Annual Groundwater Monitoring Report

Kentucky Power Company

Big Sandy Plant

Fly Ash Pond CCR Unit

Louisa, Kentucky

January 31, 2026

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Abbreviations:
ASD – Alternate Source Demonstration
BSFAP – Big Sandy Fly Ash Pond
CCR – Coal Combustion Residual
GWPS – Groundwater Protection Standard
MW – Monitoring Well
SSI – Statistically Significant Increase
SSL – Statistically Significant Level
USEPA – United States Environmental Protection Agency

I. Overview

This *Annual Groundwater Monitoring and Corrective Action Report* has been prepared to report the status of activities for the preceding year for the Big Sandy Fly Ash Pond (BSFAP), an existing CCR unit at Kentucky Power Company's Big Sandy Plant. Kentucky Power Company is a wholly owned subsidiary of American Electric Power Company (AEP). The USEPA's Coal Combustion Residuals (CCR) rules require that the Annual Groundwater Monitoring and Corrective Action Report covering the preceding year's groundwater monitoring activities be posted to the operating record no later than January 31st.

In general, the following activities were completed:

- The BSFAP CCR unit was in assessment monitoring at the beginning of 2025.
- The BSFAP CCR unit was in assessment monitoring at the end of 2025.
- An assessment monitoring program for the BSFAP CCR unit was established on April 13, 2018.
- Data and statistical analysis not available for the previous reporting period indicates that during the September 2024 semi-annual sampling event:
    - The following Appendix III parameters exceeded background concentrations:
        - boron at MW-1606
        - chloride at MW-1602, MW-1606, and MW-1607
        - sulfate at MW-1602
    - The Appendix IV parameters were not detected at statistically significant levels (SSLs) above the corresponding groundwater protection standards (GWPSs).
- During the June 2025 semi-annual sampling event:
    - The following Appendix III parameters exceeded background concentrations:
        - boron at MW-1606
        - chloride at MW-1602 and MW-1606
        - sulfate at MW-1602
    - The Appendix IV parameters were not detected at SSLs above the corresponding GWPSs.
- The October 2025 semi-annual sampling event data are still undergoing statistical analysis. MW-1601 did not yield enough water for sample collection. Upon reviewing data collected for this sampling event, it was discovered that samples for total dissolved solids and sulfate were mistakenly not collected. Additional samples for these two parameters at all wells

were collected in December 2025. At this additional event, all Appendix III and Appendix IV parameters were collected for MW-1601.

- Groundwater monitoring data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units.
- Because no Appendix IV constituents were detected at SSLs above the corresponding groundwater protection standards for any sampling event statistically analyzed in 2025, no alternative source demonstration (ASD) studies were conducted and the BSFAP remained in assessment monitoring.

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

- A map/aerial photograph showing the Big Sandy Fly Ash Pond, all CCR groundwater monitoring wells, and monitoring well identification numbers (Attached as **Appendix 1**).
- All 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 background, detection, or assessment monitoring programs (Attached as **Appendix 1**).
- Statistical analysis of monitoring data to determine if there have been statistically significant increases (SSIs) or SSLs (Attached as **Appendix 2**, where applicable).
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as **Appendix 3**, where applicable).
- 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 SSI over background concentrations (Notices attached as **Appendix 4**, where applicable).
- 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).
- 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

The CCR monitoring wells are screened in the alluvial aquifer and the bedrock.

Alluvial wells

- Background wells: MW-1604 and MW-1605
- Downgradient wells: MW-1606 and MW-1607

Bedrock wells

- Upgradient/background wells: MW-1011, MW-1012, and MW-1203
- Downgradient wells: MW-1601 and MW-1602

A figure that depicts the PE-certified groundwater monitoring network, the monitoring well locations, and their corresponding identification numbers is provided in **Appendix 1**.

III. Monitoring Wells Installed or Decommissioned

There were no monitoring wells installed or decommissioned in 2025. The network design, as summarized in the *Groundwater Monitoring Network Evaluation, Revision 1* (*Geosyntec, October 2023*) report and posted on the AEP CCR web site for Big Sandy Plant, did not change. That report discusses the facility location, hydrogeological setting, hydrostratigraphic units, uppermost aquifer, downgradient monitoring well locations, and upgradient monitoring well locations.

IV. Groundwater Quality Data and Static Water Elevation Data, With Flow Rate and Direction and Discussion

Appendix 1 contains tables showing the groundwater quality data collected during the establishment of background quality, during detection and assessment monitoring. Potentiometric maps developed after each sampling event contain the static water elevation and groundwater flow direction for each sampling event and are provided in **Appendix 1**, along with the groundwater velocity calculations.

The sampling event conducted in March 2025 satisfies the requirement of 257.95(b).

V. Groundwater Quality Data Statistical Analysis

Appendix 2 contains the statistical analysis reports for each sampling event analyzed in 2025.

- Data and statistical analysis not available for the previous reporting period indicates that during the September 2024 semi-annual sampling event:
    - The following Appendix III parameters exceeded background concentrations:

        - boron at MW-1606
        - chloride at MW-1602, MW-1606, and MW-1607
        - sulfate at MW-1602
    - The Appendix IV parameters were not detected at SSLs above the corresponding GWPSs.
- During the June 2025 semi-annual sampling event:
    - The following Appendix III parameters exceeded background concentrations:
        - boron at MW-1606
        - chloride at MW-1602 and MW-1606
        - sulfate at MW-1602
    - The Appendix IV parameters were not detected at SSLs above the corresponding GWPSs.
- The October 2025/December 2025 semi-annual sampling event data are still undergoing statistical analysis.

VI. Alternate Source Demonstrations completed

No alternate source demonstration was completed since there were no SSLs detected above the corresponding GWPSs were identified in 2025.

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

No transition was made during this reporting period and the CCR Unit remained in assessment monitoring.

The BSFAP will remain in assessment monitoring unless all Appendix III and IV parameters are below background values for two consecutive monitoring events; then it can return to detection monitoring as prescribed by 40 CFR 257.95(e). If an Appendix IV parameter exceeds its respective GWPS due to a release from the BSFAP, an assessment of corrective measures will be undertaken as required by 40 CFR 257.96.

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

VIII. Other Information Required

All required information has been included in this annual groundwater monitoring report. At the appropriate time, hydrogeological, geochemical, and statistical analyses of the groundwater assessment monitoring data will continue to attempt demonstrations of whether an alternative source or sources other than the CCR unit are causing the detection of SSLs above the corresponding groundwater protection standard statistical limits, or if the SSLs resulted from error in sampling, analysis, statistical evaluation or natural variation in groundwater quality, if warranted. In those cases where an alternative source demonstration is made, the analyses and supporting information will be reported.

The unit was dewatered of all ponded surface water prior to completion of the geomembrane liner installation within the final cover system on November 24, 2020. Ponded surface water no longer remains within the CCR unit.

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 the annual groundwater report preparation.

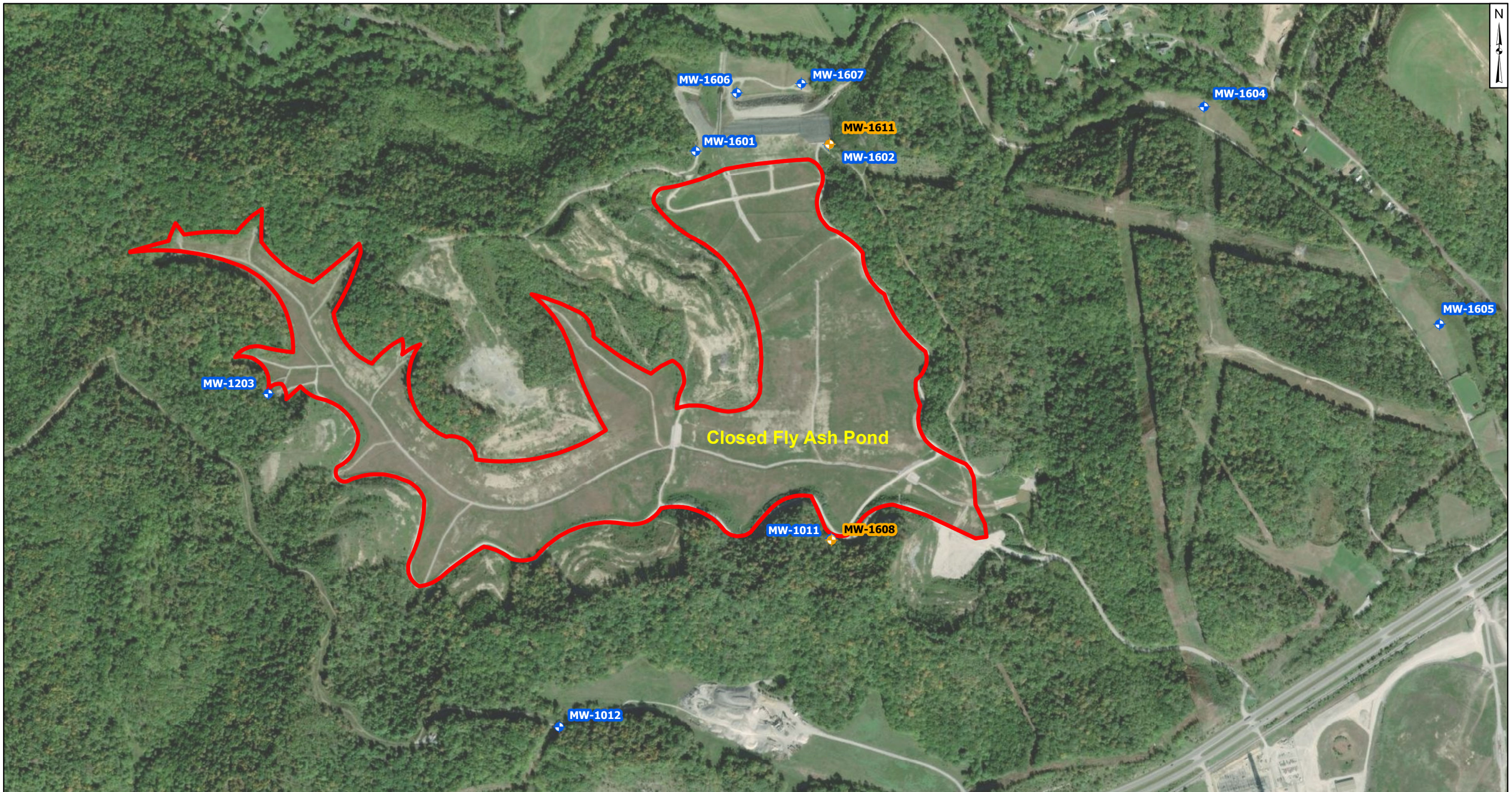
X. A Projection of Key Activities for the Upcoming Year

- Continue assessment monitoring sampling for Appendix III and Appendix IV parameters, as required by 40 CFR 257.95(b) and 40 CFR 257.95(d)(1).
- Complete the statistical evaluation of the second semi-annual groundwater monitoring event that took place October 2025/December 2025.
- Perform statistical analysis on the sampling results for the Appendix III and Appendix IV parameters as required by 40 CFR 257.95(d)(1).
- Determine applicable GWPSs for the Appendix IV parameters and compare the results of Appendix IV concentrations in downgradient wells to the GWPSs.
- Evaluate MW-1601 to determine whether an alternate sampling frequency is needed.
- If no GWPSs are exceeded, the BSFAP will remain in assessment monitoring.
- Responding to any new data received in light of CCR rule requirements.
- Preparation of the next annual groundwater report documenting activities performed in 2026.

APPENDIX 1 – Groundwater Data Tables and Figures

Figures and tables follow, showing the groundwater monitoring network, data collected, and the rate and direction of groundwater flow. The tables also provide sample collection dates and whether the data were collected under background, detection, or assessment monitoring. Historical data for MW-1603 is included in this report. MW-1603 was removed from the network design as summarized in the *Groundwater Monitoring Network Evaluation, Revision 1 (Geosyntec, October 2023)* report, posted on the AEP CCR web site for the Big Sandy Plant.

Groundwater Monitoring Network Figure



Legend

- Monitoring Well
- Gauging Well
- Fly Ash Pond (Approximate)

Notes

1. Monitoring well coordinates provided by AEP, surveyed by Eastham and Associates (April 2025).
2. Site features based on information available in Groundwater Monitoring Network Evaluation - Big Sandy Fly Ash Pond, Revision 1 (Geosyntec 2023) provided by AEP.
3. Aerial imagery provided by ESRI (dated October 2024).

1,000 500 0 1,000 Feet

Revised Groundwater Monitoring Well Network of the Uppermost Aquifer

AEP Big Sandy Plant - Fly Ash Pond
Louisa, Kentucky

Geosyntec consultants

Columbus, Ohio | 2026/01/23

Figure 1

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Big Sandy\2025\20260116_BigSandy_FAP_MW_Gauging Locations.mxd. okiemute.commander. 1/23/2026. CHA8423/05/08.

Groundwater Data Tables

Table 1. Groundwater Data Summary: MW-1011
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.071	79.1	3.39	0.19	7.0	79.5	388
11/09/2016	Background	0.081	74.6	3.43	0.21	7.0	74.4	360
1/12/2017	Background	0.103	75.4	2.83	0.25	6.9	72.8	363
2/21/2017	Background	0.098	75.8	2.68	0.21	7.1	72.5	371
4/25/2017	Background	0.148	78.0	2.71	0.23	6.7	74.7	358
5/24/2017	Background	0.156	85.2	2.86	0.20	6.7	73.8	370
6/21/2017	Background	0.129	72.6	2.19	0.22	6.7	69.4	338
7/13/2017	Background	0.111	78.1	2.31	0.21	7.1	78.2	371
9/18/2017	Detection	0.146	80.1	2.85	0.18	6.9	78.0	372
4/26/2018	Assessment	0.139	105	4.71	0.20	6.3	106	456
9/20/2018	Assessment	0.165	72.7	3.43	0.28	7.0	76.3	386
3/13/2019	Assessment	0.101	80.5	5.22	0.24	6.5	84.2	411
6/27/2019	Assessment	0.119	75.3	4.20	0.27	7.0	75.2	386
8/21/2019	Assessment	0.117	86.2	4.41	0.26	7.1	76.2	385
3/17/2020	Assessment	--	--	--	0.24	7.5	--	--
6/29/2020	Assessment	0.111	82.8	5.10	0.24	6.9	82.8	--
8/26/2020	Assessment	--	--	--	--	4.3	--	443
10/05/2020	Assessment	0.105	82.7	4.86	0.26	7.2	81.5	388
3/09/2021	Assessment	--	--	--	0.29	6.9	--	--
6/09/2021	Assessment	0.092	81.2	5.02	0.28	6.8	82.0	380
10/05/2021	Assessment	0.118	79.0	3.74	0.28	6.9	78.1	380
3/23/2022	Assessment	0.052	123 M1, P3	6.11	0.23	8.1	80.8	380
6/13/2022	Assessment	0.105	82.4	4.02	0.26	7.6	85.1	390
10/10/2022	Assessment	0.117	80.4	3.17	0.26	6.8	81.4	390
3/13/2023	Assessment	--	--	--	0.27	6.9	--	--
6/13/2023	Assessment	0.105	75.3	3.44	0.26	6.9	80.6	380 P2
10/18/2023	Assessment	0.094	75.0	5.03	0.22	7.1	77.7	400
3/13/2024	Assessment	--	--	--	0.23	7.3	--	--
5/08/2024	Assessment	0.053	102	--	0.21	6.7	--	--
8/07/2024	Assessment	--	--	3.85	--	--	121	530
9/24/2024	Assessment	0.126	77.5 M1	2.81	0.28	6.9	75.3	360
3/26/2025	Assessment	--	--	--	0.25	6.7	--	--
6/10/2025	Assessment	0.121	78.9	3.72	0.30	7.0	83.3	390
10/14/2025	Assessment	0.048 J1	94.3	6.09	0.19	6.5	73.4	--
12/02/2025	Assessment	--	--	--	--	7.2	--	360

Table 1. Groundwater Data Summary: MW-1011
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	1.01	17.8	52.0	< 0.005 U1	0.02	0.5	2.85	2.56	0.19	0.214	0.011	< 0.002 U1	1.80	0.09 J1	0.229
11/09/2016	Background	0.75	9.93	48.1	< 0.005 U1	0.02 J1	0.744	1.12	3.56	0.21	0.297	0.017	< 0.002 U1	1.51	0.07 J1	0.162
1/12/2017	Background	0.36	10.5	47.7	< 0.005 U1	0.01 J1	0.369	1.47	5.24	0.25	0.026	0.009	< 0.002 U1	1.39	0.03 J1	0.160
2/21/2017	Background	0.28	11.1	49.5	< 0.005 U1	0.008 J1	0.189	1.09	3.43	0.21	0.024	0.016	< 0.002 U1	1.21	< 0.03 U1	0.153
4/25/2017	Background	0.26	11.9	53.0	< 0.004 U1	0.01 J1	0.223	1.23	2.65	0.23	0.035	0.003	< 0.002 U1	1.23	< 0.03 U1	0.102
5/24/2017	Background	0.22	9.46	54.7	< 0.004 U1	0.008 J1	0.318	1.15	2.566	0.20	0.020	0.005	< 0.002 U1	0.99	< 0.03 U1	0.134
6/21/2017	Background	0.24	5.57	45.7	< 0.004 U1	0.006 J1	0.294	0.413	2.576	0.22	0.01 J1	0.014	0.004 J1	1.34	0.05 J1	0.098
7/13/2017	Background	0.24	5.92	46.0	< 0.004 U1	0.01 J1	0.223	0.444	2.353	0.21	0.054	0.010	< 0.002 U1	1.39	0.03 J1	0.091
4/26/2018	Assessment	0.16	13.5	63.1	< 0.004 U1	< 0.005 U1	0.207	3.25	5.69	0.20	0.095	0.010	< 0.002 U1	0.82	< 0.03 U1	0.121
9/20/2018	Assessment	0.18	7.25	44.8	< 0.02 U1	< 0.01 U1	0.588	0.683	2.56	0.28	0.08	0.009	--	0.8	< 0.03 U1	< 0.1 U1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/13/2019	Assessment	0.15	7.53	49.2	< 0.02 U1	< 0.01 U1	0.576	0.709	2.425	0.24	0.217	0.02 J1	< 0.002 U1	0.9 J1	< 0.03 U1	< 0.1 U1
6/27/2019	Assessment	0.15	5.17	47.5	< 0.02 U1	< 0.01 U1	0.304	0.438	2.582	0.27	0.181	< 0.009 U1	< 0.002 U1	0.7 J1	< 0.03 U1	< 0.1 U1
8/21/2019	Assessment	0.18	5.31	49.2	< 0.02 U1	0.01 J1	0.341	0.421	2.54	0.26	0.1 J1	0.00973	< 0.002 U1	0.7 J1	< 0.03 U1	< 0.1 U1
3/17/2020	Assessment	0.14	6.96	51.5	< 0.02 U1	< 0.01 U1	0.253	0.724	4.44	0.24	< 0.05 U1	0.00871	< 0.002 U1	0.7 J1	< 0.03 U1	< 0.1 U1
6/29/2020	Assessment	0.18	6.72	49.2	< 0.02 U1	0.01 J1	0.203	0.339	3.02	0.24	0.05 J1	0.00993	< 0.002 U1	0.8 J1	0.06 J1	< 0.1 U1
10/05/2020	Assessment	0.18	5.31	46.3	< 0.02 U1	< 0.01 U1	0.09 J1	0.321	2.57	0.26	< 0.05 U1	0.00926	< 0.002 U1	0.8 J1	0.04 J1	< 0.1 U1
3/09/2021	Assessment	0.14	7.71	50.0	< 0.007 U1	< 0.004 U1	0.481	0.438	2.81	0.29	0.06 J1	0.00977	< 0.002 U1	0.7 J1	< 0.09 U1	0.06 J1
6/09/2021	Assessment	0.17	4.84	46.4	< 0.007 U1	0.012 J1	0.35	0.452	4.09	0.28	0.10 J1	0.00852	< 0.002 U1	0.8	< 0.09 U1	0.06 J1
10/05/2021	Assessment	0.19	4.42	46.1	< 0.007 U1	0.012 J1	0.22	0.305	3.19	0.28	0.10 J1	0.00987	< 0.002 U1	0.9	< 0.09 U1	0.06 J1
3/23/2022	Assessment	0.37	19.3	57.5	0.007 J1	0.007 J1	0.36	1.12	3.69	0.23	0.15 J1	0.0106	< 0.002 U1	0.7	< 0.09 U1	0.06 J1
6/13/2022	Assessment	0.16	3.55	47.2	< 0.007 U1	< 0.004 U1	0.21	0.284	3.29	0.26	< 0.05 U1	0.00948	< 0.002 U1	0.9	< 0.09 U1	0.06 J1
10/10/2022	Assessment	0.13	3.68	44.0	< 0.007 U1	< 0.004 U1	0.30	0.223	2.73	0.26	< 0.05 U1	0.0111	< 0.004 U1	0.8	< 0.09 U1	0.04 J1
3/13/2023	Assessment	0.14	3.32	41.4	< 0.007 U1	< 0.004 U1	0.29	0.229	2.67	0.27	< 0.05 U1	0.00976	< 0.002 U1	0.8	< 0.09 U1	0.05 J1
6/13/2023	Assessment	0.161	2.87	42.0	< 0.007 U1	0.008 J1	0.54	0.197	2.05	0.26	0.09 J1	0.00880	< 0.002 U1	0.9	0.10 J1	0.06 J1
10/18/2023	Assessment	0.105	2.21	42.8	< 0.007 U1	< 0.004 U1	0.37	0.235	3.66	0.22	< 0.05 U1	0.00922	< 0.002 U1	1	0.07 J1	0.05 J1
3/13/2024	Assessment	0.244	8.02	52.2	0.009 P2, J1	0.034	0.71	1.28	3.29	0.23	0.23	0.00764 P2	< 0.002 U1	0.9	0.05 J1	0.07 J1
5/08/2024	Assessment	0.090 J1	3.05	56.0	< 0.007 U1	0.006 J1	0.78	0.395	3.31	0.21	0.32	0.00810	< 0.002 U1	0.8	< 0.04 U1	0.06 J1
9/24/2024	Assessment	0.148	2.24	40.6	< 0.007 U1	0.006 J1	0.27 J1	0.140	3.29	0.28	< 0.05 U1	0.00983	< 0.002 U1	1.1	0.13 J1	0.08 J1
3/26/2025	Assessment	0.113	3.10	45.9	< 0.007 U1	0.005 J1	0.38	0.247	1.88	0.25	< 0.05 U1	0.00929	< 0.002 U1	1.0	< 0.04 U1	0.07 J1
6/10/2025	Assessment	0.152	2.86	42.0	< 0.007 U1	0.008 J1	0.43	0.156	2.56	0.30	0.11 J1	0.00881	< 0.002 U1	0.9	0.06 J1	0.06 J1
10/14/2025	Assessment	0.06 J1	2.94	46.3	< 0.02 U1	0.007 J1	0.67	0.40	1.86	0.19	0.15 J1	0.00774	< 0.002 U1	0.82	< 0.04 U1	0.05 J1

Table 1. Groundwater Data Summary: MW-1012
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.176	1.48	1.19	0.71	8.9	35.2	547
11/09/2016	Background	0.159	1.21	1.15	0.70	9.1	35.6	535
1/12/2017	Background	0.182	1.19	1.24	0.73	9.1	40.1	553
2/22/2017	Background	0.171	1.45	1.14	0.68	9.4	36.8	554
4/26/2017	Background	0.183	1.20	1.17	0.71	8.7	37.4	546
5/24/2017	Background	0.244	1.20	1.24	0.71	8.8	36.8	540
6/22/2017	Background	0.174	1.07	1.14	0.64	8.9	38.1	547
7/13/2017	Background	0.172	1.16	1.12	0.66	9.0	38.0	558
9/19/2017	Detection	0.205	1.11	1.10	0.67	9.1	38.5	546
4/26/2018	Assessment	0.227	1.13	1.34	0.82	9.0	36.6	541
9/20/2018	Assessment	0.236	1.11	1.27	0.75	9.1	36.6	561
3/13/2019	Assessment	0.189	1.15	1.26	0.73	8.8	35.6	572
6/25/2019	Assessment	0.169	1.10	1.19	0.74	9.3	35.9	559
8/21/2019	Assessment	0.176	1.38	1.26	0.79	9.4	36.8	583
3/18/2020	Assessment	--	--	--	0.76	10.9	--	--
6/30/2020	Assessment	0.181	1.72	5.21	0.72	9.2	36.7	--
8/27/2020	Assessment	--	--	--	--	9.3	--	582
10/06/2020	Assessment	0.175	1.37	1.32	0.68	9.2	37.0	577
3/10/2021	Assessment	--	--	--	0.85	9.0	--	--
6/09/2021	Assessment	0.174	1.2	1.32	0.80	9.3	35.4	550
10/06/2021	Assessment	0.192	1.2	1.40	0.80	9.2	33.5	570
3/24/2022	Assessment	--	--	--	0.82	8.7	--	--
6/15/2022	Assessment	0.237	1.46	1.41	0.77	10.3	38.6	570
10/12/2022	Assessment	0.196	1.53	1.35	0.76	8.7	38.7	550
3/15/2023	Assessment	--	--	--	0.90	9.1	--	--
6/14/2023	Assessment	0.171	1.41	2.05	0.90	9.0	49.4	580
10/18/2023	Assessment	0.194	1.58	1.66	0.85	9.1	47.4	590
3/14/2024	Assessment	--	--	--	0.90	9.0	--	--
5/09/2024	Assessment	0.196	1.92	--	0.91	8.4	--	--
8/07/2024	Assessment	--	--	1.87	--	--	53.0	630
9/24/2024	Assessment	0.175	1.90	1.71	0.85	9.1	51.4	610
3/26/2025	Assessment	--	--	--	1.00	8.6	--	--
6/10/2025	Assessment	0.171	1.30	1.64	0.92	8.9	48.4	600
10/15/2025	Assessment	0.179	1.42	1.33	0.86	8.6	39.4	--
12/02/2025	Assessment	--	--	--	--	9.2	--	550

Table 1. Groundwater Data Summary: MW-1012
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.79	24.0	37.6	0.044	0.05	1.1	0.346	1.592	0.71	1.84	0.006	< 0.002 U1	3.25	0.2	0.03 J1
11/09/2016	Background	1.20	28.9	24.4	0.027	0.04	0.903	0.113	0.548	0.70	0.872	0.014	0.002 J1	1.68	0.05 J1	0.02 J1
1/12/2017	Background	0.79	24.7	23.8	0.01 J1	0.04	0.395	0.066	0.542	0.73	0.439	0.008	< 0.002 U1	1.12	0.04 J1	0.02 J1
2/22/2017	Background	0.99	28.8	29.5	0.026	0.14	0.578	0.184	0.452	0.68	1.17	0.009	0.002 J1	1.52	0.07 J1	0.04 J1
4/26/2017	Background	0.89	22.9	29.9	0.025	0.02	0.512	0.131	0.148	0.71	0.632	0.004	0.003 J1	1.25	0.04 J1	0.02 J1
5/24/2017	Background	0.97	23.2	23.7	0.01 J1	0.01 J1	7.84	0.078	1.72	0.71	0.334	< 0.0002 U1	0.004 J1	1.41	0.07 J1	0.01 J1
6/22/2017	Background	0.91	21.6	21.1	0.008 J1	0.007 J1	0.293	0.046	0.3575	0.64	0.261	0.018	< 0.002 U1	1.18	0.04 J1	0.02 J1
7/13/2017	Background	0.96	22.1	25.7	0.022	0.008 J1	0.449	0.102	1.301	0.66	0.546	0.004	< 0.002 U1	1.43	0.09 J1	0.02 J1
4/26/2018	Assessment	0.65	15.8	24.1	0.01 J1	0.006 J1	0.262	0.062	1.135	0.82	0.287	0.006	0.003 J1	0.89	0.05 J1	0.02 J1
9/20/2018	Assessment	0.62	14.0	24.2	0.02	< 0.01 U1	0.442	0.079	0.291	0.75	0.346	< 0.009 U1	0.013	0.8	0.08 J1	< 0.1 U1
3/13/2019	Assessment	0.60	15.2	27.2	0.03 J1	< 0.01 U1	0.459	0.106	0.3959	0.73	0.354	0.01 J1	< 0.004 U1	0.9 J1	0.09 J1	< 0.1 U1
6/25/2019	Assessment	0.67	13.4	28.0	0.03 J1	< 0.01 U1	0.252	0.097	0.506	0.74	0.352	< 0.009 U1	< 0.002 U1	0.8 J1	0.08 J1	< 0.1 U1
8/21/2019	Assessment	0.77	19.0	41.9	0.06 J1	< 0.01 U1	0.625	0.260	0.354	0.79	0.924	0.00536	< 0.002 U1	1 J1	0.3	< 0.1 U1
3/18/2020	Assessment	0.60	19.6	61.7	0.130	0.01 J1	0.850	0.519	3.47	0.76	1.97	0.00588	0.002 J1	1 J1	0.3	< 0.1 U1
6/30/2020	Assessment	0.58	19.1	68.2	0.116	0.01 J1	0.912	0.527	2.62	0.72	1.86	0.00593	0.002 J1	1 J1	0.4	< 0.1 U1
10/06/2020	Assessment	0.89	23.0	34.7	0.06 J1	0.02 J1	0.468	0.229	1.04	0.68	0.851	0.00531	< 0.002 U1	1 J1	0.2 J1	< 0.1 U1
3/10/2021	Assessment	0.76	21.2	30.5	0.03 J1	0.01 J1	0.489	0.159	0.815	0.85	0.629	0.00552	0.002 J1	2.87	0.1 J1	< 0.04 U1
6/09/2021	Assessment	0.74	18.6	30.6	0.024 J1	0.014 J1	0.44	0.117	0.58	0.80	0.47	0.00540	< 0.002 U1	1.6	< 0.09 U1	< 0.04 U1
10/06/2021	Assessment	0.77	17.8	30.5	0.026 J1	0.010 J1	0.25	0.113	0.98	0.80	0.48	0.00564	< 0.002 U1	1.8	< 0.09 U1	0.05 J1
3/24/2022	Assessment	1.52	49.9	32.6	0.018 J1	0.012 J1	0.24	0.124	1.31	0.82	0.41	0.00552	< 0.002 U1	5.5	< 0.09 U1	< 0.04 U1
6/15/2022	Assessment	1.14	45.4	28.2	0.013 J1	0.012 J1	0.52	0.084	0.50	0.77	2.4	0.00493	< 0.002 U1	4.0	0.12 J1	0.05 J1
10/12/2022	Assessment	1.08	38.6	31.2	0.016 J1	0.018 J1	0.43	0.102	2.37	0.76	0.54	0.00534	< 0.002 U1	2.9	< 0.09 U1	< 0.04 U1
3/15/2023	Assessment	3.08	94.2	32.5	0.014 J1	0.008 J1	0.35	0.121	1.16	0.90	0.43	0.00637	< 0.002 U1	8.6	< 0.09 U1	< 0.04 U1
6/14/2023	Assessment	3.18	118	29.9	0.011 J1	0.008 J1	0.39	0.090	0.79	0.90	0.31	0.00546	< 0.002 U1	9.1	0.07 J1	0.02 J1
10/18/2023	Assessment	3.07	107	32.1	0.013 J1	0.006 J1	0.48	0.086	0.47	0.85	0.40	0.00612	< 0.002 U1	8.4	< 0.04 U1	< 0.02 U1
3/14/2024	Assessment	8.54	229	31.8	< 0.007 P2, U1	< 0.004 U1	0.28 J1	0.026	0.81	0.90	0.06 J1	0.00687 P2	< 0.002 U1	13.4	< 0.04 U1	0.03 J1
5/09/2024	Assessment	5.01	208	60.9	0.061	0.051	1.18	0.382	1.67	0.91	1.76	0.00698	0.006	23.0	0.25 J1	0.04 J1
9/24/2024	Assessment	4.12	182	51.7	0.047 J1	0.052	0.81	0.327	1.78	0.85	1.77	0.00639	0.092	13.6	0.22 J1	0.05 J1
3/26/2025	Assessment	4.95	209	31.6	0.015 J1	0.009 J1	0.53	0.114	0.15	1.00	0.43	0.00722	0.006	20.4	< 0.04 U1	0.02 J1
6/10/2025	Assessment	2.83	155	27.1	0.011 J1	0.013 J1	0.61	0.068	0.38	0.92	0.35	0.00552	0.005	10.5	0.06 J1	0.03 J1
10/15/2025	Assessment	1.81	112 M1	26.2 M1	< 0.02 U1	0.009 J1	0.63	0.05	2.50	0.86	0.33	0.00552	< 0.002 U1	5.25 M1	< 0.04 U1	0.03 J1

Table 1. Groundwater Data Summary: MW-1203
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/26/2016	Background	0.097	60.5	5.72	0.15	7.8	28.4	261
11/09/2016	Background	0.088	56.8	5.35	0.13	6.9	26.5	273
1/12/2017	Background	0.110	59.9	5.69	0.13	7.0	33.4	278
2/21/2017	Background	0.092	55.8	5.23	0.12	7.0	30.2	248
4/26/2017	Background	0.122	55.6	5.18	0.12	6.6	29.0	265
5/23/2017	Background	0.160	55.6	5.08	0.12	6.5	29.6	279
6/21/2017	Background	0.137	62.3	4.74	0.11	6.7	28.0	264
7/13/2017	Background	0.089	56.7	5.05	0.10	6.7	33.0	261
9/18/2017	Detection	0.116	57.0	4.92	0.13	6.8	29.3	255
4/26/2018	Assessment	0.147	57.4	5.66	0.14	6.0	37.5	253
9/20/2018	Assessment	0.125	53.4	5.37	0.12	6.7	32.3	253
3/14/2019	Assessment	0.09 J1	54.9	5.53	0.11	6.2	38.7	259
6/27/2019	Assessment	0.1 J1	54.3	5.28	0.12	6.8	39.0	273
8/21/2019	Assessment	0.097	60.8	5.14	0.13	7.0	32.4	283
3/17/2020	Assessment	--	--	--	0.12	7.4	--	--
6/30/2020	Assessment	0.104	64.9	5.17	0.12	6.7	30.6	--
8/27/2020	Assessment	--	--	--	--	6.9	--	263
10/05/2020	Assessment	0.100	64.2	5.24	0.14	7.1	30.4	266
3/09/2021	Assessment	--	--	--	0.15	6.7	--	--
6/09/2021	Assessment	0.096	57.8	5.32	0.15	6.6	29.4	260
10/06/2021	Assessment	0.099	59.1	5.13	0.14	6.9	27.8	270
3/23/2022	Assessment	0.098	60.2	5.40	0.12	8.9	42.9	260
6/13/2022	Assessment	0.10	59.4	4.95	0.13	7.6	28.4	290 S7
10/10/2022	Assessment	0.099	59.4	4.91	0.12	6.0	28.7	260
3/13/2023	Assessment	--	--	--	0.11	6.7	--	--
6/13/2023	Assessment	0.091	57.3	5.07	0.13	7.0	28.6	270 P2
10/18/2023	Assessment	0.103	61.0	4.86	0.14	7.0	26.6	260
3/13/2024	Assessment	--	--	--	0.11	7.2	--	--
5/08/2024	Assessment	0.091	56.2	--	0.12	6.5	--	--
8/06/2024	Assessment	--	--	4.98	--	--	27.9	280
9/24/2024	Assessment	0.101	61.3	4.97	0.13	6.8	27.5	270
3/26/2025	Assessment	--	--	--	0.15	6.4	--	--
6/10/2025	Assessment	0.261	62.3	5.08	0.14	7.1	42.1	280
10/15/2025	Assessment	0.104	59.8	4.93	0.13	6.7	29.6	--
12/02/2025	Assessment	--	--	--	--	6.9	--	260

Table 1. Groundwater Data Summary: MW-1203
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/26/2016	Background	0.02 J1	0.26	95.3	0.022	< 0.004 U1	0.4	1.04	1.334	0.15	0.103	0.011	< 0.002 U1	0.21	0.04 J1	0.01 J1
11/09/2016	Background	0.03 J1	0.43	110	0.126	0.009 J1	1.50	1.04	1.473	0.13	1.28	0.017	< 0.002 U1	0.28	0.2	0.02 J1
1/12/2017	Background	0.03 J1	0.42	102	0.089	< 0.004 U1	0.718	1.15	1.657	0.13	0.748	0.014	< 0.002 U1	0.15	0.2	0.03 J1
2/21/2017	Background	0.02 J1	0.39	94.8	0.077	< 0.004 U1	0.365	0.989	2.509	0.12	0.509	0.017	< 0.002 U1	0.20	0.1	0.063
4/26/2017	Background	0.03 J1	0.45	113	0.099	< 0.005 U1	0.648	1.05	1.293	0.12	0.697	0.009	< 0.002 U1	0.20	0.2	0.02 J1
5/23/2017	Background	0.05 J1	0.61	99.9	0.149	< 0.005 U1	0.960	1.07	3.44	0.12	1.22	0.020	0.002 J1	0.15	0.3	0.02 J1
6/21/2017	Background	0.04 J1	0.63	101	0.116	< 0.005 U1	0.422	0.994	3.224	0.11	0.793	0.020	< 0.002 U1	0.62	0.3	0.03 J1
7/13/2017	Background	0.02 J1	0.44	93.8	0.062	< 0.005 U1	0.377	1.16	1.707	0.10	0.312	0.011	< 0.002 U1	0.59	0.05 J1	0.01 J1
4/26/2018	Assessment	0.03 J1	0.30	89.1	0.033	< 0.005 U1	0.171	0.886	2.476	0.14	0.034	0.013	< 0.002 U1	0.12	< 0.03 U1	0.03 J1
9/20/2018	Assessment	0.03 J1	0.51	90.1	0.08	< 0.01 U1	0.240	0.916	1.252	0.12	0.05	0.01	--	< 0.4 U1	< 0.03 U1	< 0.1 U1
10/22/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/14/2019	Assessment	0.03 J1	0.23	88.0	0.02 J1	< 0.01 U1	0.391	0.953	1.399	0.11	0.124	< 0.009 U1	< 0.004 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
6/27/2019	Assessment	< 0.02 U1	0.34	86.8	0.06 J1	< 0.01 U1	0.1 J1	0.909	1.341	0.12	0.1 J1	0.01 J1	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
8/21/2019	Assessment	< 0.02 U1	0.27	95.4	0.04 J1	< 0.01 U1	0.304	0.774	1.471	0.13	0.06 J1	0.0118	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
3/17/2020	Assessment	0.02 J1	0.35	91.0	0.06 J1	< 0.01 U1	0.265	0.859	7.524	0.12	0.08 J1	0.0130	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
6/30/2020	Assessment	0.02 J1	0.47	101	0.08 J1	< 0.01 U1	0.1 J1	0.547	2.29	0.12	0.1 J1	0.0121	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
10/05/2020	Assessment	0.02 J1	0.59	94.6	0.08 J1	< 0.01 U1	0.2 J1	0.672	1.539	0.14	0.212	0.0114	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
3/09/2021	Assessment	< 0.02 U1	0.39	93.9	0.05 J1	< 0.004 U1	0.390	0.849	1.287	0.15	0.2 J1	0.0120	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
6/09/2021	Assessment	0.03 J1	0.22	89.5	0.037 J1	< 0.004 U1	0.11 J1	0.603	1.98	0.15	0.06 J1	0.0109	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
10/06/2021	Assessment	0.02 J1	0.23	92.7	0.041 J1	< 0.004 U1	0.11 J1	0.677	2.10	0.14	0.08 J1	0.0122	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
3/23/2022	Assessment	< 0.02 U1	0.24	89.4	0.041 J1	< 0.004 U1	0.13 J1	0.885	3.33	0.12	0.05 J1	0.0137	< 0.002 U1	0.1 J1	< 0.09 U1	< 0.04 U1
6/13/2022	Assessment	0.03 J1	0.32	96.8	0.090	< 0.004 U1	0.09 J1	0.577	1.63	0.13	0.11 J1	0.0132	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
10/10/2022	Assessment	0.04 J1	0.58	99.6	0.171	< 0.004 U1	0.31	0.651	1.27	0.12	0.09 J1	0.0127	< 0.004 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
3/13/2023	Assessment	0.03 J1	0.39	85.5	0.085	< 0.004 U1	0.25	0.838	2.35	0.11	0.16 J1	0.0112	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
6/13/2023	Assessment	0.023 J1	0.30	92.6	0.053	< 0.004 U1	0.29 J1	0.548	1.62	0.13	0.07 J1	0.0105	< 0.002 U1	< 0.1 U1	< 0.04 U1	< 0.02 U1
10/18/2023	Assessment	0.032 J1	0.35	98.4	0.109	< 0.004 U1	0.30	0.603	1.42	0.14	0.07 J1	0.0123	< 0.002 U1	0.1 J1	< 0.04 U1	0.04 J1
3/13/2024	Assessment	0.042 J1	0.68	94.6	0.168 P2	< 0.004 U1	0.45	0.929	2.15	0.11	0.15 J1	0.0122 P2	< 0.002 U1	0.1 J1	< 0.04 U1	< 0.02 U1
5/08/2024	Assessment	0.037 J1	0.39	89.0	0.073	< 0.004 U1	0.60	0.769	1.87	0.12	0.18 J1	0.0115	< 0.002 U1	0.1 J1	< 0.04 U1	< 0.02 U1
9/24/2024	Assessment	0.015 J1	0.24	97.0	0.048 J1	< 0.004 U1	0.22 J1	0.641	1.78	0.13	0.10 J1	0.0116	< 0.002 U1	0.1 J1	< 0.04 U1	< 0.02 U1
3/26/2025	Assessment	0.018 J1	0.35	89.2	0.052	< 0.004 U1	0.32	0.754	0.51	0.15	0.07 J1	0.0131	< 0.002 U1	0.1 J1	< 0.04 U1	< 0.02 U1
6/10/2025	Assessment	0.030 J1	0.54	102	0.099	0.007 J1	2.28	0.933	1.90	0.14	3.16	0.0126	< 0.002 U1	< 0.1 U1	0.10 J1	< 0.02 U1
10/15/2025	Assessment	0.02 J1	0.36	94.2	0.05	< 0.004 U1	0.50	0.68	3.25	0.13	0.14 J1	0.0116	< 0.002 U1	0.10 J1	< 0.04 U1	< 0.02 U1

Table 1. Groundwater Data Summary: MW-1601
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.317	63.0	25.6	0.32	7.6	122	448
11/09/2016	Background	0.263	55.7	31.2	0.33	7.3	120	438
1/12/2017	Background	0.283	63.5	25.0	0.32	7.5	128	474
2/22/2017	Background	0.241	61.0	23.9	0.29	7.4	111	430
4/26/2017	Background	0.216	50.9	23.8	0.33	6.9	97.4	372
5/24/2017	Background	0.240	55.9	21.5	0.29	7.0	91.7	370
6/22/2017	Background	0.196	47.5	21.0	0.27	7.3	90.6	367
7/13/2017	Background	0.175	51.3	17.4	0.27	7.1	84.6	364
9/18/2017	Detection	0.183	51.5	15.8	0.29	7.2	82.7	362
1/31/2018	Detection	--	--	15.4	--	7.5	84.4	--
4/25/2018	Assessment	0.177	50.4	15.2	0.36	6.9	72.6	326
9/20/2018	Assessment	0.196	68.8	16.1	0.22	7.1	167	448
3/12/2019	Assessment	0.117	54.3	9.09	0.18	6.3	88.5	316
6/25/2019	Assessment	0.1 J1	50.7	8.23	0.15	7.0	86.4	312
8/21/2019	Assessment	0.097	52.1	8.43	0.15	7.1	82.9	326
3/18/2020	Assessment	--	--	--	0.17	8.3	--	--
3/09/2021	Assessment	--	--	--	0.18	6.8	--	--
6/09/2021	Assessment	0.109	62.5	6.58	0.18	6.8	98.0	340
10/06/2021	Assessment	0.069	59.7	3.00	0.24	7.1	105	360
3/22/2022	Assessment	--	--	--	0.16	7.9	--	--
6/15/2022	Assessment	0.119	70.2	3.95	0.17	8.3	96.0	340
10/10/2022	Assessment	0.067	59.0	3.19	0.18	6.9	110	350
3/15/2023	Assessment	--	--	--	0.13	6.8	--	--
6/13/2023	Assessment	0.077	54.4	4.54	0.13	6.8	104	340 P2
3/14/2024	Assessment	--	--	--	0.13	7.3	--	--
5/09/2024	Assessment	0.097	68.4	--	0.13	6.7	--	--
8/07/2024	Assessment	--	--	3.59	--	--	109	350
9/24/2024	Assessment	--	--	--	--	7.0	--	--
3/26/2025	Assessment	--	--	--	0.16	6.7	--	--
6/10/2025	Assessment	0.082	64.2	3.61	0.15	6.9	93.9	350 S7
12/02/2025	Assessment	< 0.06 U1	14.9	3.86	0.16	7.1	107	360 S7

Table 1. Groundwater Data Summary: MW-1601
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.13	5.03	81.7	0.026	0.009 J1	0.7	1.96	1.22	0.32	0.143	0.040	< 0.002 U1	27.7	0.2	0.124
11/09/2016	Background	0.08	5.49	85.4	0.01 J1	0.01 J1	0.863	1.46	2.335	0.33	0.321	0.035	< 0.002 U1	20.5	0.2	0.02 J1
1/12/2017	Background	0.05 J1	5.24	79.1	0.009 J1	0.01 J1	0.390	1.78	1.695	0.32	0.050	0.038	< 0.002 U1	37.5	0.08 J1	0.03 J1
2/22/2017	Background	0.08	5.15	74.0	0.009 J1	0.006 J1	0.380	1.54	1.603	0.29	0.044	0.037	< 0.002 U1	31.5	0.1	0.02 J1
4/26/2017	Background	0.17	5.48	80.4	0.009 J1	0.006 J1	0.411	1.23	1.300	0.33	0.034	0.025	< 0.002 U1	27.3	0.2	0.02 J1
5/24/2017	Background	0.09	4.30	68.1	0.007 J1	0.006 J1	0.807	0.941	1.317	0.29	0.037	0.026	< 0.002 U1	27.0	0.09 J1	0.01 J1
6/22/2017	Background	0.08	4.19	60.1	< 0.004 U1	< 0.005 U1	0.247	0.926	0.802	0.27	0.02 J1	0.037	< 0.002 U1	27.1	0.07 J1	0.01 J1
7/13/2017	Background	0.11	5.18	64.5	0.009 J1	0.008 J1	0.300	1.02	1.077	0.27	0.081	0.023	< 0.002 U1	28.3	0.07 J1	0.01 J1
4/25/2018	Assessment	0.17	4.58	56.4	0.005 J1	< 0.005 U1	0.245	0.794	2.783	0.36	0.024	0.033	< 0.002 U1	20.6	0.1	0.02 J1
9/20/2018	Assessment	0.29	3.54	75.9	< 0.02 U1	< 0.01 U1	0.378	1.21	0.698	0.22	0.04	0.031	--	19.6	0.2	< 0.1 U1
10/23/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/12/2019	Assessment	0.20	1.39	49.0	< 0.02 U1	< 0.01 U1	0.438	0.395	0.769	0.18	0.05 J1	0.009 J1	< 0.002 U1	7.00	0.2 J1	< 0.1 U1
6/25/2019	Assessment	0.17	1.04	55.5	< 0.02 U1	< 0.01 U1	0.2 J1	0.629	0.689	0.15	< 0.02 U1	< 0.009 U1	< 0.002 U1	4.89	0.2	< 0.1 U1
8/21/2019	Assessment	0.09 J1	1.58	56.6	< 0.02 U1	0.02 J1	0.351	0.831	0.855	0.15	< 0.05 U1	0.0172	< 0.002 U1	5.64	0.09 J1	< 0.1 U1
3/18/2020	Assessment	0.59	0.63	62.9	< 0.02 U1	0.01 J1	0.298	0.152	1.250	0.17	0.07 J1	0.0302	< 0.002 U1	15.6	0.5	< 0.1 U1
3/09/2021	Assessment	0.61	0.76	44.7	0.02 J1	0.02 J1	0.768	0.329	1.227	0.18	0.2 J1	0.0206	< 0.002 U1	10.0	1.0	< 0.04 U1
6/09/2021	Assessment	0.61	0.41	41.6	< 0.007 U1	0.022	0.33	0.195	0.87	0.18	0.06 J1	0.0229	< 0.002 U1	12.1	0.54	< 0.04 U1
10/06/2021	Assessment	0.92	0.53	41.4	< 0.007 U1	0.022	0.49	0.051	1.70	0.24	0.10 J1	0.0132	< 0.002 U1	4.3	0.37 J1	< 0.04 U1
3/22/2022	Assessment	0.49	0.31	39.2	< 0.007 U1	0.015 J1	0.30	0.046	2.19	0.16	< 0.05 U1	0.0205	< 0.002 U1	8.6	0.64	0.06 J1
6/15/2022	Assessment	0.54	0.40	41.3	0.01 J1	0.023	0.85	0.069	2.52	0.17	0.9 J1	0.0171	< 0.002 U1	7.7	0.52	0.04 J1
10/10/2022	Assessment	0.50	0.40	36.9	< 0.007 U1	0.009 J1	0.60	0.073	0.74	0.18	0.19 J1	0.0150	< 0.004 U1	4.3	0.21 J1	< 0.04 U1
3/15/2023	Assessment	0.47	0.30	40.2	< 0.007 U1	0.015 J1	0.33	0.067	1.00	0.13	0.06 J1	0.0197	< 0.002 U1	7.5	0.58	< 0.04 U1
6/13/2023	Assessment	0.439	0.47	35.9	0.020 J1	0.019 J1	0.60	0.272	0.46	0.13	0.25	0.0165	< 0.002 U1	6.7	0.49 J1	0.03 J1
3/14/2024	Assessment	0.416	0.32	39.0	< 0.007 P2, U1	0.064	0.84	0.045	1.11	0.13	0.43	0.0179 P2	< 0.002 U1	6.0	0.79	0.02 J1
5/09/2024	Assessment	0.459	0.47	41.5	0.018 J1	0.023	0.77	0.372	1.47	0.13	0.24	0.0183	< 0.002 U1	7.4	0.60	< 0.02 U1
3/26/2025	Assessment	0.384	0.23	35.6	< 0.007 U1	0.015 J1	0.50	0.055	1.01	0.16	< 0.05 U1	0.0183	< 0.002 U1	5.5	0.48 J1	0.02 J1
6/10/2025	Assessment	0.406	0.21	37.3	0.007 J1	0.012 J1	0.45	0.056	0.62	0.15	0.08 J1	0.0165	< 0.002 U1	6.1	0.50	0.02 J1
12/02/2025	Assessment	0.37	0.26	37.4	< 0.02 U1	< 0.04 U1	0.53	0.02 J1	1.09	0.16	0.07 J1	0.0038	< 0.002 U1	4.80	1.1 J1	0.02 J1

Table 1. Groundwater Data Summary: MW-1602
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.054	72.5	10.6	0.19	7.7	106	400
11/09/2016	Background	0.037	63.1	8.77	0.18	7.5	86.1	360
1/12/2017	Background	0.039	65.4	7.20	0.17	7.8	81.6	362
2/22/2017	Background	0.041	69.4	8.13	0.14	7.7	96.3	399
4/26/2017	Background	0.052	73.8	7.74	0.13	6.8	83.6	382
5/24/2017	Background	0.074	74.7	9.90	0.12	6.9	103	394
6/21/2017	Background	--	--	--	--	7.5	--	--
6/22/2017	Background	0.062	70.4	10.7	0.11	--	106	416
7/13/2017	Background	0.052	81.9	12.1	0.09 J1	7.0	132	484
10/19/2017	Detection	0.058	72.5	13.0	0.11	7.1	110	434
1/31/2018	Detection	--	--	15.3	--	7.5	128	--
4/26/2018	Assessment	0.143	75.2	13.9	0.14	8.0	106	416
9/20/2018	Assessment	0.070	72.1	15.2	0.11	7.0	150	492
3/13/2019	Assessment	0.07 J1	79.4	12.6	0.10	6.9	133	444
6/25/2019	Assessment	0.06 J1	69.8	12.2	0.11	7.5	111	436
8/20/2019	Assessment	0.04 J1	74.5	13.2	0.10	7.5	117	434
3/18/2020	Assessment	--	--	--	0.09	8.8	--	--
6/30/2020	Assessment	0.05 J1	79.0	17.6	0.09	7.2	--	--
8/26/2020	Assessment	--	--	--	--	4.8	121	454
10/06/2020	Assessment	0.05 J1	82.5	19.2	0.10	7.7	143	479
3/09/2021	Assessment	--	--	--	0.11	7.4	--	--
6/09/2021	Assessment	0.050	83.9	17.1	0.11	7.5	165	500
10/06/2021	Assessment	0.057	86.1	18.3	0.10	7.5	167	510
3/22/2022	Assessment	--	--	--	0.08	8.2	--	--
6/14/2022	Assessment	0.062	91.1	18.9	0.09	7.6	187	550 S7
10/11/2022	Assessment	0.064	82.8	20.2	0.08	7.3	181	540
3/15/2023	Assessment	--	--	--	0.08	7.4	--	--
6/13/2023	Assessment	0.078	92.3	18.3	0.08	7.2	206	610 P2
10/18/2023	Assessment	0.052	92.2	18.5	0.09	7.6	206	570
3/13/2024	Assessment	--	--	--	0.09	7.5	--	--
5/08/2024	Assessment	0.203	114	--	0.08	6.7	--	--
8/07/2024	Assessment	--	--	17.1	--	--	222	640
9/24/2024	Assessment	0.100	99.3	17.0	0.08	7.3	204	610
3/26/2025	Assessment	--	--	--	0.09	7.2	--	--
6/10/2025	Assessment	0.079	98.6	17.4	0.10	7.4	215	630
10/14/2025	Assessment	0.051	103	19.3	0.09	7.4	--	--
12/02/2025	Assessment	--	--	--	--	7.5	204	620 S7

Table 1. Groundwater Data Summary: MW-1602
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.16	0.50	50.7	< 0.005 U1	0.005 J1	0.8	0.060	1.233	0.19	0.067	0.008	0.002 J1	3.41	2.0	0.02 J1
11/09/2016	Background	0.13	0.42	51.1	< 0.005 U1	0.01 J1	0.590	0.028	1.143	0.18	0.059	0.013	0.002 J1	2.63	2.2	0.01 J1
1/12/2017	Background	0.10	0.45	50.2	< 0.005 U1	0.01 J1	0.666	0.043	1.545	0.17	0.030	0.004	< 0.002 U1	2.44	2.2	0.03 J1
2/22/2017	Background	0.09	0.42	48.2	< 0.005 U1	0.009 J1	0.547	0.020	0.712	0.14	0.02 J1	0.008	< 0.002 U1	2.79	2.0	0.02 J1
4/26/2017	Background	0.10	0.47	59.2	< 0.004 U1	0.01 J1	0.692	0.024	0.534	0.13	0.026	0.006	0.002 J1	1.88	2.2	0.03 J1
5/24/2017	Background	0.08	0.37	54.6	< 0.004 U1	0.009 J1	0.703	0.01 J1	1.68	0.12	0.239	0.002	0.004 J1	1.51	1.5	0.02 J1
6/22/2017	Background	0.07	0.50	55.0	< 0.004 U1	0.01 J1	0.566	0.205	0.812	0.11	0.047	0.021	0.002 J1	2.12	1.3	0.02 J1
7/13/2017	Background	0.07	0.71	57.6	< 0.004 U1	< 0.005 U1	0.482	0.850	1.138	0.09 J1	0.031	0.005	0.003 J1	2.29	1.0	0.01 J1
4/26/2018	Assessment	0.05 J1	3.15	60.9	< 0.004 U1	< 0.005 U1	0.290	0.552	1.754	0.14	0.049	0.008	0.003 J1	1.64	0.4	0.01 J1
9/20/2018	Assessment	0.03 J1	3.92	55.1	< 0.02 U1	< 0.01 U1	0.328	0.312	1.044	0.11	0.03	< 0.009 U1	< 0.004 U1	1	0.4	< 0.1 U1
3/13/2019	Assessment	0.06 J1	1.06	52.5	< 0.02 U1	< 0.01 U1	1.03	0.03 J1	0.504	0.10	0.122	0.009 J1	< 0.002 U1	2 J1	1.6	< 0.1 U1
6/25/2019	Assessment	0.07 J1	1.06	52.5	< 0.02 U1	< 0.01 U1	0.632	0.02 J1	0.5359	0.11	0.05 J1	< 0.009 U1	< 0.002 U1	1 J1	1.4	< 0.1 U1
8/20/2019	Assessment	0.06 J1	1.16	49.3	< 0.02 U1	0.01 J1	1.15	0.080	0.543	0.10	0.1 J1	0.00637	< 0.002 U1	1 J1	1.1	< 0.1 U1
3/18/2020	Assessment	0.06 J1	1.36	55.4	< 0.02 U1	< 0.01 U1	0.511	0.04 J1	1.517	0.09	0.08 J1	0.00736	< 0.002 U1	1 J1	1.1	< 0.1 U1
6/30/2020	Assessment	0.04 J1	1.59	55.9	< 0.02 U1	< 0.01 U1	0.679	0.04 J1	0.488	0.09	0.07 J1	0.00717	< 0.002 U1	1 J1	1.0	< 0.1 U1
10/06/2020	Assessment	0.04 J1	1.53	52.4	< 0.02 U1	< 0.01 U1	1.05	0.04 J1	2.003	0.10	< 0.05 U1	0.00707	< 0.002 U1	1 J1	1.1	< 0.1 U1
3/09/2021	Assessment	0.06 J1	1.72	56.9	< 0.007 U1	0.006 J1	1.26	0.075	1.018	0.11	0.1 J1	0.00787	< 0.002 U1	1 J1	2.0	< 0.04 U1
6/09/2021	Assessment	0.06 J1	0.92	53.2	< 0.007 U1	< 0.004 U1	0.62	0.014 J1	2.31	0.11	< 0.05 U1	0.00629	< 0.002 U1	1.2	2.57	< 0.04 U1
10/06/2021	Assessment	0.08 J1	0.99	61.9	< 0.007 U1	< 0.004 U1	0.59	0.009 J1	0.95	0.10	0.11 J1	0.00815	< 0.002 U1	1.3	3.19	< 0.04 U1
3/22/2022	Assessment	0.15	0.66	62.0	< 0.007 U1	0.005 J1	0.53	0.014 J1	2.25	0.08	< 0.05 U1	0.0106	0.002 J1	1	1.88	< 0.04 U1
6/14/2022	Assessment	0.18	0.91	61.9	< 0.007 U1	< 0.004 U1	0.47	0.019 J1	0.82	0.09	< 0.05 U1	0.00760	< 0.002 U1	1.1	4.10	0.05 J1
10/11/2022	Assessment	0.22	0.93	64.3	< 0.007 U1	0.007 J1	0.56	0.038	1.27	0.08	0.06 J1	0.00944	< 0.004 U1	1.1	3.37	< 0.04 U1
3/15/2023	Assessment	0.14	0.88	68.4	< 0.007 U1	0.004 J1	0.65	0.026	0.78	0.08	< 0.05 U1	0.0103	< 0.002 U1	1	2.94	< 0.04 U1
6/13/2023	Assessment	0.180	1.31	66.6	< 0.007 U1	0.017 J1	0.72	0.127	0.79	0.08	0.21	0.00862	< 0.002 U1	0.9	2.62	< 0.02 U1
10/18/2023	Assessment	0.085 J1	0.81	68.8	< 0.007 U1	0.005 J1	0.73	0.018 J1	0.82	0.09	< 0.05 U1	0.00910	< 0.002 U1	0.8	3.51	< 0.02 U1
3/13/2024	Assessment	0.059 J1	0.59	64.2	< 0.007 P2, U1	0.005 J1	0.66	0.013 J1	1.45	0.09	< 0.05 U1	0.00954 P2	< 0.002 U1	0.8	1.74	< 0.02 U1
5/08/2024	Assessment	0.057 J1	0.47	64.1	< 0.007 M1, U1	0.014 J1	0.85	0.025	1.48	0.08	0.15 J1	0.0123 M1	< 0.002 U1	0.5	0.74	< 0.02 U1
9/24/2024	Assessment	0.060 J1	0.70	73.1	< 0.007 U1	0.012 J1	0.50	0.014 J1	1.37	0.08	0.17 J1	0.0103	< 0.002 U1	0.8	3.01	< 0.02 U1
3/26/2025	Assessment	0.054 J1	0.55	63.6	< 0.007 U1	0.016 J1	0.59	0.025	0.44	0.09	< 0.05 U1	0.0129	< 0.002 U1	0.7	1.04	< 0.02 U1
6/10/2025	Assessment	0.064 J1	0.70	69.9	< 0.007 U1	0.005 J1	0.84	0.014 J1	1.81	0.10	< 0.05 U1	0.00958	< 0.002 U1	0.8	2.27	< 0.02 U1
10/14/2025	Assessment	0.07 J1	0.80	72.1	< 0.02 U1	0.011 J1	0.92	0.03	1.05	0.09	0.15 J1	0.00834	< 0.002 U1	0.87	2.57	0.03 J1

Table 1. Groundwater Data Summary: MW-1603
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/26/2016	Background	0.054	105	3.37	1.24	4.3	801	1060
11/09/2016	Background	0.053	94.7	3.22	1.10	5.6	733	1010
1/12/2017	Background	0.037	92.7	3.45	1.11	3.6	636	948
2/21/2017	Background	0.085	91.9	2.93	0.90	4.5	720	1020
4/26/2017	Background	0.052	90.5	3.28	1.04	3.3	678	994
5/24/2017	Background	0.096	93.9	3.34	0.98	3.3	646	936
6/22/2017	Background	0.051	90.6	3.10	0.98	3.0	873	1040
7/13/2017	Background	0.039	90.2	3.32	0.93	3.2	694	1000
10/19/2017	Detection	< 0.002 U1	91.0	3.24	0.93	3.5	784	962
1/31/2018	Detection	--	82.2	--	0.94	3.5	714	915
4/26/2018	Assessment	0.088	83.6	4.12	1.16	2.9	661	926
9/20/2018	Assessment	0.08	97.5	3.92	1.15	3.1	747	974
3/13/2019	Assessment	0.05 J1	84.6	4.42	0.92	3.2	709	896
6/27/2019	Assessment	0.05 J1	83.3	4.13	0.87	3.7	658	954
8/20/2019	Assessment	< 0.1 U1	95.8	3.93	0.84	3.5	704	1010
3/17/2020	Assessment	--	--	--	0.85	3.5	--	--
6/30/2020	Assessment	0.05 J1	96.6	4.18	0.71	3.4	--	--
8/26/2020	Assessment	--	--	--	--	3.3	798	1040
10/06/2020	Assessment	0.05 J1	94.5	4.10	0.47	4.1	794	1020
3/09/2021	Assessment	--	--	--	0.82	3.4	--	--
6/09/2021	Assessment	0.036 J1	79.0	4.16	0.76	3.6	618	880
10/06/2021	Assessment	0.054	93.1	3.93	0.96	3.3	735	1040
3/22/2022	Assessment	--	--	--	0.65	4.9	--	--
6/15/2022	Assessment	0.071	94.4	4.07	0.69	3.1	675	970
10/11/2022	Assessment	0.051	90.3	3.78	1.11	3.7	841	1080
3/15/2023	Assessment	--	--	--	0.73	3.3	--	--
3/17/2023	Assessment	--	--	--	0.71	3.4	--	--
6/14/2023	Assessment	0.033 J1	72.8	4.30	0.71	3.2	665	880

Table 1. Groundwater Data Summary: MW-1603
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/26/2016	Background	0.01 J1	1.51	13.4	18.6	0.84	1.1	101	6.04	1.24	9.75	0.242	< 0.002 U1	0.15	5.4	1.29
11/09/2016	Background	< 0.01 U1	1.19	15.4	18.3	0.93	1.12	94.4	6.6	1.10	8.18	0.237	< 0.002 U1	0.17	4.8	1.55
1/12/2017	Background	< 0.01 U1	1.40	11.4	17.1	0.79	0.731	89.6	5.86	1.11	6.11	0.225	< 0.002 U1	0.06 J1	5.6	1.39
2/21/2017	Background	< 0.01 U1	1.26	10.3	18.9	0.75	0.771	93.2	4.03	0.90	6.30	0.208	< 0.002 U1	0.11	4.9	1.20
4/26/2017	Background	0.01 J1	1.30	12.4	16.7	0.87	0.829	97.1	5.72	1.04	6.41	0.216	0.002 J1	0.18	6.1	1.41
5/24/2017	Background	< 0.01 U1	1.34	11.5	16.4	0.77	0.620	85.3	6.4	0.98	4.96	0.221	< 0.002 U1	0.07 J1	6.3	1.35
6/22/2017	Background	< 0.01 U1	1.29	11.4	16.4	0.86	0.821	92.4	6.00	0.98	6.47	0.263	< 0.002 U1	0.32	6.1	1.43
7/13/2017	Background	< 0.01 U1	0.89	11.3	18.0	0.80	0.485	92.5	6.36	0.93	3.72	0.217	< 0.002 U1	0.22	2.7	1.43
4/26/2018	Assessment	0.04 J1	1.60	10.5	18.7	0.74	0.771	91.1	5.09	1.16	5.27	0.187	< 0.002 U1	0.03 J1	8.1	1.39
9/20/2018	Assessment	< 0.02 U1	1.40	11.4	19.6	0.83	0.713	93.8	6.75	1.15	4.39	0.255	--	< 0.4 U1	6.3	1.70
10/23/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/13/2019	Assessment	< 0.2 U1	1.26	12.0	24.4	0.78	1 J1	87.9	4.80	0.92	4.28	0.209	< 0.002 U1	< 4 U1	4.0	1 J1
6/27/2019	Assessment	< 0.04 U1	1.36	11.0	21.8	0.70	0.618	84.7	7.149	0.87	3.68	0.192	< 0.002 U1	< 0.8 U1	4.9	1.40
8/20/2019	Assessment	< 0.1 U1	1.39	13.6	25.0	0.89	0.8 J1	96.6	10.92	0.84	4.17	0.226	< 0.002 U1	< 2 U1	5.6	2 J1
3/17/2020	Assessment	< 0.02 U1	0.83	9.92	16.4	0.64	0.560	72.0	7.19	0.85	3.95	0.156	< 0.002 U1	< 0.4 U1	4.0	1.34
6/30/2020	Assessment	< 0.04 U1	1.12	12.2	21.1	0.85	0.694	93.2	6.22	0.71	4.67	0.192	< 0.002 U1	< 0.8 U1	6.2	1.57
10/06/2020	Assessment	< 0.02 U1	1.12	14.6	17.5	0.87	0.743	90.5	2.681	0.47	4.85	0.165	< 0.002 U1	< 0.4 U1	5.8	1.82
3/09/2021	Assessment	< 0.02 U1	0.84	10.1	14.0	0.62	0.659	71.4	3.73	0.82	3.37	0.125	0.002 J1	< 0.1 U1	3.9	1.39
6/09/2021	Assessment	0.04 J1	0.69	13.1	13.3	0.709	0.51	76.8	7.18	0.76	3.39	0.135	0.002 J1	< 0.1 U1	3.30	1.62
10/06/2021	Assessment	< 0.02 U1	1.01	17.1	17.4 M1	0.913	0.59	95.1 M1	10.51	0.96	6.10	0.186 M1	0.003 J1	< 0.1 U1	4.26	2.20
3/22/2022	Assessment	< 0.02 U1	0.96	13.3	14.9	0.690	0.36	79.7	17.94	0.65	3.37	0.151	< 0.002 U1	< 0.1 U1	4.01	1.66
6/15/2022	Assessment	< 0.02 U1	1.55	8.77	15.0	0.734	0.78	98.3	6.22	0.69	6.5	0.153	< 0.002 U1	0.2 J1	6.56	1.71
10/11/2022	Assessment	< 0.02 U1	1.40	15.4	19.5	0.869	0.85	95.2	7.47	1.11	6.03	0.196	< 0.004 U1	< 0.1 U1	6.25	2.02
3/15/2023	Assessment	< 0.02 U1	0.94	10.7	15.7	0.743	0.58	79.5	6.21	0.73	4.13	0.167	< 0.002 U1	< 0.1 U1	3.75	1.57
3/17/2023	Assessment	--	--	--	--	--	--	--	--	0.71	--	--	--	--	--	--
6/14/2023	Assessment	0.012 J1	1.12	11.9	12.9	0.714	0.66	73.4	5.74	0.71	3.22	0.135	< 0.002 U1	< 0.1 U1	5.98	1.56

Table 1. Groundwater Data Summary: MW-1604
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.031	6.48	6.20	0.27	7.5	16.6	182
11/08/2016	Background	0.030	4.26	6.22	0.29	3.4	9.1	180
1/11/2017	Background	0.016	3.27	4.07	0.23	6.2	5.9	186
2/21/2017	Background	0.040	3.21	2.60	0.12	6.5	5.7	102
4/25/2017	Background	0.010	3.15	1.71	0.08	5.9	8.6	78
5/23/2017	Background	0.038	2.93	1.56	0.06	5.8	8.2	68
6/21/2017	Background	0.017	2.88	1.41	0.03 J1	5.6	10.5	49
7/12/2017	Background	0.054	3.06	1.84	0.06	5.5	9.8	85
9/18/2017	Detection	0.034	2.81	2.22	0.12	6.5	4.0	124
4/25/2018	Assessment	0.052	2.96	1.58	0.06	5.4	8.4	52
9/18/2018	Assessment	0.056	2.69	1.43	0.06 J1	6.1	7.8	62
3/12/2019	Assessment	0.02 J1	3.55	1.34	0.04 J1	5.2	10.0	46
6/25/2019	Assessment	0.02 J1	2.97	1.21	0.05 J1	6.0	9.5	50
8/20/2019	Assessment	< 0.02 U1	3.42	1.17	0.03 J1	5.4	10.5	50 J1
3/17/2020	Assessment	--	--	--	0.03 J1	5.8	--	--
6/29/2020	Assessment	< 0.02 U1	3.56	1.03	< 0.01 U1	5.2	11.1	--
8/27/2020	Assessment	--	--	--	--	5.7	--	63
10/05/2020	Assessment	< 0.02 U1	3.31	1.09	0.03 J1	6.8	10.3	50 J1
3/10/2021	Assessment	--	--	--	0.03 J1	5.1	--	--
6/08/2021	Assessment	0.018 J1	3.4	1.15	0.03 J1	5.7	10.4	60
10/05/2021	Assessment	0.016 J1	3.2	1.11	0.03 J1	5.7	9.42	60
3/24/2022	Assessment	--	--	--	< 0.02 U1	7.0	--	--
6/14/2022	Assessment	0.017 J1	3.28	1.05	0.02 J1	5.0	10.4	50
10/11/2022	Assessment	0.012 J1	2.97	1.06	0.02 J1	5.6	10.0	60
3/14/2023	Assessment	--	--	--	0.02 J1	6.1	--	--
6/12/2023	Assessment	0.011 J1	2.44	1.30	< 0.02 U1	6.3	8.2	30 P2, J1
10/17/2023	Assessment	0.012 J1	2.03	1.33	0.03 J1	5.8	6.2	36 J1
3/12/2024	Assessment	--	--	--	0.04 J1	6.1	--	--
5/07/2024	Assessment	0.013 J1	2.11	--	0.03 J1	5.6	--	--
8/06/2024	Assessment	--	--	1.47	--	--	4.7	50
9/24/2024	Assessment	0.008 J1	1.79	1.46	0.02 J1	5.7	3.8	30 J1
3/25/2025	Assessment	--	--	--	0.02 J1	7.0	--	--
6/09/2025	Assessment	0.011 J1	1.88	1.60	< 0.02 U1	5.6	4.2	30 J1
10/15/2025	Assessment	0.008 J1	1.88	1.43	0.02 J1	5.7	3.44	--
12/01/2025	Assessment	--	--	--	--	6.2	--	60

Table 1. Groundwater Data Summary: MW-1604
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.05 J1	2.74	67.1	0.029	0.007 J1	0.6	3.47	1.105	0.27	0.154	0.004	< 0.002 U1	3.48	0.2	0.01 J1
11/08/2016	Background	0.04 J1	3.61	59.0	0.048	0.008 J1	0.583	1.55	1.277	0.29	0.265	0.005	< 0.002 U1	2.34	0.1	< 0.01 U1
1/11/2017	Background	0.08	4.28	54.8	0.027	0.06	0.551	2.02	0.707	0.23	0.188	0.005	< 0.002 U1	2.23	0.2	0.119
2/21/2017	Background	0.02 J1	3.64	52.9	0.028	0.009 J1	0.427	2.78	0.927	0.12	0.103	0.009	< 0.002 U1	1.51	0.1	0.175
4/25/2017	Background	0.03 J1	3.54	65.1	0.034	0.006 J1	0.365	5.59	0.478	0.08	0.01 J1	< 0.0002 U1	< 0.002 U1	0.57	0.08 J1	< 0.01 U1
5/23/2017	Background	0.02 J1	2.24	54.8	0.040	0.03	0.401	4.18	6.707	0.06	0.062	< 0.0002 U1	< 0.002 U1	0.51	0.2	0.01 J1
6/21/2017	Background	0.03 J1	1.28	66.1	0.063	0.05	0.183	5.61	16.848	0.03 J1	0.049	0.002	0.003 J1	0.57	0.2	0.01 J1
7/12/2017	Background	0.04 J1	1.73	59.8	0.041	0.02	0.322	3.67	0.636	0.06	0.097	0.004	< 0.002 U1	15.9	0.1	< 0.01 U1
4/25/2018	Assessment	0.08	0.74	58.9	0.053	0.09	0.285	3.75	0.1535	0.06	0.263	0.010	< 0.002 U1	0.54	0.3	0.04 J1
9/18/2018	Assessment	0.06	1.47	63.5	0.061	0.07	0.388	4.53	0.951	0.06 J1	0.092	0.003	--	0.86	0.2	0.04 J1
10/22/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/12/2019	Assessment	0.03 J1	0.16	66.8	0.06 J1	0.08	0.547	0.844	0.458	0.04 J1	0.04 J1	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
6/25/2019	Assessment	0.03 J1	0.12	68.3	0.07 J1	0.09	0.231	0.503	0.799	0.05 J1	0.03 J1	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
8/20/2019	Assessment	< 0.02 U1	0.09 J1	78.3	0.117	0.08	0.612	0.246	0.641	0.03 J1	< 0.05 U1	0.00104	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
3/17/2020	Assessment	< 0.02 U1	0.05 J1	82.7	0.159	0.08	0.632	0.119	2.93	0.03 J1	< 0.05 U1	0.00113	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
6/29/2020	Assessment	< 0.02 U1	0.05 J1	90.0	0.182	0.09	0.681	0.130	1.121	< 0.01 U1	< 0.05 U1	0.00106	< 0.002 U1	< 0.4 U1	0.5	< 0.1 U1
10/05/2020	Assessment	< 0.02 U1	0.10	75.8	0.149	0.09	0.589	0.289	0.491	0.03 J1	0.2 J1	0.000964	< 0.002 U1	< 0.4 U1	0.4	< 0.1 U1
3/10/2021	Assessment	< 0.02 U1	0.07 J1	75.3	0.129	0.09	0.850	0.148	0.2279	0.03 J1	< 0.05 U1	0.000944	< 0.002 U1	< 0.1 U1	0.4	< 0.04 U1
6/08/2021	Assessment	0.02 J1	0.07 J1	82.3	0.167	0.086	0.77	0.257	1.07	0.03 J1	0.06 J1	0.00095	< 0.002 U1	< 0.1 U1	0.36 J1	< 0.04 U1
10/05/2021	Assessment	< 0.02 U1	0.06 J1	70.2	0.143	0.079	0.61	0.154	1.67	0.03 J1	0.06 J1	0.00101	< 0.002 U1	0.1 J1	0.31 J1	< 0.04 U1
3/24/2022	Assessment	< 0.02 U1	0.05 J1	78.5	0.177	0.070	0.76	0.229	1.03	< 0.02 U1	0.08 J1	0.00101	< 0.002 U1	< 0.1 U1	0.42 J1	< 0.04 U1
6/14/2022	Assessment	< 0.02 U1	< 0.03 U1	78.4	0.182	0.070	0.91	0.124	0.83	0.02 J1	< 0.05 U1	0.00100	< 0.002 U1	< 0.1 U1	0.35 J1	< 0.04 U1
10/11/2022	Assessment	< 0.02 U1	< 0.03 U1	69.7	0.148	0.060	0.87	0.096	0.96	0.02 J1	< 0.05 U1	0.00117	< 0.004 U1	< 0.1 U1	0.31 J1	< 0.04 U1
3/14/2023	Assessment	< 0.02 U1	0.04 J1	47.9	0.086	0.077	0.67	0.321	0.93	0.02 J1	< 0.05 U1	0.00071	< 0.002 U1	< 0.1 U1	0.18 J1	< 0.04 U1
6/12/2023	Assessment	0.009 J1	0.03 J1	56.4	0.123	0.049	0.93	0.130	0.67	< 0.02 U1	< 0.05 U1	0.00080	< 0.002 U1	< 0.1 U1	0.31 J1	< 0.02 U1
10/17/2023	Assessment	0.008 J1	< 0.03 U1	44.9	0.103	0.036	0.81	0.084	0.44	0.03 J1	< 0.05 U1	0.00083	< 0.002 U1	< 0.1 U1	0.33 J1	< 0.02 U1
3/12/2024	Assessment	0.020 J1	0.22	43.1	0.074 P2	0.049	0.34	5.22	1.21	0.04 J1	< 0.05 U1	0.00056 P2	< 0.002 U1	0.2 J1	0.06 J1	< 0.02 U1
5/07/2024	Assessment	0.028 J1	0.07 J1	41.6	0.105	0.062	0.98	0.516	0.88	0.03 J1	0.22	0.00072	< 0.002 U1	< 0.1 U1	0.24 J1	0.03 J1
9/24/2024	Assessment	< 0.008 U1	0.06 J1	39.7	0.094	0.039	0.82	0.190	1.68	0.02 J1	0.07 J1	0.00078	< 0.002 U1	< 0.1 U1	0.20 J1	< 0.02 U1
3/25/2025	Assessment	0.018 J1	0.04 J1	35.7	0.094	0.047	0.96	0.243	0.68	0.02 J1	0.05 J1	0.00073	< 0.002 U1	< 0.1 U1	0.16 J1	0.04 J1
6/09/2025	Assessment	0.012 J1	0.05 J1	38.7	0.094	0.036	1.08	0.145	0.62	< 0.02 U1	0.13 J1	0.00072	< 0.002 U1	< 0.1 U1	0.18 J1	< 0.02 U1
10/15/2025	Assessment	< 0.02 U1	0.04 J1	35.2	0.09	0.023	1.27	0.02 J1	1.04	0.02 J1	0.11 J1	0.00076	< 0.002 U1	< 0.05 U1	0.19 J1	< 0.02 U1

Table 1. Groundwater Data Summary: MW-1605
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.008	1.00	0.43	< 0.02 U1	5.7	5.2	30 J1
11/08/2016	Background	0.005	1.01	0.43	< 0.02 U1	2.3	4.2	40
1/11/2017	Background	< 0.002 U1	0.979	0.62	< 0.02 U1	4.6	5.7	35
2/21/2017	Background	0.061	1.37	1.49	< 0.02 U1	5.1	7.4	74
4/25/2017	Background	0.025	1.31	1.21	< 0.02 U1	4.9	6.0	30 J1
5/23/2017	Background	0.063	1.21	1.00	< 0.02 U1	4.8	5.4	30 J1
6/21/2017	Background	0.017	1.15	0.90	< 0.02 U1	4.9	5.8	25
7/12/2017	Background	0.075	1.11	1.32	< 0.02 U1	4.7	4.5	37
9/14/2017	Detection	0.102	1.01	1.72	< 0.02 U1	4.7	4.9	20 J1
4/25/2018	Assessment	0.070	1.30	0.69	< 0.02 U1	4.6	6.5	37
9/18/2018	Assessment	0.036	0.930	0.62	< 0.02 U1	4.0	4.3	29
3/12/2019	Assessment	0.02 J1	1.27	0.53	0.02 J1	4.3	7.2	33
6/25/2019	Assessment	< 0.02 U1	1.20	0.43	< 0.01 U1	5.2	5.7	37
8/20/2019	Assessment	< 0.02 U1	1.01	0.46	0.01 J1	5.5	5.5	30 J1
3/17/2020	Assessment	--	--	--	0.01 J1	5.0	--	--
6/29/2020	Assessment	< 0.02 U1	1.24	0.43	< 0.01 U1	5.0	5.3	--
8/27/2020	Assessment	--	--	--	--	5.1	--	30 J1
10/05/2020	Assessment	< 0.02 U1	1.04	0.39	< 0.01 U1	5.6	5.3	40 J1
3/10/2021	Assessment	--	--	--	0.02 J1	4.6	--	--
6/08/2021	Assessment	0.009 J1	1.2	0.59	0.01 J1	5.2	5.08	50
10/05/2021	Assessment	0.011 J1	1.2	0.41	< 0.02 U1	5.1	4.59	40 J1
3/23/2022	Assessment	0.011 J1	1.60	0.65	< 0.02 U1	6.5	9.21	30 J1
6/14/2022	Assessment	< 0.009 U1	1.18	0.56	< 0.02 U1	4.5	5.24	50
10/12/2022	Assessment	0.010 J1	1.15	0.36	< 0.02 U1	5.2	5.27	< 20 S12, U1
3/14/2023	Assessment	--	--	--	0.03 J1	6.5	--	--
6/12/2023	Assessment	0.014 J1	3.52	0.50	< 0.02 U1	6.2	7.9	64 P2
10/17/2023	Assessment	0.011 J1	1.30	0.36	< 0.02 U1	5.3	4.8	46 J1
3/13/2024	Assessment	--	--	--	0.04 J1	6.4	--	--
5/08/2024	Assessment	0.016 J1	4.71	--	0.04 J1	6.1	--	--
8/06/2024	Assessment	--	--	0.50	--	--	5.7	40 J1
9/23/2024	Assessment	0.009 J1	1.31	0.50	< 0.02 U1	4.8	4.5	50
3/25/2025	Assessment	--	--	--	< 0.02 U1	6.6	--	--
6/09/2025	Assessment	0.051	4.68	0.64	0.02 J1	5.6	6.9	60
10/14/2025	Assessment	0.008 J1	1.43	0.35	< 0.02 U1	5.4	5.10	--
12/01/2025	Assessment	--	--	--	--	5.7	--	50

Table 1. Groundwater Data Summary: MW-1605
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	< 0.01 U1	0.04 J1	30.3	0.091	0.06	2.7	0.897	0.679	< 0.02 U1	0.126	0.002	< 0.002 U1	0.08 J1	0.2	0.01 J1
11/08/2016	Background	0.01 J1	0.08	30.5	0.121	0.06	2.50	0.917	1.986	< 0.02 U1	0.210	0.007	< 0.002 U1	0.05 J1	0.2	0.01 J1
1/11/2017	Background	0.01 J1	0.07	32.2	0.111	0.07	2.53	1.64	0.1382	< 0.02 U1	0.190	0.008	< 0.002 U1	0.1 J1	0.2	0.01 J1
2/21/2017	Background	< 0.01 U1	0.03 J1	42.6	0.138	0.09	2.61	1.45	0.904	< 0.02 U1	0.107	0.005	< 0.002 U1	0.10	0.2	0.03 J1
4/25/2017	Background	0.01 J1	0.06	39.1	0.119	0.09	2.57	0.991	0.2779	< 0.02 U1	0.121	< 0.0002 U1	< 0.002 U1	0.13	0.2	0.01 J1
5/23/2017	Background	< 0.01 U1	0.03 J1	35.0	0.114	0.07	2.39	0.667	6.077	< 0.02 U1	0.104	0.008	< 0.002 U1	0.07 J1	0.2	0.01 J1
6/21/2017	Background	< 0.01 U1	0.05 J1	33.4	0.105	0.07	2.44	0.592	10.864	< 0.02 U1	0.110	0.002	< 0.002 U1	0.09 J1	0.3	< 0.01 U1
7/12/2017	Background	< 0.01 U1	0.23	31.7	0.103	0.07	2.33	0.495	0.3796	< 0.02 U1	0.107	0.0003 J1	< 0.002 U1	23.7	0.2	0.01 J1
4/25/2018	Assessment	0.04 J1	0.07	37.1	0.123	0.08	2.70	0.434	0.421	< 0.02 U1	0.193	0.009	< 0.002 U1	0.07 J1	0.3	0.03 J1
9/18/2018	Assessment	0.02 J1	0.04 J1	29.7	0.104	0.06	2.58	0.265	0.694	< 0.02 U1	0.092	0.002	--	0.04 J1	0.2	0.03 J1
10/22/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/12/2019	Assessment	< 0.02 U1	0.17	36.6	0.131	0.08	2.91	0.483	0.2025	0.02 J1	0.305	< 0.009 U1	0.003 J1	< 0.4 U1	0.3	< 0.1 U1
6/25/2019	Assessment	< 0.02 U1	0.05 J1	34.8	0.123	0.08	2.53	0.253	0.9023	< 0.01 U1	0.164	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
8/20/2019	Assessment	< 0.02 U1	0.03 J1	29.1	0.09 J1	0.06	2.41	0.215	0.268	0.01 J1	0.09 J1	0.000637	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
3/17/2020	Assessment	< 0.02 U1	< 0.03 U1	40.9	0.130	0.08	2.47	0.272	1.1942	0.01 J1	0.1 J1	0.000757	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
6/29/2020	Assessment	< 0.02 U1	< 0.03 U1	36.5	0.119	0.07	2.41	0.222	0.11	< 0.01 U1	0.05 J1	0.000694	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
10/05/2020	Assessment	< 0.02 U1	0.04 J1	33.7	0.113	0.07	2.55	0.219	4.041	< 0.01 U1	0.1 J1	0.000695	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
3/10/2021	Assessment	< 0.02 U1	0.06 J1	56.7	0.160	0.11	2.71	0.398	2.826	0.02 J1	0.2 J1	0.000806	0.002 J1	< 0.1 U1	0.2	< 0.04 U1
6/08/2021	Assessment	< 0.02 U1	< 0.03 U1	34.8	0.102	0.067	2.27	0.236	1.12	0.01 J1	0.08 J1	0.00063	< 0.002 U1	< 0.1 U1	0.20 J1	< 0.04 U1
10/05/2021	Assessment	< 0.02 U1	0.04 J1	36.9	0.118	0.074	2.68	0.184	0.97	< 0.02 U1	0.1 J1	0.00075	< 0.004 U1	< 0.1 U1	0.24 J1	< 0.04 U1
3/23/2022	Assessment	< 0.02 U1	0.05 J1	47.9	0.152	0.101	2.55	0.341	1.36	< 0.02 U1	0.14 J1	0.00089	< 0.002 U1	< 0.1 U1	0.22 J1	< 0.04 U1
6/14/2022	Assessment	< 0.02 U1	0.03 J1	34.5	0.111	0.071	2.41	0.242	0.41	< 0.02 U1	0.09 J1	0.00068	< 0.002 U1	< 0.1 U1	0.21 J1	< 0.04 U1
10/12/2022	Assessment	< 0.02 U1	0.04 J1	36.6	0.116	0.069	3.26	0.194	0.77	< 0.02 U1	0.08 J1	0.00071	< 0.002 U1	< 0.1 U1	0.25 J1	< 0.04 U1
3/14/2023	Assessment	0.09 J1	1.42	41.9	0.243	0.025	5.05	1.17	1.05	0.03 J1	2.16	0.00260	0.005	0.3 J1	0.56	0.07 J1
6/12/2023	Assessment	0.033 J1	0.69	30.3	0.155	0.044	2.89	0.737	0.69	< 0.02 U1	1.04	0.00153	0.003 J1	< 0.1 U1	0.51	0.06 J1
10/17/2023	Assessment	0.046 J1	1.00	57.2	0.349	0.082	6.60	1.91	1.10	< 0.02 U1	2.55	0.00403	0.002 J1	0.1 J1	1.04	0.07 J1
3/13/2024	Assessment	0.074 J1	0.83	32.6	0.155 P2	0.035	5.29	0.649	0.87	0.04 J1	1.20	0.00186 P2	0.003 J1	0.2 J1	0.65	0.04 J1
5/08/2024	Assessment	0.063 J1	0.69	33.9	0.149	0.044	4.20	0.665	0.61	0.04 J1	1.12	0.00129	0.004 J1	0.2 J1	0.58	0.02 J1
9/23/2024	Assessment	0.028 J1	0.93	57.8	0.313	0.087	5.47	1.90	0.78	< 0.02 U1	2.43	0.00288	0.007	0.1 J1	0.72	0.05 J1
3/25/2025	Assessment	0.026 J1	0.31	42.0	0.159	0.075	3.04	0.564	0.64	< 0.02 U1	0.55	0.00139	< 0.002 U1	< 0.1 U1	0.27 J1	0.02 J1
6/09/2025	Assessment	0.034 J1	0.38	36.6	0.147	0.054	3.85	0.599	0.21	0.02 J1	1.32	0.00148	< 0.002 U1	0.1 J1	0.33 J1	0.02 J1
10/14/2025	Assessment	< 0.02 U1	0.12	30.5	0.13	0.055	2.61	0.42	2.31	< 0.02 U1	0.27	0.00086	< 0.002 U1	< 0.05 U1	0.26 J1	< 0.02 U1

Table 1. Groundwater Data Summary: MW-1606
BigSandy - FAP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	1.92	78.6	31.3	0.17	7.4	54.0	362
11/08/2016	Background	1.80	75.9	31.5	0.19	7.2	54.5	400
1/12/2017	Background	1.77	75.1	31.2	0.21	7.3	58.8	396
2/22/2017	Background	1.63	76.7	30.4	0.18	7.2	53.9	358
4/26/2017	Background	1.78	73.8	31.7	0.19	6.7	56.1	380
5/23/2017	Background	1.87	78.1	31.7	0.19	6.8	56.2	360
6/21/2017	Background	1.89	78.1	31.1	0.17	6.7	55.3	369
7/12/2017	Background	1.79	75.7	31.4	0.17	6.5	57.0	382
9/18/2017	Detection	1.83	77.0	31.3	0.19	6.9	58.1	380
1/31/2018	Detection	1.63	--	32.0	--	7.2	--	--
4/25/2018	Assessment	1.81	73.7	31.3	0.26	6.6	56.0	350
9/19/2018	Assessment	1.82	71.8	31.1	0.24	6.6	56.9	380
3/13/2019	Assessment	1.93	74.2	31.7	0.22	6.9	58.8	389
6/25/2019	Assessment	1.84	74.5	30.8	0.23	7.1	58.7	384
8/20/2019	Assessment	1.74	75.1	31.4	0.21	7.0	58.3	385
3/18/2020	Assessment	--	--	--	0.20	9.1	--	--
6/30/2020	Assessment	2.04	79.7	31.8	0.18	6.8	61.2	--
8/26/2020	Assessment	--	--	--	--	6.5	--	392
10/06/2020	Assessment	2.00	78.7	32.0	0.22	6.7	62.8	363
3/10/2021	Assessment	--	--	--	0.26	6.9	--	--
6/08/2021	Assessment	1.99	74.1	31.8	0.24	7.5	61.6	370
10/05/2021	Assessment	2.04	74.5	31.4	0.22	7.0	60.7	400
3/23/2022	Assessment	2.22	81.3	32.7	0.21	7.7	63.3	370
6/14/2022	Assessment	2.08	73.6	31.7	0.21	7.3	64.9	430
10/11/2022	Assessment	2.11	75.9	32.3	0.20	6.7	64.7	390
3/14/2023	Assessment	--	--	--	0.20	7.5	--	--
6/12/2023	Assessment	1.97	73.2	32.3	0.19	7.6	65.6	380 P2
10/17/2023	Assessment	2.07	75.9	31.4	0.20	7.0	63.3	390
3/12/2024	Assessment	--	--	--	0.20	7.1	--	--
5/07/2024	Assessment	2.17	76.9	--	0.20	6.7	--	--
8/06/2024	Assessment	--	--	31.7	--	--	64.5	400
9/23/2024	Assessment	2.13	75.7	31.8	0.20	6.6	65.5	380
3/25/2025	Assessment	--	--	--	0.24	8.0	--	--
6/09/2025	Assessment	2.14	76.1	32.0	0.24	7.0	68.2	390 S7
10/14/2025	Assessment	2.26	74.6	31.9	0.21	6.8	67.9	--
12/01/2025	Assessment	--	--	--	--	7.2	--	380

Table 1. Groundwater Data Summary: MW-1606
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.03 J1	0.85	1030	0.064	0.009 J1	1.7	0.814	2.76	0.17	1.19	0.006	< 0.002 U1	0.68	0.2	0.04 J1
11/08/2016	Background	0.04 J1	1.24	994	0.114	0.01 J1	2.34	1.26	4.082	0.19	1.88	0.014	< 0.002 U1	0.51	0.3	0.03 J1
1/12/2017	Background	0.07	1.19	883	0.058	0.06	1.52	0.919	3.35	0.21	1.02	0.010	< 0.002 U1	0.67	0.2	0.110
2/22/2017	Background	< 0.01 U1	0.97	875	0.025	< 0.004 U1	0.747	0.381	2.289	0.18	0.330	0.008	0.002 J1	0.91	0.2	0.01 J1
4/26/2017	Background	0.03 J1	1.40	1080	0.053	0.007 J1	1.33	0.951	2.398	0.19	0.862	0.003	< 0.002 U1	0.84	0.1	0.02 J1
5/23/2017	Background	0.01 J1	1.03	949	0.023	< 0.005 U1	0.790	0.411	3.37	0.19	0.341	0.006	0.002 J1	0.54	0.09 J1	< 0.01 U1
6/21/2017	Background	< 0.01 U1	0.98	884	0.01 J1	< 0.005 U1	0.385	0.209	2.79	0.17	0.159	0.004	0.003 J1	0.60	0.06 J1	< 0.01 U1
7/12/2017	Background	0.01 J1	1.14	773	0.01 J1	< 0.005 U1	0.353	0.153	3.37	0.17	0.103	0.008	< 0.002 U1	7.56	0.06 J1	< 0.01 U1
4/25/2018	Assessment	0.05	0.97	767	0.008 J1	< 0.005 U1	0.301	0.101	3.71	0.26	0.077	0.014	< 0.002 U1	0.58	0.06 J1	0.01 J1
9/19/2018	Assessment	0.03 J1	0.97	797	0.01 J1	< 0.005 U1	0.366	0.155	3.28	0.24	0.126	0.001	--	0.58	0.07 J1	0.03 J1
10/22/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/13/2019	Assessment	< 0.02 U1	1.22	764	< 0.02 U1	< 0.01 U1	0.535	0.208	2.63	0.22	0.123	< 0.009 U1	< 0.002 U1	2.60	0.05 J1	< 0.1 U1
6/25/2019	Assessment	< 0.02 U1	0.94	843	< 0.02 U1	< 0.01 U1	0.1 J1	0.055	2.366	0.23	0.05 J1	< 0.009 U1	< 0.002 U1	0.6 J1	0.06 J1	< 0.1 U1
8/20/2019	Assessment	< 0.02 U1	0.85	768	< 0.02 U1	< 0.01 U1	0.304	0.05 J1	3.12	0.21	< 0.05 U1	0.00301	< 0.002 U1	0.6 J1	0.05 J1	< 0.1 U1
3/18/2020	Assessment	< 0.02 U1	1.00	828	< 0.02 U1	< 0.01 U1	0.343	0.196	2.49	0.20	0.1 J1	0.00340	< 0.002 U1	0.6 J1	0.08 J1	< 0.1 U1
6/30/2020	Assessment	< 0.02 U1	0.92	816	< 0.02 U1	< 0.01 U1	0.2 J1	0.068	3.16	0.18	0.1 J1	0.00364	< 0.002 U1	0.5 J1	0.07 J1	< 0.1 U1
10/06/2020	Assessment	< 0.02 U1	1.00	750	< 0.02 U1	< 0.01 U1	0.1 J1	0.060	2.91	0.22	< 0.05 U1	0.00329	< 0.002 U1	0.5 J1	0.07 J1	< 0.1 U1
3/10/2021	Assessment	< 0.02 U1	1.04	739	0.009 J1	< 0.004 U1	0.433	0.100	1.92	0.26	0.08 J1	0.00306	< 0.002 U1	0.5 J1	< 0.09 U1	< 0.04 U1
6/08/2021	Assessment	< 0.02 U1	0.96	768 M1, P3	< 0.007 U1	< 0.004 U1	0.59	0.066	4.12	0.24	0.08 J1	0.00317	< 0.002 U1	0.6	< 0.09 U1	< 0.04 U1
10/05/2021	Assessment	< 0.02 U1	0.98	757 M1, P3	0.007 J1	< 0.004 U1	0.16 J1	0.086	4.15	0.22	0.08 J1	0.00354	< 0.002 U1	0.5	< 0.09 U1	< 0.04 U1
3/23/2022	Assessment	< 0.02 U1	0.80	783	< 0.007 U1	< 0.004 U1	0.09 J1	0.049	2.66	0.21	< 0.05 U1	0.00394	< 0.002 U1	0.5	< 0.09 U1	< 0.04 U1
6/14/2022	Assessment	< 0.02 U1	0.88	764	< 0.007 U1	< 0.004 U1	0.1 J1	0.047	2.75	0.21	< 0.05 U1	0.00328	< 0.002 U1	0.5	< 0.09 U1	< 0.04 U1
10/11/2022	Assessment	< 0.02 U1	0.90	730	0.009 J1	< 0.004 U1	0.91	0.079	2.96	0.20	0.05 J1	0.00378	< 0.004 U1	0.5	< 0.09 U1	< 0.04 U1
3/14/2023	Assessment	< 0.02 U1	0.95	769	0.007 J1	< 0.004 U1	0.32	0.103	3.35	0.20	0.09 J1	0.00331	< 0.002 U1	0.5	< 0.09 U1	< 0.04 U1
6/12/2023	Assessment	0.912	0.88	731	0.01 J1	0.005 J1	0.39	0.135	2.69	0.19	0.23	0.00392	< 0.002 U1	0.5	0.06 J1	< 0.02 U1
10/17/2023	Assessment	< 0.008 U1	0.73	739	0.009 J1	< 0.004 U1	0.30	0.088	3.43	0.20	0.08 J1	0.00381	< 0.002 U1	0.5	< 0.04 U1	< 0.02 U1
3/12/2024	Assessment	0.013 J1	0.85	722	0.015 P2, J1	< 0.004 U1	0.53	0.218	2.57	0.20	0.21	0.00364 P2	< 0.002 U1	0.5	0.07 J1	< 0.02 U1
5/07/2024	Assessment	0.025 J1	0.74	742	0.011 J1	0.007 J1	0.67	0.079	3.15	0.20	0.29	0.00353	< 0.002 U1	0.5	0.07 J1	< 0.02 U1
9/23/2024	Assessment	0.010 J1	0.74	730	< 0.007 U1	0.007 J1	0.25 J1	0.065	2.64	0.20	0.13 J1	0.00350	< 0.002 U1	0.5	0.04 J1	< 0.02 U1
3/25/2025	Assessment	0.020 J1	0.79	641	0.010 J1	< 0.004 U1	0.60	0.088	2.48	0.24	0.13 J1	0.00373	< 0.002 U1	0.5	< 0.04 U1	< 0.02 U1
6/09/2025	Assessment	0.014 J1	0.74	706	< 0.007 U1	0.005 J1	0.53	0.072	3.48	0.24	0.12 J1	0.00355	< 0.002 U1	0.5	< 0.04 U1	< 0.02 U1
10/14/2025	Assessment	< 0.02 U1	0.64	694	< 0.02 U1	< 0.004 U1	0.39	0.05	3.12	0.21	0.13 J1	0.00373	< 0.002 U1	0.46 J1	< 0.04 U1	< 0.02 U1

Table 1. Groundwater Data Summary: MW-1607
BigSandy - FAP
Appendix III Constituents

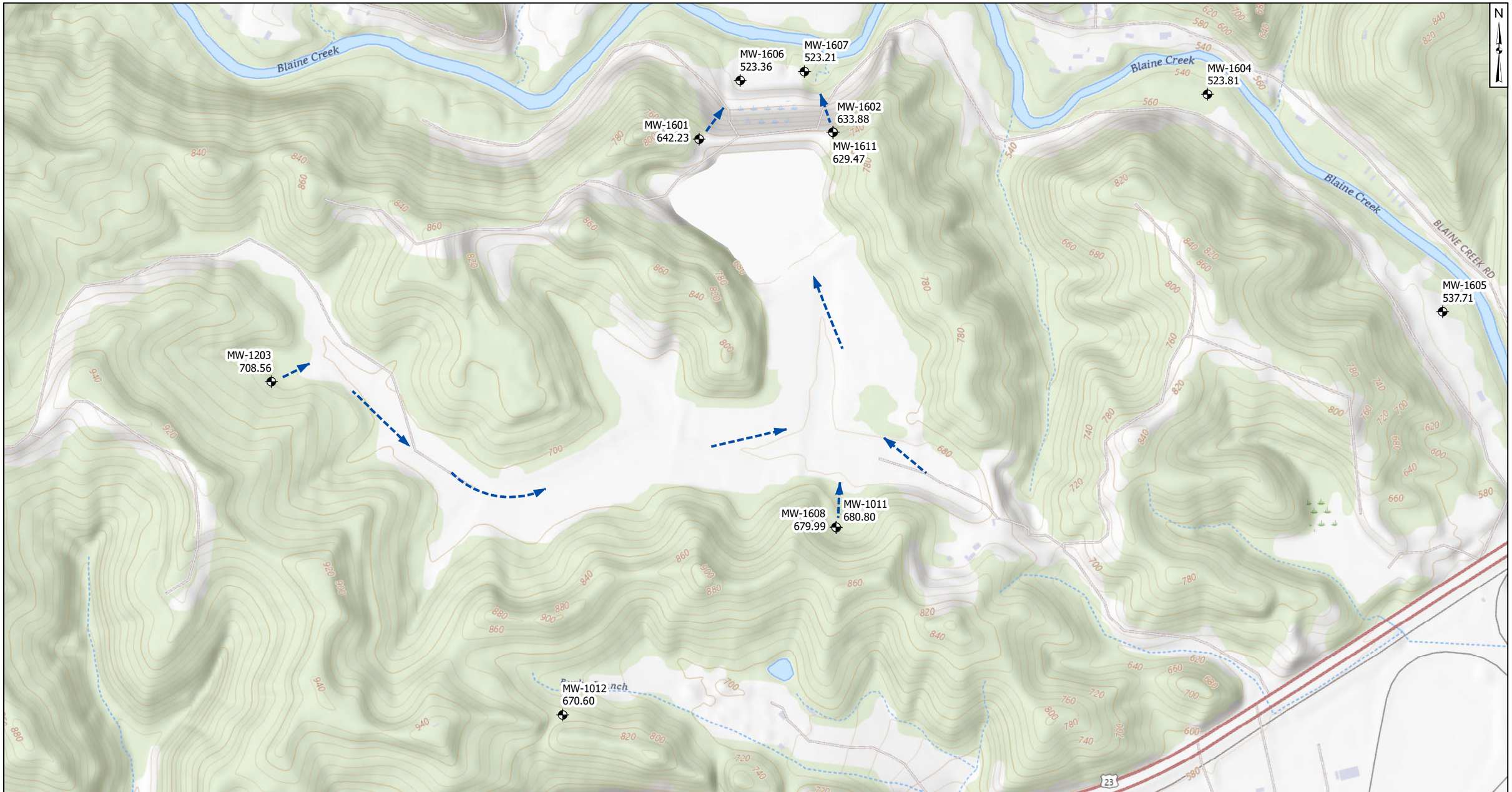
Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.159	97.6	3.34	0.04 J1	6.9	132	406
11/08/2016	Background	0.202	76.3	15.5	0.06	6.8	88.4	368
1/11/2017	Background	0.171	99.0	5.96	0.06	6.0	171	474
2/21/2017	Background	0.195	105	3.47	0.06	6.5	150	470
4/25/2017	Background	0.273	80.8	10.2	0.07	6.3	85.3	332
5/23/2017	Background	0.186	89.4	3.24	0.06 J1	6.3	114	338
6/21/2017	Background	0.164	92.5	2.42	0.05 J1	6.3	119	368
7/12/2017	Background	0.167	86.0	2.28	0.05 J1	5.8	105	358
9/18/2017	Detection	0.155	90.7	2.73	0.07	6.4	125	398
1/31/2018	Detection	--	110	--	--	6.6	159	--
4/25/2018	Assessment	0.234	101	3.66	0.08	6.2	137	430
9/19/2018	Assessment	0.255	95.6	7.52	0.08	6.0	144	428
3/13/2019	Assessment	0.209	93.7	5.17	0.06	6.1	135	415
6/25/2019	Assessment	0.208	91.9	5.22	0.08	6.6	120	388
8/20/2019	Assessment	0.160	101	3.84	0.07	6.5	141	419
3/18/2020	Assessment	--	--	--	0.06	8.1	--	--
6/30/2020	Assessment	0.195	85.4	8.26	0.06 J1	6.3	94.1	--
8/26/2020	Assessment	--	--	--	--	6.0	--	372
10/06/2020	Assessment	0.155	99.4	4.76	0.07	6.9	129	381
3/10/2021	Assessment	--	--	--	0.08	6.4	--	--
6/08/2021	Assessment	0.151	81.2	3.56	0.09	6.9	89.2	330
10/05/2021	Assessment	0.161	97.0	4.05	0.08	6.5	112	420
3/24/2022	Assessment	--	--	--	0.06	7.7	--	--
6/14/2022	Assessment	0.152	87.0	3.21	0.07	6.9	87.7	370
10/11/2022	Assessment	0.144	83.0	4.12	0.06	6.3	85.2	350
3/14/2023	Assessment	--	--	--	0.06	7.0	--	--
6/12/2023	Assessment	0.144	87.9	3.23	0.06	7.4	97.1	400 P2
10/17/2023	Assessment	0.141	89.4	3.29	0.07	6.6	99.6	370
3/12/2024	Assessment	--	--	--	0.08	6.6	--	--
5/07/2024	Assessment	0.236	98.2	--	0.07	6.6	--	--
8/06/2024	Assessment	--	--	2.53	--	--	78.5	340
9/23/2024	Assessment	0.206	73.4	6.52	0.07	6.2	69.5	310
3/25/2025	Assessment	--	--	--	0.08	7.6	--	--
6/09/2025	Assessment	0.179	73.2	3.96	0.07	6.6	86.1	320
10/14/2025	Assessment	0.189	67.5	4.65	0.06	6.3	78.8	--
12/01/2025	Assessment	--	--	--	--	6.8	--	270 L1

Table 1. Groundwater Data Summary: MW-1607
BigSandy - FAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.02 J1	7.36	34.3	0.01 J1	< 0.004 U1	0.6	1.41	1.551	0.04 J1	0.156	0.003	< 0.002 U1	0.52	0.1 J1	0.03 J1
11/08/2016	Background	0.02 J1	11.6	42.3	0.025	0.007 J1	0.619	1.45	1.683	0.06	0.376	0.002	< 0.002 U1	0.62	0.1	0.02 J1
1/11/2017	Background	0.06	12.5	53.5	0.01 J1	0.05	0.456	1.31	0.577	0.06	0.129	0.007	< 0.002 U1	0.83	0.1	0.119
2/21/2017	Background	0.01 J1	8.71	34.3	0.01 J1	< 0.004 U1	0.359	1.24	1.339	0.06	0.030	0.005	< 0.002 U1	0.54	0.05 J1	0.055
4/25/2017	Background	0.03 J1	15.4	38.1	0.028	0.006 J1	0.682	1.34	1.080	0.07	0.416	0.003	< 0.002 U1	0.53	0.2	0.02 J1
5/23/2017	Background	0.02 J1	8.87	33.9	0.01 J1	0.008 J1	0.350	1.30	6.76	0.06 J1	0.081	0.009	0.004 J1	0.42	0.1	0.02 J1
6/21/2017	Background	0.02 J1	9.22	27.5	0.01 J1	< 0.005 U1	0.324	1.39	1.274	0.05 J1	0.123	0.004	< 0.002 U1	0.45	0.1	0.02 J1
7/12/2017	Background	0.02 J1	7.59	25.0	0.01 J1	< 0.005 U1	0.293	1.13	0.33	0.05 J1	0.070	0.004	< 0.002 U1	9.02	0.1	0.02 J1
4/25/2018	Assessment	0.27	68.5	37.2	0.111	< 0.005 U1	0.851	1.57	3.217	0.08	0.799	0.012	< 0.002 U1	0.90	0.7	0.04 J1
9/19/2018	Assessment	0.04 J1	23.6	42.6	0.02 J1	< 0.005 U1	0.423	1.59	0.611	0.08	0.159	0.001	--	0.59	0.1	0.04 J1
10/22/2018	Assessment	--	--	--	--	--	--	--	--	--	--	--	< 0.002 U1	--	--	--
3/13/2019	Assessment	< 0.02 U1	7.67	31.6	< 0.02 U1	< 0.01 U1	0.424	1.43	0.18541	0.06	0.05 J1	< 0.009 U1	< 0.002 U1	1 J1	0.08 J1	< 0.1 U1
6/25/2019	Assessment	0.02 J1	19.3	38.1	< 0.02 U1	< 0.01 U1	0.250	1.39	0.501	0.08	0.09 J1	< 0.009 U1	< 0.002 U1	0.7 J1	0.1 J1	< 0.1 U1
8/20/2019	Assessment	< 0.02 U1	14.4	29.1	< 0.02 U1	< 0.01 U1	0.347	1.19	0.685	0.07	< 0.05 U1	0.0001 J1	< 0.002 U1	0.6 J1	0.09 J1	< 0.1 U1
3/18/2020	Assessment	0.02 J1	14.2	34.6	< 0.02 U1	< 0.01 U1	0.305	1.34	2.1757	0.06	0.1 J1	0.000332	< 0.002 U1	0.8 J1	0.2 J1	0.1 J1
6/30/2020	Assessment	0.03 J1	17.7	25.7	< 0.02 U1	< 0.01 U1	0.209	1.33	1.398	0.06 J1	0.08 J1	0.0001 J1	< 0.002 U1	0.6 J1	0.1 J1	< 0.1 U1
10/06/2020	Assessment	0.16	24.9	30.2	< 0.02 U1	< 0.01 U1	0.352	1.22	1.017	0.07	0.1 J1	0.0002 J1	< 0.002 U1	0.6 J1	0.1 J1	< 0.1 U1
3/10/2021	Assessment	< 0.02 U1	12.3	54.7	0.01 J1	0.009 J1	0.276	1.75	0.2646	0.08	0.09 J1	0.000310	< 0.002 U1	0.6 J1	0.1 J1	< 0.04 U1
6/08/2021	Assessment	0.02 J1	14.3	24.3	0.009 J1	< 0.004 U1	0.23	0.946	0.88	0.09	0.05 J1	0.00012 J1	< 0.002 U1	0.6	< 0.09 U1	0.05 J1
10/05/2021	Assessment	0.03 J1	16.7	32.4	0.012 J1	0.004 J1	0.20	1.05	2.20	0.08	0.07 J1	0.00018 J1	< 0.002 U1	0.7	< 0.09 U1	< 0.04 U1
3/24/2022	Assessment	< 0.02 U1	16.7	30.2	0.012 J1	0.009 J1	0.22	1.30	0.87	0.06	0.11 J1	0.00013 J1	< 0.002 U1	0.7	0.12 J1	< 0.04 U1
6/14/2022	Assessment	0.02 J1	17.7	31.7	0.011 J1	< 0.004 U1	0.22	1.08	0.73	0.07	0.09 J1	0.00013 J1	< 0.002 U1	0.6	< 0.09 U1	< 0.04 U1
10/11/2022	Assessment	< 0.02 U1	18.7	36.7	0.008 J1	< 0.004 U1	0.33	0.913	0.49	0.06	< 0.05 U1	0.00013 J1	< 0.004 U1	0.6	< 0.09 U1	< 0.04 U1
3/14/2023	Assessment	< 0.02 U1	15.4	41.7	0.01 J1	< 0.004 U1	0.32	1.08	1.81	0.06	0.09 J1	0.00012 J1	< 0.002 U1	0.5	0.12 J1	< 0.04 U1
6/12/2023	Assessment	0.023 J1	17.8	37.6	0.013 J1	< 0.004 U1	0.40	0.916	1.38	0.06	0.12 J1	0.00011 J1	< 0.002 U1	0.6	0.15 J1	0.02 J1
10/17/2023	Assessment	0.015 J1	12.2	41.7	0.012 J1	< 0.004 U1	0.30	0.739	0.82	0.07	0.06 J1	0.00013 J1	< 0.002 U1	0.4 J1	0.12 J1	0.03 J1
3/12/2024	Assessment	0.026 J1	27.8	98.0	0.015 P2, J1	0.008 J1	0.42	0.876	1.42	0.08	0.20	0.00024 P2, J1	< 0.002 U1	0.7	0.14 J1	< 0.02 U1
5/07/2024	Assessment	0.028 J1	16.4	60.5	0.018 J1	< 0.004 U1	0.71	0.921	1.45	0.07	0.78	0.00029 J1	< 0.002 U1	0.5	0.14 J1	< 0.02 U1
9/23/2024	Assessment	0.021 J1	12.0	40.9	0.012 J1	0.016 J1	0.23 J1	0.892	1.71	0.07	0.16 J1	0.00031	< 0.002 U1	0.4 J1	0.07 J1	< 0.02 U1
3/25/2025	Assessment	0.024 J1	15.0	54.7	0.020 J1	0.005 J1	0.38	0.959	1.01	0.08	0.11 J1	0.00033	< 0.002 U1	0.4 J1	0.13 J1	0.02 J1
6/09/2025	Assessment	0.024 J1	9.06	45.4	0.008 J1	0.006 J1	0.50	0.676	0.86	0.07	0.10 J1	0.00014 J1	< 0.002 U1	0.3 J1	0.08 J1	< 0.02 U1
10/14/2025	Assessment	0.03 J1	7.80	39.6	< 0.02 U1	0.014 J1	0.54	1.11	0.26	0.06	0.12 J1	0.00015	< 0.002 U1	0.23 J1	0.19 J1	0.04 J1

Notes:
1. Combined radium values were calculated from the sum of the reported radium-226 and radium-228 results.
Radium data quality flags were not included. Reported negative radium-226 or radium-228 results were replaced with zero.
--: 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.
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
P2: The precision on the laboratory control sample duplicate (LCSD) 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.
S12: Residue weight is below the method criteria but was already analyzed with 100mL.
SU: standard unit
µg/L: micrograms per liter

Groundwater Flow Direction Maps



Legend

- Groundwater Monitoring Well
- Inferred Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on March 24, 2025) provided by AEP.
2. Site features based on information available in Groundwater Monitoring Network Evaluation - Big Sandy Fly Ash Pond, Revision 1 (Geosyntec 2023) provided by AEP.
3. Groundwater elevation units are feet above mean sea level (ft amsl) (Datum: KY SP North NAD83, NAVD88).
4. Fly Ash Pond cap liner construction completed in November 2020.
5. Monitoring well locations surveyed by Eastham and Associates (April 2025).
6. Elevation contours are from orthoimagery collected in 2020, contours show a saddle dam that was removed in 2021.
7. United States Geological Survey topographic basemap provided by ESRI (September 2022), one feature removed to represent current conditions.

1,000 500 0 1,000 Feet

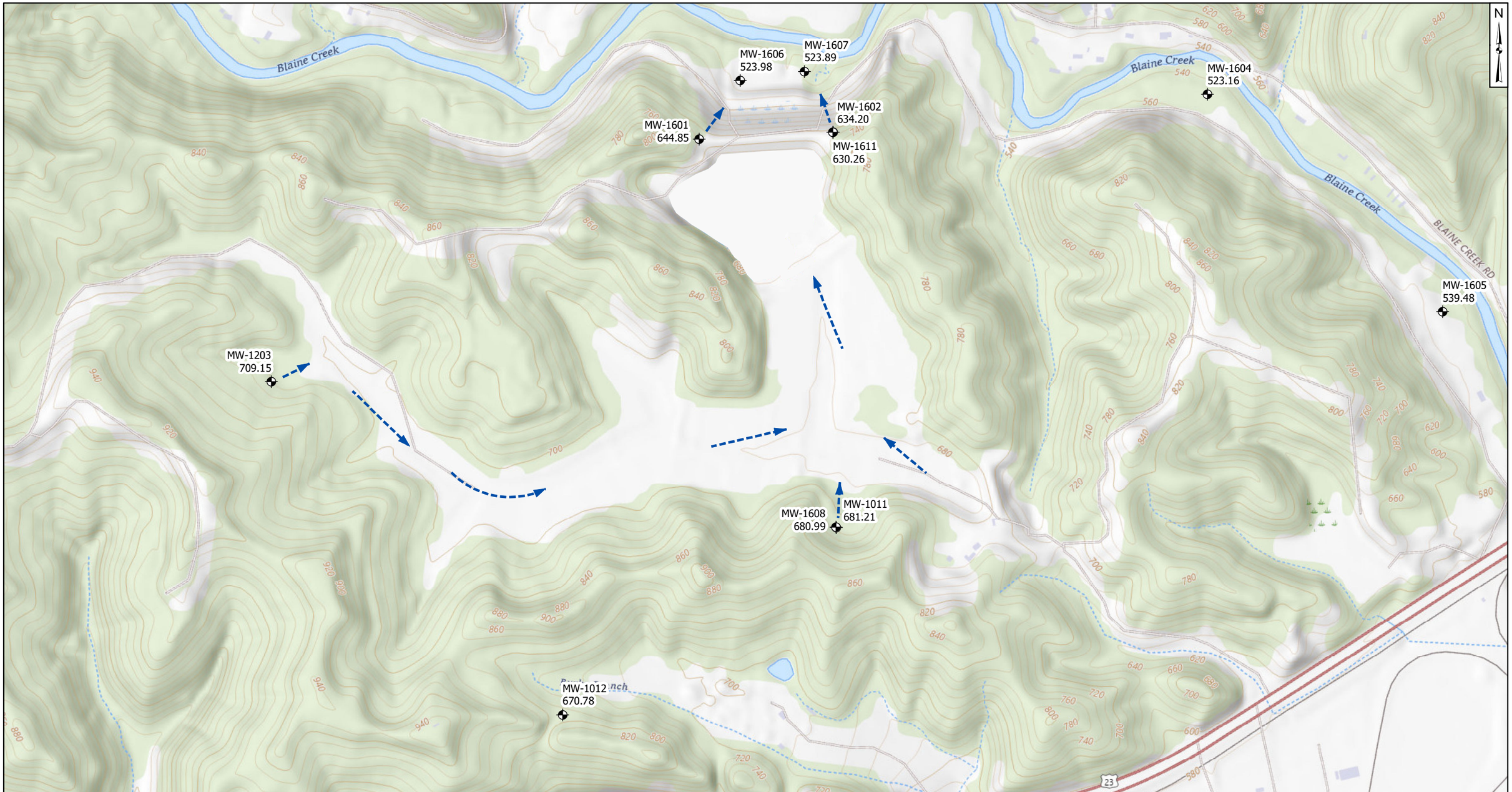
Potentiometric Surface Map - Uppermost Aquifer
March 2025
AEP Big Sandy Plant - Fly Ash Pond
Louisa, Kentucky

Geosyntec consultants

Columbus, Ohio | 2026/01/23

Figure **2**

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Big Sandy\2025\AEP-BigSandy_FAP_GW_2025-03-Mar.mxd. okiemute.commander. 1/23/2026. CHA8423/05/08.



Legend

- Groundwater Monitoring Well
- Inferred Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on June 9, 2025) provided by AEP.
2. Site features based on information available in Groundwater Monitoring Network Evaluation - Big Sandy Fly Ash Pond, Revision 1 (Geosyntec 2023) provided by AEP.
3. Groundwater elevation units are feet above mean sea level (ft amsl) (Datum: KY SP North NAD83, NAVD88).
4. Fly Ash Pond cap liner construction completed in November 2020.
5. Monitoring well locations surveyed by Eastham and Associates (April 2025).
6. Elevation contours are from orthoimagery collected in 2020, contours show a saddle dam that was removed in 2021.
7. United States Geological Survey topographic basemap provided by ESRI (September 2022), one feature removed to represent current conditions.

1,000 500 0 1,000 Feet

Potentiometric Surface Map - Uppermost Aquifer
June 2025
AEP Big Sandy Plant - Fly Ash Pond
Louisa, Kentucky

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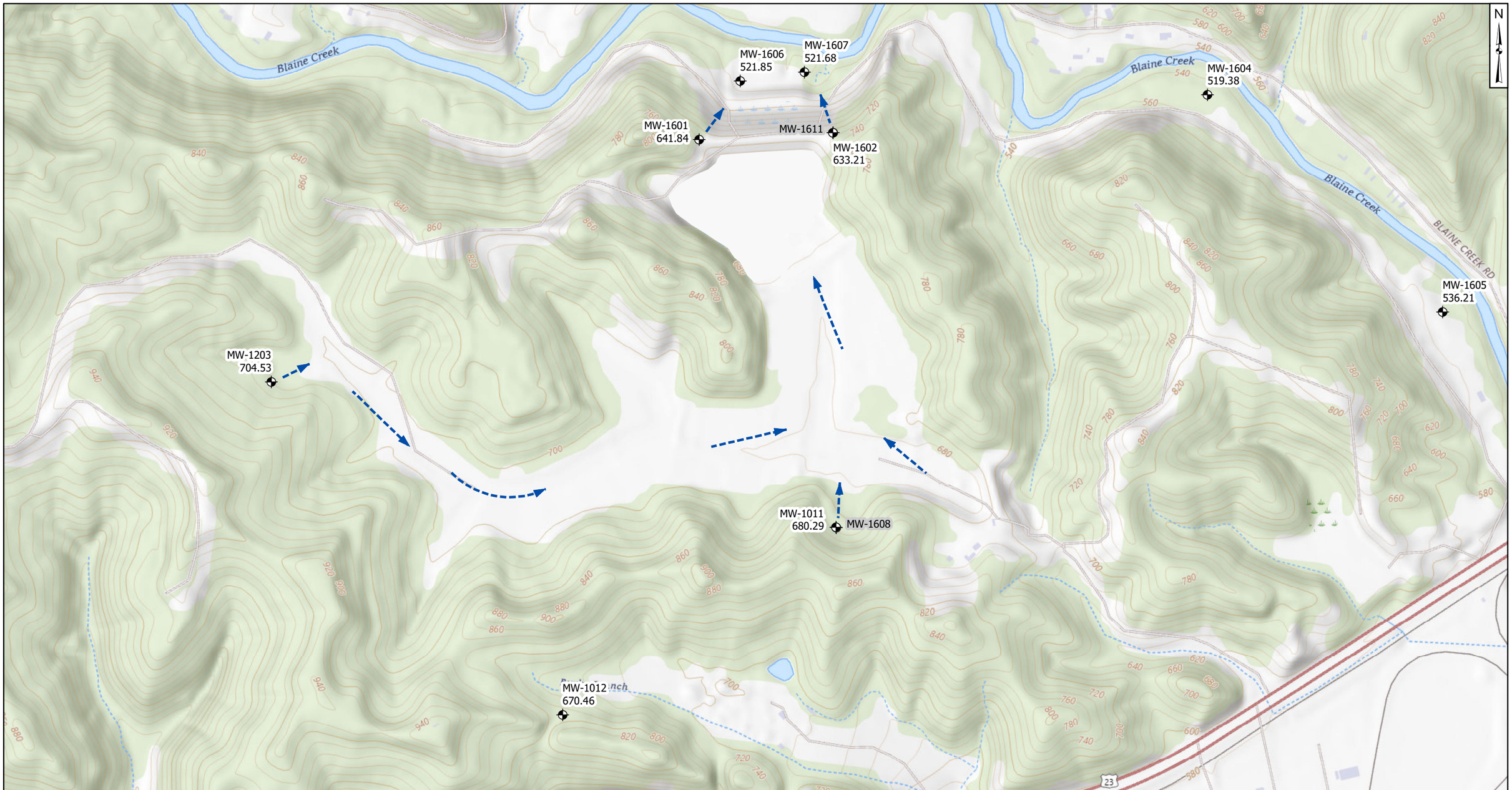
Columbus, Ohio | 2026/01/23

Figure 3

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Big Sandy\2025\AEP-BigSandy_FAP_GW_2025-06-Jun.mxd. okiemute.commander. 1/23/2026. CHA8423/05/08.



Legend

- Groundwater Monitoring Well
- Inferred Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on October 14, 2025) provided by AEP.
2. MW-1608 and MW-1611 were not gauged during the October 2025 groundwater sampling event.
3. Site features based on information available in Groundwater Monitoring Network Evaluation - Big Sandy Fly Ash Pond, Revision 1 (Geosyntec 2023) provided by AEP.
4. Groundwater elevation units are feet above mean sea level (ft amsl) (Datum: KY SP North NAD83, NAVD88).
5. Fly Ash Pond cap liner construction completed in November 2020.
6. Monitoring well locations surveyed by Eastham and Associates (April 2025).
7. Elevation contours are from orthoimagery collected in 2020, contours show a saddle dam that was removed in 2021.
8. United States Geological Survey topographic basemap provided by ESRI (September 2022), one feature removed to represent current conditions.

1,000 500 0 1,000 Feet

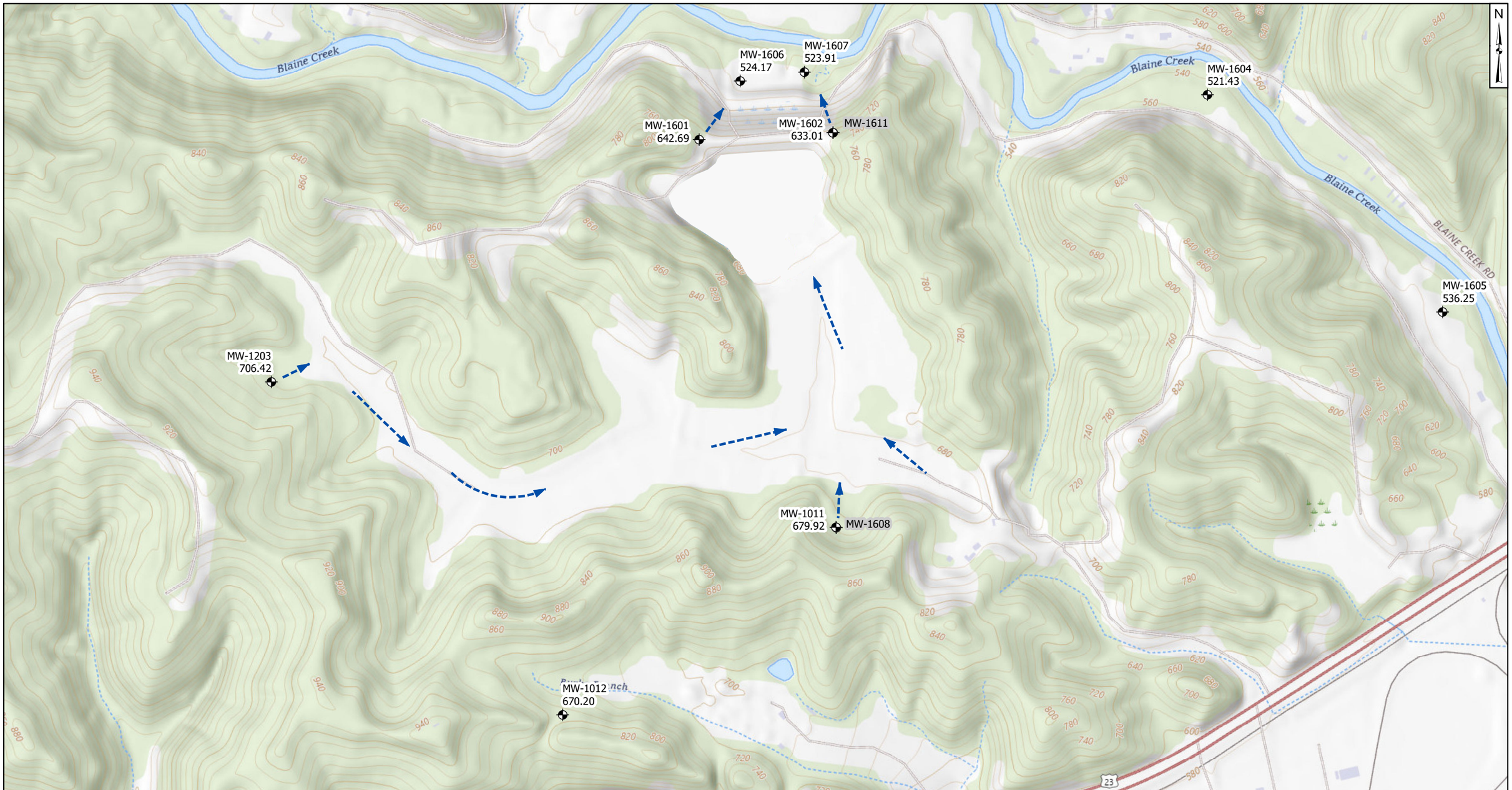
Potentiometric Surface Map - Uppermost Aquifer
October 2025
AEP Big Sandy Plant - Fly Ash Pond
Louisa, Kentucky

Geosyntec consultants

Columbus, Ohio | 2026/01/23

Figure 4

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Big Sandy\2025\AEP-BigSandy_FAP_GW_2025-10-Oct.mxd. okiemute.commander. 1/23/2026. CHA8423/05/08.



Legend

- Groundwater Monitoring Well
- Inferred Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on December 1, 2025) provided by AEP.
2. MW-1608 and MW-1611 were not gauged during the December 2025 groundwater sampling event.
3. Site features based on information available in Groundwater Monitoring Network Evaluation - Big Sandy Fly Ash Pond, Revision 1 (Geosyntec 2023) provided by AEP.
4. Groundwater elevation units are feet above mean sea level (ft amsl) (Datum: KY SP North NAD83, NAVD88).
5. Fly Ash Pond cap liner construction completed in November 2020.
6. Monitoring well locations surveyed by Eastham and Associates (April 2025).
7. Elevation contours are from orthoimagery collected in 2020, contours show a saddle dam that was removed in 2021.
8. United States Geological Survey topographic basemap provided by ESRI (September 2022), one feature removed to represent current conditions.

1,000 500 0 1,000 Feet

Potentiometric Surface Map - Uppermost Aquifer
December 2025
AEP Big Sandy Plant - Fly Ash Pond
Louisa, Kentucky

Geosyntec consultants

Columbus, Ohio | 2026/01/23

Figure 5

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Big Sandy\2025\AEP-BigSandy_FAP_GW_2025-12-Dec.mxd. okiemute.commander. 1/23/2026. CHA8423/05/08.

Groundwater Flow Velocity Calculations

Table 2: Residence Time Calculation Summary
Big Sandy Fly Ash Pond

			2025-03		2025-06		2025-10		2025-12	
CCR Unit	Monitoring Well	Well Diameter (inches)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Fly Ash Pond	MW-1011 [1]	2.0	33.0	1.8	33.0	1.8	33.0	1.8	33.0	1.8
	MW-1012 [1]	2.0	33.0	1.8	33.0	1.8	33.0	1.8	33.0	1.8
	MW-1203 [1]	2.0	33.0	1.8	33.0	1.8	33.0	1.8	33.0	1.8
	MW-1601 [2]	4.0	33.0	3.7	33.0	3.7	33.0	3.7	33.0	3.7
	MW-1602 [2]	4.0	33.0	3.7	33.0	3.7	33.0	3.7	33.0	3.7
	MW-1604 [3]	4.0	33.5	3.6	20.8	5.8	64.3	1.9	16.9	7.2
	MW-1605 [3]	4.0	33.5	3.6	20.8	5.8	64.3	1.9	16.9	7.2
	MW-1606 [2]	4.0	33.5	3.6	20.8	5.8	64.3	1.9	16.9	7.2
	MW-1607 [2]	4.0	33.5	3.6	20.8	5.8	64.3	1.9	16.9	7.2

Notes:
[1] - Upgradient Well
[2] - Downgradient Well
[3] - Background Well

APPENDIX 2 – Statistical Analyses

The reports summarizing the statistical evaluations follow.

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY - 2024 2ND SEMIANNUAL EVENT FLY ASH POND

Big Sandy Plant
Louisa, Kentucky

Prepared for

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

Prepared by

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500 West Wilson Bridge Road, Suite 250
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Project Number: CHA8500B

January 2025

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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

ACRONYMS AND ABBREVIATIONS

CCR	coal combustion residuals
CFR	code of federal regulations
FAP	Fly Ash Pond
GWPS	groundwater protection standard
LPL	lower prediction limit
MCL	maximum contaminant level
mg/L	milligrams per liter
PQL	practical quantitation limit
QA/QC	quality assurance/quality control
SSI	statistically significant increase
SSL	statistically significant level
TDS	total dissolved solids
UPL	upper prediction limit

1. INTRODUCTION

In accordance with United States Environmental Protection Agency 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 Fly Ash Pond (FAP), an existing CCR unit at the Big Sandy Power Plant in Louisa, Kentucky. Recent groundwater monitoring results were used to identify any concentrations of Appendix IV constituents that are above the groundwater protection standards (GWPSs).

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, calcium, chloride, fluoride, sulfate, and total dissolved solids (TDS) at the FAP. An alternative source was not identified following the detection monitoring events; thus, the FAP has been in assessment monitoring since 2018. During the most recent assessment monitoring event, completed in May 2024, no statistically significant levels (SSLs) were identified, and the unit remained in assessment monitoring (Geosyntec 2024).

A semiannual sampling event for Appendix III parameters and Appendix IV parameters, as required by 40 CFR 257.95(d)(1), was completed in September 2024. The results of the September 2024 assessment sampling event are documented in this report.

Before the statistical analyses were conducted, the 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. GWPSs were reestablished for the Appendix IV parameters following calculation of site-specific background values. Confidence intervals were calculated from the Appendix IV parameter data at the compliance wells to assess whether any were present at SSLs above the corresponding GWPS. No SSLs were identified; however, concentrations of Appendix III parameters remained above background. Therefore, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

2. FLY ASH POND EVALUATION

2.1 Data Validation and QA/QC

One set of samples was collected for analysis from each upgradient and downgradient well, except MW-1601, to meet the requirements of 40 CFR 257.95(d)(1) in September 2024 as part of the assessment monitoring program. Downgradient well MW-1601 was dry during the September 2024 event and a sample could not be collected from that location. Samples from the September 2024 sample event were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during this assessment monitoring event is presented 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.10.0.24 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 FAP were conducted in accordance with the October 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 September 2024 were screened for potential outliers. Outliers were identified at background well MW-1012 for antimony, arsenic, and molybdenum. While no evidence of anthropogenic impacts were identified, these values and other recent results at background well MW-1012 were flagged and removed from the dataset to construct tolerance limits using relatively stable data. These values may be incorporated into future analyses pending additional investigation.

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 2020). The established GWPS was determined to be the greater value of the background concentration and either the 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 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 cobalt and combined radium. Nonparametric tolerance limits were calculated for antimony, arsenic, barium, beryllium, cadmium, chromium, fluoride, lead, lithium, molybdenum, selenium, and thallium due to apparent nonnormal distributions. A nonparametric tolerance limit was calculated

for mercury because greater than 50% of the data was composed of nondetect results. 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. 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 exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). The calculated confidence limits (Attachment B) were compared to the GWPSs provided in Table 2.

No SSLs were identified at the Big Sandy FAP.

2.2.3 Updating Appendix III Prediction Limits

Upper prediction limits (UPLs) were originally established for all Appendix III parameters 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. 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 BSFAP. Because the interwell Appendix III limits and the Appendix IV GWPSs are based on data from background wells which we would not expect to have been impacted by a release, these tests were used for intrawell Appendix III tests for pH only. Mann-Whitney tests were used to compare the medians of historical data (September 2016 – June 2022) to the new compliance samples (October 2022 – May 2024) for pH. Results were evaluated to determine if the medians of the two groups were statistically different at the 99% confidence level. Where no statistically 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, truncating historical data and using only 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 findings can be found in Attachment C. No statistically significant differences at the downgradient monitoring locations were found.

Prediction limits for the interwell tests were recalculated using data collected through the September 2024 assessment monitoring event. New background well data were tested for outliers prior to being added to the background data set. Background 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 revised interwell prediction limits were used to evaluate potential SSIs for boron, calcium, chloride, fluoride, sulfate, and TDS.

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

The updated interwell prediction limits for boron, calcium, chloride, fluoride, sulfate, and TDS and the updated intrawell prediction limits for pH are summarized in Table 3. The UPLs 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 lower prediction limit (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. The retesting procedures allow achieving an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated using intrawell prediction limits.

2.2.4 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 September 2024 assessment monitoring event from each compliance well were compared to updated prediction limits to assess whether the results were statistically above background values. The results from these events and the prediction limits are summarized in Table 3. The following exceedances of the UPLs were noted:

- Boron concentrations were above the interwell UPL of 0.244 milligrams per liter (mg/L) at MW-1606 (2.13 mg/L).
- Chloride concentrations were above the interwell UPL of 6.22 mg/L at MW-1602 (17.0 mg/L), MW-1606 (31.8 mg/L), and MW-1607 (6.52 mg/L).
- Sulfate concentrations were above the interwell UPL of 106 mg/L at MW-1602 (204 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the September 2024 sample was above the UPL or, in the case of pH, below the LPL. Based on this evaluation, concentrations of Appendix III constituents appear to be above background concentrations and the unit will remain in assessment monitoring.

2.3 Conclusions

A semiannual assessment monitoring event was 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 prevented data usage. The antimony, arsenic, and molybdenum results from the September 2024 sampling event at background well MW-1012 were removed from the dataset. GWPSs were reestablished for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval was above the GWPSs. No SSLs were identified. Appendix III parameters were compared to updated prediction limits; concentrations of boron, chloride, and sulfate were identified above the prediction limits.

Based on this evaluation, the Big Sandy FAP CCR unit will remain in assessment monitoring.

3. REFERENCES

Geosyntec. 2018. Statistical Analysis Summary – Fly Ash Pond. Big Sandy Plant, Louisa, Kentucky. January.

Geosyntec. 2020. Statistical Analysis Plan – Big Sandy Plant. Geosyntec Consultants, Inc. October.

Geosyntec. 2024. Statistical Analysis Summary – 2024 1st Semiannual Event, Fly Ash Pond, Big Sandy Plant, Louisa, Kentucky. Geosyntec Consultants, Inc. October.

TABLES

Table 1. Groundwater Data Summary
Statistical Analysis Summary
Big Sandy Plant – Fly Ash Pond

Parameter	Unit	MW-1011	MW-1012	MW-1203	MW-1602	MW-1604	MW-1605	MW-1606	MW-1607
		9/24/2024	9/24/2024	9/24/2024	9/24/2024	9/24/2024	9/23/2024	9/23/2024	9/23/2024
Antimony	µg/L	0.148	4.12	0.015 J1	0.060 J1	0.1 U1	0.028 J1	0.010 J1	0.021 J1
Arsenic	µg/L	2.24	182	0.24	0.70	0.06 J1	0.93	0.74	12.0
Barium	µg/L	40.6	51.7	97.0	73.1	39.7	57.8	730	40.9
Beryllium	µg/L	0.05 U1	0.047 J1	0.048 J1	0.05 U1	0.094	0.313	0.05 U1	0.012 J1
Boron	mg/L	0.126	0.175	0.101	0.100	0.008 J1	0.009 J1	2.13	0.206
Cadmium	µg/L	0.006 J1	0.052	0.02 U1	0.012 J1	0.039	0.087	0.007 J1	0.016 J1
Calcium	mg/L	77.5 M1	1.90	61.3	99.3	1.79	1.31	75.7	73.4
Chloride	mg/L	2.81	1.71	4.97	17.0	1.46	0.50	31.8	6.52
Chromium	µg/L	0.27 J1	0.81	0.22 J1	0.50	0.82	5.47	0.25 J1	0.23 J1
Cobalt	µg/L	0.140	0.327	0.641	0.014 J1	0.190	1.90	0.065	0.892
Combined Radium	pCi/L	3.29	1.78	1.78	1.37	1.68	0.78	2.64	1.71
Fluoride	mg/L	0.28	0.85	0.13	0.08	0.02 J1	0.06 U1	0.20	0.07
Lead	µg/L	0.2 U1	1.77	0.10 J1	0.17 J1	0.07 J1	2.43	0.13 J1	0.16 J1
Lithium	mg/L	0.00983	0.00639	0.0116	0.0103	0.00078	0.00288	0.00350	0.00031
Mercury	µg/L	0.005 U1	0.092	0.005 U1	0.005 U1	0.005 U1	0.007	0.005 U1	0.005 U1
Molybdenum	µg/L	1.1	13.6	0.1 J1	0.8	0.5 U1	0.1 J1	0.5	0.4 J1
Selenium	µg/L	0.13 J1	0.22 J1	0.5 U1	3.01	0.20 J1	0.72	0.04 J1	0.07 J1
Sulfate	mg/L	75.3	51.4	27.5	204	3.8	4.5	65.5	69.5
Thallium	µg/L	0.08 J1	0.05 J1	0.2 U1	0.2 U1	0.2 U1	0.05 J1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	360	610	270	610	30 J1	50	380	310
pH	SU	6.9	9.1	6.8	7.3	5.7	4.8	6.6	6.2

Notes:
1. MW-1601 could not be sampled due to insufficient water.
J1: Estimated value. Parameter was detected in concentrations below the reporting limit.
M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U1: Non-detect value. For statistical analysis, parameters that were not detected were replaced with the reporting limit.
µg/L: micrograms per liter

Table 2. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Big Sandy Plant – Fly Ash Pond

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.00120	0.00600
Arsenic, Total (mg/L)	0.0100		0.0289	0.0289
Barium, Total (mg/L)	2.00		0.113	2.00
Beryllium, Total (mg/L)	0.00400		0.000349	0.00400
Cadmium, Total (mg/L)	0.00500		0.000140	0.00500
Chromium, Total (mg/L)	0.100		0.00660	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00360	0.00600
Combined Radium, Total (pCi/L)	5.00		4.14	5.00
Fluoride, Total (mg/L)	4.00		0.910	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00255	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0200	0.0400
Mercury, Total (mg/L)	0.00200		0.0000920	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00550	0.100
Selenium, Total (mg/L)	0.0500		0.00104	0.0500
Thallium, Total (mg/L)	0.00200		0.000229	0.00200

Notes:
1. Calculated UTL (upper tolerance limit) represents site-specific background values.
2. Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.
CCR: coal combustion residuals
GWPS: groundwater protection standard
MCL: maximum contaminant level
mg/L: milligrams per liter
n/a: not applicable
pCi/L: picocuries per liter

Table 3. Appendix III Data Summary
Statistical Analysis Summary
Big Sandy Plant – Fly Ash Pond

Analyte	Unit	Description	MW-1602	MW-1606	MW-1607
			9/24/2024	9/23/2024	9/23/2024
Boron	mg/L	Interwell Background Value (UPL)	0.244		
		Analytical Result	0.100	**2.13**	0.206
Calcium	mg/L	Interwell Background Value (UPL)	123		
		Analytical Result	99.3	75.7	73.4
Chloride	mg/L	Interwell Background Value (UPL)	6.22		
		Analytical Result	**17.0**	**31.8**	**6.52**
Fluoride	mg/L	Interwell Background Value (UPL)	0.900		
		Analytical Result	0.08	0.20	0.07
pH	SU	Intrawell Background Value (UPL)	8.26	7.6	7.5
		Intrawell Background Value (LPL)	6.63	6.4	5.6
		Analytical Result	7.3	6.6	6.2
Sulfate	mg/L	Interwell Background Value (UPL)	106		
		Analytical Result	**204**	65.5	69.5
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	590		
		Analytical Result	610	380	310

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
3. MW-1601 could not be sampled due to insufficient water.
--: not measured
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 Big Sandy Fly 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

33232	Kentucky	01.22.2025
License Number	Licensing State	Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS
CONSULTING

January 22, 2025

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

Re: Big Sandy Fly Ash Pond
Assessment Monitoring & Background Update – September 2024

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background update and analysis of 2024 groundwater data for American Electric Power (AEP) Company's Big Sandy Fly 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 site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Background wells**: MW-1011, MW-1012, MW-1203, MW-1604, and MW-1605
- **Downgradient wells:** MW-1601, MW-1602, MW-1606, and MW-1607

Note that downgradient well MW-1601 was dry during the September 2024 event. Additionally, downgradient well MW-1603 was historically sampled; however, the groundwater monitoring well network was revised in October 2023 to remove well MW-1603 from the network due to the presence of coal in the screened interval. Additionally, AEP determined that background well MW-1012 is screened in the same geologic formation as neighboring upgradient wells, but is in an adjacent watershed with

a groundwater divide between the two watersheds. Therefore, groundwater in this formation does not flow from background well MW-1012 through the facility or vice versa.

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. The statistical analysis was reviewed by Dr. Jim Loftis, Civil & Environmental Engineering professor emeritus at Colorado State University and Senior Advisor to 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 & B, respectively). A summary of the values identified as outliers in this report and through previous screenings follows this letter. These values are deselected prior to the statistical analysis. All flagged values may also be seen in a lighter font and disconnected symbol on the time series graphs.

Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. A summary of well/constituent pairs with 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.

For regulatory comparison of current observations against statistical limits for Appendix III constituents, the annual site-wide false positive rate is based on the USEPA Unified Guidance (2009) recommendation of 10% (5% for each semi-annual sample event or 2.5% for quarterly sample events). The EPA suggests the selected statistical method should provide at least 55% power at 3 standard deviations or at least 80% power at 4 standard deviations. Power curves were based on the following:

Semi-Annual Sampling

1-of-2 resample plan
Constituents: 7
Downgradient wells: 4

Data at all wells were evaluated during the initial background screening conducted in December 2017 for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix III parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. Power curves are provided in this report to demonstrate that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance recommendations as discussed below.

Summary of Statistical Methods – Appendix III Parameters

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

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

Parametric prediction 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. 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 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 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 for parametric limits. 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 current groundwater quality. In the interwell case, prediction limits are updated with upgradient well data following each sampling event after 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 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 Background Screening – Conducted in December 2017

Outlier Analysis

All proposed background data were screened for outliers and trends during the background screening. The findings of those reports were submitted with that analysis. Interwell prediction limits utilize all upgradient well data for construction of statistical limits. During each sample event, upgradient well data are screened for any newly suspected outliers or obvious trending patterns using time series plots. Intrawell prediction limits utilized the background data set from the most recent update. Then in each future update, as recommended in the EPA Unified Guidance (2009), the intrawell background data sets are evaluated for the purpose of updating statistical limits with new data, as described below, using the Mann-Whitney two-sample test. Future updates are performed when an additional four to eight measurements are available.

Seasonality

No seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made to the data. When seasonal patterns are observed, data may be deseasonalized so that the resulting limits will

correctly account for the seasonality as a predictable pattern rather than random variation or a release. It was noted that for each constituent evaluated, the highest concentrations are reported in the upgradient wells.

Trend Test Evaluation

While trends may be visual, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits. No adjustments were required at the time, and results of the trend tests were included with the 2017 screening.

Appendix III – Determination of Spatial Variation

The Analysis of Variance (ANOVA) was used to statistically evaluate differences in average concentrations among upgradient wells and background well MW-1012, which assists in identifying the most appropriate statistical approach. Interwell tests, which compare downgradient well data to statistical limits constructed from pooled upgradient well and background well data, are appropriate when average concentrations are similar across upgradient wells. Intrawell tests, which compare compliance data from a single well to screened historical data within the same well, are appropriate when upgradient wells and background well MW-1012 exhibit spatial variation; when statistical limits constructed from upgradient wells and background well MW-1012 would not be readily capable of detecting changes in groundwater quality; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameter.

The results of the 2017 screening demonstrated that intrawell background limits, based on a 1-of-2 resample plan, were appropriate for pH and that interwell background limits, based on a 1-of-2 resample plan, were appropriate for boron, calcium, chloride, fluoride, sulfate, and TDS. A summary of the ANOVA results was included with the 2017 screening.

Appendix III Background Update Summaries

Fall 2022 & Fall 2023

Proposed background data, as mentioned above, were originally screened during December 2017. In the Fall 2022 update, data were re-evaluated using Tukey's outlier test and visual screening at all wells for pH, which is evaluated using intrawell prediction limits. The low value of 2.36 SU for pH at well MW-1605 was flagged in order to reduce variation. Additionally, the previously flagged measurement of 10.85 SU for pH at background well MW-1012 was unflagged during the update since similar concentrations were observed in the record.

The Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical pH data through June 2020 to the new compliance samples at each well through June 2022 to evaluate whether the groups are statistically different at the 99% confidence level. When no statistically significant difference is found, background data may be updated with compliance data. No statistically significant differences were identified; therefore, all records were updated with compliance data through June 2022.

In the Fall 2023 update, data were re-evaluated using visual screening and trend analysis at upgradient wells and background well MW-1012 for boron, calcium, chloride, fluoride, sulfate, and TDS, which are evaluated using interwell prediction limits. No new values were flagged among upgradient wells or background well MW-1012 for Appendix III parameters evaluated with interwell prediction limits.

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. The results of the trend analyses showed statistically significant increasing trends for chloride, fluoride, and TDS in upgradient well MW-1011 and background well MW-1012. Statistically significant decreasing trends were noted for chloride, fluoride, and TDS in upgradient well MW-1604 and chloride at upgradient well MW-1605. Although statistically significant trends were identified when each upgradient well was tested individually, the magnitudes of the trends are low relative to average concentrations among pooled upgradient well and background well data, and reported measurements are consistent with those reported at one or more neighboring upgradient wells. Since the resulting statistical limits were representative of current background groundwater quality conditions, no adjustments were made to the records at that time.

Fall 2024

<u>Outlier Analysis</u>

During this analysis, Tukey's outlier test and visual screening were used to evaluate data through May 2024 at all wells for pH, which is tested using intrawell prediction limits, and through September 2024 using pooled upgradient well and background well data for boron, calcium, chloride, fluoride, sulfate, and TDS, which are tested using interwell prediction limits (Figure C).

Tukey's outlier test on data at all wells for pH identified both high and low values for pH, and confirmed previously flagged values. Additional low-level values that were identified by Tukey's were flagged for pH at upgradient well MW-1011 and downgradient well MW-1602 in order to reduce variation. Any values identified by Tukey's, but not flagged in the database, appeared representative of natural variation. While not identified by Tukey's test, visual screening identified a low-level observation for pH at upgradient well MW-1604 and also confirmed a low-level observation that was previously flagged for pH at upgradient well MW-1605.

Tukey's outlier test on pooled upgradient well and background well data for boron, calcium, chloride, fluoride, sulfate, and TDS did not identify any potential outliers; therefore, no values were flagged for these constituents. 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 June 2022 to the new compliance samples at each well through May 2024 to evaluate whether the groups are statistically different at the 99% confidence level (Figure D). If no statistically significant difference is found, background data may be updated with compliance data. A statistically significant difference in concentrations was identified for the following well/constituent pair:

- pH: MW-1605 (upgradient)

Although a statistically significant increase in concentrations was identified, all of the compliance data were within the range of historic observations; therefore, this record and all other records for pH were updated with compliance data through May 2024. A summary of the Mann-Whitney results follows this report.

Intrawell – Prediction Limits

Intrawell prediction limits for pH were constructed using all historical data through May 2024 with a 1-of-2 resample plan (Figure E). A summary of the limits follows this letter and no comparison of the September 2024 compliance data was performed in this analysis.

Interwell – Trend Test Evaluation

The Sen's Slope/Mann Kendall trend test was used to evaluate data at background well and 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:

- Chloride: MW-1012
- Fluoride: MW-1012
- TDS: MW-1012

Decreasing:

- Boron: MW-1604
- Chloride: MW-1604
- Fluoride: MW-1604
- TDS: MW-1604

Although statistically significant trends were identified when each upgradient well or background well was tested individually, the magnitudes of the trends are low relative to average concentrations among pooled upgradient well and background well data, and reported measurements are consistent with those reported at one or more neighboring upgradient wells. Therefore, no adjustments were made to the records at this time, and resulting statistical limits are representative of current groundwater quality conditions. All records will be re-evaluated during the next background update and, if earlier measurements are no longer representative of current conditions, the historical portion of the records may 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 and background well data through September 2024 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 and background well MW-1012. A summary table of the updated limits

may be found following this letter in the Prediction Limit Summary Tables. No comparison of the September 2024 compliance data to statistical limits was made in this analysis.

Evaluation of Appendix IV Parameters – Fall 2024

Prior to evaluating Appendix IV parameters, all background data at upgradient wells and background well MW-1012 are screened through visual screening and Tukey's outlier test for potential outliers.

Outlier Analysis

For the current analysis, Tukey's outlier test on pooled upgradient well and background well data through September 2024 identified outliers for antimony, arsenic, beryllium, chromium, cobalt, combined radium 226 + 228, lead, and molybdenum (Figure C). Data from background well MW-1012 have been included during past statistical analyses; however, more recent groundwater samples have shown increasing concentrations for antimony, arsenic, and molybdenum. It was mutually agreed upon by AEP and Groundwater Stats Consulting to flag these measurements as outliers and deselect the outliers from the datasets used to calculate tolerance limits pending further analysis, as discussed below. According to AEP, the flagged observations for these constituents at background well MW-1012 are not a result of anthropogenic influences. Any values identified by Tukey's test but not flagged in the database were either similar to concentrations from neighboring upgradient wells or were lower than the respective Maximum Contaminant Level (MCL). All flagged measurements from previous background updates were confirmed during this analysis by Tukey's outlier test and visual screening.

Additionally, downgradient well data through September 2024 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. No outliers among downgradient wells are flagged for Appendix IV parameters. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

Interwell Upper Tolerance Limits

Interwell upper tolerance limits were used to calculate background limits from all available pooled upgradient well and background well data through September 2024 (Figure H). These limits are updated on an annual basis and will be updated again during the Fall 2025 sample event. Parametric limits use a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution, such as cobalt and

combined radium 226 + 228. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were used. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

Groundwater Protection Standards

These limits were compared to the MCLs and CCR-Rule specified levels, as shown in the Groundwater Protection Standards (GWPS) table following this letter (Figure I), to determine the highest limit for use as the GWPS in the confidence Interval comparisons.

Confidence Intervals

Confidence intervals were then constructed using data through September 2024 on downgradient wells for each Appendix IV constituent (Figure J). The confidence intervals were then compared against the GWPS (i.e., the highest limit of the MCL or background limit as discussed above). 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. 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 lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete results of the confidence interval analysis follow this letter, and no exceedances were identified.

Trend Test Evaluation – Appendix IV

When confidence interval exceedances are identified in downgradient wells, data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether concentrations are statistically increasing, decreasing, or stable at the 95% confidence level. Utilizing the 95% confidence level for trend tests readily identifies significant trends and is more sensitive than the 99% confidence level without drastically increasing the false

negative rate. Upgradient wells and background well MW-1012 are included in the trend analyses for all parameters found to exceed their confidence interval in downgradient wells. When similar patterns exist upgradient of the site, it is an indication of variability in groundwater which may be unrelated to practices at the site. Since no exceedances were identified, no trend tests were required.

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

For Groundwater Stats Consulting,

Andrew T. Collins
Project Manager

Kristina L. Rayner
Senior Statistician

100% Non-Detects

Analysis Run 1/8/2025 4:48 PM View: Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Beryllium (mg/L)
MW-1602

FIGURE A

Time Series

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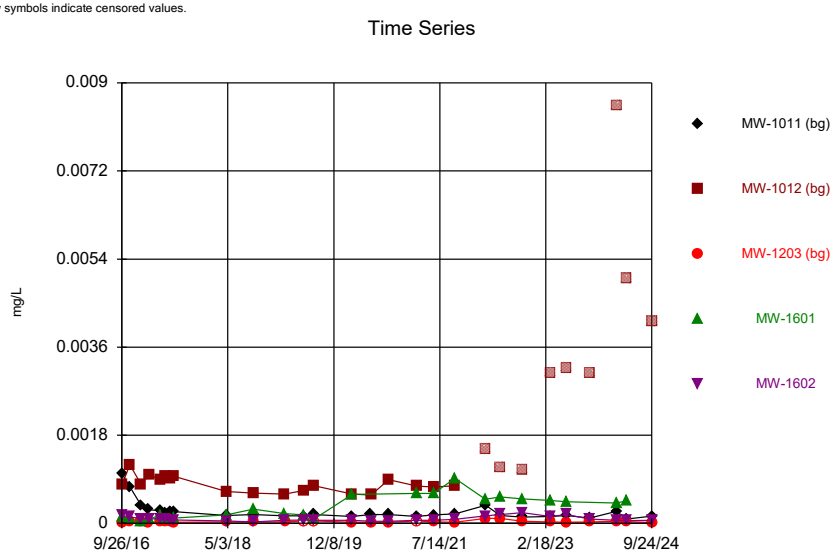
Hollow symbols indicate censored values.



Constituent: Antimony Analysis Run 1/14/2025 4:22 PM
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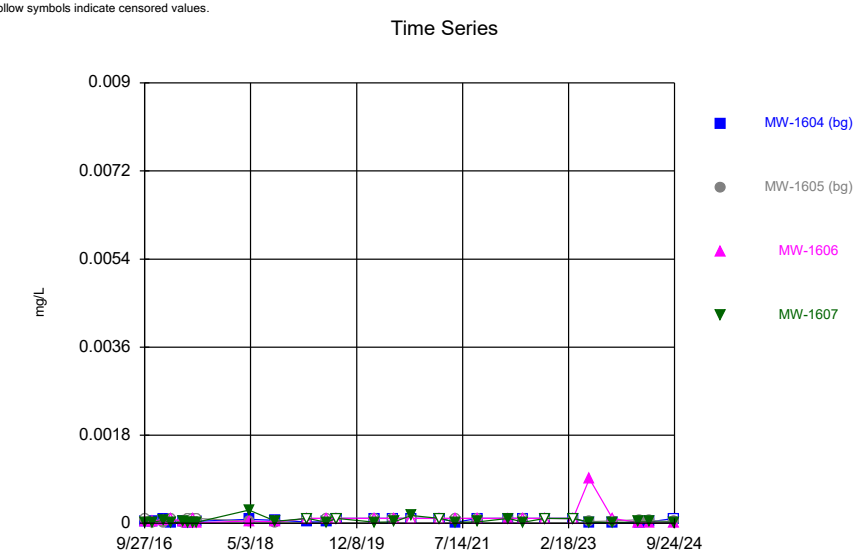
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



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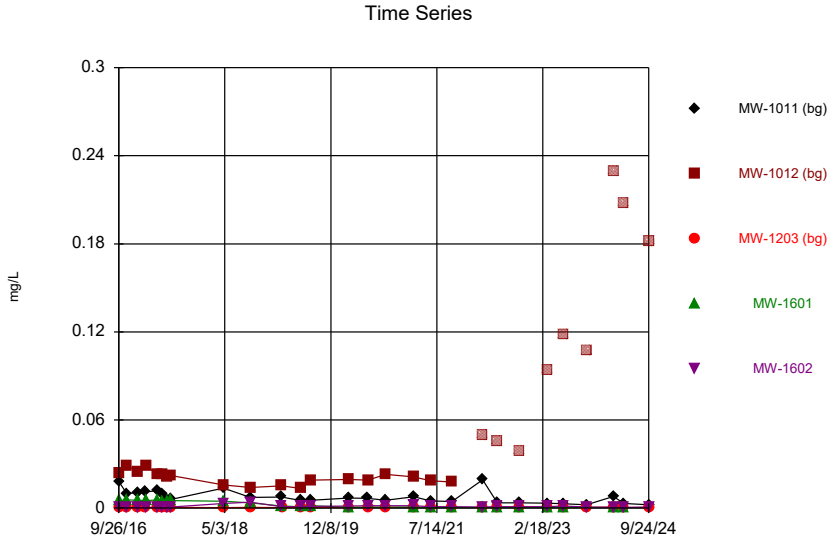
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Arsenic Analysis Run 1/14/2025 4:22 PM
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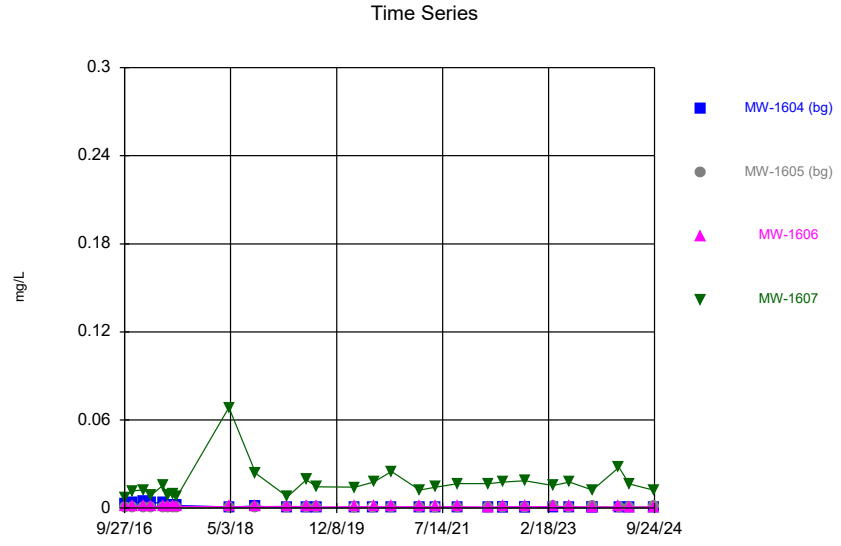

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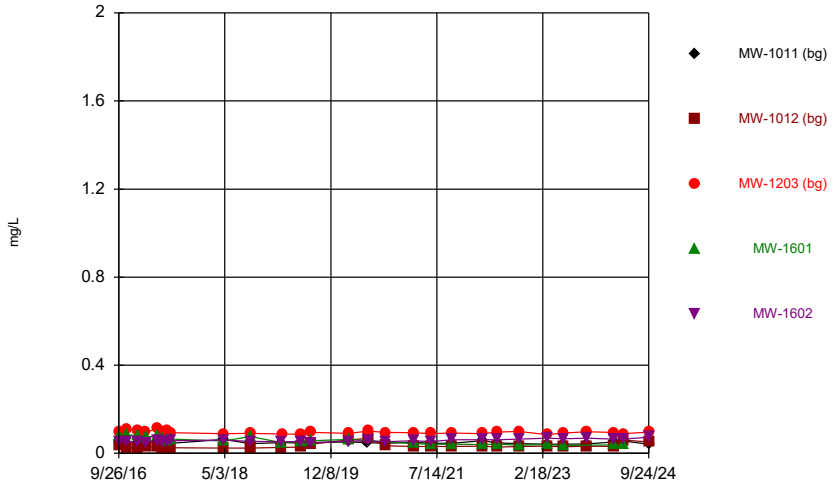
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Time Series

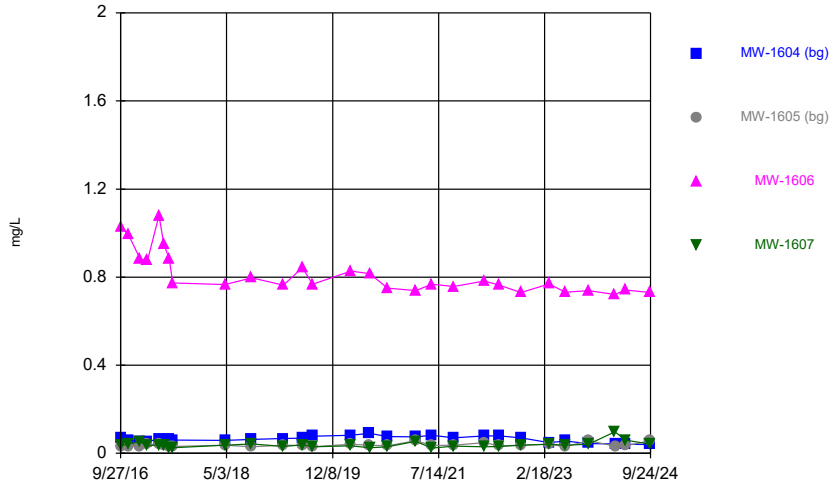


Constituent: Barium Analysis Run 1/14/2025 4:22 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Time Series



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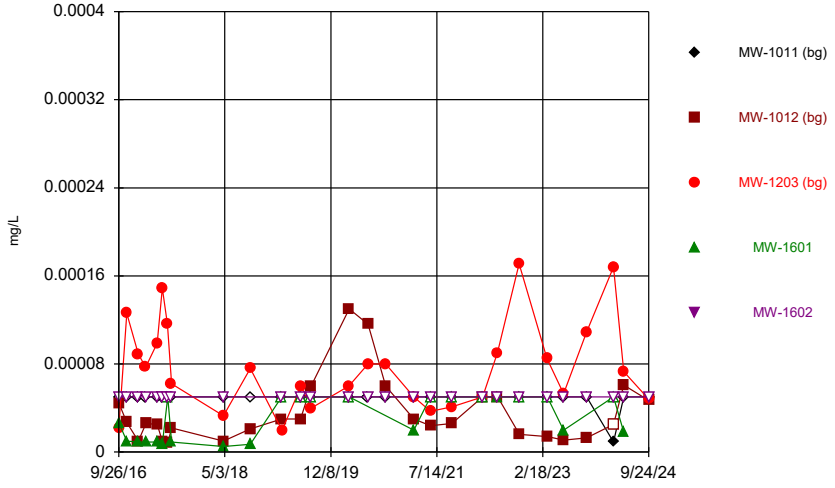
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series

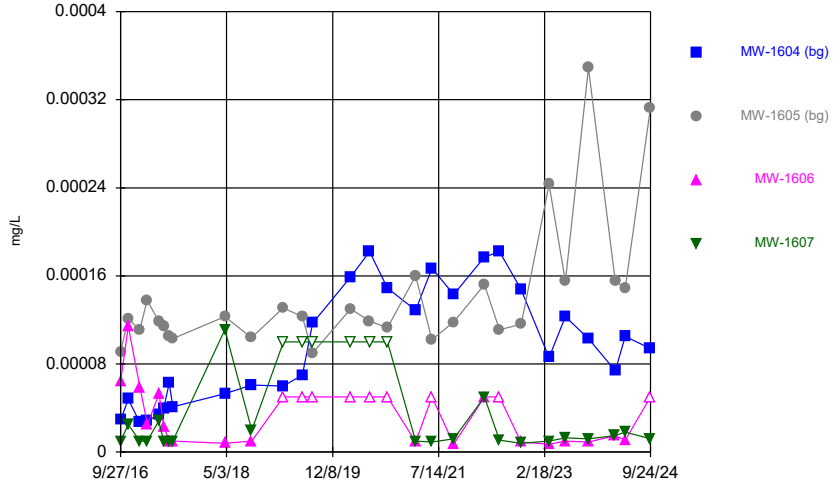


Constituent: Beryllium Analysis Run 1/14/2025 4:22 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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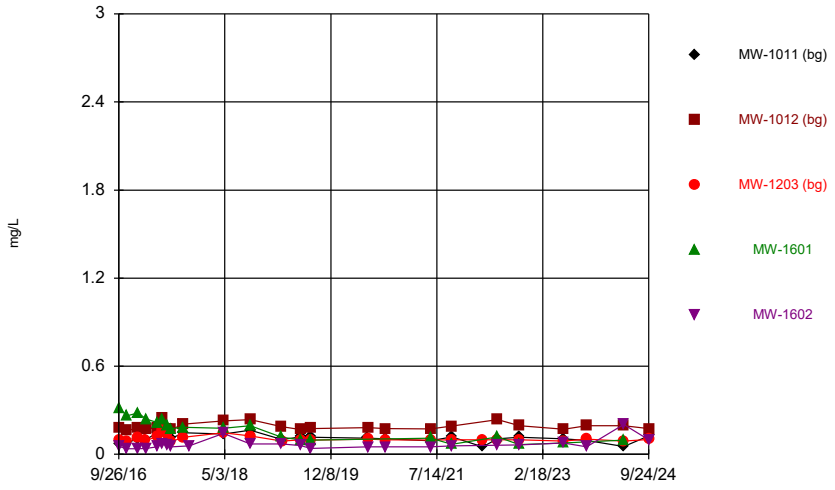
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Time Series



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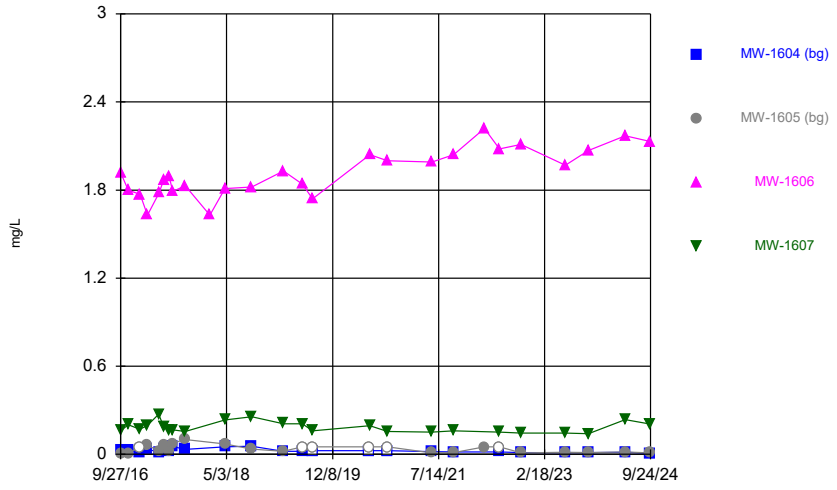
Hollow symbols indicate censored values.

Time Series



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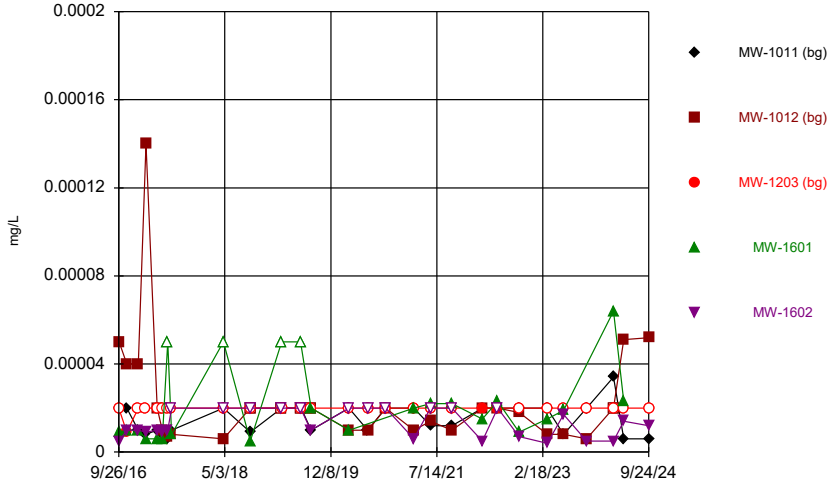
Hollow symbols indicate censored values.

Time Series



Constituent: Cadmium Analysis Run 1/14/2025 4:22 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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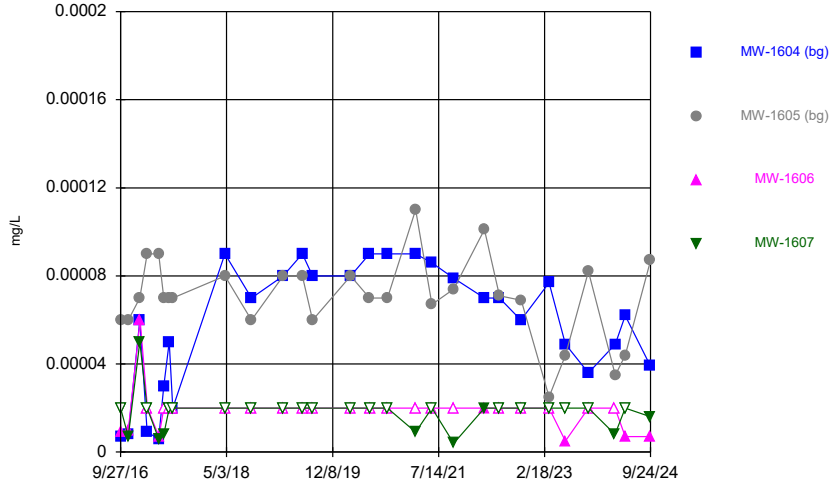
Hollow symbols indicate censored values.

Time Series



Constituent: Cadmium Analysis Run 1/14/2025 4:22 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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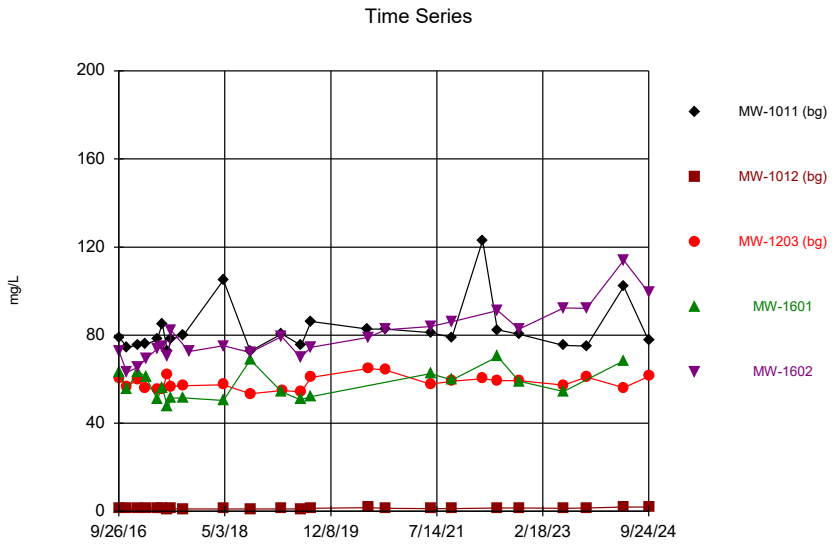

Constituent: Calcium Analysis Run 1/14/2025 4:22 PM
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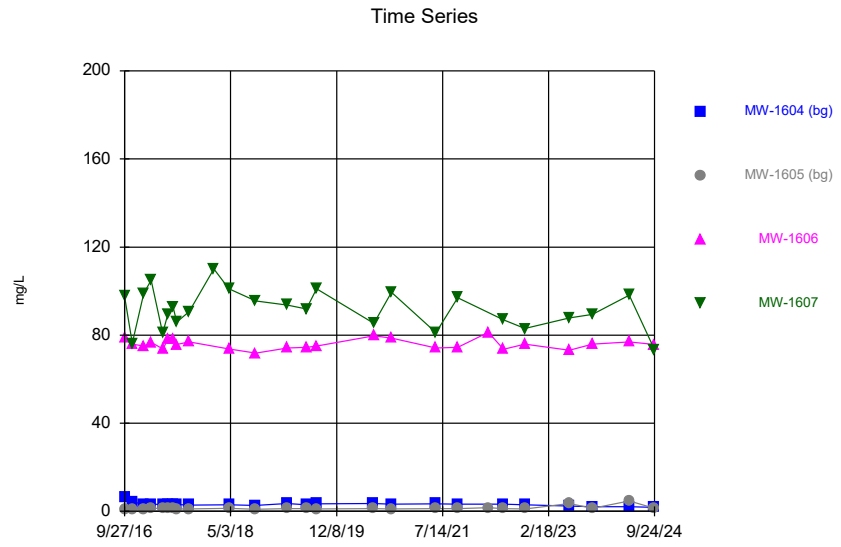

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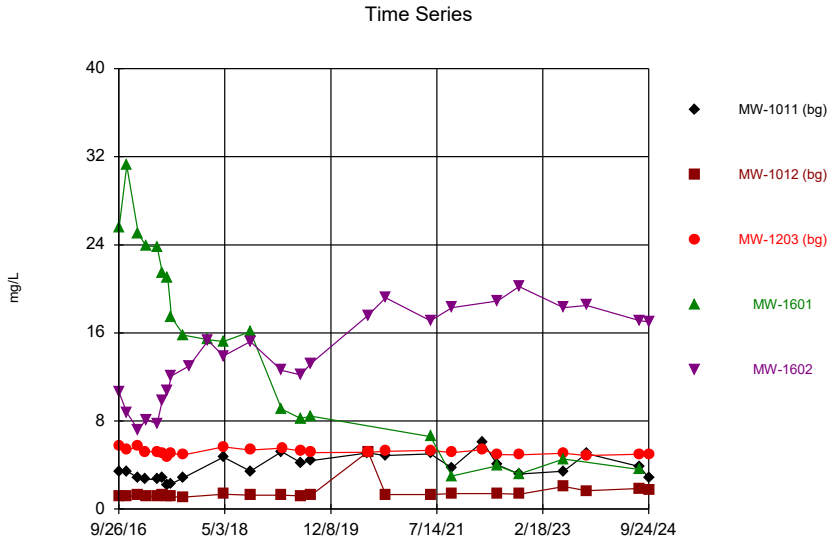

Constituent: Chloride Analysis Run 1/14/2025 4:22 PM
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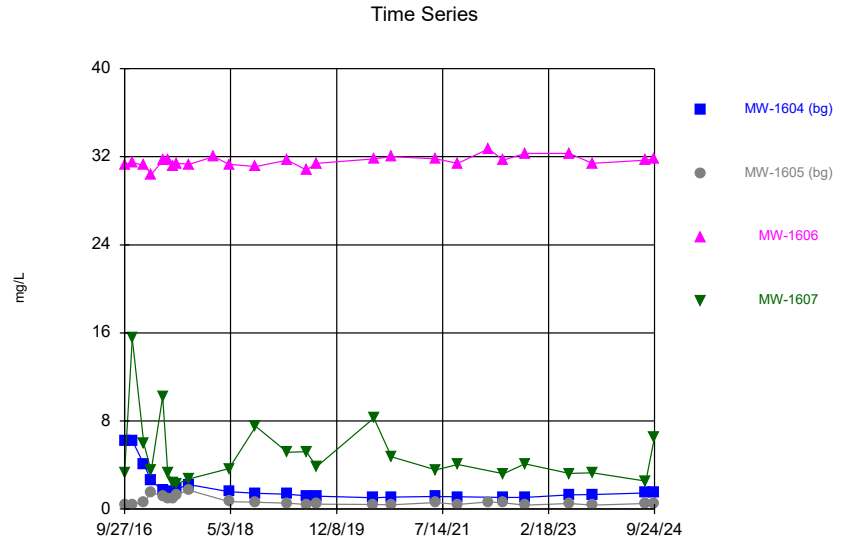

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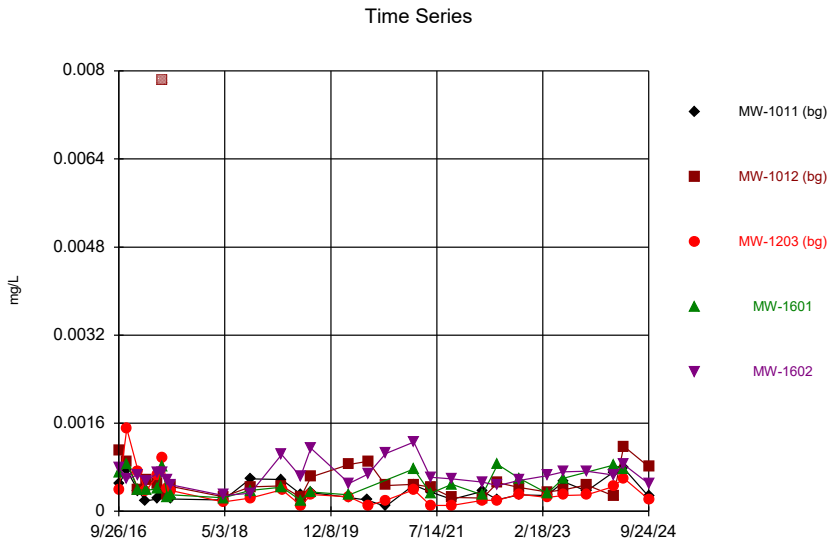

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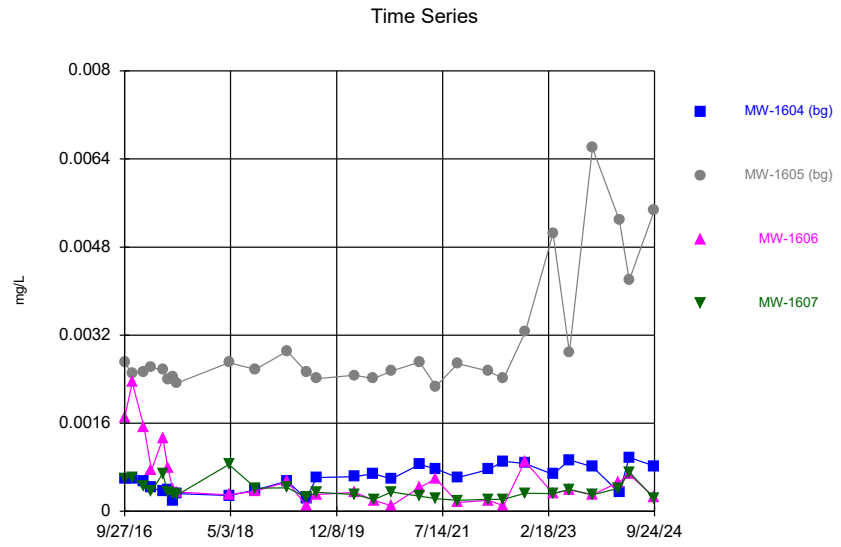

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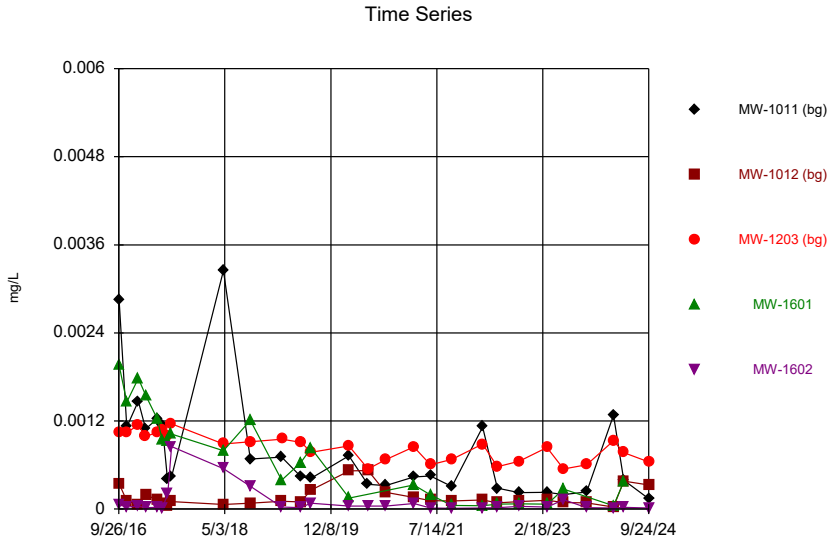

Constituent: Cobalt Analysis Run 1/14/2025 4:23 PM
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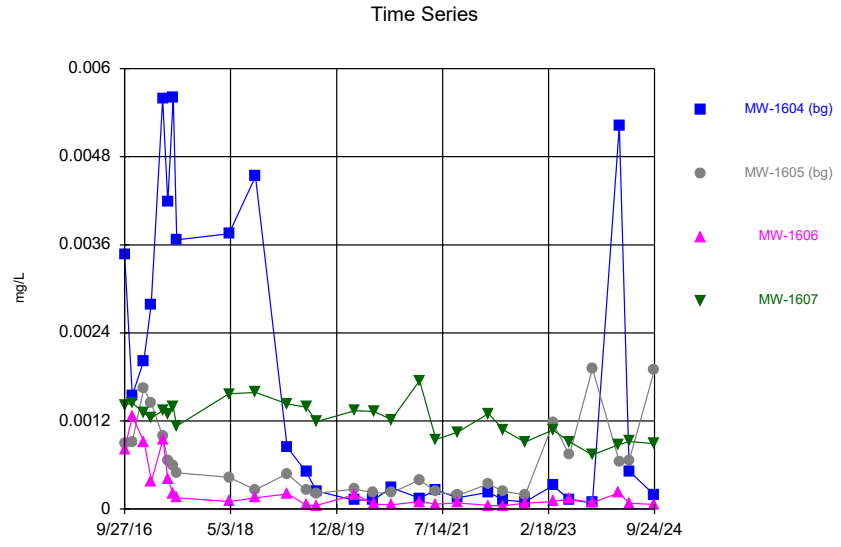

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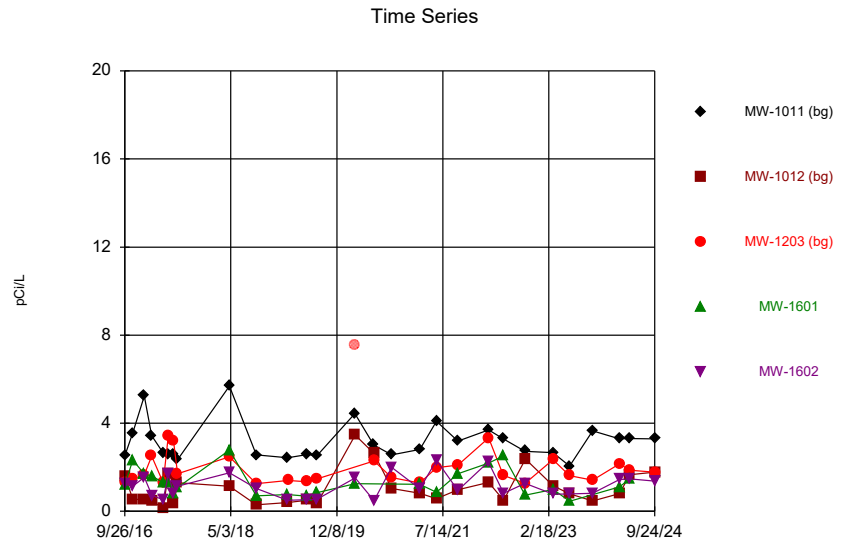
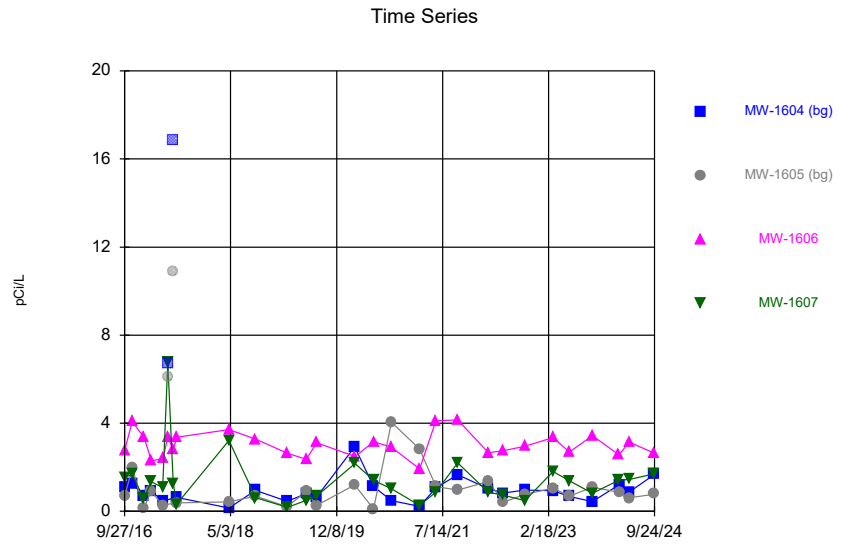
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Combined Radium 226 + 228 Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Combined Radium 226 + 228 Analysis Run 1/14/2025 4:23 PM

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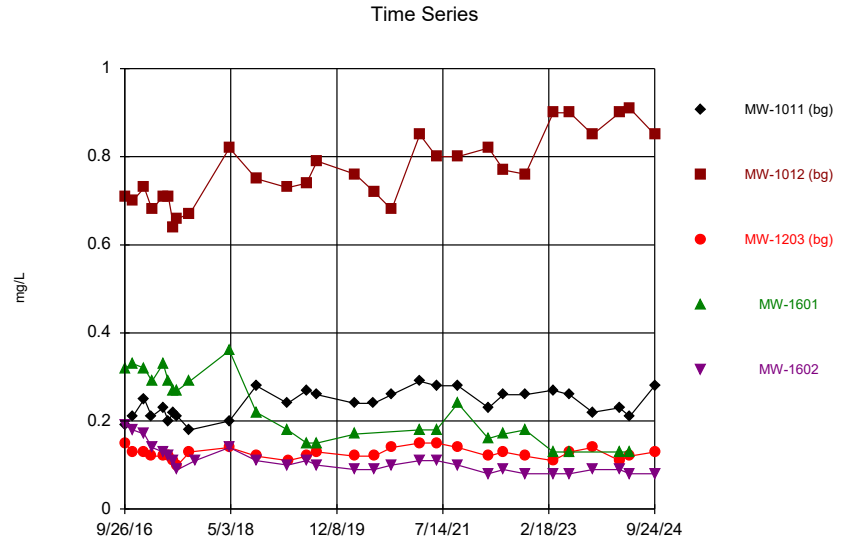
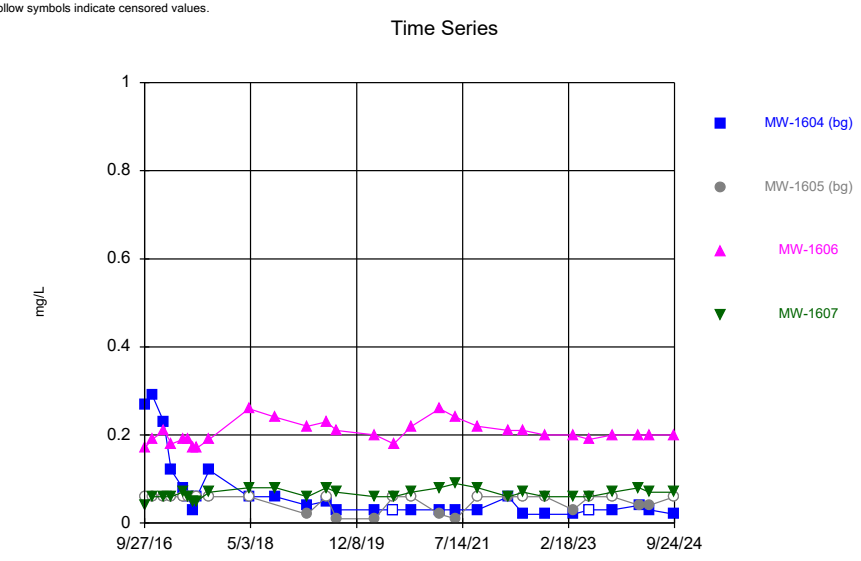
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Fluoride Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



Constituent: Fluoride Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
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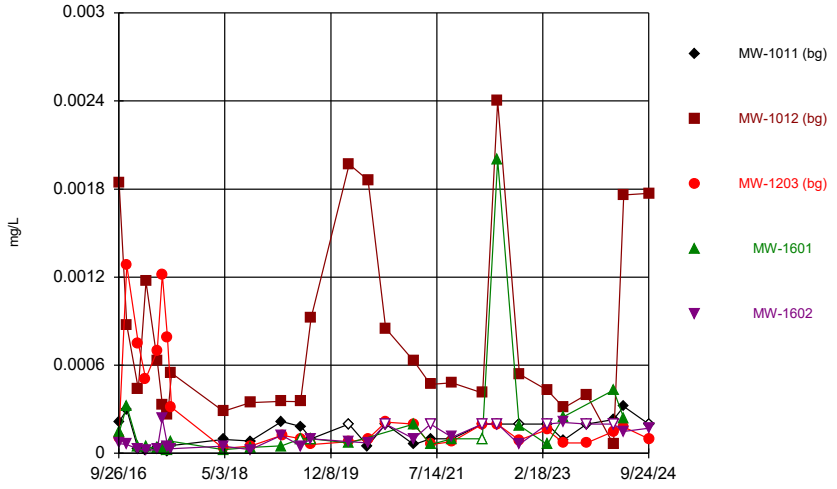
Time Series



Constituent: Lead Analysis Run 1/14/2025 4:23 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
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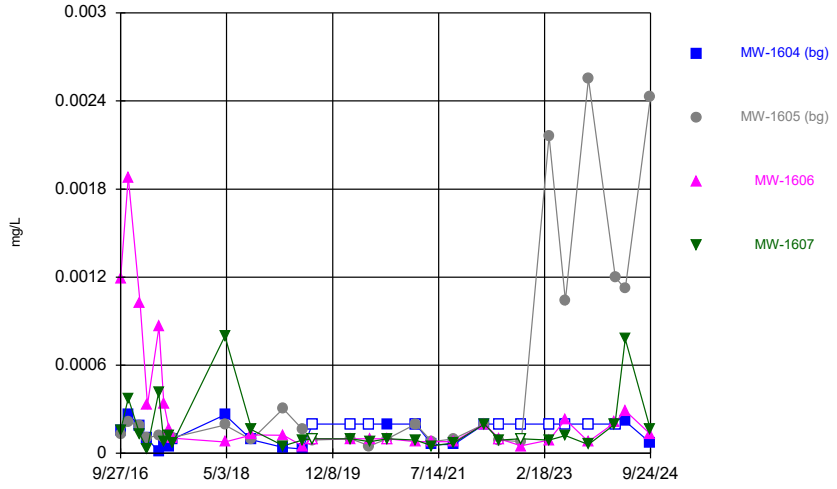
Time Series



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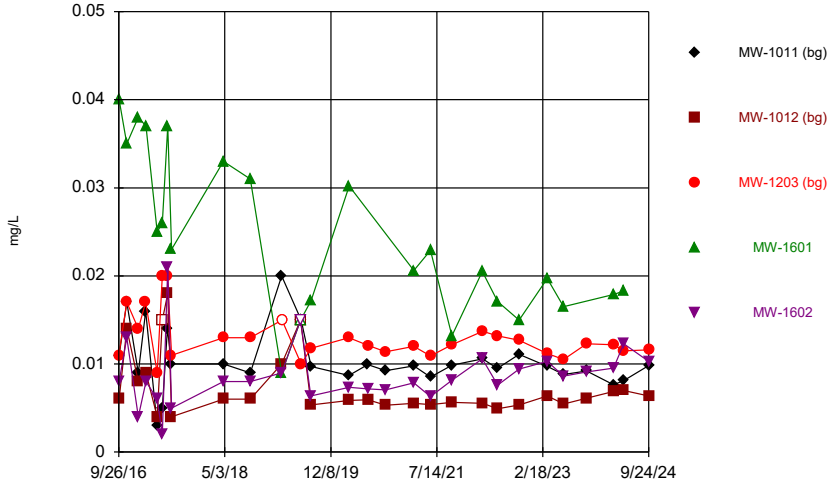

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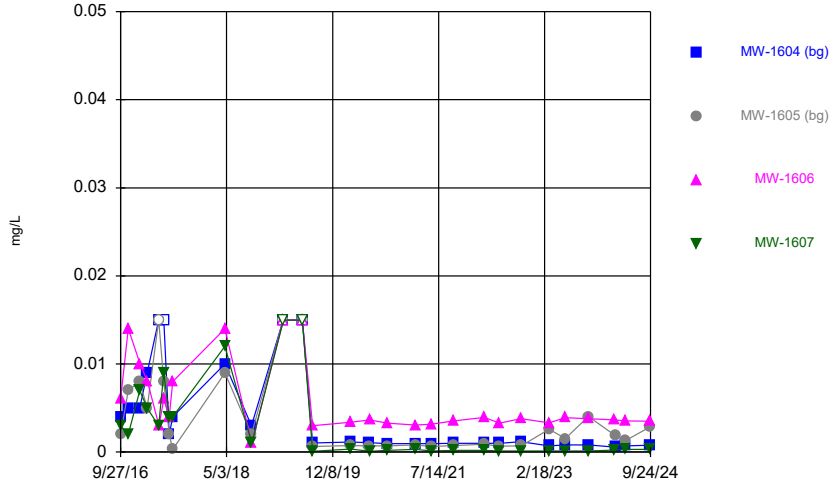
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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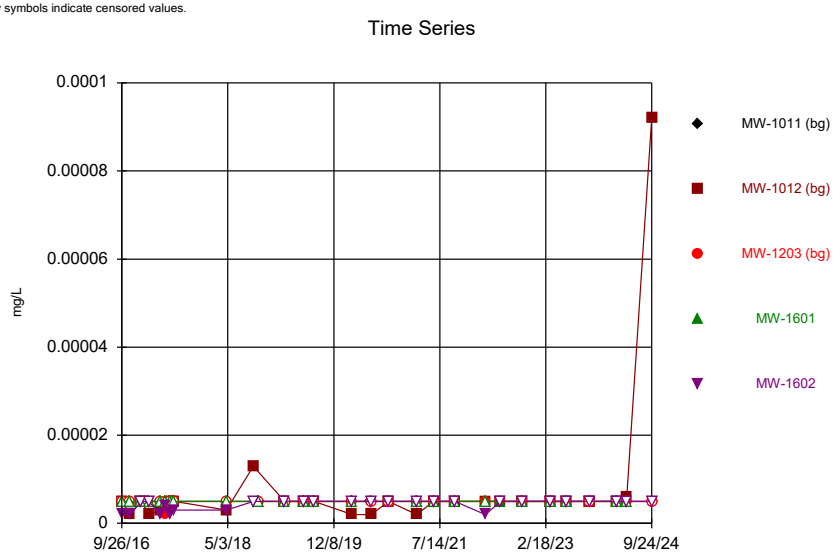
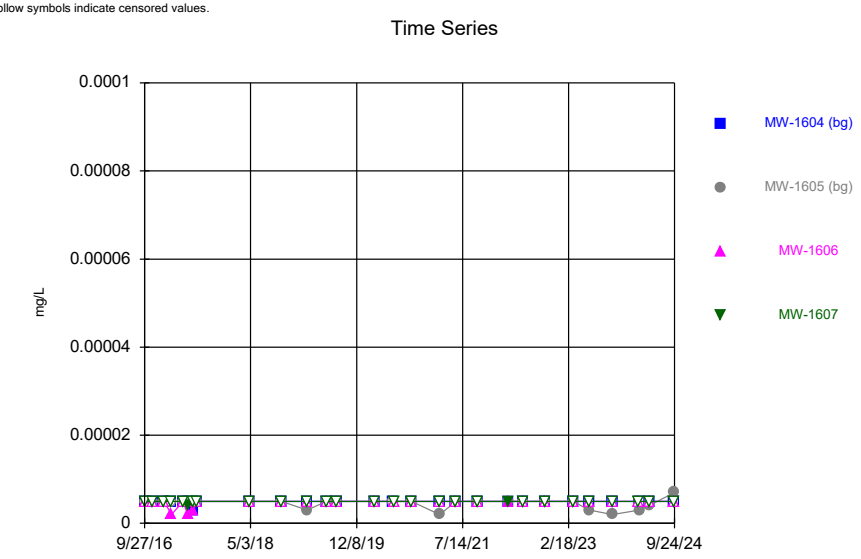
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



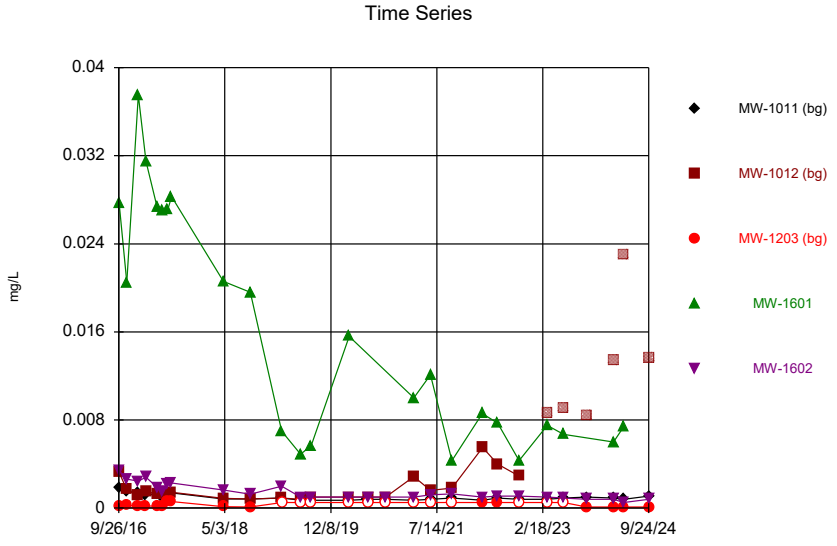
Constituent: Mercury Analysis Run 1/14/2025 4:23 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



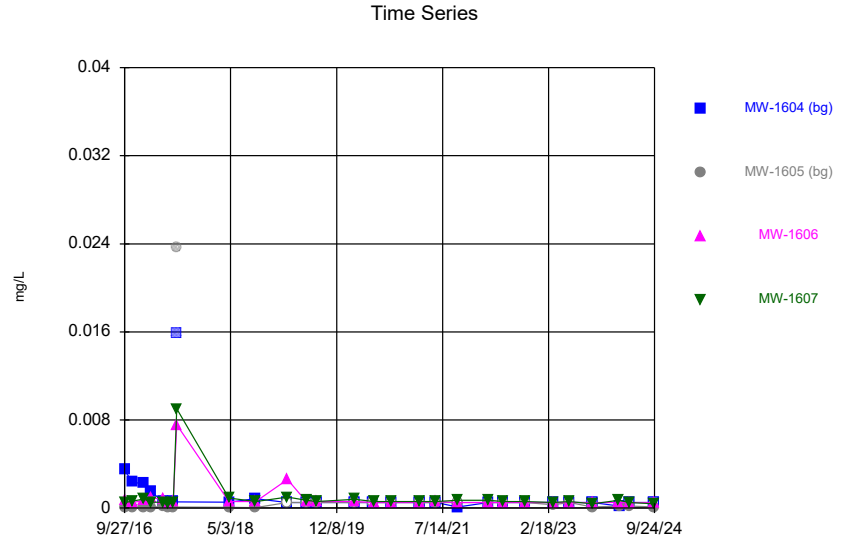
Constituent: Mercury Analysis Run 1/14/2025 4:23 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



Constituent: Molybdenum Analysis Run 1/14/2025 4:23 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

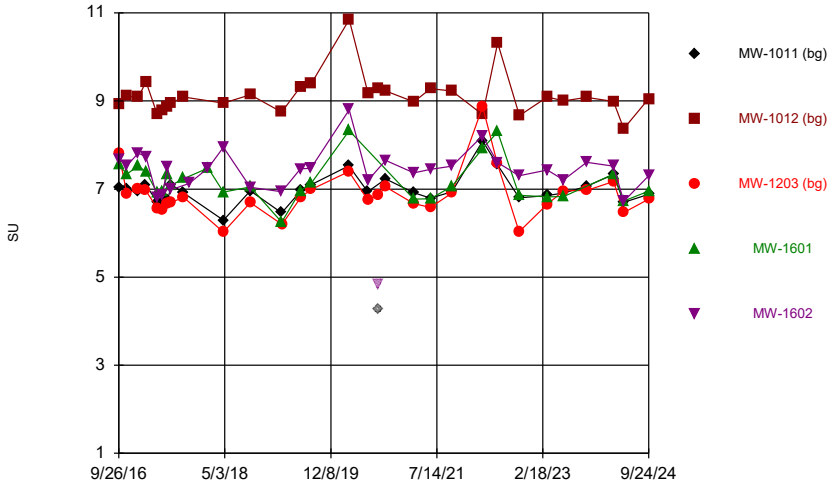
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



Constituent: Molybdenum Analysis Run 1/14/2025 4:23 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Time Series

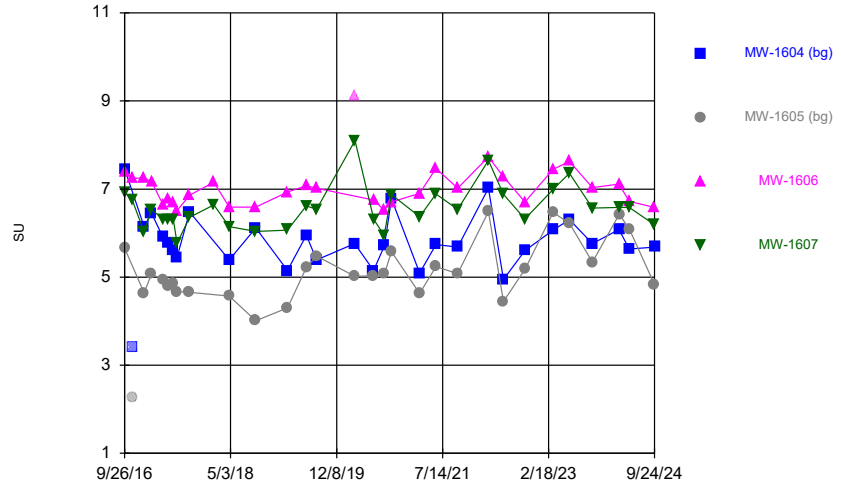


Constituent: pH Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Time Series

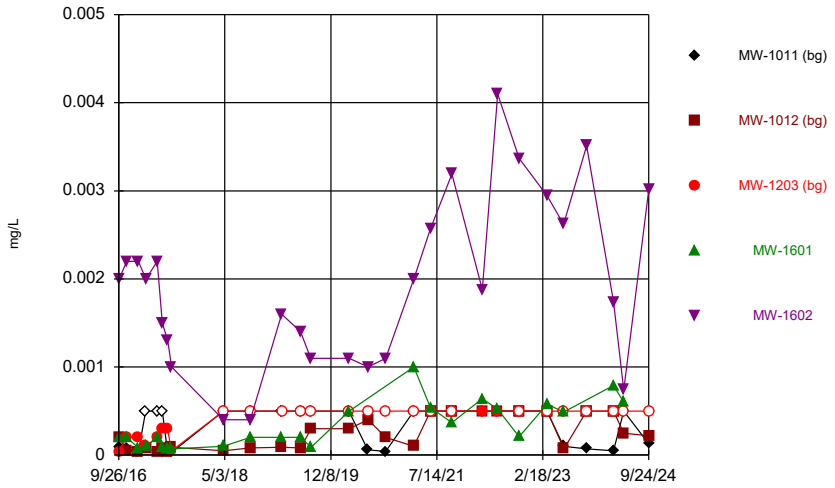


Constituent: pH Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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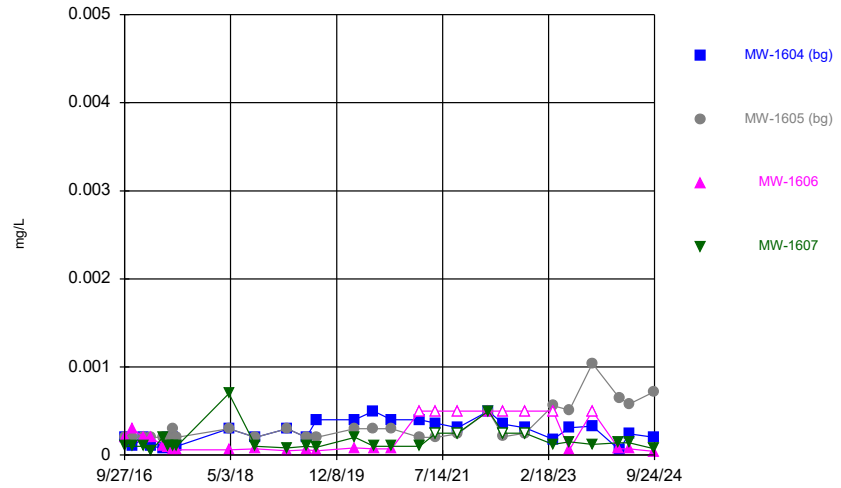
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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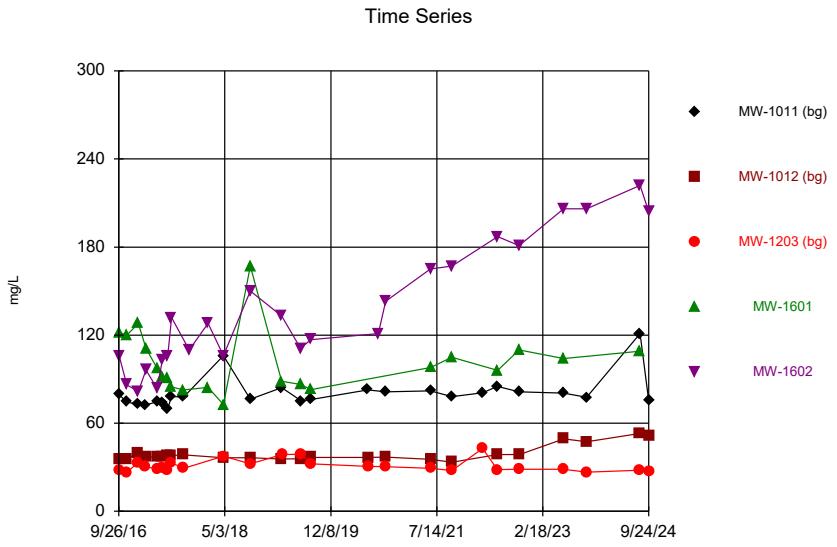
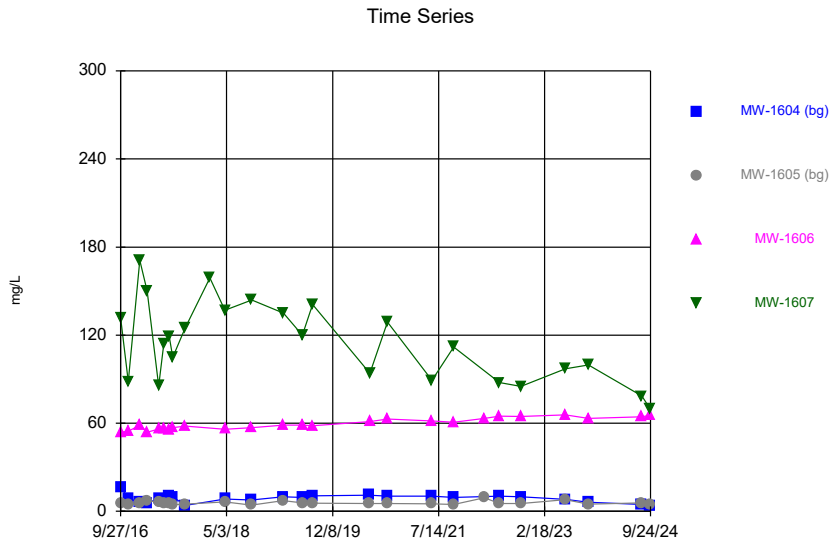


Constituent: Sulfate Analysis Run 1/14/2025 4:23 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



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Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
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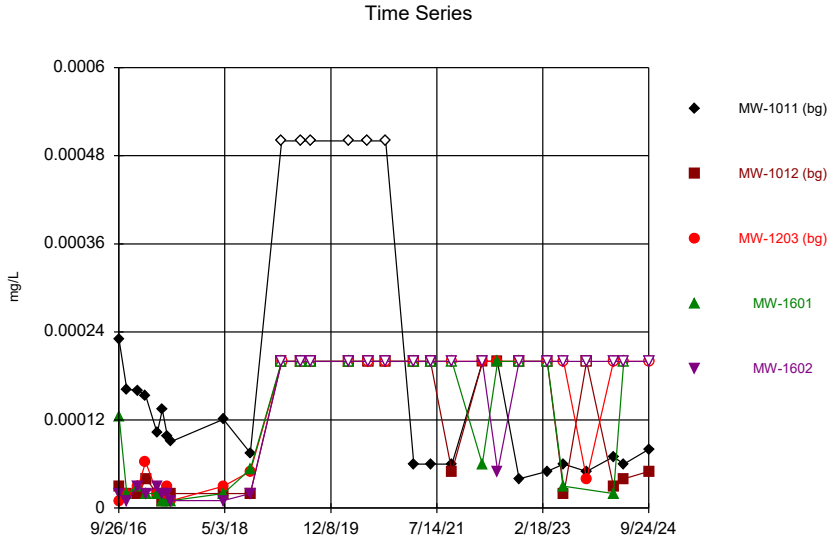

Constituent: Thallium Analysis Run 1/14/2025 4:23 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG
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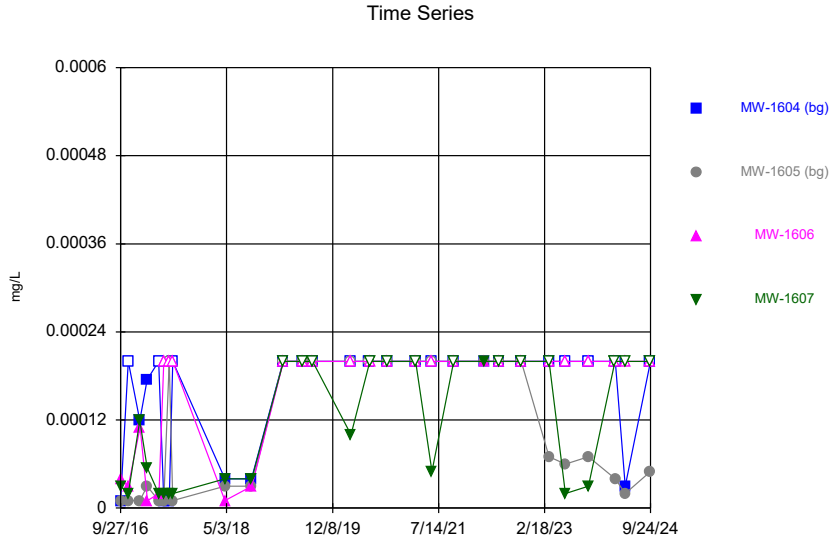

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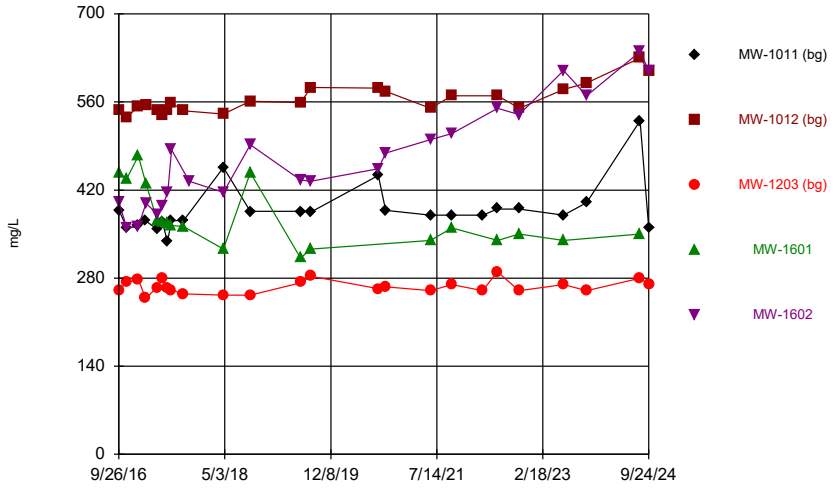
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Total Dissolved Solids Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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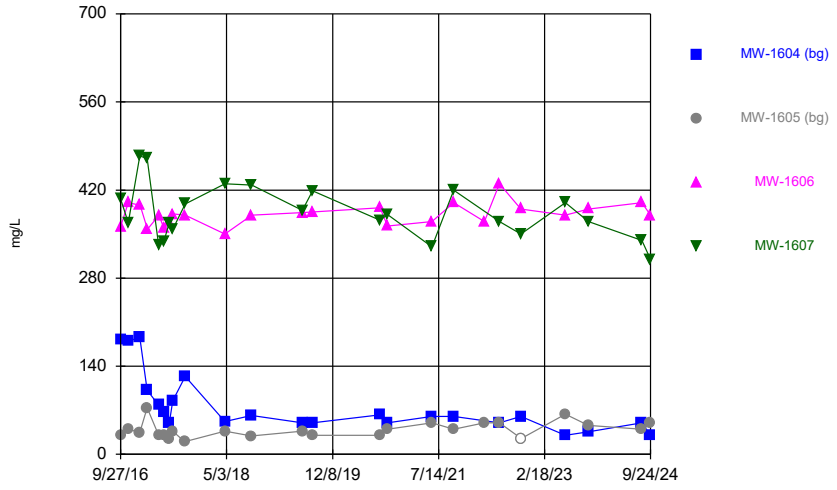
Hollow symbols indicate censored values.

Time Series



Constituent: Total Dissolved Solids Analysis Run 1/14/2025 4:23 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE B

Box Plots

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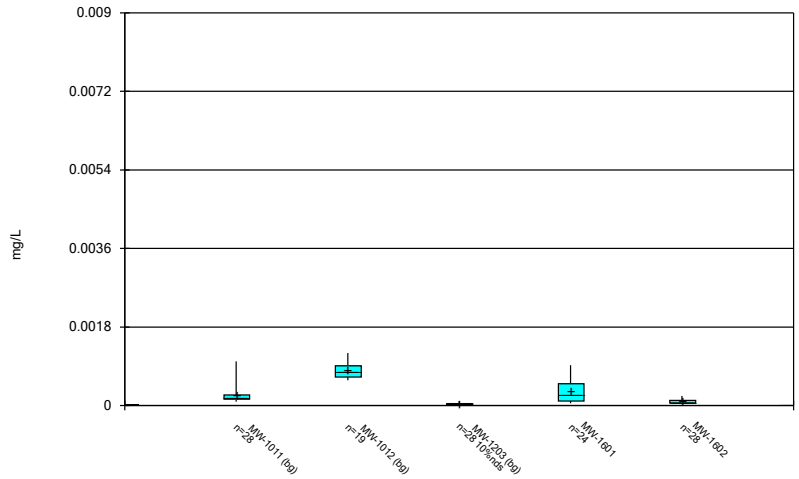
Box & Whiskers Plot



Constituent: Antimony Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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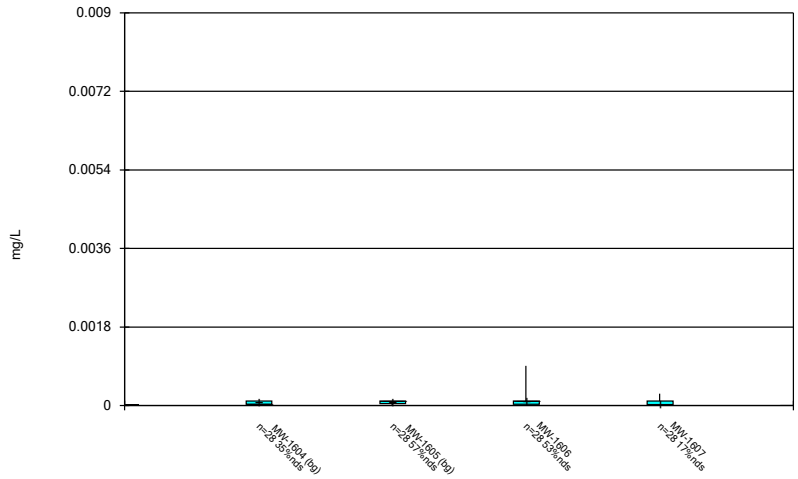
Box & Whiskers Plot



Constituent: Antimony Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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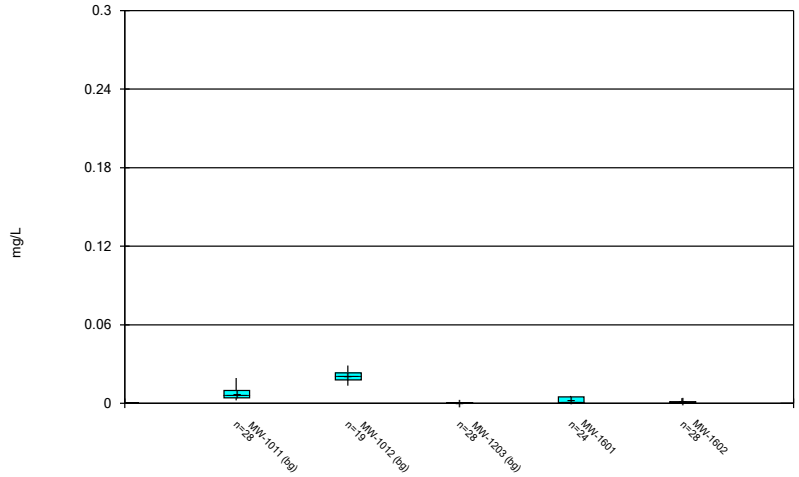
Box & Whiskers Plot



Constituent: Arsenic Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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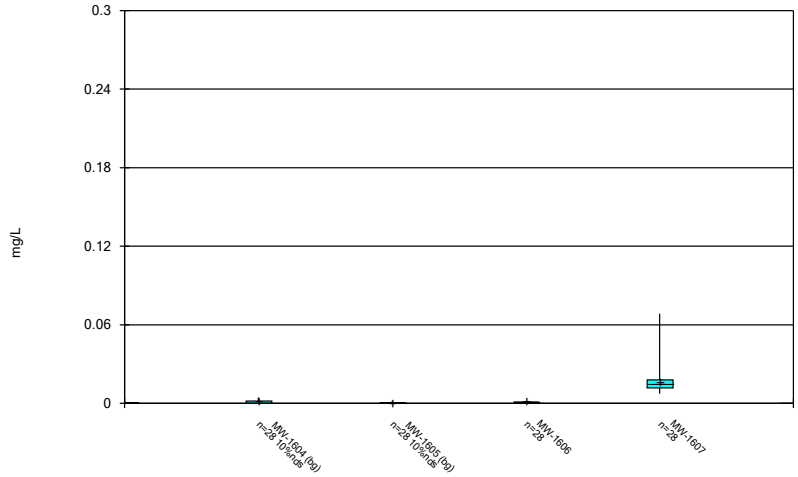
Box & Whiskers Plot



Constituent: Arsenic Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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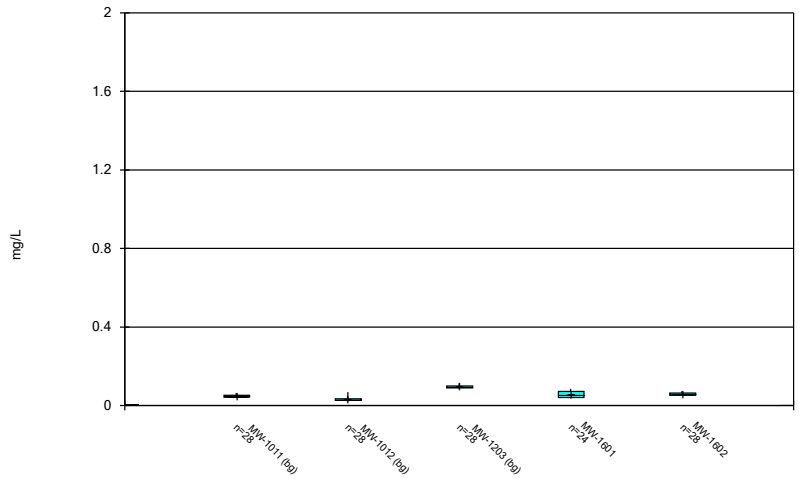
Box & Whiskers Plot



Constituent: Barium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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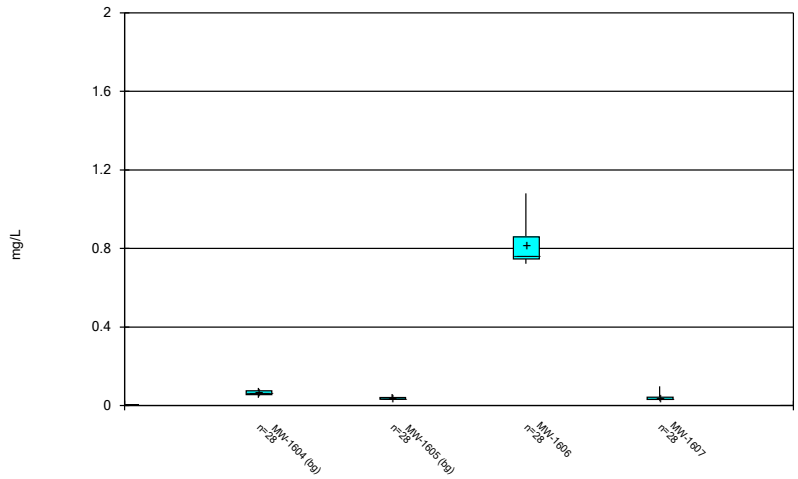
Box & Whiskers Plot



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Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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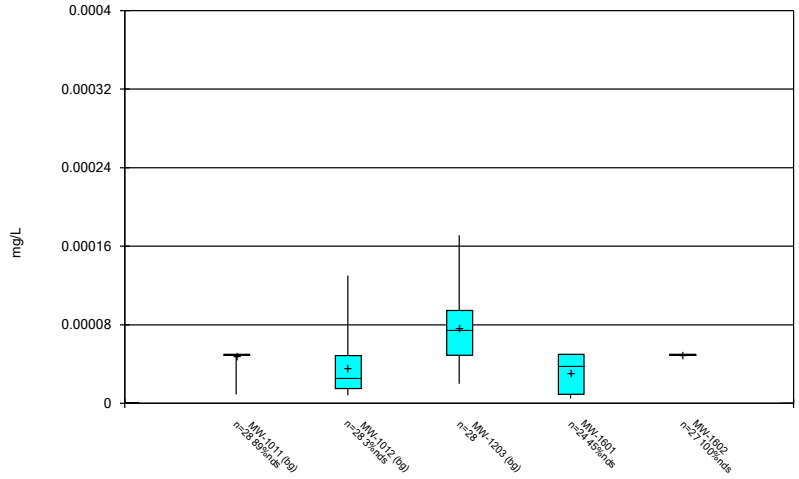
Box & Whiskers Plot



Constituent: Beryllium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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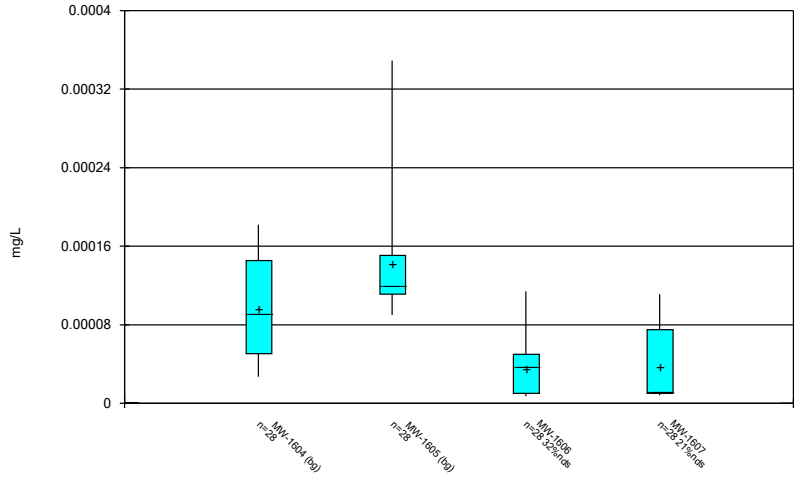
Box & Whiskers Plot



Constituent: Beryllium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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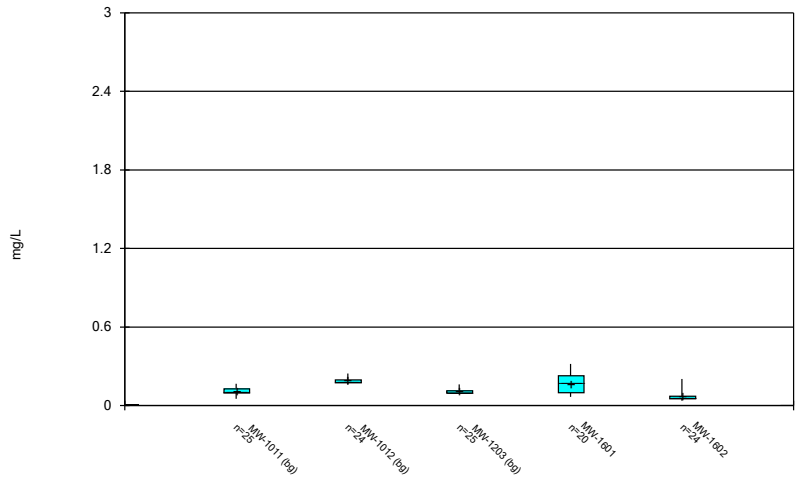
Box & Whiskers Plot



Constituent: Boron Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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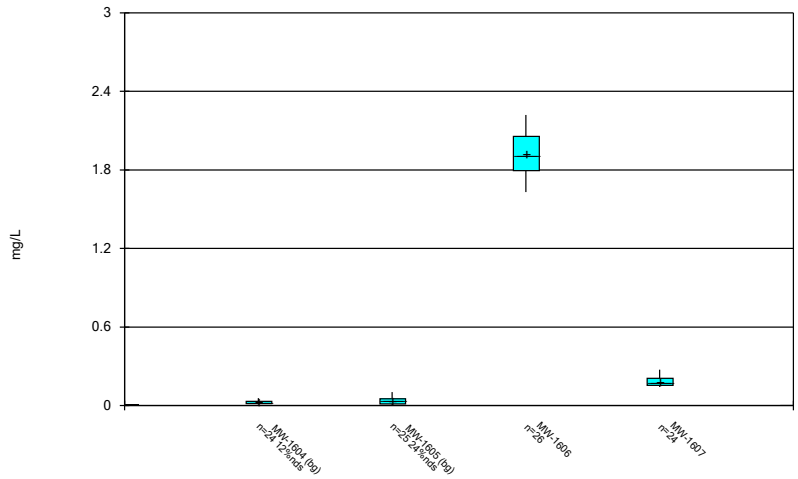
Box & Whiskers Plot



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Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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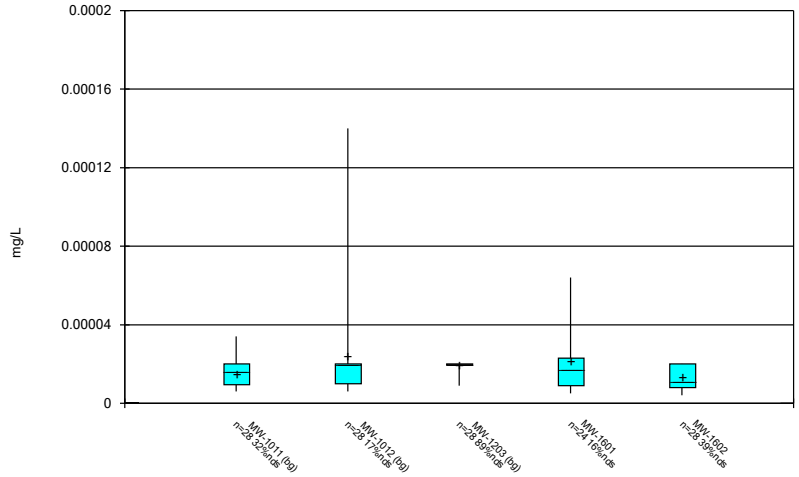
Box & Whiskers Plot



Constituent: Cadmium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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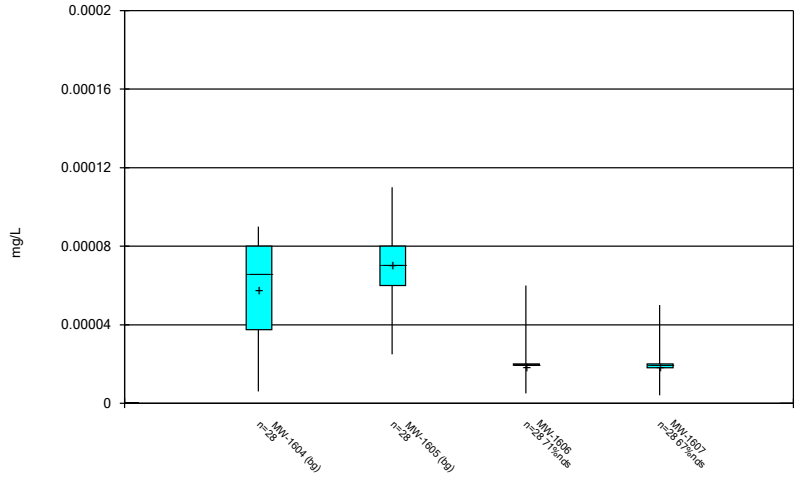
Box & Whiskers Plot



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Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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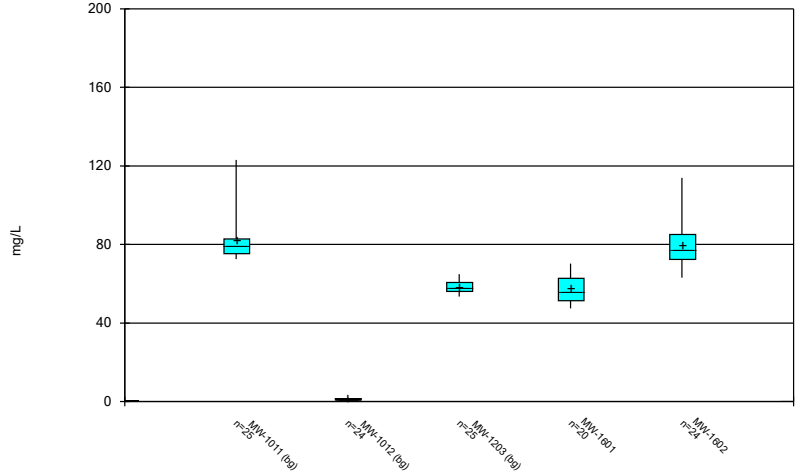
Box & Whiskers Plot



Constituent: Calcium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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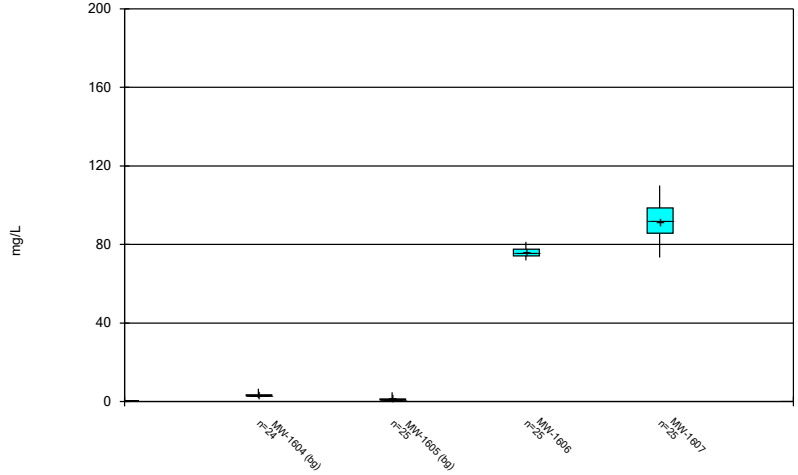
Box & Whiskers Plot



Constituent: Calcium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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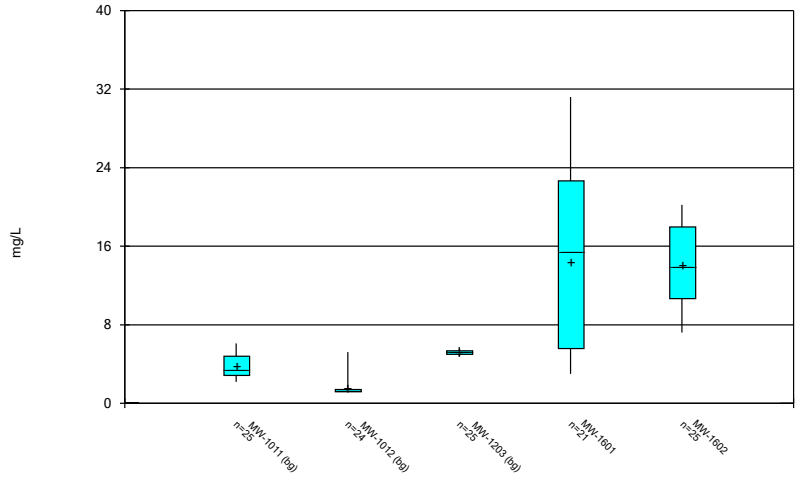
Box & Whiskers Plot



Constituent: Chloride Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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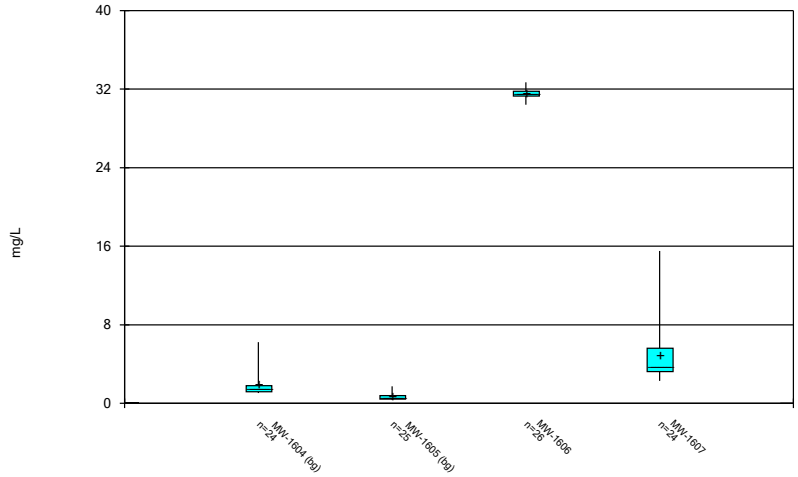
Box & Whiskers Plot



Constituent: Chloride Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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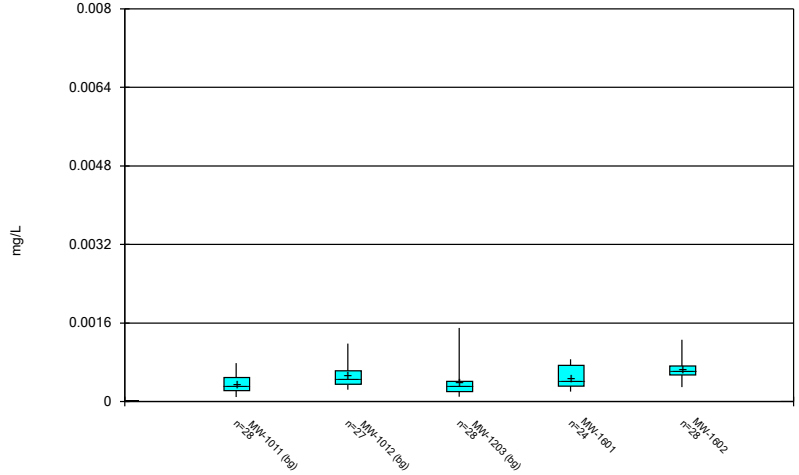
Box & Whiskers Plot



Constituent: Chromium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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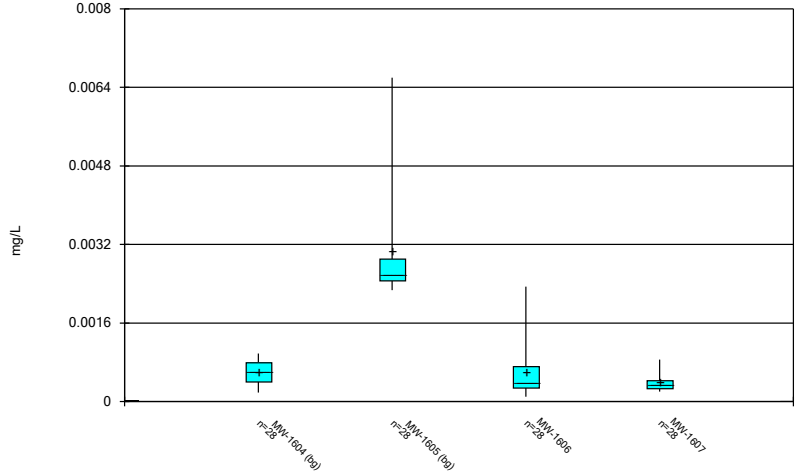
Box & Whiskers Plot



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Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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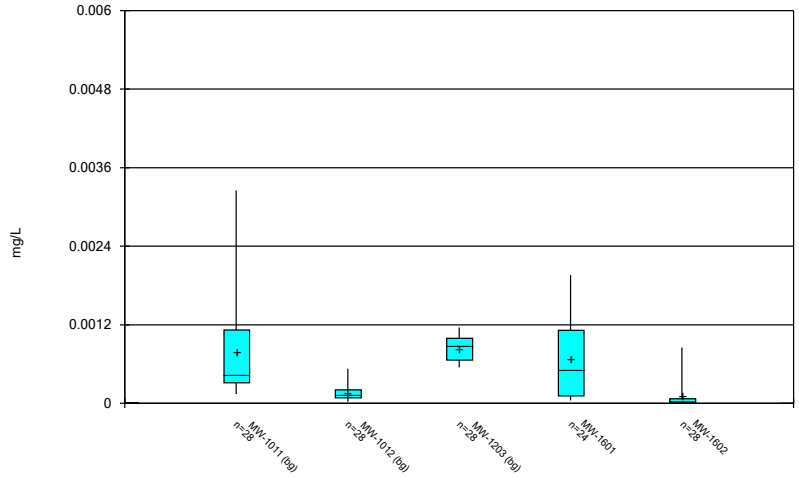
Box & Whiskers Plot



Constituent: Cobalt Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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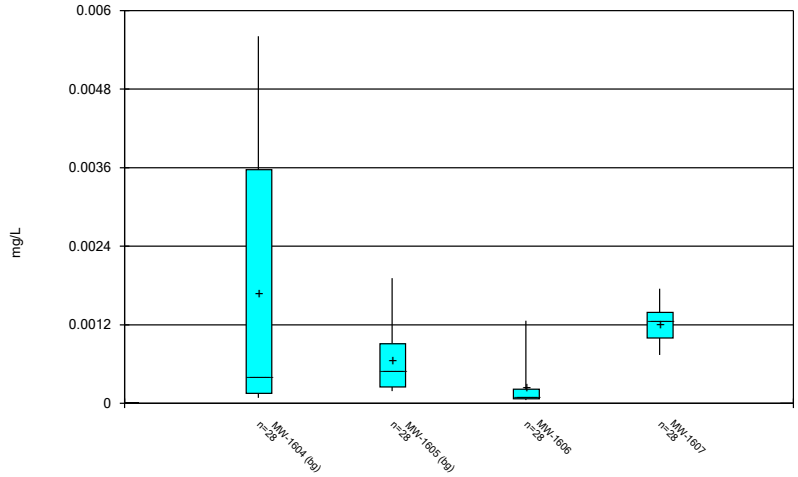
Box & Whiskers Plot



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Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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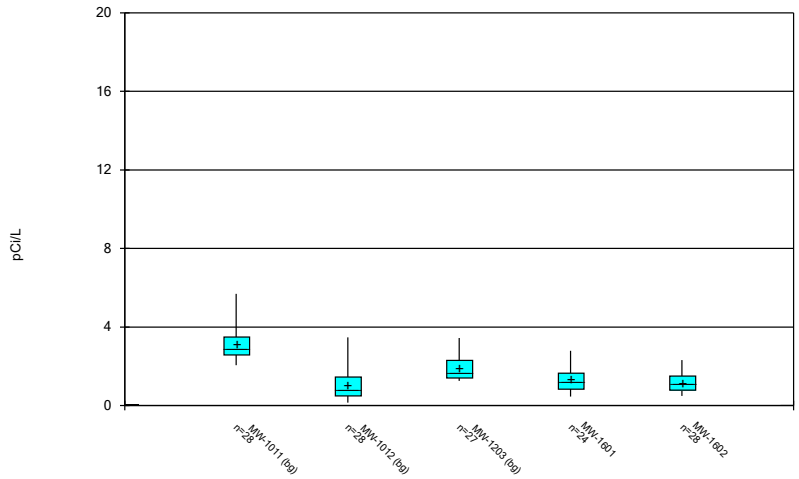
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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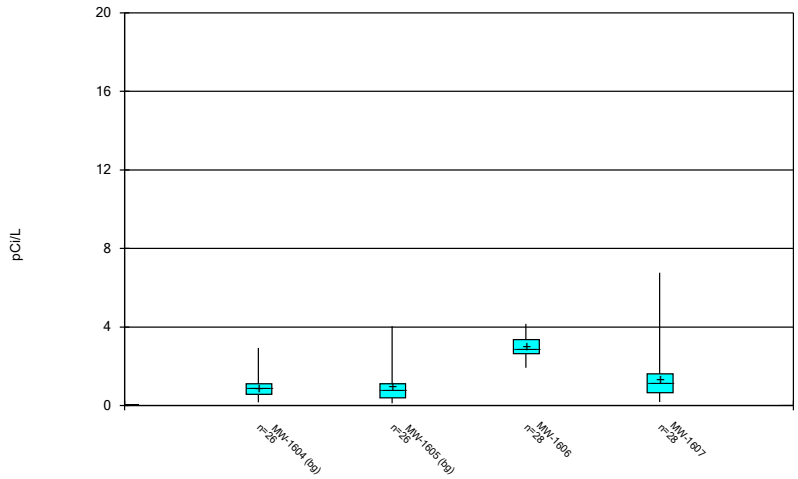
Box & Whiskers Plot



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Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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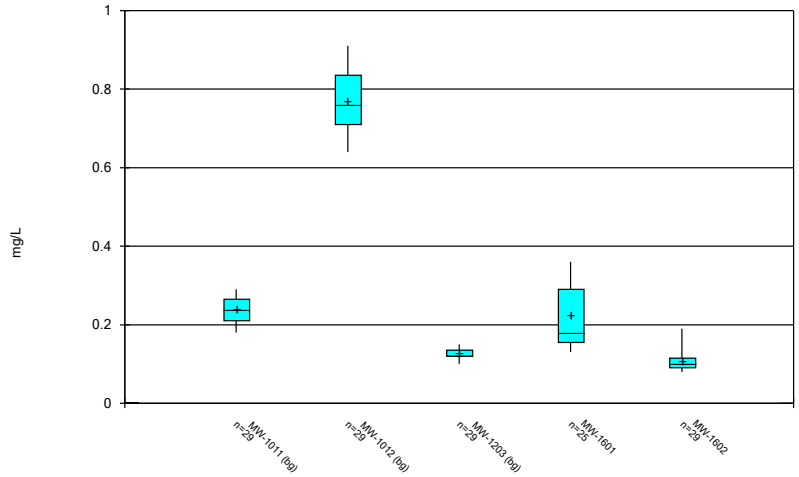
Box & Whiskers Plot



Constituent: Fluoride Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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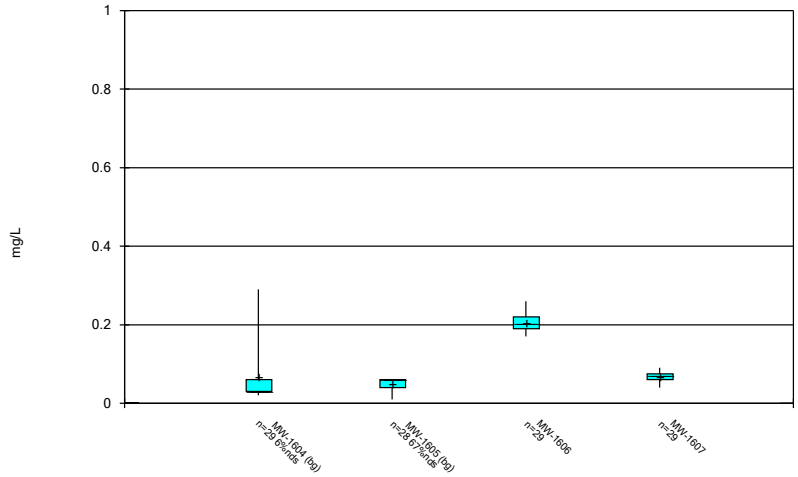
Box & Whiskers Plot



Constituent: Fluoride Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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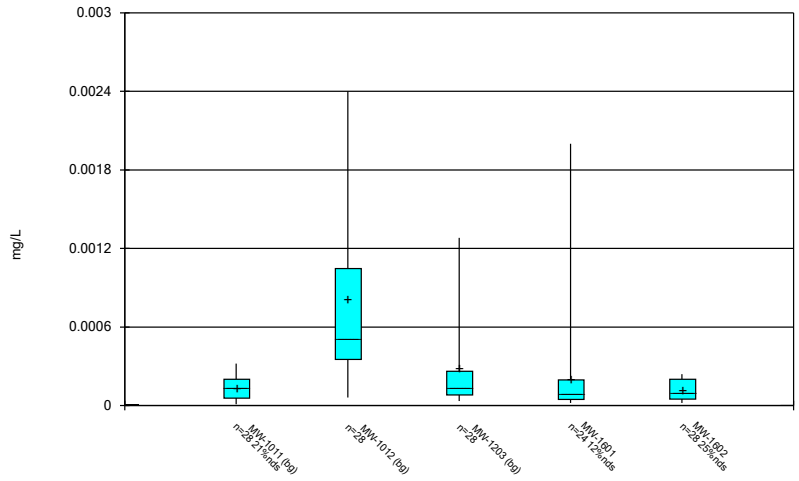
Box & Whiskers Plot



Constituent: Lead Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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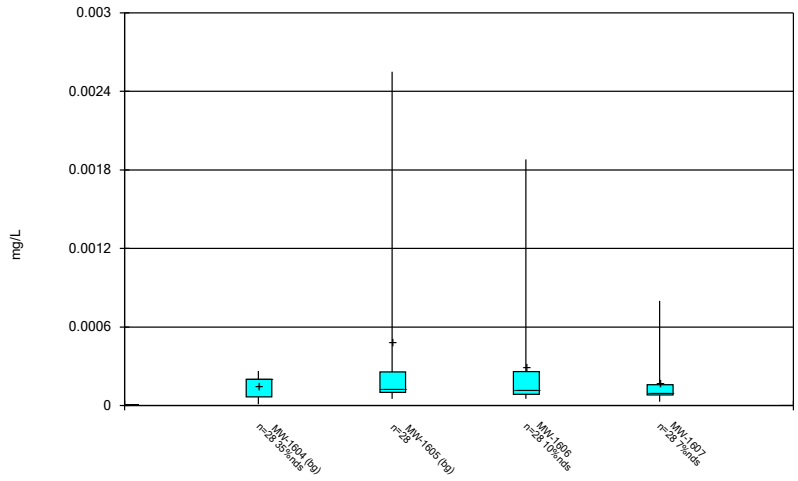
Box & Whiskers Plot



Constituent: Lead Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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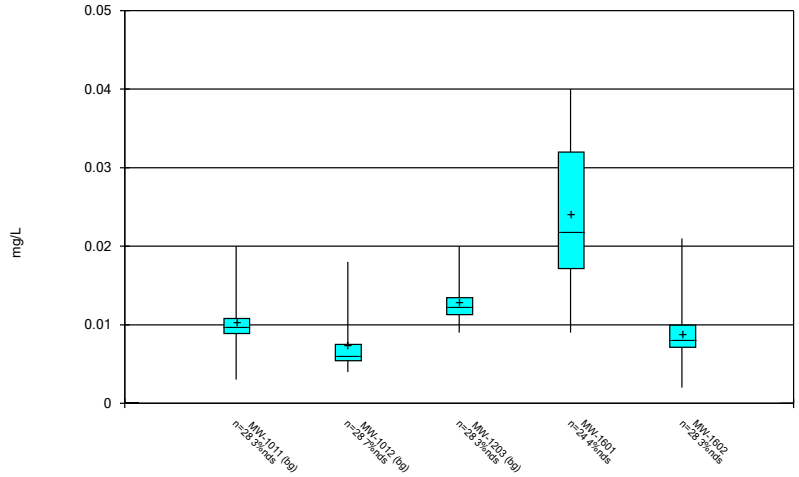
Box & Whiskers Plot

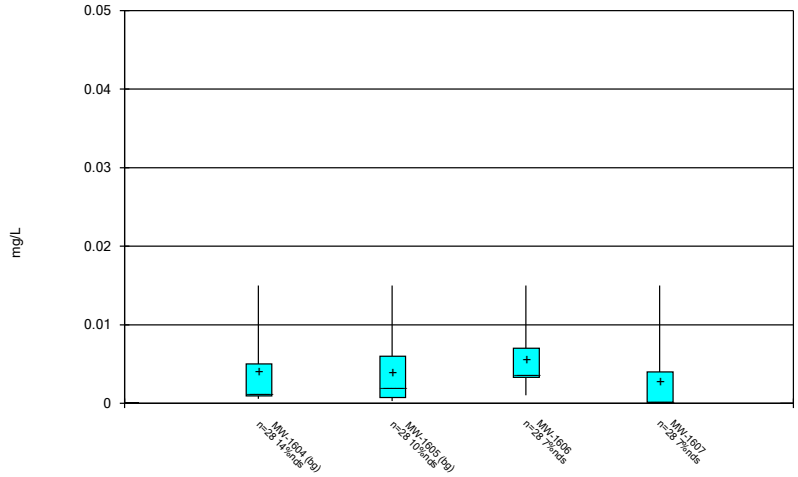


Constituent: Lithium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Lithium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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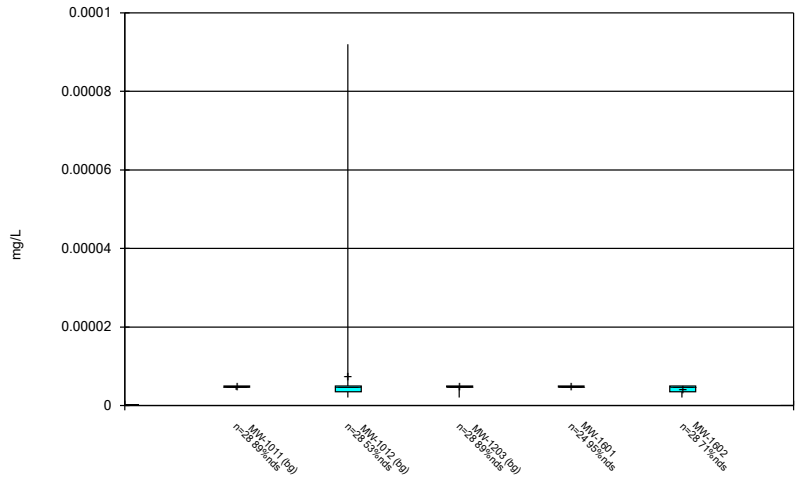
Box & Whiskers Plot



Constituent: Mercury Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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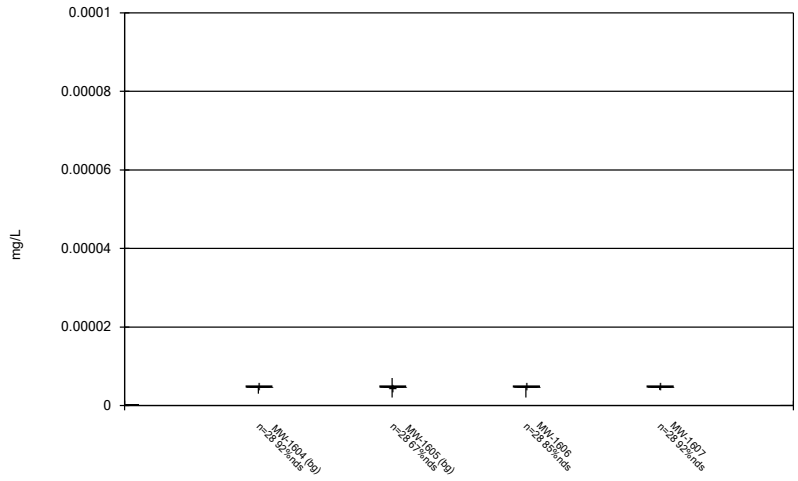
Box & Whiskers Plot



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Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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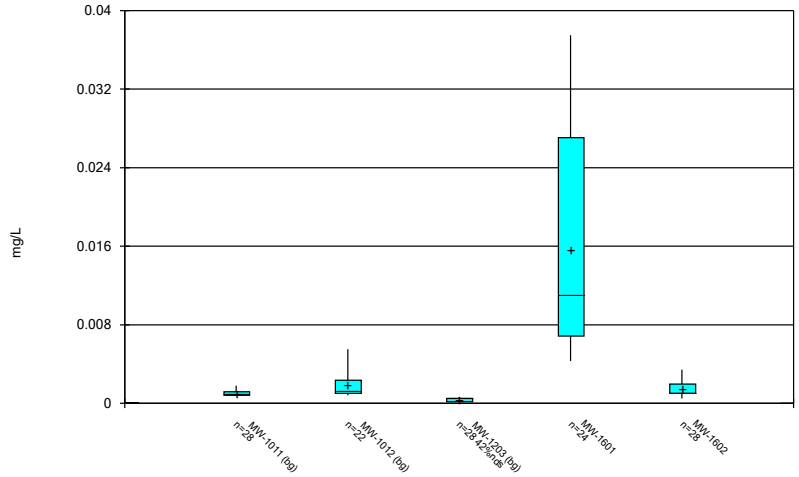
Box & Whiskers Plot



Constituent: Molybdenum Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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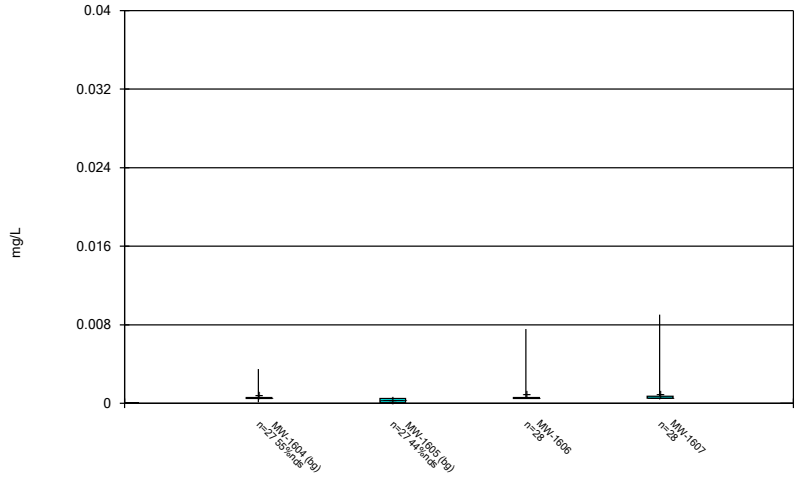
Box & Whiskers Plot



Constituent: Molybdenum Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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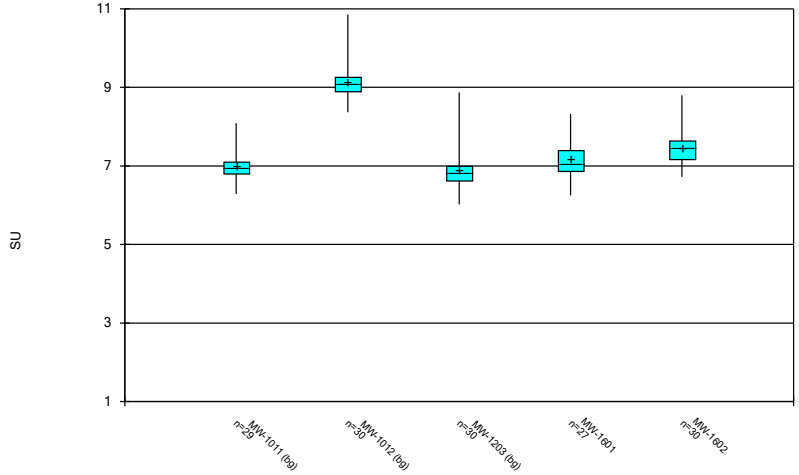
Box & Whiskers Plot



Constituent: pH Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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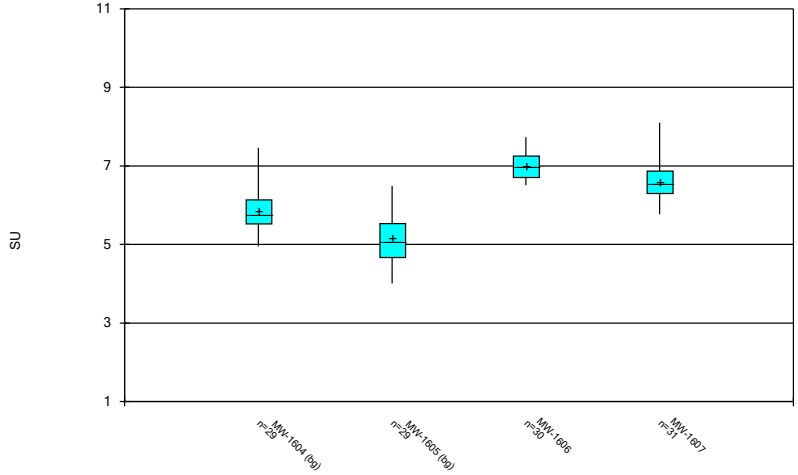
Box & Whiskers Plot



Constituent: pH Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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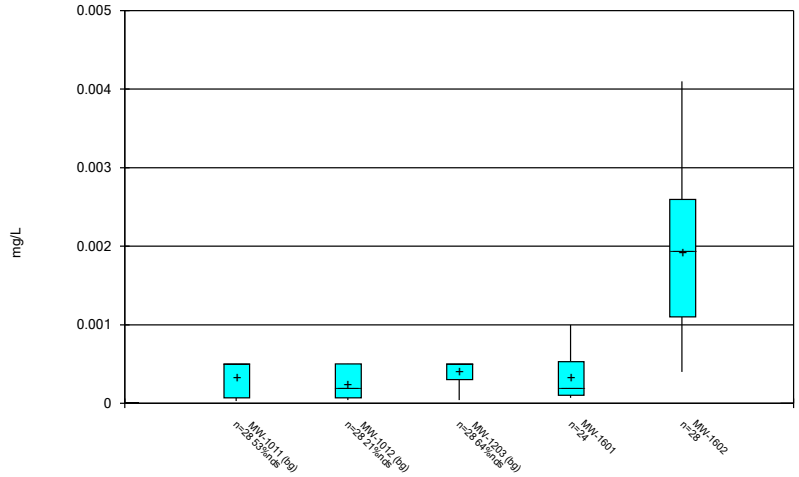
Box & Whiskers Plot



Constituent: Selenium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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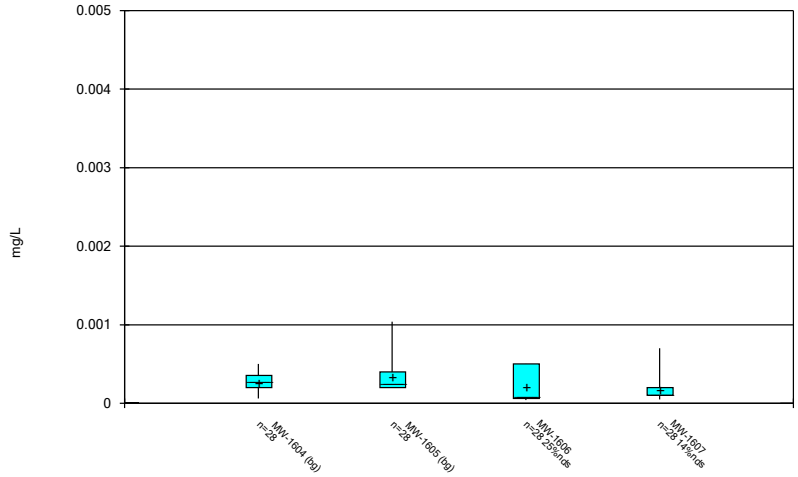
Box & Whiskers Plot



Constituent: Selenium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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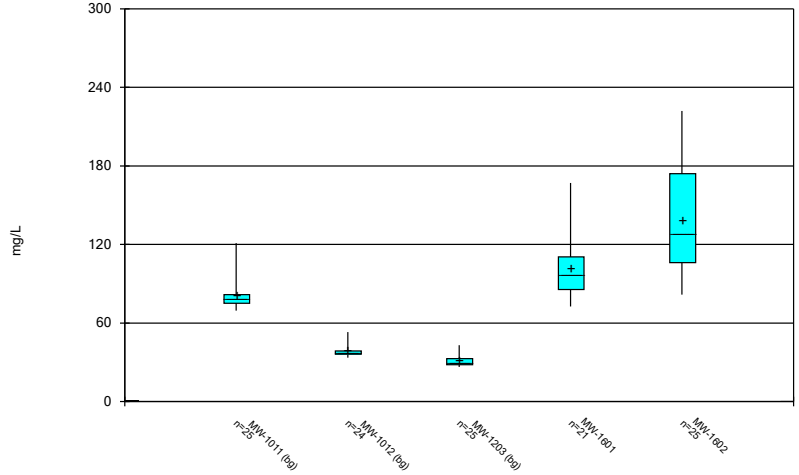
Box & Whiskers Plot



Constituent: Sulfate Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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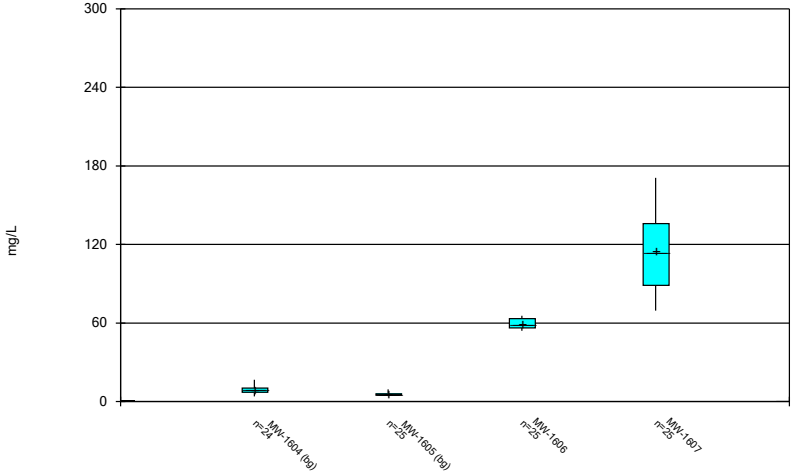
Box & Whiskers Plot



Constituent: Sulfate Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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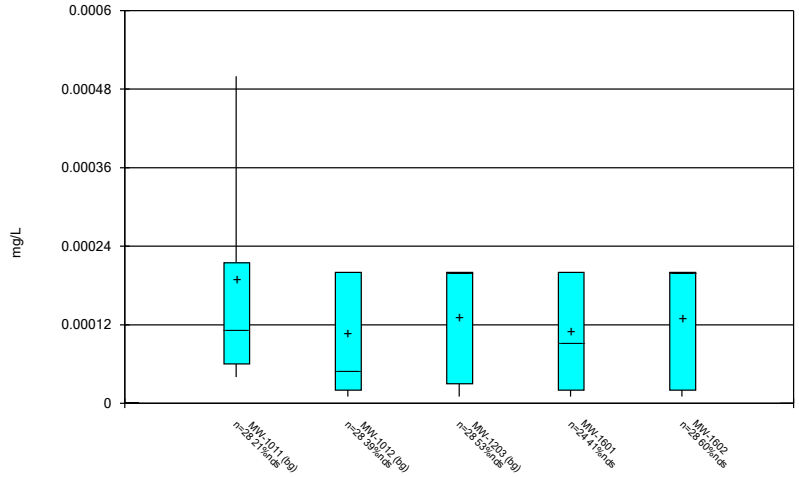
Box & Whiskers Plot



Constituent: Thallium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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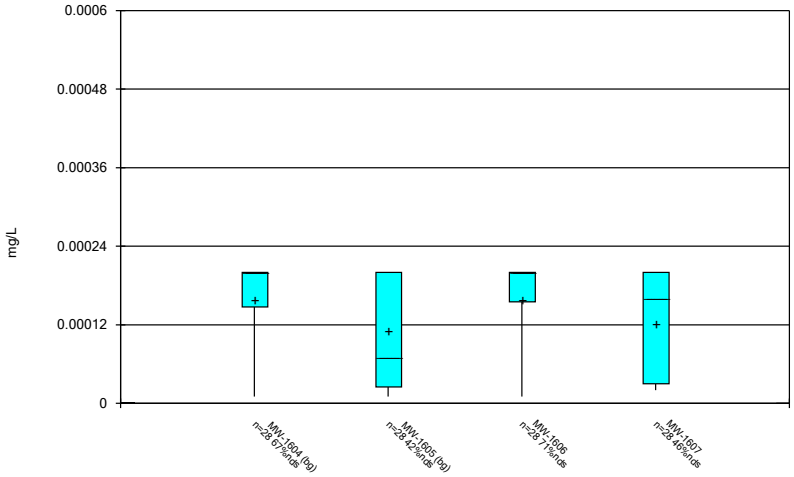
Box & Whiskers Plot



Constituent: Thallium Analysis Run 1/14/2025 4:24 PM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE C

Outlier Summary and Tukey's Outlier Test

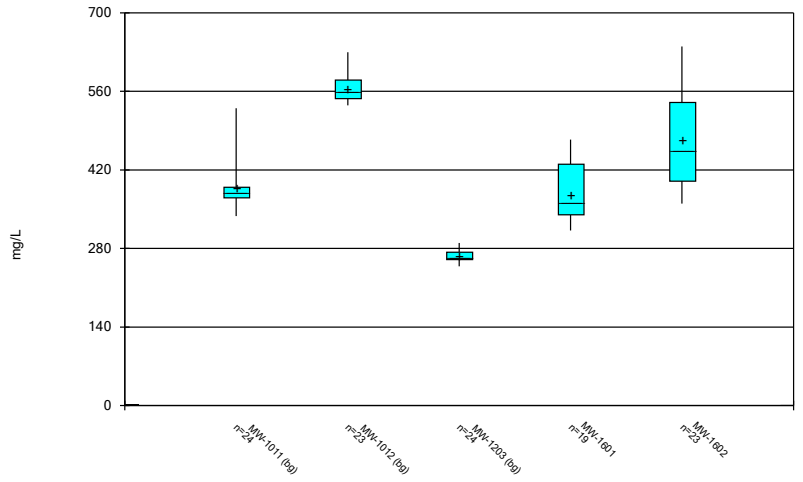
Outlier Summary

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/14/2025, 4:27 PM

	MW-1012 Antimony (mg/L)	MW-1012 Arsenic (mg/L)	MW-1012 Chromium (mg/L)	MW-1203 Combined Radium 226 + 228 (pCi/L)	MW-1604 Combined Radium 226 + 228 (pCi/L)	MW-1605 Combined Radium 226 + 228 (pCi/L)	MW-1012 Molybdenum (mg/L)	MW-1604 Molybdenum (mg/L)	MW-1605 Molybdenum (mg/L)	MW-1011 pH (SU)
11/8/2016										
5/23/2017					6.707 (o)	6.077 (o)				
5/24/2017			0.00784 (o)							
6/21/2017					16.848 (o)	10.864 (o)				
7/12/2017								0.0159 (o)	0.0237 (o)	
3/17/2020				7.524 (o)						
3/18/2020										
8/26/2020										4.26 (o)
3/24/2022	0.00152 (o)	0.0499 (o)								
6/15/2022	0.00114 (o)	0.0454 (o)								
10/12/2022	0.00108 (o)	0.0386 (o)								
3/15/2023	0.00308 (o)	0.0942 (o)					0.0086 (o)			
6/14/2023	0.00318 (o)	0.118 (o)					0.0091 (o)			
10/18/2023	0.00307 (o)	0.107 (o)					0.0084 (o)			
3/14/2024	0.00854 (o)	0.229 (o)					0.0134 (o)			
5/9/2024	0.00501 (o)	0.208 (o)					0.023 (o)			
9/24/2024	0.00412 (o)	0.182 (o)					0.0136 (o)			

	MW-1602 pH (SU)	MW-1604 pH (SU)	MW-1605 pH (SU)	MW-1606 pH (SU)
11/8/2016		3.41 (o)	2.26 (o)	
5/23/2017				
5/24/2017				
6/21/2017				
7/12/2017				
3/17/2020				
3/18/2020				9.11 (o)
8/26/2020	4.83 (o)			
3/24/2022				
6/15/2022				
10/12/2022				
3/15/2023				
6/14/2023				
10/18/2023				
3/14/2024				
5/9/2024				
9/24/2024				

Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 1/14/2025 4:24 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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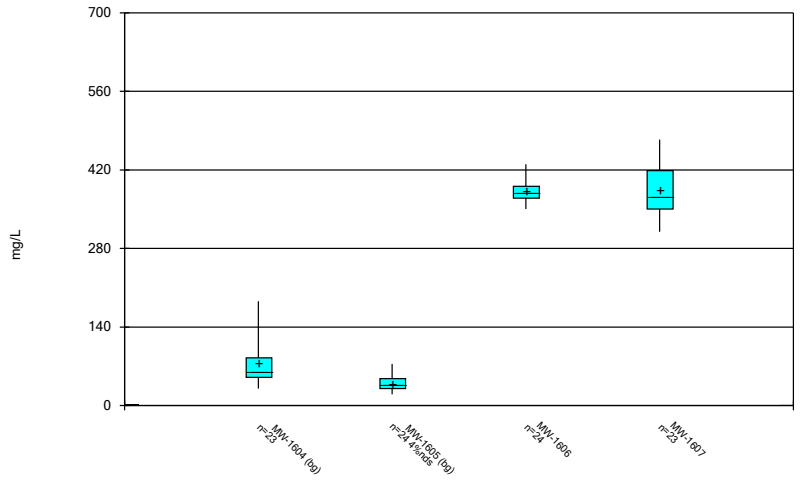
Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 1/14/2025 4:24 PM
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Tukey's Outlier Test - Significant Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/7/2025, 12:11 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
pH (SU)	**MW-1011 (bg)**	**Yes**	**4.26**	**8/26/2020**	**NP**	**NaN**	**29**	**6.893**	**0.6103**	**normal**	**ChiSquared**
pH (SU)	**MW-1012 (bg)**	**Yes**	**10.85**	**3/18/2020**	**NP**	**NaN**	**29**	**9.129**	**0.4754**	**normal**	**ChiSquared**
pH (SU)	**MW-1203 (bg)**	**Yes**	**8.87**	**3/23/2022**	**NP**	**NaN**	**29**	**6.883**	**0.5462**	**normal**	**ChiSquared**
pH (SU)	**MW-1602**	**Yes**	**4.83**	**8/26/2020**	**NP**	**NaN**	**30**	**7.36**	**0.6386**	**normal**	**ChiSquared**
pH (SU)	**MW-1603**	**Yes**	**5.56**	**11/9/2016**	**NP**	**NaN**	**28**	**3.593**	**0.589**	**normal**	**ChiSquared**
pH (SU)	**MW-1606**	**Yes**	**9.11**	**3/18/2020**	**NP**	**NaN**	**30**	**7.069**	**0.5086**	**normal**	**ChiSquared**

Tukey's Outlier Test - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/7/2025, 12:12 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
pH (SU)	**MW-1011 (bg)**	**Yes**	**4.26**	**8/26/2020**	**NP**	**NaN**	**29**	**6.893**	**0.6103**	**normal**	**ChiSquared**
pH (SU)	**MW-1012 (bg)**	**Yes**	**10.85**	**3/18/2020**	**NP**	**NaN**	**29**	**9.129**	**0.4754**	**normal**	**ChiSquared**
pH (SU)	**MW-1203 (bg)**	**Yes**	**8.87**	**3/23/2022**	**NP**	**NaN**	**29**	**6.883**	**0.5462**	**normal**	**ChiSquared**
pH (SU)	MW-1601	No	n/a	n/a	NP	NaN	26	7.188	0.4735	normal	ChiSquared
pH (SU)	**MW-1602**	**Yes**	**4.83**	**8/26/2020**	**NP**	**NaN**	**30**	**7.36**	**0.6386**	**normal**	**ChiSquared**
pH (SU)	**MW-1603**	**Yes**	**5.56**	**11/9/2016**	**NP**	**NaN**	**28**	**3.593**	**0.589**	**normal**	**ChiSquared**
pH (SU)	MW-1604 (bg)	No	n/a	n/a	NP	NaN	29	5.794	0.7352	normal	ChiSquared
pH (SU)	MW-1605 (bg)	No	n/a	n/a	NP	NaN	29	5.085	0.8493	normal	ChiSquared
pH (SU)	**MW-1606**	**Yes**	**9.11**	**3/18/2020**	**NP**	**NaN**	**30**	**7.069**	**0.5086**	**normal**	**ChiSquared**
pH (SU)	MW-1607	No	n/a	n/a	NP	NaN	30	6.577	0.4985	normal	ChiSquared

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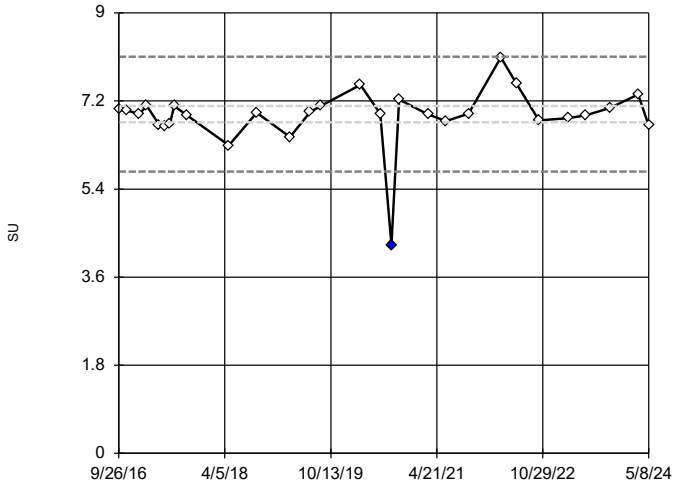
Tukey's Outlier Screening

MW-1011 (bg)



n = 29

Outlier is drawn as solid. Tukey's method selected by user.

High cutoff = 8.105, low cutoff = 5.76, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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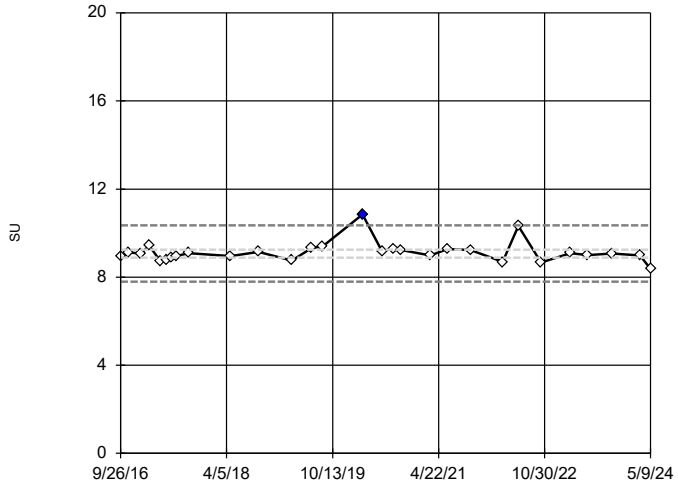
Tukey's Outlier Screening

MW-1012 (bg)



n = 29

Outlier is drawn as solid. Tukey's method selected by user.

High cutoff = 10.35, low cutoff = 7.795, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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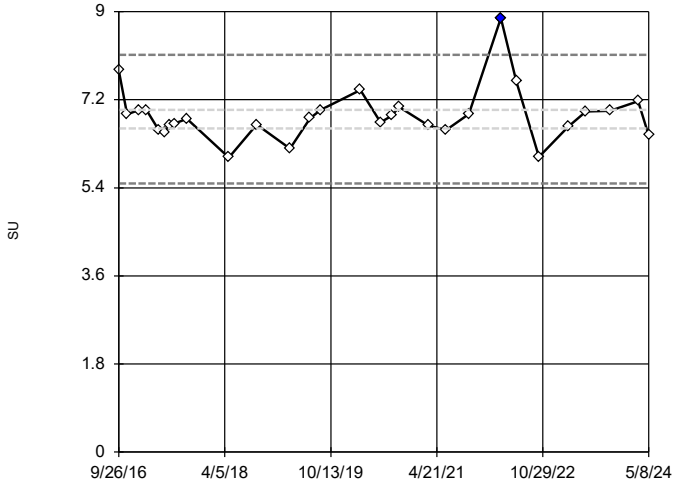
Tukey's Outlier Screening

MW-1203 (bg)



n = 29

Outlier is drawn as solid. Tukey's method selected by user.

High cutoff = 8.115, low cutoff = 5.49, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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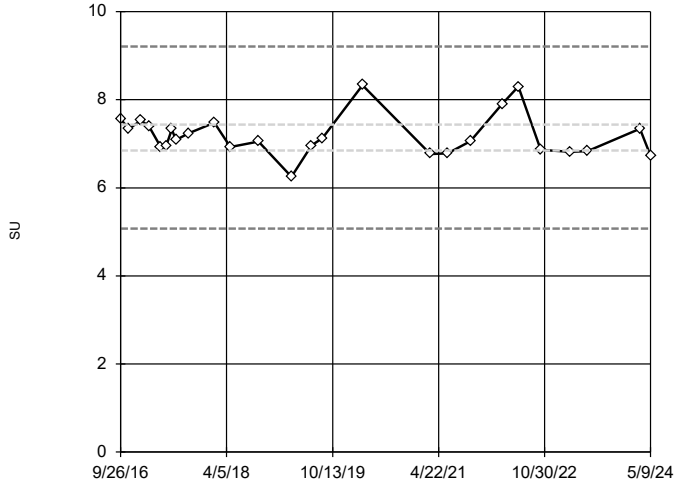
Tukey's Outlier Screening

MW-1601



n = 26

No outliers found. Tukey's method selected by user.

High cutoff = 9.205, low cutoff = 5.075, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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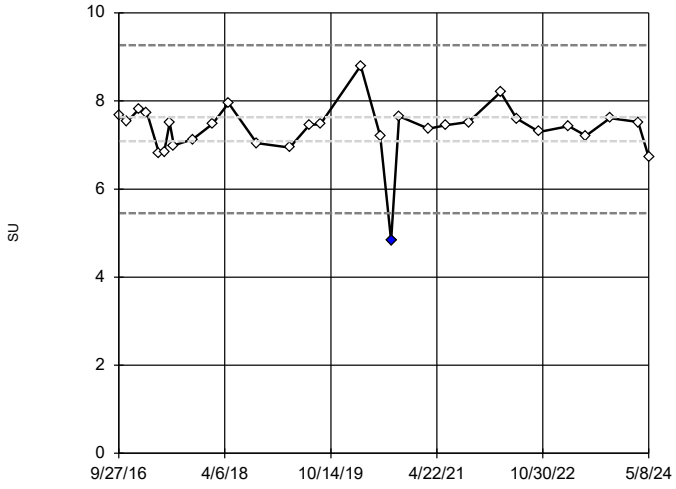
Tukey's Outlier Screening

MW-1602



n = 30

Outlier is drawn as solid. Tukey's method selected by user.

High cutoff = 9.265, low cutoff = 5.45, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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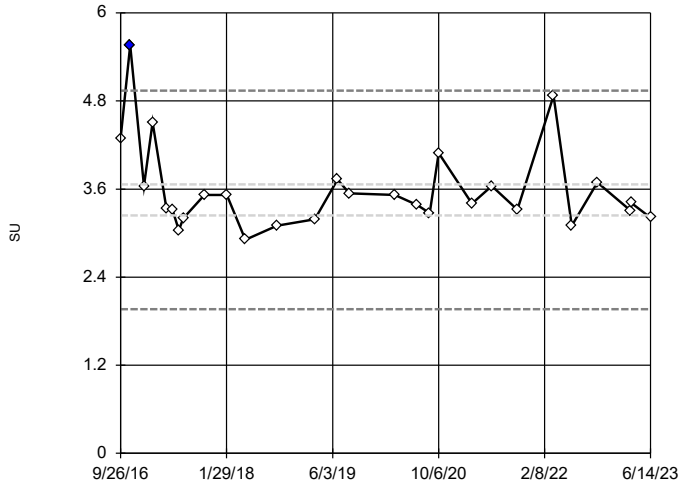
Tukey's Outlier Screening

MW-1603



n = 28

Outlier is drawn as solid. Tukey's method selected by user.

High cutoff = 4.94, low cutoff = 1.965, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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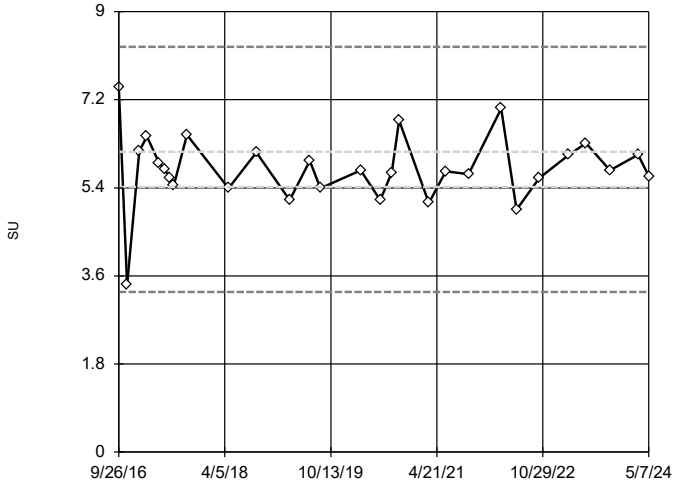
Tukey's Outlier Screening

MW-1604 (bg)



n = 29

No outliers found. Tukey's method selected by user.

High cutoff = 8.28, low cutoff = 3.275, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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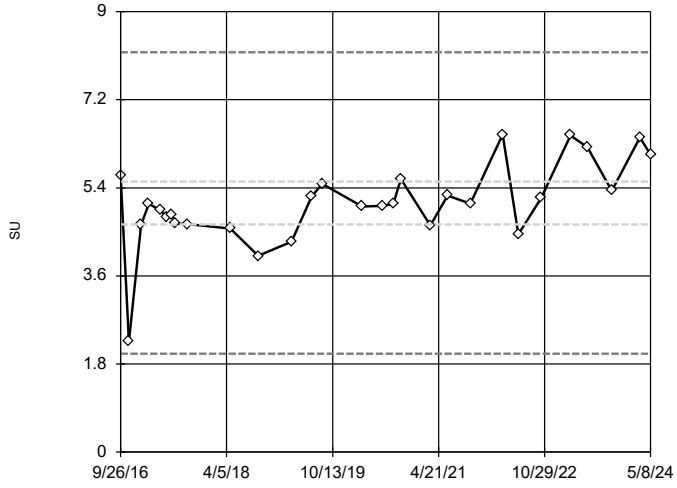
Tukey's Outlier Screening

MW-1605 (bg)



n = 29

No outliers found. Tukey's method selected by user.

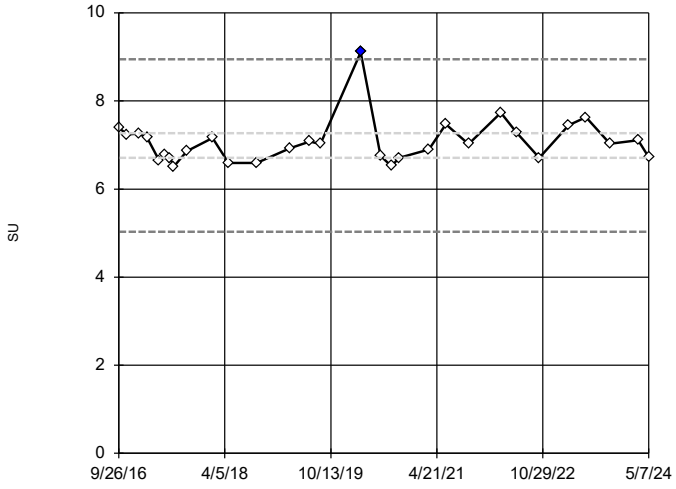
High cutoff = 8.17, low cutoff = 2.01, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Tukey's Outlier Screening

MW-1606



n = 30

Outlier is drawn as solid. Tukey's method selected by user.

High cutoff = 8.95, low cutoff = 5.03, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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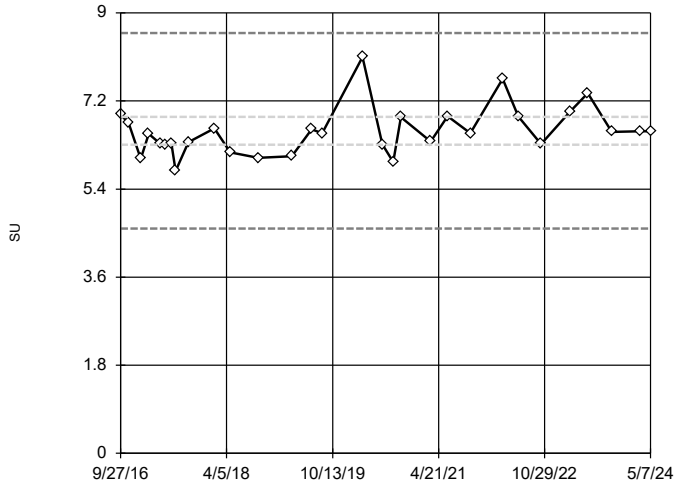
Tukey's Outlier Screening

MW-1607



n = 30

No outliers found. Tukey's method selected by user.

High cutoff = 8.585, low cutoff = 4.595, based on IQR multiplier of 3.

Constituent: pH Analysis Run 1/7/2025 12:11 PM View: Tukey's Outlier Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Tukey's Outlier Test - Upgradient Wells - Significant Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/7/2025, 12:10 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00101,0.0012,0.00099,0.00089,0.00089,0.00097,0.**	**NP**	**NaN**	**140**	**0.0004114**	**0.001006**	**normal**	**ChiSquared**
Arsenic (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.0499,0.0454,0.0386,0.0942,0.118,0.107,0.229,0.2**	**NP**	**NaN**	**140**	**0.01225**	**0.03379**	**normal**	**ChiSquared**
Beryllium (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.000349**	**NP**	**NaN**	**140**	**0.00007996**	**0.00005616**	**normal**	**ChiSquared**
Chromium (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00784,0.00291,0.00326,0.00505,0.00289,0.0066,0.**	**NP**	**NaN**	**140**	**0.001042**	**0.001315**	**normal**	**ChiSquared**
Cobalt (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00325,0.00347,0.00559,0.00418,0.00561,0.00367,0**	**NP**	**NaN**	**140**	**0.0008257**	**0.00108**	**normal**	**ChiSquared**
Combined Radium 226 + 228 (pCi/L)	**MW-1011,MW-1012,M...**	**Yes**	**16.85,10.86**	**NP**	**NaN**	**140**	**1.906**	**2.011**	**normal**	**ChiSquared**
Lead (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00184,0.00117,0.00197,0.00186,0.0024,0.00176,0.**	**NP**	**NaN**	**140**	**0.0003612**	**0.0005317**	**normal**	**ChiSquared**
Molybdenum (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00325,0.00287,0.0055,0.004,0.0029,0.0086,0.0091**	**NP**	**NaN**	**140**	**0.001579**	**0.003552**	**normal**	**ChiSquared**

Tukey's Outlier Test - Upgradient Wells - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/7/2025, 12:10 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00101,0.0012,0.00099,0.00089,0.00089,0.00097,0.**	**NP**	**NaN**	**140**	**0.0004114**	**0.001006**	**normal**	**ChiSquared**
Arsenic (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.0499,0.0454,0.0386,0.0942,0.118,0.107,0.229,0.2**	**NP**	**NaN**	**140**	**0.01225**	**0.03379**	**normal**	**ChiSquared**
Barium (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	140	0.05588	0.02428	normal	ChiSquared
Beryllium (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.000349**	**NP**	**NaN**	**140**	**0.00007996**	**0.00005616**	**normal**	**ChiSquared**
Boron (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	123	0.09211	0.06439	normal	ChiSquared
Cadmium (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	140	0.00003744	0.00002963	normal	ChiSquared
Calcium (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	123	29.8	35.03	normal	ChiSquared
Chloride (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	123	2.635	1.879	normal	ChiSquared
Chromium (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00784,0.00291,0.00326,0.00505,0.00289,0.0066,0.**	**NP**	**NaN**	**140**	**0.001042**	**0.001315**	**normal**	**ChiSquared**
Cobalt (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00325,0.00347,0.00559,0.00418,0.00561,0.00367,0**	**NP**	**NaN**	**140**	**0.0008257**	**0.00108**	**normal**	**ChiSquared**
Combined Radium 226 + 228 (pCi/L)	**MW-1011,MW-1012,M...**	**Yes**	**16.85,10.86**	**NP**	**NaN**	**140**	**1.906**	**2.011**	**normal**	**ChiSquared**
Fluoride (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	144	0.2478	0.2769	normal	ChiSquared
Lead (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00184,0.00117,0.00197,0.00186,0.0024,0.00176,0.**	**NP**	**NaN**	**140**	**0.0003612**	**0.0005317**	**normal**	**ChiSquared**
Lithium (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	140	0.007758	0.005276	normal	ChiSquared
Mercury (mg/L)	MW-1011,MW-1012,M...	n/a	n/a	NP	NaN	140	0.0000054210	0.000007449	unknown	ChiSquared
Molybdenum (mg/L)	**MW-1011,MW-1012,M...**	**Yes**	**0.00325,0.00287,0.0055,0.004,0.0029,0.0086,0.0091**	**NP**	**NaN**	**140**	**0.001579**	**0.003552**	**normal**	**ChiSquared**
Selenium (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	140	0.000316	0.0001893	normal	ChiSquared
Sulfate (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	123	33.2	27.88	normal	ChiSquared
Thallium (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	140	0.0001267	0.00008125	normal	ChiSquared
Total Dissolved Solids (mg/L)	MW-1011,MW-1012,M...	No	n/a	NP	NaN	118	266.1	197.7	normal	ChiSquared

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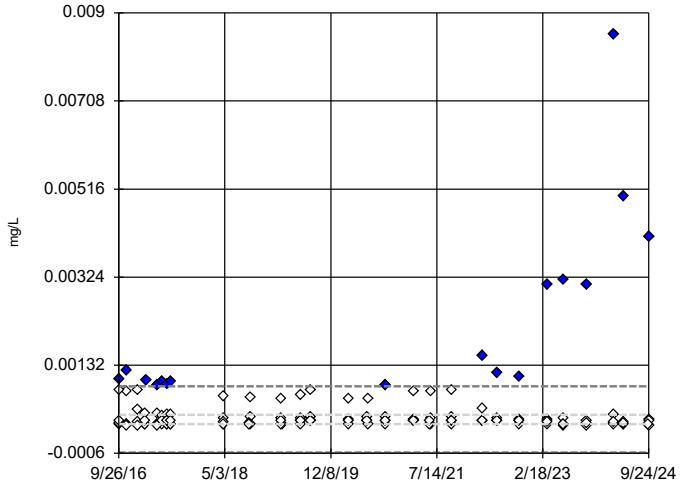
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outliers are drawn as solid.
Tukey's method selected by user.

High cutoff = 0.000863, low cutoff = -0.000586, based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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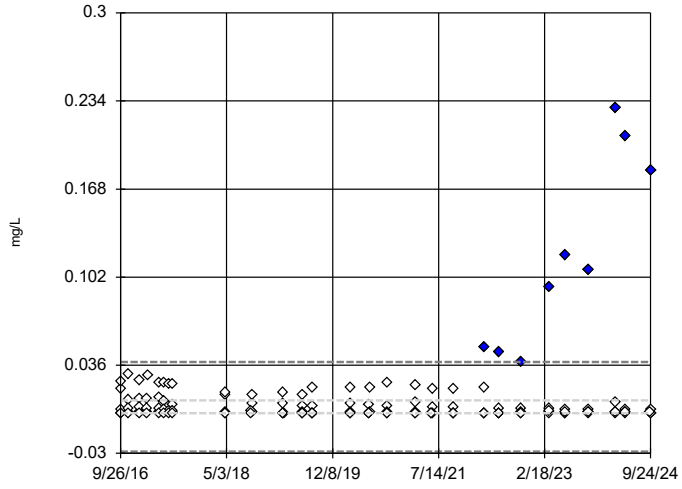
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outliers are drawn as solid.
Tukey's method selected by user.

High cutoff = 0.03845, low cutoff = -0.02865, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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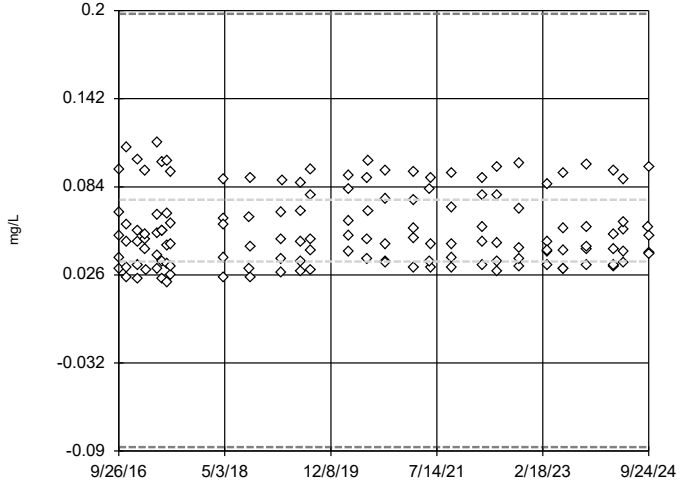
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

No outliers found.
Tukey's method selected by user.

High cutoff = 0.1978, low cutoff = -0.08745, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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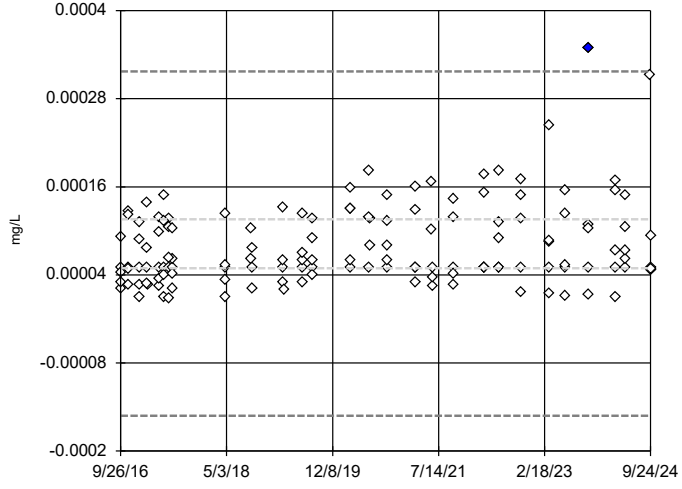
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outlier is drawn as solid.
Tukey's method selected by user.

High cutoff = 0.000317, low cutoff = -0.000152, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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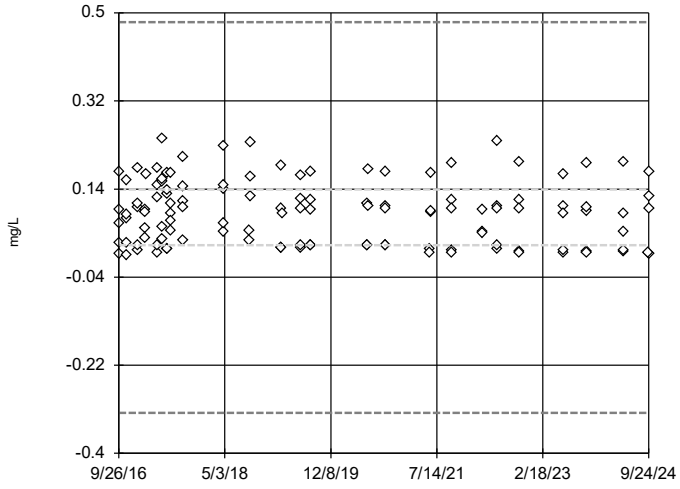
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 123

No outliers found. Tukey's method selected by user.

High cutoff = 0.481, low cutoff = -0.317, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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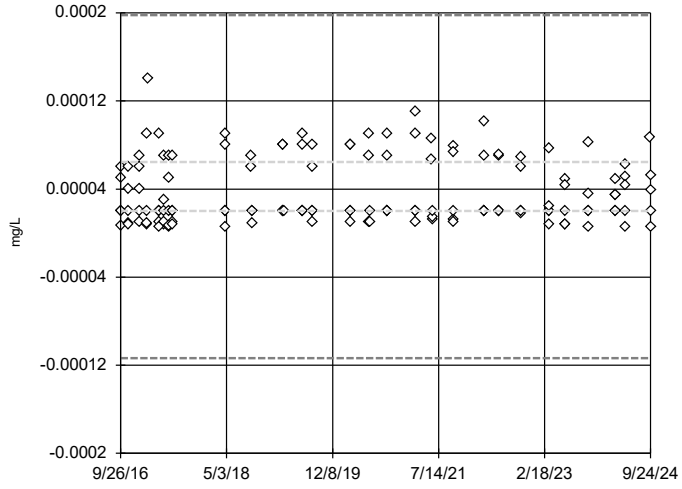
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

No outliers found. Tukey's method selected by user.

High cutoff = 0.000198, low cutoff = -0.0001135, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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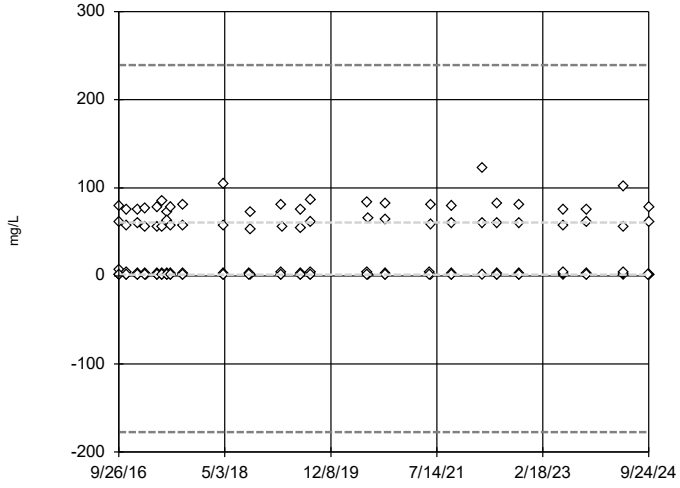
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 123

No outliers found. Tukey's method selected by user.

High cutoff = 239.3, low cutoff = -177.2, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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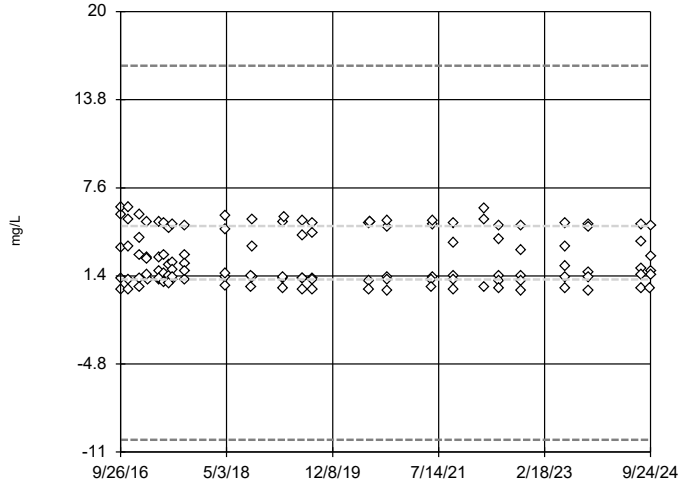
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 123

No outliers found. Tukey's method selected by user.

High cutoff = 16.19, low cutoff = -10.13, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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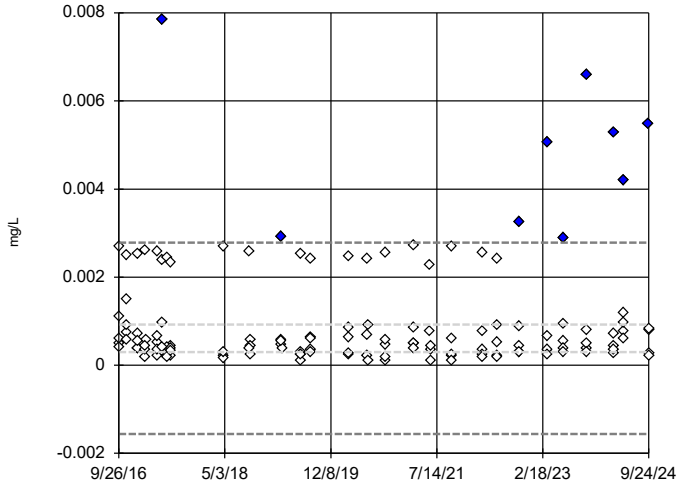
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outliers are drawn as solid.
Tukey's method selected by user.

High cutoff = 0.002784, low cutoff = -0.001563, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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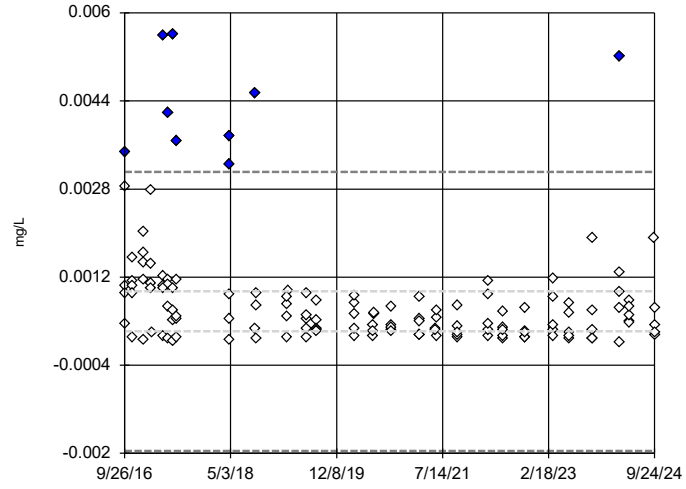
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outliers are drawn as solid.
Tukey's method selected by user.

High cutoff = 0.003113, low cutoff = -0.001955, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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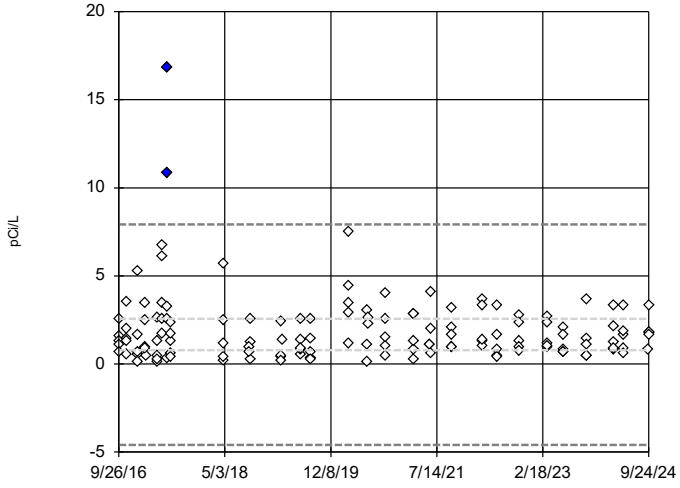
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outliers are drawn as solid.
Tukey's method selected by user.

High cutoff = 7.927, low cutoff = -4.589, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradi
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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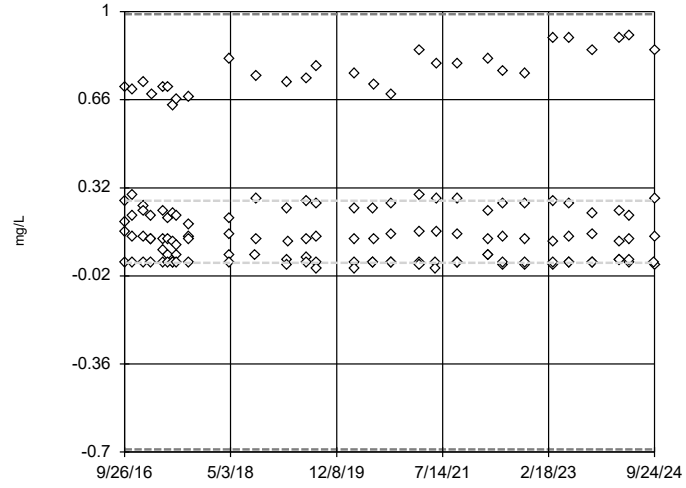
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 144

No outliers found.
Tukey's method selected by user.

High cutoff = 0.99, low cutoff = -0.69, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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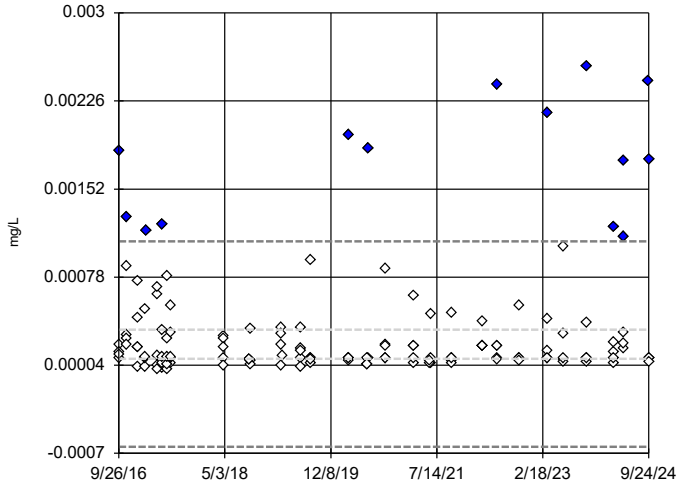
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outliers are drawn as solid.
Tukey's method selected by user.

High cutoff = 0.00108, low cutoff = -0.000646, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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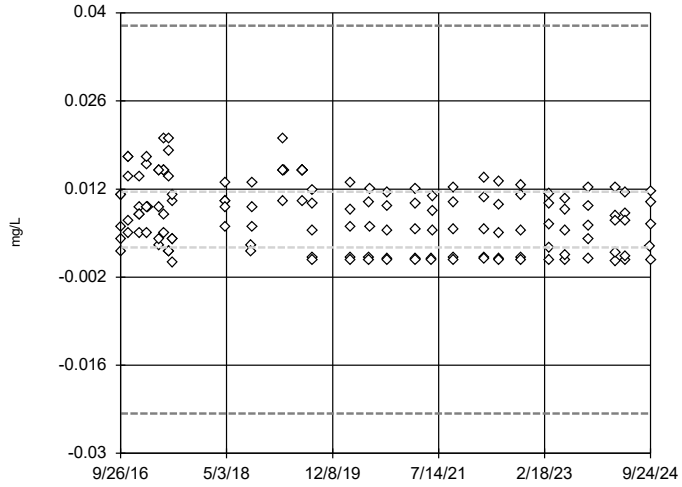
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

No outliers found.
Tukey's method selected by user.

High cutoff = 0.03798, low cutoff = -0.02369, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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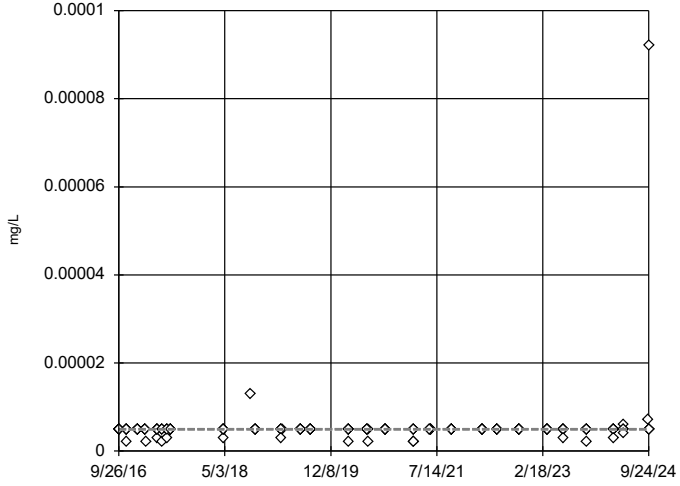
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

No outliers found.
Tukey's method selected by user.

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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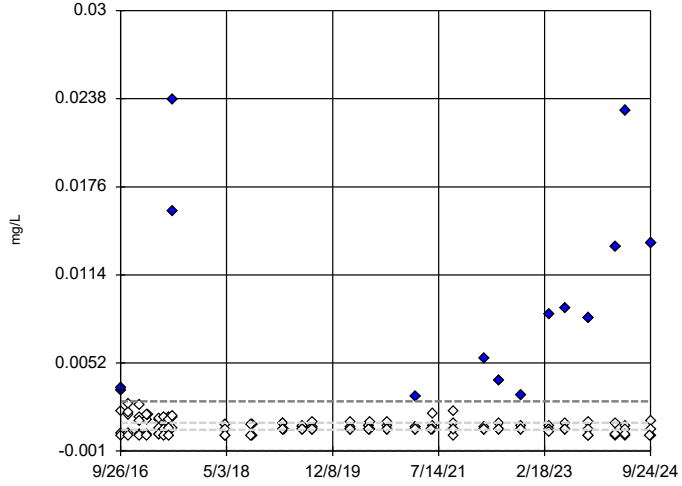
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

Outliers are drawn as solid.
Tukey's method selected by user.

High cutoff = 0.0025, low cutoff = -0.001, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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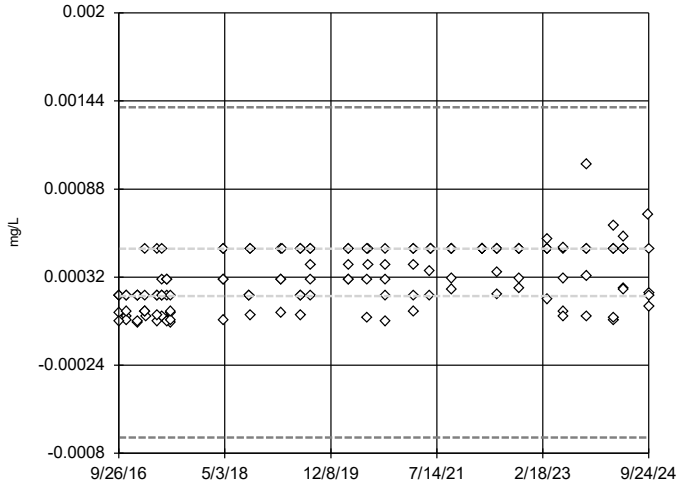
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

No outliers found. Tukey's method selected by user.

High cutoff = 0.0014, low cutoff = -0.0007, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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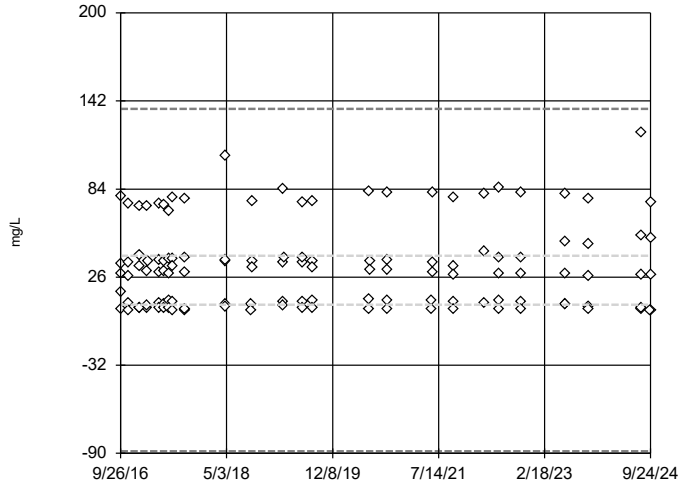
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 123

No outliers found. Tukey's method selected by user.

High cutoff = 136.7, low cutoff = -88.7, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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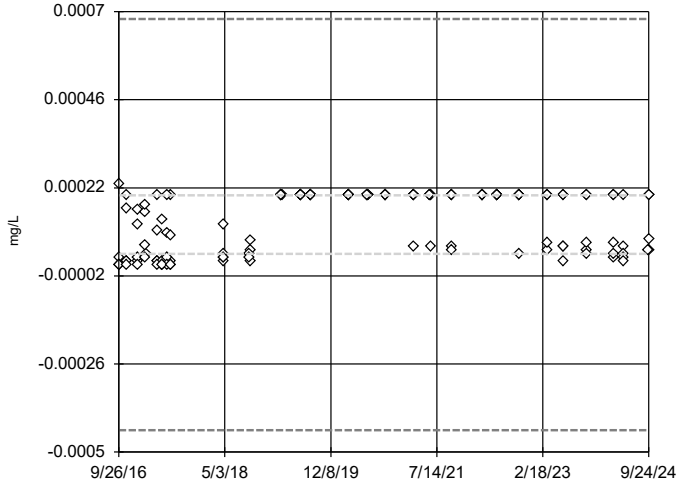
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 140

No outliers found. Tukey's method selected by user.

High cutoff = 0.00068, low cutoff = -0.00044, based on IQR multiplier of 3.

Constituent: Thallium Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Test

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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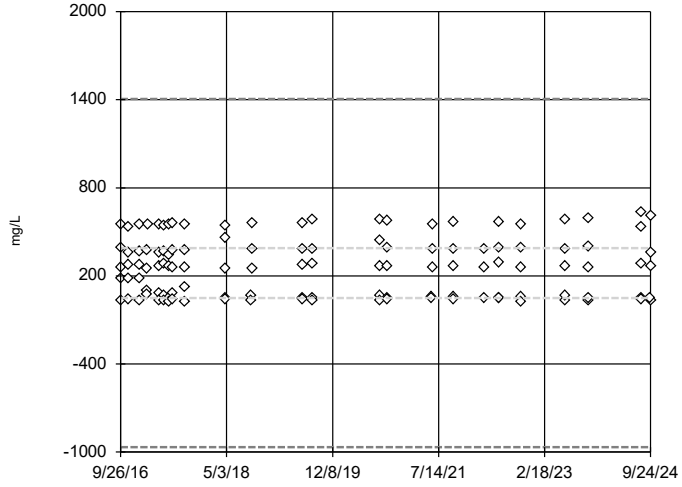
Tukey's Outlier Screening, Pooled Background

MW-1011,MW-1012,MW-1203,MW-1604,MW-16...



n = 118

No outliers found. Tukey's method selected by user.

High cutoff = 1406, low cutoff = -967, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/7/2025 12:09 PM View: Tukey's Outlier Upgradient Te

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE D

Mann-Whitney

Welch's t-test/Mann-Whitney - Significant Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/9/2025, 10:01 AM

Constituent	Well	Calc.	0.01	Alpha	Sig.	Method
pH (SU)	**MW-1605 (bg)**	**2.884**	**Yes**	**0.01**	**Yes**	**Mann-W**

Welch's t-test/Mann-Whitney - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/9/2025, 10:01 AM

Constituent	Well	Calc.	0.01	Alpha	Sig.	Method
pH (SU)	MW-1011 (bg)	-0.6166	No	0.01	No	Mann-W
pH (SU)	MW-1012 (bg)	-1.697	No	0.01	No	Mann-W
pH (SU)	MW-1203 (bg)	-0.6462	No	0.01	No	Mann-W
pH (SU)	MW-1601	-1.92	No	0.01	No	Mann-W
pH (SU)	MW-1602	-0.9692	No	0.01	No	Mann-W
pH (SU)	MW-1604 (bg)	0.3921	No	0.01	No	Mann-W
pH (SU)	**MW-1605 (bg)**	**2.884**	**Yes**	**0.01**	**Yes**	**Mann-W**
pH (SU)	MW-1606	0.8618	No	0.01	No	Mann-W
pH (SU)	MW-1607	1.323	No	0.01	No	Mann-W

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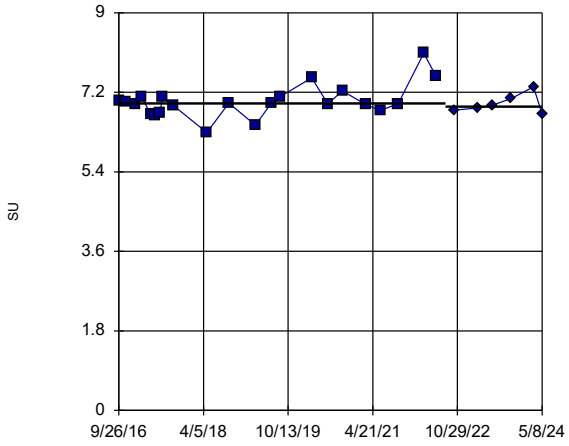
Mann-Whitney (Wilcoxon Rank Sum)

MW-1011 (bg)



MW-1011 background

MW-1011 compliance

background median = 6.95

compliance median = 6.88

Z = -0.6166 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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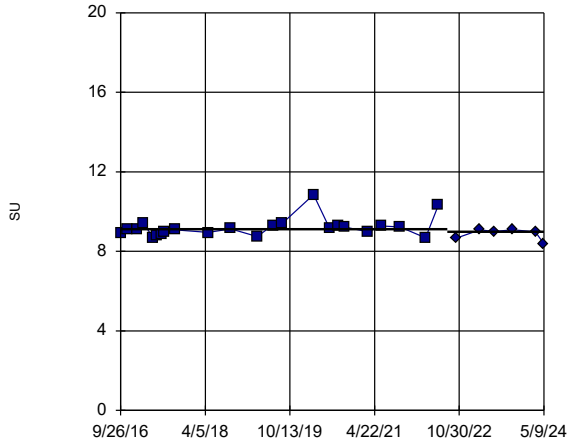
Mann-Whitney (Wilcoxon Rank Sum)

MW-1012 (bg)



MW-1012 background

MW-1012 compliance

background median = 9.11

compliance median = 8.995

Z = -1.697 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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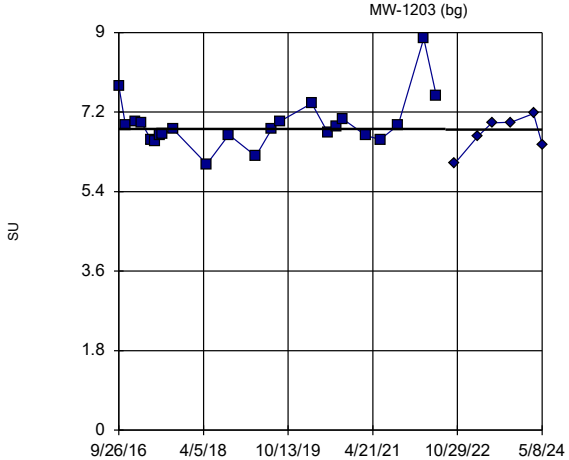
Mann-Whitney (Wilcoxon Rank Sum)

MW-1203 (bg)



MW-1203 background

MW-1203 compliance

background median = 6.82

compliance median = 6.805

Z = -0.6462 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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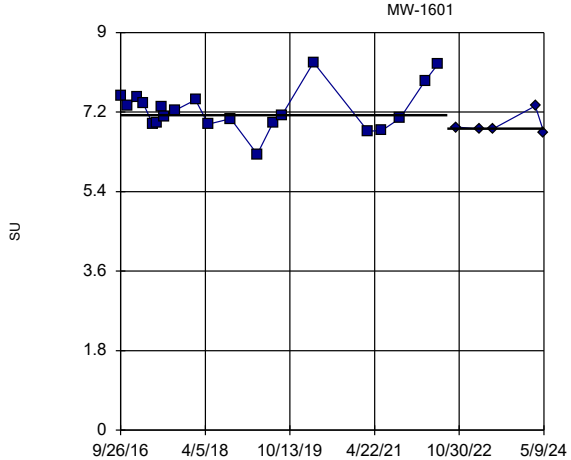
Mann-Whitney (Wilcoxon Rank Sum)

MW-1601



MW-1601 background

MW-1601 compliance

background median = 7.13

compliance median = 6.83

Z = -1.92 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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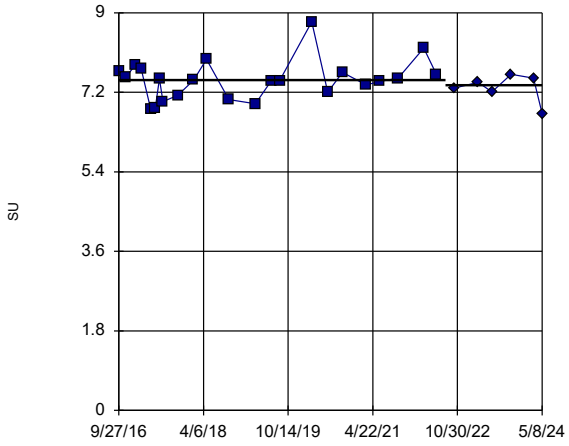
Mann-Whitney (Wilcoxon Rank Sum)

MW-1602



MW-1602 background

MW-1602 compliance

background median = 7.48

compliance median = 7.365

Z = -0.9692 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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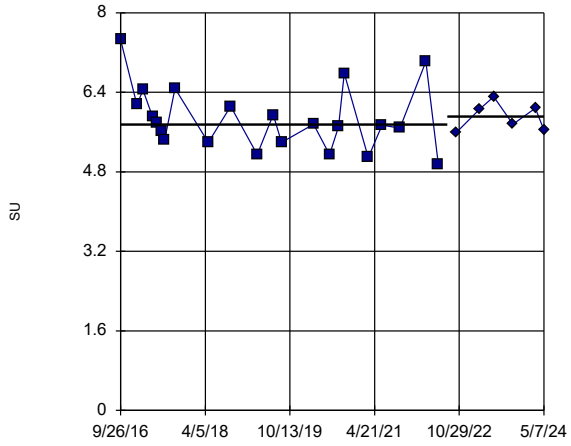
Mann-Whitney (Wilcoxon Rank Sum)

MW-1604 (bg)



MW-1604 background

MW-1604 compliance

background median = 5.75

compliance median = 5.915

Z = 0.3921 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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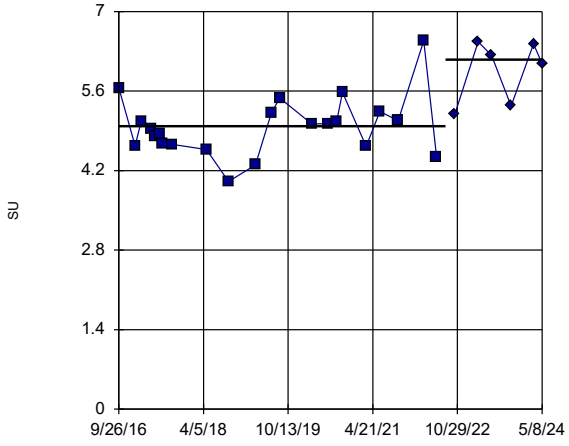
Mann-Whitney (Wilcoxon Rank Sum)

MW-1605 (bg)



MW-1605 background

MW-1605 compliance

background median = 4.98

compliance median = 6.155

Z = 2.884 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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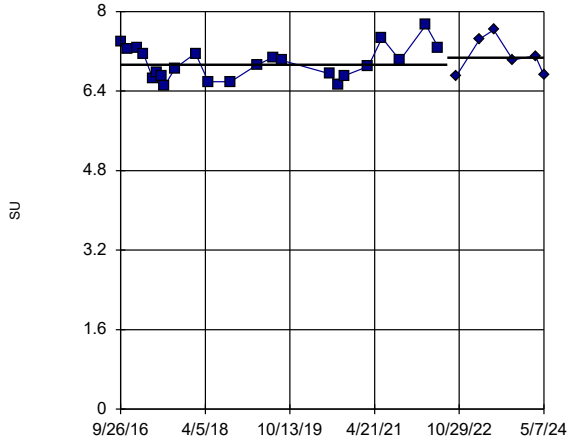
Mann-Whitney (Wilcoxon Rank Sum)

MW-1606



MW-1606 background

MW-1606 compliance

background median = 6.93

compliance median = 7.07

Z = 0.8618 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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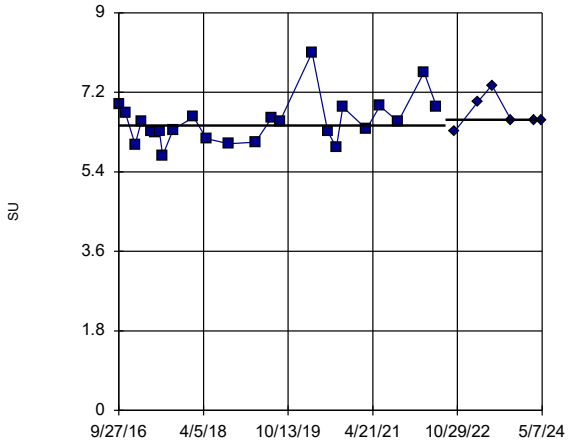
Mann-Whitney (Wilcoxon Rank Sum)

MW-1607



MW-1607 background

MW-1607 compliance

background median = 6.45

compliance median = 6.58

Z = 1.323 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH Analysis Run 1/9/2025 10:00 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE E

Intrawell PLs

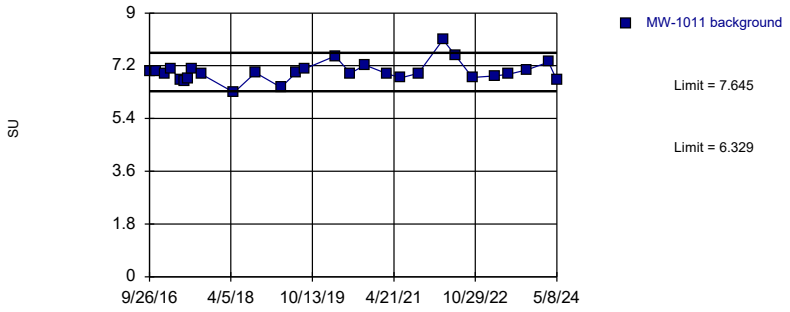
Appendix III Intrawell Prediction Limits - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/14/2025, 11:04 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
pH (SU)	MW-1011 (bg)	7.645	6.329	n/a	1 future	n/a	28	6.987	0.3469	0	None	No	0.0009398	Param Intra 1 of 2
pH (SU)	MW-1012 (bg)	10.85	8.37	n/a	1 future	n/a	29	n/a	n/a	0	n/a	n/a	0.004345	NP Intra (normality) 1 of 2
pH (SU)	MW-1203 (bg)	8.87	6.02	n/a	1 future	n/a	29	n/a	n/a	0	n/a	n/a	0.004345	NP Intra (normality) 1 of 2
pH (SU)	MW-1601	8.095	6.281	n/a	1 future	n/a	26	7.188	0.4735	0	None	No	0.0009398	Param Intra 1 of 2
pH (SU)	MW-1602	8.262	6.633	n/a	1 future	n/a	29	7.447	0.4312	0	None	No	0.0009398	Param Intra 1 of 2
pH (SU)	MW-1604 (bg)	6.99	4.769	n/a	1 future	n/a	28	5.88	0.5851	0	None	No	0.0009398	Param Intra 1 of 2
pH (SU)	MW-1605 (bg)	6.447	3.924	n/a	1 future	n/a	28	5.186	0.6648	0	None	No	0.0009398	Param Intra 1 of 2
pH (SU)	MW-1606	7.636	6.361	n/a	1 future	n/a	29	6.998	0.3376	0	None	No	0.0009398	Param Intra 1 of 2
pH (SU)	MW-1607	7.514	5.64	n/a	1 future	n/a	30	6.577	0.4985	0	None	No	0.0009398	Param Intra 1 of 2

Prediction Limit

Intrawell Parametric, MW-1011 (bg)



Background Data Summary: Mean=6.987, Std. Dev.=0.3469, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9135, critical = 0.896. Kappa = 1.898 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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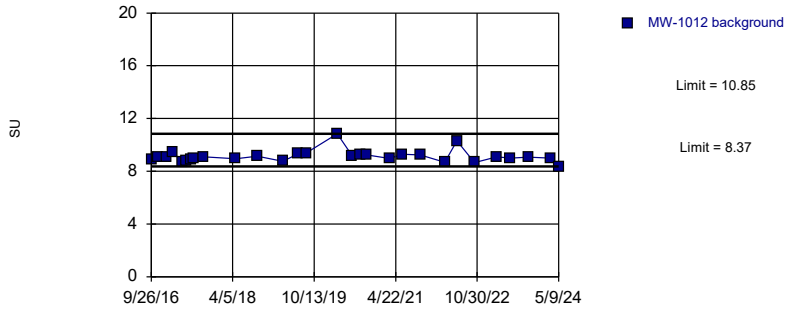
Prediction Limit

Intrawell Non-parametric, MW-1012 (bg)



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 29 background values. Well-constituent pair annual alpha = 0.00868. Individual comparison alpha = 0.004345 (1 of 2). Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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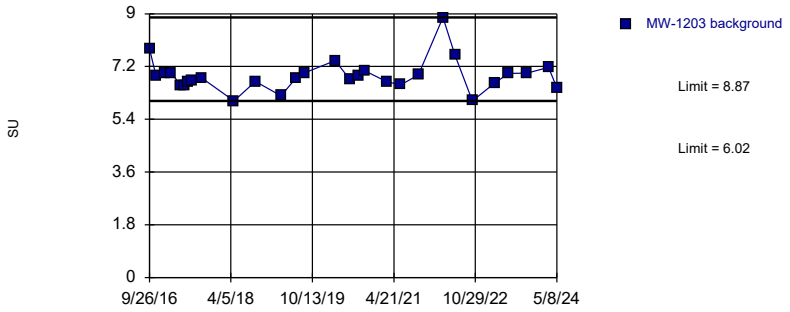
Prediction Limit

Intrawell Non-parametric, MW-1203 (bg)



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 29 background values. Well-constituent pair annual alpha = 0.00868. Individual comparison alpha = 0.004345 (1 of 2). Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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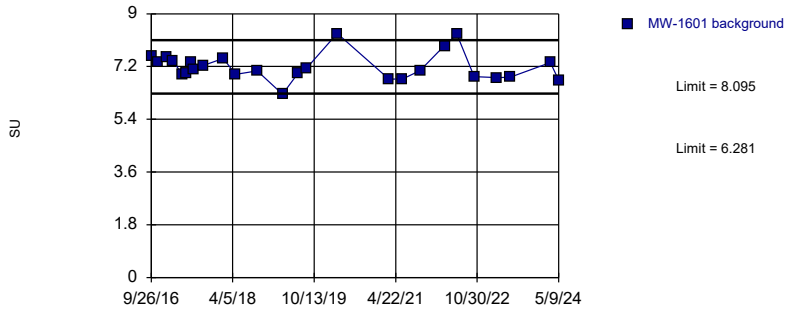
Prediction Limit

Intrawell Parametric, MW-1601



Background Data Summary: Mean=7.188, Std. Dev.=0.4735, n=26. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9234, critical = 0.891. Kappa = 1.915 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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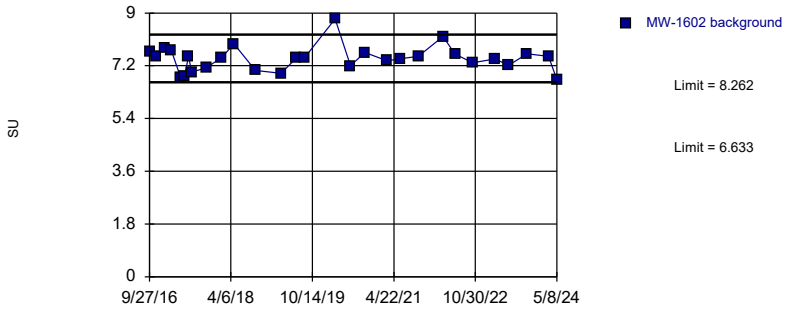
Prediction Limit

Intrawell Parametric, MW-1602



Background Data Summary: Mean=7.447, Std. Dev.=0.4312, n=29. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9349, critical = 0.898. Kappa = 1.889 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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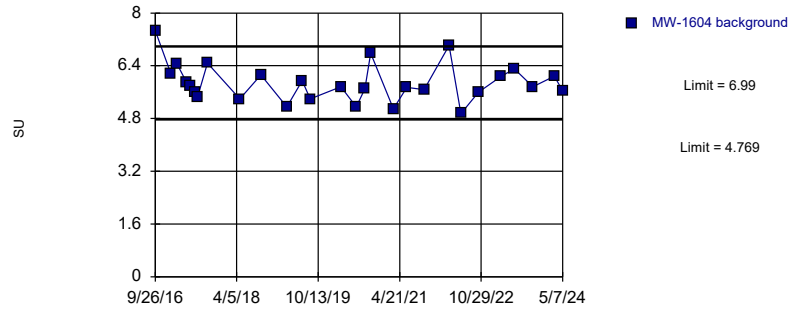
Prediction Limit

Intrawell Parametric, MW-1604 (bg)



Background Data Summary: Mean=5.88, Std. Dev.=0.5851, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9504, critical = 0.896. Kappa = 1.898 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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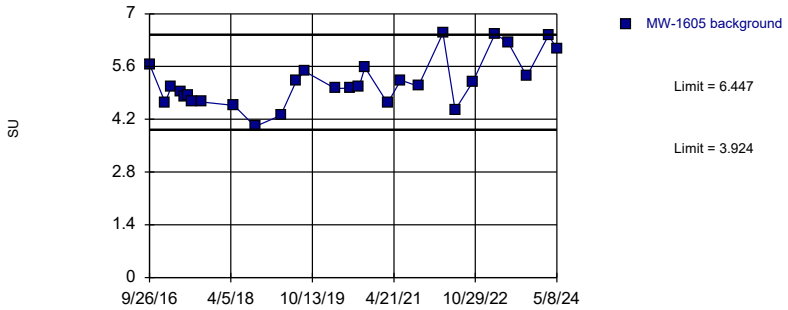
Prediction Limit

Intrawell Parametric, MW-1605 (bg)



Background Data Summary: Mean=5.186, Std. Dev.=0.6648, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9334, critical = 0.896. Kappa = 1.898 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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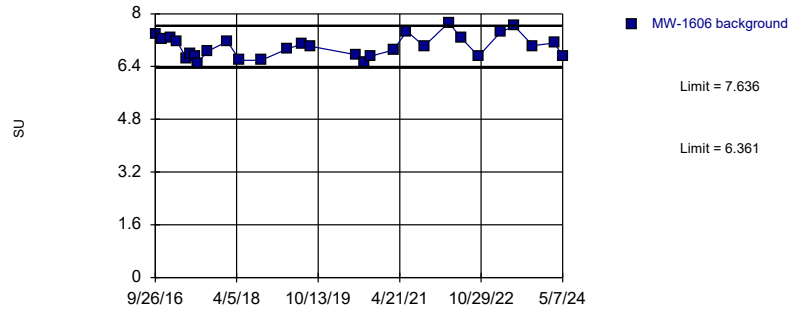
Prediction Limit

Intrawell Parametric, MW-1606



Background Data Summary: Mean=6.998, Std. Dev.=0.3376, n=29. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9539, critical = 0.898. Kappa = 1.889 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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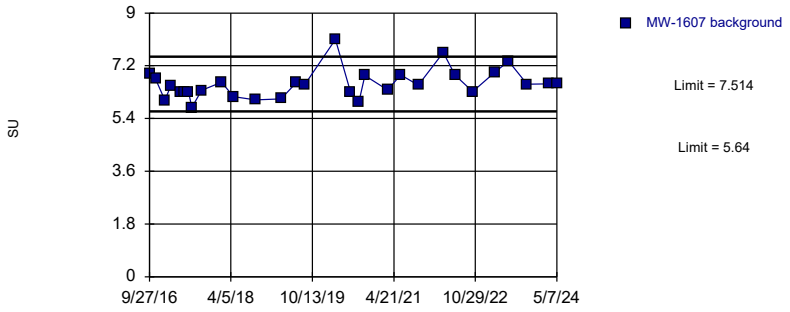
Prediction Limit

Intrawell Parametric, MW-1607

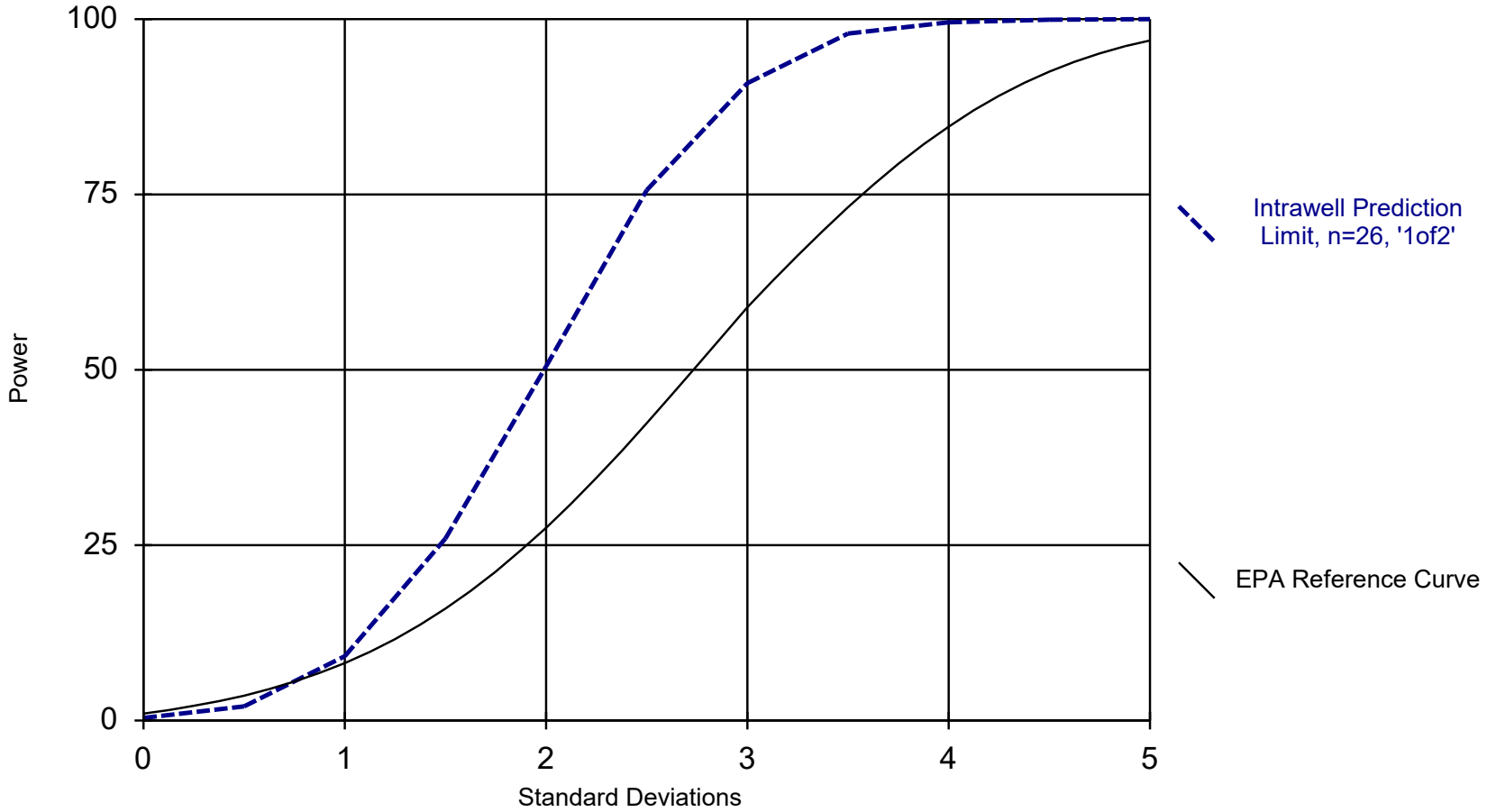


Background Data Summary: Mean=6.577, Std. Dev.=0.4985, n=30. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9183, critical = 0.9. Kappa = 1.88 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: pH Analysis Run 1/14/2025 11:03 AM View: Appendix III - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Intrawell Power Curve



Kappa = 1.915, based on 4 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 1/14/2025 11:12 AM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE F

Upgradient Trend Tests – Appendix III

Upgradient Well Trend Tests - Significant Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/7/2025, 12:29 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Boron (mg/L)	**MW-1604 (bg)**	**-0.002845**	**-119**	**-105**	**Yes**	**24**	**12.5**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	**MW-1012 (bg)**	**0.05505**	**165**	**105**	**Yes**	**24**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	**MW-1604 (bg)**	**-0.1474**	**-152**	**-105**	**Yes**	**24**	**0**	**n/a**	**0.01**	**NP**
Fluoride (mg/L)	**MW-1012 (bg)**	**0.02447**	**242**	**139**	**Yes**	**29**	**0**	**n/a**	**0.01**	**NP**
Fluoride (mg/L)	**MW-1604 (bg)**	**-0.008167**	**-247**	**-139**	**Yes**	**29**	**6.897**	**n/a**	**0.01**	**NP**
Total Dissolved Solids (mg/L)	**MW-1012 (bg)**	**6.6**	**143**	**98**	**Yes**	**23**	**0**	**n/a**	**0.01**	**NP**
Total Dissolved Solids (mg/L)	**MW-1604 (bg)**	**-8.118**	**-155**	**-98**	**Yes**	**23**	**0**	**n/a**	**0.01**	**NP**

Upgradient Well Trend Tests - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/7/2025, 12:29 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Boron (mg/L)	MW-1011 (bg)	-0.002429	-37	-111	No	25	0	n/a	0.01	NP
Boron (mg/L)	MW-1012 (bg)	0.001155	35	105	No	24	0	n/a	0.01	NP
Boron (mg/L)	MW-1203 (bg)	-0.0009328	-30	-111	No	25	0	n/a	0.01	NP
Boron (mg/L)	**MW-1604 (bg)**	**-0.002845**	**-119**	**-105**	**Yes**	**24**	**12.5**	**n/a**	**0.01**	**NP**
Boron (mg/L)	MW-1605 (bg)	-0.002146	-59	-111	No	25	24	n/a	0.01	NP
Calcium (mg/L)	MW-1011 (bg)	0.5596	51	111	No	25	0	n/a	0.01	NP
Calcium (mg/L)	MW-1012 (bg)	0.04813	89	105	No	24	0	n/a	0.01	NP
Calcium (mg/L)	MW-1203 (bg)	0.3678	54	111	No	25	0	n/a	0.01	NP
Calcium (mg/L)	MW-1604 (bg)	-0.1528	-101	-105	No	24	0	n/a	0.01	NP
Calcium (mg/L)	MW-1605 (bg)	0.03705	93	111	No	25	0	n/a	0.01	NP
Chloride (mg/L)	MW-1011 (bg)	0.1764	87	111	No	25	0	n/a	0.01	NP
Chloride (mg/L)	**MW-1012 (bg)**	**0.05505**	**165**	**105**	**Yes**	**24**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	MW-1203 (bg)	-0.05473	-110	-111	No	25	0	n/a	0.01	NP
Chloride (mg/L)	**MW-1604 (bg)**	**-0.1474**	**-152**	**-105**	**Yes**	**24**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	MW-1605 (bg)	-0.04	-107	-111	No	25	0	n/a	0.01	NP
Fluoride (mg/L)	MW-1011 (bg)	0.006189	123	139	No	29	0	n/a	0.01	NP
Fluoride (mg/L)	**MW-1012 (bg)**	**0.02447**	**242**	**139**	**Yes**	**29**	**0**	**n/a**	**0.01**	**NP**
Fluoride (mg/L)	MW-1203 (bg)	0	3	139	No	29	0	n/a	0.01	NP
Fluoride (mg/L)	**MW-1604 (bg)**	**-0.008167**	**-247**	**-139**	**Yes**	**29**	**6.897**	**n/a**	**0.01**	**NP**
Fluoride (mg/L)	MW-1605 (bg)	0	-51	-131	No	28	67.86	n/a	0.01	NP
Sulfate (mg/L)	MW-1011 (bg)	1.045	98	111	No	25	0	n/a	0.01	NP
Sulfate (mg/L)	MW-1012 (bg)	0.5655	83	105	No	24	0	n/a	0.01	NP
Sulfate (mg/L)	MW-1203 (bg)	-0.2454	-51	-111	No	25	0	n/a	0.01	NP
Sulfate (mg/L)	MW-1604 (bg)	-0.07746	-22	-105	No	24	0	n/a	0.01	NP
Sulfate (mg/L)	MW-1605 (bg)	-0.02998	-19	-111	No	25	0	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-1011 (bg)	3.599	97	105	No	24	0	n/a	0.01	NP
Total Dissolved Solids (mg/L)	**MW-1012 (bg)**	**6.6**	**143**	**98**	**Yes**	**23**	**0**	**n/a**	**0.01**	**NP**
Total Dissolved Solids (mg/L)	MW-1203 (bg)	0.6236	22	105	No	24	0	n/a	0.01	NP
Total Dissolved Solids (mg/L)	**MW-1604 (bg)**	**-8.118**	**-155**	**-98**	**Yes**	**23**	**0**	**n/a**	**0.01**	**NP**
Total Dissolved Solids (mg/L)	MW-1605 (bg)	1.865	82	105	No	24	4.167	n/a	0.01	NP

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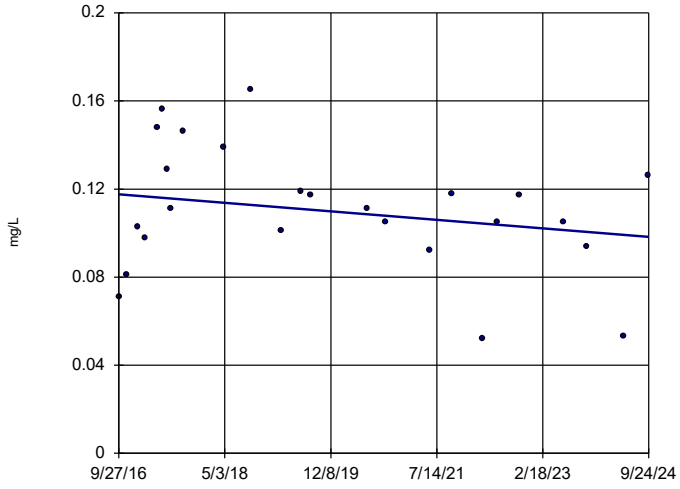
Sen's Slope Estimator

MW-1011 (bg)



n = 25

Slope = -0.002429 units per year.

Mann-Kendall statistic = -37 critical = -111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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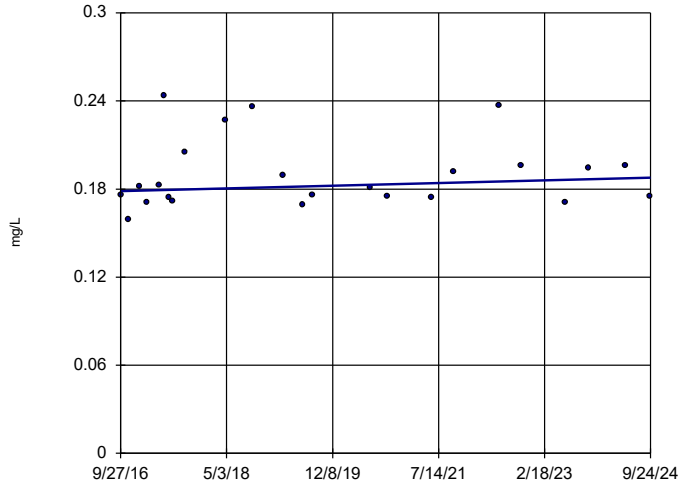
Sen's Slope Estimator

MW-1012 (bg)



n = 24

Slope = 0.001155 units per year.

Mann-Kendall statistic = 35 critical = 105

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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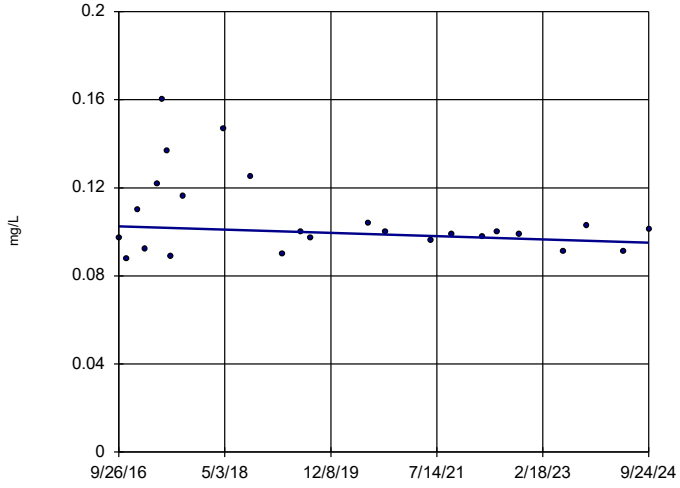
Sen's Slope Estimator

MW-1203 (bg)



n = 25

Slope = -0.0009328 units per year.

Mann-Kendall statistic = -30 critical = -111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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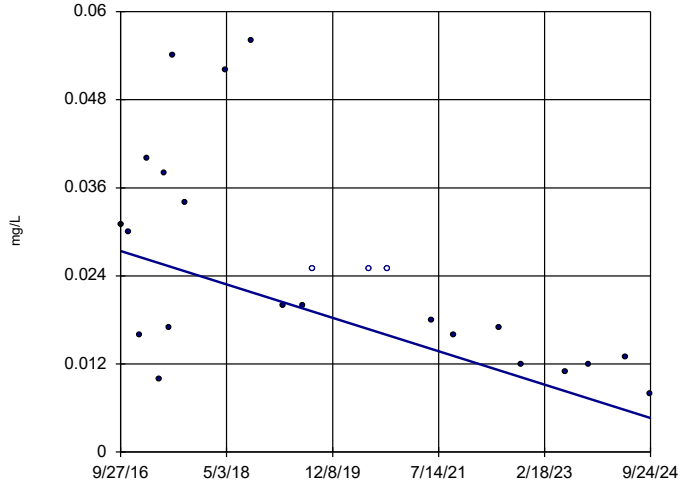
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1604 (bg)



n = 24

Slope = -0.002845 units per year.

Mann-Kendall statistic = -119 critical = -105

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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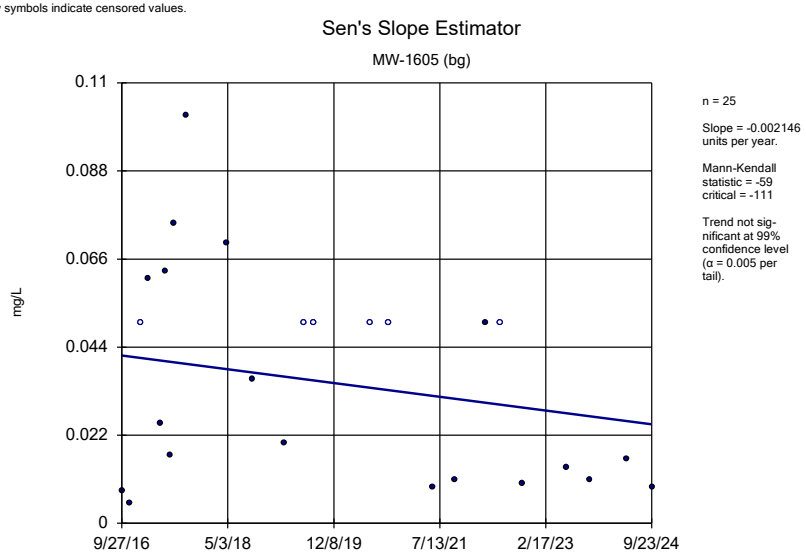
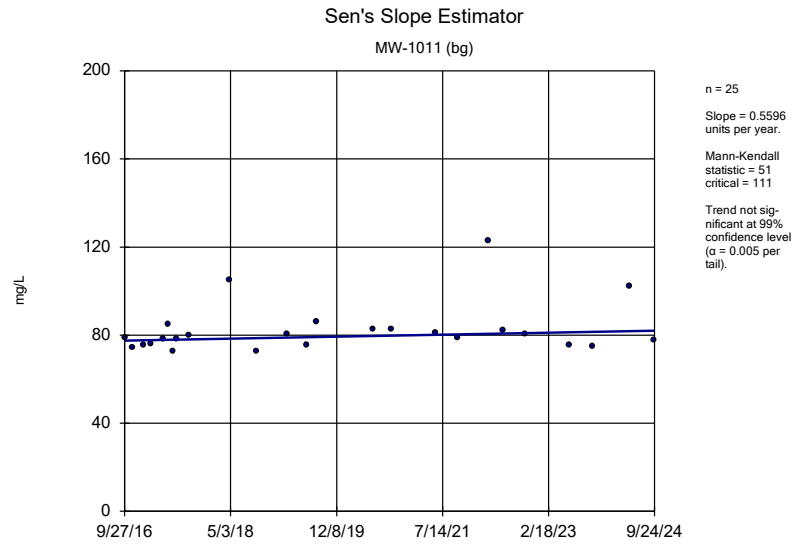
Hollow symbols indicate censored values.



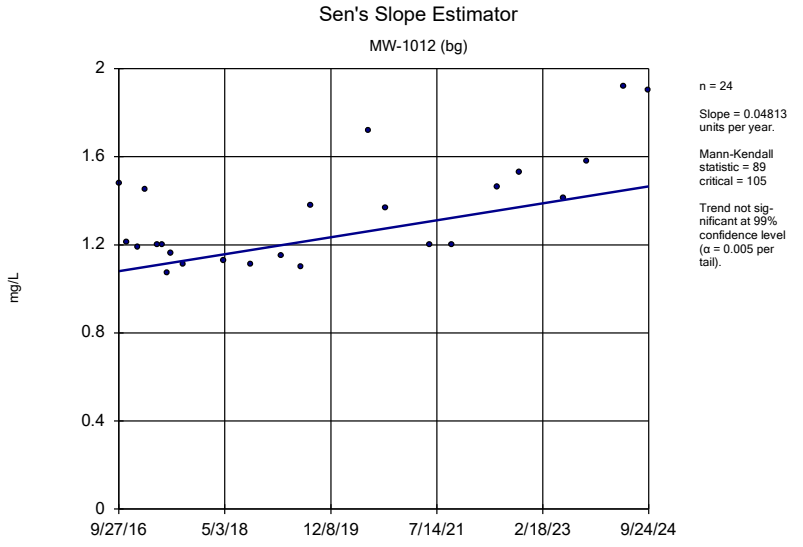
Constituent: Boron Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



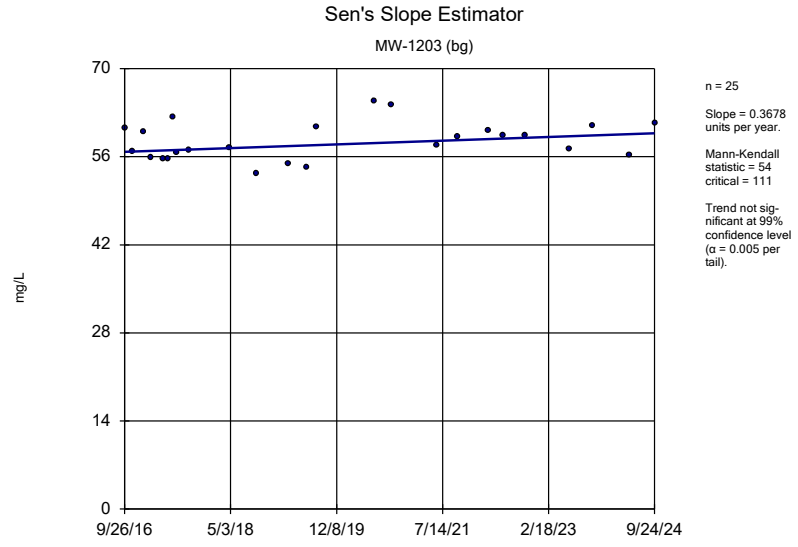
Constituent: Calcium Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Calcium Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Calcium Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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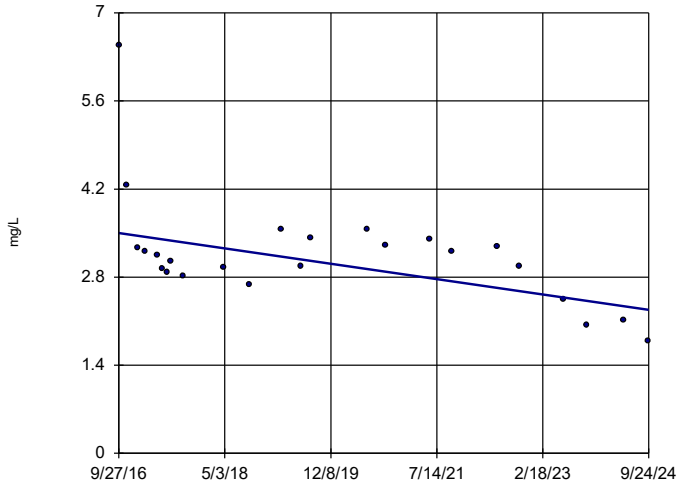
Sen's Slope Estimator

MW-1604 (bg)



n = 24

Slope = -0.1528 units per year.

Mann-Kendall statistic = -101 critical = -105

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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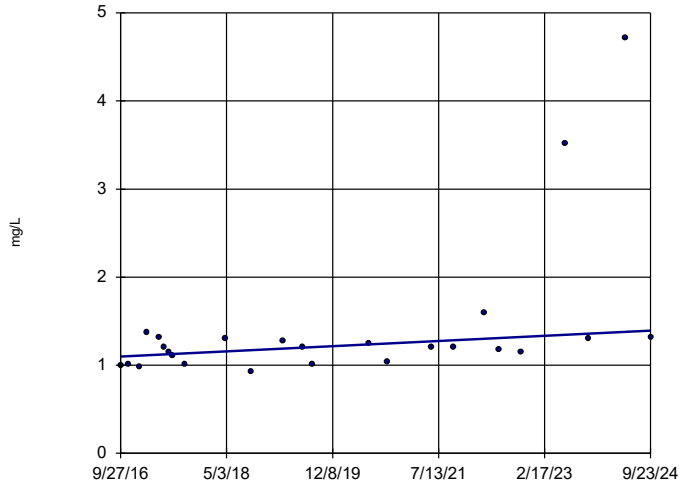
Sen's Slope Estimator

MW-1605 (bg)



n = 25

Slope = 0.03705 units per year.

Mann-Kendall statistic = 93 critical = 111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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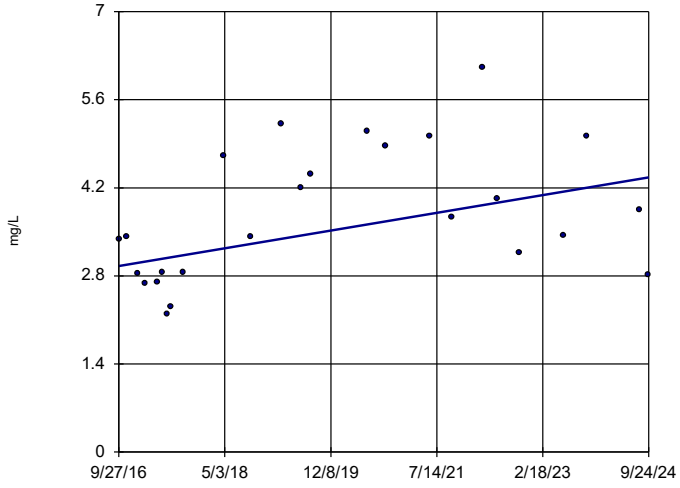
Sen's Slope Estimator

MW-1011 (bg)



n = 25

Slope = 0.1764 units per year.

Mann-Kendall statistic = 87 critical = 111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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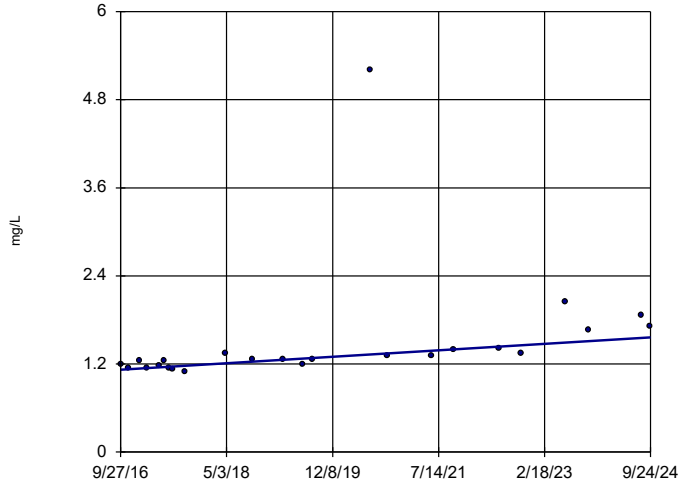
Sen's Slope Estimator

MW-1012 (bg)



n = 24

Slope = 0.05505 units per year.

Mann-Kendall statistic = 165 critical = 105

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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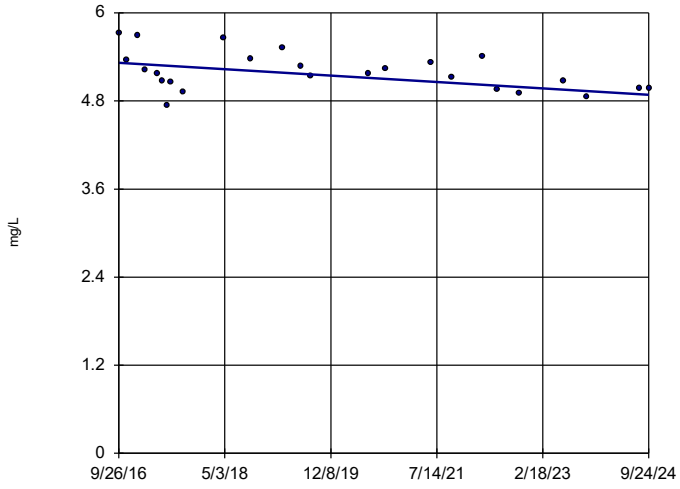
Sen's Slope Estimator

MW-1203 (bg)



n = 25

Slope = -0.05473 units per year.

Mann-Kendall statistic = -110 critical = -111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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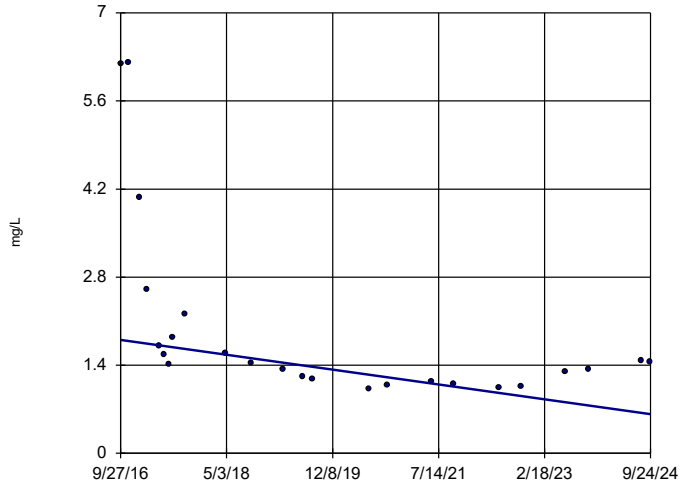
Sen's Slope Estimator

MW-1604 (bg)



n = 24

Slope = -0.1474 units per year.

Mann-Kendall statistic = -152 critical = -105

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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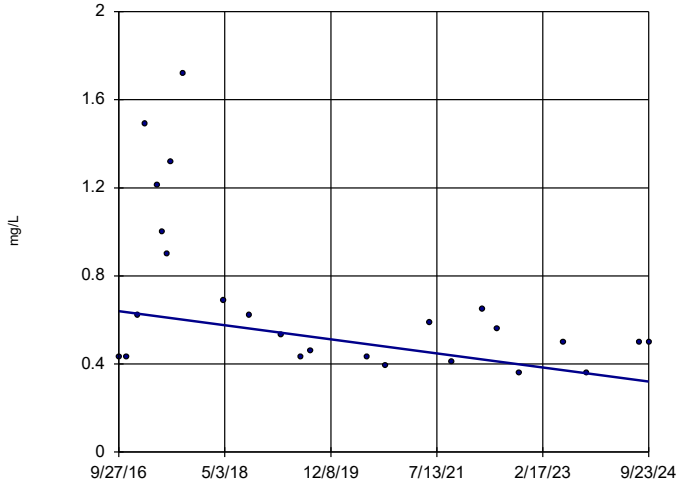
Sen's Slope Estimator

MW-1605 (bg)



n = 25

Slope = -0.04 units per year.

Mann-Kendall statistic = -107 critical = -111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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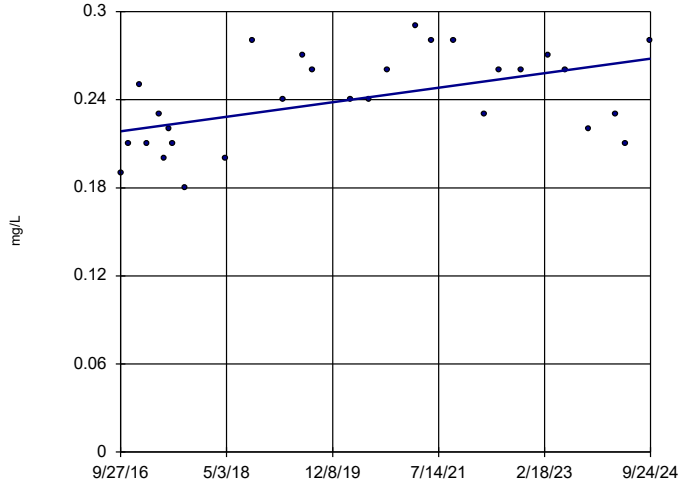
Sen's Slope Estimator

MW-1011 (bg)



n = 29

Slope = 0.006189 units per year.

Mann-Kendall statistic = 123 critical = 139

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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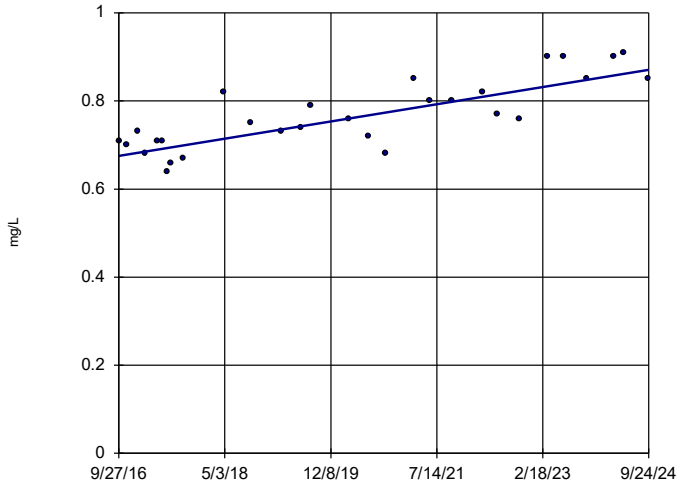
Sen's Slope Estimator

MW-1012 (bg)



n = 29

Slope = 0.02447
units per year.

Mann-Kendall
statistic = 242
critical = 139

Increasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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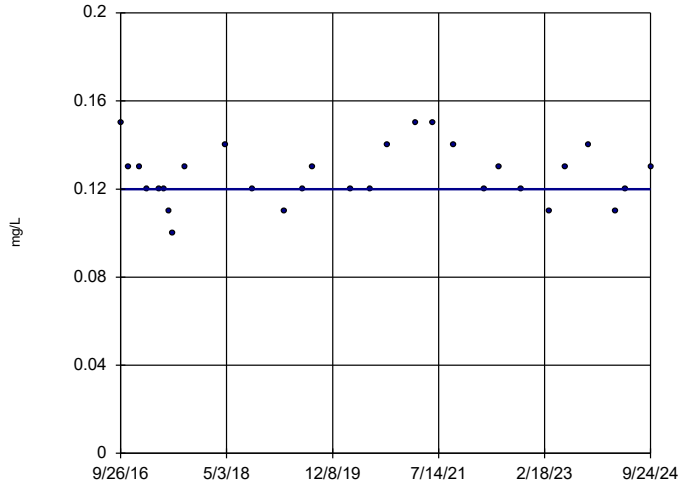
Sen's Slope Estimator

MW-1203 (bg)



n = 29

Slope = 0
units per year.

Mann-Kendall
statistic = 3
critical = 139

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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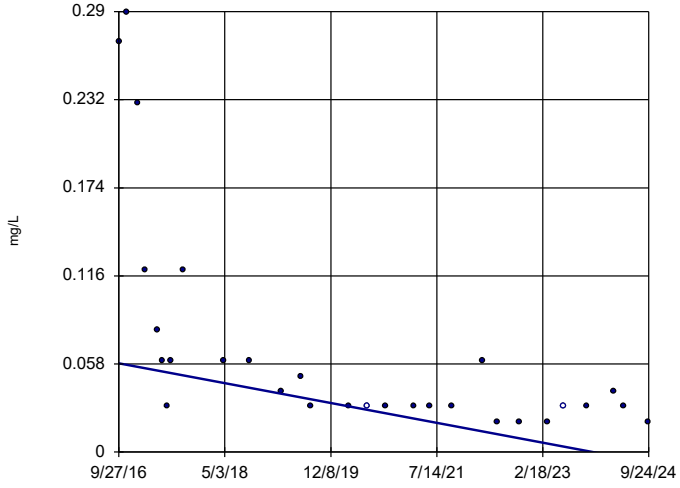
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1604 (bg)



n = 29

Slope = -0.008167
units per year.

Mann-Kendall
statistic = -247
critical = -139

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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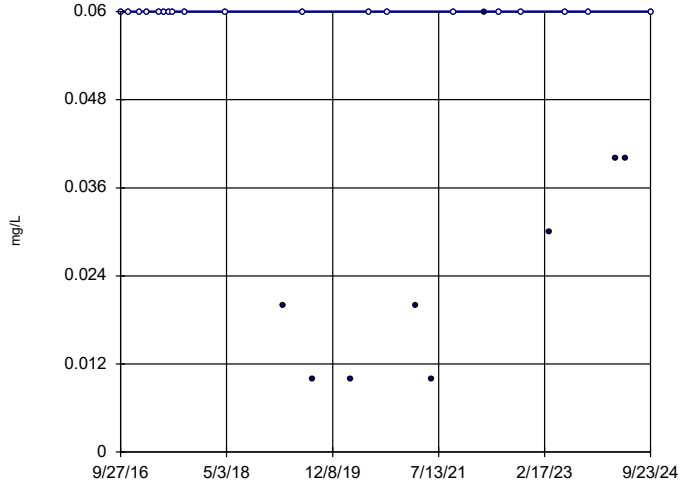
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1605 (bg)



n = 28

Slope = 0
units per year.

Mann-Kendall
statistic = -51
critical = -131

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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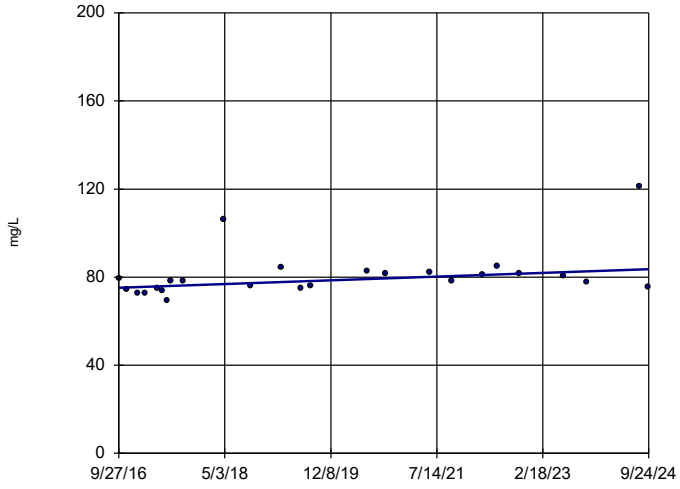
Sen's Slope Estimator

MW-1011 (bg)



n = 25

Slope = 1.045 units per year.

Mann-Kendall statistic = 98 critical = 111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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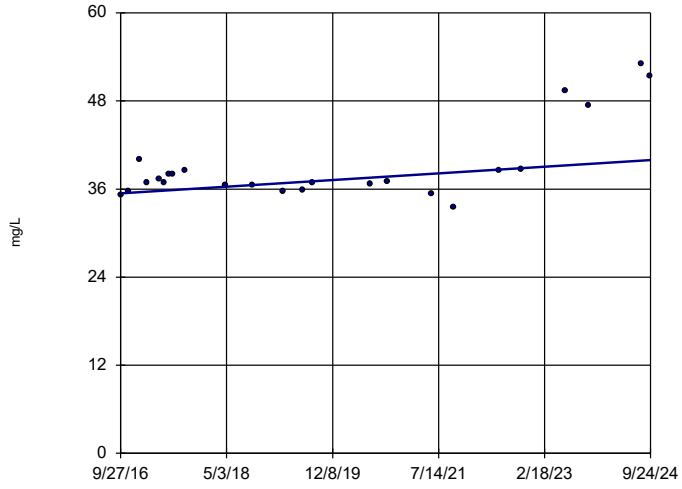
Sen's Slope Estimator

MW-1012 (bg)



n = 24

Slope = 0.5655 units per year.

Mann-Kendall statistic = 83 critical = 105

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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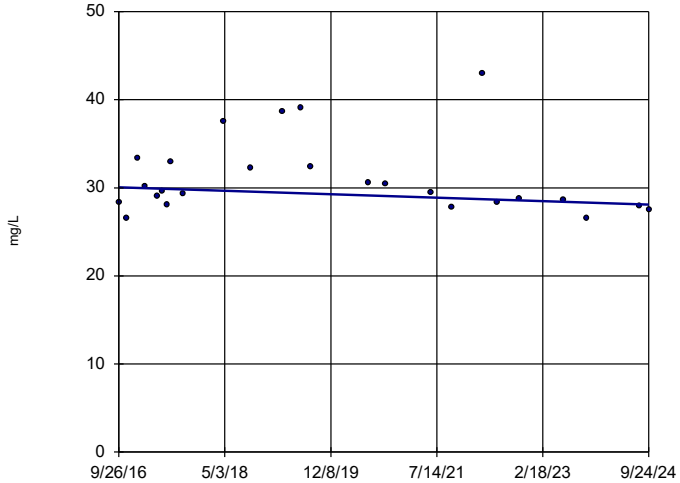
Sen's Slope Estimator

MW-1203 (bg)



n = 25

Slope = -0.2454 units per year.

Mann-Kendall statistic = -51 critical = -111

Trend not significant at 99% confidence level (α = 0.005 per tail).

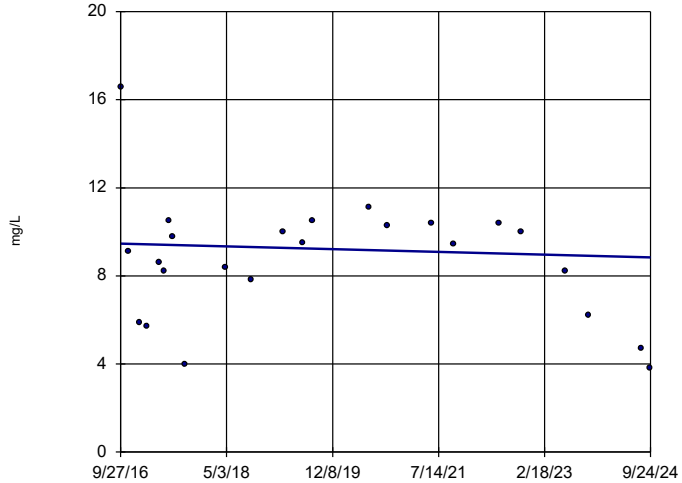
Constituent: Sulfate Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1604 (bg)



n = 24

Slope = -0.07746 units per year.

Mann-Kendall statistic = -22 critical = -105

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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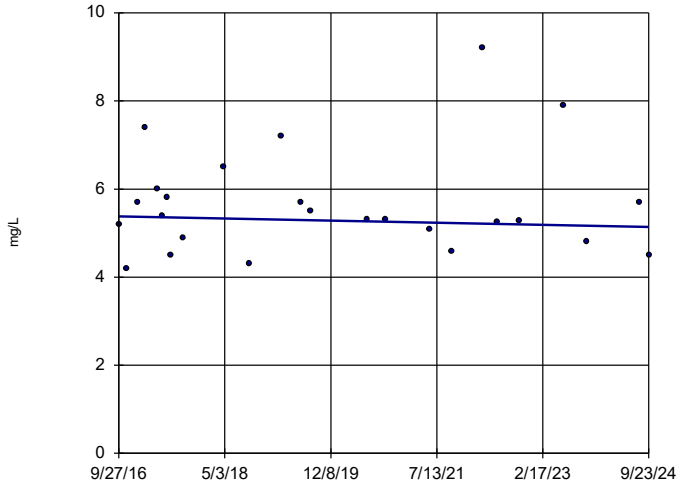
Sen's Slope Estimator

MW-1605 (bg)



n = 25

Slope = -0.02998 units per year.

Mann-Kendall statistic = -19 critical = -111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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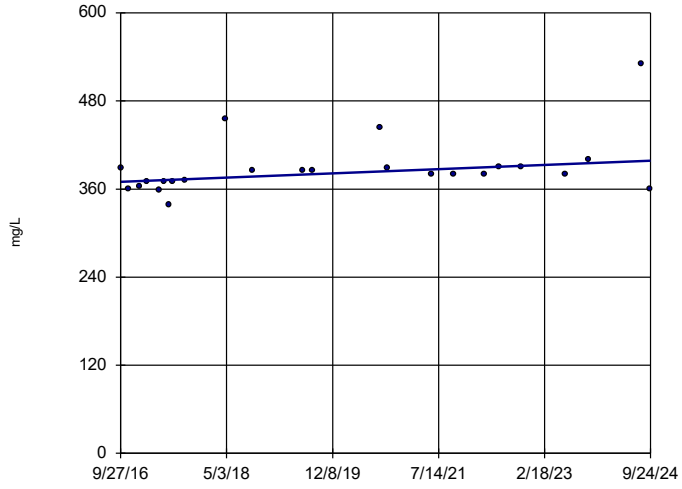
Sen's Slope Estimator

MW-1011 (bg)



n = 24

Slope = 3.599 units per year.

Mann-Kendall statistic = 97 critical = 105

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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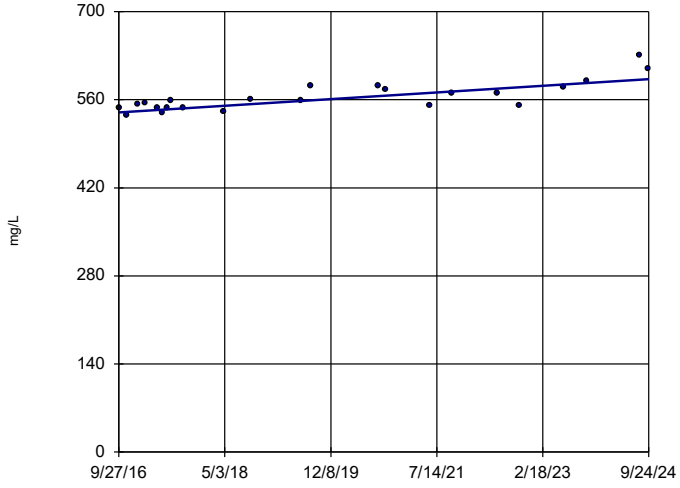
Sen's Slope Estimator

MW-1012 (bg)



n = 23

Slope = 6.6 units per year.

Mann-Kendall statistic = 143 critical = 98

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

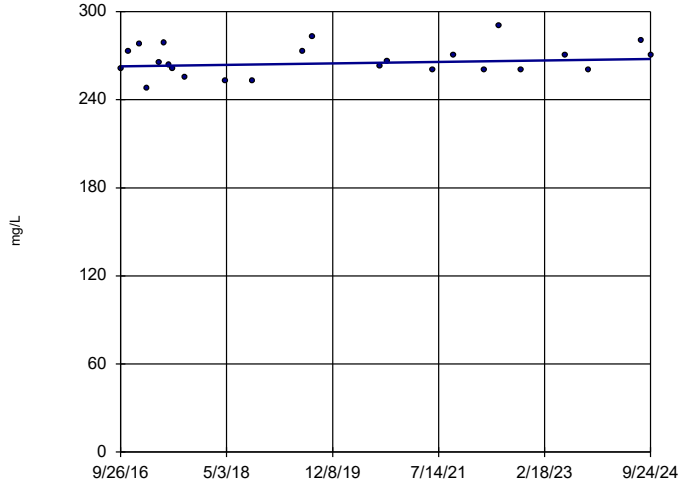
Constituent: Total Dissolved Solids Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1203 (bg)



n = 24

Slope = 0.6236 units per year.

Mann-Kendall statistic = 22 critical = 105

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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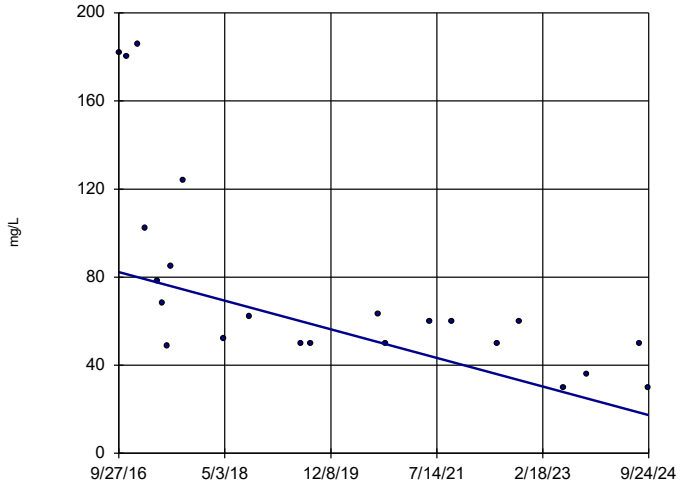
Sen's Slope Estimator

MW-1604 (bg)



n = 23

Slope = -8.118 units per year.

Mann-Kendall statistic = -155 critical = -98

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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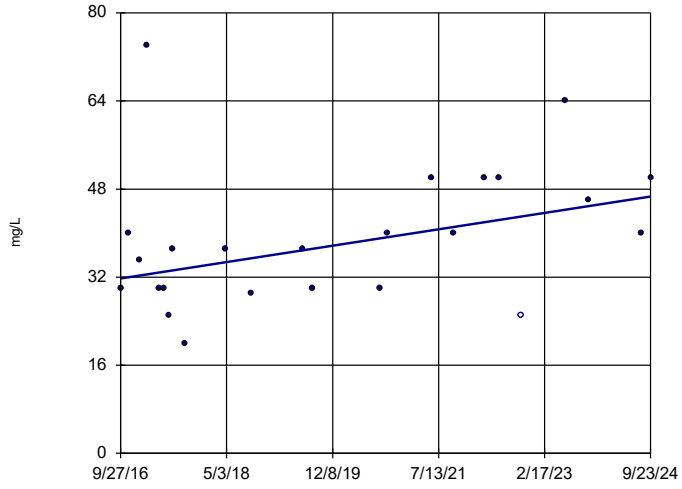
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1605 (bg)



n = 24

Slope = 1.865 units per year.

Mann-Kendall statistic = 82 critical = 105

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 1/7/2025 12:23 PM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE G

Interwell PLs

Appendix III Interwell Prediction Limits - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/14/2025, 11:05 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg NBg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	n/a	0.244	n/a	n/a	4 future	n/a	123	n/a	n/a	7.317	n/a	n/a	0.0001299	NP Inter (normality) 1 of 2
Calcium (mg/L)	n/a	123	n/a	n/a	4 future	n/a	123	n/a	n/a	0	n/a	n/a	0.0001299	NP Inter (normality) 1 of 2
Chloride (mg/L)	n/a	6.22	n/a	n/a	4 future	n/a	123	n/a	n/a	0	n/a	n/a	0.0001299	NP Inter (normality) 1 of 2
Fluoride (mg/L)	n/a	0.91	n/a	n/a	4 future	n/a	144	n/a	n/a	14.58	n/a	n/a	0.00009509	NP Inter (normality) 1 of 2
Sulfate (mg/L)	n/a	121	n/a	n/a	4 future	n/a	123	n/a	n/a	0	n/a	n/a	0.0001299	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	n/a	630	n/a	n/a	4 future	n/a	118	n/a	n/a	0.8475	n/a	n/a	0.000141	NP Inter (normality) 1 of 2

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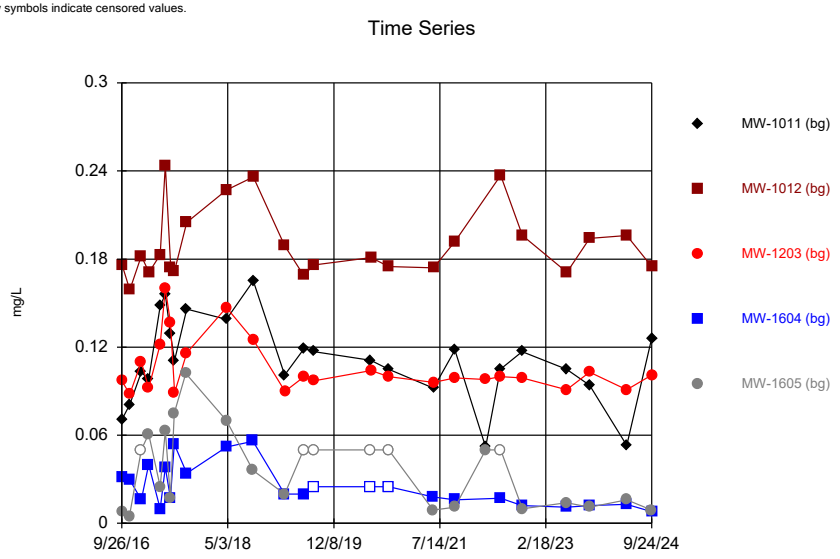
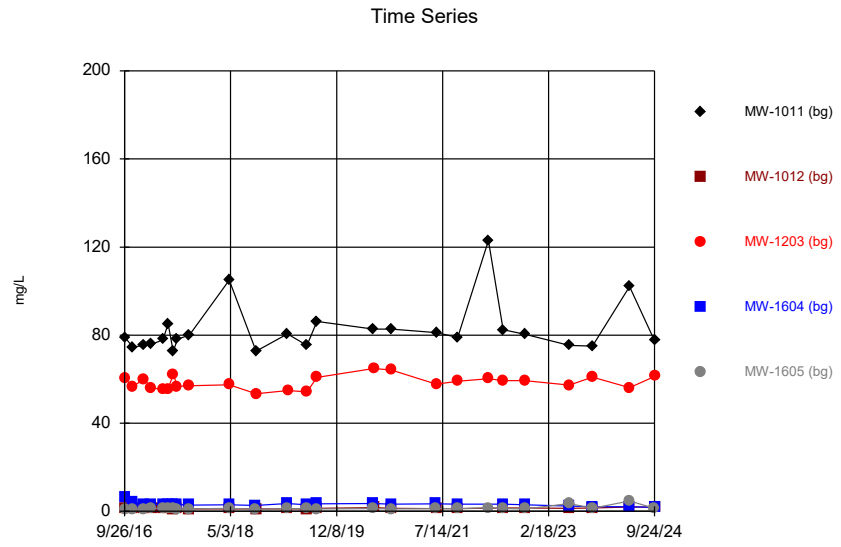
Hollow symbols indicate censored values.



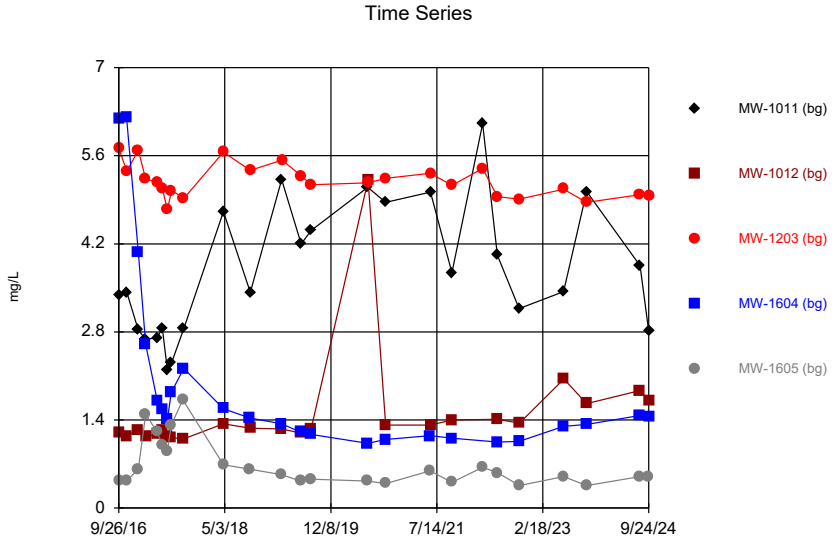
Constituent: Boron Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Calcium Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Chloride Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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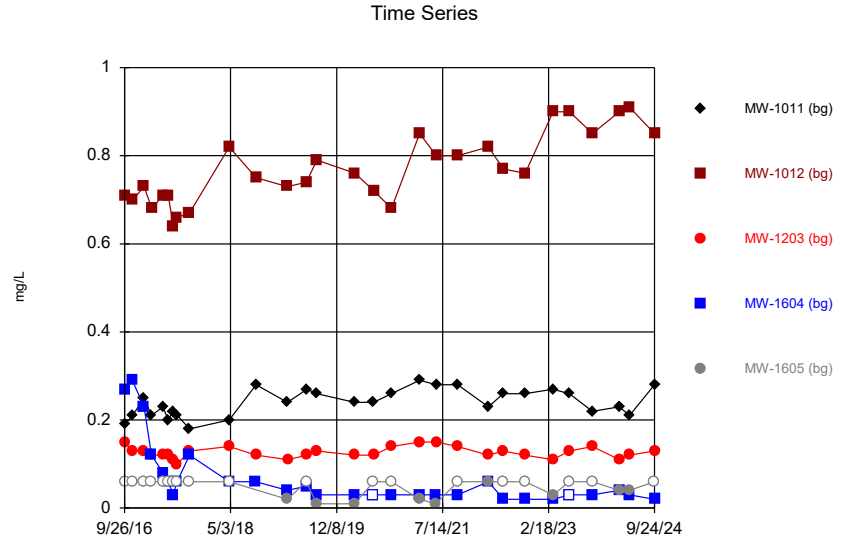
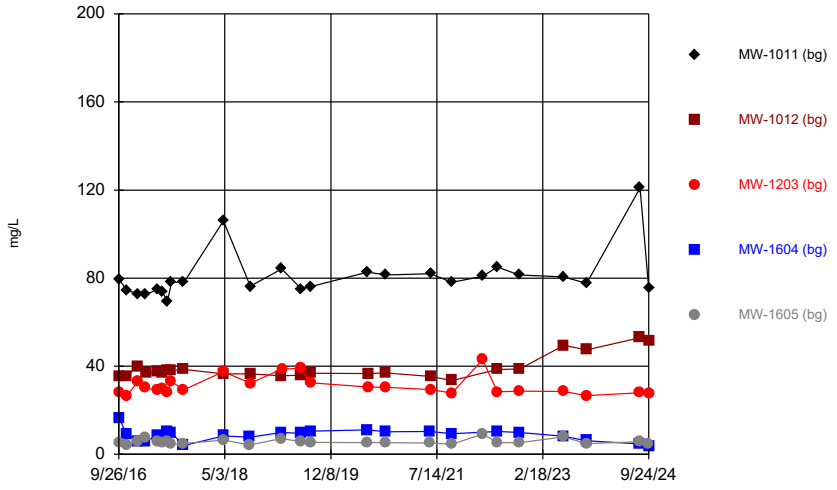
Hollow symbols indicate censored values.



Constituent: Fluoride Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Sulfate Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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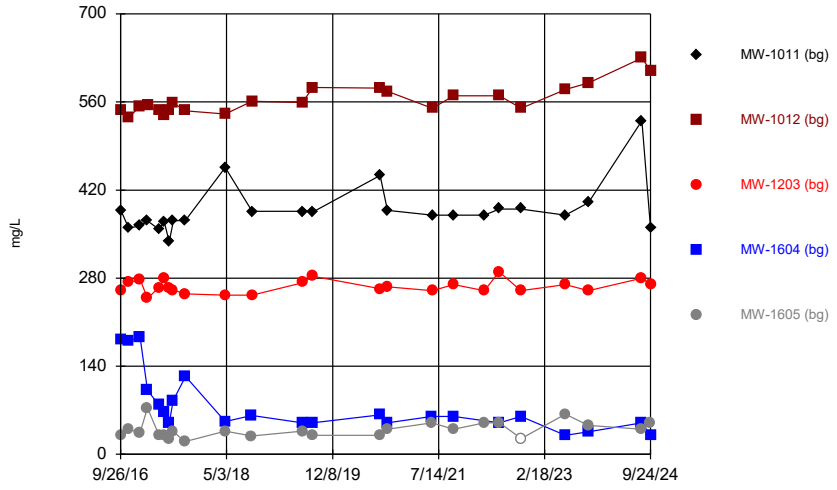
Hollow symbols indicate censored values.

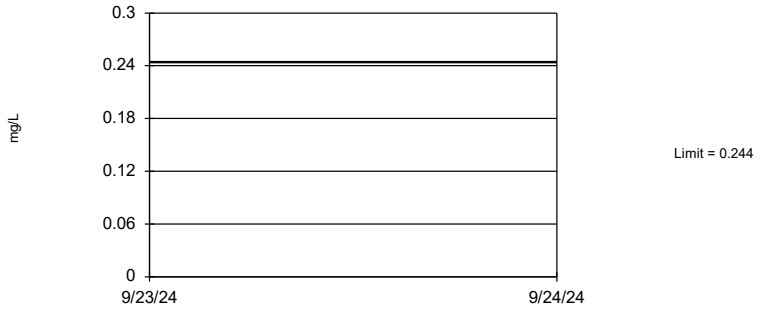
Time Series



Constituent: Total Dissolved Solids Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 123 background values. 7.317% NDs. Annual per-constituent alpha = 0.001038. Individual comparison alpha = 0.0001299 (1 of 2). Assumes 4 future values.

Constituent: Boron Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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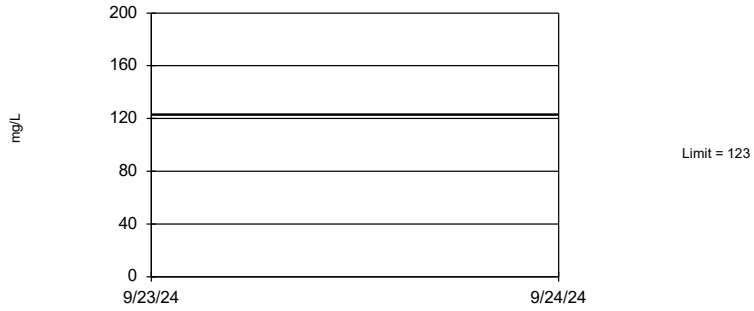
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 123 background values. Annual per-constituent alpha = 0.001038. Individual comparison alpha = 0.0001299 (1 of 2). Assumes 4 future values.

Constituent: Calcium Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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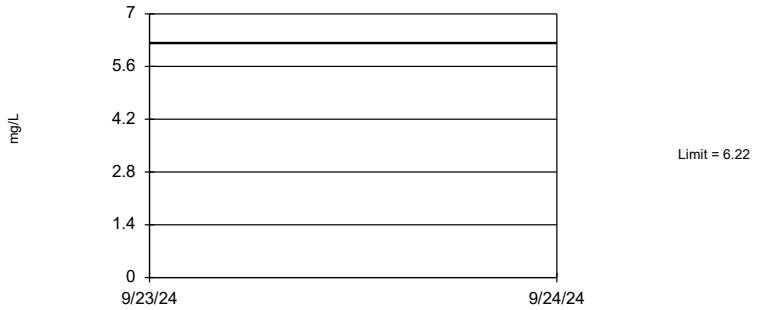
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 123 background values. Annual per-constituent alpha = 0.001038. Individual comparison alpha = 0.0001299 (1 of 2). Assumes 4 future values.

Constituent: Chloride Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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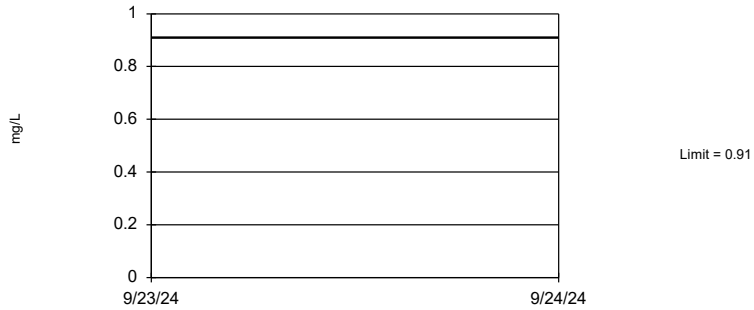
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 14.58% NDs. Annual per-constituent alpha = 0.0007605. Individual comparison alpha = 0.00009509 (1 of 2). Assumes 4 future values.

Constituent: Fluoride Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Prediction Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 123 background values. Annual per-constituent alpha = 0.001038. Individual comparison alpha = 0.0001299 (1 of 2). Assumes 4 future values.

Constituent: Sulfate Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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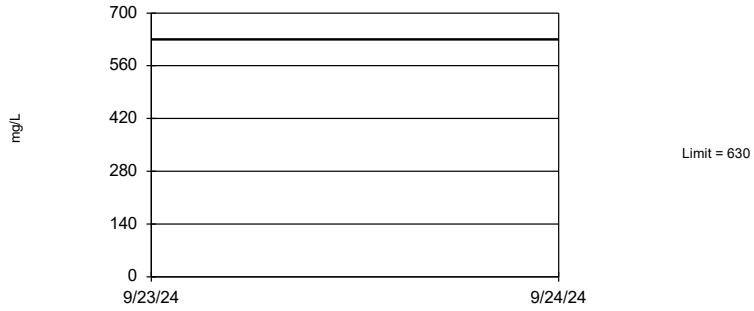
Prediction Limit

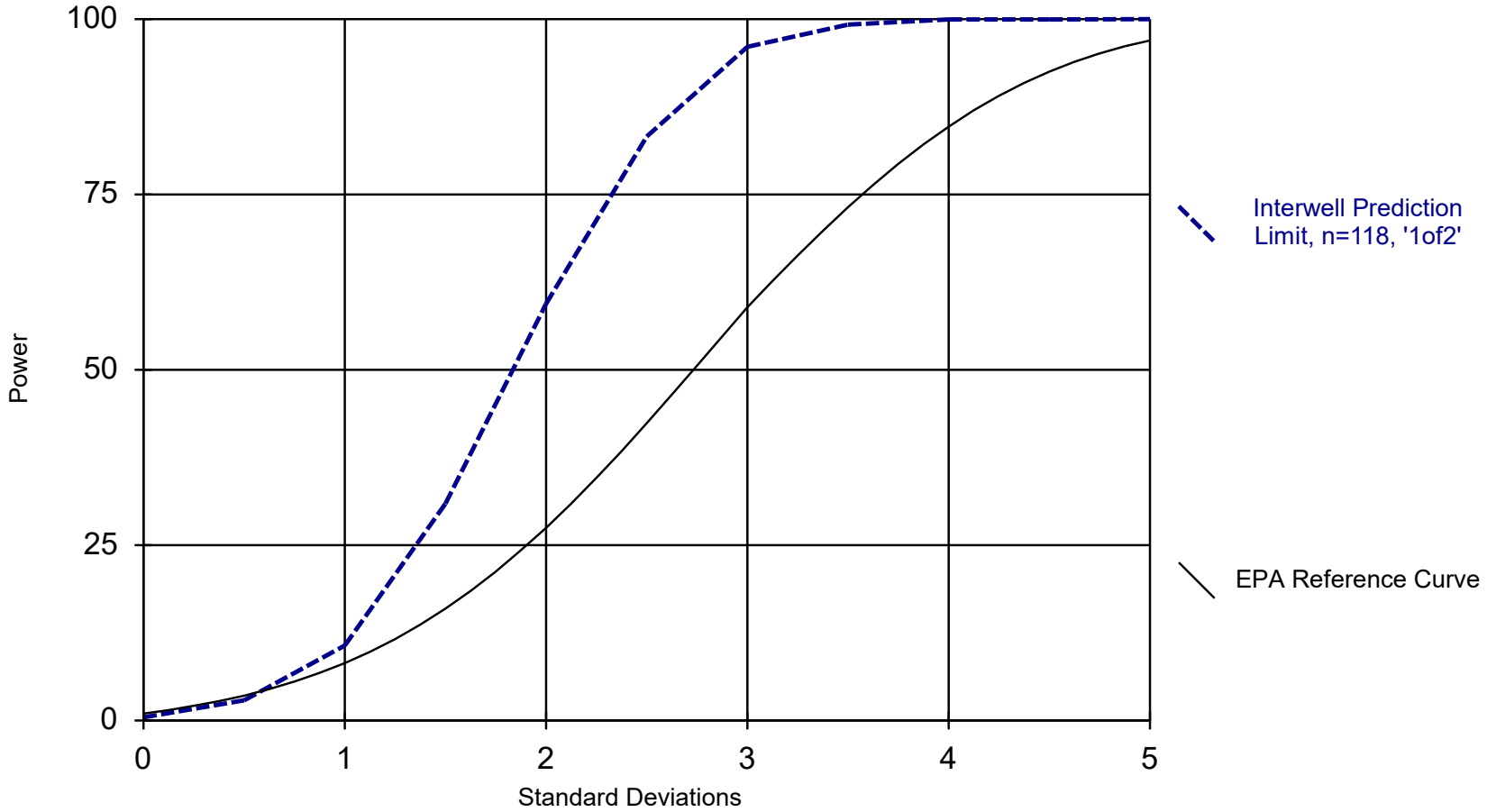
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 118 background values. 0.8475% NDs. Annual per-constituent alpha = 0.001128. Individual comparison alpha = 0.000141 (1 of 2). Assumes 4 future values.

Constituent: Total Dissolved Solids Analysis Run 1/14/2025 11:05 AM View: Appendix III - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Interwell Power Curve



Kappa = 1.741, based on 4 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 1/14/2025 11:13 AM

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE H

UTLs

Upper Tolerance Limits Summary Table

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/14/2025, 4:29 PM

Constituent	Upper Lim.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	0.0012	131	n/a	n/a	22.14	n/a	n/a	0.001207	NP Inter(normality)
Arsenic (mg/L)	0.0289	131	n/a	n/a	4.58	n/a	n/a	0.001207	NP Inter(normality)
Barium (mg/L)	0.113	140	n/a	n/a	0	n/a	n/a	0.0007609	NP Inter(normality)
Beryllium (mg/L)	0.000349	140	n/a	n/a	18.57	n/a	n/a	0.0007609	NP Inter(normality)
Cadmium (mg/L)	0.00014	140	n/a	n/a	27.86	n/a	n/a	0.0007609	NP Inter(normality)
Chromium (mg/L)	0.0066	139	n/a	n/a	0	n/a	n/a	0.0008009	NP Inter(normality)
Cobalt (mg/L)	0.003597	140	-7.698	1.103	0	None	ln(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	4.143	135	1.192	0.4482	0	None	sqrt(x)	0.05	Inter
Fluoride (mg/L)	0.91	144	n/a	n/a	14.58	n/a	n/a	0.0006197	NP Inter(normality)
Lead (mg/L)	0.00255	140	n/a	n/a	11.43	n/a	n/a	0.0007609	NP Inter(normality)
Lithium (mg/L)	0.02	140	n/a	n/a	7.857	n/a	n/a	0.0007609	NP Inter(normality)
Mercury (mg/L)	0.000092	140	n/a	n/a	78.57	n/a	n/a	0.0007609	NP Inter(NDs)
Molybdenum (mg/L)	0.0055	132	n/a	n/a	29.55	n/a	n/a	0.001147	NP Inter(normality)
Selenium (mg/L)	0.00104	140	n/a	n/a	27.86	n/a	n/a	0.0007609	NP Inter(normality)
Thallium (mg/L)	0.000229	140	n/a	n/a	45	n/a	n/a	0.0007609	NP Inter(normality)

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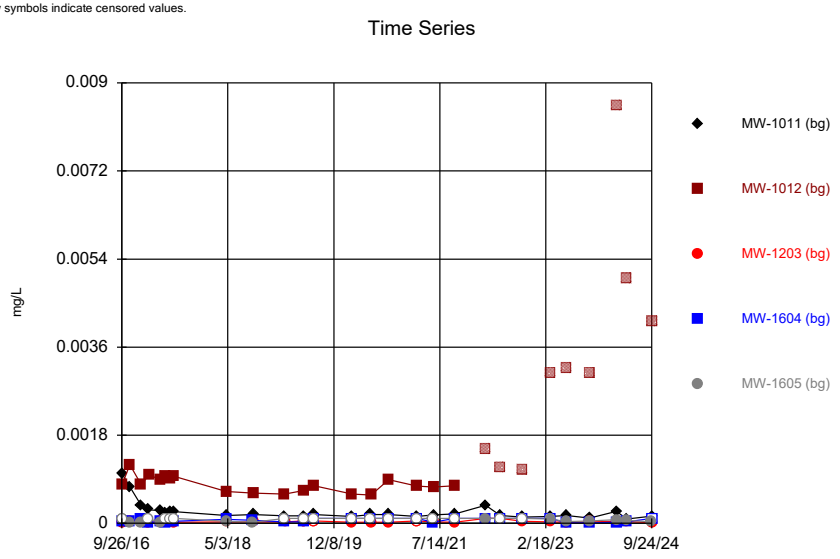
Hollow symbols indicate censored values.



Constituent: Antimony Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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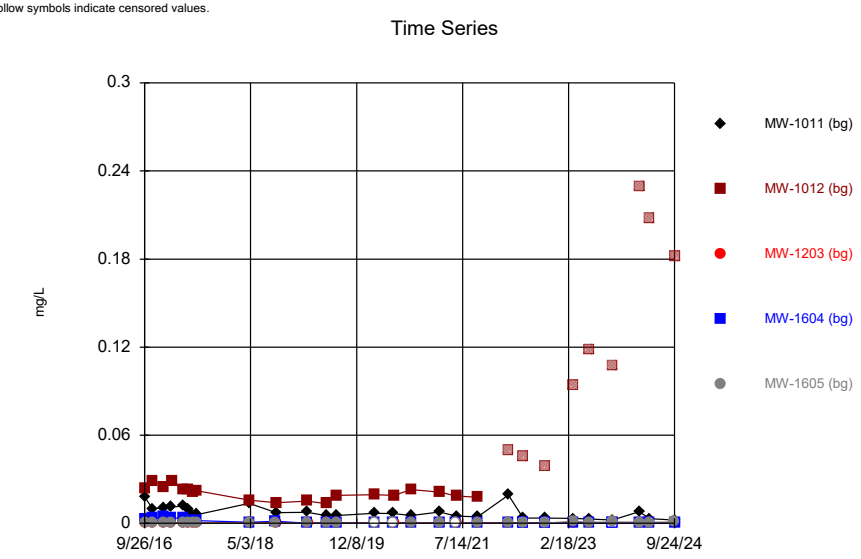
Hollow symbols indicate censored values.



Constituent: Arsenic Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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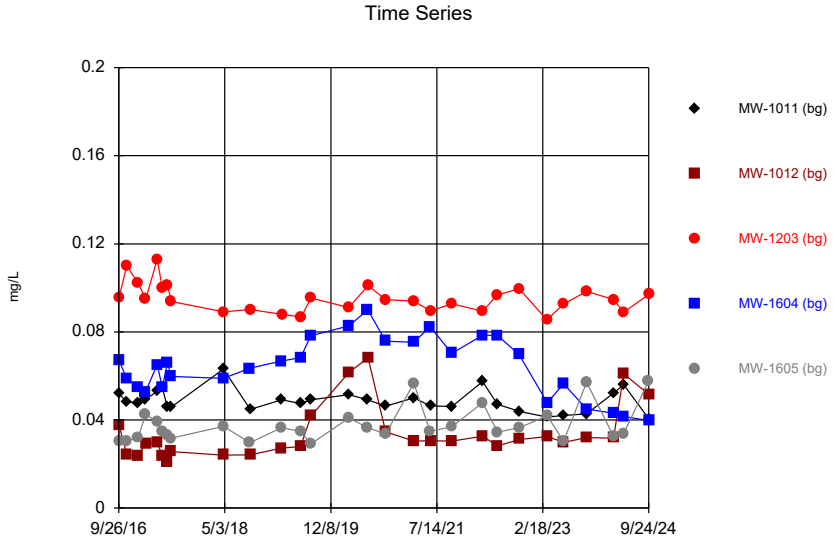

Constituent: Barium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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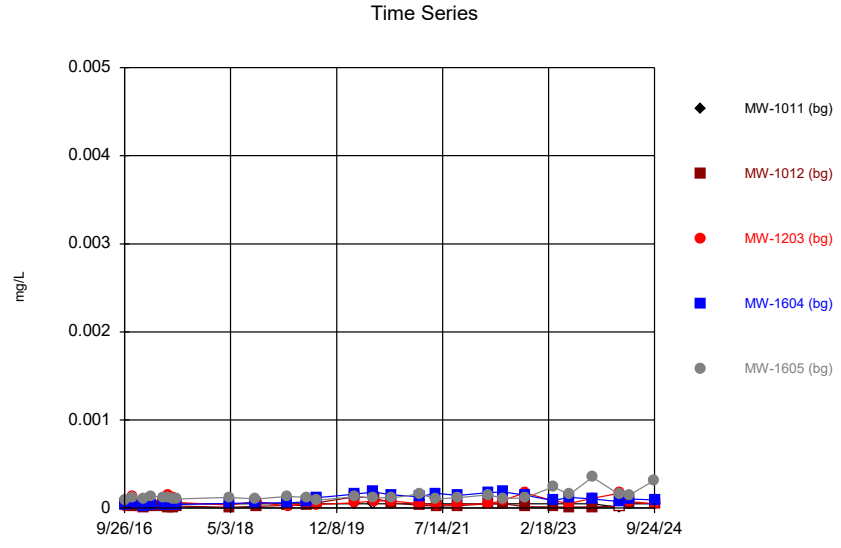
Hollow symbols indicate censored values.



Constituent: Beryllium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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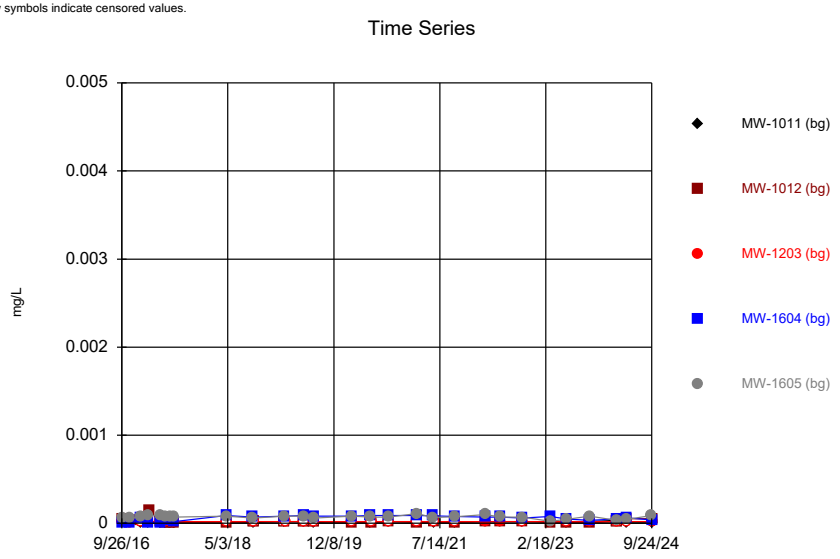
Hollow symbols indicate censored values.



Constituent: Cadmium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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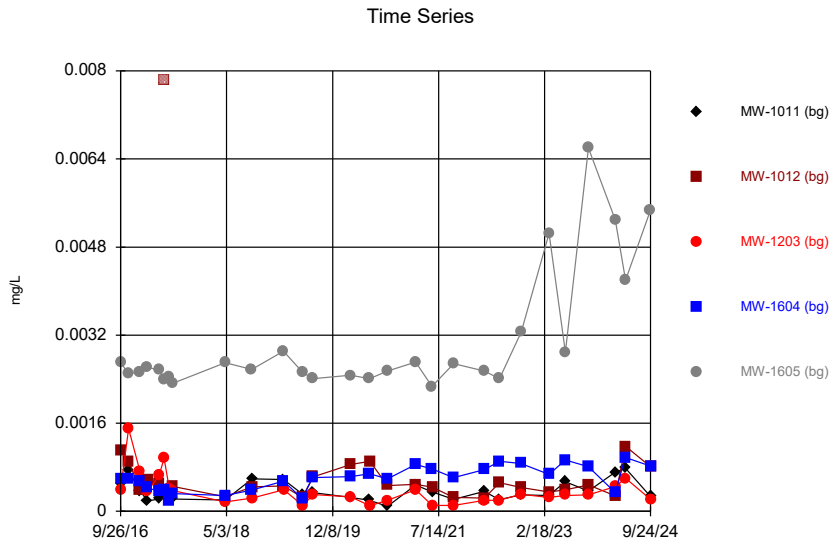

Constituent: Chromium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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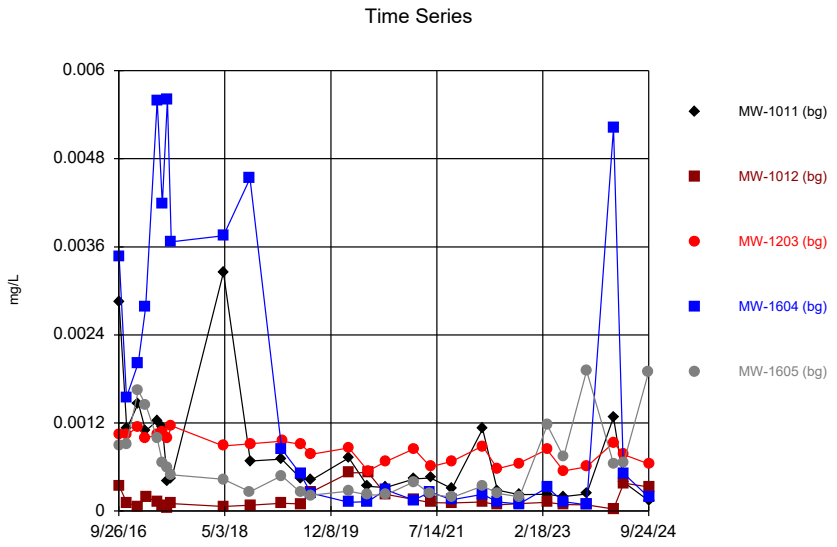
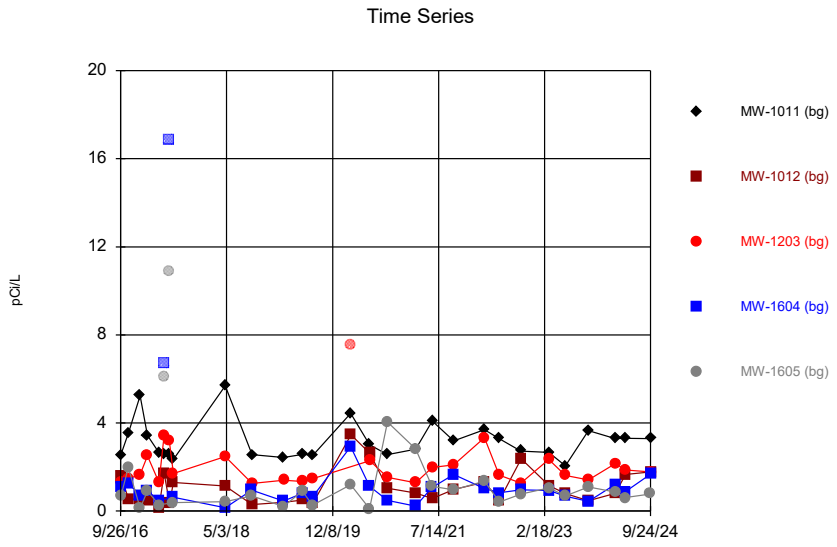


Constituent: Cobalt Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Constituent: Combined Radium 226 + 228 Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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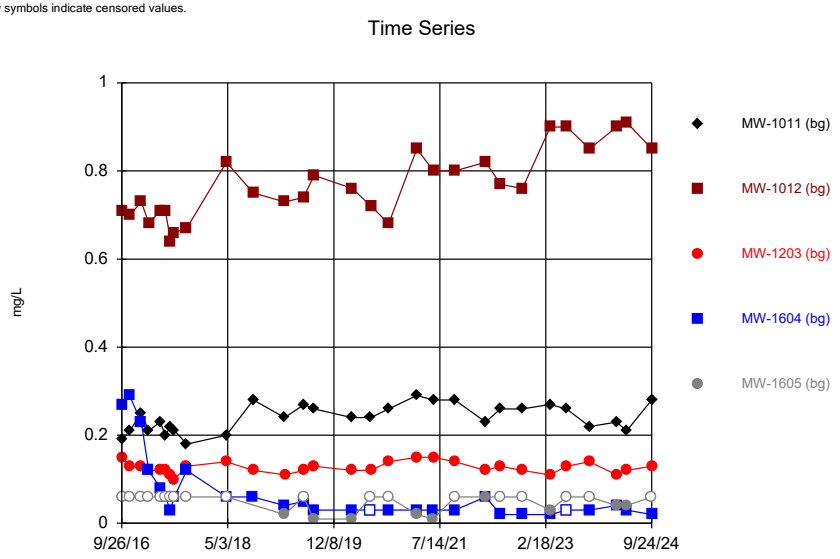
Hollow symbols indicate censored values.



Constituent: Fluoride Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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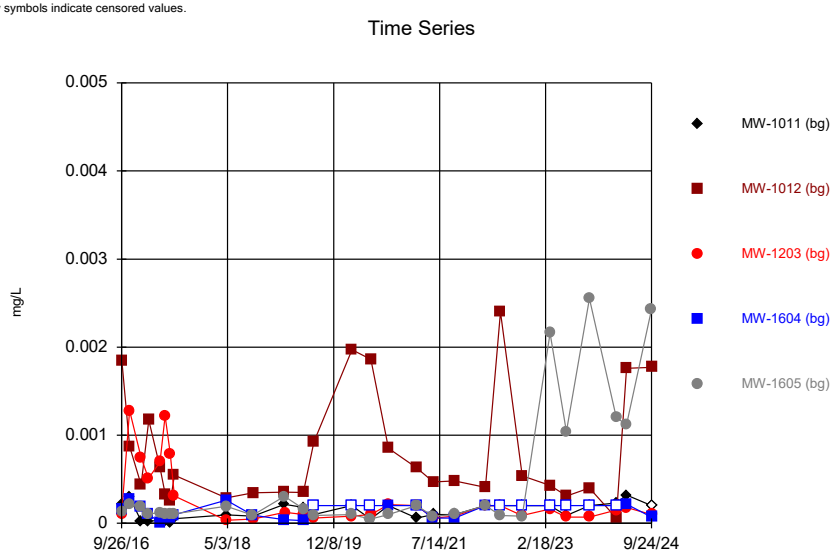
Hollow symbols indicate censored values.



Constituent: Lead Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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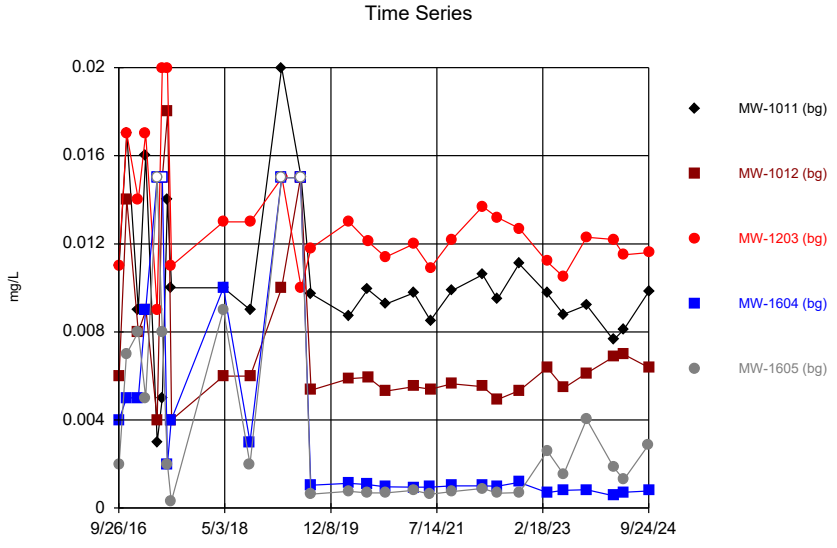
Hollow symbols indicate censored values.



Constituent: Lithium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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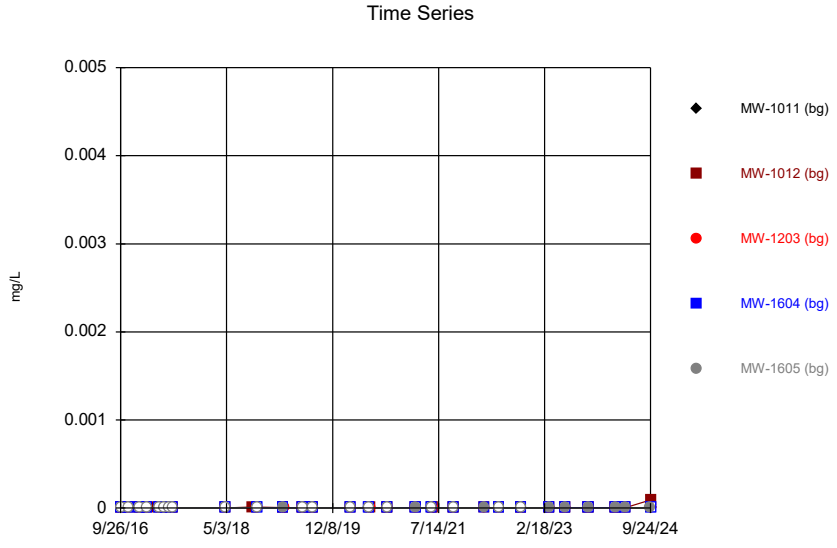
Hollow symbols indicate censored values.



Constituent: Mercury Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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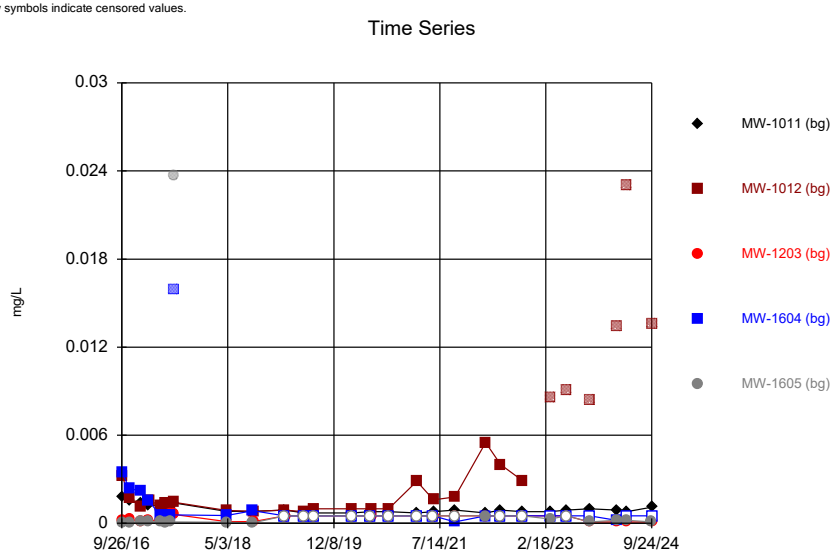
Hollow symbols indicate censored values.



Constituent: Molybdenum Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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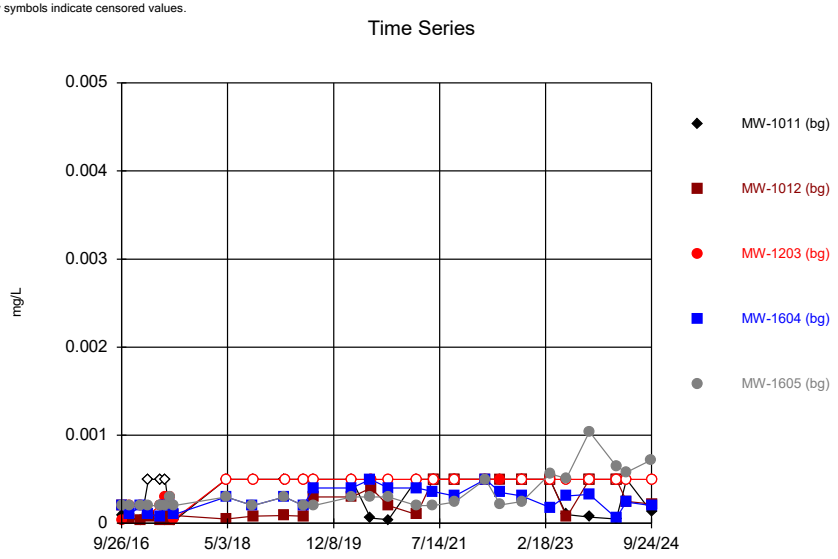
Hollow symbols indicate censored values.



Constituent: Selenium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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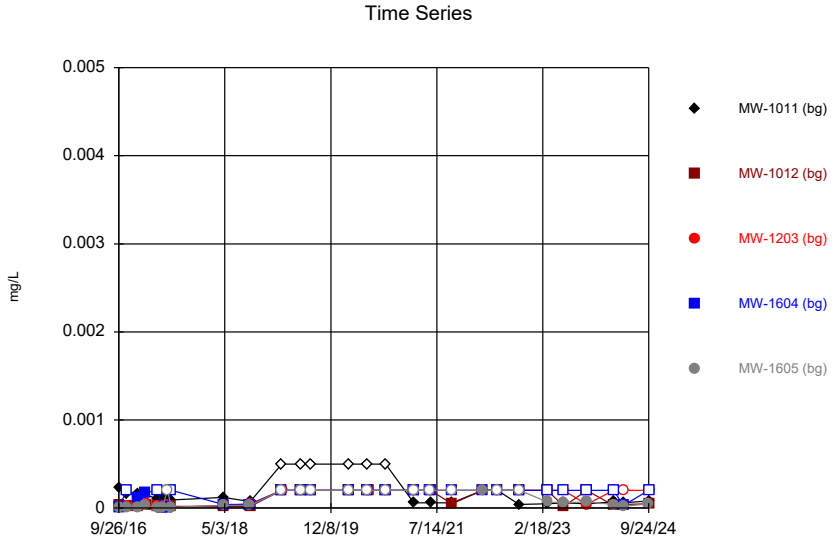
Hollow symbols indicate censored values.



Constituent: Thallium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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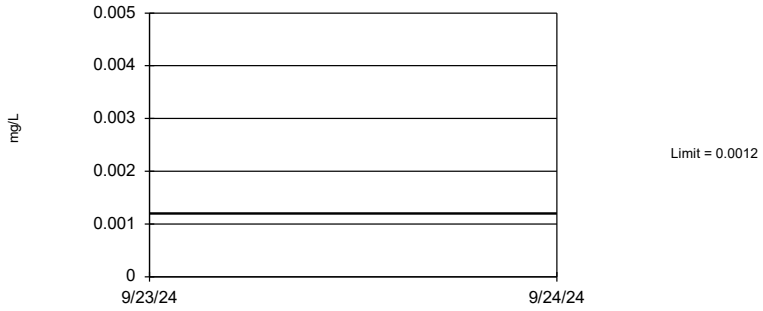
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 131 background values. 22.14% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.001207.

Constituent: Antimony Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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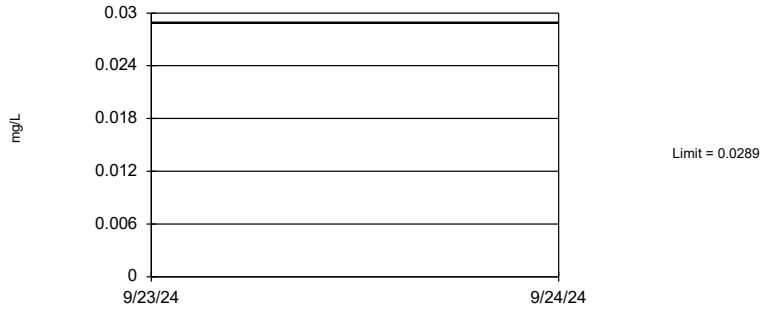
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 131 background values. 4.58% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.001207.

Constituent: Arsenic Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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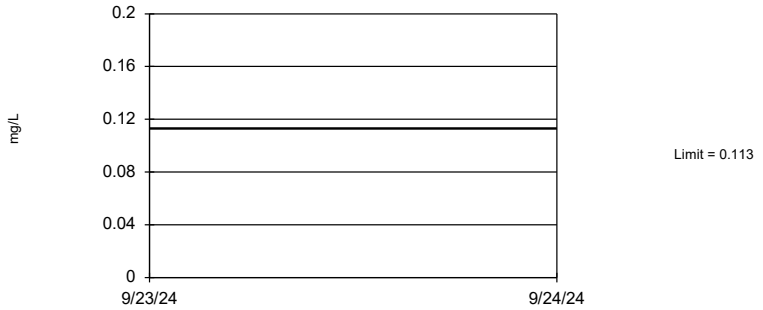
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Barium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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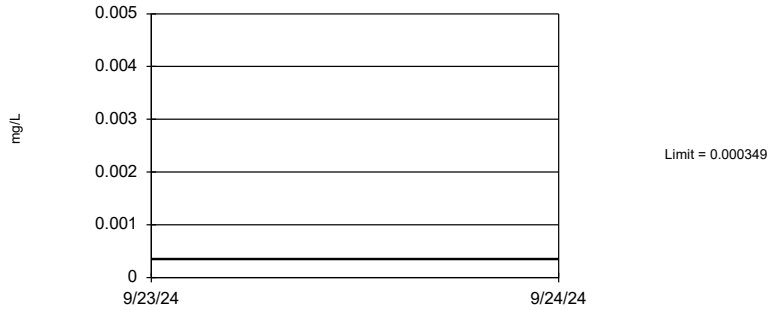
Tolerance Limit

Interwell Non-parametric



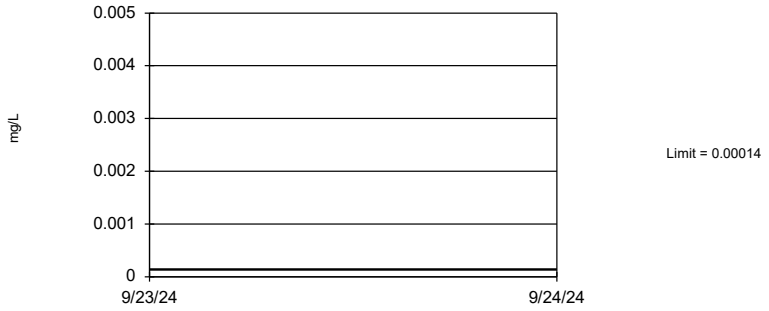
Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 18.57% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Beryllium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 27.86% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

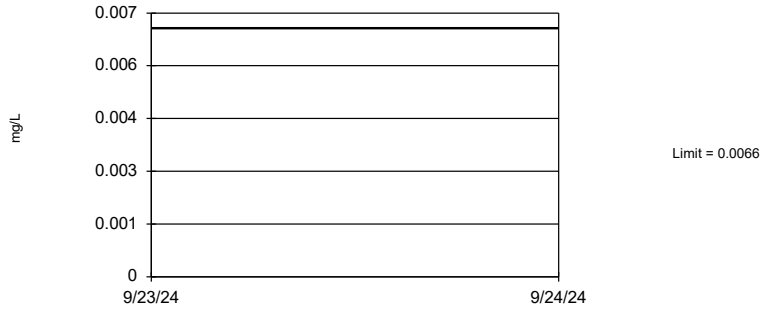
Constituent: Cadmium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 139 background values. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0008009.

Constituent: Chromium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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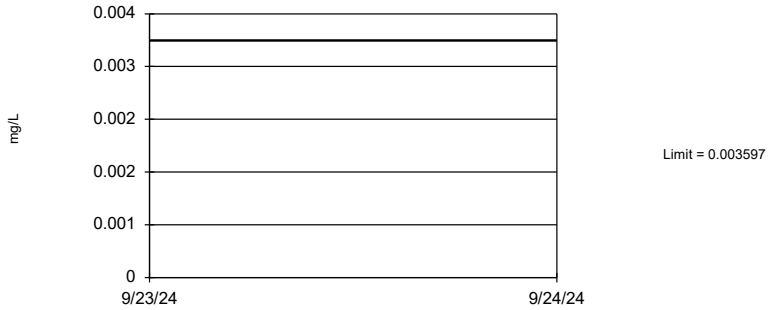
Tolerance Limit

Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-7.698, Std. Dev.=1.103, n=140. Normality test: Chi Squared @alpha = 0.01, calculated = 8.571, critical = 14.07. Report alpha = 0.05.

Constituent: Cobalt Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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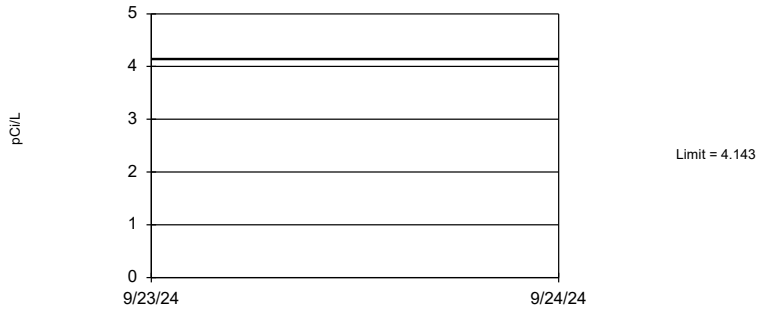
Tolerance Limit

Interwell Parametric



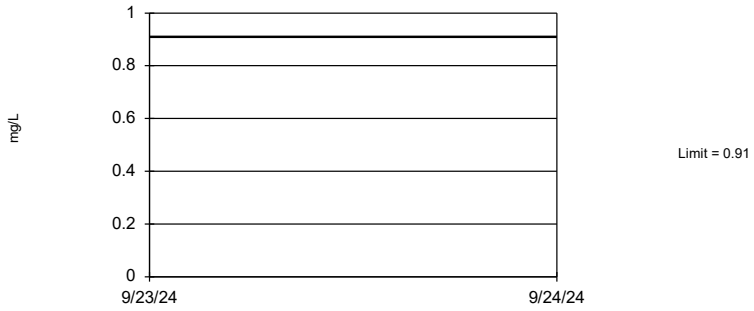
95% coverage. Background Data Summary (based on square root transformation): Mean=1.192, Std. Dev.=0.4482, n=135. Normality test: Chi Squared @alpha = 0.01, calculated = 10.7, critical = 14.07. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 14.58% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Fluoride Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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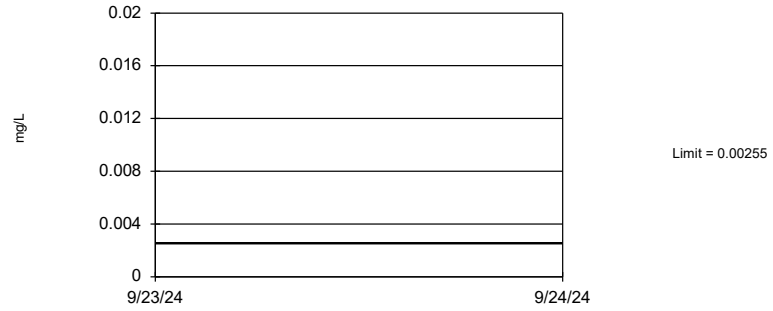
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 11.43% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Lead Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Tolerance Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 7.857% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Lithium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Tolerance Limit

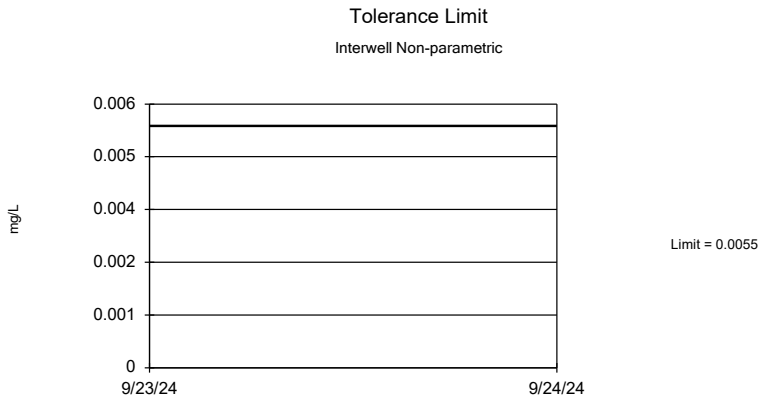
Interwell Non-parametric

Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 140 background values. 78.57% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Mercury Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

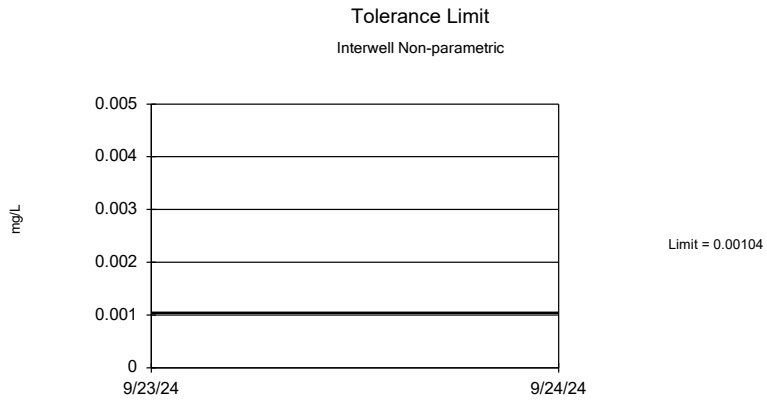
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 132 background values. 29.55% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.001147.

Constituent: Molybdenum Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

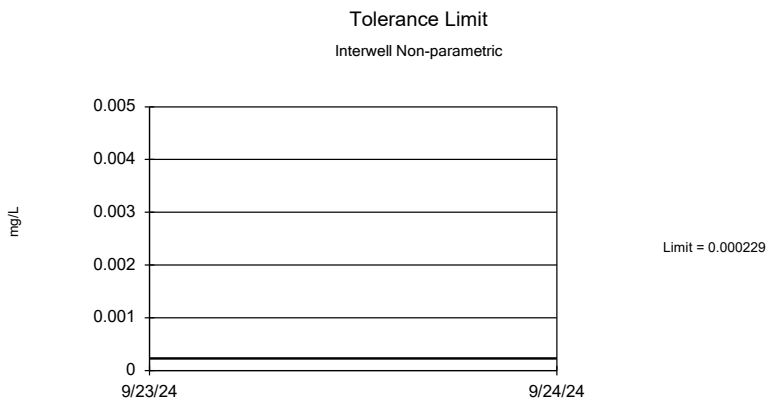
Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 27.86% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Selenium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 45% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Thallium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE I

GWPS

BIG SANDY FAP GWPS				
Constituent Name	**MCL**	**CCR-Rule Specified**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006		0.0012	0.006
Arsenic, Total (mg/L)	0.01		0.029	0.029
Barium, Total (mg/L)	2		0.11	2
Beryllium, Total (mg/L)	0.004		0.00035	0.004
Cadmium, Total (mg/L)	0.005		0.00014	0.005
Chromium, Total (mg/L)	0.1		0.0066	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.0036	0.006
Combined Radium, Total (pCi/L)	5		4.14	5
Fluoride, Total (mg/L)	4		0.91	4
Lead, Total (mg/L)	0.015		0.0026	0.015
Lithium, Total (mg/L)	n/a	0.04	0.02	0.04
Mercury, Total (mg/L)	0.002		0.000092	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0055	0.1
Selenium, Total (mg/L)	0.05		0.001	0.05
Thallium, Total (mg/L)	0.002		0.00023	0.002

**Grey cell indicates Background is higher than MCL or CCR-Rule Specified Level*

**GWPS = Groundwater Protection Standard*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

FIGURE J

Confidence Intervals

Confidence Interval Summary Table - All Results (No Significant)

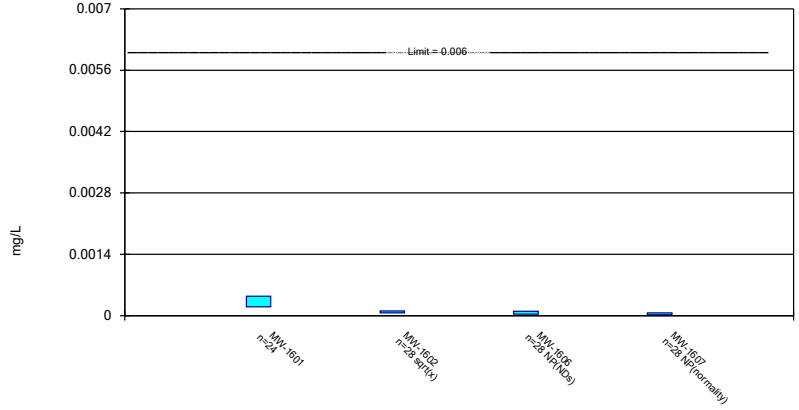
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/8/2025, 4:51 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	MW-1601	0.0004439	0.0002022	0.006	No	24	0.0003231	0.0002369	0	None	No	0.01	Param.
Antimony (mg/L)	MW-1602	0.0001072	0.00006567	0.006	No	28	0.00009075	0.00004905	0	None	sqrt(x)	0.01	Param.
Antimony (mg/L)	MW-1606	0.0001	0.00003	0.006	No	28	0.0001011	0.0001631	53.57	None	No	0.01	NP (NDs)
Antimony (mg/L)	MW-1607	0.00006	0.00002	0.006	No	28	0.00005439	0.00005771	17.86	None	No	0.01	NP (normality)
Arsenic (mg/L)	MW-1601	0.00503	0.00041	0.029	No	24	0.002383	0.002162	0	None	No	0.01	NP (normality)
Arsenic (mg/L)	MW-1602	0.001149	0.0006595	0.029	No	28	0.001056	0.0008035	0	None	ln(x)	0.01	Param.
Arsenic (mg/L)	MW-1606	0.001042	0.000895	0.029	No	28	0.0009686	0.0001574	0	None	No	0.01	Param.
Arsenic (mg/L)	MW-1607	0.01837	0.0119	0.029	No	28	0.01677	0.01138	0	None	ln(x)	0.01	Param.
Barium (mg/L)	MW-1601	0.06473	0.04788	2	No	24	0.0563	0.01651	0	None	No	0.01	Param.
Barium (mg/L)	MW-1602	0.06117	0.05497	2	No	28	0.05807	0.006634	0	None	No	0.01	Param.
Barium (mg/L)	MW-1606	0.843	0.75	2	No	28	0.8134	0.09663	0	None	No	0.01	NP (normality)
Barium (mg/L)	MW-1607	0.04252	0.03229	2	No	28	0.03887	0.01449	0	None	ln(x)	0.01	Param.
Beryllium (mg/L)	MW-1601	0.00005	0.000009	0.004	No	24	0.00003121	0.00001975	45.83	None	No	0.01	NP (normality)
Beryllium (mg/L)	MW-1606	0.00005	0.00001	0.004	No	28	0.000034	0.00002596	32.14	None	No	0.01	NP (normality)
Beryllium (mg/L)	MW-1607	0.00005	0.00001	0.004	No	28	0.00003657	0.00003916	21.43	None	No	0.01	NP (normality)
Cadmium (mg/L)	MW-1601	0.000014010	0.000006443	0.005	No	24	0.00002175	0.00001749	16.67	Kaplan-Meier	x^(1/3)	0.01	Param.
Cadmium (mg/L)	MW-1602	0.00002	0.000009	0.005	No	28	0.00001314	0.000006252	39.29	None	No	0.01	NP (normality)
Cadmium (mg/L)	MW-1606	0.00002	0.00001	0.005	No	28	0.00001875	0.00000964	71.43	None	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-1607	0.00002	0.000016	0.005	No	28	0.00001814	0.000008276	67.86	None	No	0.01	NP (NDs)
Chromium (mg/L)	MW-1601	0.0005877	0.0003687	0.1	No	24	0.0004953	0.0002228	0	None	sqrt(x)	0.01	Param.
Chromium (mg/L)	MW-1602	0.0007789	0.000568	0.1	No	28	0.0006734	0.0002257	0	None	No	0.01	Param.
Chromium (mg/L)	MW-1606	0.0007114	0.0003111	0.1	No	28	0.000581	0.0005377	0	None	sqrt(x)	0.01	Param.
Chromium (mg/L)	MW-1607	0.0004415	0.0002992	0.1	No	28	0.0003821	0.0001674	0	None	sqrt(x)	0.01	Param.
Cobalt (mg/L)	MW-1601	0.0009904	0.0003751	0.006	No	24	0.0006828	0.0006029	0	None	No	0.01	Param.
Cobalt (mg/L)	MW-1602	0.00006	0.000019	0.006	No	28	0.00009807	0.0001869	0	None	No	0.01	NP (normality)
Cobalt (mg/L)	MW-1606	0.000209	0.000068	0.006	No	28	0.0002538	0.000324	0	None	No	0.01	NP (normality)
Cobalt (mg/L)	MW-1607	0.001334	0.001101	0.006	No	28	0.001218	0.0002494	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1601	1.636	1.004	5	No	24	1.32	0.6195	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1602	1.404	0.9169	5	No	28	1.16	0.5207	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606	3.281	2.753	5	No	28	3.017	0.5651	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607	1.599	0.7745	5	No	28	1.372	1.256	0	None	x^(1/3)	0.01	Param.
Fluoride (mg/L)	MW-1601	0.261	0.1846	4	No	25	0.2228	0.07662	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1602	0.12	0.09	4	No	29	0.1086	0.03009	0	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-1606	0.2162	0.1942	4	No	29	0.2052	0.024	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1607	0.07164	0.06146	4	No	29	0.06655	0.01111	0	None	No	0.01	Param.
Lead (mg/L)	MW-1601	0.0001653	0.00005709	0.015	No	24	0.0001977	0.0003977	12.5	None	ln(x)	0.01	Param.
Lead (mg/L)	MW-1602	0.000096770	0.00004988	0.015	No	28	0.0001148	0.00007303	25	Kaplan-Meier	sqrt(x)	0.01	Param.
Lead (mg/L)	MW-1606	0.00023	0.00009	0.015	No	28	0.0002957	0.0004264	10.71	None	No	0.01	NP (normality)
Lead (mg/L)	MW-1607	0.0001751	0.00008531	0.015	No	28	0.0001739	0.0001944	7.143	None	ln(x)	0.01	Param.
Lithium (mg/L)	MW-1601	0.02867	0.01951	0.04	No	24	0.02409	0.008974	4.167	None	No	0.01	Param.
Lithium (mg/L)	MW-1602	0.01008	0.006915	0.04	No	28	0.008753	0.003563	3.571	None	sqrt(x)	0.01	Param.
Lithium (mg/L)	MW-1606	0.006	0.00331	0.04	No	28	0.005708	0.004091	7.143	None	No	0.01	NP (normality)
Lithium (mg/L)	MW-1607	0.004	0.00013	0.04	No	28	0.002964	0.004549	7.143	None	No	0.01	NP (normality)
Mercury (mg/L)	MW-1601	0.000005	0.000005	0.002	No	24	0.000005	2.6e-14	95.83	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1602	0.000005	0.000004	0.002	No	28	0.000004286	0.000001213	71.43	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1606	0.000005	0.000003	0.002	No	28	0.000004714	8.5e-7	85.71	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1607	0.000005	0.000005	0.002	No	28	0.000004964	1.9e-7	92.86	None	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-1601	0.01944	0.009358	0.1	No	24	0.01562	0.01044	0	None	sqrt(x)	0.01	Param.
Molybdenum (mg/L)	MW-1602	0.001695	0.001079	0.1	No	28	0.001446	0.0007238	0	None	sqrt(x)	0.01	Param.
Molybdenum (mg/L)	MW-1606	0.0006	0.0005	0.1	No	28	0.0008918	0.001366	0	None	No	0.01	NP (normality)
Molybdenum (mg/L)	MW-1607	0.0007	0.00053	0.1	No	28	0.000915	0.001595	0	None	No	0.01	NP (normality)
Selenium (mg/L)	MW-1601	0.000422	0.0001797	0.05	No	24	0.000335	0.0002606	0	None	sqrt(x)	0.01	Param.
Selenium (mg/L)	MW-1602	0.002385	0.001484	0.05	No	28	0.001935	0.0009637	0	None	No	0.01	Param.
Selenium (mg/L)	MW-1606	0.0005	0.00006	0.05	No	28	0.0002129	0.0001939	25	None	No	0.01	NP (normality)
Selenium (mg/L)	MW-1607	0.0002	0.0001	0.05	No	28	0.0001664	0.0001384	14.29	None	No	0.01	NP (normality)
Thallium (mg/L)	MW-1601	0.0002	0.00002	0.002	No	24	0.0001095	0.00008806	41.67	None	No	0.01	NP (normality)
Thallium (mg/L)	MW-1602	0.0002	0.00003	0.002	No	28	0.00013	0.0000889	60.71	None	No	0.01	NP (NDs)
Thallium (mg/L)	MW-1606	0.0002	0.00011	0.002	No	28	0.0001589	0.00007425	71.43	None	No	0.01	NP (NDs)
Thallium (mg/L)	MW-1607	0.0002	0.00003	0.002	No	28	0.0001209	0.00008347	46.43	None	No	0.01	NP (normality)

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

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.



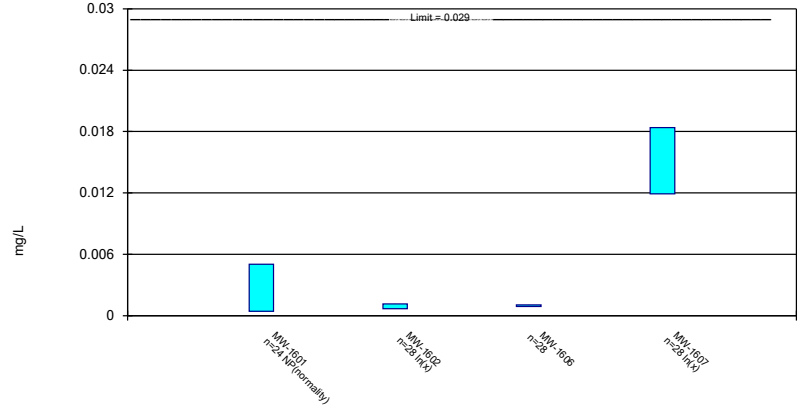
Constituent: Antimony Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

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.



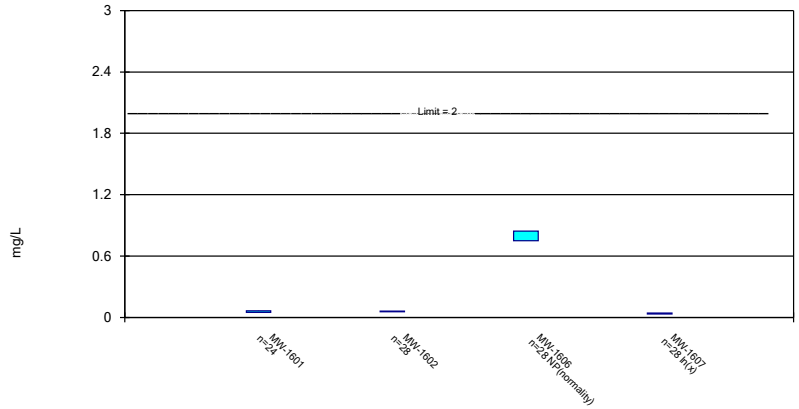
Constituent: Arsenic Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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



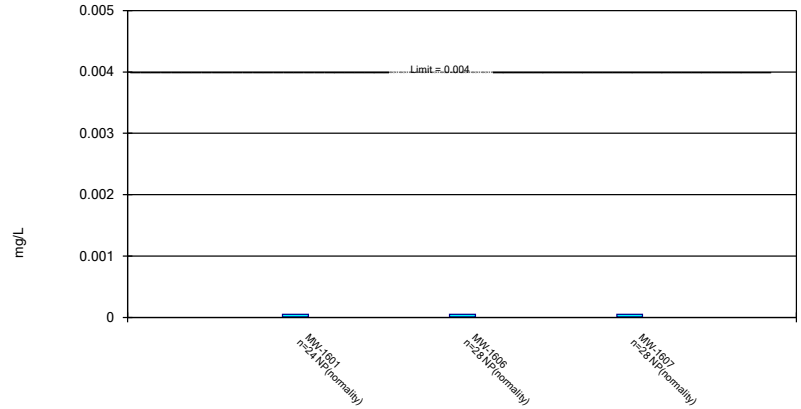
Constituent: Barium Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

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



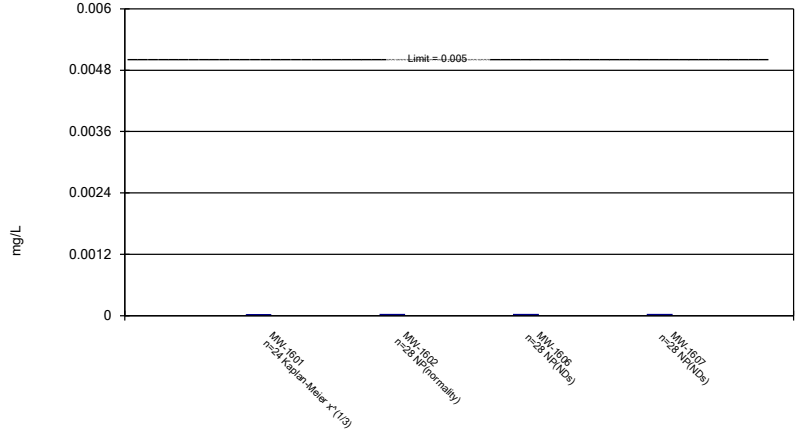
Constituent: Beryllium Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

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.



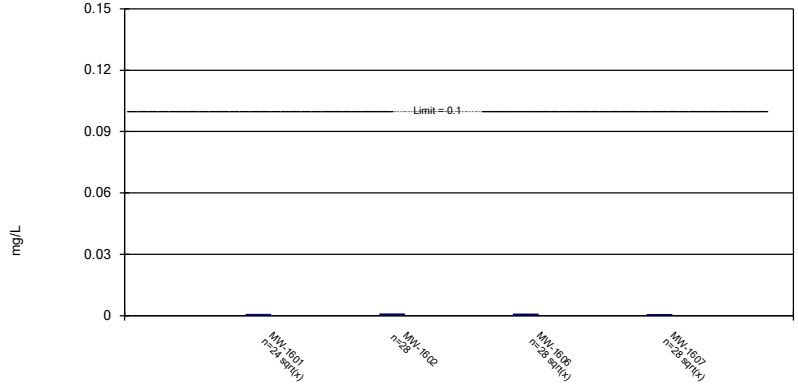
Constituent: Cadmium Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Parametric Confidence Interval

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



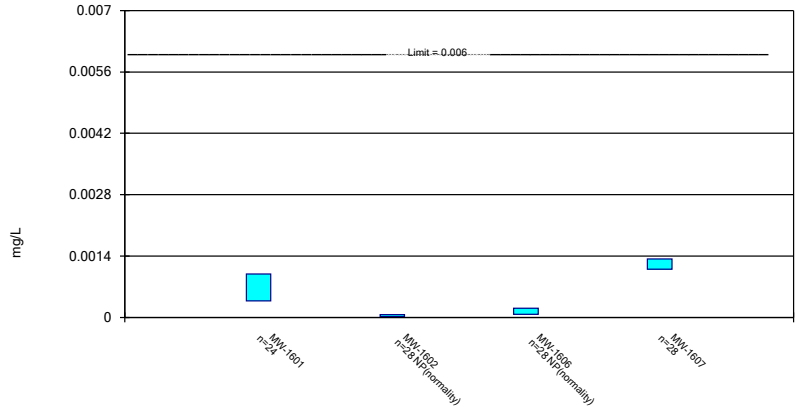
Constituent: Chromium Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Cobalt Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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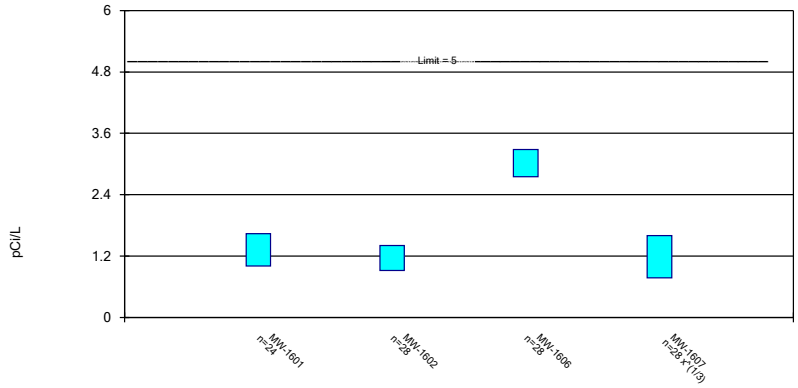
Parametric Confidence Interval

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 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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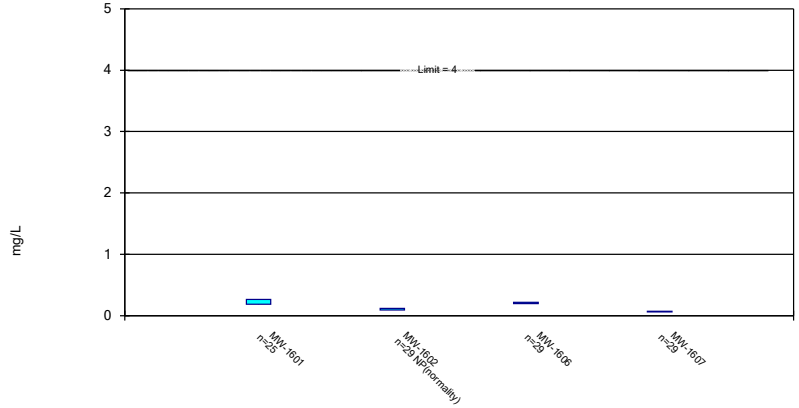
Parametric and Non-Parametric (NP) Confidence Interval

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



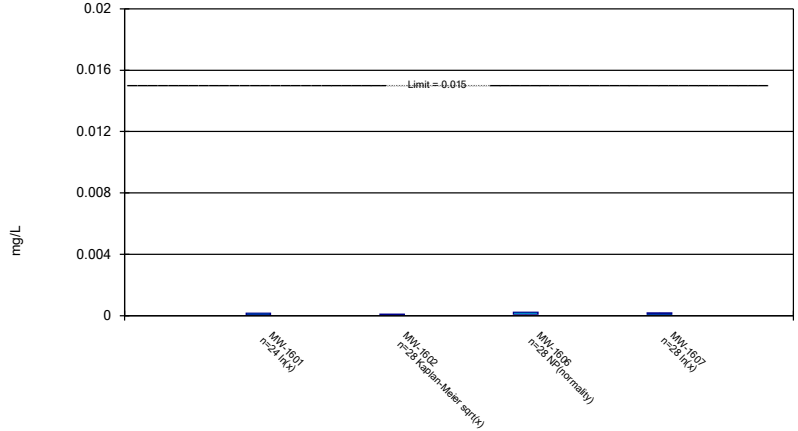
Constituent: Fluoride Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

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 Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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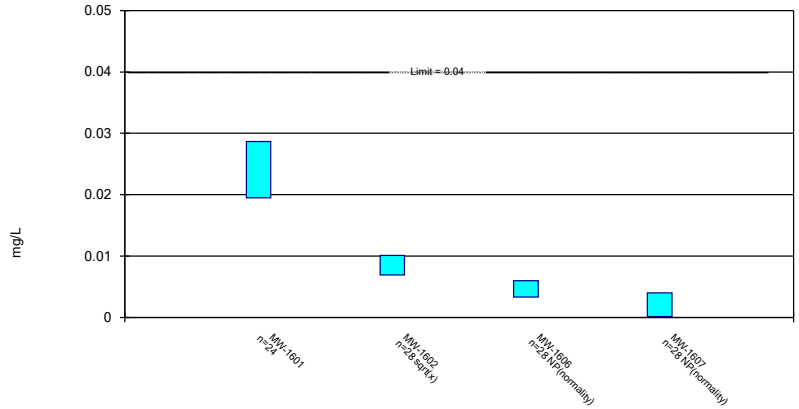
Parametric and Non-Parametric (NP) Confidence Interval

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



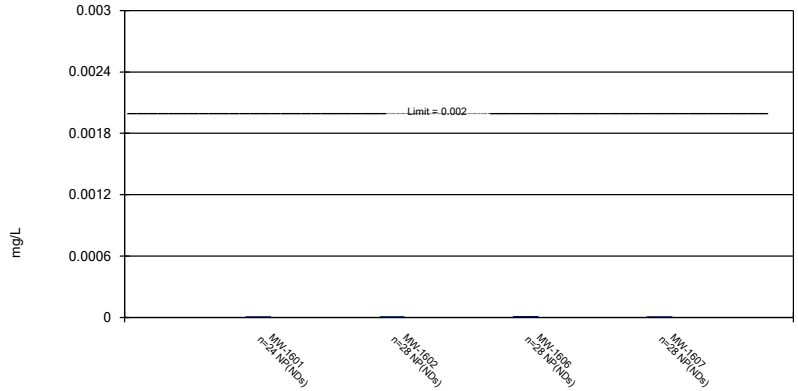
Constituent: Lithium Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

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



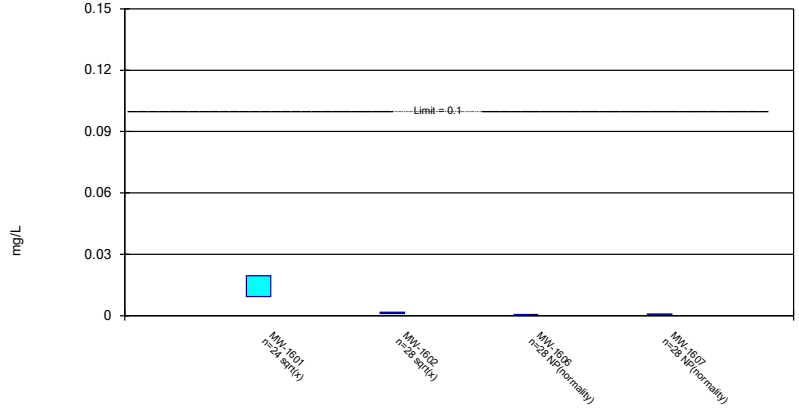
Constituent: Mercury Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

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.



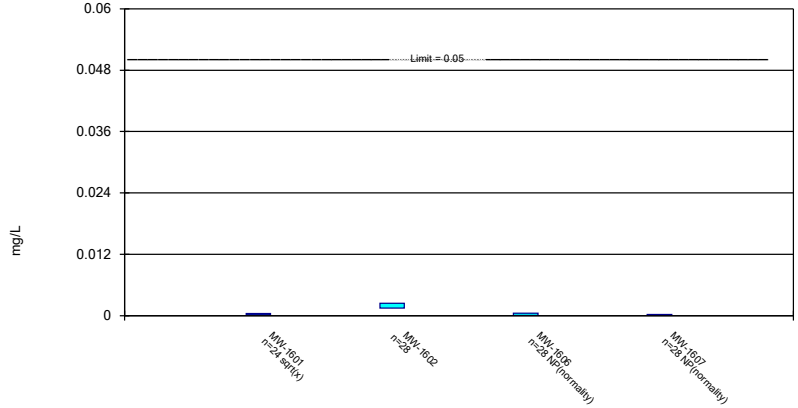
Constituent: Molybdenum Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

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.



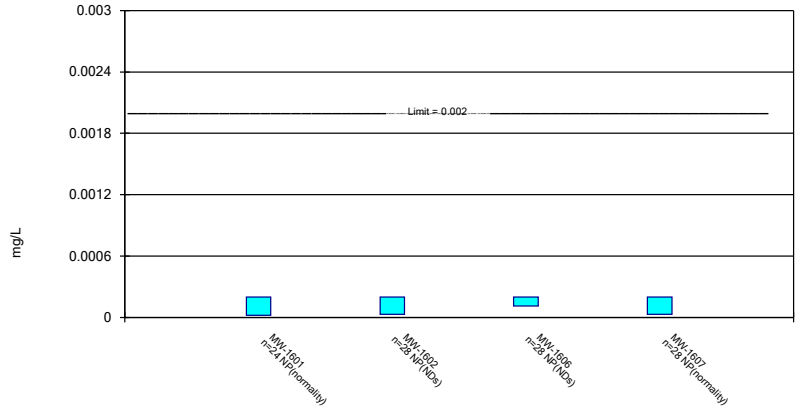
Constituent: Selenium Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.24 Software licensed to Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

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



Constituent: Thallium Analysis Run 1/8/2025 4:49 PM View: Confidence Intervals

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY, 2025 1ST SEMIANNUAL EVENT FLY ASH POND

Big Sandy Plant

Louisa, Kentucky

Prepared for

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October 2025

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Attachment A: Certification by Qualified Professional Engineer

Attachment B: Statistical Analysis Output

ACRONYMS AND ABBREVIATIONS

CCR	coal combustion residuals
CFR	code of federal regulations
FAP	Fly Ash Pond
GWPS	groundwater protection standard
mg/L	milligrams per liter
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
UPL	upper prediction limit

1. INTRODUCTION

In accordance with the United States Environmental Protection Agency 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 Fly Ash Pond (FAP), an existing CCR unit at the Big Sandy Power Plant in Louisa, Kentucky. Recent groundwater monitoring results were used to identify any concentrations of Appendix IV constituents that are above the groundwater protection standards (GWPSs).

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, calcium, chloride, fluoride, sulfate, and total dissolved solids at the FAP. An alternative source was not identified following the detection monitoring events; thus, the FAP has been in assessment monitoring since 2018. During the most recent assessment monitoring event, no statistically significant levels (SSLs) were identified and the unit remained in assessment monitoring (Geosyntec 2025).

An annual sampling event at the FAP for the Appendix IV parameters required by 40 CFR 257.95(b) was completed in March 2025, and a semiannual sampling event for the Appendix III and Appendix IV parameters required by 40 CFR 257.95(d)(1) was completed in June 2025. The results of these annual and semiannual assessment monitoring events are documented in this report.

Before statistical analyses were conducted, the 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 from the Appendix IV parameter data at the compliance wells to assess whether any were present at SSLs above the corresponding GWPS. No SSLs were identified; however, concentrations of Appendix III parameters remained above background. Therefore, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

2. FLY ASH POND EVALUATION

2.1 Data Validation and QA/QC

Samples were collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95b in March 2025 and 257.95(d)(1) in June 2025 as part of the assessment monitoring program. Samples from the March 2025 event were analyzed for Appendix IV parameters only, whereas samples from the June 2025 event were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during these assessment monitoring events is presented 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.10.0.27 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 FAP were conducted in accordance with the October 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 June 2025 were screened for potential outliers; however, no outliers were identified in these sets 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 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 2025).

No SSLs were identified at the Big Sandy FAP.

2.2.2 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 June 2025 assessment monitoring event from each compliance well were compared to previously established prediction limits to assess whether the results were above background values (Table 3). The following concentrations were above the upper prediction limits (UPLs):

- The boron concentration was above the interwell UPL of 0.244 milligrams per liter (mg/L) at MW-1606 (2.14 mg/L).
- Chloride concentrations were above the interwell UPL of 6.22 mg/L at MW-1602 (17.4 mg/L) and MW-1606 (32.0 mg/L).
- The sulfate concentration was above the interwell UPL of 121 mg/L at MW-1602 (215 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the June 2025 sample was above the UPL or, in the case of pH, below the lower prediction limit. Based on these results, concentrations of Appendix III constituents appear to be above background concentrations, and the unit will remain in assessment monitoring.

2.3 Conclusions

Annual and semiannual assessment 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 or June 2025 data. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. No SSLs were identified. Appendix III parameters were compared to established prediction limits; concentrations of boron, chloride, and sulfate were identified above the prediction limits.

Based on this evaluation, the Big Sandy FAP CCR unit will remain in assessment monitoring.

3. REFERENCES

Geosyntec. 2020. Statistical Analysis Plan – Big Sandy Plant. Geosyntec Consultants, Inc. October.

Geosyntec. 2025. Statistical Analysis Summary, 2024 2nd Semiannual Event – Fly Ash Pond. Big Sandy Plant. Louisa, Kentucky. Geosyntec Consultants, Inc. January.

TABLES

Table 1. Groundwater Data Summary
Statistical Analysis Summary
Big Sandy Plant – Fly Ash Pond

Parameter	Unit	MW-1011		MW-1012		MW-1203		MW-1601		MW-1602	
		3/26/2025	6/10/2025	3/26/2025	6/10/2025	3/26/2025	6/10/2025	3/26/2025	6/10/2025	3/26/2025	6/10/2025
Antimony	µg/L	0.113	0.152	4.95	2.83	0.018 J1	0.030 J1	0.384	0.406	0.054 J1	0.064 J1
Arsenic	µg/L	3.10	2.86	209	155	0.35	0.54	0.23	0.21	0.55	0.70
Barium	µg/L	45.9	42.0	31.6	27.1	89.2	102	35.6	37.3	63.6	69.9
Beryllium	µg/L	0.05 U1	0.05 U1	0.015 J1	0.011 J1	0.052	0.099	0.05 U1	0.007 J1	0.05 U1	0.05 U1
Boron	mg/L	--	0.121	--	0.171	--	0.261	--	0.082	--	0.079
Cadmium	µg/L	0.005 J1	0.008 J1	0.009 J1	0.013 J1	0.02 U1	0.007 J1	0.015 J1	0.012 J1	0.016 J1	0.005 J1
Calcium	mg/L	--	78.9	--	1.30	--	62.3	--	64.2	--	98.6
Chloride	mg/L	--	3.72	--	1.64	--	5.08	--	3.61	--	17.4
Chromium	µg/L	0.38	0.43	0.53	0.61	0.32	2.28	0.50	0.45	0.59	0.84
Cobalt	µg/L	0.247	0.156	0.114	0.068	0.754	0.933	0.055	0.056	0.025	0.014 J1
Combined Radium	pCi/L	1.88	2.56	0.15	0.38	0.51	1.9	1.01	0.62	0.44	1.81
Fluoride	mg/L	0.25	0.30	1.00	0.92	0.15	0.14	0.16	0.15	0.09	0.10
Lead	µg/L	0.2 U1	0.11 J1	0.43	0.35	0.07 J1	3.16	0.2 U1	0.08 J1	0.2 U1	0.2 U1
Lithium	mg/L	0.00929	0.00881	0.00722	0.00552	0.0131	0.0126	0.0183	0.0165	0.0129	0.00958
Mercury	µg/L	0.005 U1	0.005 U1	0.006	0.005	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1	0.005 U1
Molybdenum	µg/L	1.0	0.9	20.4	10.5	0.1 J1	0.5 U1	5.5	6.1	0.7	0.8
Selenium	µg/L	0.5 U1	0.06 J1	0.5 U1	0.06 J1	0.5 U1	0.10 J1	0.48 J1	0.50	1.04	2.27
Sulfate	mg/L	--	83.3	--	48.4	--	42.1	--	93.9	--	215
Thallium	µg/L	0.07 J1	0.06 J1	0.02 J1	0.03 J1	0.2 U1	0.2 U1	0.02 J1	0.02 J1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	--	390	--	600	--	280	--	350 S7	--	630
pH	SU	6.7	7.0	8.6	8.9	6.4	7.1	6.7	6.9	7.2	7.4

Notes:
J1: Estimated value. Parameter was detected in concentrations below the reporting limit.
mg/L: milligrams per liter
pCi/L: picocuries per liter
S7: Sample did not achieve constant weight.
SU: standard unit
U1: Non-detect value. For statistical analysis, parameters that were not detected were replaced with the reporting limit.
µg/L: micrograms per liter

Table 1 (Continued). Groundwater Data Summary
Statistical Analysis Summary
Big Sandy Plant – Fly Ash Pond

Parameter	Unit	MW-1604		MW-1605		MW-1606		MW-1607	
		3/25/2025	6/9/2025	3/25/2025	6/9/2025	3/25/2025	6/9/2025	3/25/2025	6/9/2025
Antimony	µg/L	0.018 J1	0.012 J1	0.026 J1	0.034 J1	0.020 J1	0.014 J1	0.024 J1	0.024 J1
Arsenic	µg/L	0.04 J1	0.05 J1	0.31	0.38	0.79	0.74	15.0	9.06
Barium	µg/L	35.7	38.7	42.0	36.6	641	706	54.7	45.4
Beryllium	µg/L	0.094	0.094	0.159	0.147	0.010 J1	0.05 U1	0.020 J1	0.008 J1
Boron	mg/L	--	0.011 J1	--	0.051	--	2.14	--	0.179
Cadmium	µg/L	0.047	0.036	0.075	0.054	0.02 U1	0.005 J1	0.005 J1	0.006 J1
Calcium	mg/L	--	1.88	--	4.68	--	76.1	--	73.2
Chloride	mg/L	--	1.60	--	0.64	--	32.0	--	3.96
Chromium	µg/L	0.96	1.08	3.04	3.85	0.60	0.53	0.38	0.50
Cobalt	µg/L	0.243	0.145	0.564	0.599	0.088	0.072	0.959	0.676
Combined Radium	pCi/L	0.68	0.62	0.64	0.21	2.48	3.48	1.01	0.86
Fluoride	mg/L	0.02 J1	0.06 U1	0.06 U1	0.02 J1	0.24	0.24	0.08	0.07
Lead	µg/L	0.05 J1	0.13 J1	0.55	1.32	0.13 J1	0.12 J1	0.11 J1	0.10 J1
Lithium	mg/L	0.00073	0.00072	0.00139	0.00148	0.00373	0.00355	0.00033	0.00014 J1
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
Molybdenum	µg/L	0.5 U1	0.5 U1	0.5 U1	0.1 J1	0.5	0.5	0.4 J1	0.3 J1
Selenium	µg/L	0.16 J1	0.18 J1	0.27 J1	0.33 J1	0.5 U1	0.5 U1	0.13 J1	0.08 J1
Sulfate	mg/L	--	4.2	--	6.9	--	68.2	--	86.1
Thallium	µg/L	0.04 J1	0.2 U1	0.02 J1	0.02 J1	0.2 U1	0.2 U1	0.02 J1	0.2 U1
Total Dissolved Solids	mg/L	--	30 J1	--	60	--	390 S7	--	320
pH	SU	7.0	5.6	6.6	5.6	8.0	7.0	7.6	6.6

Notes:
J1: Estimated value. Parameter was detected in concentrations below the reporting limit.
mg/L: milligrams per liter
pCi/L: picocuries per liter
S7: Sample did not achieve constant weight.
SU: standard unit
U1: Non-detect value. For statistical analysis, parameters that were not detected were replaced with the reporting limit.
µg/L: micrograms per liter

Table 2. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Big Sandy Plant – Fly Ash Pond

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.00120	0.00600
Arsenic, Total (mg/L)	0.0100		0.0289	0.0289
Barium, Total (mg/L)	2.00		0.113	2.00
Beryllium, Total (mg/L)	0.00400		0.000349	0.00400
Cadmium, Total (mg/L)	0.00500		0.000140	0.00500
Chromium, Total (mg/L)	0.100		0.00660	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00360	0.00600
Combined Radium, Total (pCi/L)	5.00		4.14	5.00
Fluoride, Total (mg/L)	4.00		0.910	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00255	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0200	0.0400
Mercury, Total (mg/L)	0.00200		0.0000920	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00550	0.100
Selenium, Total (mg/L)	0.0500		0.00104	0.0500
Thallium, Total (mg/L)	0.00200		0.000229	0.00200

Notes:
1. Calculated UTL (upper tolerance limit) represents site-specific background values.
2. Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.
CCR: coal combustion residuals
GWPS: groundwater protection standard
MCL: maximum contaminant level
mg/L: milligrams per liter
n/a: not applicable
pCi/L: picocuries per liter

Table 3. Appendix III Data Summary
Statistical Analysis Summary
Big Sandy Plant – Fly Ash Pond

Analyte	Unit	Description	MW-1601	MW-1602	MW-1606	MW-1607
			6/10/2025	6/10/2025	6/9/2025	6/9/2025
Boron	mg/L	Interwell Background Value (UPL)	0.244			
		Analytical Result	0.082	0.079	**2.14**	0.179
Calcium	mg/L	Interwell Background Value (UPL)	123			
		Analytical Result	64.2	98.6	76.1	73.2
Chloride	mg/L	Interwell Background Value (UPL)	6.22			
		Analytical Result	3.61	**17.4**	**32.0**	3.96
Fluoride	mg/L	Interwell Background Value (UPL)	0.910			
		Analytical Result	0.15	0.10	0.24	0.07
pH	SU	Intrawell Background Value (UPL)	8.1	8.3	7.6	7.5
		Intrawell Background Value (LPL)	6.3	6.6	6.4	5.6
		Analytical Result	6.9	7.4	7.0	6.6
Sulfate	mg/L	Interwell Background Value (UPL)	121			
		Analytical Result	93.9	**215**	68.2	86.1
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	630			
		Analytical Result	350	630	390	320

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 Big Sandy Fly 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

33232	Kentucky	10.09.2025
License Number	Licensing State	Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS
CONSULTING

October 8, 2025

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

Re: Big Sandy Fly Ash Pond
Assessment Monitoring Summary – March & June 2025

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data for the March and June 2025 Assessment Monitoring sample events at American Electric Power Company's Big Sandy Fly 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 the site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** MW-1011, MW-1012, MW-1203, MW-1604, and MW-1605
- **Downgradient wells:** MW-1601, MW-1602, MW-1606, and MW-1607

Upgradient wells are followed by "bg" to designate background data on attached figures. Note that downgradient well MW-1603 was historically sampled; however, the groundwater monitoring well network was revised in October 2023 to remove MW-1603 from the network due to the presence of coal in the screened interval.

Data were sent electronically, and the statistical analysis was conducted according to the Statistical Analysis Plan (Geosyntec 2020) and background screening evaluation prepared

by GSC (December 2017) which was approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC. The statistical analysis was reviewed by Dr. Jim Loftis, Civil & Environmental Engineering professor emeritus at Colorado State University and Senior Advisor to Groundwater Stats Consulting.

The CCR Assessment Monitoring program consists of the following constituents:

- **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).

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 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. In some cases, the reporting limit provided by the laboratory contains varying limits for a given parameter; therefore, the substitution may differ from well to well. Reporting limit changes may occur depending on laboratory capabilities. The computed statistical limits, both background and compliance limits, were not adversely affected by these substitutions.

Summary of Statistical Methods – Appendix IV Parameters

The overall approach for assessing compliance is to compute a Groundwater Protection Standard (GWPS) for each Appendix IV parameter, using the higher of a background tolerance limit or a regulatory limit. Then for each downgradient well and parameter, a confidence interval for the mean or median is compared to the GWPS.

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 nonparametric (NP) tolerance limits as appropriate.

- 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 in background, 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 for parametric limits. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits and confidence intervals are used on data containing greater than 50% non-detects or data sets which do not follow a normal or transformed-normal distribution.

Summary of Background Update – Conducted in January 2025

Outlier Analysis

Prior to constructing tolerance limits, background 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. A discussion of those findings is provided below.

Tukey's outlier test on pooled upgradient well and background well data through September 2024 identified outliers for antimony, arsenic, beryllium, chromium, cobalt, combined radium 226 + 228, lead, and molybdenum. Data from background well MW-1012 have been included during past statistical analyses; however, more recent groundwater samples have shown increasing concentrations for antimony, arsenic, and molybdenum. It was mutually agreed upon by AEP and Groundwater Stats Consulting to flag these measurements as outliers and deselect the outliers from the datasets used to calculate tolerance limits pending further analysis, as discussed below. According to AEP, the flagged observations for these constituents at background well MW-1012 are not a result of anthropogenic influences. Any values identified by Tukey's test but not flagged in the database were either similar to concentrations from neighboring upgradient wells or were lower than the respective Maximum Contaminant Level (MCL). All flagged measurements from previous background updates were confirmed during the update by Tukey's outlier test and visual screening.

Additionally, downgradient well data through September 2024 were screened through visual screening using time series graphs. Since the downgradient well data are used to

construct confidence intervals, values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. No outliers among downgradient wells are flagged for Appendix IV parameters. The Tukey's test results from January 2025 screening were included with the prior report.

Interwell Upper Tolerance Limits

Interwell upper tolerance limits (UTLs) were used to calculate background limits from all available pooled upgradient well and background well data through September 2024 (Figure D). These limits are updated on an annual basis and will be updated again during the Fall 2025 sample event. Parametric limits use a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution, such as cobalt and combined radium 226 + 228. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, nonparametric tolerance limits were used. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

Groundwater Protection Standards

The upper tolerance limits were compared to the 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).

Summary of Data Screening – March & June 2025

Outlier Analysis

Time series plots were used to visually identify potential outliers in downgradient wells for the March and June 2025 sample events. When suspected outliers are identified, Tukey's outlier test may be used to formally test whether measurements are statistically significant. As mentioned above, high outliers are cautiously flagged in downgradient wells when measurements are clearly much different from remaining data within a given well. Although flagging values will also reduce the mean and thus lower the entire interval, the intent is to reduce the variance and thus reduce the width of parametric confidence intervals to better represent the actual mean. No additional outliers were identified in downgradient wells based on visual screening; therefore, Tukey's outlier test was not performed during this analysis. A summary of the Tukey's formal outlier test that was performed in January 2025 was submitted with the previous report (Geosyntec 2025).

Note that while upgradient well data are plotted on the time series and box plots through June 2025, the statistical limits are based only on background data through September 2024. As mentioned above, a list of flagged values for Appendix IV constituents follows this report. All upgradient well data will be re-evaluated during the next background update.

Evaluation of Appendix IV Parameters – March & June 2025

Confidence Intervals

Confidence intervals were constructed with data through June 2025 on downgradient wells for each of the Appendix IV parameters. These confidence intervals are compared against GWPS using the highest limit of the MCL, CCR-Rule specified levels, or background limit as the GWPS as discussed above (Figure F). When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. Nonparametric confidence intervals, which use the appropriate large and small order statistics depending on the sample size as interval limits, were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. A summary of the confidence interval results follows this letter. No exceedances were identified.

Trend Test Evaluation – Appendix IV

When confidence interval exceedances are identified in downgradient wells, data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether concentrations are statistically increasing, decreasing, or stable at the 95% confidence level. The 95% confidence level rapidly identifies statistically significant trends and is recommended in cases with limited sample sizes as well as new downgradient wells. Upgradient wells are included in the trend analyses for all parameters found to exceed their confidence interval in downgradient wells. When similar patterns exist upgradient of the site, it is an indication of variability in groundwater which may be unrelated to practices at the site. Since no exceedances were identified, no trend tests were required.

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

For Groundwater Stats Consulting,

Easton Rayner
Groundwater Analyst

Andrew Collins
Project Manager

100% Non-Detects

Analysis Run 8/13/2025 11:53 AM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Beryllium (mg/L)
MW-1602

FIGURE A

Time Series

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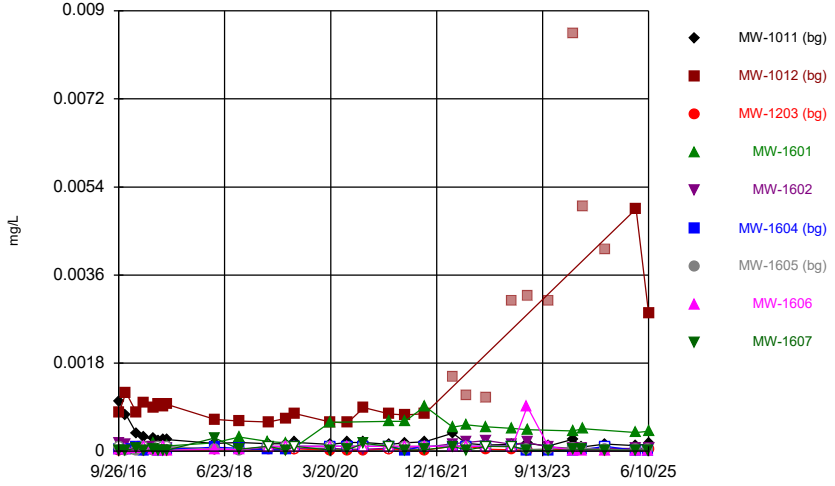
Hollow symbols indicate censored values.

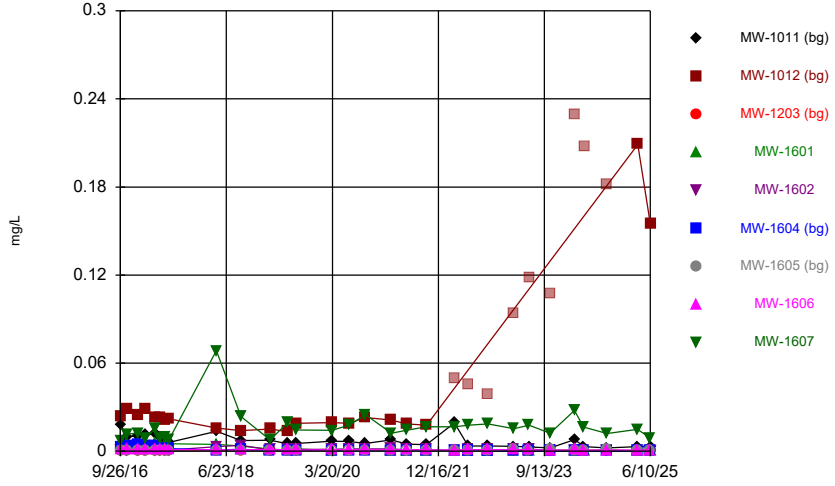
Time Series



Constituent: Antimony Analysis Run 8/13/2025 4:29 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Arsenic Analysis Run 8/13/2025 4:29 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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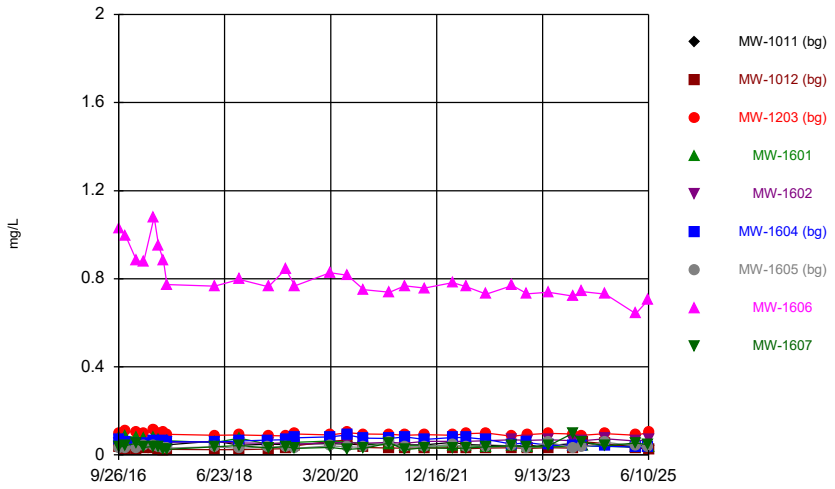
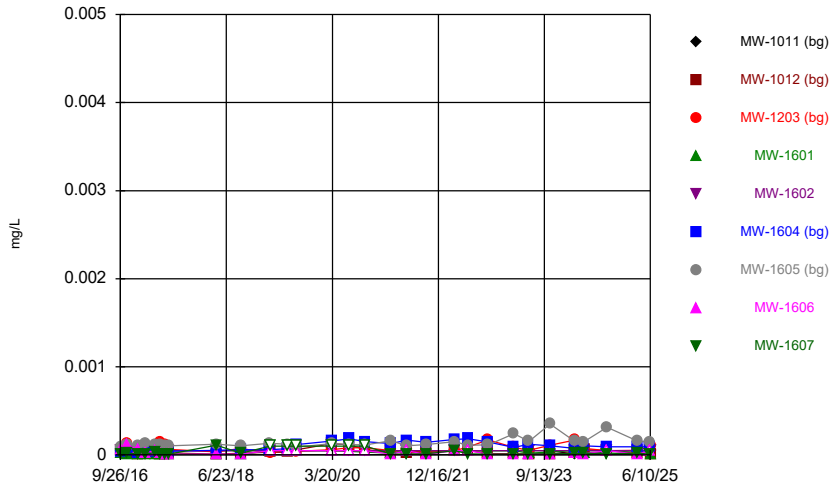
Time Series



Constituent: Barium Analysis Run 8/13/2025 4:29 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

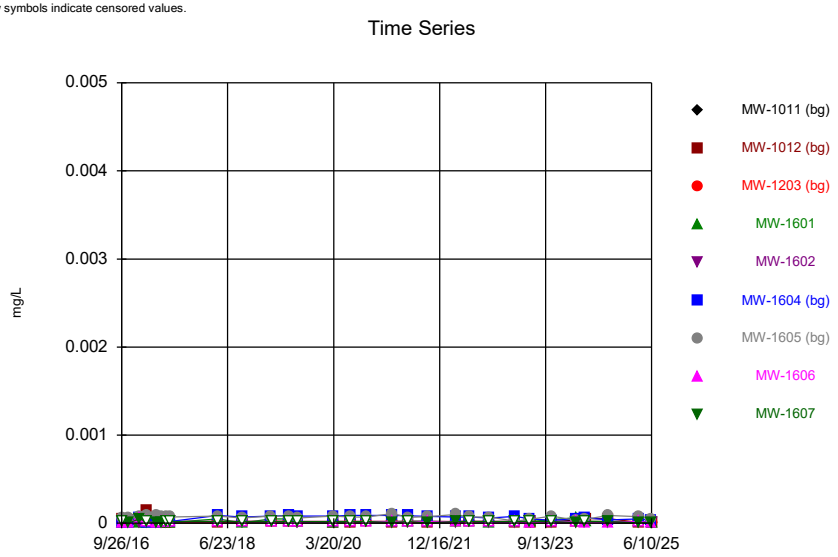
Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



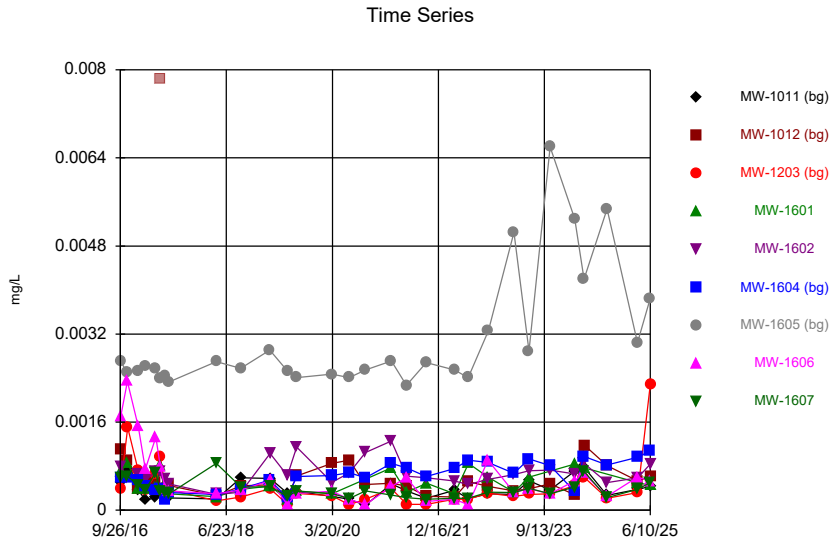
Constituent: Beryllium Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



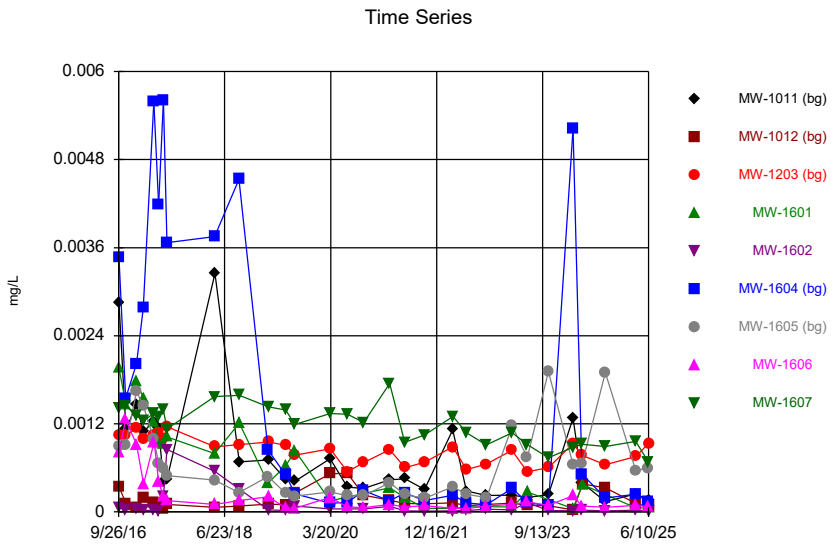
Constituent: Cadmium Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG



Constituent: Chromium Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG



Constituent: Cobalt Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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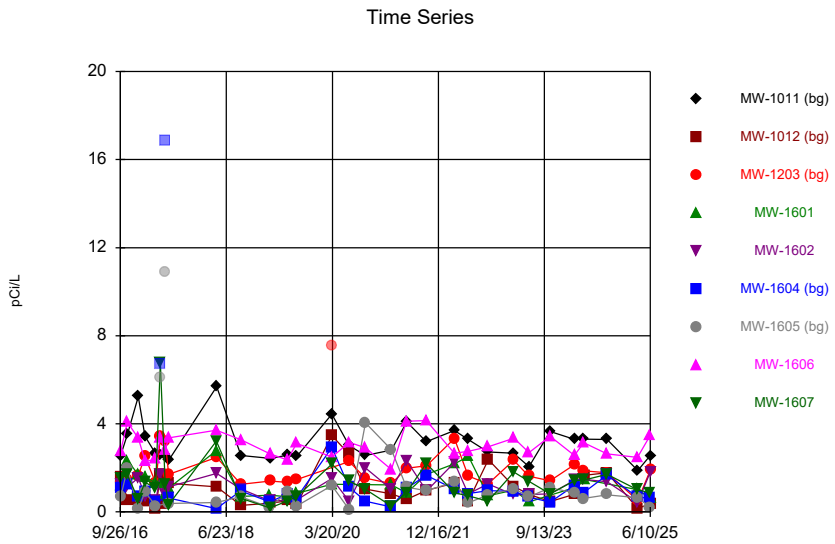
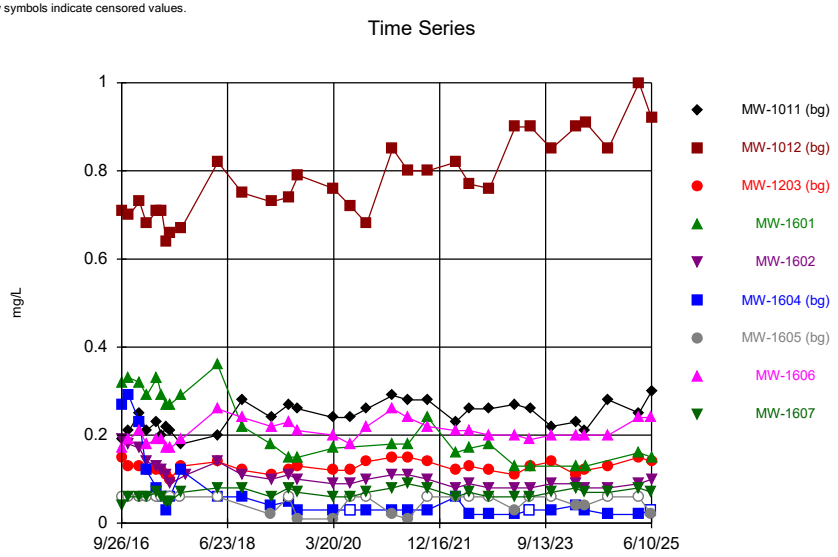


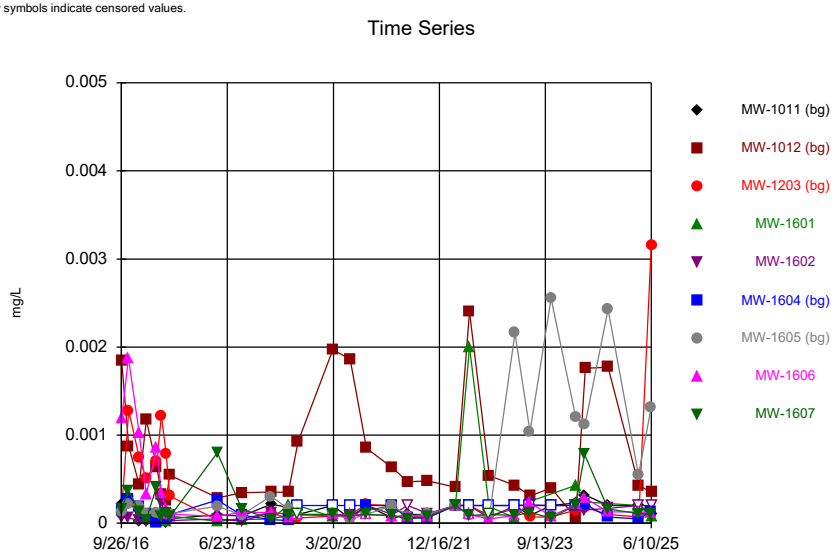
Constituent: Combined Radium 226 + 228 Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



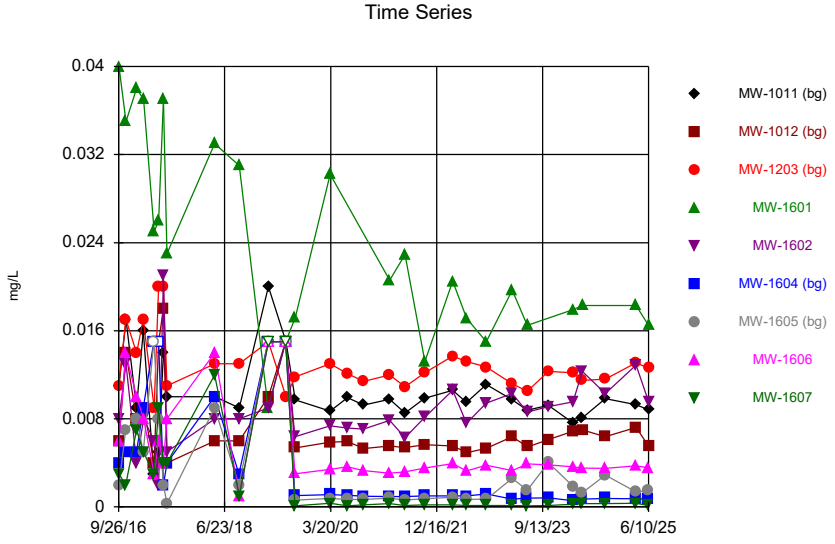
Constituent: Fluoride Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



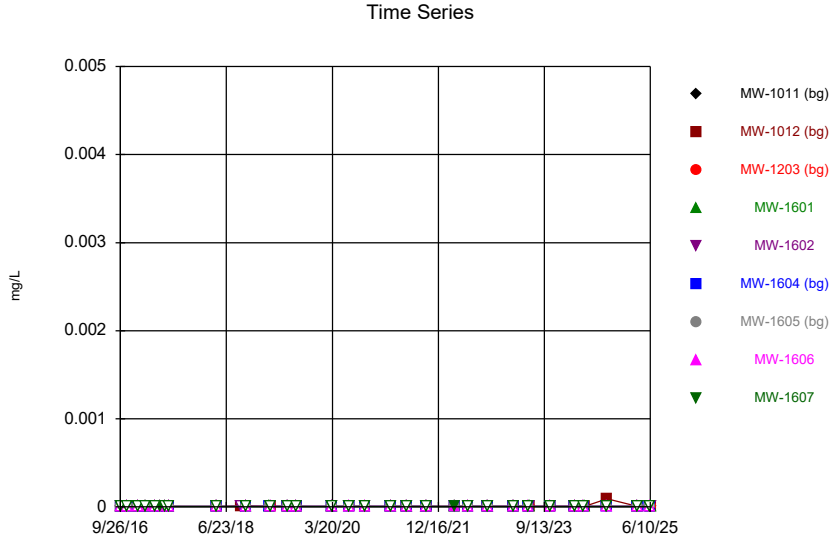
Constituent: Lead Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



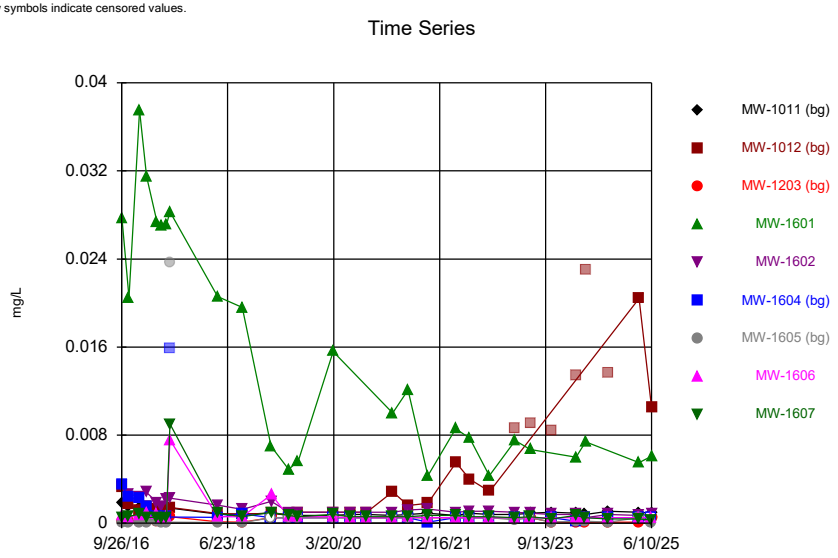
Constituent: Lithium Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



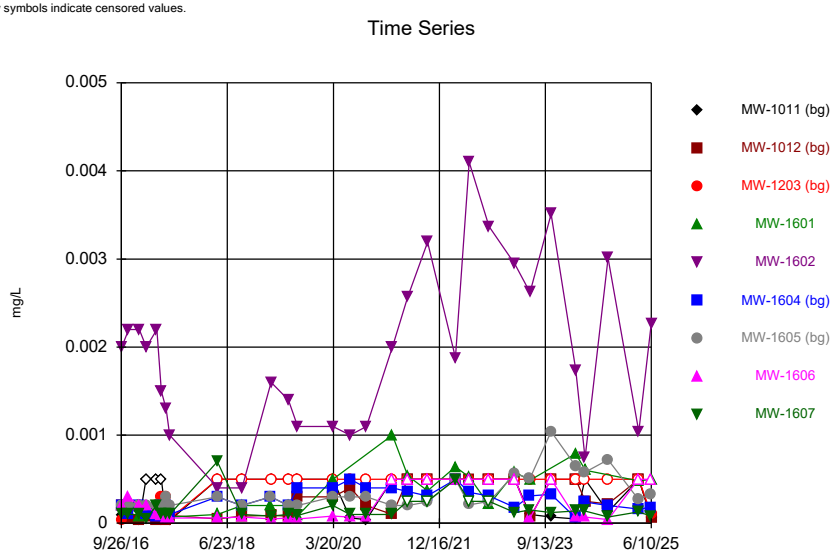
Constituent: Mercury Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



Constituent: Molybdenum Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.



Constituent: Selenium Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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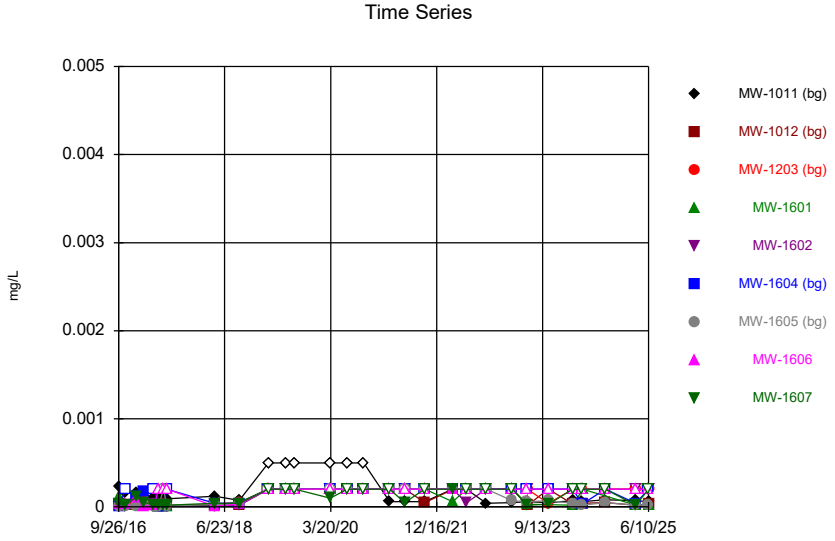
Hollow symbols indicate censored values.



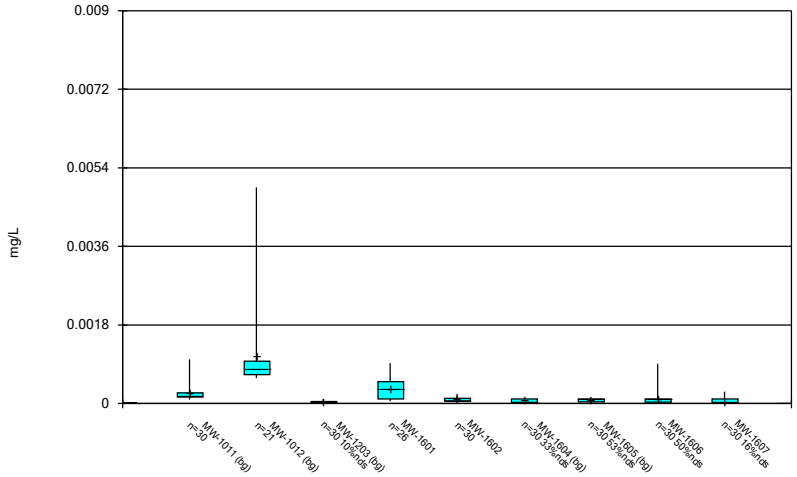
Constituent: Thallium Analysis Run 8/13/2025 4:30 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE B

Box Plots

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot

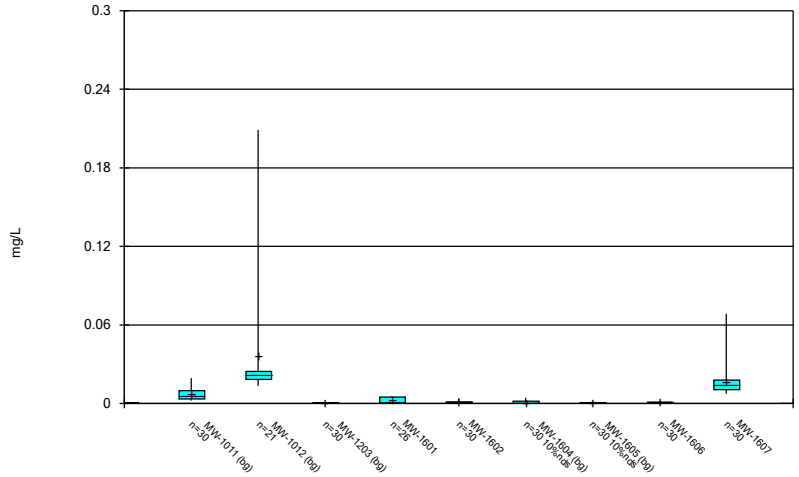


Constituent: Antimony Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot

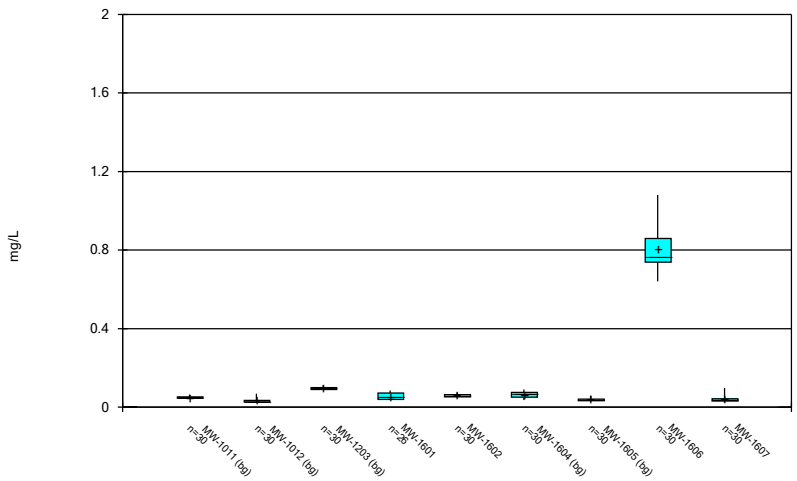


Constituent: Arsenic Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot

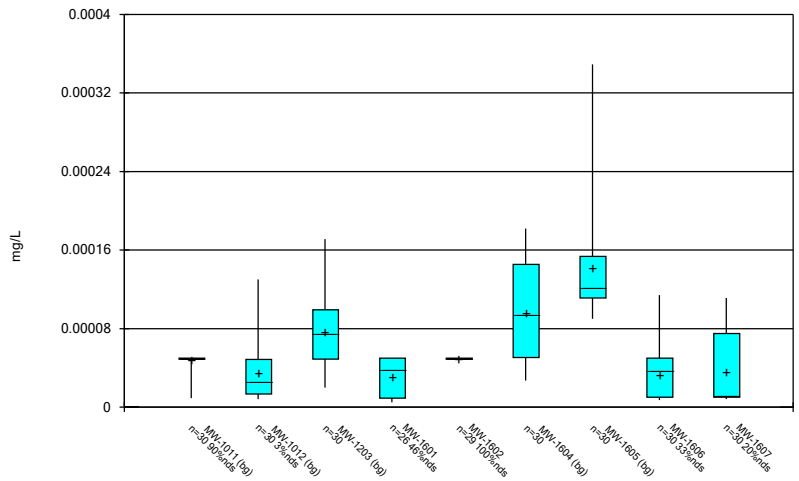


Constituent: Barium Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Beryllium Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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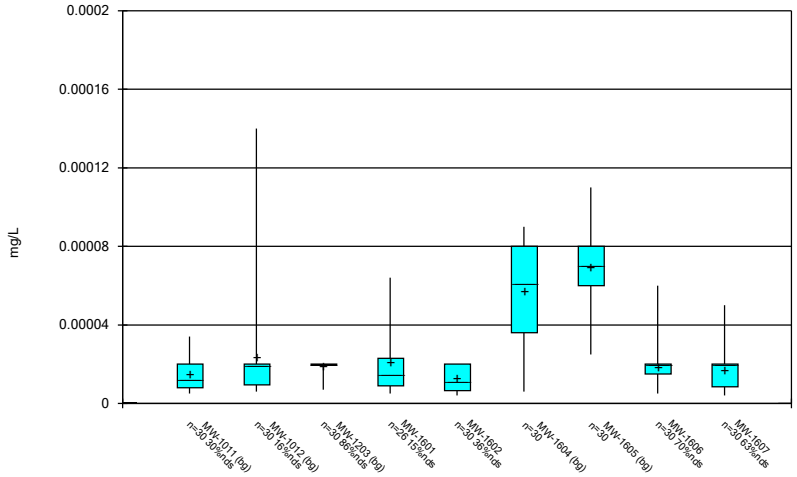
Box & Whiskers Plot



Constituent: Cadmium Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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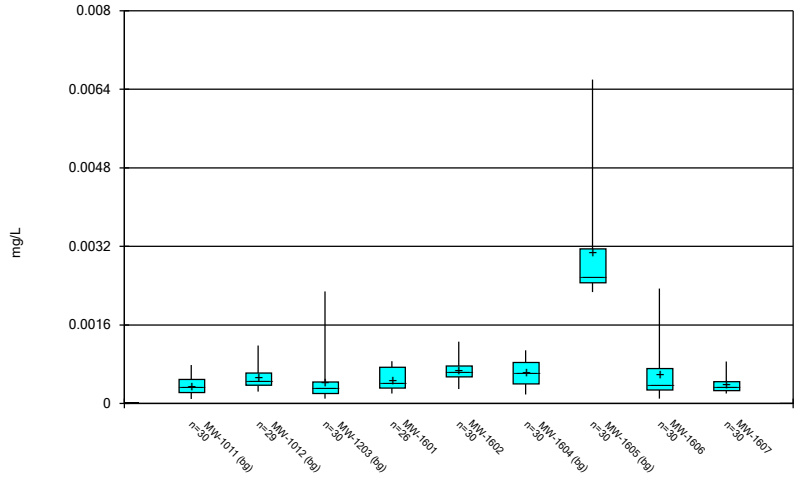
Box & Whiskers Plot



Constituent: Chromium Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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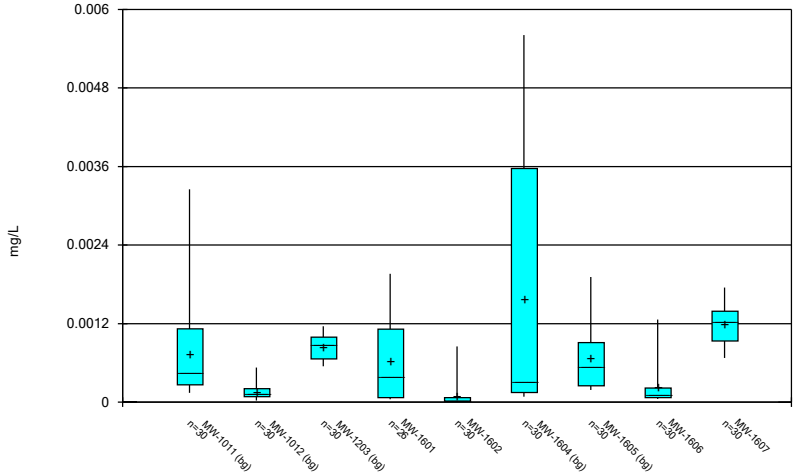
Box & Whiskers Plot



Constituent: Cobalt Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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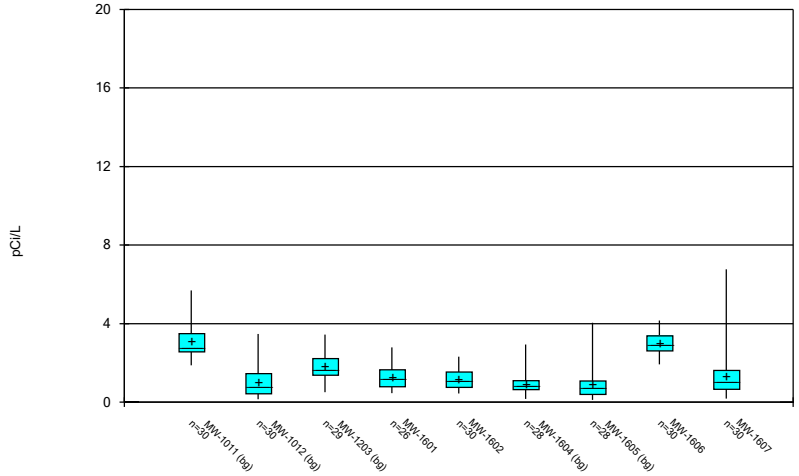
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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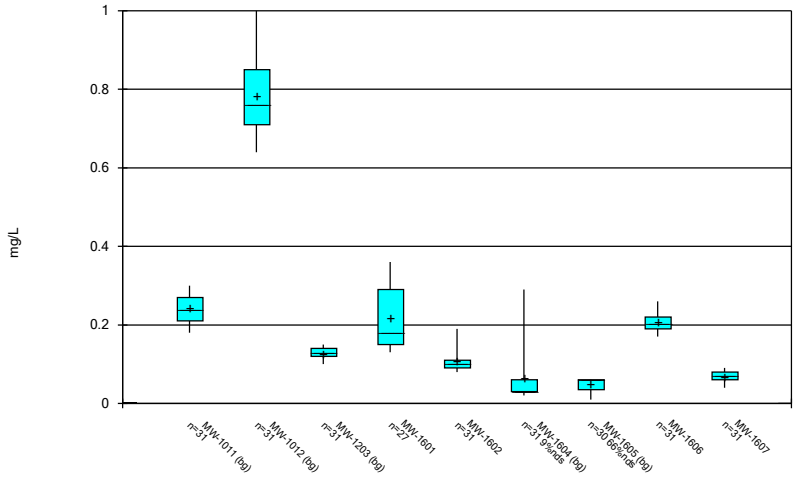
Box & Whiskers Plot



Constituent: Fluoride Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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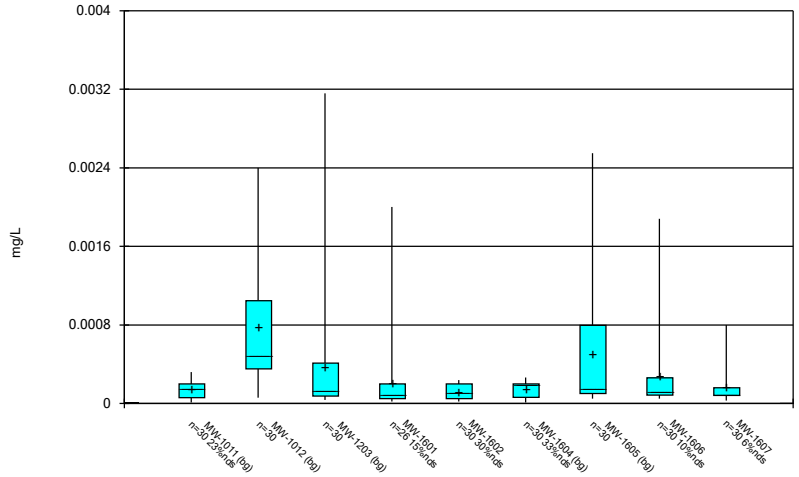
Box & Whiskers Plot



Constituent: Lead Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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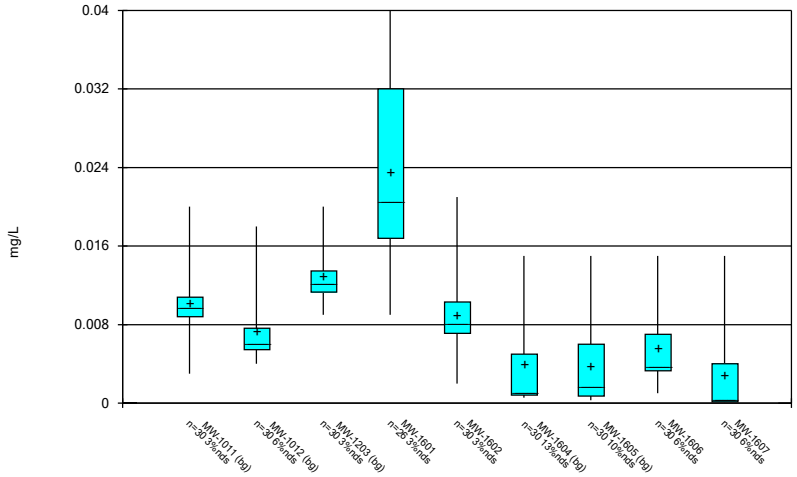
Box & Whiskers Plot

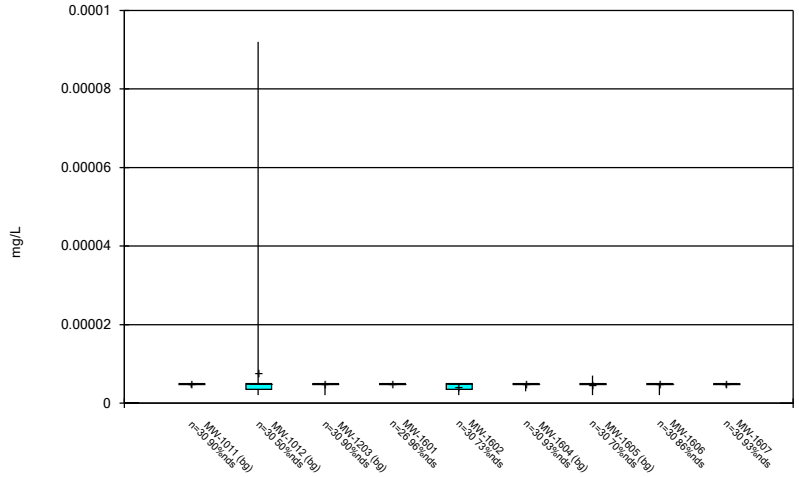


Constituent: Lithium Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot

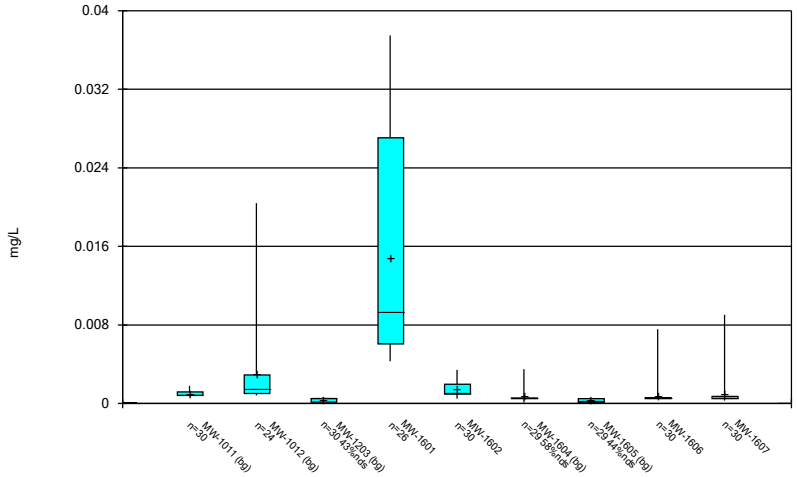


Constituent: Mercury Analysis Run 8/13/2025 4:34 PM View: Appendix IV

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.10.0.27 Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Molybdenum Analysis Run 8/13/2025 4:34 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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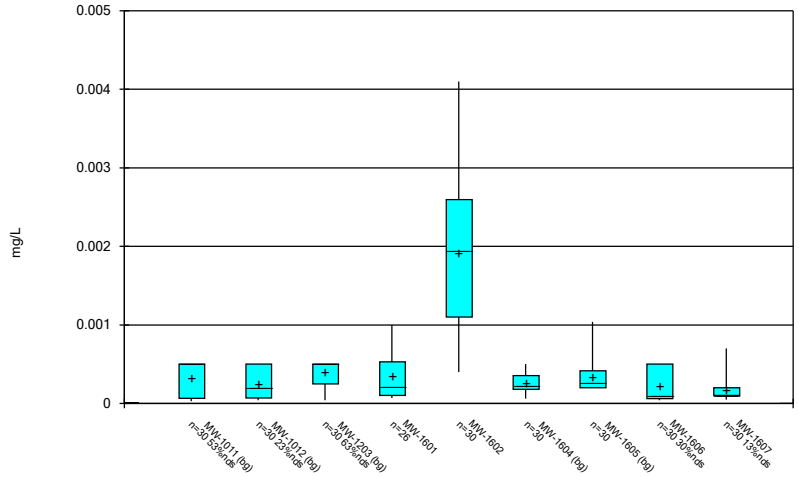
Box & Whiskers Plot



Constituent: Selenium Analysis Run 8/13/2025 4:34 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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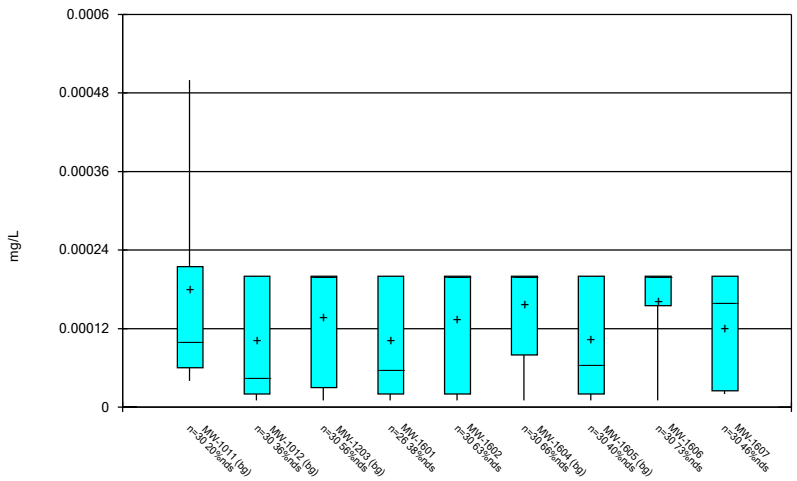
Box & Whiskers Plot



Constituent: Thallium Analysis Run 8/13/2025 4:34 PM View: Appendix IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE C

Outlier Summary

Appendix IV Outlier Summary

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 8/13/2025, 12:15 PM

	MW-1012 Antimony (mg/L)	MW-1012 Arsenic (mg/L)	MW-1012 Chromium (mg/L)	MW-1203 Combined Radium 226 + 228 (pCi/L)	MW-1604 Combined Radium 226 + 228 (pCi/L)	MW-1605 Combined Radium 226 + 228 (pCi/L)	MW-1012 Molybdenum (mg/L)	MW-1604 Molybdenum (mg/L)	MW-1605 Molybdenum (mg/L)
5/23/2017				6.707 (o)	6.077 (o)				
5/24/2017			0.00784 (o)						
6/21/2017				16.848 (o)	10.864 (o)				
7/12/2017								0.0159 (o)	0.0237 (o)
3/17/2020			7.524 (o)						
3/24/2022	0.00152 (o)	0.0499 (o)							
6/15/2022	0.00114 (o)	0.0454 (o)							
10/12/2022	0.00108 (o)	0.0386 (o)							
3/15/2023	0.00308 (o)	0.0942 (o)					0.0086 (o)		
6/14/2023	0.00318 (o)	0.118 (o)					0.0091 (o)		
10/18/2023	0.00307 (o)	0.107 (o)					0.0084 (o)		
3/14/2024	0.00854 (o)	0.229 (o)					0.0134 (o)		
5/9/2024	0.00501 (o)	0.208 (o)					0.023 (o)		
9/24/2024	0.00412 (o)	0.182 (o)					0.0136 (o)		

FIGURE D

UTLs

Upper Tolerance Limits Summary Table

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 1/14/2025, 4:29 PM

Constituent	Upper Lim.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	0.0012	131	n/a	n/a	22.14	n/a	n/a	0.001207	NP Inter(normality)
Arsenic (mg/L)	0.0289	131	n/a	n/a	4.58	n/a	n/a	0.001207	NP Inter(normality)
Barium (mg/L)	0.113	140	n/a	n/a	0	n/a	n/a	0.0007609	NP Inter(normality)
Beryllium (mg/L)	0.000349	140	n/a	n/a	18.57	n/a	n/a	0.0007609	NP Inter(normality)
Cadmium (mg/L)	0.00014	140	n/a	n/a	27.86	n/a	n/a	0.0007609	NP Inter(normality)
Chromium (mg/L)	0.0066	139	n/a	n/a	0	n/a	n/a	0.0008009	NP Inter(normality)
Cobalt (mg/L)	0.003597	140	-7.698	1.103	0	None	ln(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	4.143	135	1.192	0.4482	0	None	sqrt(x)	0.05	Inter
Fluoride (mg/L)	0.91	144	n/a	n/a	14.58	n/a	n/a	0.0006197	NP Inter(normality)
Lead (mg/L)	0.00255	140	n/a	n/a	11.43	n/a	n/a	0.0007609	NP Inter(normality)
Lithium (mg/L)	0.02	140	n/a	n/a	7.857	n/a	n/a	0.0007609	NP Inter(normality)
Mercury (mg/L)	0.000092	140	n/a	n/a	78.57	n/a	n/a	0.0007609	NP Inter(NDs)
Molybdenum (mg/L)	0.0055	132	n/a	n/a	29.55	n/a	n/a	0.001147	NP Inter(normality)
Selenium (mg/L)	0.00104	140	n/a	n/a	27.86	n/a	n/a	0.0007609	NP Inter(normality)
Thallium (mg/L)	0.000229	140	n/a	n/a	45	n/a	n/a	0.0007609	NP Inter(normality)

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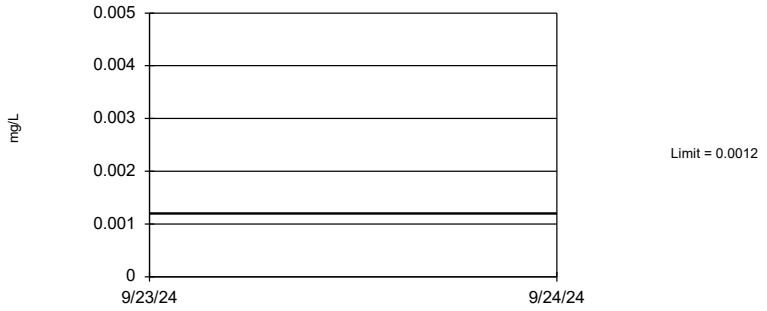
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 131 background values. 22.14% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.001207.

Constituent: Antimony Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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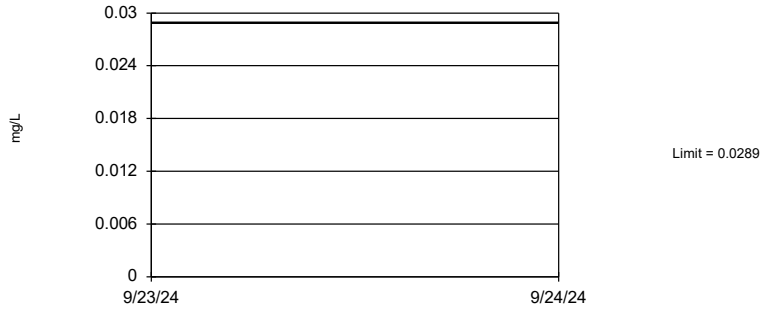
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 131 background values. 4.58% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.001207.

Constituent: Arsenic Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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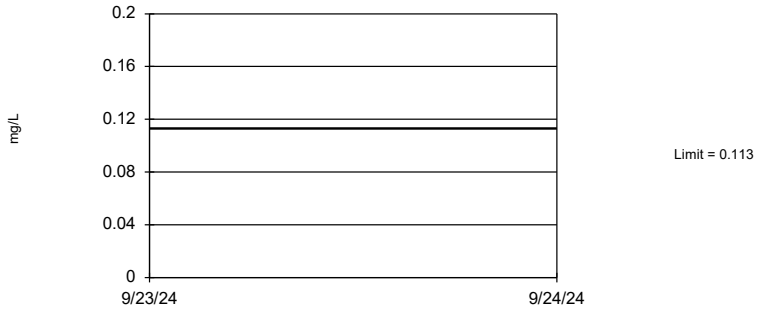
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Barium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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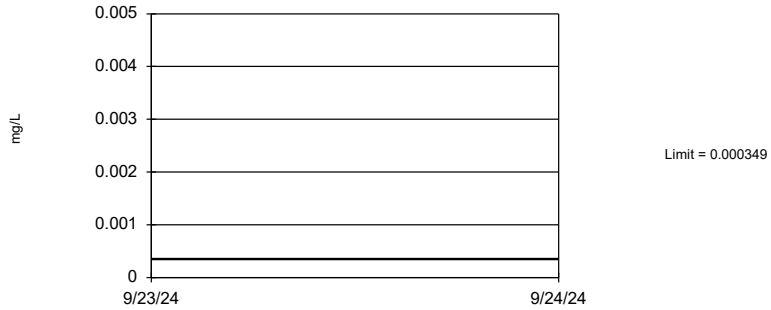
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 18.57% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Beryllium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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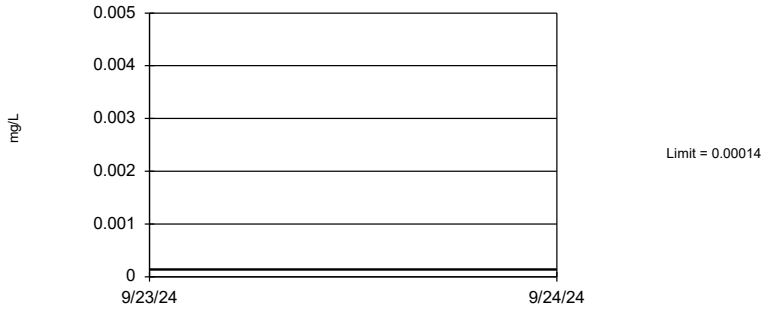
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 27.86% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Cadmium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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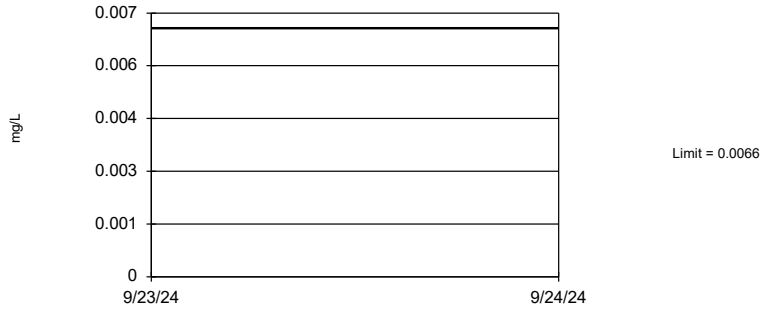
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 139 background values. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0008009.

Constituent: Chromium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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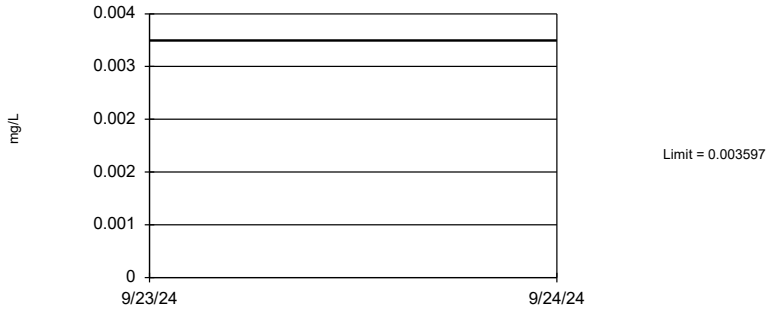
Tolerance Limit

Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-7.698, Std. Dev.=1.103, n=140. Normality test: Chi Squared @alpha = 0.01, calculated = 8.571, critical = 14.07. Report alpha = 0.05.

Constituent: Cobalt Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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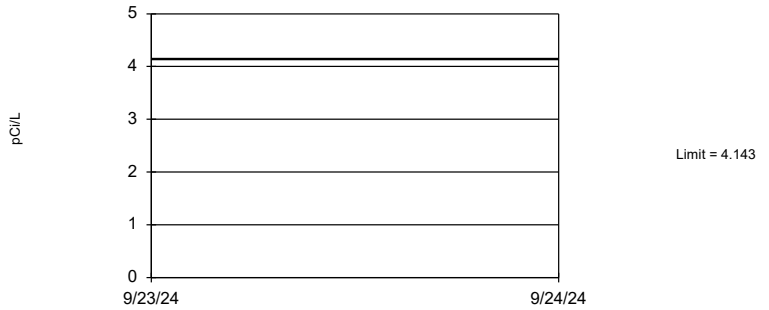
Tolerance Limit

Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=1.192, Std. Dev.=0.4482, n=135. Normality test: Chi Squared @alpha = 0.01, calculated = 10.7, critical = 14.07. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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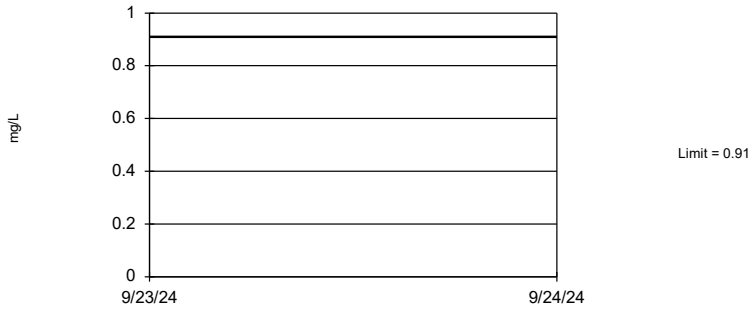
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 144 background values. 14.58% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0006197.

Constituent: Fluoride Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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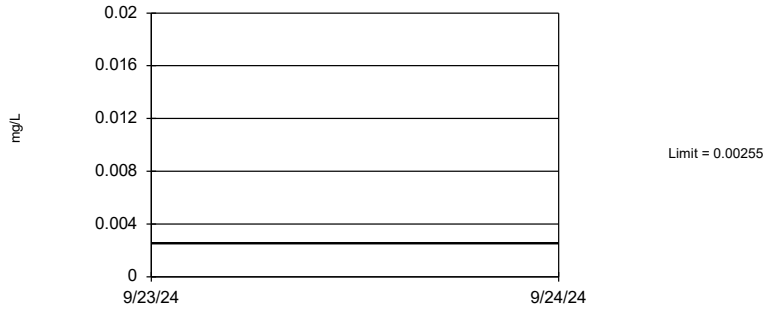
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 11.43% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Lead Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Tolerance Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 7.857% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Lithium Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Tolerance Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 140 background values. 78.57% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Mercury Analysis Run 1/14/2025 4:28 PM View: UTLs

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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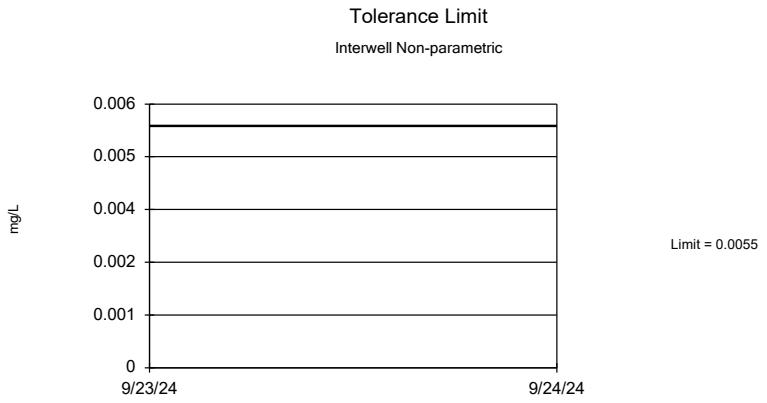

Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 132 background values. 29.55% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.001147.

Constituent: Molybdenum Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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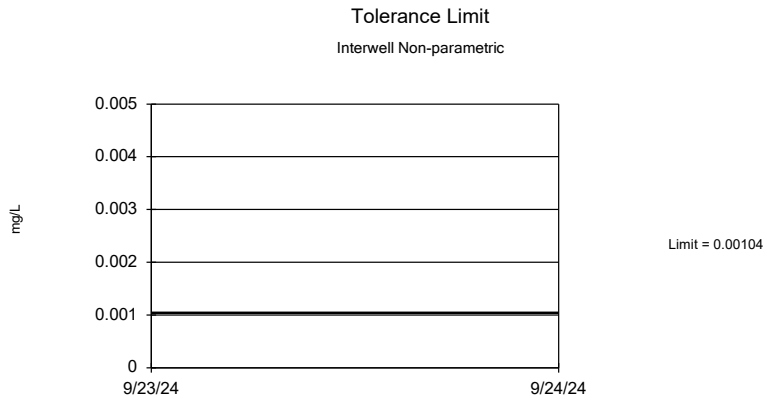

Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 27.86% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Selenium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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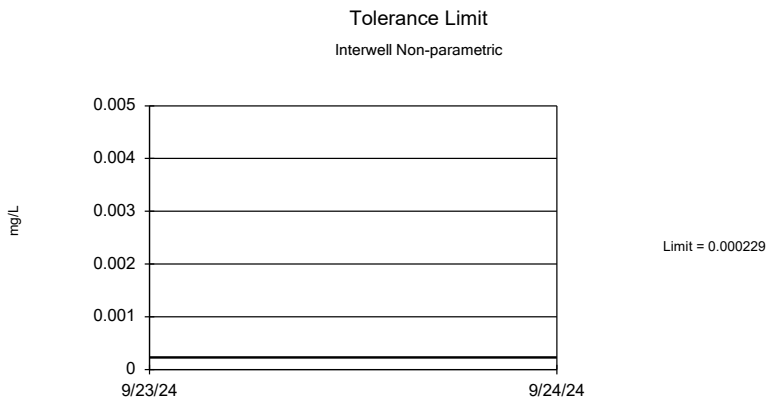

Non-parametric test used in lieu of parametric tolerance limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 140 background values. 45% NDs. 96.68% coverage at alpha=0.01; 97.85% coverage at alpha=0.05; 99.41% coverage at alpha=0.5. Report alpha = 0.0007609.

Constituent: Thallium Analysis Run 1/14/2025 4:28 PM View: UTLs
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

FIGURE E

GWPS

BIG SANDY FAP GWPS				
Constituent Name	**MCL**	**CCR-Rule Specified**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006		0.0012	0.006
Arsenic, Total (mg/L)	0.01		0.029	0.029
Barium, Total (mg/L)	2		0.11	2
Beryllium, Total (mg/L)	0.004		0.00035	0.004
Cadmium, Total (mg/L)	0.005		0.00014	0.005
Chromium, Total (mg/L)	0.1		0.0066	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.0036	0.006
Combined Radium, Total (pCi/L)	5		4.14	5
Fluoride, Total (mg/L)	4		0.91	4
Lead, Total (mg/L)	0.015		0.0026	0.015
Lithium, Total (mg/L)	n/a	0.04	0.02	0.04
Mercury, Total (mg/L)	0.002		0.000092	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0055	0.1
Selenium, Total (mg/L)	0.05		0.001	0.05
Thallium, Total (mg/L)	0.002		0.00023	0.002

**Grey cell indicates Background is higher than MCL or CCR-Rule Specified Level*

**GWPS = Groundwater Protection Standard*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

FIGURE F

Confidence Intervals

Appendix IV - Confidence Intervals - All Results (No Significant)

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 8/13/2025, 4:39 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	MW-1601	0.0004398	0.0002175	0.006	No	26	0.0003286	0.000228	0	None	No	0.01	Param.
Antimony (mg/L)	MW-1602	0.0001037	0.00006505	0.006	No	30	0.00008863	0.00004803	0	None	sqrt(x)	0.01	Param.
Antimony (mg/L)	MW-1606	0.0001	0.00003	0.006	No	30	0.00009547	0.0001588	50	None	No	0.01	NP (normality)
Antimony (mg/L)	MW-1607	0.00006	0.00002	0.006	No	30	0.00005237	0.00005621	16.67	None	No	0.01	NP (normality)
Arsenic (mg/L)	MW-1601	0.00458	0.0004	0.029	No	26	0.002217	0.002156	0	None	No	0.01	NP (normality)
Arsenic (mg/L)	MW-1602	0.001105	0.0006556	0.029	No	30	0.001027	0.0007832	0	None	ln(x)	0.01	Param.
Arsenic (mg/L)	MW-1606	0.001027	0.0008828	0.029	No	30	0.000955	0.0001605	0	None	No	0.01	Param.
Arsenic (mg/L)	MW-1607	0.01788	0.01185	0.029	No	30	0.01645	0.01107	0	None	ln(x)	0.01	Param.
Barium (mg/L)	MW-1601	0.06144	0.04573	2	No	26	0.05478	0.01673	0	None	x^(1/3)	0.01	Param.
Barium (mg/L)	MW-1602	0.06172	0.05558	2	No	30	0.05865	0.006819	0	None	No	0.01	Param.
Barium (mg/L)	MW-1606	0.828	0.742	2	No	30	0.8041	0.1001	0	None	No	0.01	NP (normality)
Barium (mg/L)	MW-1607	0.04315	0.0331	2	No	30	0.03962	0.01432	0	None	ln(x)	0.01	Param.
Beryllium (mg/L)	MW-1601	0.00005	0.000009	0.004	No	26	0.000031	0.00001991	46.15	None	No	0.01	NP (normality)
Beryllium (mg/L)	MW-1606	0.00005	0.00001	0.004	No	30	0.00003373	0.00002562	33.33	None	No	0.01	NP (normality)
Beryllium (mg/L)	MW-1607	0.000028	0.00001	0.004	No	30	0.00003507	0.00003825	20	None	No	0.01	NP (normality)
Cadmium (mg/L)	MW-1601	0.00001369	0.00000671	0.005	No	26	0.00002112	0.00001693	15.38	Kaplan-Meier	x^(1/3)	0.01	Param.
Cadmium (mg/L)	MW-1602	0.00002	0.000007	0.005	No	30	0.00001297	0.000006239	36.67	None	No	0.01	NP (normality)
Cadmium (mg/L)	MW-1606	0.00002	0.00001	0.005	No	30	0.00001833	0.000009639	70	None	No	0.01	NP (NDs)
Cadmium (mg/L)	MW-1607	0.00002	0.000016	0.005	No	30	0.0000173	0.000008607	63.33	None	No	0.01	NP (NDs)
Chromium (mg/L)	MW-1601	0.0005979	0.0003895	0.1	No	26	0.0004937	0.0002139	0	None	No	0.01	Param.
Chromium (mg/L)	MW-1602	0.0007753	0.0005771	0.1	No	30	0.0006762	0.0002205	0	None	No	0.01	Param.
Chromium (mg/L)	MW-1606	0.0007001	0.0003263	0.1	No	30	0.0005799	0.0005189	0	None	sqrt(x)	0.01	Param.
Chromium (mg/L)	MW-1607	0.0004417	0.0003073	0.1	No	30	0.000386	0.0001629	0	None	sqrt(x)	0.01	Param.
Cobalt (mg/L)	MW-1601	0.0007889	0.0002473	0.006	No	26	0.0006345	0.0006029	0	None	sqrt(x)	0.01	Param.
Cobalt (mg/L)	MW-1602	0.000043	0.000019	0.006	No	30	0.00009283	0.0001814	0	None	No	0.01	NP (normality)
Cobalt (mg/L)	MW-1606	0.000208	0.000072	0.006	No	30	0.0002422	0.0003157	0	None	No	0.01	NP (normality)
Cobalt (mg/L)	MW-1607	0.001309	0.001072	0.006	No	30	0.001191	0.0002638	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1601	1.579	0.9826	5	No	26	1.281	0.6123	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1602	1.398	0.9179	5	No	30	1.158	0.5338	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606	3.266	2.762	5	No	30	3.014	0.5609	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607	1.546	0.7854	5	No	30	1.343	1.217	0	None	x^(1/3)	0.01	Param.
Fluoride (mg/L)	MW-1601	0.29	0.16	4	No	27	0.2178	0.07582	0	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-1602	0.11	0.09	4	No	31	0.1077	0.02929	0	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-1606	0.2183	0.1965	4	No	31	0.2074	0.02476	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-1607	0.07196	0.06224	4	No	31	0.0671	0.01101	0	None	No	0.01	Param.
Lead (mg/L)	MW-1601	0.0001282	0.00004524	0.015	No	26	0.0002048	0.0003806	15.38	Kaplan-Meier	ln(x)	0.01	Param.
Lead (mg/L)	MW-1602	0.0002	0.000059	0.015	No	30	0.0001205	0.0000737	30	None	No	0.01	NP (normality)
Lead (mg/L)	MW-1606	0.00021	0.00009	0.015	No	30	0.0002844	0.0004137	10	None	No	0.01	NP (normality)
Lead (mg/L)	MW-1607	0.000169	0.00008661	0.015	No	30	0.0001693	0.0001884	6.667	None	ln(x)	0.01	Param.
Lithium (mg/L)	MW-1601	0.02786	0.01928	0.04	No	26	0.02357	0.008801	3.846	None	No	0.01	Param.
Lithium (mg/L)	MW-1602	0.0105	0.007335	0.04	No	30	0.008919	0.003522	3.333	None	No	0.01	Param.
Lithium (mg/L)	MW-1606	0.006	0.0034	0.04	No	30	0.00557	0.003982	6.667	None	No	0.01	NP (normality)
Lithium (mg/L)	MW-1607	0.003	0.00014	0.04	No	30	0.002782	0.004443	6.667	None	No	0.01	NP (normality)
Mercury (mg/L)	MW-1601	0.000005	0.000005	0.002	No	26	0.000005	2.5e-14	96.15	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1602	0.000005	0.000004	0.002	No	30	0.000004333	0.000001184	73.33	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1606	0.000005	0.000003	0.002	No	30	0.000004733	8.3e-7	86.67	None	No	0.01	NP (NDs)
Mercury (mg/L)	MW-1607	0.000005	0.000005	0.002	No	30	0.000004967	1.8e-7	93.33	None	No	0.01	NP (NDs)
Molybdenum (mg/L)	MW-1601	0.01653	0.008188	0.1	No	26	0.01486	0.01036	0	None	ln(x)	0.01	Param.
Molybdenum (mg/L)	MW-1602	0.001601	0.001036	0.1	No	30	0.001399	0.0007205	0	None	x^(1/3)	0.01	Param.
Molybdenum (mg/L)	MW-1606	0.0006	0.0005	0.1	No	30	0.0008657	0.001322	0	None	No	0.01	NP (normality)
Molybdenum (mg/L)	MW-1607	0.0007	0.00052	0.1	No	30	0.0008773	0.001546	0	None	No	0.01	NP (normality)
Selenium (mg/L)	MW-1601	0.000429	0.0001969	0.05	No	26	0.0003469	0.0002535	0	None	sqrt(x)	0.01	Param.
Selenium (mg/L)	MW-1602	0.002341	0.001491	0.05	No	30	0.001916	0.0009465	0	None	No	0.01	Param.
Selenium (mg/L)	MW-1606	0.0005	0.00007	0.05	No	30	0.000232	0.0002008	30	None	No	0.01	NP (normality)
Selenium (mg/L)	MW-1607	0.00015	0.0001	0.05	No	30	0.0001623	0.0001346	13.33	None	No	0.01	NP (normality)
Thallium (mg/L)	MW-1601	0.0002	0.00002	0.002	No	26	0.0001026	0.00008789	38.46	None	No	0.01	NP (normality)
Thallium (mg/L)	MW-1602	0.0002	0.00003	0.002	No	30	0.0001347	0.0000876	63.33	None	No	0.01	NP (NDs)
Thallium (mg/L)	MW-1606	0.0002	0.00011	0.002	No	30	0.0001617	0.0000724	73.33	None	No	0.01	NP (NDs)
Thallium (mg/L)	MW-1607	0.0002	0.00003	0.002	No	30	0.0001201	0.00008398	46.67	None	No	0.01	NP (normality)

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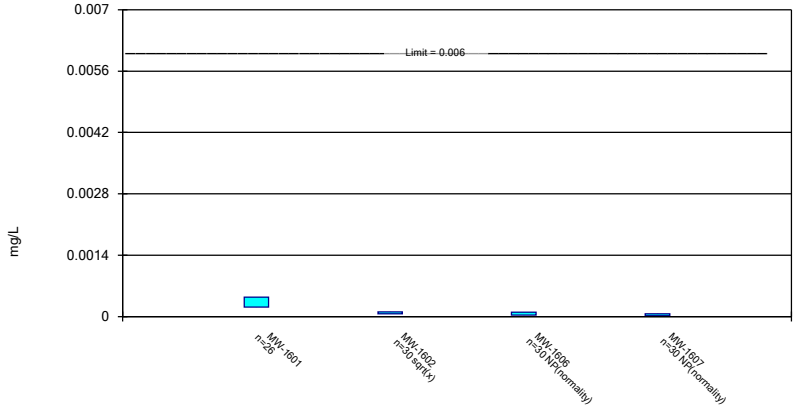
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Antimony Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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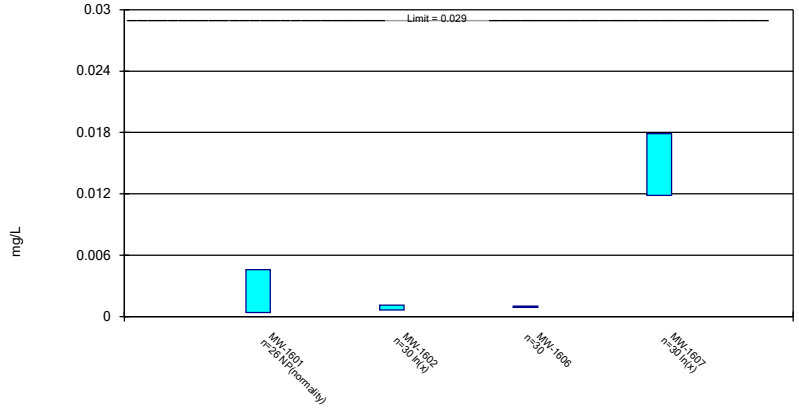
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Arsenic Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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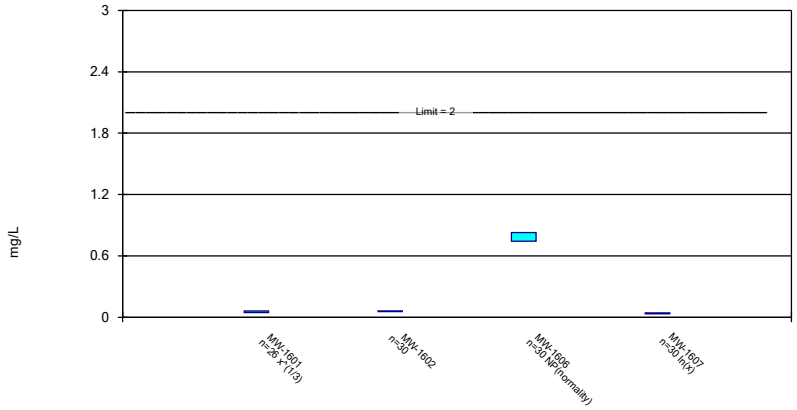
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Barium Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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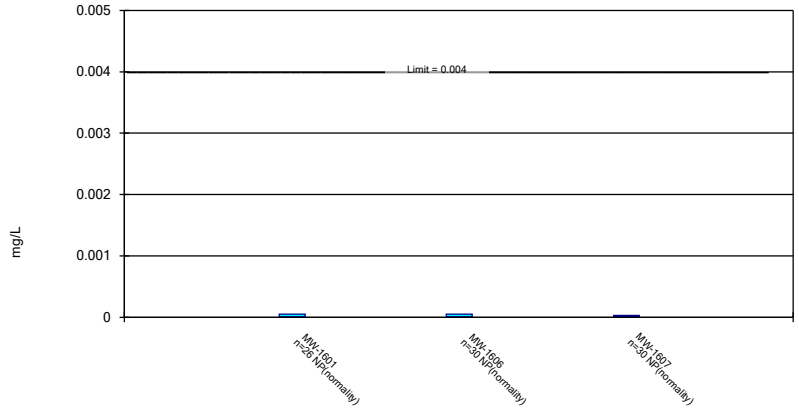
Non-Parametric Confidence Interval

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



Constituent: Beryllium Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Parametric and Non-Parametric (NP) Confidence Interval

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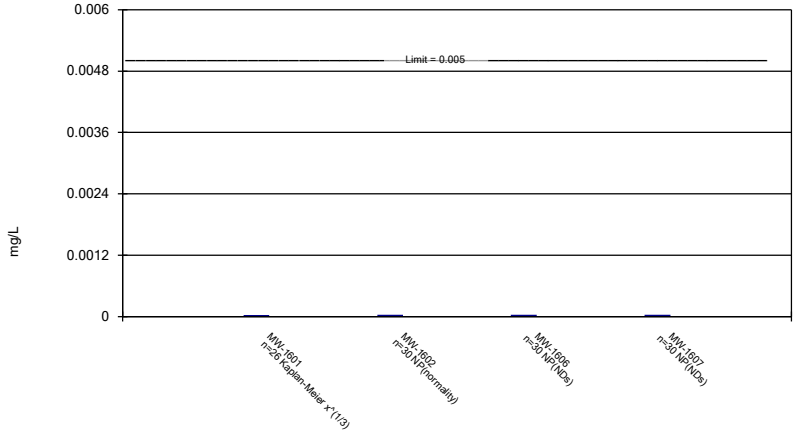

Constituent: Cadmium Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Parametric Confidence Interval

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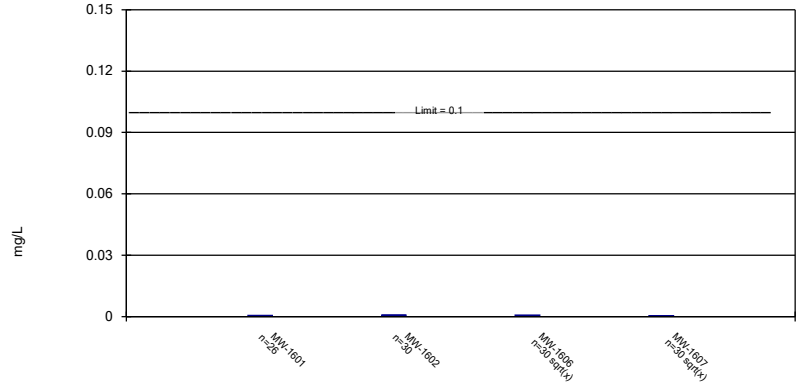

Constituent: Chromium Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Parametric and Non-Parametric (NP) Confidence Interval

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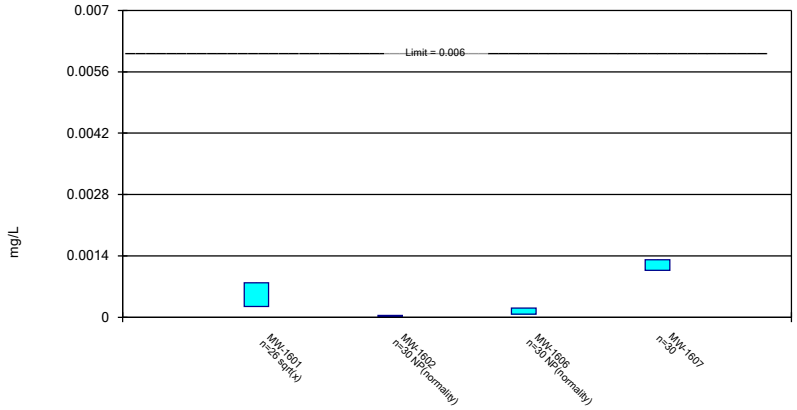

Constituent: Cobalt Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Parametric Confidence Interval

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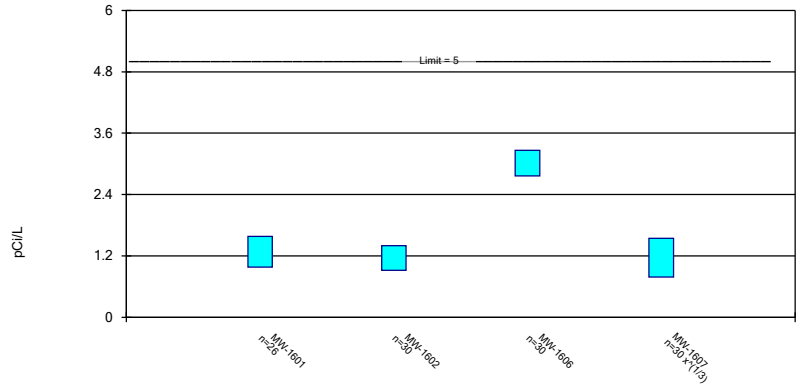

Constituent: Combined Radium 226 + 228 Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confiden
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Parametric and Non-Parametric (NP) Confidence Interval

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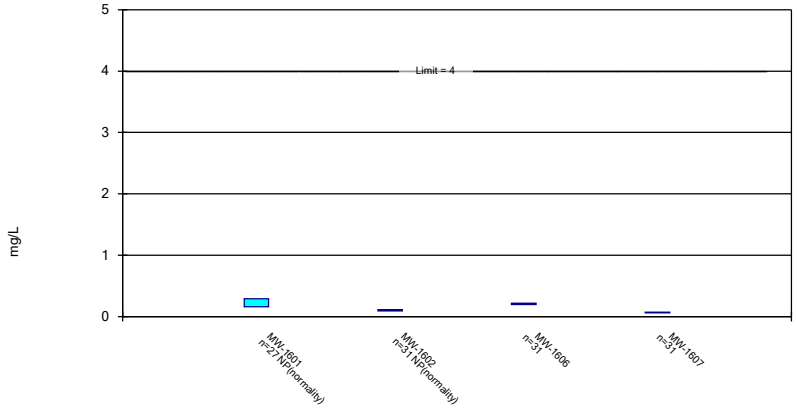

Constituent: Fluoride Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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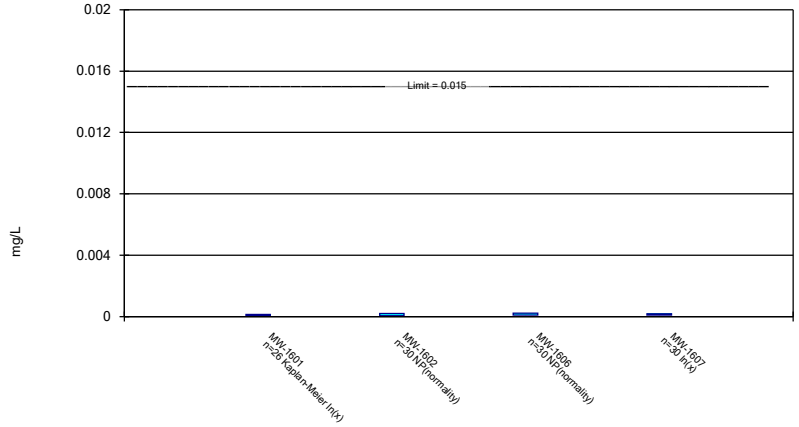
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Lead Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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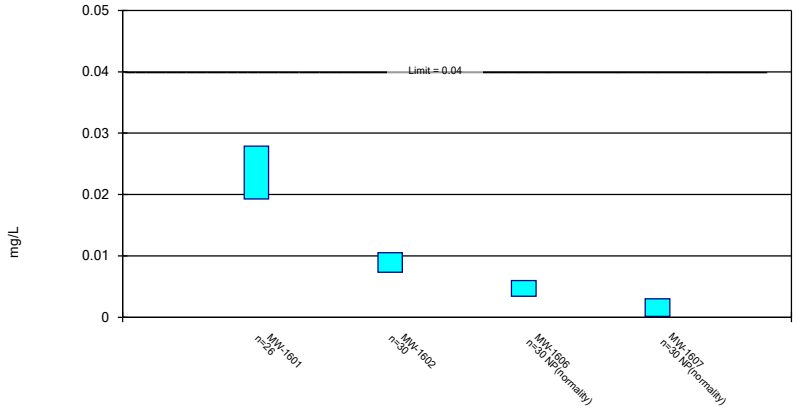
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Lithium Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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Non-Parametric Confidence Interval

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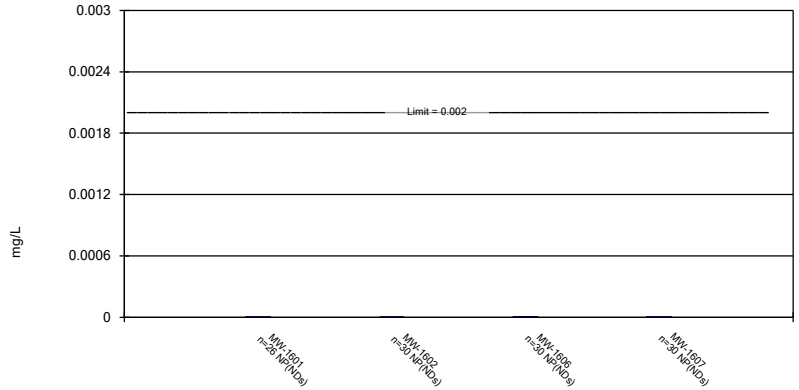

Constituent: Mercury Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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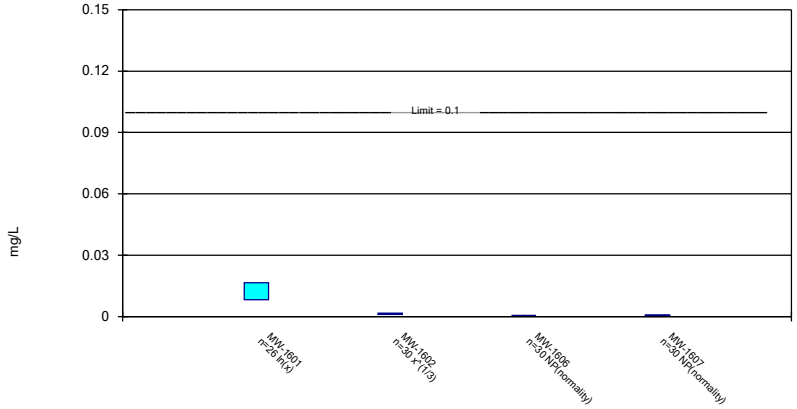
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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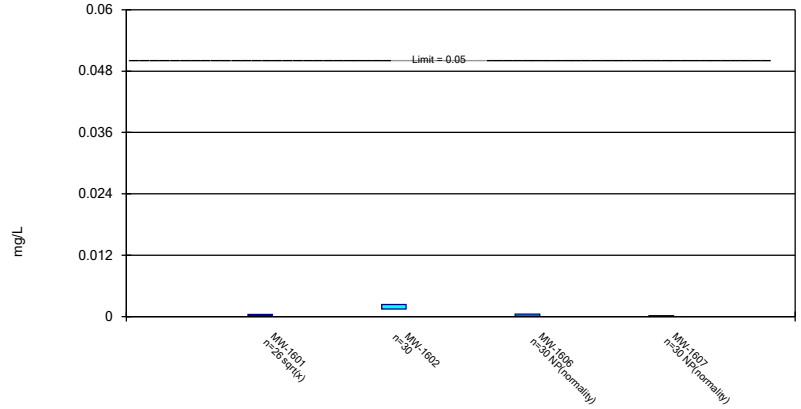
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

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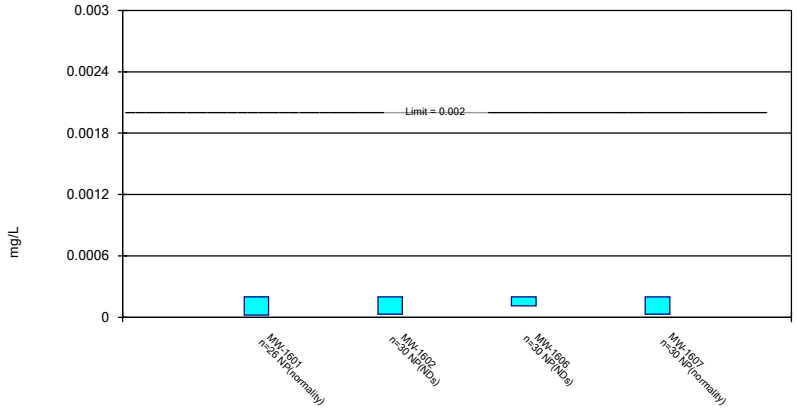
Non-Parametric Confidence Interval

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



Constituent: Thallium Analysis Run 8/13/2025 4:36 PM View: Appendix IV - Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

APPENDIX 3 – Alternate Source Demonstrations

No alternate source demonstrations were completed during this reporting period.

APPENDIX 4 – Notices for Monitoring Program Transitions

The notification that an assessment monitoring program was initiated in 2018 follows. No transitions between monitoring programs occurred during this reporting period; the BSFAP CCR unit remained in assessment monitoring.

Big Sandy Plant

Notice of Assessment Monitoring Program Establishment

Fly Ash Pond

On January 15, 2018, it was determined that Big Sandy Plant's fly ash pond had statistically significant increases over background for boron, calcium, chloride, fluoride, total dissolved solids, and sulfate. 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).

APPENDIX 5 – Well Installation/Decommissioning Logs

No wells were installed or decommissioned during this reporting period. Well installation/decommissioning logs are not applicable at this time.