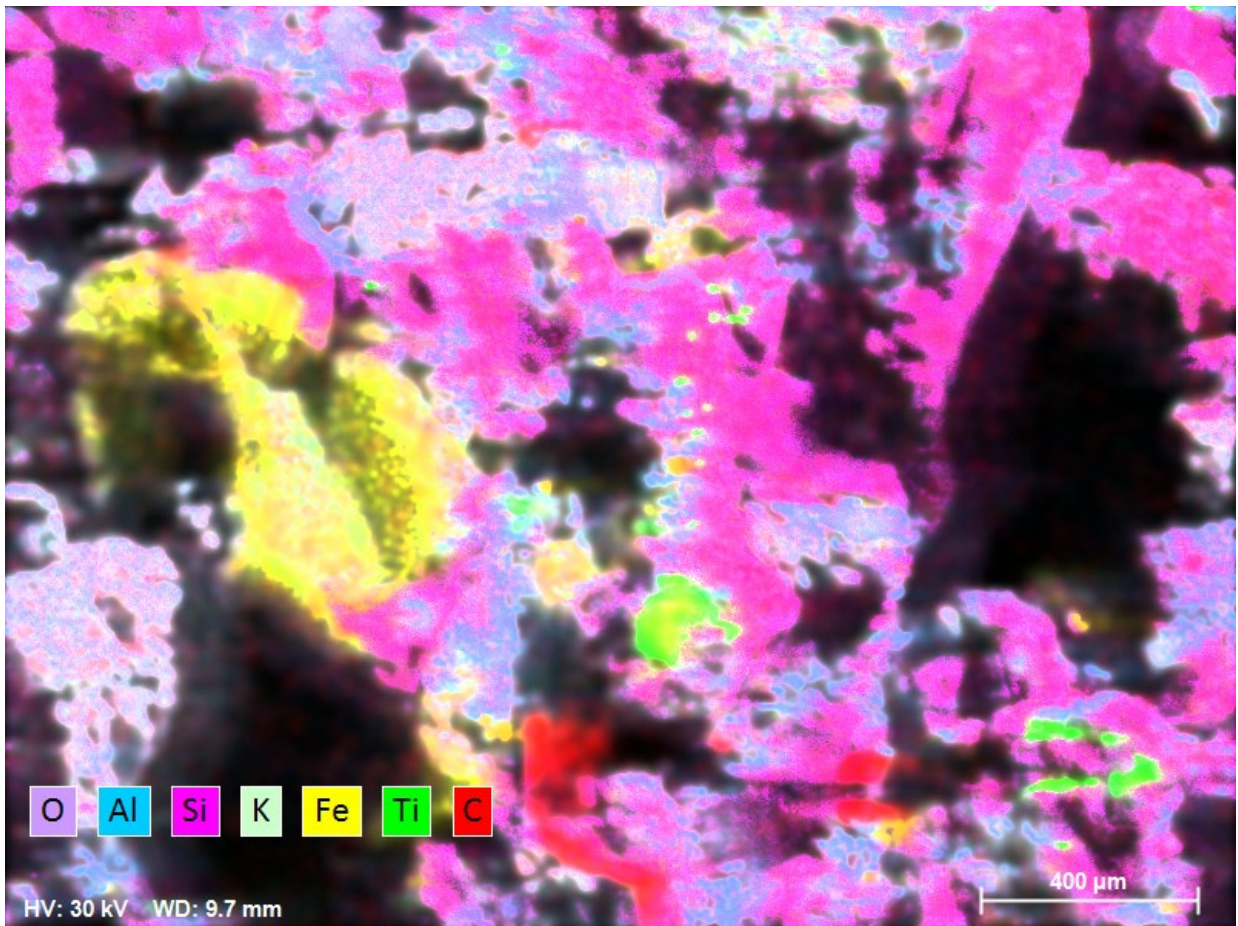


23009-02 Report



MAG: 126x HV: 30 kV WD: 9.7 mm

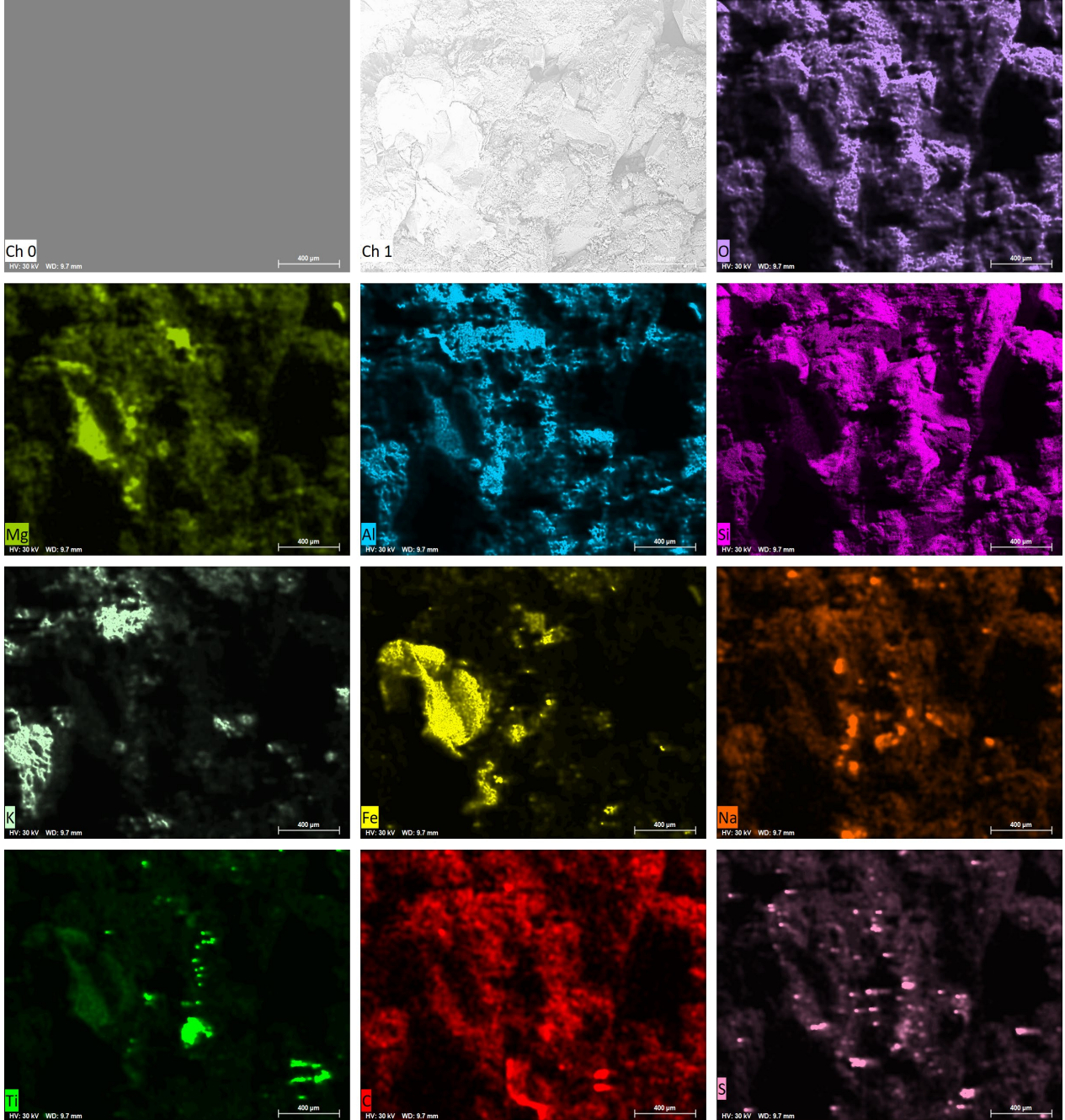
Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/7/2023	4:17:17 PM	30.0 keV	126x	9.7 mm



HV: 30 kV WD: 9.7 mm

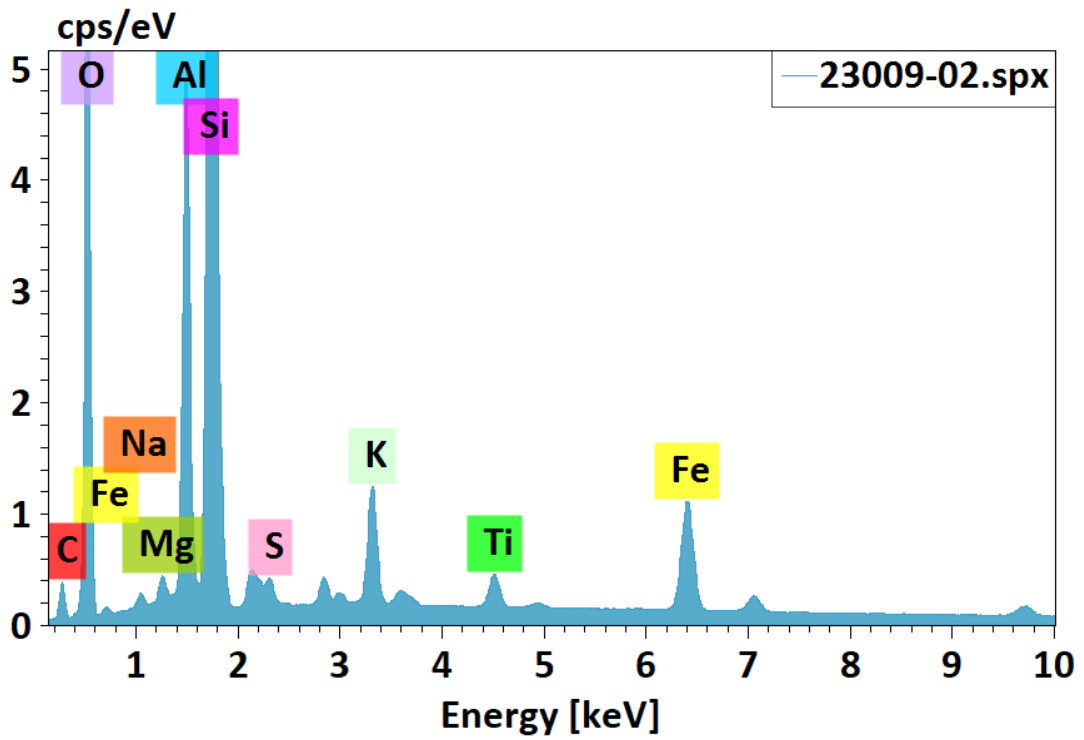
Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:36:58 PM	30.0 keV	126x	9.7 mm

3/8/2023



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Company / Department

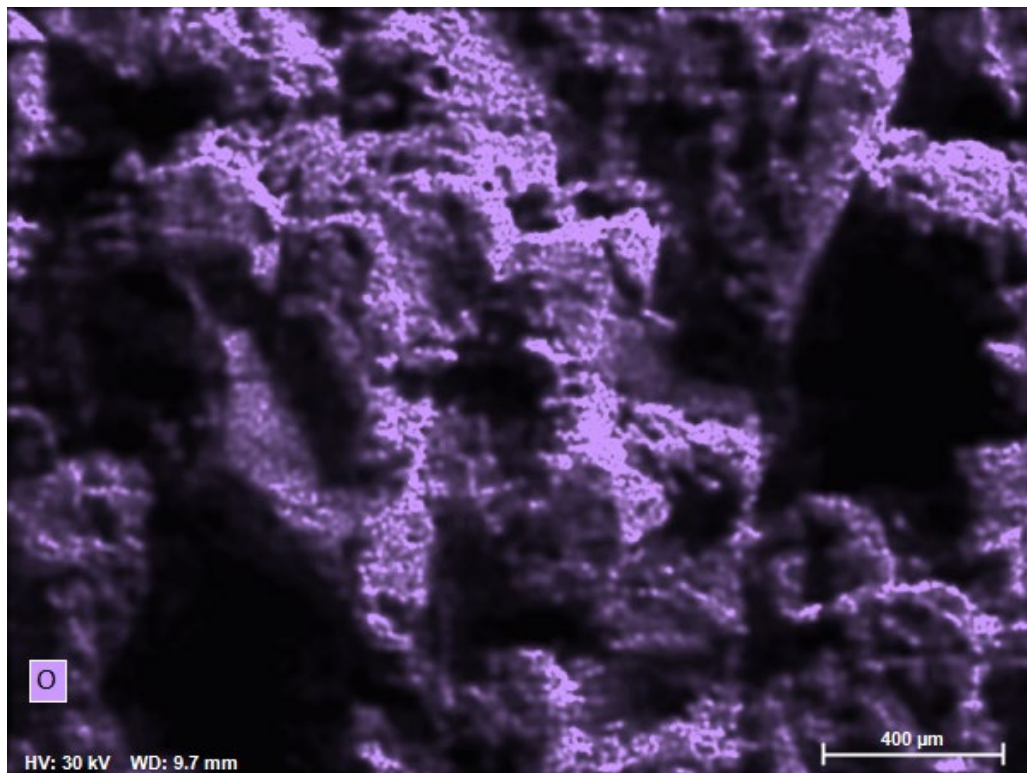


23009-02.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	7.69	8.00	12.75
Oxygen	8	48.06	49.98	59.82
Sodium	11	0.42	0.43	0.36
Magnesium	12	0.39	0.40	0.32
Aluminium	13	6.02	6.26	4.45
Silicon	14	28.19	29.31	19.98
Sulfur	16	0.39	0.40	0.24
Potassium	19	1.71	1.78	0.87
Titanium	22	0.64	0.67	0.27
Iron	26	2.65	2.75	0.94
		96.16	100.00	100.00

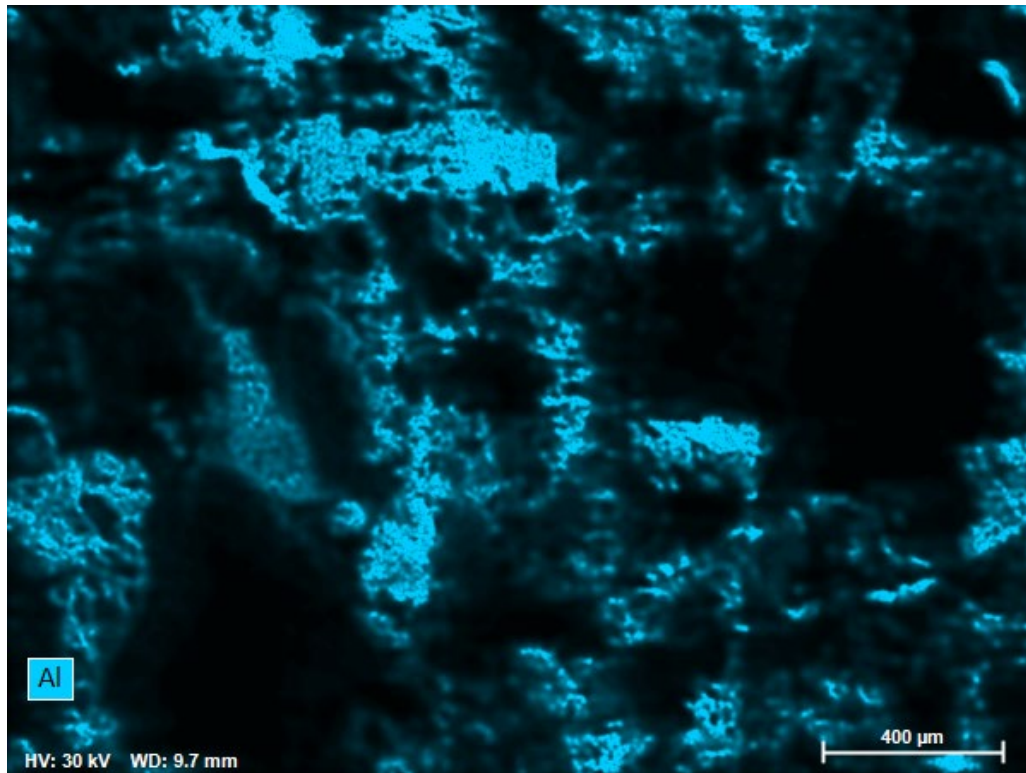
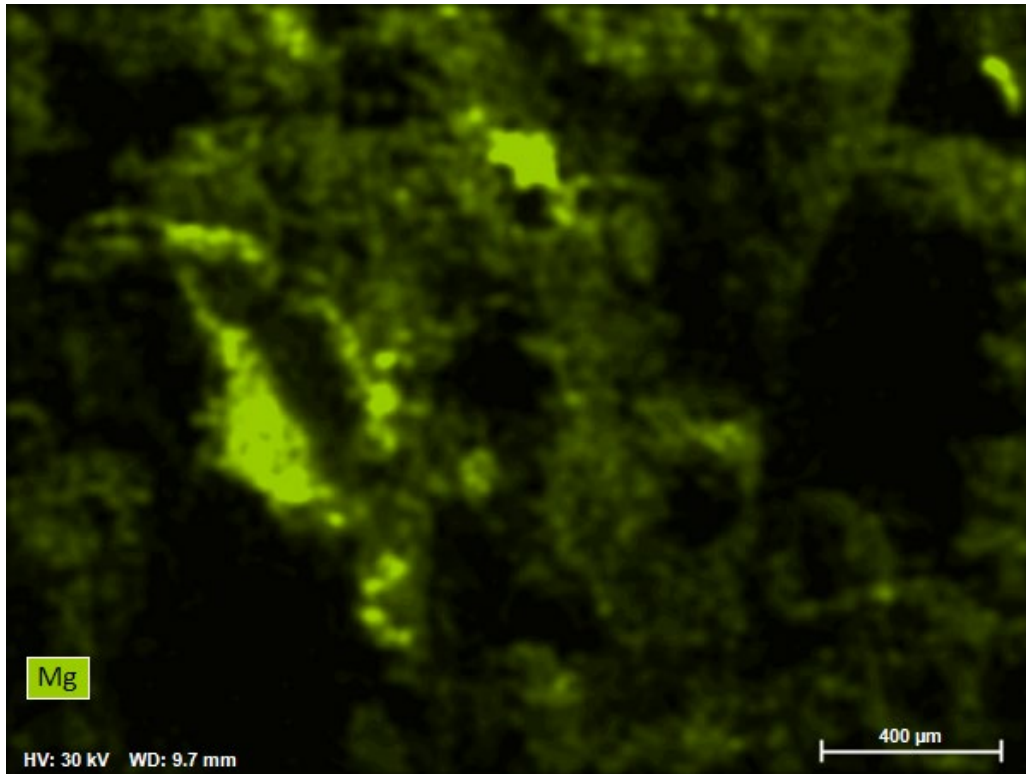
EDS Report

Company / Department



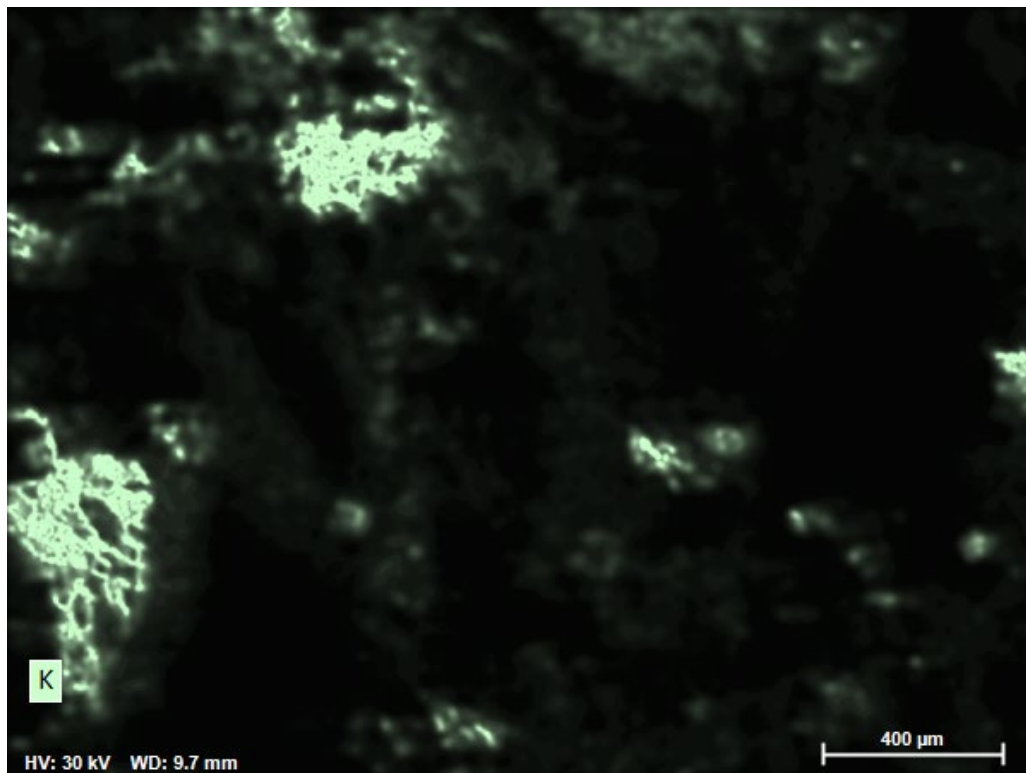
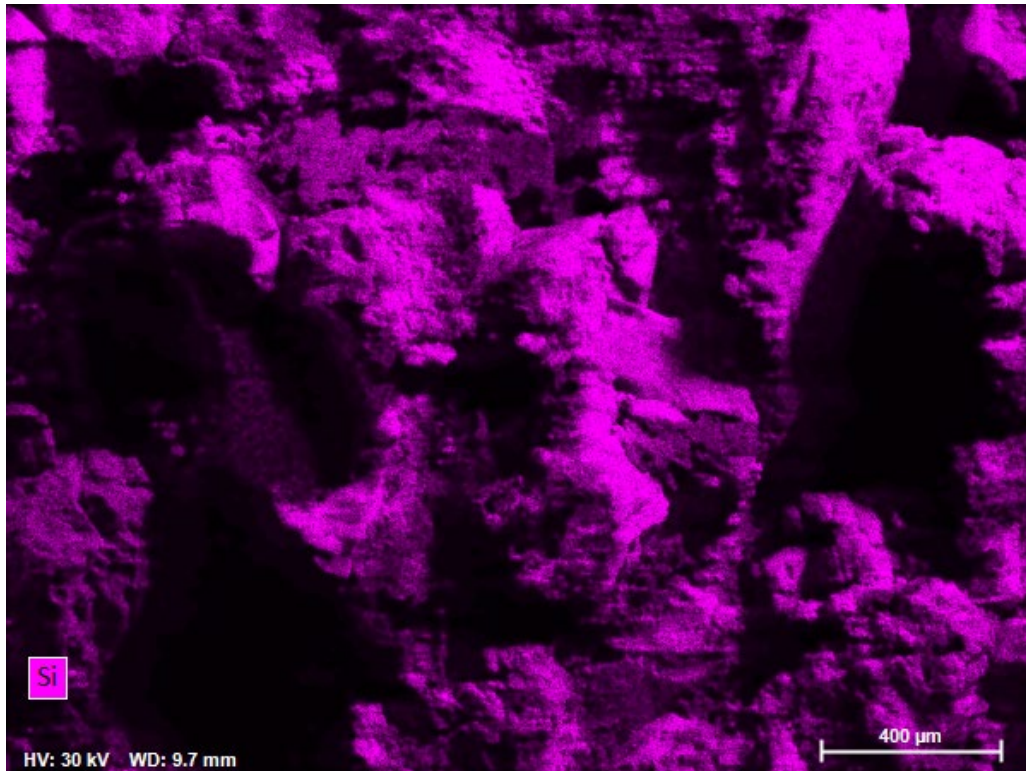
EDS Report

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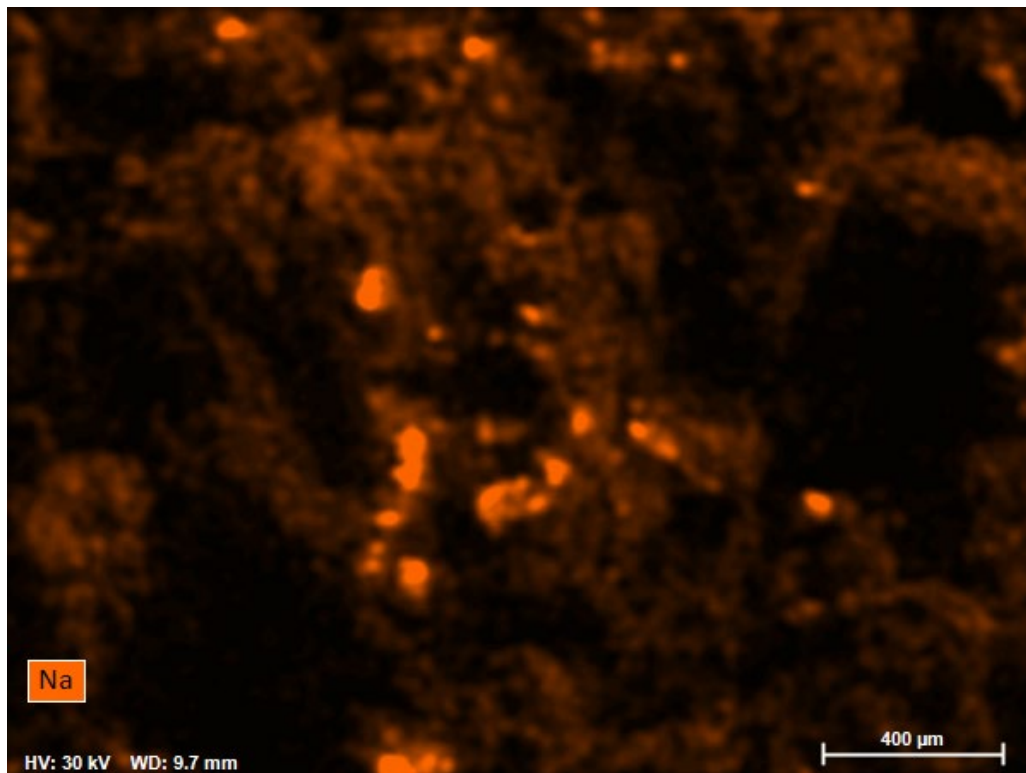
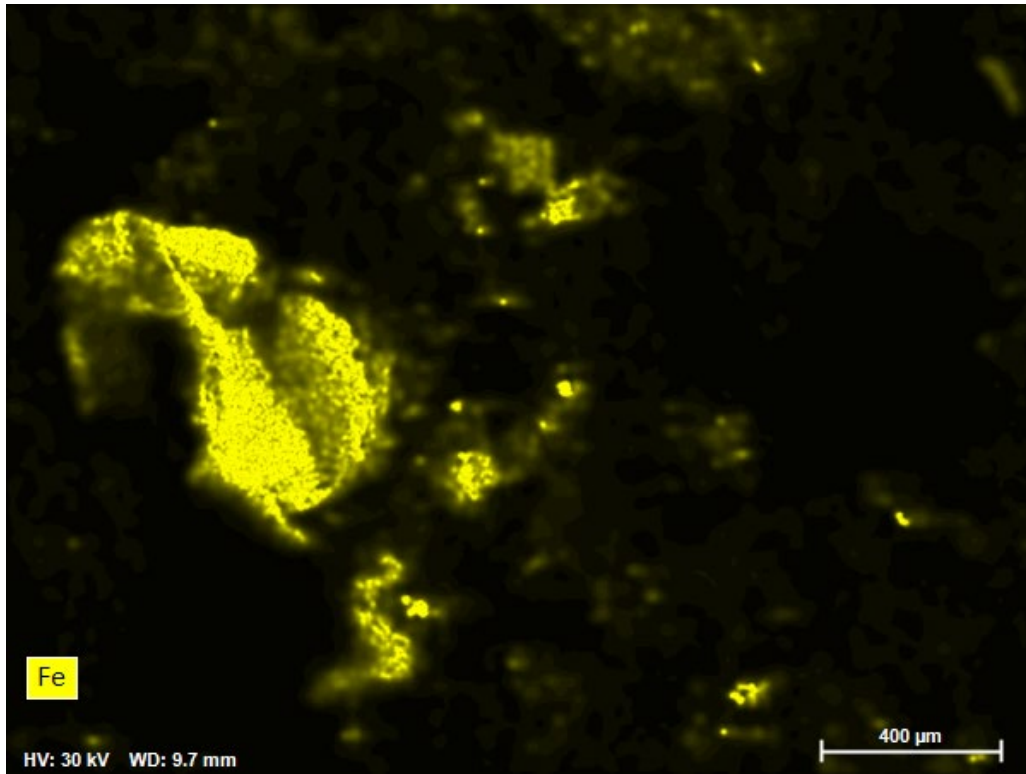
EDS Report

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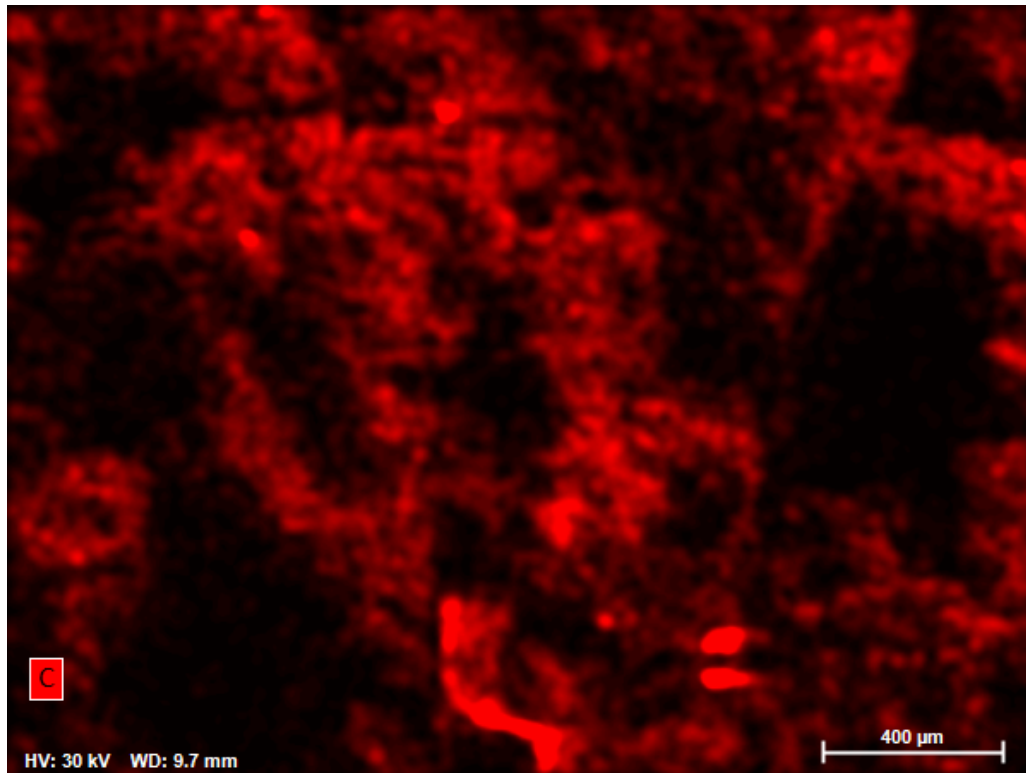
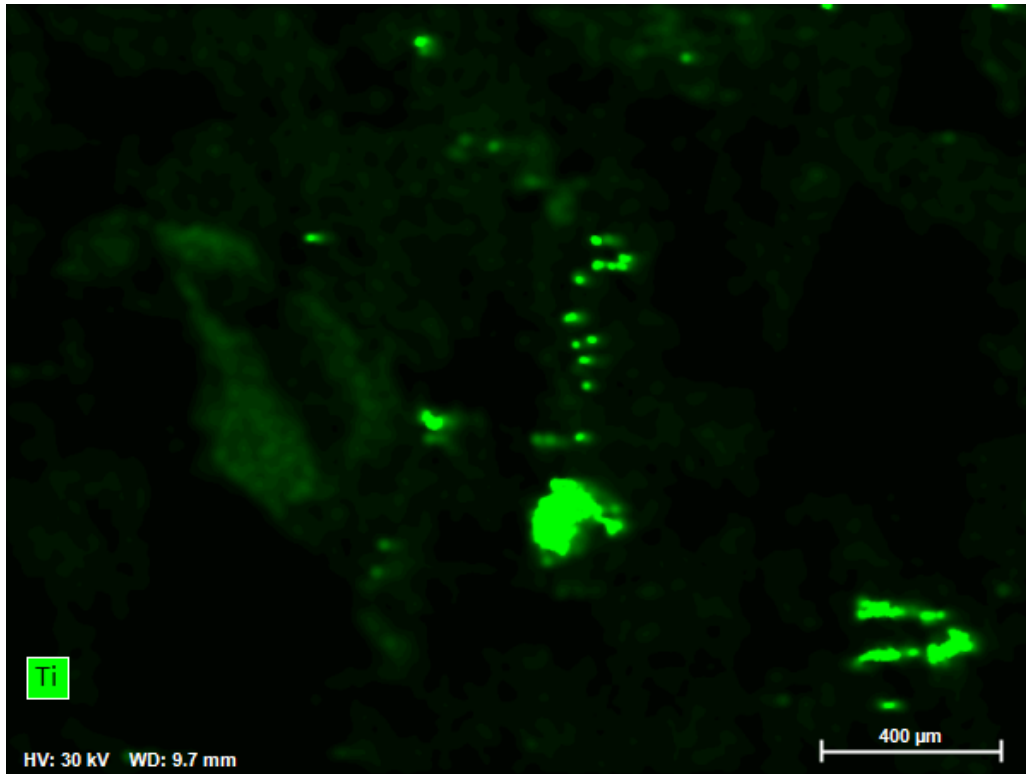
EDS Report

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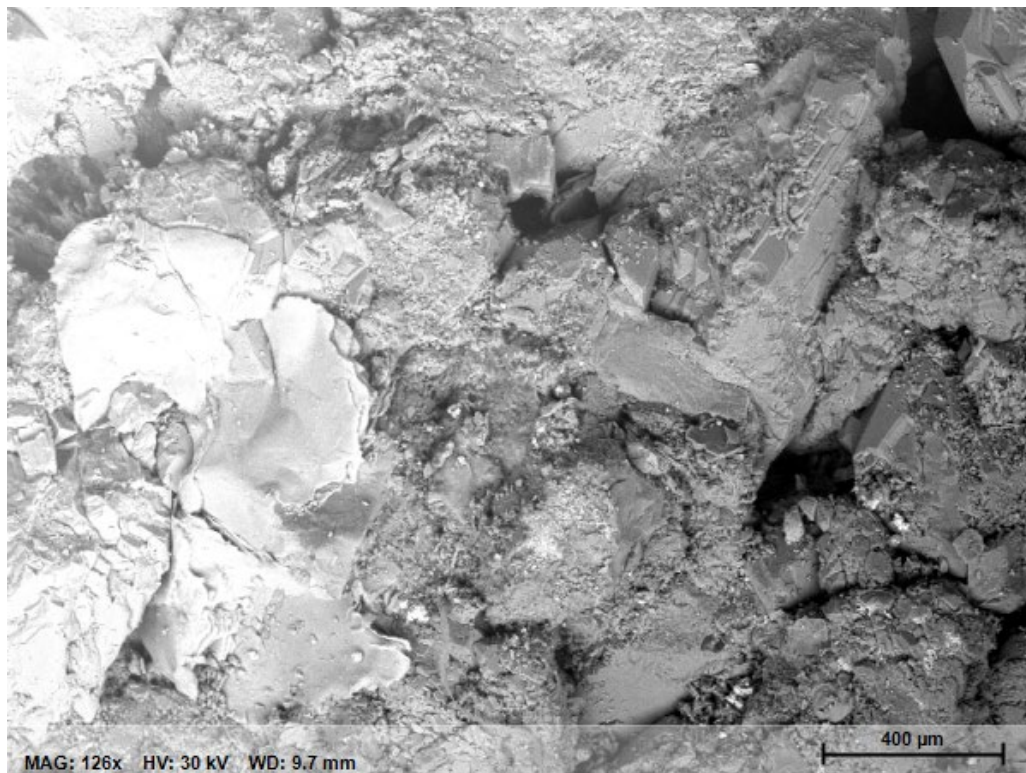
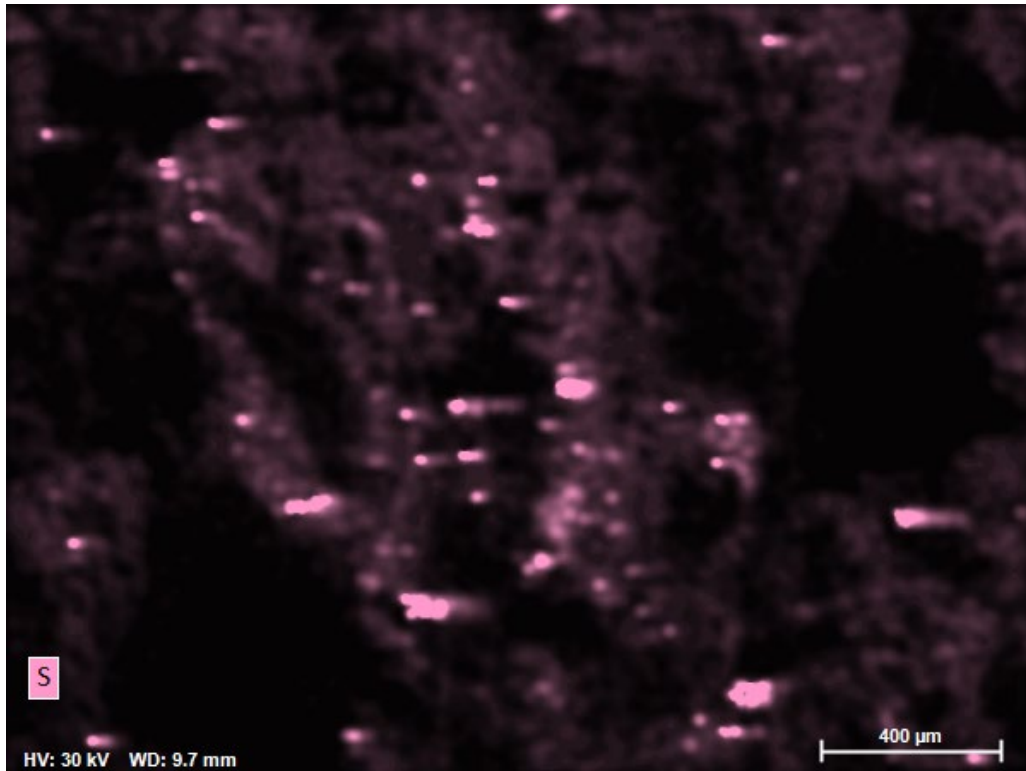
EDS Report

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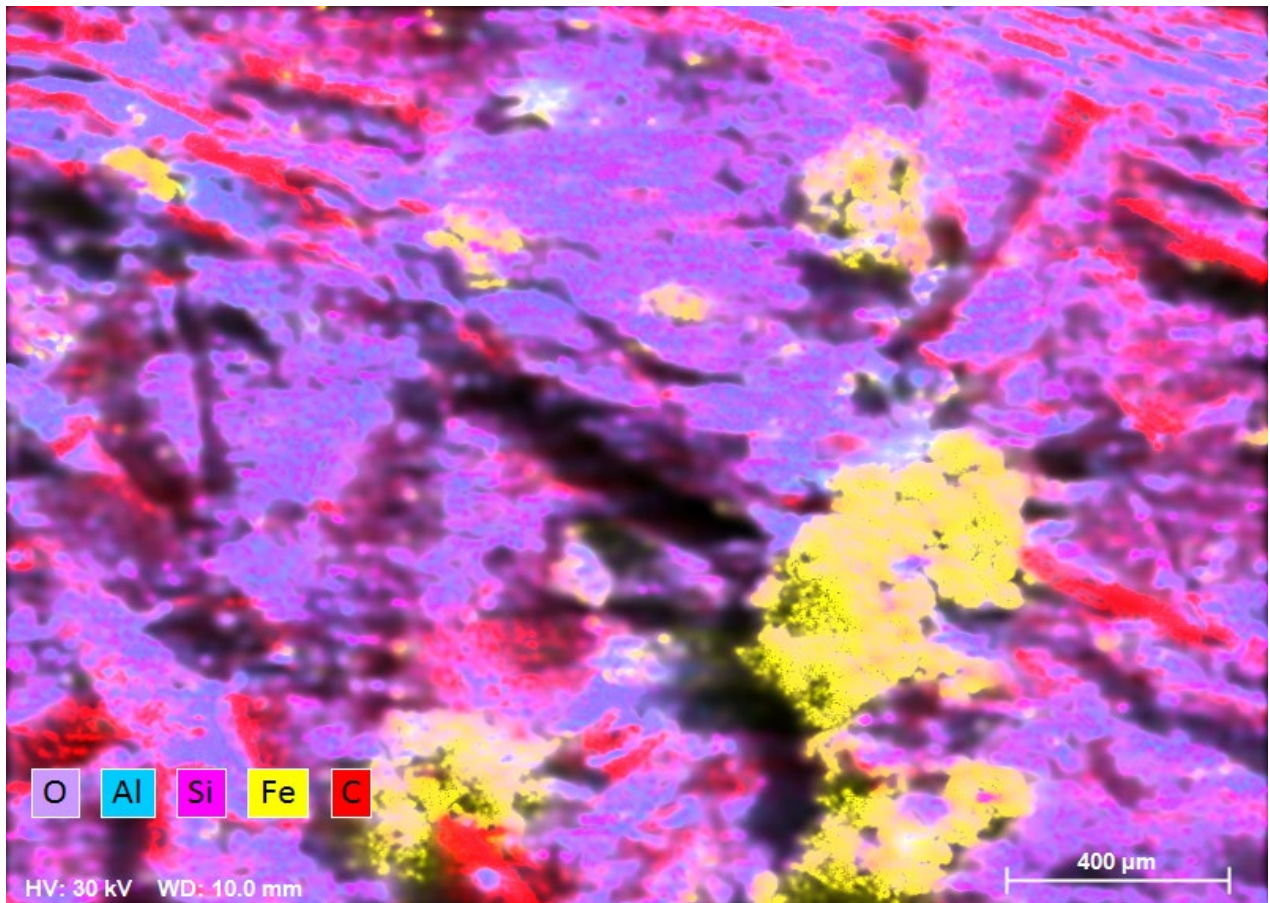
Company / Department



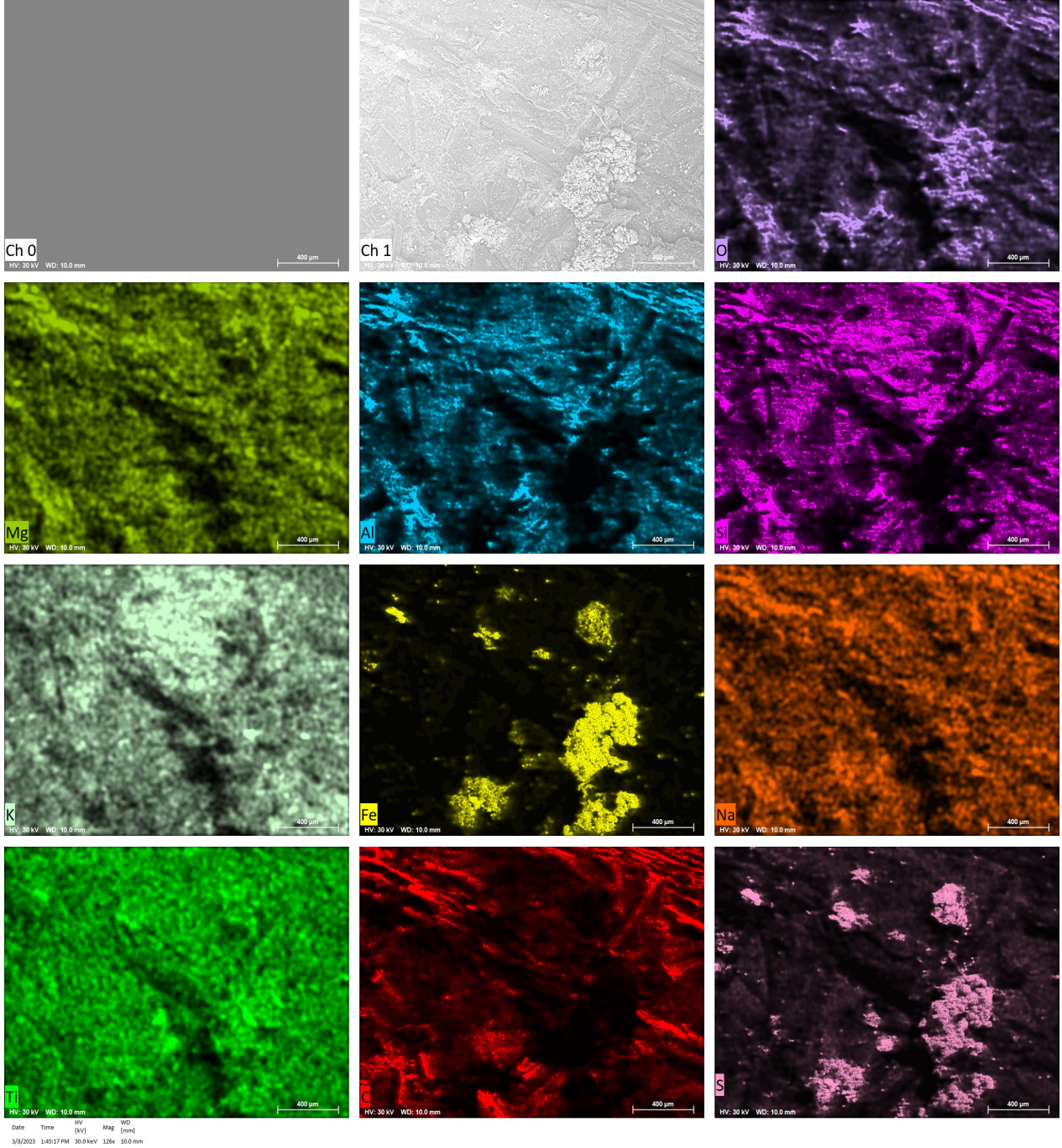
23009-03 Report



Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	9:09:21 AM	30.0 keV	126x	10.0 mm

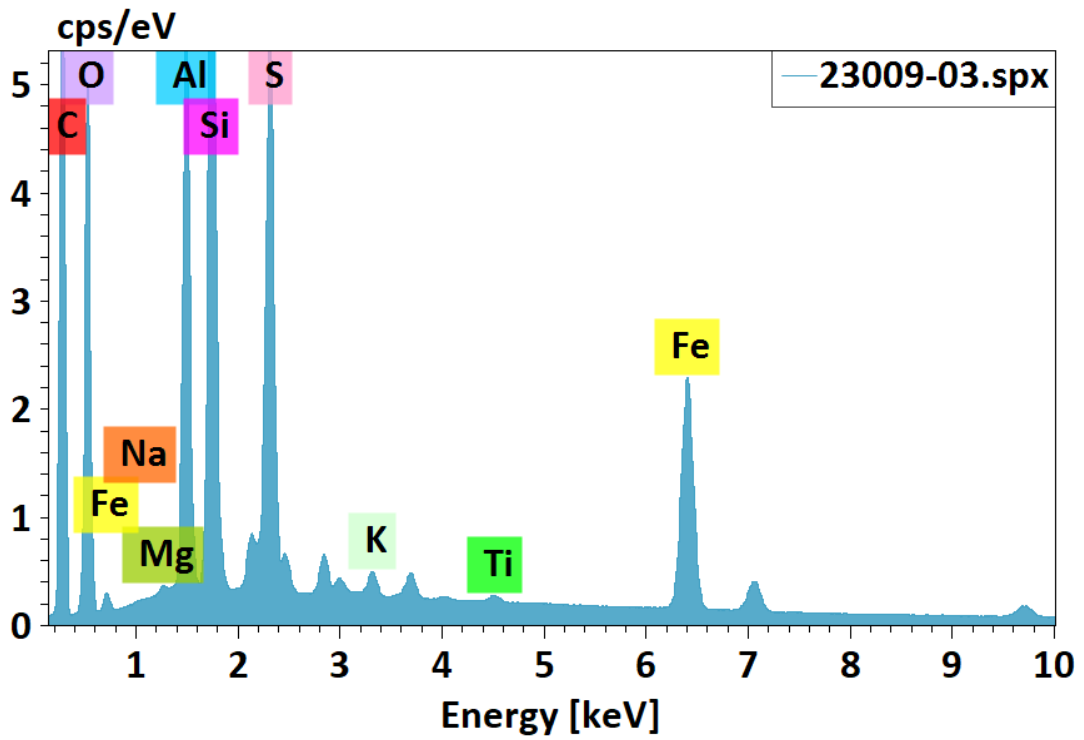


Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:45:17 PM	30.0 keV	126x	10.0 mm



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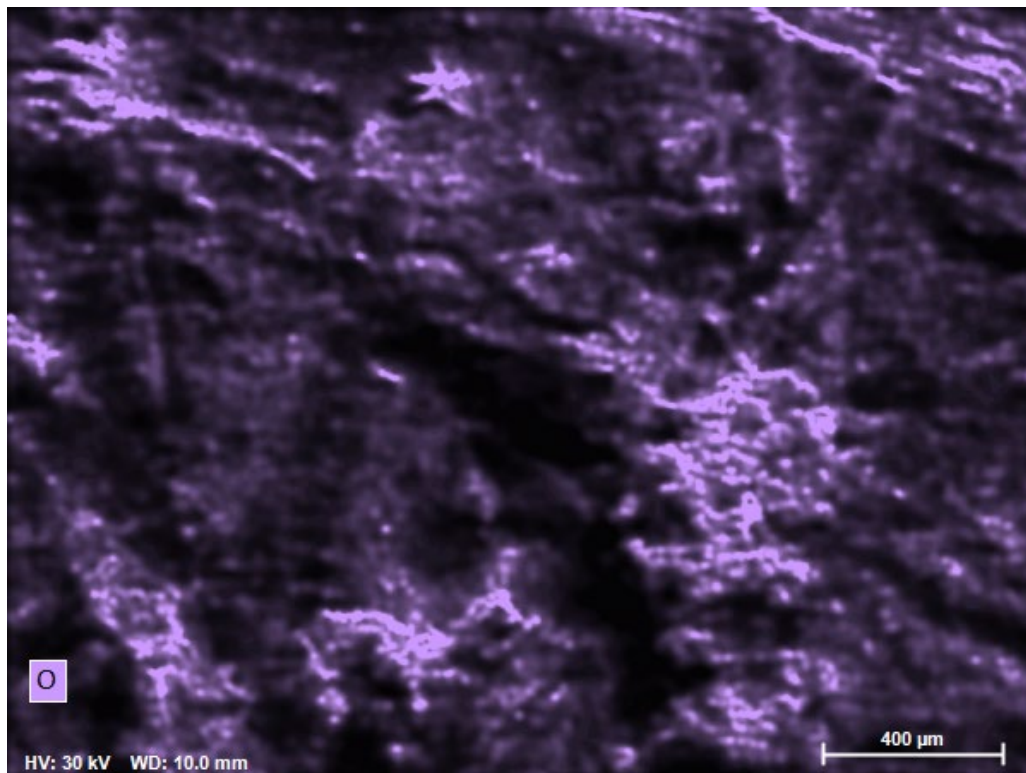
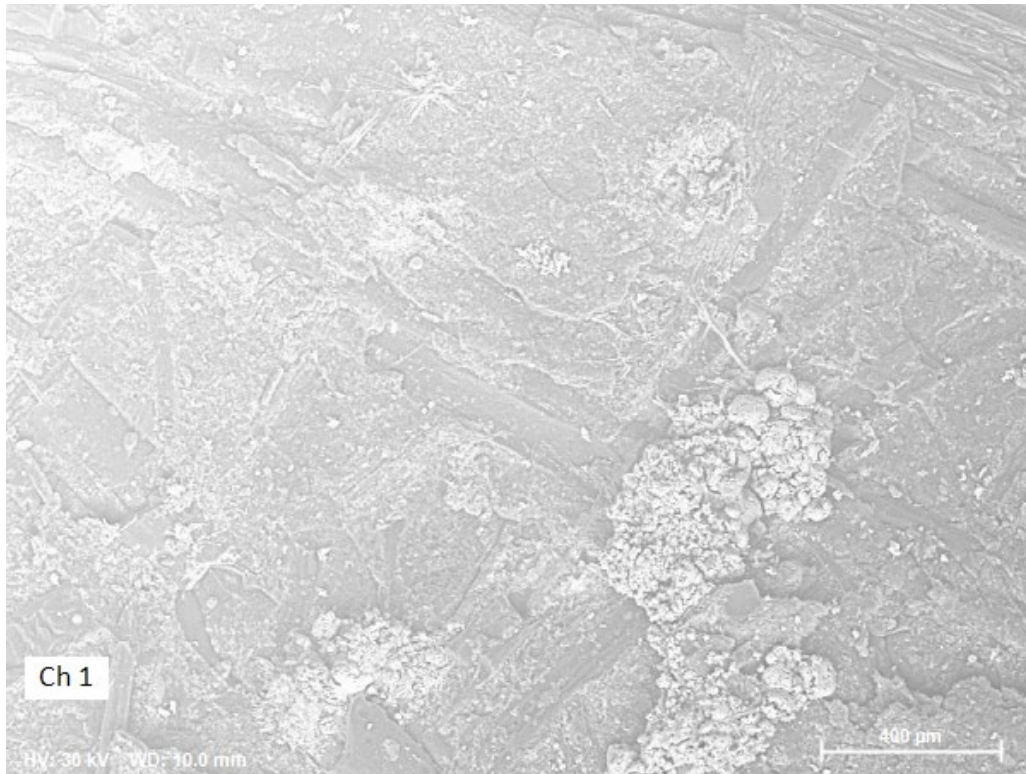


23009-03.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	52.76	50.55	61.86
Oxygen	8	35.41	33.92	31.16
Sodium	11	0.06	0.05	0.03
Magnesium	12	0.04	0.04	0.03
Aluminium	13	3.81	3.65	1.99
Silicon	14	4.75	4.55	2.38
Sulfur	16	3.37	3.23	1.48
Potassium	19	0.13	0.12	0.05
Titanium	22	0.06	0.06	0.02
Iron	26	4.00	3.84	1.01
		104.38	100.00	100.00

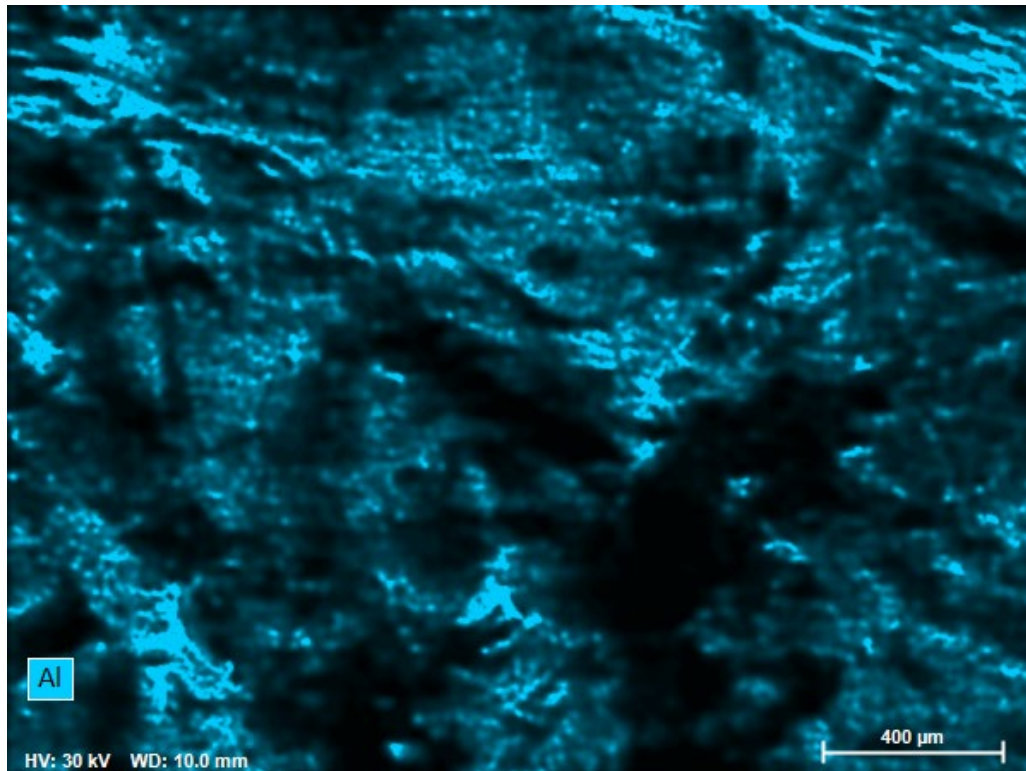
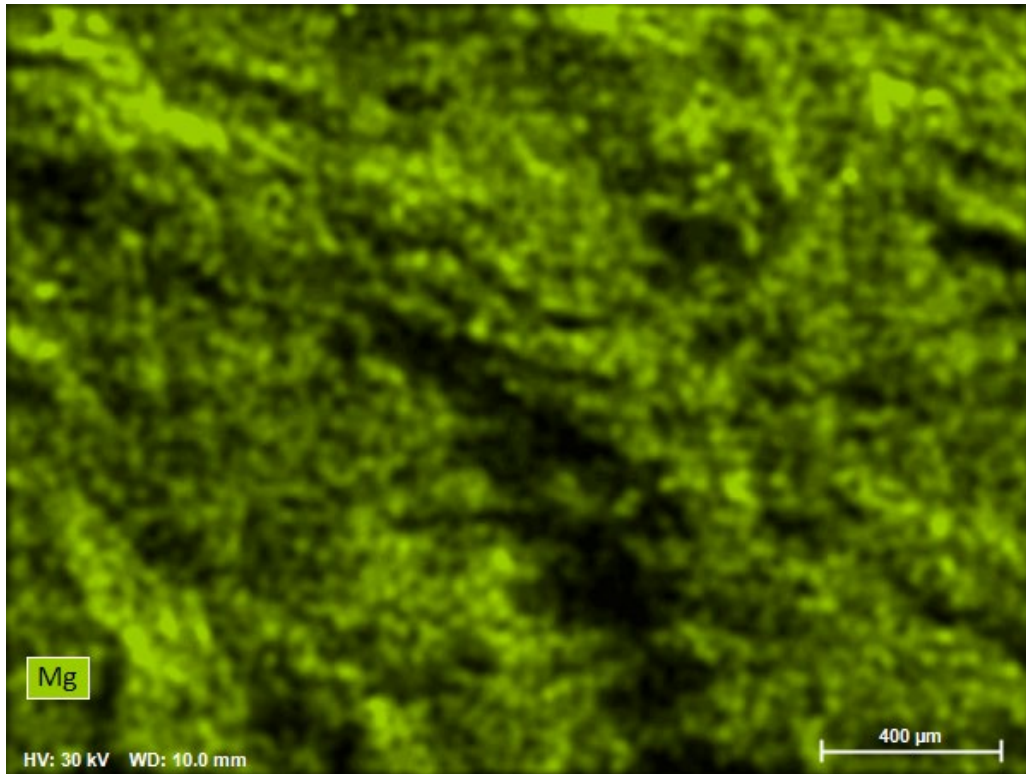
EDS Report

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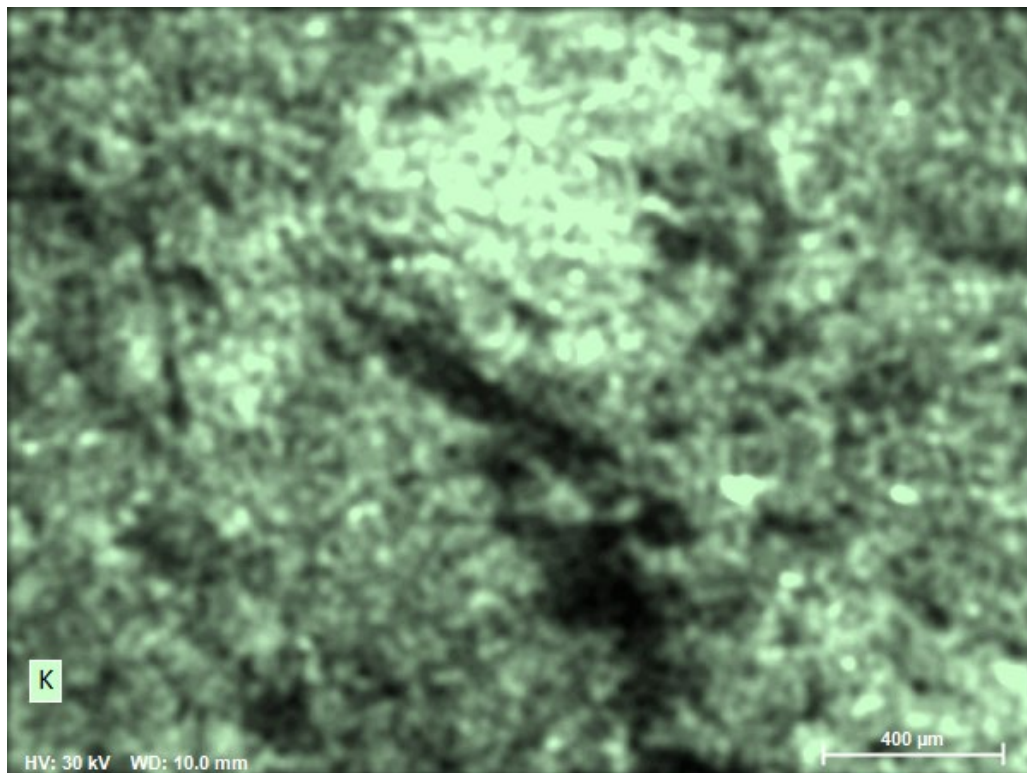
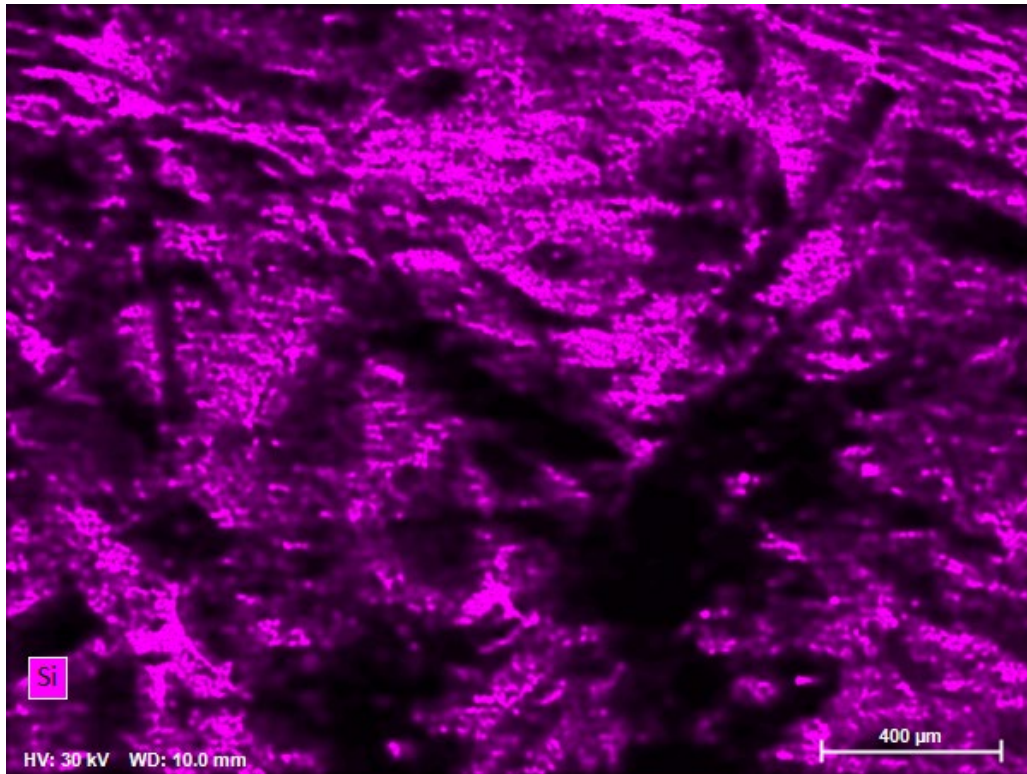
EDS Report

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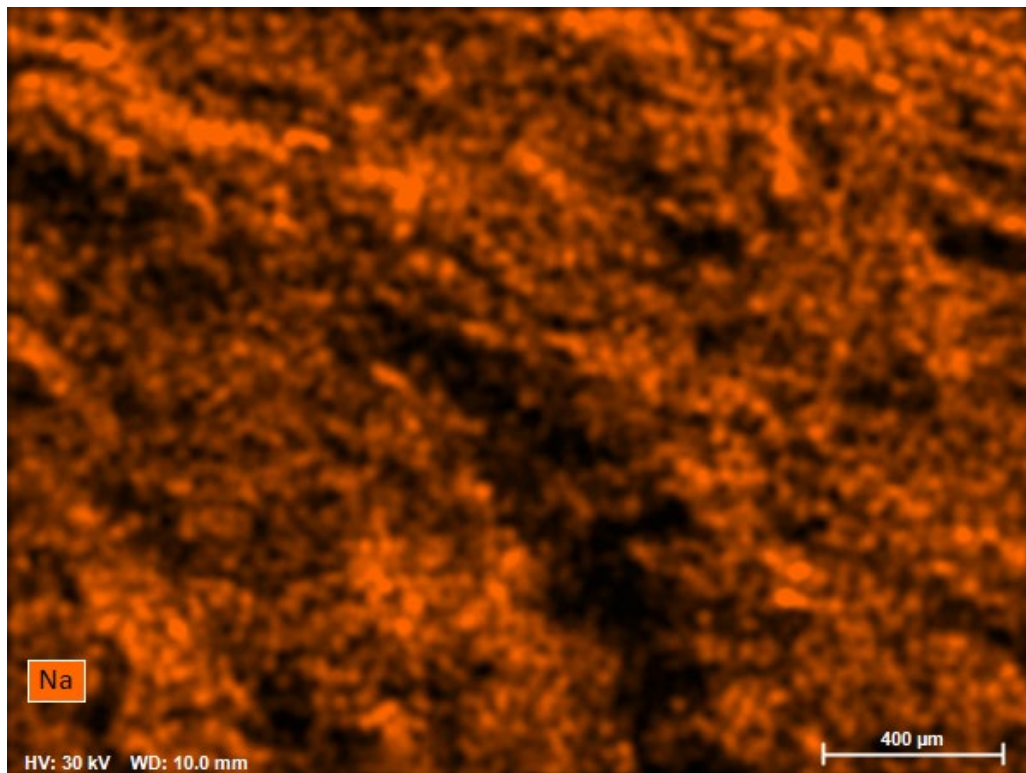
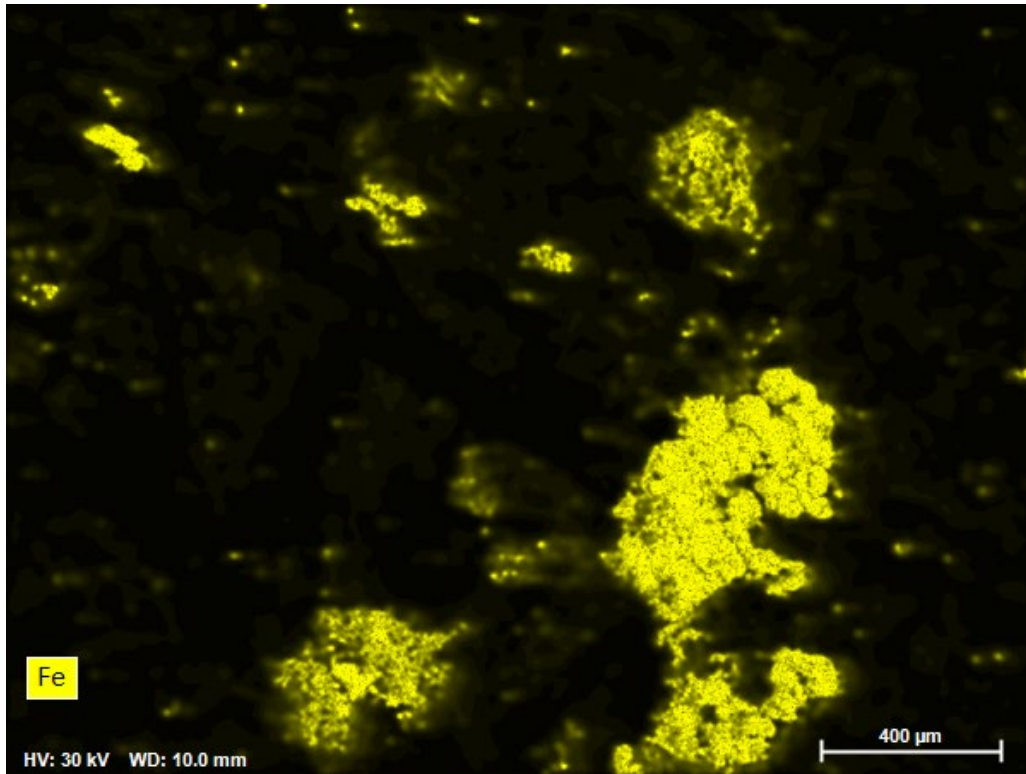
EDS Report

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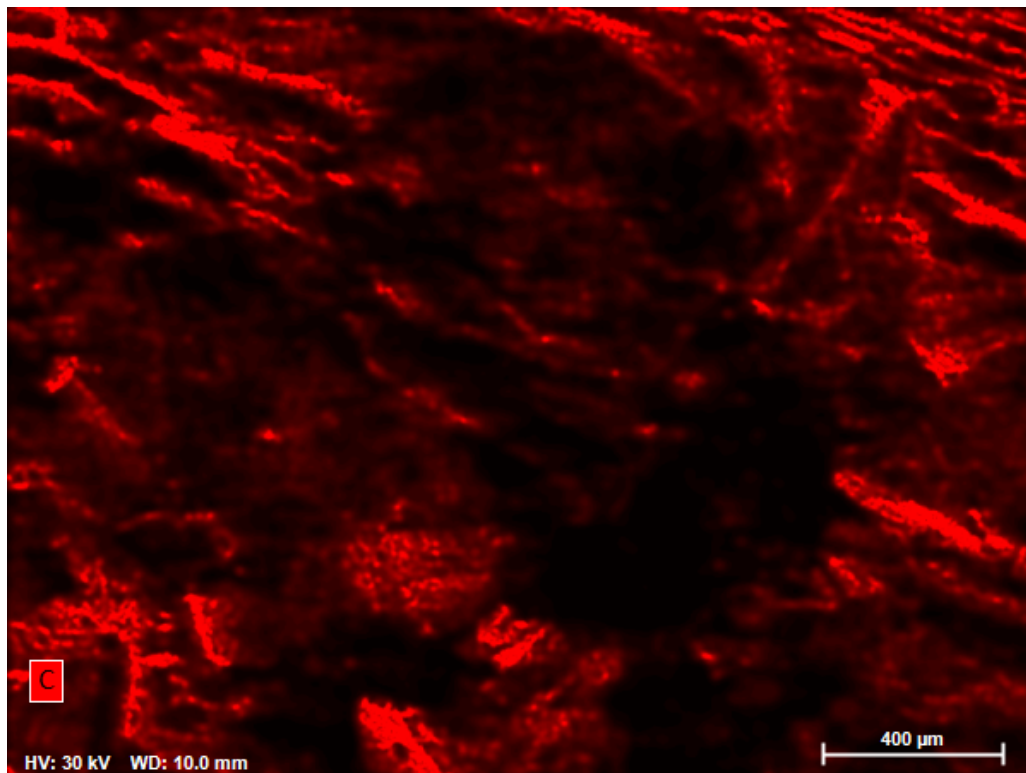
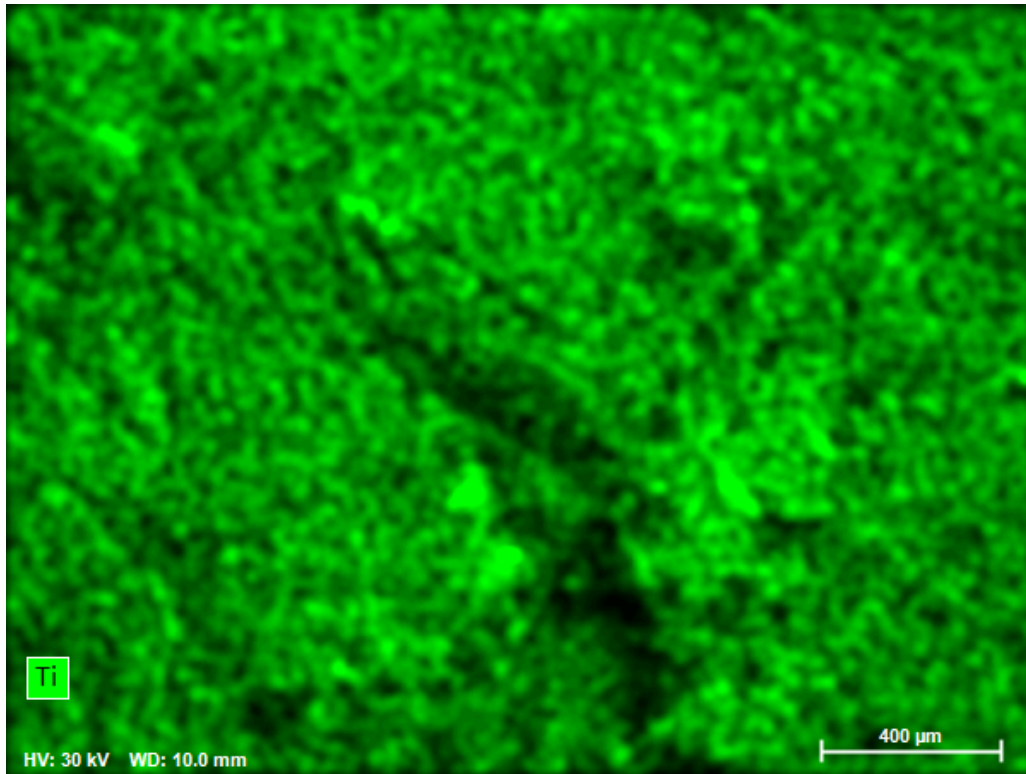
EDS Report

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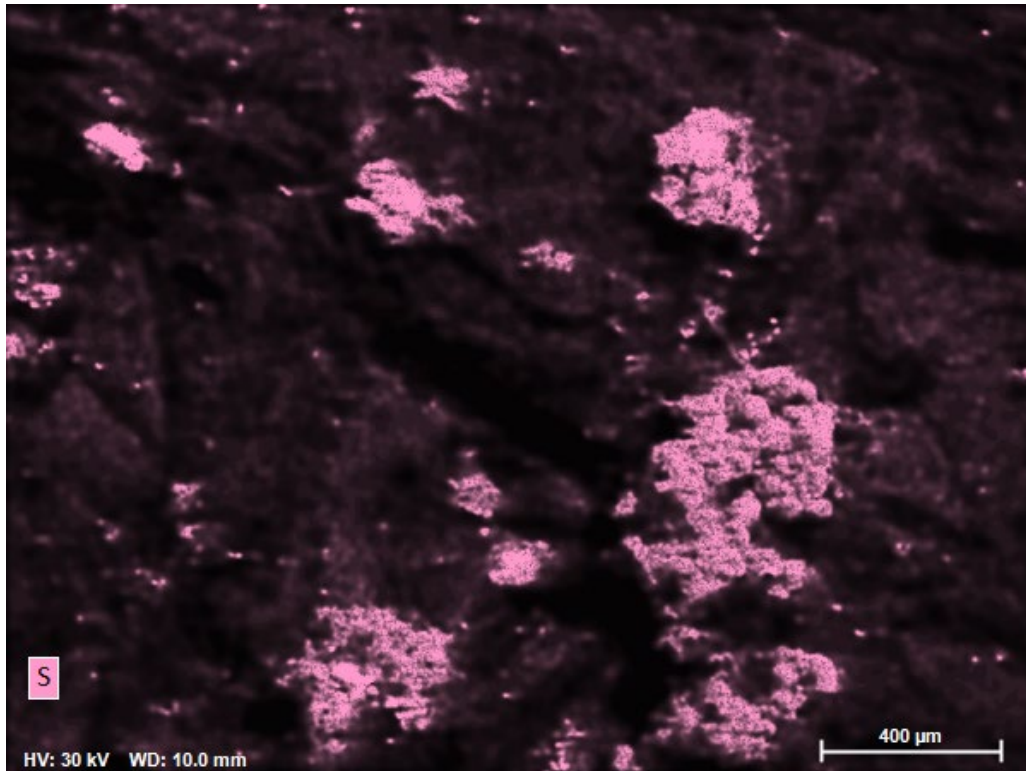
EDS Report

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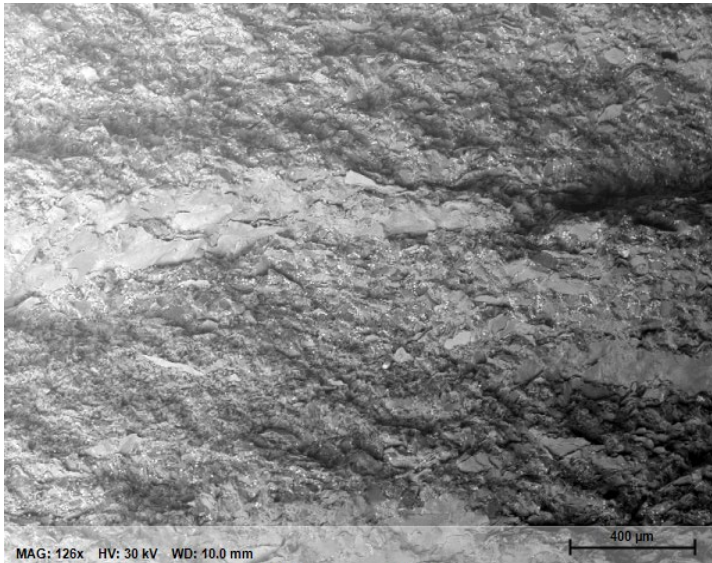


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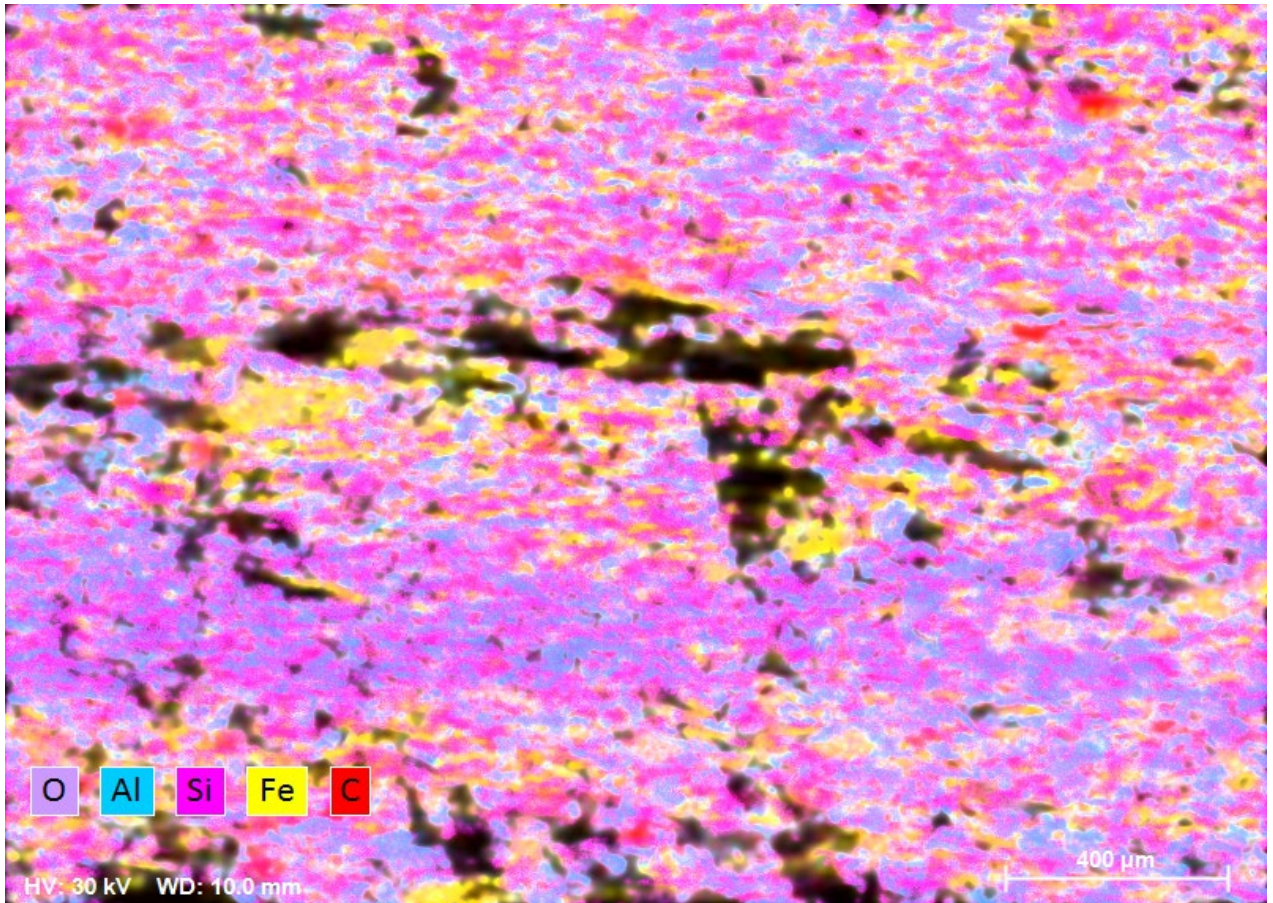


23009-04 Report



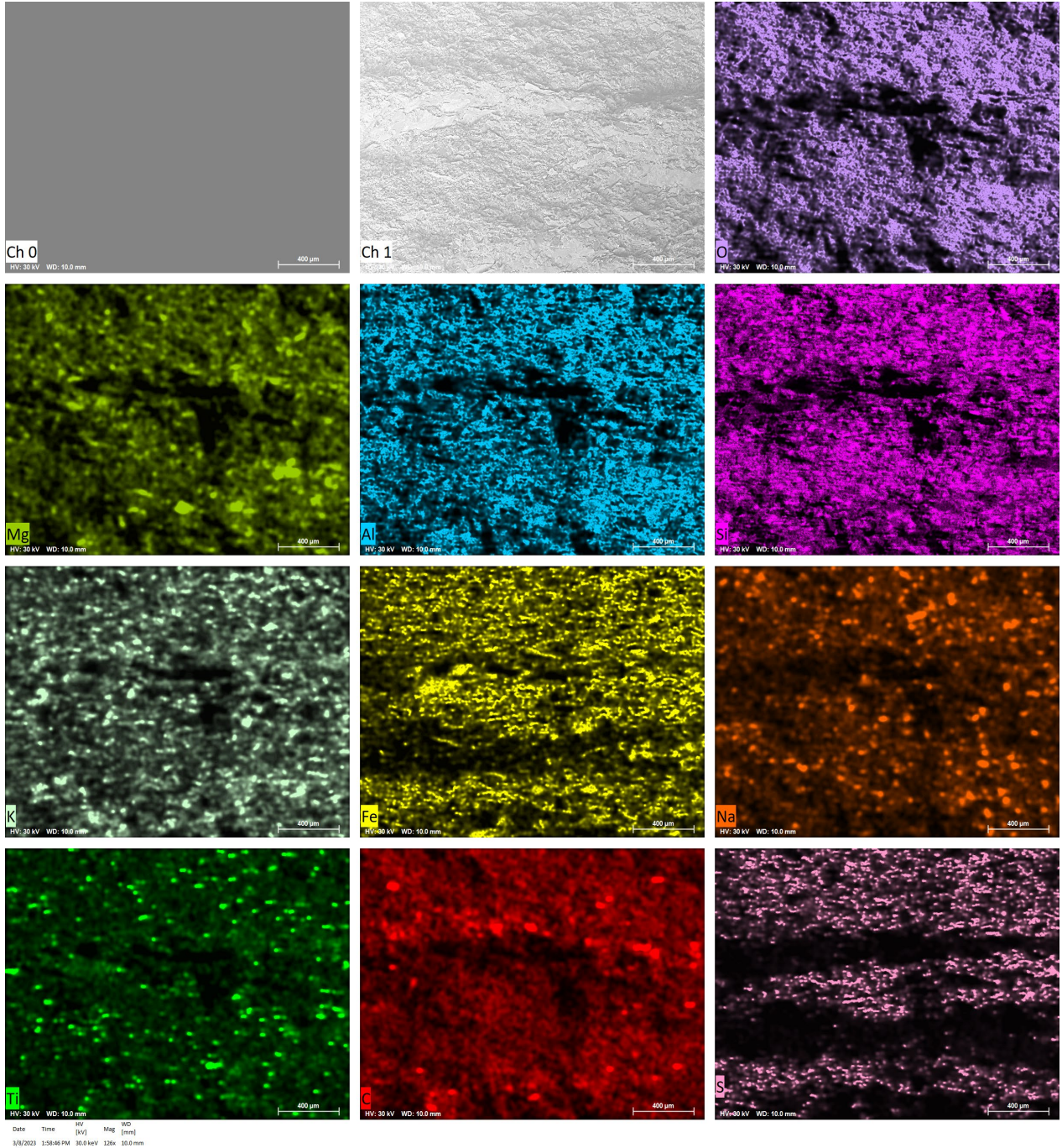
MAG: 126x HV: 30 kV WD: 10.0 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	9:56:20 AM	30.0 keV	126x	10.0 mm



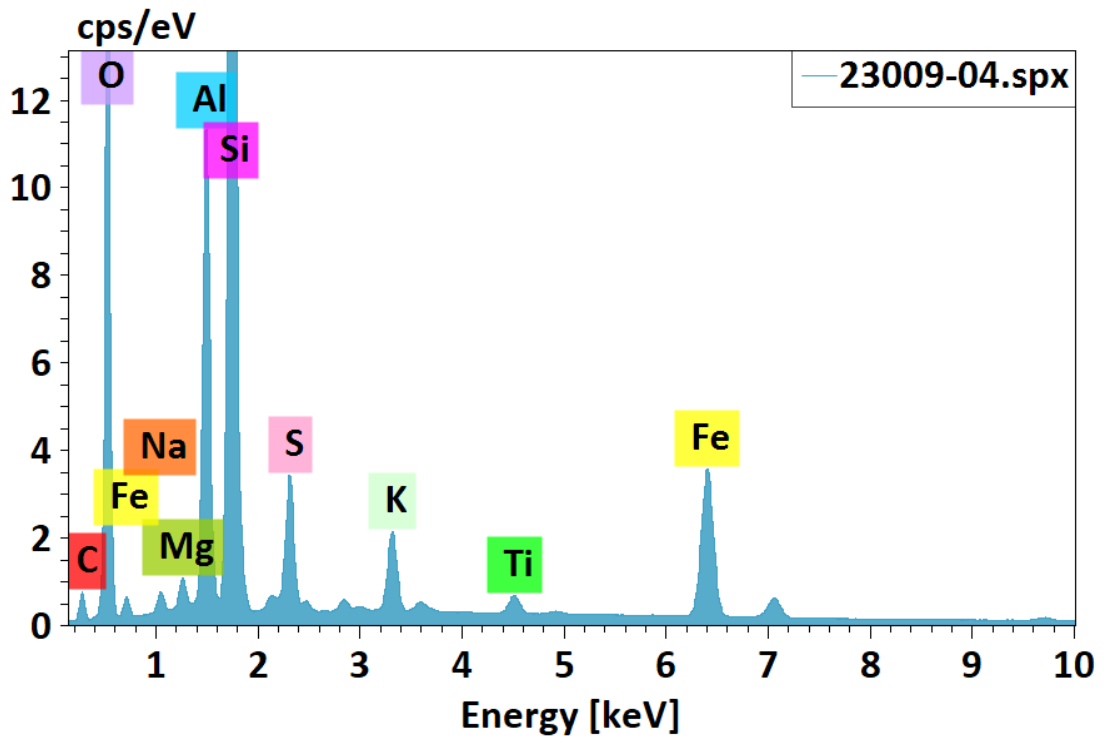
HV: 30 kV WD: 10.0 mm

Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	1:58:46 PM	30.0 keV	126x	10.0 mm



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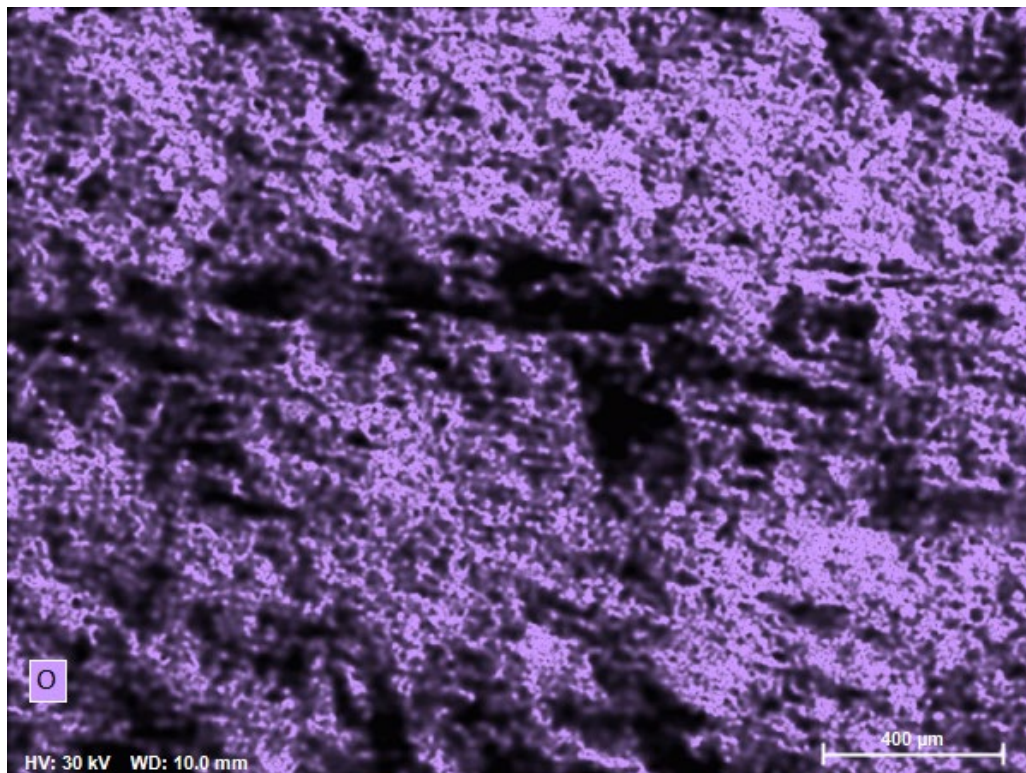
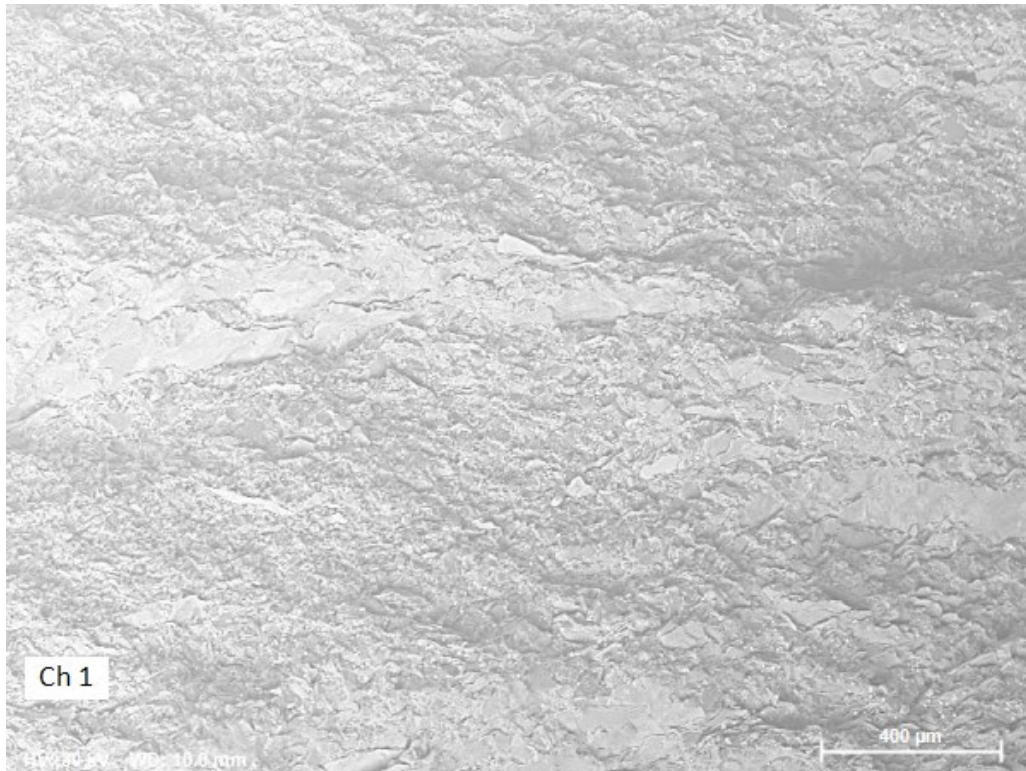


23009-04.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	9.05	7.82	12.53
Oxygen	8	58.88	50.88	61.18
Sodium	11	1.07	0.93	0.78
Magnesium	12	0.86	0.74	0.59
Aluminium	13	9.16	7.92	5.65
Silicon	14	25.39	21.93	15.03
Sulfur	16	2.89	2.50	1.50
Potassium	19	1.76	1.52	0.75
Titanium	22	0.55	0.47	0.19
Iron	26	6.12	5.29	1.82
		115.73	100.00	100.00

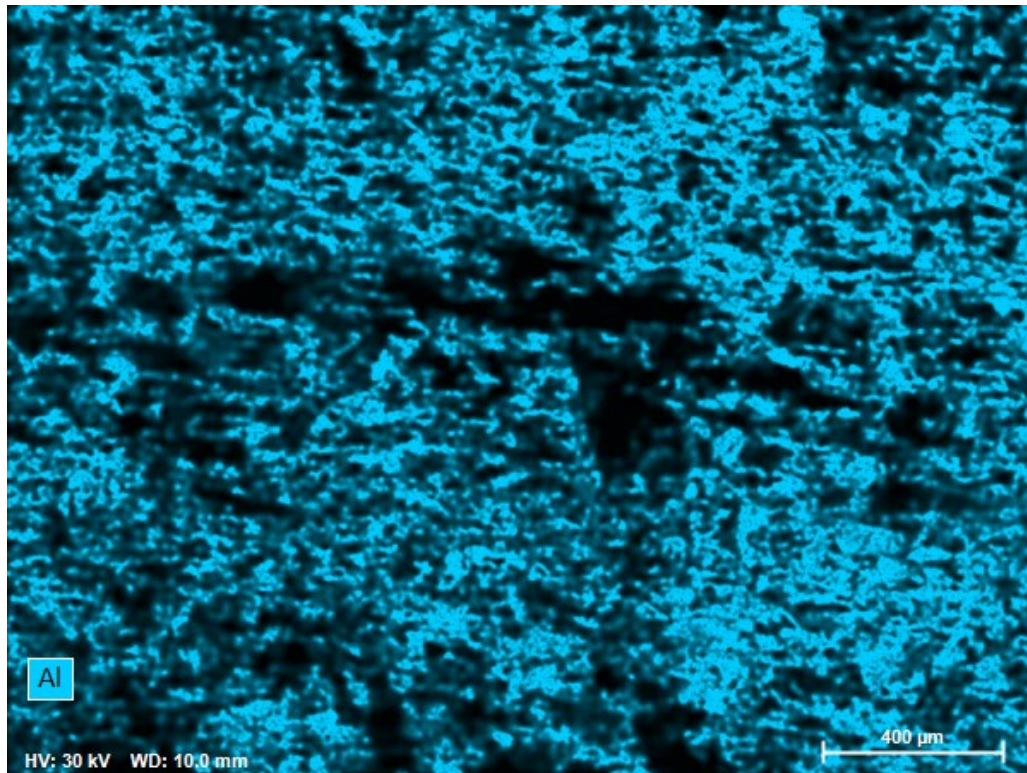
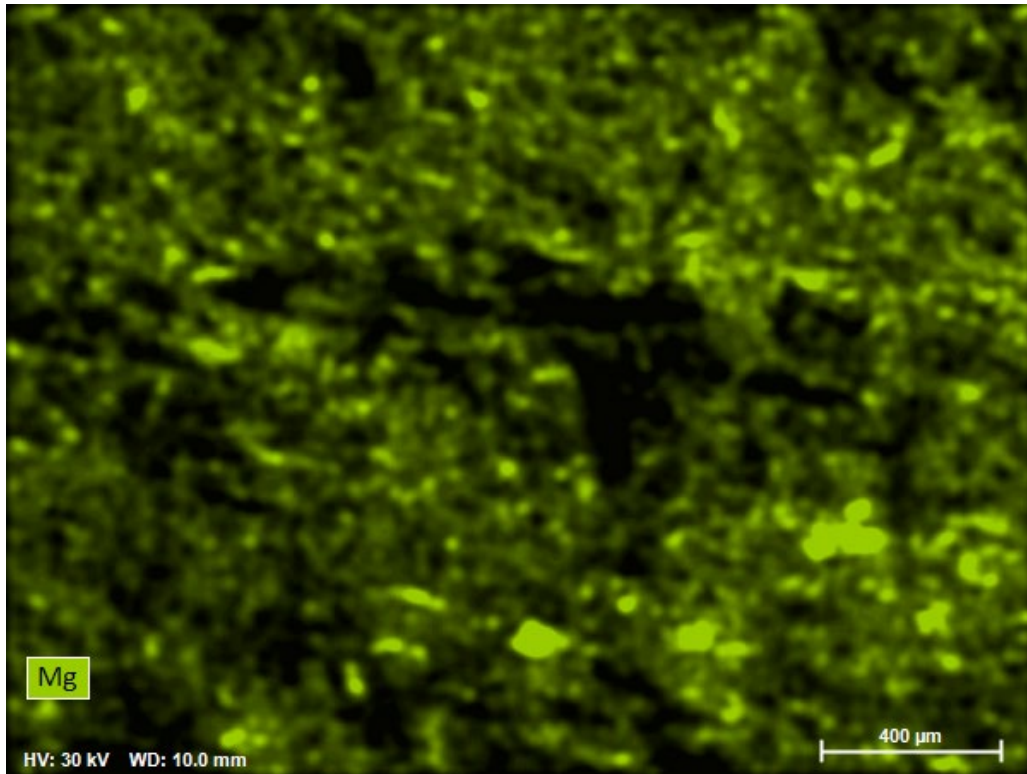
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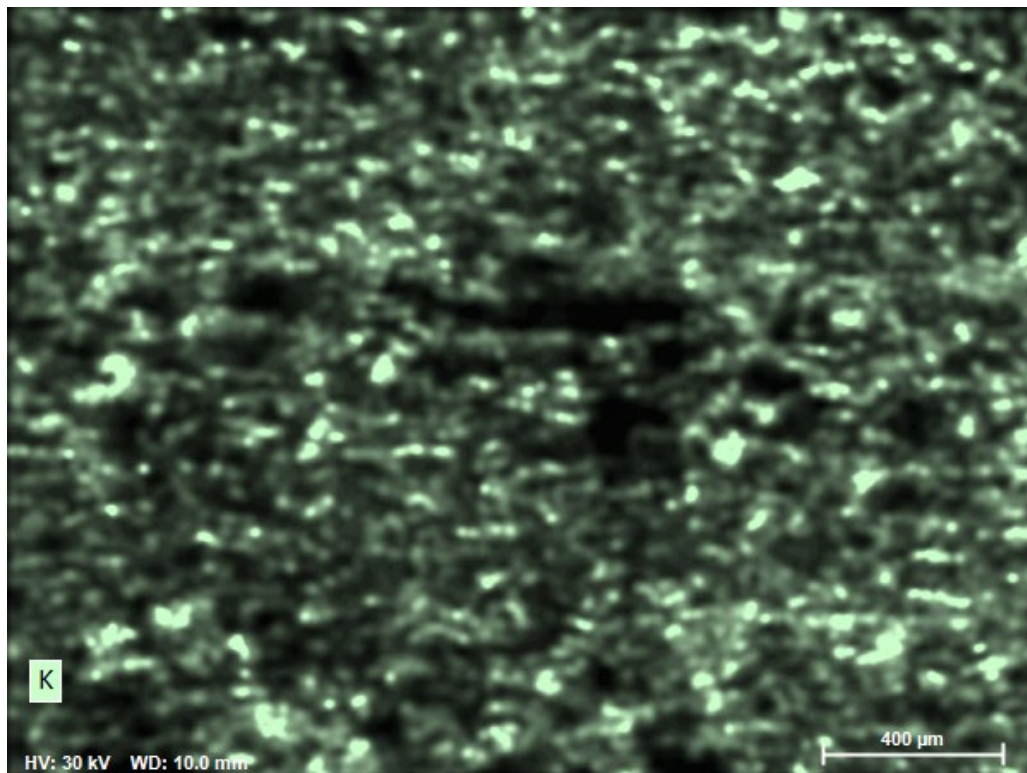
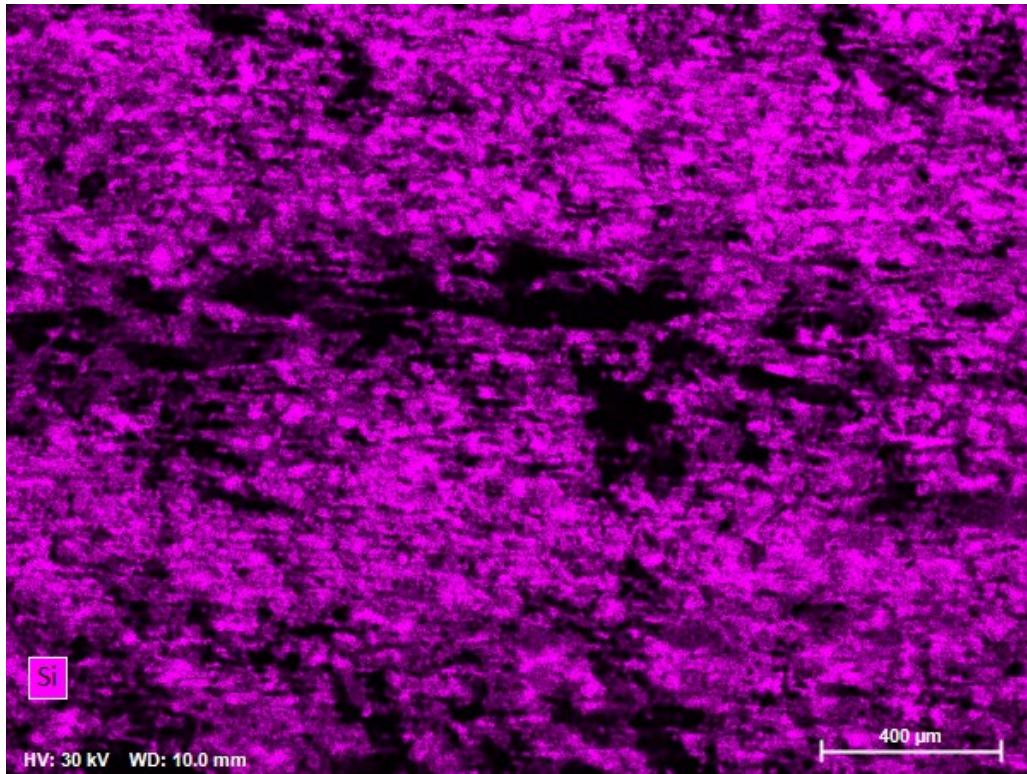
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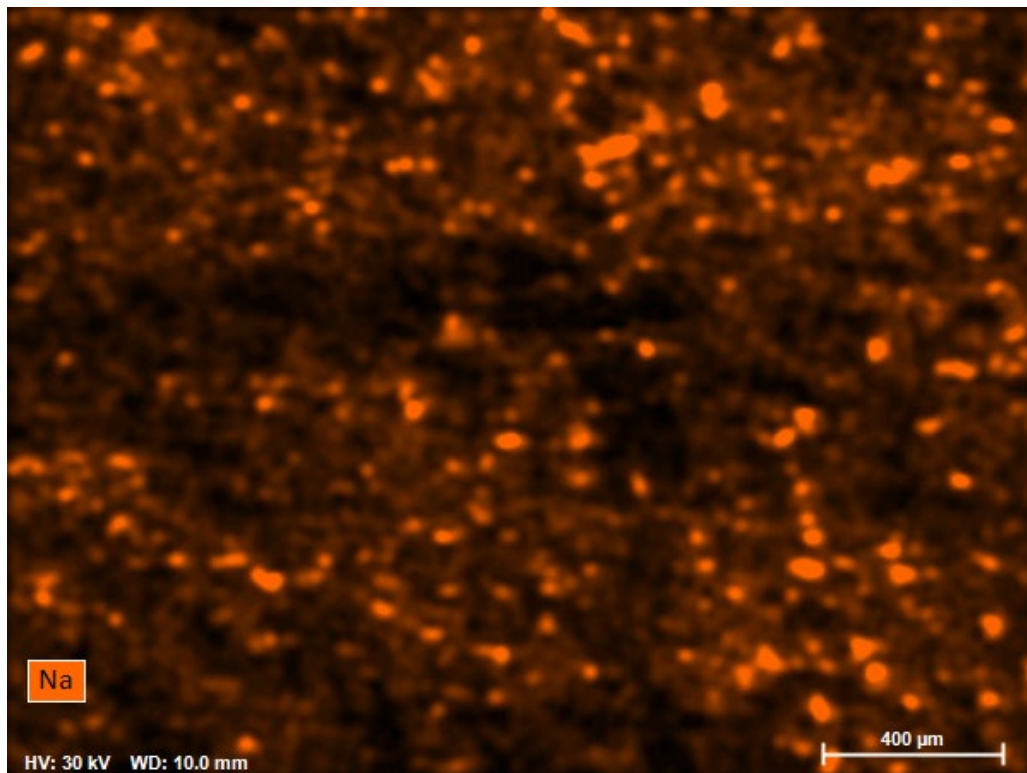
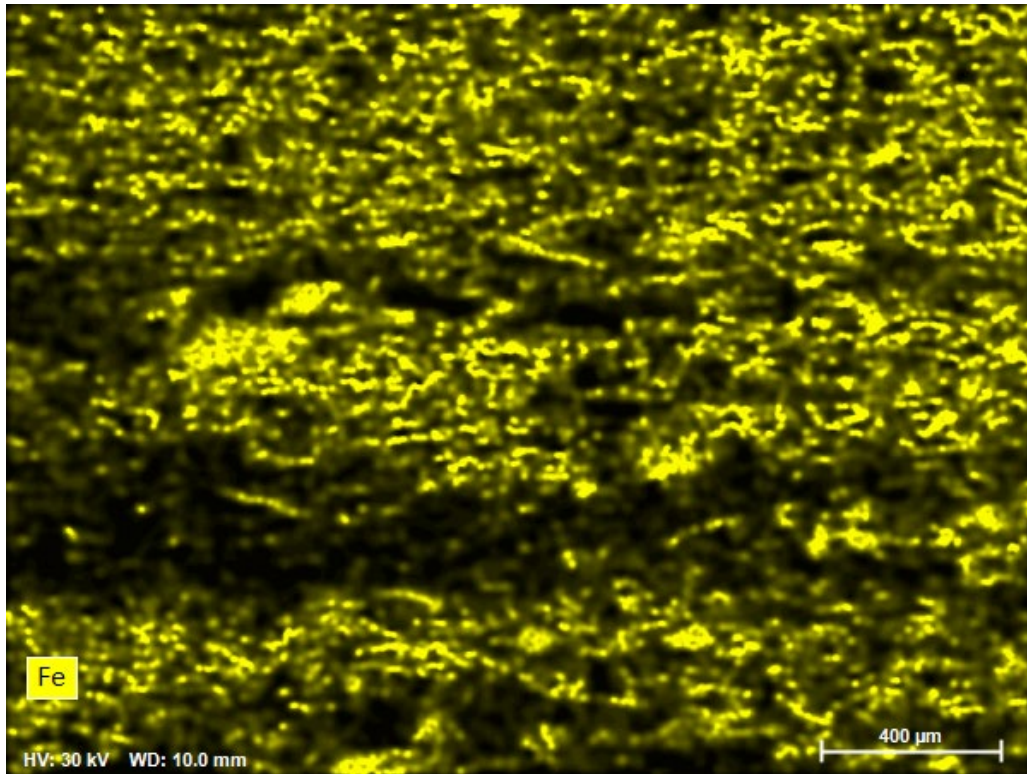
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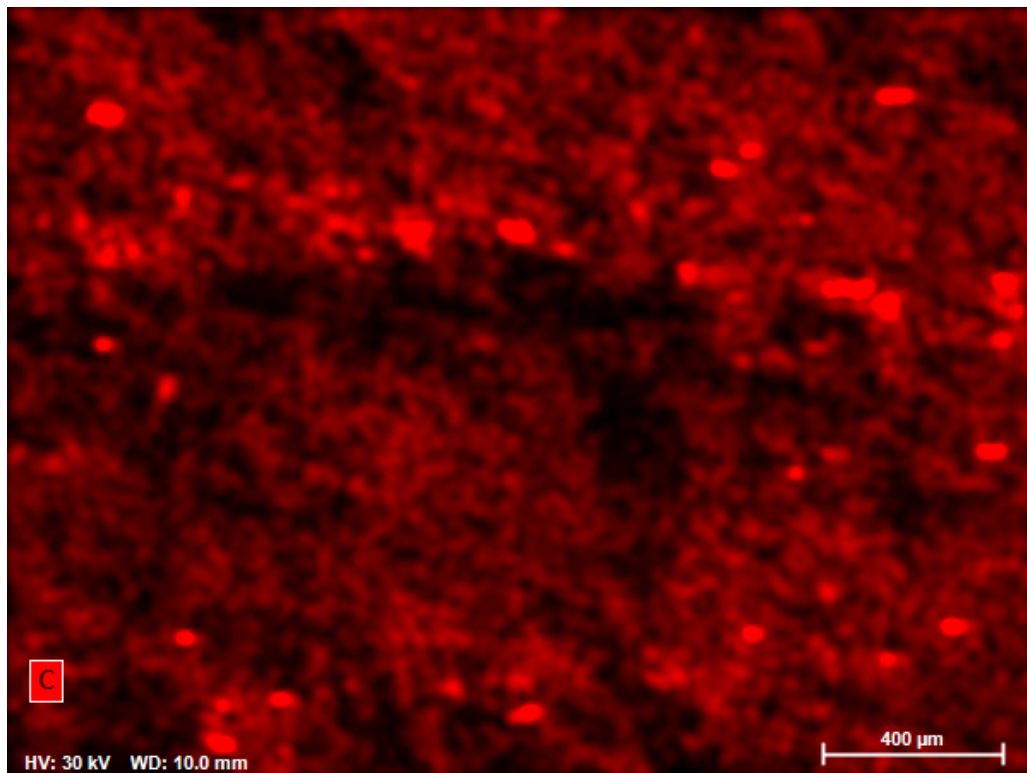
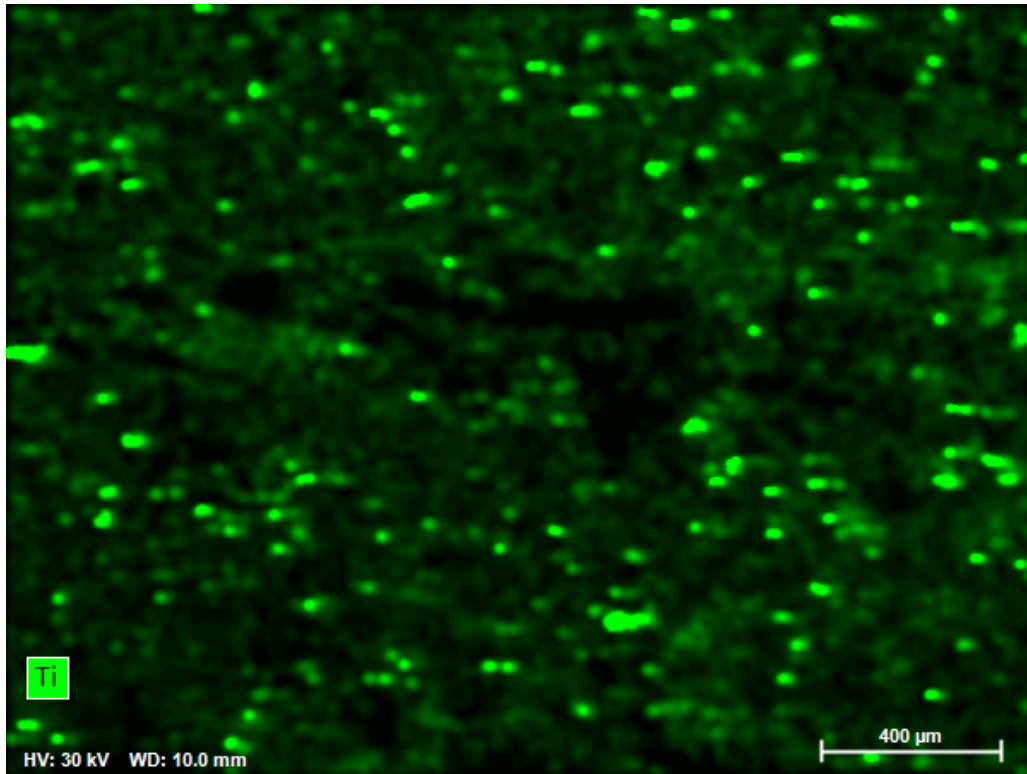
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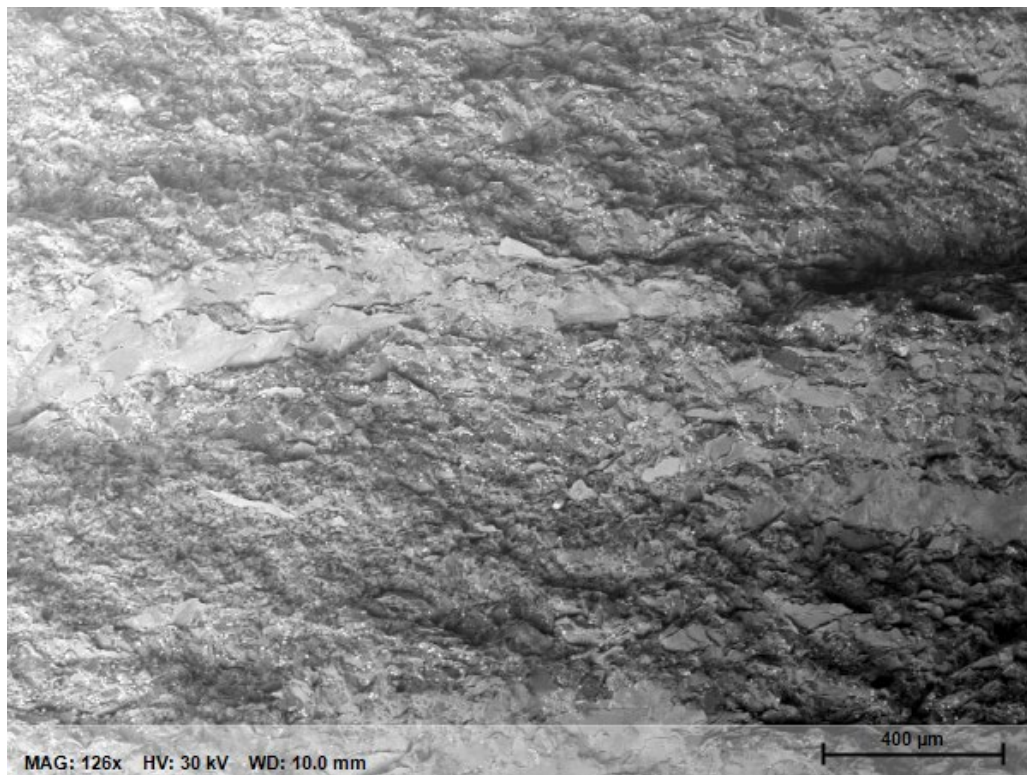
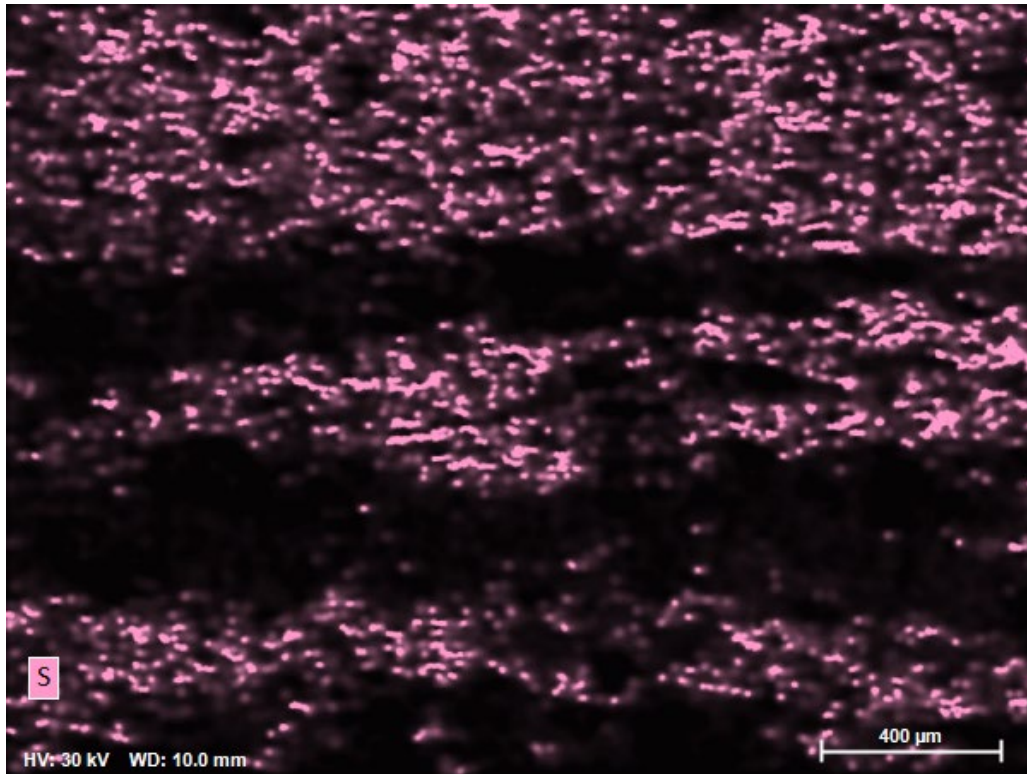
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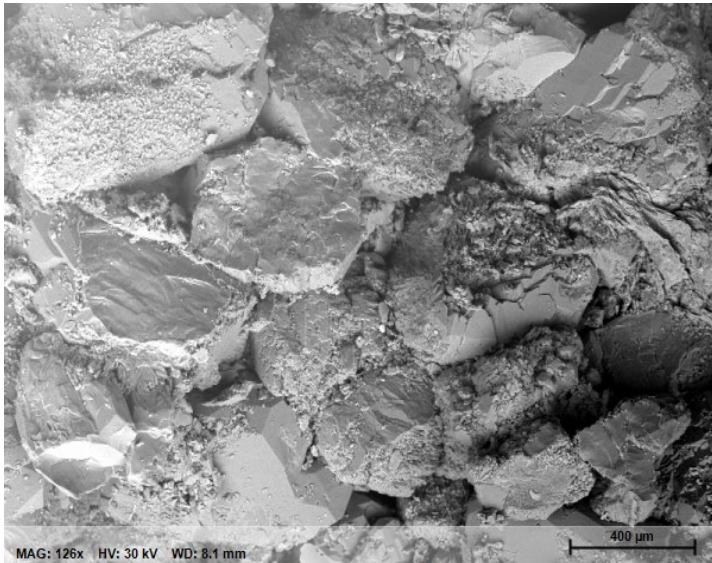


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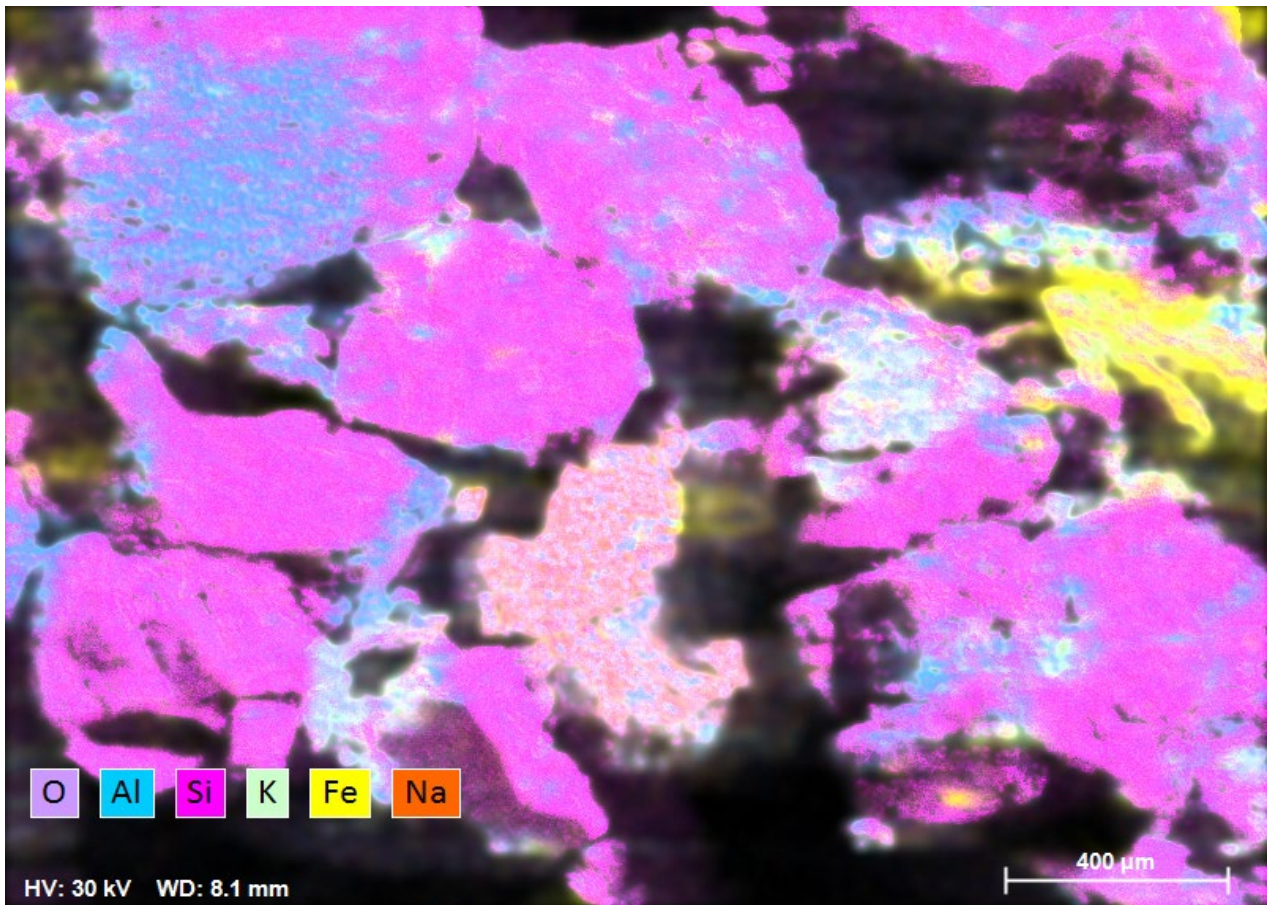


23009-05 Report



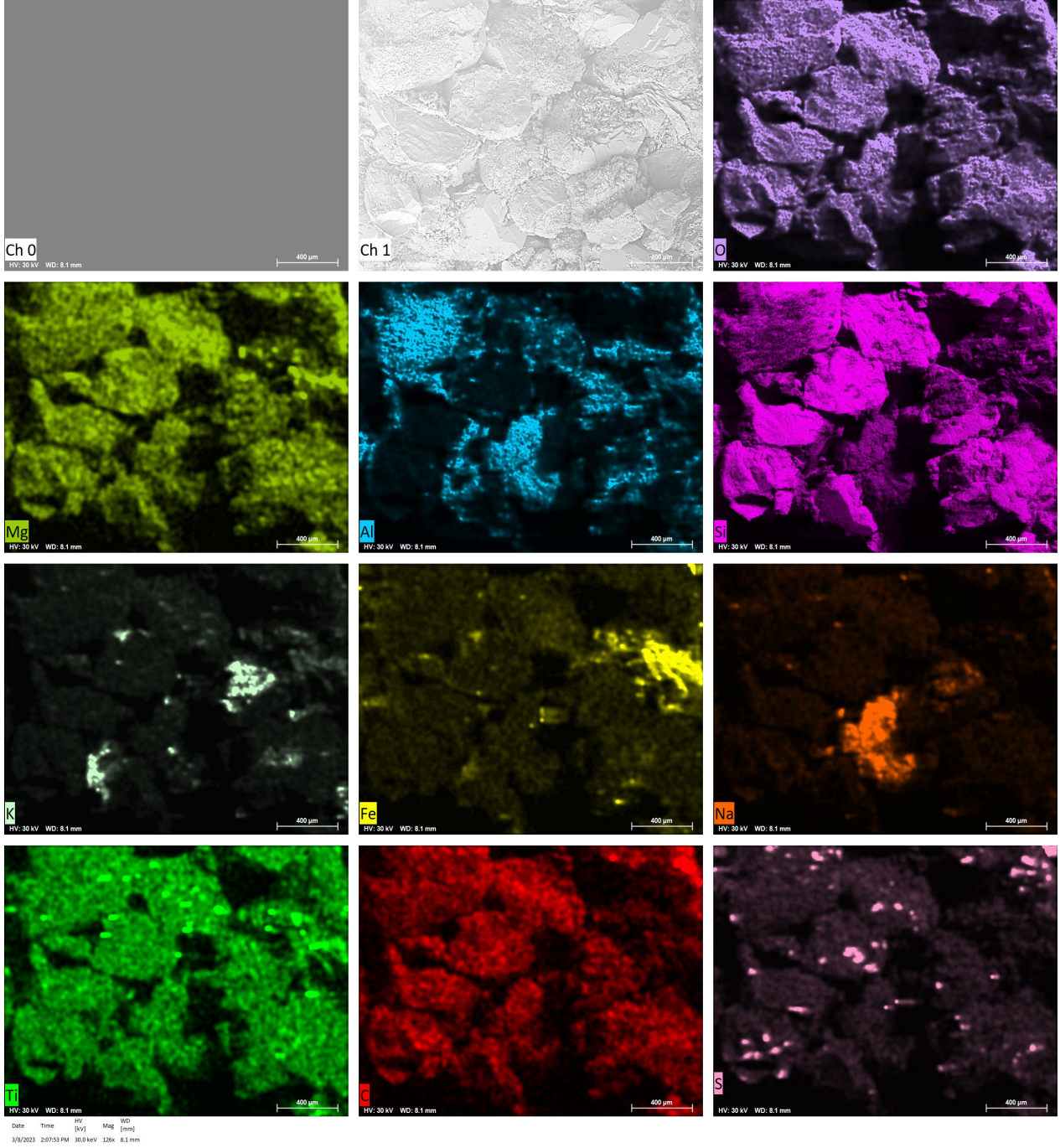
MAG: 126x HV: 30 kV WD: 8.1 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	10:34:09 AM	30.0 keV	126x	8.1 mm



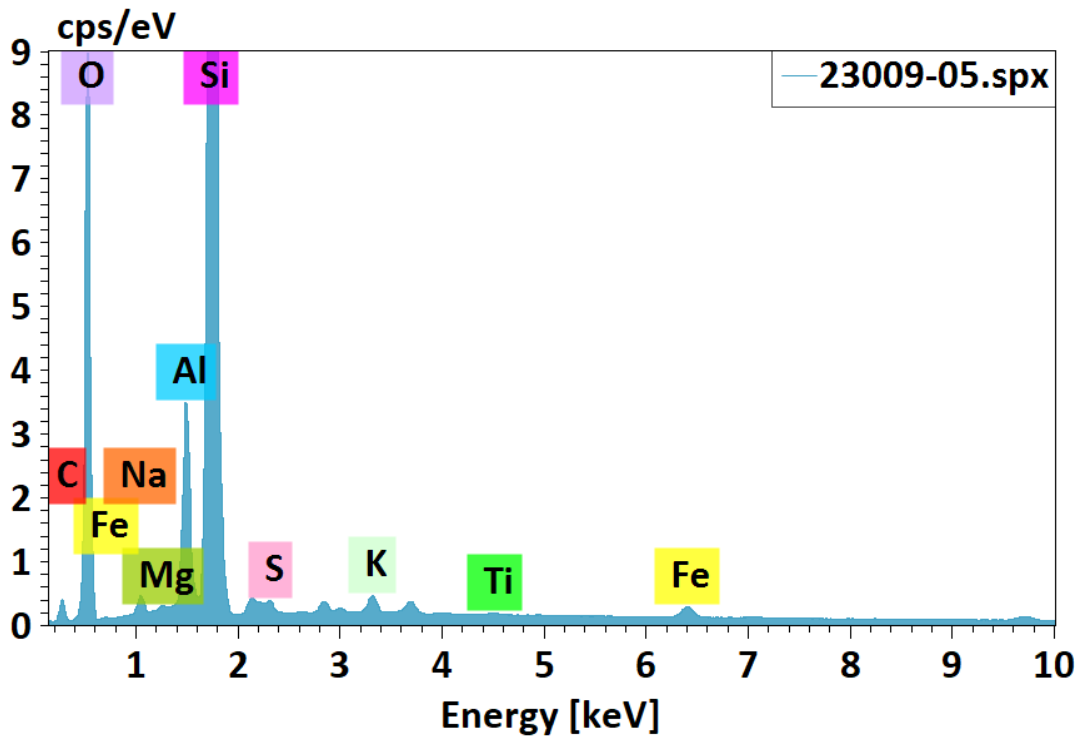
HV: 30 kV WD: 8.1 mm

Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	2:07:53 PM	30.0 keV	126x	8.1 mm



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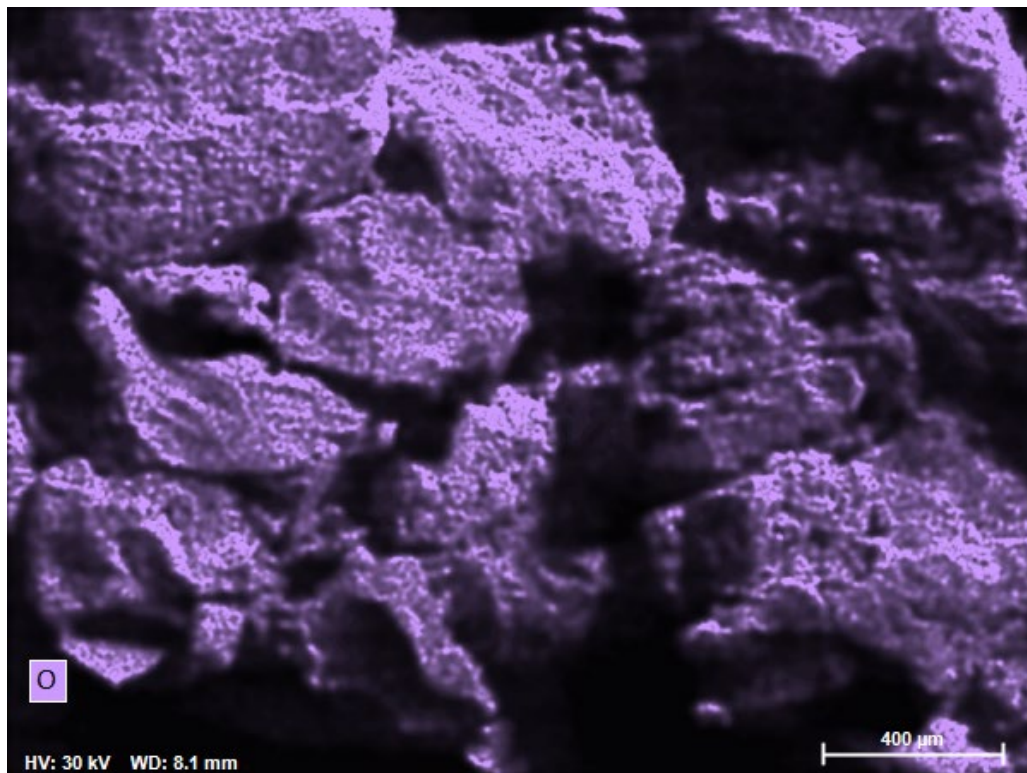


23009-05.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	7.34	7.92	12.30
Oxygen	8	49.03	52.85	61.66
Sodium	11	0.69	0.74	0.60
Magnesium	12	0.05	0.06	0.04
Aluminium	13	3.31	3.57	2.47
Silicon	14	31.35	33.79	22.46
Sulfur	16	0.24	0.25	0.15
Potassium	19	0.31	0.33	0.16
Titanium	22	0.04	0.04	0.02
Iron	26	0.42	0.46	0.15
		92.78	100.00	100.00

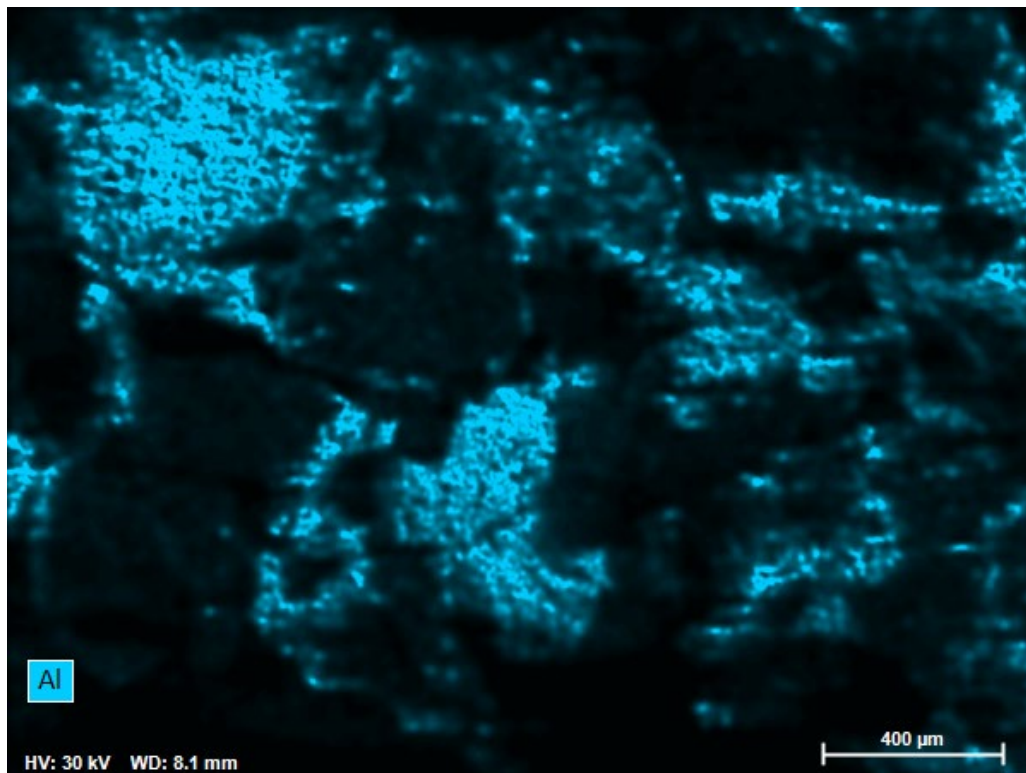
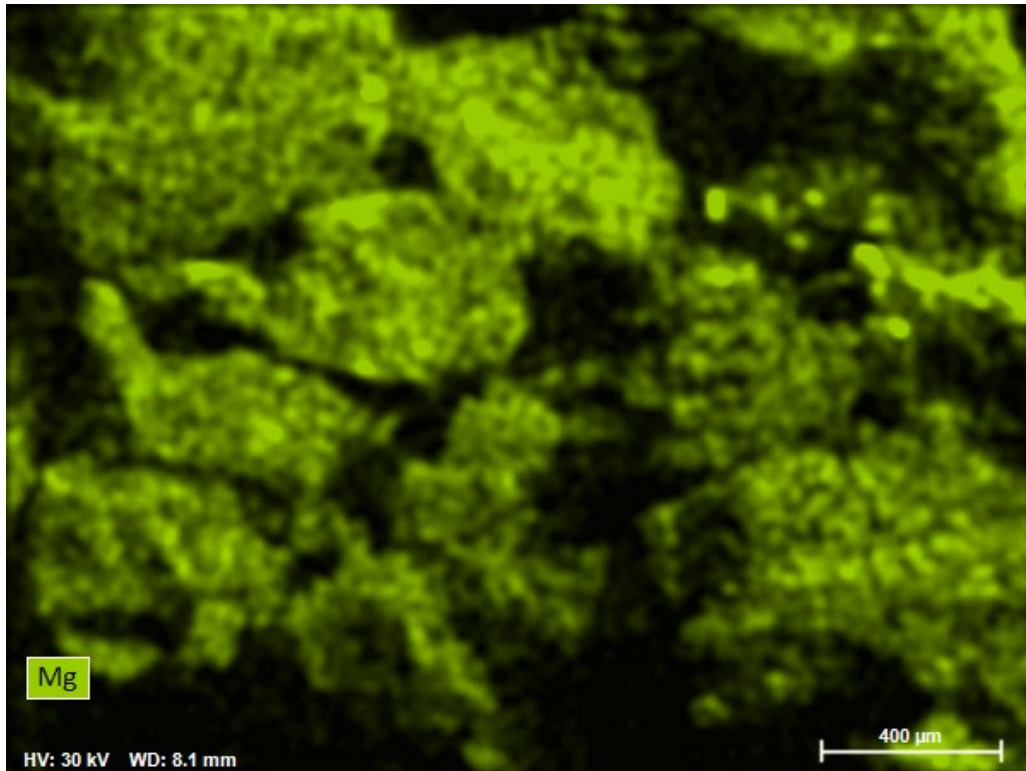
EDS Report

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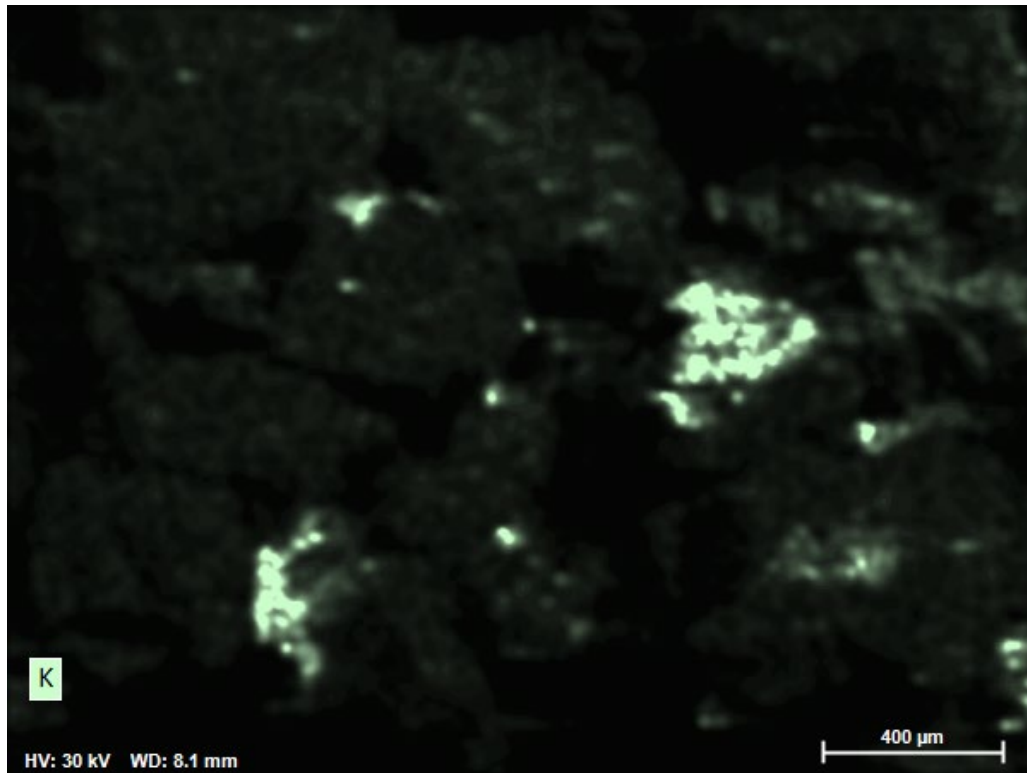
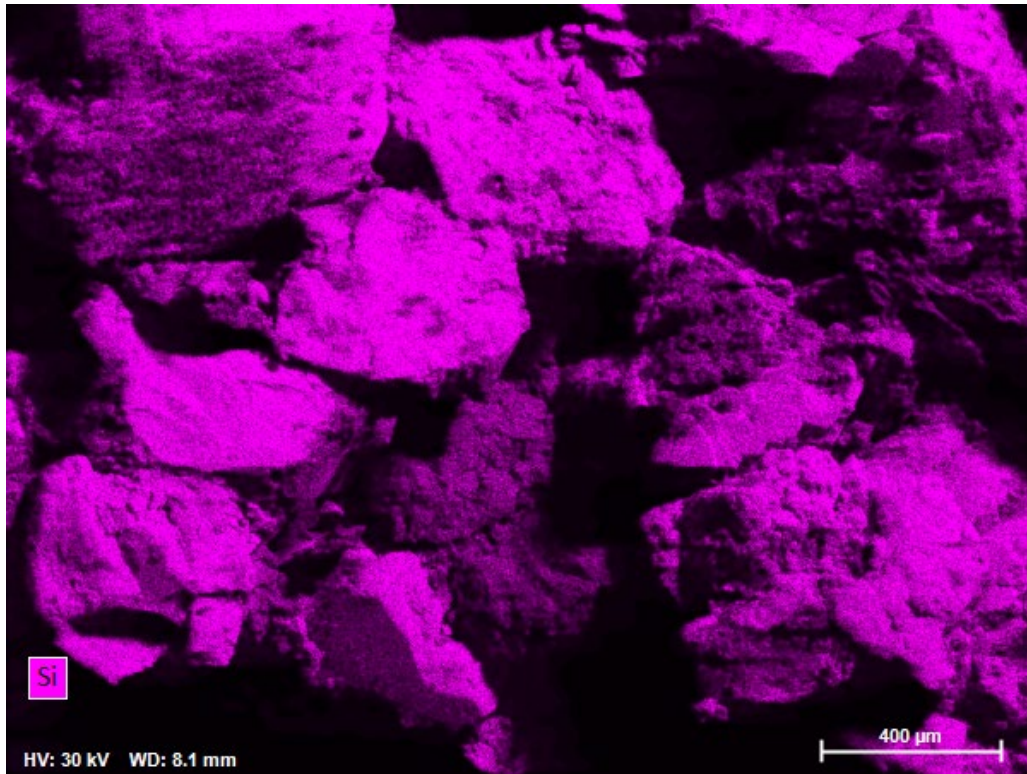
EDS Report

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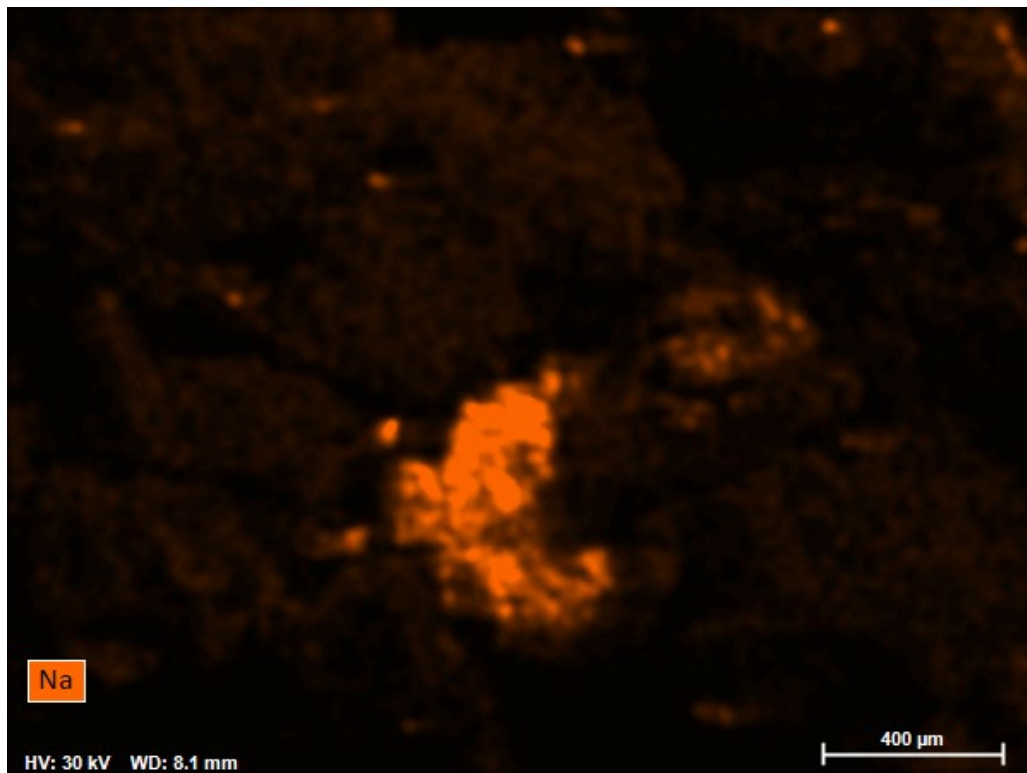
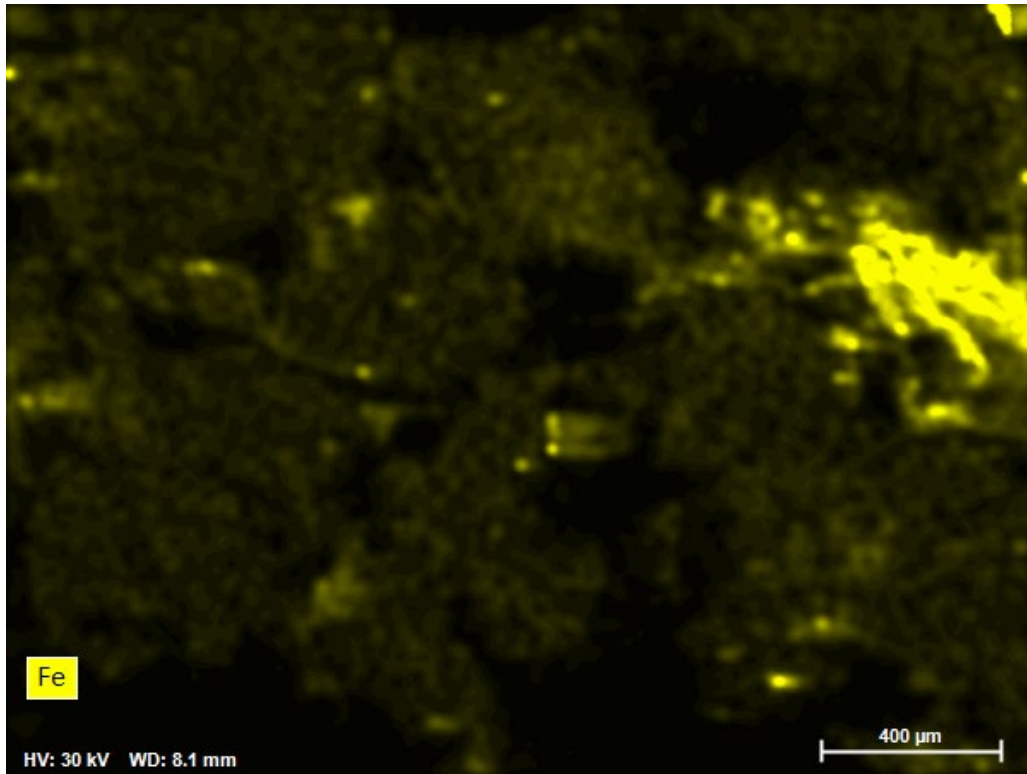
EDS Report

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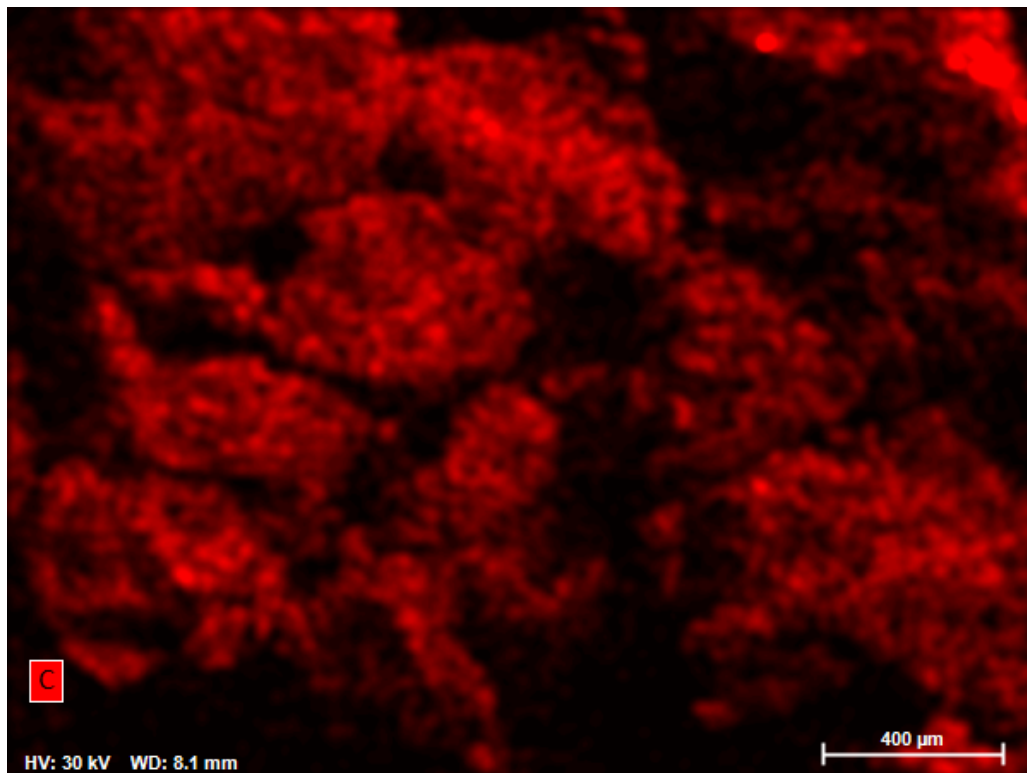
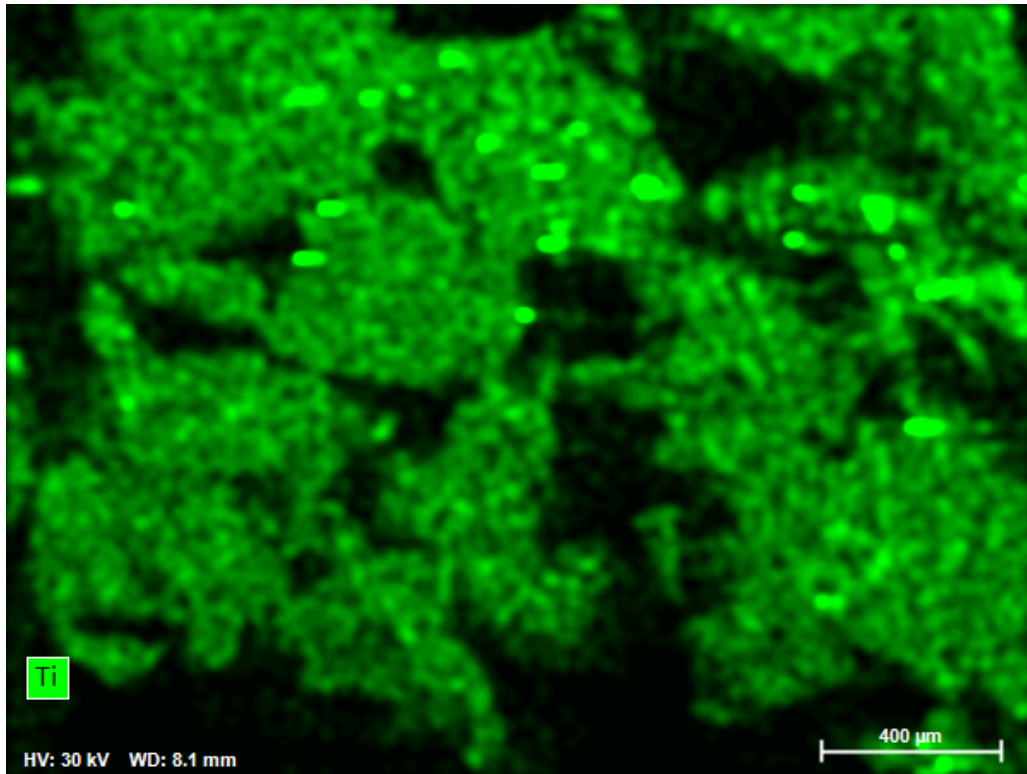
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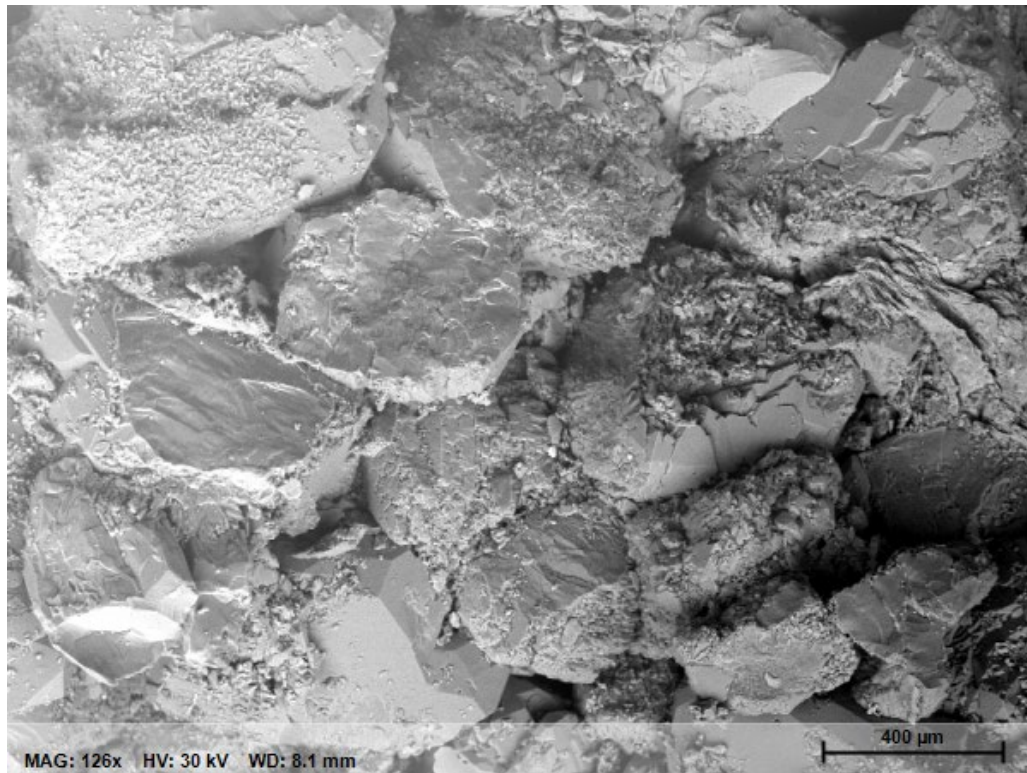
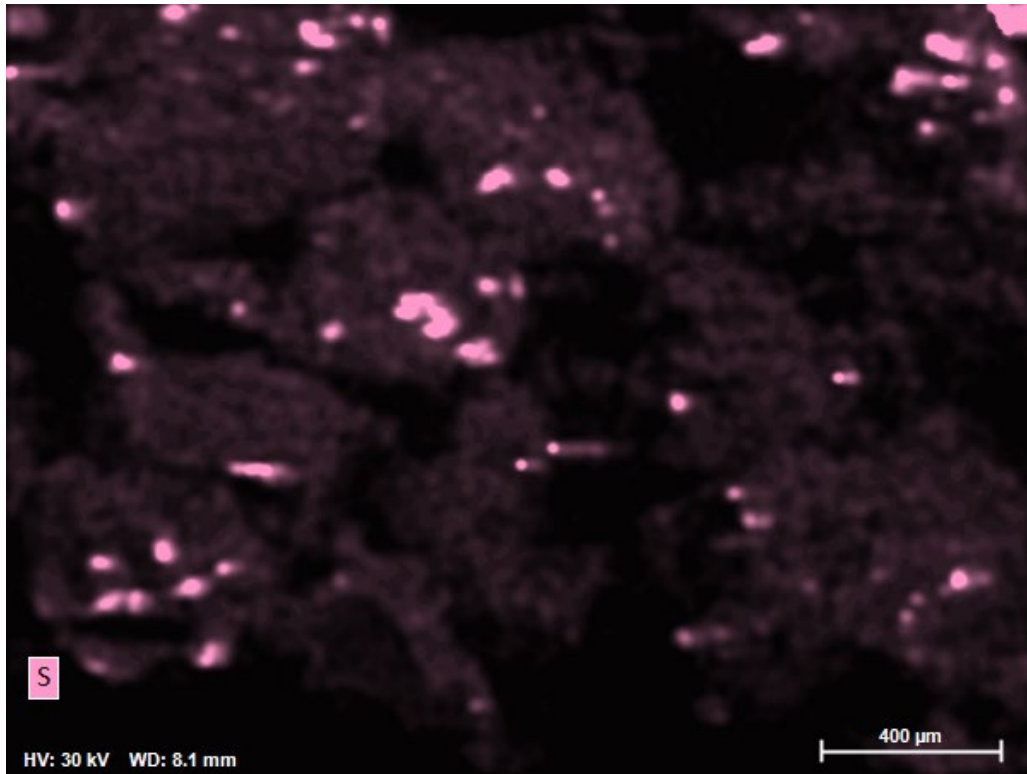
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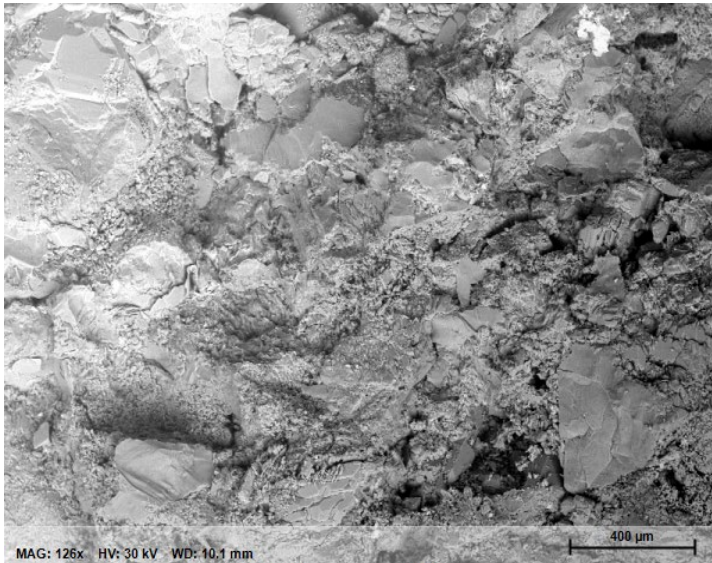


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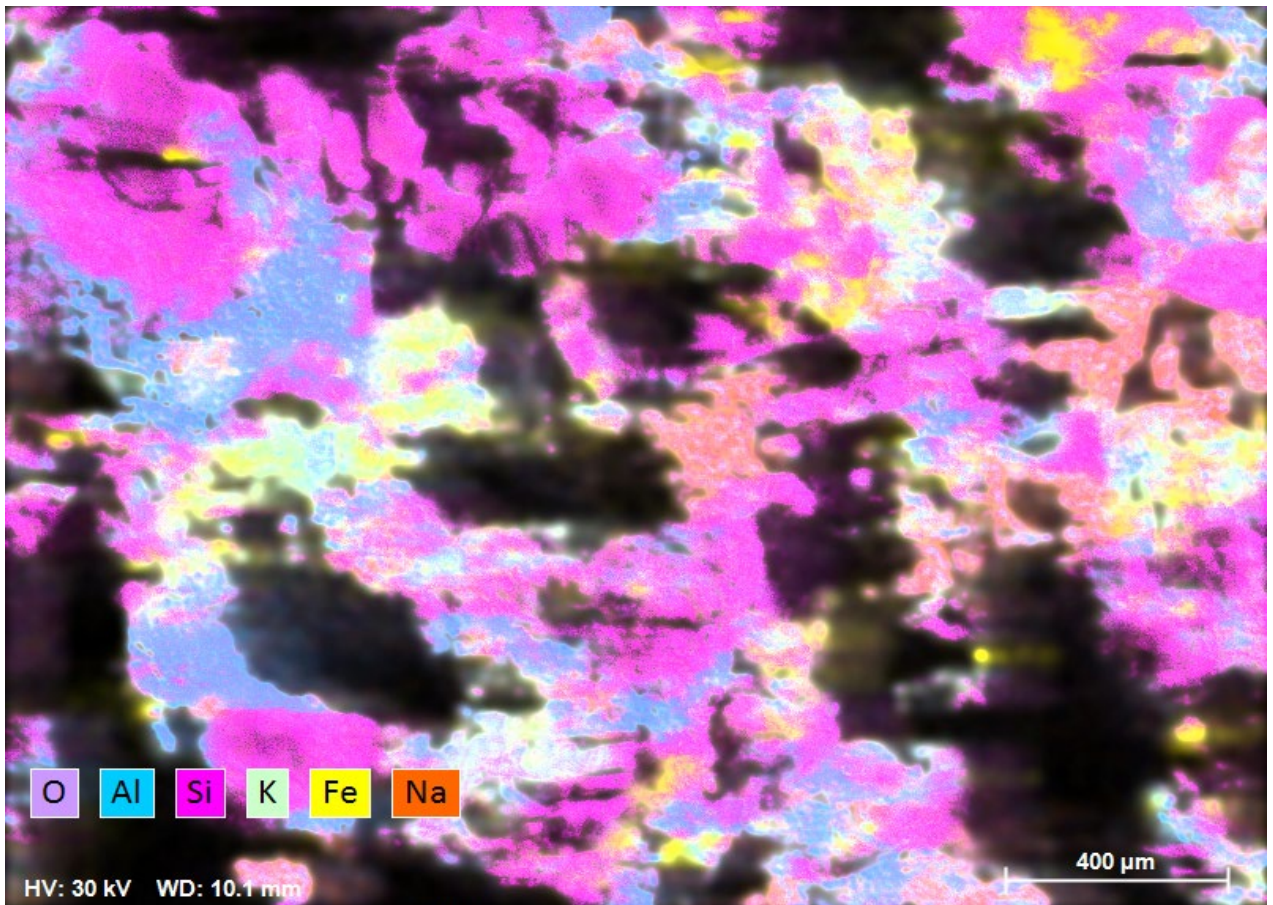


23009-06 Report



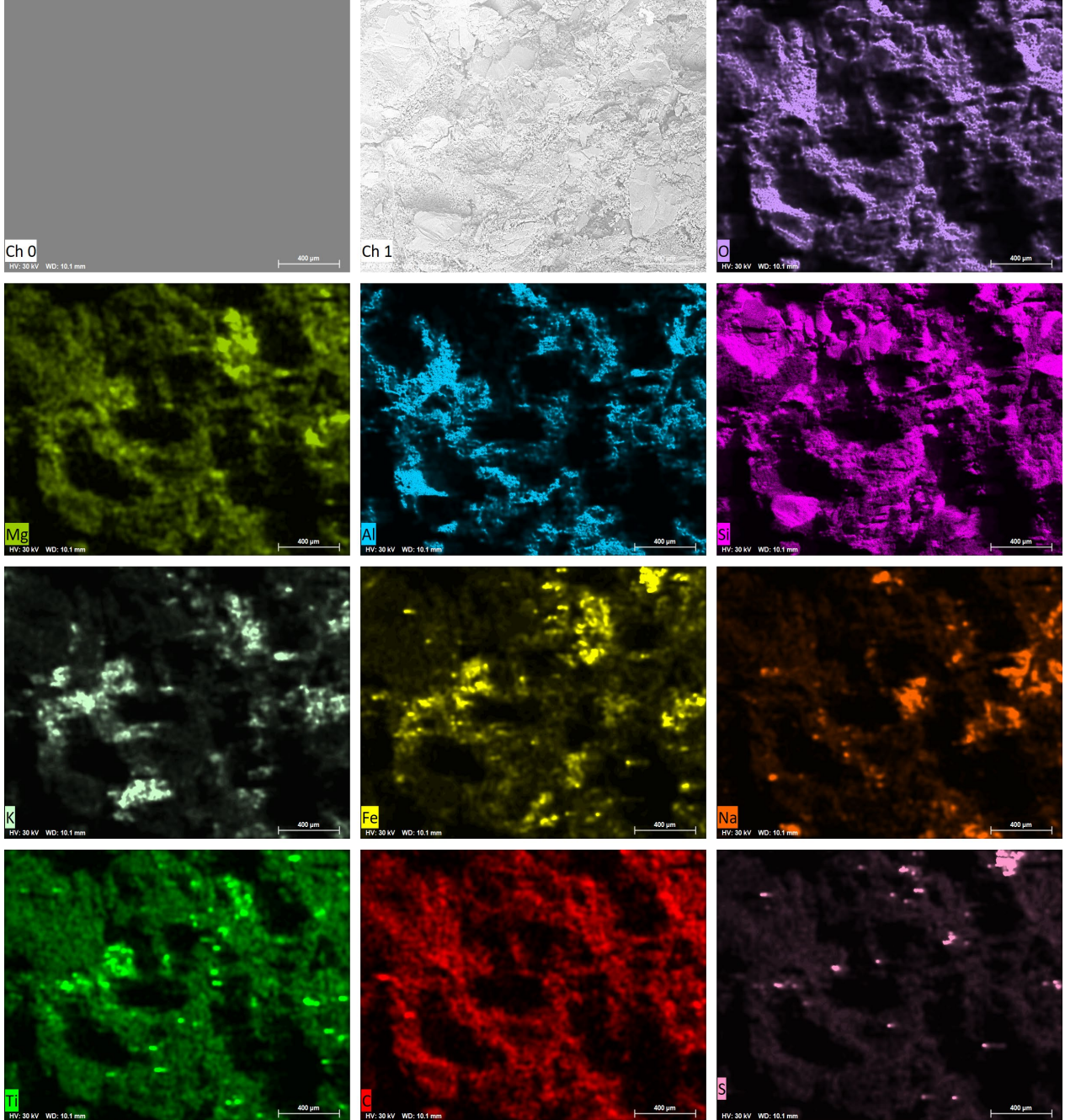
MAG: 126x HV: 30 kV WD: 10.1 mm

Name	Date	Time	HV [kV]	Mag	WD [mm]
EXTERN_1	3/8/2023	11:40:56 AM	30.0 keV	126x	10.1 mm



HV: 30 kV WD: 10.1 mm

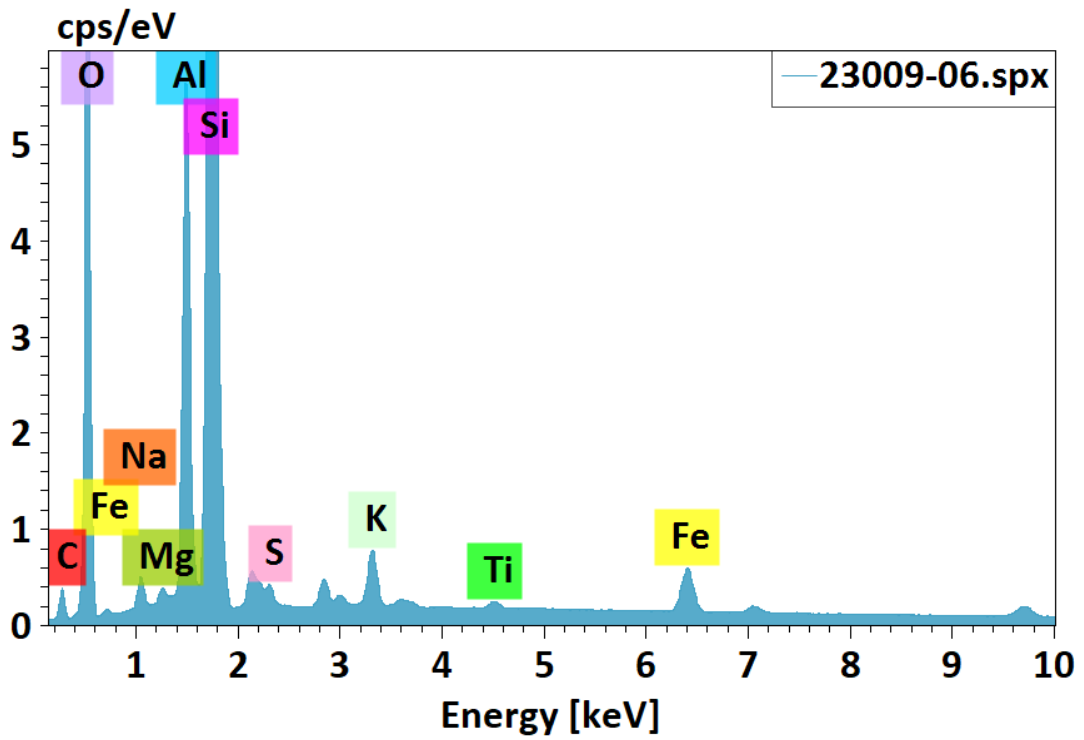
Date	Time	HV [kV]	Mag	WD [mm]
3/8/2023	2:14:31 PM	30.0 keV	126x	10.1 mm



Date	Time	HV (kV)	Mag	WD (mm)
3/8/2023	2:14:31 PM	30.0 keV	126x	10.1 mm

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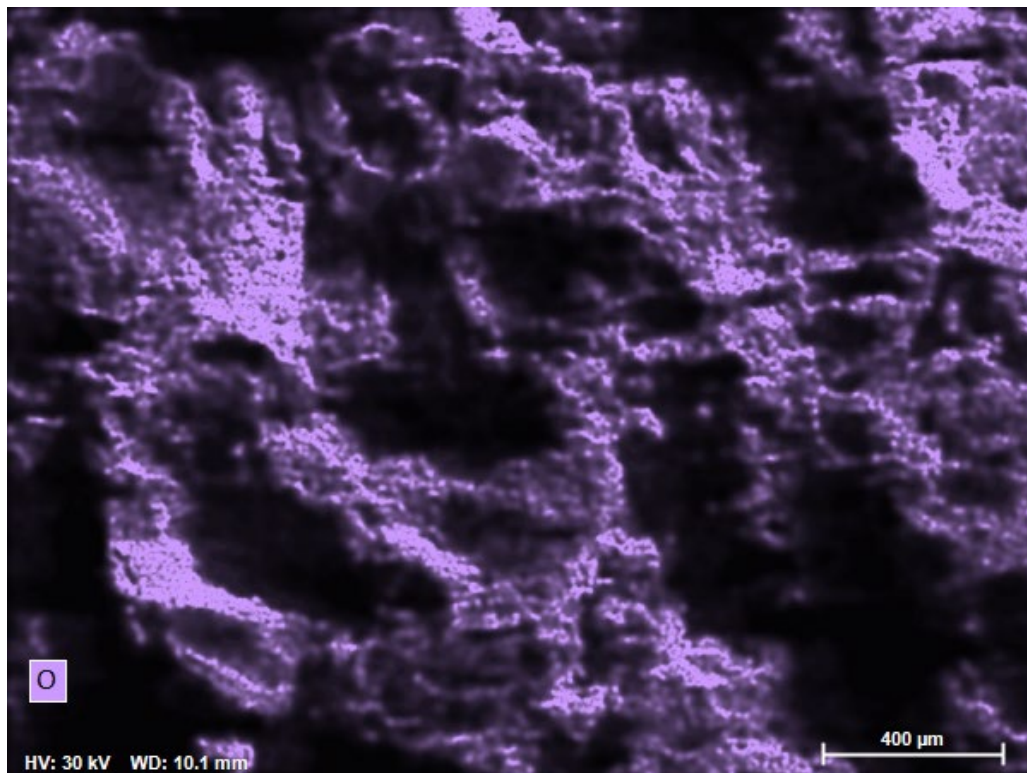


23009-06.spx

Element	At. No.	Mass [%]	Mass Norm. [%]	Atom [%]
Carbon	6	7.22	7.64	12.07
Oxygen	8	47.75	50.50	59.93
Sodium	11	0.87	0.92	0.76
Magnesium	12	0.22	0.23	0.18
Aluminium	13	6.19	6.55	4.61
Silicon	14	29.84	31.57	21.34
Sulfur	16	0.35	0.37	0.22
Potassium	19	0.86	0.91	0.44
Titanium	22	0.15	0.16	0.06
Iron	26	1.09	1.15	0.39
		94.54	100.00	100.00

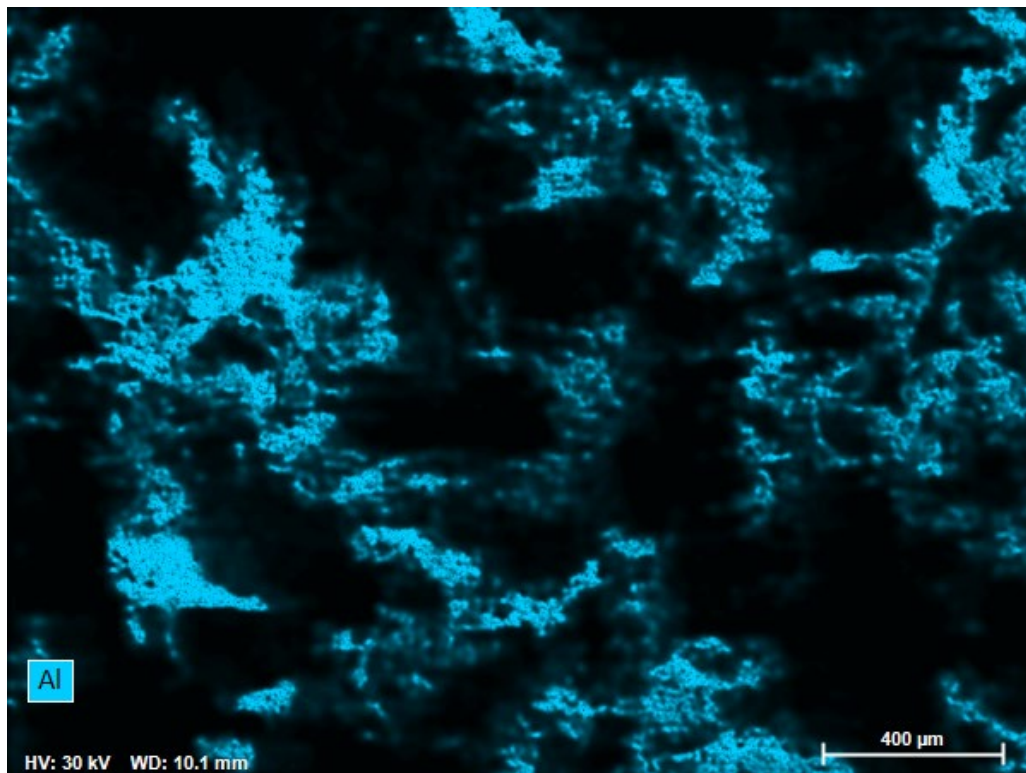
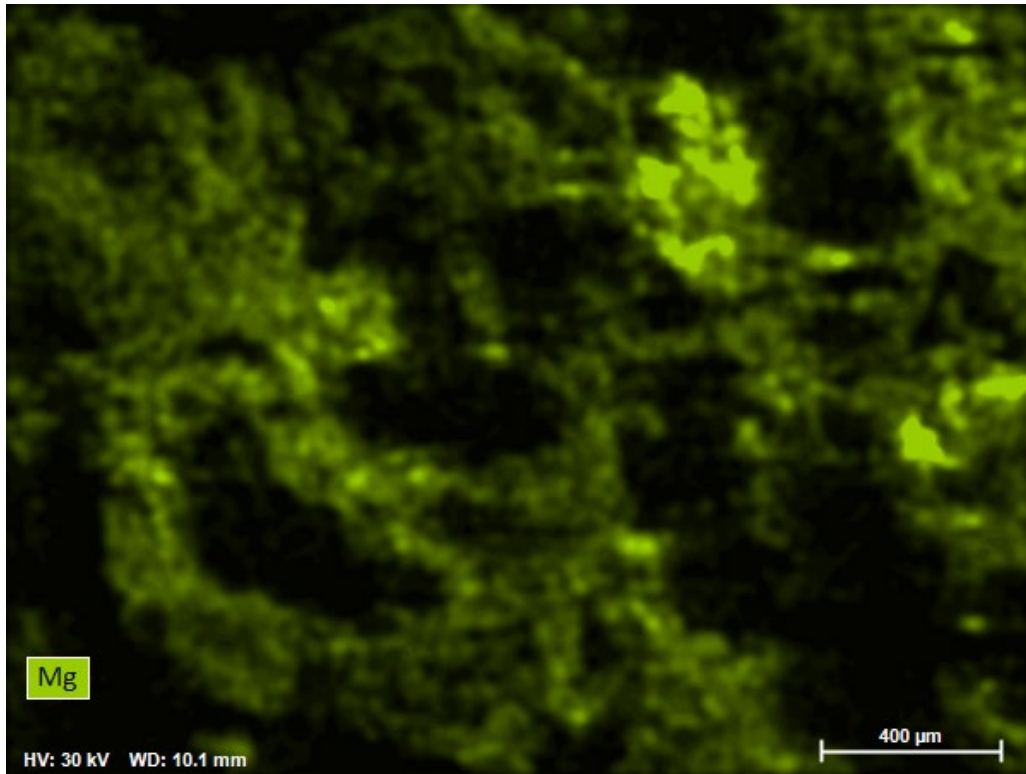
EDS Report

Company / Department



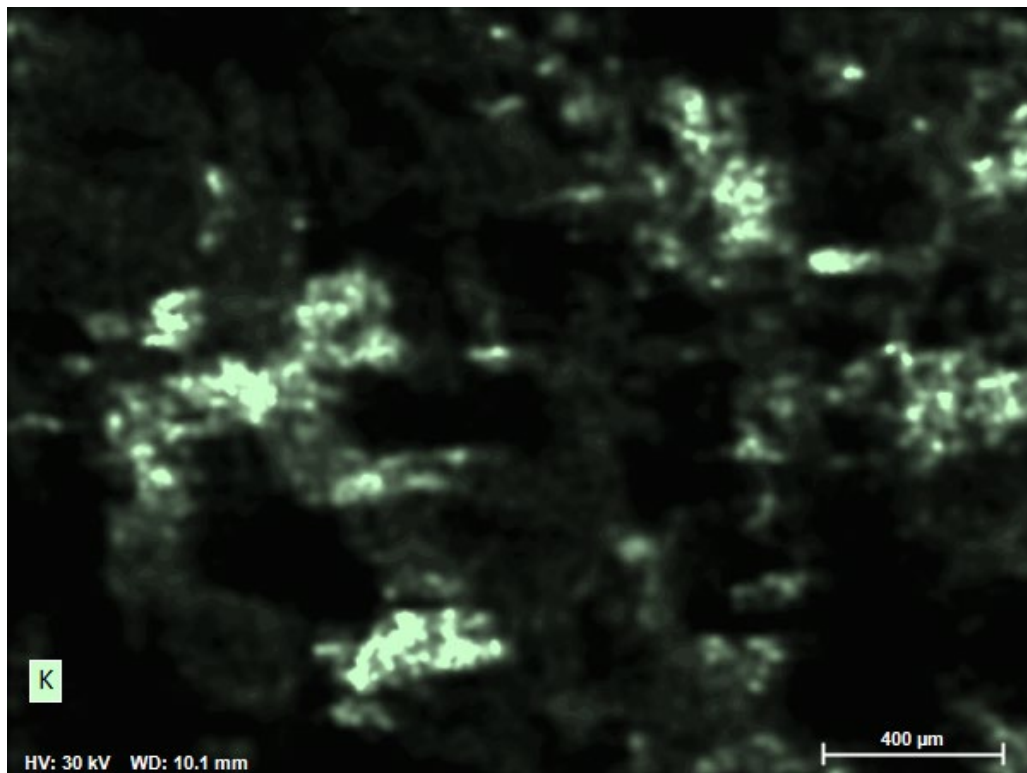
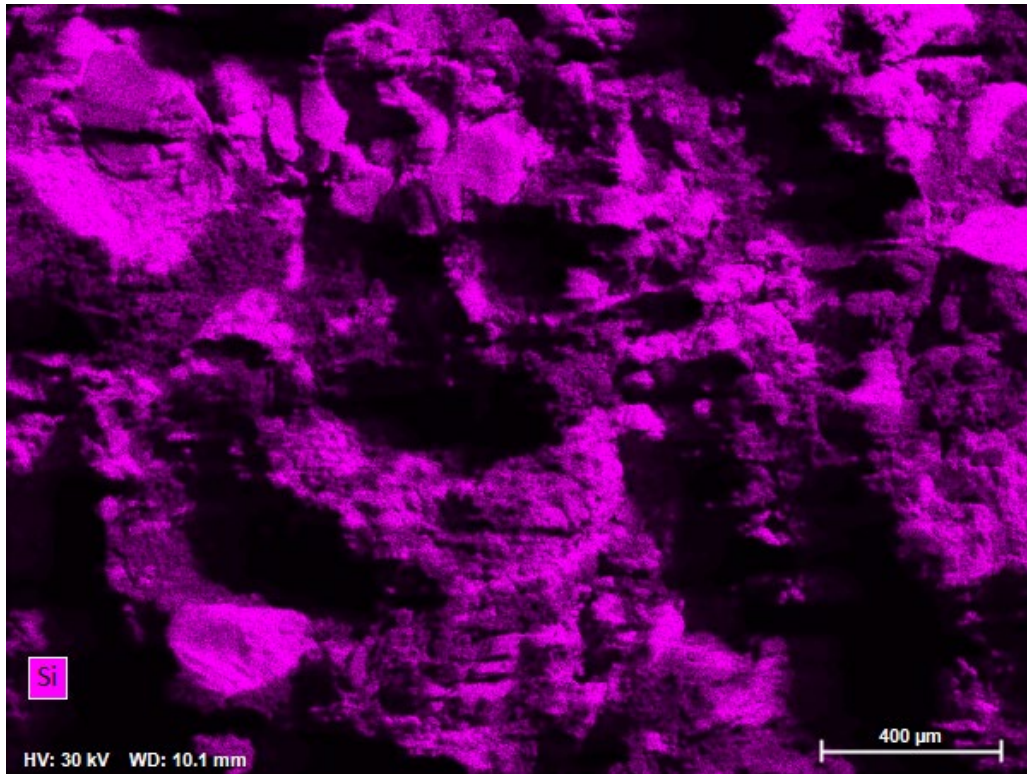
EDS Report

Company / Department



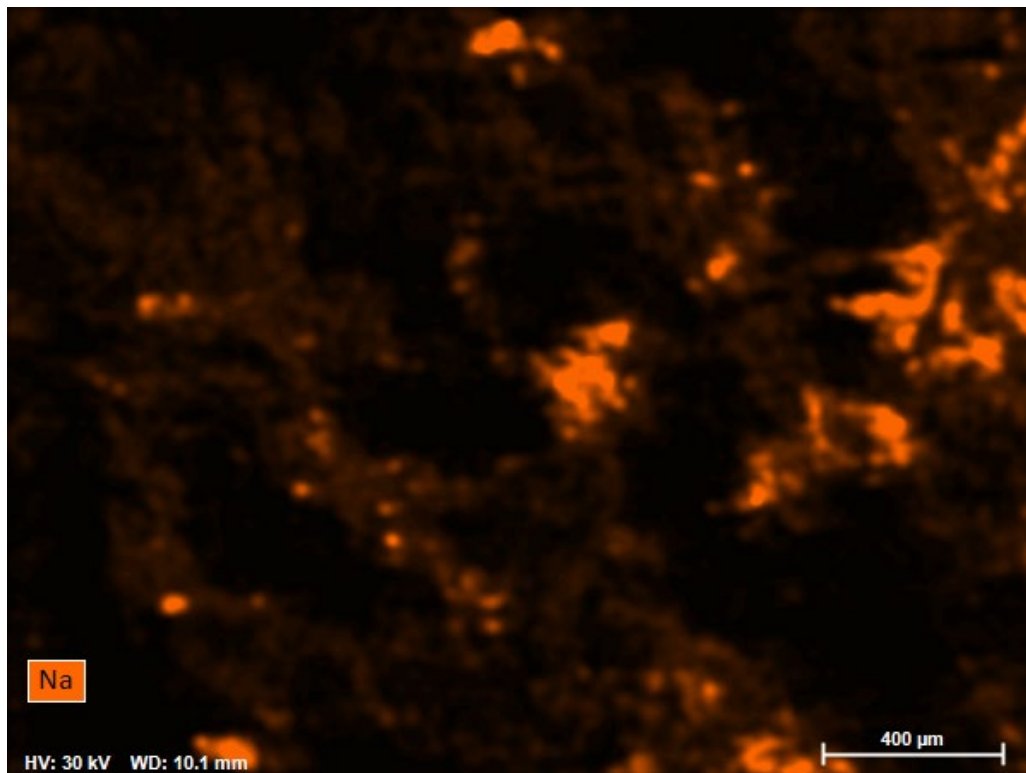
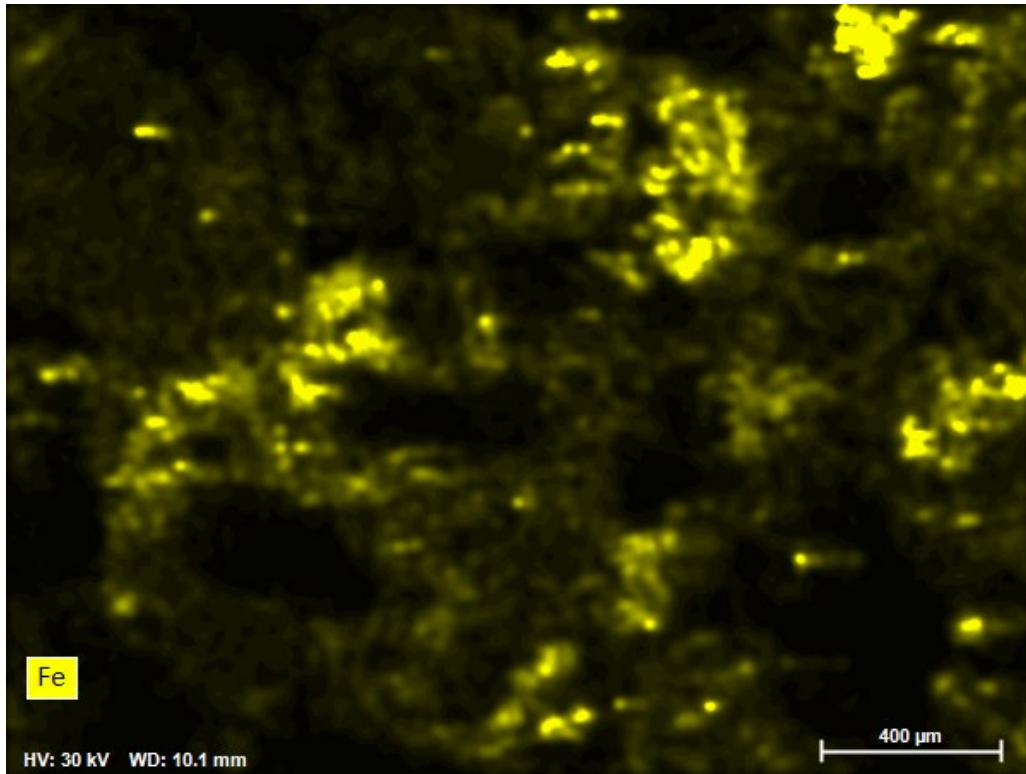
EDS Report

Company / Department



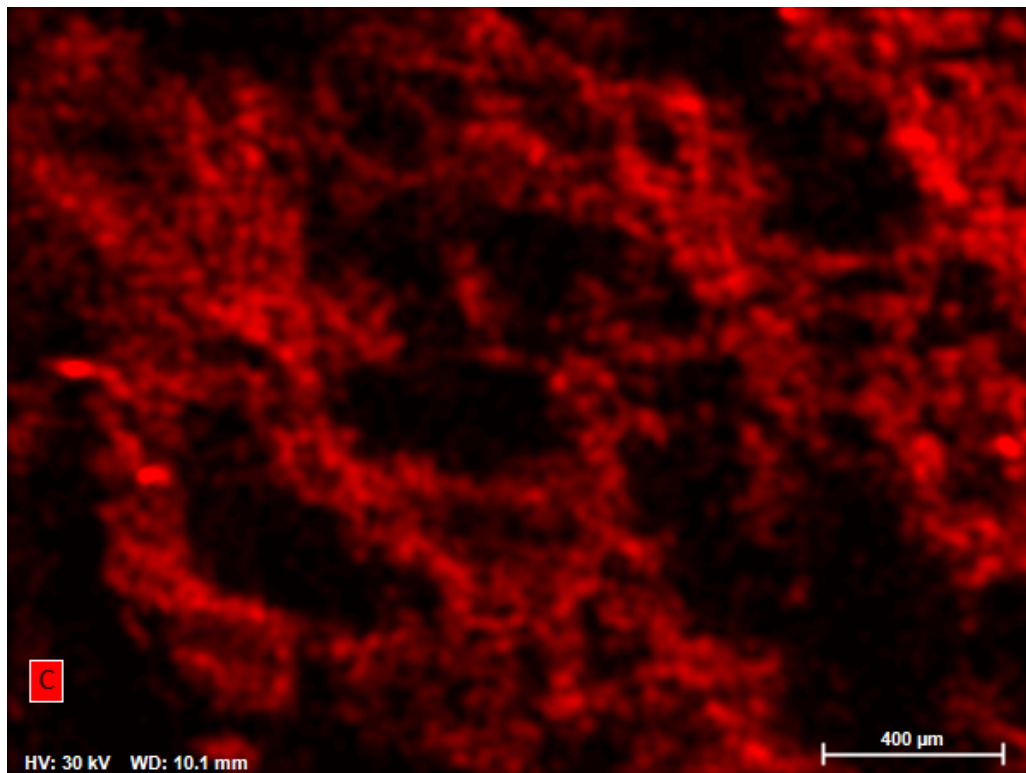
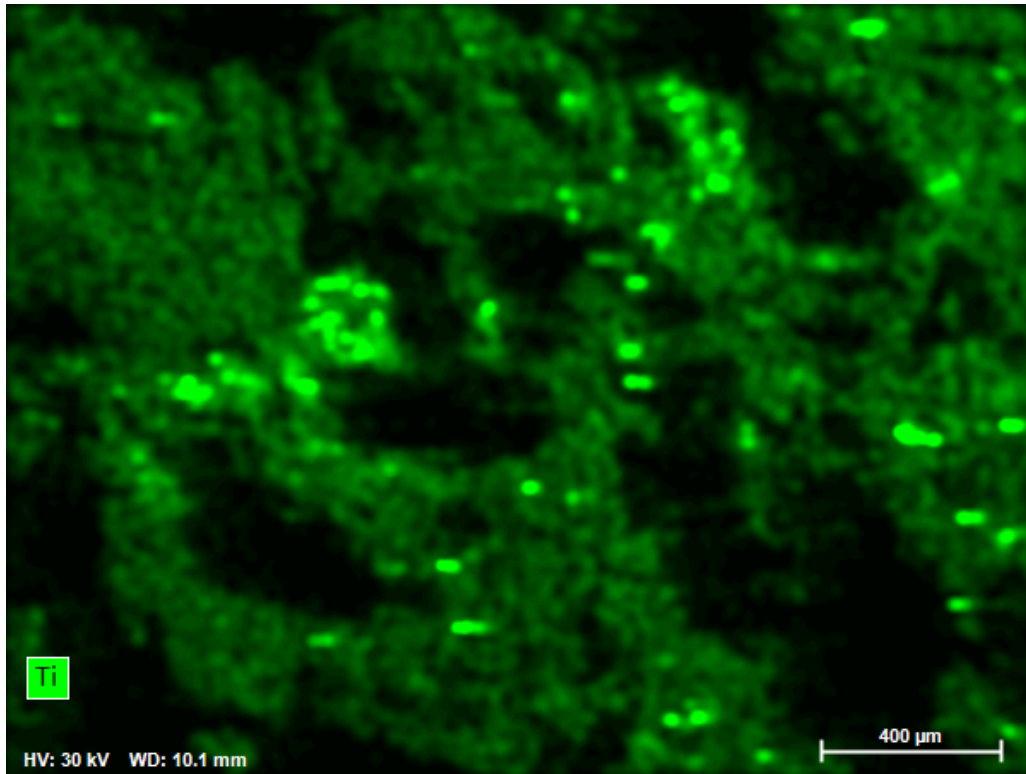
EDS Report

Company / Department



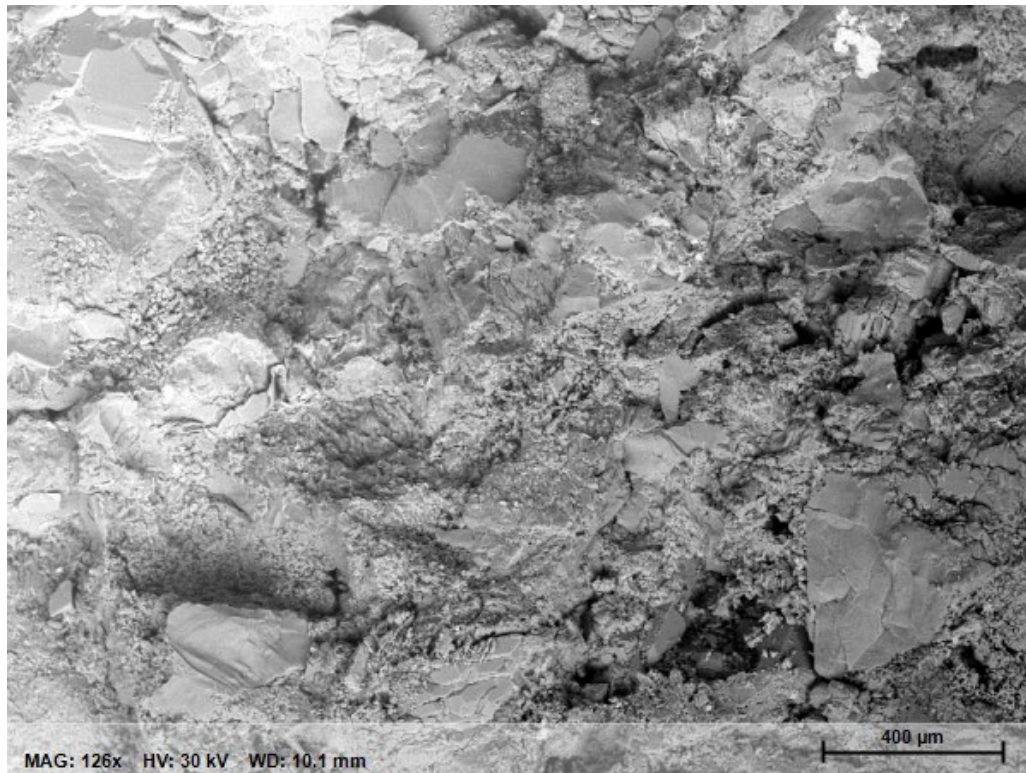
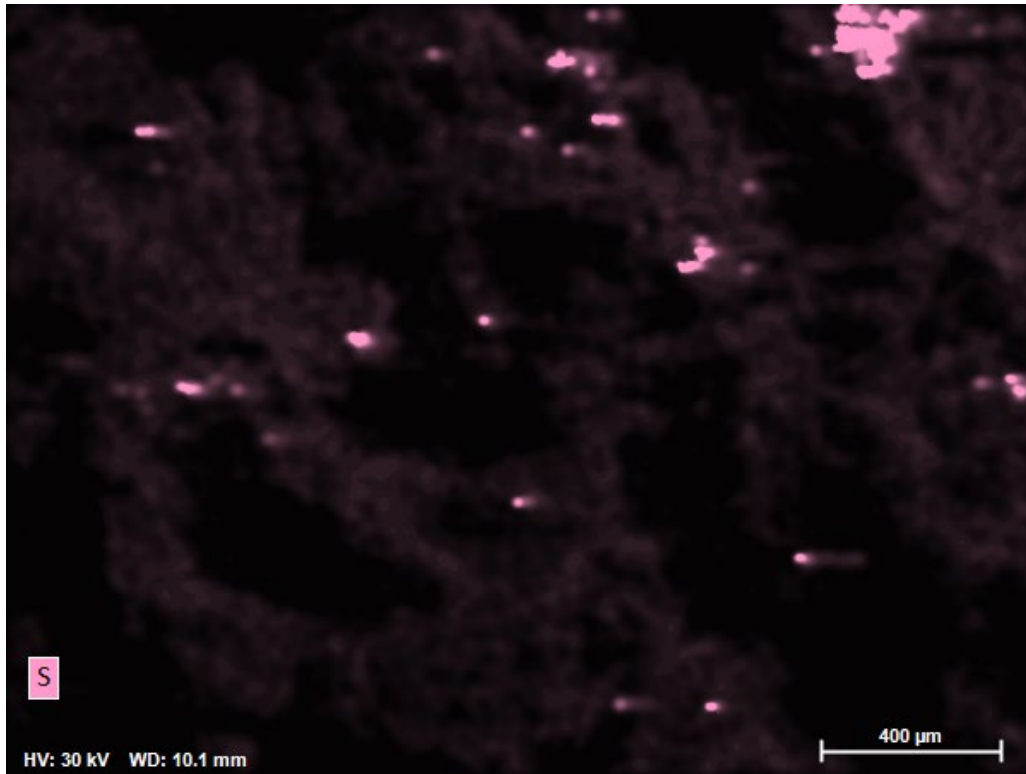
EDS Report

Company / Department



EDS Report

Company / Department



ATTACHMENT D
Bedrock Sampling Analytical Report –
Mineralogy, Inc.

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Allison Kreinberg
Geosyntec Consultants Inc
500 West Wilson Bridge Road
Suite 250
Worthington, Ohio 43085
Generated 4/18/2023 12:16:08 PM

JOB DESCRIPTION

MTR BAP

JOB NUMBER

240-183413-1

Eurofins Canton

Job Notes

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

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

Authorization

Roxanne Cisneros Generated
4/18/2023 12:16:08 PM

Authorized for release by
Roxanne Cisneros, Senior Project Manager
roxanne.cisneros@et.eurofinsus.com
(615)301-5761



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Definitions/Glossary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Job ID: 240-183413-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-183413-1

Comments

Run Total Metals - no leaching - per client email request.

Receipt

The samples were received on 4/12/2023 9:45 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 19.6° C.

Metals

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

Organic Prep

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

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Method Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET CAN
3050B	Preparation, Metals	SW846	EET CAN
Part Size Red	Particle Size Reduction Preparation	None	EET CAN

Protocol References:

None = None

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

Laboratory References:

EET CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

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Sample Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-183413-1	MW-1805-122	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-2	MW-1805-124.5	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-3	MW-1805-128	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-4	MW-1805-130.5	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-5	MW-1922D-104.5	Solid	12/21/22 00:00	04/12/23 09:45
240-183413-6	MW-1922D-111	Solid	12/21/22 00:00	04/12/23 09:45

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Detection Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-122

Lab Sample ID: 240-183413-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	55	B	0.81	0.048	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1805-124.5

Lab Sample ID: 240-183413-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.6	B	0.71	0.043	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1805-128

Lab Sample ID: 240-183413-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	56	B	9.6	0.58	mg/Kg	20		6020B	Total/NA

Client Sample ID: MW-1805-130.5

Lab Sample ID: 240-183413-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	2.9	B	0.87	0.052	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1922D-104.5

Lab Sample ID: 240-183413-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.5	B	0.88	0.053	mg/Kg	2		6020B	Total/NA

Client Sample ID: MW-1922D-111

Lab Sample ID: 240-183413-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	5.2	B	0.77	0.046	mg/Kg	2		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Canton

Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-122

Lab Sample ID: 240-183413-1

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	55	B	0.81	0.048	mg/Kg		04/13/23 14:00	04/14/23 16:54	2

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Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-124.5

Lab Sample ID: 240-183413-2

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.6	B	0.71	0.043	mg/Kg		04/13/23 14:00	04/14/23 16:57	2

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Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-128

Lab Sample ID: 240-183413-3

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	56	B	9.6	0.58	mg/Kg		04/13/23 14:00	04/14/23 17:00	20

- 1
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Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-130.5

Lab Sample ID: 240-183413-4

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.9	B	0.87	0.052	mg/Kg		04/13/23 14:00	04/14/23 17:02	2

- 1
- 2
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Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1922D-104.5

Lab Sample ID: 240-183413-5

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.5	B	0.88	0.053	mg/Kg		04/13/23 14:00	04/14/23 17:05	2

- 1
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Client Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1922D-111

Lab Sample ID: 240-183413-6

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.2	B	0.77	0.046	mg/Kg		04/13/23 14:00	04/14/23 17:08	2

- 1
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QC Sample Results

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 240-569247/1-A ^2
Matrix: Solid
Analysis Batch: 569539

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 569247

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0634	J	1.0	0.060	mg/Kg		04/13/23 14:00	04/14/23 15:49	2

Lab Sample ID: LCS 240-569247/2-A ^2
Matrix: Solid
Analysis Batch: 569539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 569247

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	90.1		mg/Kg		90	80 - 120



QC Association Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Metals

Processed Batch: 569171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-183413-1	MW-1805-122	Total/NA	Solid	Part Size Red	
240-183413-2	MW-1805-124.5	Total/NA	Solid	Part Size Red	
240-183413-3	MW-1805-128	Total/NA	Solid	Part Size Red	
240-183413-4	MW-1805-130.5	Total/NA	Solid	Part Size Red	
240-183413-5	MW-1922D-104.5	Total/NA	Solid	Part Size Red	
240-183413-6	MW-1922D-111	Total/NA	Solid	Part Size Red	

Prep Batch: 569247

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-183413-1	MW-1805-122	Total/NA	Solid	3050B	569171
240-183413-2	MW-1805-124.5	Total/NA	Solid	3050B	569171
240-183413-3	MW-1805-128	Total/NA	Solid	3050B	569171
240-183413-4	MW-1805-130.5	Total/NA	Solid	3050B	569171
240-183413-5	MW-1922D-104.5	Total/NA	Solid	3050B	569171
240-183413-6	MW-1922D-111	Total/NA	Solid	3050B	569171
MB 240-569247/1-A ^2	Method Blank	Total/NA	Solid	3050B	
LCS 240-569247/2-A ^2	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 569539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-183413-1	MW-1805-122	Total/NA	Solid	6020B	569247
240-183413-2	MW-1805-124.5	Total/NA	Solid	6020B	569247
240-183413-3	MW-1805-128	Total/NA	Solid	6020B	569247
240-183413-4	MW-1805-130.5	Total/NA	Solid	6020B	569247
240-183413-5	MW-1922D-104.5	Total/NA	Solid	6020B	569247
240-183413-6	MW-1922D-111	Total/NA	Solid	6020B	569247
MB 240-569247/1-A ^2	Method Blank	Total/NA	Solid	6020B	569247
LCS 240-569247/2-A ^2	Lab Control Sample	Total/NA	Solid	6020B	569247

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1805-122

Lab Sample ID: 240-183413-1

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 16:54

Client Sample ID: MW-1805-124.5

Lab Sample ID: 240-183413-2

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 16:57

Client Sample ID: MW-1805-128

Lab Sample ID: 240-183413-3

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		20	569539	RKT	EET CAN	04/14/23 17:00

Client Sample ID: MW-1805-130.5

Lab Sample ID: 240-183413-4

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 17:02

Client Sample ID: MW-1922D-104.5

Lab Sample ID: 240-183413-5

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 17:05

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Client Sample ID: MW-1922D-111

Lab Sample ID: 240-183413-6

Date Collected: 12/21/22 00:00

Matrix: Solid

Date Received: 04/12/23 09:45

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Analyst</u>	<u>Lab</u>	<u>Prepared or Analyzed</u>
Total/NA	Processed	Part Size Red			569171	POP	EET CAN	04/13/23 07:24
Total/NA	Prep	3050B			569247	DEE	EET CAN	04/13/23 14:00
Total/NA	Analysis	6020B		2	569539	RKT	EET CAN	04/14/23 17:08

Laboratory References:

EET CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396



Accreditation/Certification Summary

Client: Geosyntec Consultants Inc
Project/Site: MTR BAP

Job ID: 240-183413-1

Laboratory: Eurofins Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-27-23 *
Connecticut	State	PH-0590	06-29-23
Florida	NELAP	E87225	06-30-23
Georgia	State	4062	02-28-24
Illinois	NELAP	200004	07-31-23
Iowa	State	421	06-01-23
Kentucky (UST)	State	112225	02-27-23 *
Kentucky (WW)	State	KY98016	12-31-23
Michigan	State	9135	02-27-23 *
Minnesota	NELAP	039-999-348	12-31-23
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-23
New York	NELAP	10975	04-01-24
Ohio	State	8303	02-27-24
Ohio VAP	State	ORELAP 4062	02-27-24
Oregon	NELAP	4062	02-28-24
Pennsylvania	NELAP	68-00340	08-31-23
Texas	NELAP	T104704517-22-17	08-31-23
Virginia	NELAP	460175	09-14-23
West Virginia DEP	State	210	12-31-23

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


Eurofins Canton

Chain of Custody Record

19.4/19.6

eurolins Canton
10 S. Van Buren Ave
Canton, OH 44203-3543
Phone 330.497.9396 fax 330.497.0772

Regulatory Program: Allison Kreinberg <small>Email: Allison.Kreinberg@eurolins.com</small> Tel/Fax: 614-468-0421		Site Contact: _____ Lab Contact: _____		Date: 4/6/2023 Carrier: _____		COC No.: _____ 1 of 1 COCs	
Client Contact eosyntec Consultants 10 West Wilson Bridge Road, Suite 250 Worthington, OH 43085 614-468-0421 (xx) xxx-xxxx FAX Object Name: MTR BAP Inter: MTR O # CHA8495B/07		Project Manager: Allison Kreinberg Analysis Turnaround Time TAT if different from Below _____		Sampler: _____ For Lab Use Only: _____ Walk-in Client: _____ Lab Sampling: _____ Job / SDG No.: _____		Sample Specific Notes: Please complete DI water leach on all samples prior to analysis	
Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Am / Mal Arset	
MW-1805-122	12/21/22		G	Rock	1	X	
MW-1805-124.5	12/21/22		G	Rock	1	X	
MW-1805-128	12/21/22		G	Rock	1	X	
MW-1805-130.5	12/21/22		G	Rock	1	X	
MW-1922D-104.5	12/21/22		G	Rock	1	X	
MW-1922D-111	12/21/22		G	Rock	1	X	


 240-183413 Chain of Custody

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Therm ID No.: _____ Date/Time: 4/6/2023 9:45		Company: _____ Date/Time: _____	
Received by: <i>Ronelle</i> Date/Time: 4/6/2023		Received in Laboratory by: _____ Date/Time: _____	

Eurofins - Canton Sample Receipt Form/Narrative
Barberton Facility

Login # : _____

Client Geosyntec

Site Name _____

Cooler unpacked by:

Rockelle Haidet

Cooler Received on 4/12/23

Opened on 4/12/23

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off Eurofins Courier Other

Receipt After-hours: Drop-off Date/Time _____

Storage Location _____

Eurofins Cooler # EE Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form

IR GUN # 13 (CF +2 °C) Observed Cooler Temp. 19.4 °C Corrected Cooler Temp. 19.6 °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____ Yes No

-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA

-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No

-Were tamper/custody seals intact and uncompromised? Yes No NA

3. Shippers' packing slip attached to the cooler(s)? Yes No

4. Did custody papers accompany the sample(s)? Yes No

5. Were the custody papers relinquished & signed in the appropriate place? Yes No

6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No

7. Did all bottles arrive in good condition (Unbroken)? Yes No

8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No

9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?

10. Were correct bottle(s) used for the test(s) indicated? Yes No

11. Sufficient quantity received to perform indicated analyses? Yes No

12. Are these work share samples and all listed on the COC? Yes No

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

14. Were VOAs on the COC? Yes No

15. Were air bubbles >6 mm in any VOA vials? Yes No NA



16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No

17. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page

Samples processed by: _____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

ATTACHMENT E

Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that this alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Mountaineer BAPs CCR management unit and that the requirements of 40 CFR 257.95(g)(3)(ii) have been met.

John Seymour
Printed Name of Licensed Professional Engineer


Signature



017091
License Number

West Virginia
Licensing State

12/6/2023
Date

Appendix 4

The notice of initiating the assessment monitoring program and subsequently the Assessment of Corrective Measures program follow.

Mountaineer Plant

Notice of Assessment Monitoring Program Establishment

Bottom Ash Pond

On January 15, 2018, it was determined that Mountaineer Plant's Bottom Ash Pond had statistically significant increases over background for Boron, Calcium, Chloride, Fluoride, Sulfate, and Total Dissolved Solids (TDS). An alternative source demonstration was not successful within the 90 day period as allowed for in 257.94(e)(2) prompting the initiation of an assessment monitoring program, which was established on April 13, 2018. Therefore this notice is being placed in the operating record in accordance with the requirement of 257.94(e)(3).

Mountaineer Plant

Notice for Initiating an Assessment of Corrective Measures

CCR Unit – Bottom Ash Pond

This notice is being provided, as required by 40 CFR 257.95(g)(5), that an Assessment of Corrective Measures was initiated on March 26, 2019 for Mountaineer Plant's Bottom Ash Pond due to the statistically significant concentrations detected above the established groundwater protection standard for lithium.

Appendix 5

No monitoring wells were installed or decommissioned during this reporting period.