

Annual Groundwater Monitoring Report

Kentucky Power Company

Mitchell Plant

Bottom Ash Pond

Moundsville, WV

January 2024

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An **AEP** Company

BOUNDLESS ENERGYSM

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I. Overview

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year for the Bottom Ash Pond at Kentucky Power Company's, a wholly owned subsidiary of American Electric Power Company (AEP), Mitchell Power Plant. The USEPA's CCR rules require that the Annual Groundwater Monitoring Report be posted to the operating record for the preceding year no later than January 31st.

In general, the following activities were completed in 2023:

- The CCR unit was in assessment monitoring at the beginning and end of 2023;
- Groundwater samples were collected on March 21 and 22, 2023 and analyzed in accordance with 40 CFR 257.95(b) for all Appendix IV constituents. Groundwater samples were collected on May 16 and 17, 2023 in accordance with 40 CFR 257.95(d)(1), and analyzed for all Appendix III constituents and those Appendix IV constituents that were detected during the previous sampling in accordance with 40 CFR 257.95(b) in March 2023. Groundwater samples were collected on October 10 and 11, 2023 in accordance with 40 CFR 257.95(d)(1), and analyzed for all Appendix III constituents and those Appendix IV constituents that were detected during the previous sampling in accordance with 40 CFR 257.95(b) in March 2023. All sampling was performed in accordance with 40 CFR 257.95 *et seq.*, and AEP's *Groundwater Sampling and Analysis Plan (2016)*;
- Groundwater monitoring data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units;
- Statistical analysis of assessment monitoring samples collected on October 17, 2022 was completed on February 6, 2023. Statistical analysis of assessment monitoring samples collected in March and May 2023 was completed on August 30, 2023;
- Because no statistically significant levels (SSLs) above the groundwater protection standard were detected, assessment monitoring continued;
- No alternative source demonstrations (ASDs) relative to the Appendix IV SSLs above the groundwater protection standard were conducted.

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

- A map, aerial photograph or a drawing showing the CCR management unit, all groundwater monitoring wells and monitoring well identification numbers;
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates

the samples were collected, and whether the sample was collected as part of detection monitoring or assessment monitoring programs (attached as Appendix 1);

- Statistical comparison of monitoring data to determine if there have been statistically significant levels above the groundwater protection standards (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, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring (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 regarding the rationale for the installation/decommission (attached as Appendix 5, where applicable); and
- Other information required to be included in the annual report such as an alternate monitoring frequency, or assessment of corrective measures, 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

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

III. Monitoring Wells Installed or Decommissioned

There were no monitoring wells installed or decommissioned in 2023. The network design, as summarized in the *Groundwater Monitoring Network Design Report* (2016) and as posted at the CCR web site for Mitchell Plant, did not change. That design report, viewable on the AEP CCR web site, discusses the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, downgradient monitoring well locations, and the 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, detection monitoring, and assessment monitoring. Static water elevation data from each monitoring event also are shown in Appendix 1, along with the

groundwater velocities, groundwater flow direction, and potentiometric maps developed after each sampling event.

V. Groundwater Quality Data Statistical Analysis

Statistical analysis of assessment monitoring samples collected on October 17, 2022 was completed on February 6, 2023. Statistical analysis of assessment monitoring samples collected in March and May 2023 was completed on August 30, 2023. Statistical analyses of samples collected during the October 10 and 11, 2023 sampling event will be completed in 2024. No SSLs above the groundwater protection standards were identified during either the February 2023 or the August 2023 analysis. The results of these statistical analyses are documented in the corresponding statistical analysis summary reports, which are provided in Appendix 2. Appendix 2 also contains a memorandum that explains the reissuance of select analytical laboratory reports to correct laboratory equipment data quality assurance/quality control issues.

VI. Alternative Source Demonstrations

ASDs relative to Appendix IV SSLs above the groundwater protection standard were not necessary because no SSLs above the groundwater protection standards were identified from the completed sampling events required by 40 CFR 257.95(d)(1). A statement to this effect is provided in Appendix 3.

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

No transition between monitoring requirements occurred in 2023; the CCR unit was in assessment monitoring at the beginning and at the end of the year. A statement to this effect is provided in Appendix 4.

The Mitchell bottom ash pond monitoring program would return to detection monitoring if all Appendix III and IV constituents are below background values for two consecutive monitoring events. If one or more Appendix IV constituents exceed the corresponding groundwater protection standard due to a release from the bottom ash pond, and are not demonstrated to be caused by a source other than the CCR unit or resulting from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality by means of an ASD, 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 is high enough at this facility that no modification of the assessment monitoring schedule is necessary.

VIII. Other Information Required

The Mitchell bottom ash pond has progressed from detection monitoring to its current status in assessment monitoring. All required information has been included in this annual groundwater monitoring report.

IX. Description of Any Problems Encountered in 2023 and Actions Taken

No significant problems were encountered. Through the use of low-flow purging and sampling methodology, samples representative of uppermost aquifer groundwater were obtained and the schedule was met to support this annual groundwater report preparation.

X. A Projection of Key Activities for the Upcoming Year

Key activities for 2024 include the following:

- Assessment monitoring on a semiannual schedule;
- Statistical evaluation of the assessment monitoring results to determine any statistically significant increases (or decreases with respect to pH) over an established groundwater protection standard, or whether the concentrations have returned below background concentrations;
- Responding to any new data received in light of CCR rule requirements;
- Preparation of the next annual groundwater report.

APPENDIX 1 - Groundwater Data Tables and Figures

Tables follow showing the groundwater monitoring data collected, the rate of groundwater flow each time groundwater was sampled, the number of samples collected per monitoring well, dates that the samples were collected, and whether each sample was collected as part of a detection monitoring or an assessment monitoring program. Figures follow showing the PE-certified groundwater monitoring network with the corresponding well identifications along with static water elevation data and groundwater flow directions each time groundwater was sampled in the form of annotated satellite images.

**Table 1. Groundwater Data Summary: MW-1504
Mitchell - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/13/2016	Background	0.054	220	99.1	0.23	6.9	375	990
8/1/2016	Background	0.070	220	103	0.25	7.0	403	970
9/26/2016	Background	0.098	225	103	0.24	7.1	389	946
11/8/2016	Background	0.053	219	92.8	0.19	7.1	369	930
2/7/2017	Background	0.162	218	81.7	0.20	7.1	291	904
4/4/2017	Background	0.105	237	89.8	0.21	7.3	362	924
5/16/2017	Background	0.113	225	93.5	0.22	7.2	371	995
7/19/2017	Background	0.129	230	96.3	0.15	7.2	405	999
10/9/2017	Detection	0.114	212	93.4	0.24	7.2	392	982
4/11/2018	Assessment	0.063	204	83.6	0.19	7.0	291	842
8/22/2018	Assessment	0.096	230	91.9	0.20	7.3	372	936
5/1/2019	Assessment	0.05 J1	220	81.8	0.17	8.0	317	926
6/11/2019	Assessment	0.04 J1	183	78.5	0.17	7.6	261	829
10/22/2019	Assessment	0.02 J1	196	85.9	0.15	7.3	242	801
3/17/2020	Assessment	--	--	--	0.15	7.1	--	--
5/5/2020	Assessment	0.04 J1	230	96.2	0.12	7.5	372	1,020
10/20/2020	Assessment	0.082	255	--	0.14	7.3	--	1,230
1/7/2021	Assessment	--	--	101	--	--	292	--
3/16/2021	Assessment	--	--	--	0.15	7.7	--	--
5/11/2021	Assessment	0.03 J1	206	101	0.15	8.6	300	908
10/19/2021	Assessment	0.046 J1	252	107	0.15	7.1	467	1,150
3/15/2022	Assessment	--	--	--	0.13	7.2	--	--
5/11/2022	Assessment	0.026 J1	224 M1, P3	79.4	0.12	7.8	239	810
10/17/2022	Assessment	2.86	271	170	0.20	6.9	851	1,630
3/21/2023	Assessment	--	--	--	0.20	7.3	--	--
5/17/2023	Assessment	4.16	171	245	0.17	7.0	705	1,510
10/10/2023	Assessment	5.77	178	217	0.17	7.2	612	1,330

Table 1. Groundwater Data Summary: MW-1504

Mitchell - BAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/13/2016	Background	0.03 J1	0.73	46.2	0.01 J1	0.04	0.4	0.523	0.0838	0.23	0.379	0.002	< 0.002 U1	0.59	0.1	0.02 J1
8/1/2016	Background	0.02 J1	0.52	42.7	0.009 J1	0.04	0.5	0.549	0.248	0.25	0.222	< 0.0002 U1	0.002 J1	0.74	0.07 J1	0.02 J1
9/26/2016	Background	< 0.05 U1	0.38	36.7	< 0.02 U1	0.03 J1	0.3	0.362	0.656	0.24	0.104	0.007	< 0.002 U1	2.31	0.2 J1	0.1 J1
11/8/2016	Background	0.02 J1	0.36	38.4	< 0.005 U1	0.03	0.469	0.249	1.748	0.19	0.041	0.004	< 0.002 U1	0.66	< 0.03 U1	0.089
2/7/2017	Background	0.02 J1	0.39	33.8	< 0.005 U1	0.03	0.530	0.239	0.563	0.20	0.022	0.008	< 0.002 U1	0.94	< 0.03 U1	0.090
4/4/2017	Background	0.02 J1	0.35	40.5	< 0.005 U1	0.04	0.283	0.277	0.327	0.21	0.021	0.009	< 0.002 U1	0.81	0.06 J1	0.110
5/16/2017	Background	0.02 J1	0.46	37.3	< 0.004 U1	0.04	0.250	0.319	0.3882	0.22	0.01 J1	0.011	< 0.002 U1	0.55	0.05 J1	0.02 J1
7/19/2017	Background	0.03 J1	0.41	34.9	< 0.004 U1	0.04	0.175	0.382	0.401	0.15	0.087	0.012	< 0.002 U1	1.25	< 0.03 U1	0.03 J1
4/11/2018	Assessment	0.02 J1	0.36	36.9	0.005 J1	0.03	0.562	0.114	0.349	0.19	0.052	0.004	< 0.004 U1	0.41	0.04 J1	0.03 J1
8/22/2018	Assessment	0.05 J1	0.28	37.9	< 0.004 U1	0.03	0.331	0.093	1.048	0.20	0.037	0.006	< 0.002 U1	0.33	0.04 J1	0.03 J1
5/1/2019	Assessment	< 0.02 U1	0.22	36.4	< 0.02 U1	0.03 J1	0.305	0.071	0.675	0.17	0.02 J1	< 0.009 U1	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
6/11/2019	Assessment	< 0.02 U1	0.24	33.5	< 0.02 U1	< 0.01 U1	0.05 J1	0.04 J1	0.261	0.17	< 0.02 U1	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.7	< 0.1 U1
10/22/2019	Assessment	0.06 J1	0.29	37.0	< 0.02 U1	0.03 J1	0.399	0.475	0.613	0.15	< 0.05 U1	0.00448	< 0.002 U1	< 0.4 U1	0.05 J1	< 0.1 U1
3/17/2020	Assessment	< 0.02 U1	0.29	48.3	< 0.02 U1	0.03 J1	0.238	0.04 J1	0.4423	0.15	< 0.05 U1	0.00441	< 0.002 U1	< 0.4 U1	7.3	< 0.1 U1
5/5/2020	Assessment	< 0.02 U1	0.26	43.8	< 0.02 U1	0.03 J1	0.238	0.03 J1	0.758	0.12	< 0.05 U1	0.00442	< 0.002 U1	< 0.4 U1	3.8	< 0.1 U1
10/20/2020	Assessment	< 0.02 U1	0.28	41.0	< 0.02 U1	0.03 J1	0.204	0.04 J1	0.093	0.14	< 0.05 U1	0.00430	< 0.002 U1	< 0.4 U1	7.5	< 0.1 U1
3/16/2021	Assessment	< 0.02 U1	0.25	39.2	< 0.007 U1	0.02 J1	0.325	0.03 J1	0.0768	0.15	< 0.05 U1	0.00459	< 0.002 U1	0.2 J1	1.9	< 0.04 U1
5/11/2021	Assessment	< 0.02 U1	0.25	39.2	< 0.007 U1	0.02 J1	0.314	0.03 J1	0.439	0.15	< 0.05 U1	0.00447	< 0.002 U1	1 J1	0.3 J1	< 0.04 U1
10/19/2021	Assessment	< 0.02 U1	0.21	34.8	< 0.007 U1	0.024	0.26	0.027	1.48	0.15	< 0.05 U1	0.00434	< 0.002 U1	0.2 J1	4.38	< 0.04 U1
3/15/2022	Assessment	< 0.02 U1	0.23	40.0	< 0.007 U1	0.018 J1	0.26	0.031	2.16	0.13	0.05 J1	0.00483	< 0.002 U1	0.2 J1	5.69	< 0.04 U1
5/11/2022	Assessment	0.02 J1	0.27	38.1	< 0.007 U1	0.034	0.38	0.334	0.37	0.12	0.08 J1	0.00461	< 0.004 U1	0.2 J1	0.1 J1	< 0.04 U1
10/17/2022	Assessment	0.03 J1	0.34	40.9	< 0.007 U1	0.025	0.36	0.124	0.83	0.20	0.20	0.00600	< 0.007 U1	0.3 J1	9.02	< 0.04 U1
3/21/2023	Assessment	0.02 J1	0.36	24.4	0.011 J1	0.061	0.53	0.275	0.55	0.20	0.24	0.00575	0.002 J1	0.3 J1	8.75	< 0.04 U1
5/17/2023	Assessment	0.018 J1	0.26	23.4	< 0.007 U1	0.030	0.35	0.189	0.55	0.17	0.12 J1	0.00472	< 0.002 U1	0.3 J1	9.17	< 0.02 U1
10/10/2023	Assessment	0.025 J1	0.27	25.4	< 0.007 U1	0.027	0.7	0.144	0.88	0.17	0.13 J1	0.00595	< 0.002 U1	0.2 J1	5.33	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1505
Mitchell - BAP
Appendix III Constituents**

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/14/2016	Background	10.8	288	365	< 0.05 U1	7.1	337	1,530
8/1/2016	Background	10.6	294	358	< 0.05 U1	7.1	337	1,580
9/26/2016	Background	10.3	289	345	< 0.05 U1	7.2	317	1,420
11/8/2016	Background	9.12	261	316	< 0.05 U1	7.2	307	1,470
2/7/2017	Background	10.0	296	318	< 0.05 U1	7.2	317	1,340
4/4/2017	Background	8.80	293	303	< 0.05 U1	7.3	324	1,350
5/16/2017	Background	10.1	278	298	< 0.05 U1	7.2	316	1,550
7/19/2017	Background	9.13	267	293	< 0.05 U1	7.3	318	1,390
10/10/2017	Detection	8.70	255	287	< 0.05 U1	7.2	327	1,270
12/27/2017	Detection	8.02	259	288	--	7.3	--	1,220
4/11/2018	Assessment	8.00	282	289	< 0.05 U1	7.0	401	1,220
8/22/2018	Assessment	8.00	274	284	0.02 J1	7.3	383	1,520
5/1/2019	Assessment	7.31	287	285	< 0.01 U1	7.8	408	1,580
6/11/2019	Assessment	7.79	279	261	0.03 J1	7.7	404	1,450
10/22/2019	Assessment	7.37	285	260	0.03 J1	7.2	455	1,480
3/17/2020	Assessment	--	--	--	0.03 J1	7.2	--	--
5/5/2020	Assessment	7.36	282	252	0.02 J1	7.5	471	1,460
10/20/2020	Assessment	6.78	242	--	0.03 J1	7.3	--	1,420
1/7/2021	Assessment	--	--	240	--	--	502	--
3/16/2021	Assessment	--	--	--	0.04 J1	7.7	--	--
5/11/2021	Assessment	8.40	281	284	0.04 J1	7.7	599	1,620
10/19/2021	Assessment	8.22 P3, M1	273	265	0.03 J1	7.1	601	1,560 S7
3/15/2022	Assessment	--	--	--	< 0.02 U1	7.3	--	--
5/11/2022	Assessment	3.70	323	185	< 0.05 U1	7.8	927	1,770
10/17/2022	Assessment	6.17	271	253	< 0.05 U1	7.1	983	1,760
3/22/2023	Assessment	--	--	--	0.02 J1	7.1	--	--
5/17/2023	Assessment	3.39	147	150	< 0.05 U1	7.1	538	1,190
10/10/2023	Assessment	4.56	184	198	0.06 J1	7.4	580	1,280

Table 1. Groundwater Data Summary: MW-1505

Mitchell - BAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/14/2016	Background	0.06	1.40	57.7	0.049	0.03	33.2	0.966	0.466	< 0.05 U1	1.02	0.006	0.002 J1	2.94	0.2	0.074
8/1/2016	Background	0.11	3.73	81.0	0.150	0.05	10.4	2.69	1.2271	< 0.05 U1	3.69	0.011	0.013	0.95	0.9	0.093
9/26/2016	Background	< 0.05 U1	0.79	47.2	< 0.02 U1	0.03 J1	0.9	0.404	0.912	< 0.05 U1	0.546	0.008	< 0.002 U1	7.35	0.4 J1	0.464
11/8/2016	Background	0.07	2.14	63.3	0.091	0.03	7.07	1.77	1.26	< 0.05 U1	2.06	0.007	0.006	0.90	0.5	0.093
2/7/2017	Background	0.04 J1	1.16	51.7	0.035	0.03	9.06	0.772	1.236	< 0.05 U1	0.697	0.010	0.002 J1	1.21	0.5	0.102
4/4/2017	Background	0.03 J1	0.41	47.2	< 0.005 U1	0.02	11.0	0.509	0.4842	< 0.05 U1	0.091	0.007	< 0.002 U1	1.54	0.3	0.057
5/16/2017	Background	0.04 J1	0.73	45.5	0.01 J1	0.02	4.93	0.594	0.604	< 0.05 U1	0.224	0.017	< 0.002 U1	0.85	0.4	0.067
7/19/2017	Background	0.04 J1	0.78	45.9	0.02 J1	0.03 J1	2.38	0.628	1.222	< 0.05 U1	0.434	0.012	< 0.002 U1	1.69	0.9	0.08 J1
4/11/2018	Assessment	0.03 J1	0.44	46.0	0.006 J1	0.03	1.16	0.151	0.582	< 0.05 U1	0.116	0.005	< 0.002 U1	0.67	0.7	0.065
8/22/2018	Assessment	0.05 J1	0.38	48.0	0.007 J1	0.03	1.40	0.257	0.576	0.02 J1	0.150	0.008	< 0.002 U1	1.35	0.4	0.070
5/1/2019	Assessment	0.03 J1	0.29	48.7	< 0.02 U1	0.03 J1	0.665	0.199	0.2396	< 0.01 U1	0.07 J1	< 0.009 U1	< 0.002 U1	0.6 J1	0.9	< 0.1 U1
6/11/2019	Assessment	0.03 J1	0.28	49.3	< 0.02 U1	0.03 J1	0.849	0.155	0.526	0.03 J1	0.04 J1	0.01 J1	< 0.002 U1	0.7 J1	0.4	< 0.1 U1
10/22/2019	Assessment	0.03 J1	0.34	49.9	< 0.02 U1	0.03 J1	0.450	0.143	0.759	0.03 J1	< 0.05 U1	0.00534	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
3/17/2020	Assessment	< 0.02 U1	0.31	42.8	< 0.02 U1	0.02 J1	0.624	0.100	0.715	0.03 J1	< 0.05 U1	0.00501	< 0.002 U1	< 0.4 U1	0.06 J1	< 0.1 U1
5/5/2020	Assessment	0.03 J1	0.27	48.4	< 0.02 U1	0.03 J1	0.291	0.096	0.7905	0.02 J1	< 0.05 U1	0.00493	< 0.002 U1	< 0.4 U1	0.06 J1	< 0.1 U1
10/20/2020	Assessment	0.03 J1	0.35	43.0	< 0.02 U1	0.02 J1	0.603	0.151	0.1742	0.03 J1	0.09 J1	0.00501	< 0.002 U1	0.5 J1	0.06 J1	< 0.1 U1
3/16/2021	Assessment	0.03 J1	0.35	48.6	0.01 J1	0.03 J1	0.567	0.211	0.158	0.04 J1	0.1 J1	0.00529	< 0.002 U1	0.3 J1	0.2 J1	0.07 J1
5/11/2021	Assessment	0.03 J1	0.32	48.6	0.008 J1	0.03 J1	0.361	0.218	0.895	0.04 J1	0.1 J1	0.00527	< 0.002 U1	0.6 J1	0.2 J1	0.08 J1
10/19/2021	Assessment	0.03 J1	0.29	38.9	< 0.007 U1	0.025	0.42	0.215	1.98	0.03 J1	0.10 J1	0.00577	< 0.002 U1	0.2 J1	0.09 J1	0.06 J1
3/15/2022	Assessment	0.03 J1	0.38	35.5	0.009 J1	0.022	0.70	0.286	1.27	< 0.02 U1	0.14 J1	0.00664	< 0.002 U1	0.4 J1	2.41	0.07 J1
5/11/2022	Assessment	0.03 J1	0.40	33.5	< 0.007 U1	0.020	0.65	0.245	0.54	< 0.05 U1	0.16 J1	0.00676	< 0.002 U1	0.3 J1	2.76	0.06 J1
10/17/2022	Assessment	0.04 J1	0.57	37.1	0.014 J1	0.017 J1	0.86	0.404	0.90	< 0.05 U1	0.32	0.00705	0.005	0.2 J1	2.82	0.07 J1
3/22/2023	Assessment	0.036 J1	0.43	25.6	0.011 J1	0.013 J1	0.49	0.178	2.22	0.02 J1	0.27	0.0076	0.0052	0.1 J1	1.29	0.05 J1
5/17/2023	Assessment	0.026 J1	0.22	17.8	< 0.007 U1	0.009 J1	0.29 J1	0.074	0.95	< 0.05 U1	0.08 J1	0.00555	0.003 J1	< 0.1 U1	3.76	0.03 J1
10/10/2023	Assessment	0.094 J1	0.31	23.4	< 0.007 U1	0.022	1.08	0.200	0.61	0.06 J1	0.72	0.00583	0.002 J1	< 0.1 U1	2.98	0.04 J1

**Table 1. Groundwater Data Summary: MW-1506
Mitchell - BAP
Appendix III Constituents**

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/14/2016	Background	8.04	275	422	0.07 J1	7.1	315	1,640
8/2/2016	Background	9.72	299	418	0.07 J1	7.0	325	1,600
9/27/2016	Background	6.77	304	428	< 0.05 U1	7.2	323	1,610
11/9/2016	Background	5.50	281	392	< 0.05 U1	7.4	285	1,510
2/8/2017	Background	5.70	289	395	< 0.05 U1	7.3	292	1,350
4/5/2017	Background	5.59	282	389	< 0.05 U1	7.4	301	1,430
5/17/2017	Background	7.11	278	393	< 0.05 U1	7.3	307	1,520
7/19/2017	Background	6.26	277	379	< 0.05 U1	7.3	297	1,480
10/10/2017	Detection	8.03	257	357	< 0.05 U1	7.3	326	1,390
12/27/2017	Detection	6.14	264	383	--	7.3	--	1,280
4/11/2018	Assessment	5.73	275	382	< 0.05 U1	7.1	347	1,300
8/22/2018	Assessment	5.91	270	369	0.05 J1	7.4	349	1,590
5/1/2019	Assessment	5.24	280	331	0.03 J1	7.9	347	1,360
6/11/2019	Assessment	5.27	265	315	0.05 J1	7.8	335	1,370
10/22/2019	Assessment	4.49	293	364	0.04 J1	7.4	354	1,330
3/17/2020	Assessment	--	--	--	0.04 J1	7.3	--	--
5/5/2020	Assessment	4.07	290	379	0.03 J1	7.5	337	1,530
10/20/2020	Assessment	4.59	265	--	0.04 J1	7.4	--	1,490
1/7/2021	Assessment	--	--	259	--	--	404	--
3/16/2021	Assessment	--	--	--	0.06 J1	7.6	--	--
5/11/2021	Assessment	5.81	245	228	0.06	7.6	477	1,330
10/19/2021	Assessment	5.90	282	328	0.04 J1	7.3	399	1,340 S7
3/15/2022	Assessment	--	--	--	0.04 J1	7.4	--	--
5/10/2022	Assessment	3.72	283	195	< 0.05 U1	8.9	703	1,450 S7, L1
10/17/2022	Assessment	5.03 M1, P3	272 M1, P3	227	< 0.05 U1	7.1	909	1,640
3/22/2023	Assessment	--	--	--	0.05 J1	7.3	--	--
5/17/2023	Assessment	6.13	247	157	0.05 J1	7.1	840	1,620
10/10/2023	Assessment	4.22	187	234	0.07 J1	7.3	619	1,360

Table 1. Groundwater Data Summary: MW-1506

Mitchell - BAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/14/2016	Background	0.07	1.65	73.0	0.053	0.04	1.1	1.31	0.488	0.07 J1	1.25	0.006	0.004 J1	0.74	0.2	0.070
8/2/2016	Background	0.05 J1	1.01	70.4	0.026	0.04	0.8	0.799	0.67	0.07 J1	0.601	0.015	0.003 J1	0.68	0.09 J1	0.060
9/27/2016	Background	0.05 J1	1.14	62.0	0.030	0.03	1.0	0.739	1.263	< 0.05 U1	0.744	0.015	0.002 J1	0.55	0.2	0.064
11/9/2016	Background	0.03 J1	0.64	57.4	0.01 J1	0.02 J1	0.959	0.251	2.196	< 0.05 U1	0.272	0.008	< 0.002 U1	0.45	0.07 J1	0.05 J1
2/8/2017	Background	0.03 J1	0.62	52.9	0.008 J1	0.02 J1	4.28	0.305	0.4008	< 0.05 U1	0.217	0.013	< 0.002 U1	1.07	< 0.03 U1	0.066
4/5/2017	Background	0.04 J1	0.81	60.1	0.021	0.02	3.87	0.891	0.438	< 0.05 U1	0.574	0.011	0.002 J1	0.49	0.08 J1	0.04 J1
5/17/2017	Background	0.05 J1	1.26	60.9	0.027	0.03	2.83	0.768	0.226	< 0.05 U1	0.726	0.016	0.002 J1	1.22	0.1	0.05 J1
7/19/2017	Background	0.18	0.80	54.9	0.02 J1	0.02 J1	3.15	0.932	0.889	< 0.05 U1	0.457	0.016	< 0.002 U1	1.14	< 0.06 U1	0.06 J1
4/11/2018	Assessment	0.03 J1	0.73	55.4	0.021	0.02 J1	2.01	0.476	0.592	< 0.05 U1	0.477	0.009	0.002 J1	1.23	0.1	0.05 J1
8/22/2018	Assessment	0.06	0.46	54.6	0.01 J1	0.02	2.47	0.581	1.723	0.05 J1	0.319	0.010	< 0.002 U1	0.50	0.09 J1	0.050
5/1/2019	Assessment	0.03 J1	0.34	53.5	< 0.02 U1	0.02 J1	0.752	0.256	0.1879	0.03 J1	0.135	0.02 J1	< 0.002 U1	2 J1	0.07 J1	< 0.1 U1
6/11/2019	Assessment	0.03 J1	0.42	49.8	< 0.02 U1	0.01 J1	1.11	0.290	1.009	0.05 J1	0.234	< 0.009 U1	< 0.002 U1	0.4 J1	0.04 J1	< 0.1 U1
10/22/2019	Assessment	0.03 J1	0.37	52.7	< 0.02 U1	0.02 J1	0.708	0.167	0.997	0.04 J1	0.1 J1	0.00873	< 0.002 U1	2 J1	0.04 J1	< 0.1 U1
3/17/2020	Assessment	< 0.02 U1	0.44	53.0	< 0.02 U1	0.01 J1	4.24	0.393	< 0.680 U1	0.04 J1	0.213	0.00825	< 0.002 U1	1 J1	0.09 J1	< 0.1 U1
5/5/2020	Assessment	0.02 J1	0.33	52.2	< 0.02 U1	0.01 J1	0.592	0.162	0.478	0.03 J1	0.2 J1	0.00782	< 0.002 U1	0.7 J1	< 0.03 U1	< 0.1 U1
10/20/2020	Assessment	0.02 J1	0.30	47.7	< 0.02 U1	0.02 J1	0.407	0.119	0.5997	0.04 J1	0.1 J1	0.00774	< 0.002 U1	2.05	< 0.03 U1	< 0.1 U1
3/16/2021	Assessment	0.03 J1	0.33	49.9	0.009 J1	0.02 J1	0.680	0.512	0.612	0.06 J1	0.1 J1	0.00783	< 0.002 U1	0.7 J1	< 0.09 U1	< 0.04 U1
5/11/2021	Assessment	0.03 J1	0.38	51.9	0.009 J1	0.02 J1	0.591	0.357	0.4573	0.06	0.2 J1	0.00771	< 0.002 U1	0.7 J1	< 0.09 U1	0.05 J1
10/19/2021	Assessment	0.03 J1	0.27	44.7	< 0.007 U1	0.022	0.55	0.465	1.42	0.04 J1	0.13 J1	0.00735	< 0.002 U1	1	0.10 J1	0.06 J1
3/15/2022	Assessment	0.03 J1	0.34	41.2	0.012 J1	0.014 J1	0.73	0.344	1.22	0.04 J1	0.14 J1	0.00753	< 0.002 U1	1.3	0.13 J1	< 0.04 U1
5/10/2022	Assessment	0.02 J1	0.31	42.5	< 0.007 U1	0.012 J1	0.42	0.183	0.99	< 0.05 U1	0.08 J1	0.00764	< 0.002 U1	0.4 J1	1.51	< 0.04 U1
10/17/2022	Assessment	0.03 J1	0.38	38.3	0.007 J1	0.011 J1	0.39	0.154	0.59	< 0.05 U1	0.19 J1	0.00814	0.004 J1	0.3 J1	2.30	0.04 J1
3/22/2023	Assessment	0.030 J1	0.27	35.3	< 0.007 U1	0.024	0.32	0.133	1.48	0.05 J1	0.30	0.0087	0.0042 J1	0.4 J1	0.45 J1	0.04 J1
5/17/2023	Assessment	0.028 J1	0.22	26.8	< 0.007 U1	0.010 J1	0.40	0.093	0.26	0.05 J1	< 0.05 U1	0.00744	< 0.002 U1	0.2 J1	0.28 J1	0.03 J1
10/10/2023	Assessment	0.031 J1	0.25	23.6	< 0.007 U1	0.011 J1	0.70	0.129	0.50	0.07 J1	0.09 J1	0.00770	< 0.002 U1	0.2 J1	1.53	0.03 J1

Table 1. Groundwater Data Summary: MW-1507

Geosyntec Consultants, Inc.

**Mitchell - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/14/2016	Background	13.2	333	529	0.06 J1	7.0	339	1,070
8/2/2016	Background	12.2	323	497	0.07 J1	7.0	332	1,890
9/27/2016	Background	14.1	355	517	0.06 J1	7.1	345	1,840
11/9/2016	Background	12.1	325	480	0.06 J1	7.1	314	1,840
2/8/2017	Background	11.1	312	401	0.06 J1	7.1	276	1,480
4/5/2017	Background	10.6	324	445	0.05 J1	7.2	306	1,630
5/17/2017	Background	12.1	308	437	0.05 J1	7.2	310	1,680
7/19/2017	Background	11.1	298	447	< 0.05 U1	7.2	308	1,740
10/10/2017	Detection	10.7	289	430	0.06 J1	7.2	316	1,660
12/27/2017	Detection	10.4	284	450	--	7.2	--	1,380
4/11/2018	Assessment	10.4	296	400	0.06 J1	6.9	347	1,390
8/21/2018	Assessment	9.29	272	331	0.07	7.2	323	1,430
5/1/2019	Assessment	8.36	271	296	0.07	8.0	346	1,270
6/11/2019	Assessment	8.41	257	279	0.07	7.8	349	1,340
10/22/2019	Assessment	8.39	273	295	0.08	7.4	369	1,360
3/18/2020	Assessment	--	--	--	0.07	7.2	--	--
5/5/2020	Assessment	7.72	262	310	0.05 J1	7.4	350	1,330
10/21/2020	Assessment	7.12	229	242	0.07	7.4	420	1,300
3/16/2021	Assessment	--	--	--	0.09	7.7	--	--
5/11/2021	Assessment	7.12	252	274	0.08	7.5	387	1,300
10/19/2021	Assessment	7.28	255	262	0.07	7.2	378	1,320
3/15/2022	Assessment	--	--	--	0.04 J1	7.3	--	--
5/10/2022	Assessment	4.08	251	169	0.05 J1	8.3	671	1,500 L1
10/17/2022	Assessment	9.07	360	288	< 0.05 U1	7.0	1,040	1,900
3/22/2023	Assessment	--	--	--	0.03 J1	7.2	--	--
5/16/2023	Assessment	4.65	167	145	0.04 J1	7.2	592	1,250
10/10/2023	Assessment	4.93	166	218	0.09	7.4	571	1,250

Table 1. Groundwater Data Summary: MW-1507

Mitchell - BAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/14/2016	Background	0.05 J1	2.19	84.5	0.142	0.07	3.6	3.18	0.521	0.06 J1	4.07	0.011	0.025	0.25	0.7	0.051
8/2/2016	Background	0.12	4.54	104	0.168	0.07	10.4	4.10	2.09	0.07 J1	4.48	0.019	0.016	2.14	0.5	0.078
9/27/2016	Background	0.10	3.58	92.0	0.134	0.06	14.0	3.06	2.029	0.06 J1	2.96	0.020	0.010	1.80	0.5	0.08 J1
11/9/2016	Background	0.11	4.15	102	0.202	0.07	12.6	4.50	1.784	0.06 J1	3.97	0.016	0.010	12.8	0.5	0.09 J1
2/8/2017	Background	0.08	2.16	73.6	0.089	0.04	6.16	1.77	16.587	0.06 J1	1.86	0.013	0.007	2.31	0.3	0.081
4/5/2017	Background	0.06	1.51	71.3	0.053	0.04	19.4	1.26	0.600	0.05 J1	1.17	0.011	0.006	5.29	0.2	0.053
5/17/2017	Background	0.11	1.30	63.6	0.031	0.04	12.6	0.990	0.767	0.05 J1	0.799	0.024	0.003 J1	4.54	0.2	0.04 J1
7/19/2017	Background	0.06 J1	1.29	62.0	0.044	0.04	12.1	2.37	1.215	< 0.05 U1	0.999	0.018	0.004 J1	4.37	0.1 J1	0.06 J1
4/11/2018	Assessment	0.07	1.67	71.2	0.062	0.04	21.3	1.45	0.701	0.06 J1	1.56	0.012	0.006	2.73	0.3	0.059
8/21/2018	Assessment	0.08	0.47	62.1	0.01 J1	0.03	2.00	0.426	1.419	0.07	0.308	0.010	0.002 J1	0.87	0.08 J1	0.05 J1
5/1/2019	Assessment	0.03 J1	0.43	53.9	< 0.02 U1	0.03 J1	2.35	0.331	0.496	0.07	0.239	< 0.009 U1	< 0.002 U1	1 J1	0.07 J1	< 0.1 U1
6/11/2019	Assessment	0.03 J1	0.24	52.2	< 0.02 U1	0.03 J1	0.315	0.160	1.454	0.07	< 0.02 U1	0.01 J1	0.003 J1	0.4 J1	0.04 J1	< 0.1 U1
10/22/2019	Assessment	0.03 J1	0.45	54.8	< 0.02 U1	0.03 J1	1.51	0.343	0.952	0.08	0.239	0.00814	0.003 J1	< 0.4 U1	0.08 J1	< 0.1 U1
3/18/2020	Assessment	< 0.02 U1	0.44	53.0	< 0.02 U1	0.03 J1	2.69	0.342	0.381	0.07	0.217	0.00794	< 0.002 U1	0.8 J1	0.06 J1	< 0.1 U1
5/5/2020	Assessment	0.03 J1	0.42	53.1	< 0.02 U1	0.03 J1	1.30	0.345	0.836	0.05 J1	0.208	0.00757	< 0.002 U1	0.7 J1	0.08 J1	< 0.1 U1
10/21/2020	Assessment	0.03 J1	0.41	48.3	< 0.02 U1	0.04 J1	0.857	0.347	0.0979	0.07	0.201	0.00799	< 0.002 U1	0.7 J1	0.05 J1	< 0.1 U1
3/16/2021	Assessment	0.03 J1	0.44	53.5	0.02 J1	0.02 J1	1.91	0.384	0.5512	0.09	0.232	0.00710	< 0.002 U1	1 J1	< 0.09 U1	< 0.04 U1
5/11/2021	Assessment	0.03 J1	0.42	54.4	0.01 J1	0.03 J1	1.71	0.360	0.506	0.08	0.225	0.00739	< 0.002 U1	0.9 J1	< 0.09 U1	0.04 J1
10/19/2021	Assessment	0.04 J1	0.37	45.5	0.009 J1	0.035	2.31	0.845	1.24	0.07	0.23	0.00784	< 0.002 U1	0.7	< 0.09 U1	< 0.04 U1
3/15/2022	Assessment	0.03 J1	0.31	44.0	0.011 J1	0.026	1.49	0.357	1.19	0.04 J1	0.10 J1	0.00842	< 0.002 U1	0.8	< 0.09 U1	0.04 J1
5/10/2022	Assessment	0.03 J1	0.49	45.0	0.012 J1	0.022	1.48	0.330	1.31	0.05 J1	0.24	0.00831	< 0.002 U1	0.8	4.44	< 0.04 U1
10/17/2022	Assessment	0.03 J1	0.32	45.1	< 0.007 U1	0.034	0.75	0.102	1.15	< 0.05 U1	< 0.05 U1	0.00889	0.004 J1	0.4 J1	0.28 J1	0.07 J1
3/22/2023	Assessment	0.028 J1	0.24	25.2	< 0.007 U1	0.015 J1	0.79	0.051	0.73	0.03 J1	< 0.05 U1	0.0092	0.0036 J1	0.8	0.79	0.04 J1
5/16/2023	Assessment	0.026 J1	0.19	19.8	< 0.007 U1	0.011 J1	0.94	0.050	0.85	0.04 J1	< 0.05 U1	0.00773	< 0.002 U1	0.3 J1	0.71	0.03 J1
10/10/2023	Assessment	0.027 J1	0.20	22.6	< 0.007 U1	0.015 J1	1.21	0.105	0.57	0.09	0.06 J1	0.00608	< 0.002 U1	1.8	0.57	0.03 J1

**Table 1. Groundwater Data Summary: MW-1508
Mitchell - BAP
Appendix III Constituents**

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/14/2016	Background	0.509	204	211	0.1 J1	6.9	291	1,060
8/1/2016	Background	0.690	218	237	0.1 J1	7.0	302	1,100
9/26/2016	Background	1.03	215	238	0.1 J1	7.0	304	1,110
11/8/2016	Background	1.36	234	227	0.08 J1	7.2	304	1,140
2/8/2017	Background	1.04	236	220	0.08 J1	7.1	301	1,070
4/5/2017	Background	0.780	228	215	0.08 J1	7.2	311	1,070
5/16/2017	Background	0.846	218	208	0.07 J1	7.1	296	1,130
7/18/2017	Background	1.00	224	214	0.06 J1	7.1	305	1,110
10/9/2017	Detection	0.881	207	212	0.08 J1	7.1	322	1,200
4/11/2018	Assessment	0.806	229	200	0.08	6.9	302	1,050
8/21/2018	Assessment	0.952	219	204	0.08	7.2	313	1,080
5/1/2019	Assessment	0.622	221	178	0.08	8.2	287	978
6/12/2019	Assessment	0.679	209	163	0.08	7.1	285	988
10/22/2019	Assessment	0.860	212	168	0.09	7.3	309	991
3/18/2020	Assessment	--	--	--	0.08	7.2	--	--
5/6/2020	Assessment	0.486	198	148	0.06	7.2	273	947
10/20/2020	Assessment	0.962	201	--	0.08	7.1	--	982
1/7/2021	Assessment	--	--	161	--	--	286	--
3/17/2021	Assessment	--	--	--	0.09	7.5	--	--
5/12/2021	Assessment	0.454	205	156	0.09	7.6	281	974
10/20/2021	Assessment	0.439	195	157	0.09	7.4	283	940
3/15/2022	Assessment	--	--	--	0.09	7.0	--	--
5/11/2022	Assessment	0.215	245	147	0.06 J1	7.6	335	980
10/17/2022	Assessment	4.06	248	191	0.06 J1	7.0	734	1,360
3/21/2023	Assessment	--	--	--	0.08	7.0	--	--
5/16/2023	Assessment	5.11	265	173	0.08	6.8	859	1,670
10/11/2023	Assessment	5.21	214	174	0.1	7.1	691	1,380 S7

Table 1. Groundwater Data Summary: MW-1508

Mitchell - BAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/14/2016	Background	0.04 J1	1.05	48.7	0.038	0.09	0.8	3.21	0.763	0.1 J1	1.61	0.009	0.003 J1	0.93	0.5	0.04 J1
8/1/2016	Background	0.04 J1	1.07	51.7	0.037	0.07	1.2	2.22	0.0803	0.1 J1	1.34	< 0.0002 U1	0.008	0.74	0.7	0.03 J1
9/26/2016	Background	0.06 J1	1.65	50.2	0.06 J1	0.07 J1	2.3	2.34	0.596	0.1 J1	1.69	0.007	0.003 J1	1.17	0.8	< 0.05 U1
11/8/2016	Background	0.05 J1	1.32	53.9	0.058	0.05	1.70	2.17	2.782	0.08 J1	2.06	0.003	0.002 J1	0.63	0.7	0.03 J1
2/8/2017	Background	0.04 J1	0.97	46.1	0.042	0.04	1.34	1.40	12.465	0.08 J1	1.32	0.009	0.003 J1	0.53	0.7	0.04 J1
4/5/2017	Background	0.04 J1	1.09	49.9	0.049	0.04	1.74	1.66	0.394	0.08 J1	1.71	0.008	0.004 J1	0.35	0.9	0.03 J1
5/16/2017	Background	0.04 J1	1.21	47.0	0.041	0.03	1.32	1.12	0.931	0.07 J1	1.13	0.014	< 0.002 U1	0.46	0.9	0.04 J1
7/18/2017	Background	0.04 J1	1.11	45.1	0.040	0.04	1.33	1.27	0.597	0.06 J1	1.20	0.012	< 0.002 U1	0.68	0.6	0.04 J1
4/11/2018	Assessment	0.04 J1	1.04	46.4	0.040	0.04	1.40	1.03	0.236	0.08	1.11	0.008	< 0.004 U1	0.45	0.7	0.05 J1
8/21/2018	Assessment	0.06	0.44	40.1	0.01 J1	0.04	0.691	0.678	0.3152	0.08	0.384	0.007	< 0.002 U1	0.25	0.4	0.03 J1
5/1/2019	Assessment	0.03 J1	0.60	37.4	0.02 J1	0.03 J1	0.735	0.637	0.636	0.08	0.540	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
6/12/2019	Assessment	< 0.02 U1	0.41	35.2	< 0.02 U1	0.03 J1	0.590	0.419	0.295	0.08	0.336	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
10/22/2019	Assessment	0.05 J1	0.35	34.8	< 0.02 U1	0.03 J1	1.20	0.521	1.491	0.09	0.2 J1	0.00485	< 0.002 U1	0.6 J1	0.3	< 0.1 U1
3/18/2020	Assessment	< 0.02 U1	0.52	36.2	< 0.02 U1	0.03 J1	0.820	0.481	0.636	0.08	0.298	0.00484	< 0.002 U1	0.8 J1	0.1 J1	< 0.1 U1
5/6/2020	Assessment	< 0.02 U1	0.44	35.4	< 0.02 U1	0.03 J1	0.654	0.413	0.5934	0.06	0.311	0.00483	< 0.002 U1	0.7 J1	0.1 J1	< 0.1 U1
10/20/2020	Assessment	< 0.02 U1	0.29	31.4	< 0.02 U1	0.02 J1	0.336	0.114	0.01901	0.08	0.05 J1	0.00416	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
3/17/2021	Assessment	< 0.02 U1	0.36	34.0	0.01 J1	0.04 J1	0.661	0.242	0.3413	0.09	0.233	0.00475	< 0.002 U1	0.4 J1	0.2 J1	< 0.04 U1
5/12/2021	Assessment	< 0.02 U1	0.39	36.4	< 0.007 U1	0.04 J1	0.511	0.261	1.083	0.09	0.217	0.00458	< 0.002 U1	1 J1	0.2 J1	< 0.04 U1
10/20/2021	Assessment	< 0.02 U1	0.30	29.6	< 0.007 U1	0.037	0.53	0.244	0.17	0.09	0.14 J1	0.00423	< 0.002 U1	0.4 J1	0.15 J1	< 0.04 U1
3/15/2022	Assessment	< 0.02 U1	0.30	28.7	< 0.007 U1	0.038	0.31	0.219	0.70	0.09	< 0.05 U1	0.00421	< 0.002 U1	0.3 J1	0.1 J1	< 0.04 U1
5/11/2022	Assessment	< 0.02 U1	0.28	30.7	< 0.007 U1	0.026	0.31	0.162	0.85	0.06 J1	< 0.05 U1	0.00432	< 0.002 U1	0.3 J1	0.83	< 0.04 U1
10/17/2022	Assessment	< 0.02 U1	0.28	28.6	< 0.007 U1	0.022	0.59	0.147	0.86	0.06 J1	0.06 J1	0.00473	< 0.002 U1	0.2 J1	3.34	< 0.04 U1
3/21/2023	Assessment	< 0.02 U1	0.24	23.1	< 0.007 U1	0.036	0.38	0.409	0.55	0.08	0.07 J1	0.00506	0.0016 J1	0.2 J1	2.9	< 0.04 U1
5/16/2023	Assessment	0.017 J1	0.32	21.5	< 0.007 U1	0.030	0.58	0.634	0.61	0.08	0.11 J1	0.00445	< 0.002 U1	0.4 J1	2.70	< 0.02 U1
10/11/2023	Assessment	0.018 J1	0.29	20.2	< 0.007 U1	0.022	0.65	0.372	0.37	0.1	0.15 J1	0.00470	< 0.002 U1	0.3 J1	0.47 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1509
Mitchell - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/14/2016	Background	12.4	280	435	0.16	7.0	380	1,730
8/9/2016	Background	11.6	292	401	0.16	7.1	388	1,670
9/27/2016	Background	10.6	292	371	0.1 J1	7.1	418	1,540
11/8/2016	Background	8.29	258	333	0.1 J1	7.1	400	1,410
2/7/2017	Background	7.65	280	360	0.15	7.1	416	1,450
4/5/2017	Background	6.22	290	358	0.1 J1	7.2	416	1,560
5/17/2017	Background	7.36	284	354	0.1 J1	7.2	420	1,520
7/19/2017	Background	6.54	279	346	0.1 J1	7.2	418	1,560
10/10/2017	Detection	6.70	277	345	0.1 J1	7.2	432	1,490
12/27/2017	Detection	6.31	271	315	--	7.1	--	1,360
4/11/2018	Assessment	6.81	272	324	0.15	6.9	488	1,390
8/21/2018	Assessment	6.97	279	323	0.14	7.2	465	1,540
5/1/2019	Assessment	8.73	287	328	0.13	8.5	429	1,480
6/11/2019	Assessment	8.37	273	311	0.13	7.8	432	1,410
10/22/2019	Assessment	8.02	273	297	0.15	7.3	468	1,420
3/18/2020	Assessment	--	--	--	0.13	7.3	--	--
5/5/2020	Assessment	10.6	262	331	0.10	7.4	402	1,390
10/21/2020	Assessment	7.97	237	291	0.14	7.3	463	1,360
3/16/2021	Assessment	--	--	--	0.16	7.9	--	--
5/11/2021	Assessment	7.29	239	230	0.15	7.6	447	1,310
10/19/2021	Assessment	7.37	234	238	0.15	7.2	413	1,260
3/15/2022	Assessment	--	--	--	0.09	7.3	--	--
5/10/2022	Assessment	8.95	240	267	0.09 J1	8.4	456	1,270 S7, L1
10/17/2022	Assessment	6.99	279	251	0.06 J1	7.2	918	1,730
3/21/2023	Assessment	--	--	--	0.09	7.3	--	--
5/16/2023	Assessment	5.55	171	177	0.1 J1	7.0	776	1,550
10/10/2023	Assessment	4.90	203	220	0.12 J1	7.3	677	1,340

Table 1. Groundwater Data Summary: MW-1509

Mitchell - BAP
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/14/2016	Background	0.03 J1	0.55	64.4	0.008 J1	0.03	2.5	0.514	0.816	0.16	0.102	0.0009 J1	< 0.002 U1	1.43	0.1	0.03 J1
8/9/2016	Background	0.03 J1	0.62	64.4	0.01 J1	0.02	0.5	0.484	0.45569	0.16	0.251	0.015	< 0.002 U1	1.00	0.1	0.03 J1
9/27/2016	Background	0.03 J1	0.39	61.0	< 0.005 U1	0.02	4.6	0.424	2.664	0.1 J1	0.024	0.018	< 0.002 U1	1.07	0.2	0.04 J1
11/8/2016	Background	0.03 J1	0.40	62.0	< 0.005 U1	0.02	0.627	0.253	0.413	0.1 J1	0.006 J1	0.012	< 0.002 U1	0.59	0.1	0.05 J1
2/7/2017	Background	0.03 J1	0.50	56.7	< 0.005 U1	0.02	0.650	0.130	1.399	0.15	0.056	0.011	< 0.002 U1	0.66	0.09 J1	0.04 J1
4/5/2017	Background	0.02 J1	0.33	63.5	< 0.005 U1	0.02 J1	1.15	0.189	0.304	0.1 J1	0.01 J1	0.012	< 0.002 U1	0.48	0.2	0.03 J1
5/17/2017	Background	0.02 J1	0.56	61.5	< 0.004 U1	0.01 J1	1.05	0.255	1.673	0.1 J1	0.02 J1	0.022	0.002 J1	0.56	0.2	0.03 J1
7/19/2017	Background	0.03 J1	0.65	58.5	0.01 J1	0.01 J1	0.857	0.344	1.134	0.1 J1	0.220	0.017	< 0.002 U1	0.80	0.2 J1	0.04 J1
4/11/2018	Assessment	0.03 J1	0.42	52.8	0.005 J1	0.01 J1	0.657	0.215	0.792	0.15	0.062	0.009	0.002 J1	0.34	0.2	0.057
8/21/2018	Assessment	0.09	0.33	53.8	< 0.004 U1	0.008 J1	0.777	0.132	0.736	0.14	0.035	0.012	< 0.002 U1	0.32	0.3	0.03 J1
5/1/2019	Assessment	0.03 J1	0.33	47.2	< 0.02 U1	0.01 J1	2.28	0.324	0.4075	0.13	0.114	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
6/11/2019	Assessment	0.03 J1	0.28	48.6	< 0.02 U1	0.02 J1	1.47	0.097	0.559	0.13	0.05 J1	0.02 J1	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
10/22/2019	Assessment	0.03 J1	0.37	47.2	< 0.02 U1	0.01 J1	1.22	0.164	1.441	0.15	0.08 J1	0.00911	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
3/18/2020	Assessment	< 0.02 U1	0.42	45.8	< 0.02 U1	< 0.01 U1	0.518	0.144	0.5514	0.13	0.2 J1	0.00934	< 0.002 U1	< 0.4 U1	0.07 J1	< 0.1 U1
5/5/2020	Assessment	0.03 J1	0.27	43.7	< 0.02 U1	< 0.01 U1	0.633	0.092	1.2019	0.10	0.05 J1	0.00897	< 0.002 U1	0.6 J1	0.1 J1	< 0.1 U1
10/21/2020	Assessment	0.03 J1	0.35	45.9	< 0.02 U1	< 0.01 U1	0.698	0.115	1.6015	0.14	0.09 J1	0.00809	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
3/16/2021	Assessment	0.03 J1	0.30	43.8	0.01 J1	0.009 J1	0.552	0.099	0.33	0.16	0.1 J1	0.00749	< 0.002 U1	0.3 J1	0.6	< 0.04 U1
5/11/2021	Assessment	0.03 J1	0.37	45.0	0.009 J1	0.01 J1	0.492	0.143	0.56	0.15	0.2 J1	0.00732	< 0.002 U1	0.3 J1	0.7	< 0.04 U1
10/19/2021	Assessment	0.03 J1	0.33	37.3	< 0.007 U1	0.012 J1	0.61	0.261	1.32	0.15	0.20	0.00763	0.002 J1	0.3 J1	0.24 J1	< 0.04 U1
3/15/2022	Assessment	0.03 J1	0.45	43.3	0.021 J1	0.014 J1	0.70	0.422	1.48	0.09	0.24	0.0101	0.002 J1	0.6	< 0.09 U1	< 0.04 U1
5/10/2022	Assessment	0.02 J1	0.31	36.7	< 0.007 U1	0.009 J1	0.34	0.129	0.47	0.09 J1	0.09 J1	0.00952	< 0.002 U1	2.2	1.03	< 0.04 U1
10/17/2022	Assessment	0.03 J1	0.54	44.3	0.014 J1	0.011 J1	0.52	0.279	0.54	0.06 J1	0.29	0.00987	0.006	0.2 J1	1.10	< 0.04 U1
3/21/2023	Assessment	0.03 J1	0.25	28.2	< 0.007 U1	0.009 J1	0.64	0.164	1.10	0.09	0.05 J1	0.0118	0.003 J1	0.4 J1	0.22 J1	< 0.04 U1
5/16/2023	Assessment	0.026 J1	0.37	24.8	0.010 J1	0.010 J1	0.45	0.286	0.59	0.1 J1	0.22	0.00871	< 0.002 U1	0.3 J1	0.17 J1	0.05 J1
10/10/2023	Assessment	0.033 J1	0.27	24.2	< 0.007 U1	0.01 J1	0.90	0.217	0.75	0.12 J1	0.22	0.00914	< 0.002 U1	0.3 J1	0.07 J1	0.02 J1

**Table 1. Groundwater Data Summary: MW-1510
Mitchell - BAP
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/14/2016	Background	9.36	283	334	0.06 J1	7.0	358	1,520
8/2/2016	Background	9.18	294	333	0.06 J1	7.0	356	1,410
9/27/2016	Background	10.1	296	338	0.05 J1	7.1	367	1,410
11/9/2016	Background	9.22	280	325	< 0.05 U1	7.1	332	1,420
2/8/2017	Background	10.4	281	314	0.06 J1	7.2	325	1,270
4/5/2017	Background	9.23	261	303	0.06 J1	7.3	313	1,330
5/17/2017	Background	10.8	249	306	0.05 J1	7.2	307	1,340
7/18/2017	Background	9.86	255	311	< 0.05 U1	7.2	309	1,410
10/9/2017	Detection	8.70	249	327	0.05 J1	7.2	356	1,520
12/27/2017	Detection	8.83	261	339	--	7.2	--	1,300
4/12/2018	Assessment	10.4	292	322	< 0.05 U1	7.0	398	1,290
8/21/2018	Assessment	9.13	268	334	0.09	7.3	428	1,550
5/1/2019	Assessment	8.83	287	325	0.10	8.1	467	1,460
6/12/2019	Assessment	8.50	266	293	0.10	6.9	469	1,430
10/22/2019	Assessment	9.30	259	283	0.11	7.2	483	1,360
3/18/2020	Assessment	--	--	--	0.11	7.4	--	--
5/6/2020	Assessment	9.14	228	252	0.10	7.4	484	1,440
10/20/2020	Assessment	8.38	197	--	0.11	7.4	--	1,280
1/7/2021	Assessment	--	--	229	--	--	441	--
3/17/2021	Assessment	--	--	--	0.13	7.6	--	--
5/12/2021	Assessment	7.52	180	226	0.13	7.4	405	1,220
10/20/2021	Assessment	7.70	186	215	0.13	7.3	409	1,250
3/15/2022	Assessment	--	--	--	0.13	7.3	--	--
5/11/2022	Assessment	5.04	163	175	0.1 J1	7.7	354	1,010
10/17/2022	Assessment	6.50	195	165	0.09 J1	7.2	612	1,450
3/21/2023	Assessment	--	--	--	0.08 J1	7.3	--	--
5/16/2023	Assessment	4.00	222	258	0.09 J1	7.1	859	1,810
10/11/2023	Assessment	6.65	142	117	0.12 J1	7.3	549	1,150

Table 1. Groundwater Data Summary: MW-1510

Mitchell - BAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/14/2016	Background	0.03 J1	0.72	50.8	0.02 J1	0.01 J1	0.6	0.257	0.331	0.06 J1	0.282	0.003	< 0.002 U1	0.65	0.2	0.057
8/2/2016	Background	0.03 J1	0.62	49.0	0.02 J1	0.009 J1	0.7	0.256	1.383	0.06 J1	0.269	0.016	< 0.002 U1	0.92	0.2	0.02 J1
9/27/2016	Background	0.03 J1	0.70	48.7	0.02 J1	0.009 J1	0.8	0.329	0.865	0.05 J1	0.333	0.014	< 0.002 U1	0.45	0.2	0.04 J1
11/9/2016	Background	0.02 J1	0.58	44.6	0.02 J1	0.01 J1	0.655	0.230	0.88	< 0.05 U1	0.261	0.009	< 0.002 U1	0.33	0.1	0.03 J1
2/8/2017	Background	0.02 J1	0.47	39.5	< 0.005 U1	0.005 J1	0.521	0.073	6.828	0.06 J1	0.066	0.013	< 0.002 U1	0.42	0.08 J1	0.02 J1
4/5/2017	Background	0.02 J1	0.36	41.4	< 0.005 U1	0.006 J1	2.34	0.175	1.12829	0.06 J1	0.094	0.011	< 0.002 U1	0.27	0.07 J1	< 0.01 U1
5/17/2017	Background	0.02 J1	0.53	40.2	< 0.004 U1	0.005 J1	1.40	0.138	0.176	0.05 J1	0.049	0.015	< 0.002 U1	0.28	0.1	0.01 J1
7/18/2017	Background	0.02 J1	0.51	41.0	0.007 J1	0.008 J1	6.41	0.234	0.97	< 0.05 U1	0.125	0.014	< 0.002 U1	0.85	0.1	0.01 J1
4/12/2018	Assessment	0.03 J1	0.42	43.3	0.01 J1	0.005 J1	27.4	0.217	0.094	< 0.05 U1	0.119	0.006	0.002 J1	3.30	0.1	0.02 J1
8/21/2018	Assessment	0.03 J1	0.37	42.6	0.008 J1	0.006 J1	5.64	0.383	1.237	0.09	0.133	0.011	< 0.002 U1	0.43	0.1	0.01 J1
5/1/2019	Assessment	0.02 J1	0.29	41.7	< 0.02 U1	< 0.01 U1	1.75	0.172	0.5725	0.10	0.105	0.01 J1	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
6/12/2019	Assessment	0.02 J1	0.27	41.3	< 0.02 U1	< 0.01 U1	0.697	0.105	0.4098	0.10	0.07 J1	0.02 J1	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
10/22/2019	Assessment	0.02 J1	0.33	38.7	< 0.02 U1	< 0.01 U1	1.12	0.154	0.333	0.11	0.07 J1	0.00862	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
3/18/2020	Assessment	< 0.02 U1	0.31	38.0	< 0.02 U1	< 0.01 U1	2.10	0.121	0.864	0.11	0.08 J1	0.00808	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
5/6/2020	Assessment	< 0.02 U1	0.29	36.7	< 0.02 U1	< 0.01 U1	0.886	0.109	0.7374	0.10	0.07 J1	0.00750	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
10/20/2020	Assessment	0.02 J1	0.27	32.6	< 0.02 U1	< 0.01 U1	0.688	0.091	0.3002	0.11	0.06 J1	0.00675	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
3/17/2021	Assessment	0.02 J1	0.25	30.6	0.01 J1	0.004 J1	1.04	0.098	0.5272	0.13	0.08 J1	0.00720	< 0.002 U1	0.2 J1	0.3	< 0.04 U1
5/12/2021	Assessment	0.02 J1	0.34	33.4	0.01 J1	0.005 J1	3.16	0.339	1.024	0.13	0.2 J1	0.00689	< 0.002 U1	0.5 J1	0.3 J1	< 0.04 U1
10/20/2021	Assessment	0.02 J1	0.26	29.7	< 0.007 U1	0.005 J1	0.57	0.128	0.62	0.13	0.11 J1	0.00701	< 0.002 U1	0.5	0.23 J1	< 0.04 U1
3/15/2022	Assessment	0.02 J1	0.29	26.5	0.015 J1	0.006 J1	0.73	0.127	0.60	0.13	0.12 J1	0.00687	0.003 J1	0.2 J1	0.59	< 0.04 U1
5/11/2022	Assessment	0.02 J1	0.27	25.8	< 0.007 U1	0.004 J1	0.54	0.119	0.43	0.1 J1	0.08 J1	0.00616	0.002 J1	0.2 J1	0.60	< 0.04 U1
10/17/2022	Assessment	0.03 J1	0.35	37.6	< 0.007 U1	0.005 J1	0.93	0.275	0.50	0.09 J1	0.12 J1	0.00760	0.019	0.3 J1	7.10	< 0.04 U1
3/21/2023	Assessment	0.02 J1	0.22	32.9	< 0.007 U1	0.007 J1	0.40	0.131	1.32	0.08 J1	0.52	0.00818	0.0134	0.2 J1	3.68	< 0.04 U1
5/16/2023	Assessment	0.019 J1	0.26	31.8	< 0.007 U1	0.007 J1	0.39	0.168	0.22	0.09 J1	0.06 J1	0.00774	0.014	0.2 J1	2.13	< 0.02 U1
10/11/2023	Assessment	0.025 J1	0.32	23.3	< 0.007 U1	0.006 J1	0.72	0.226	0.45	0.12 J1	0.13 J1	0.00728	0.008	0.3 J1	2.16	< 0.02 U1

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

Geosyntec Consultants, Inc.

Notes:

--: Not analyzed

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

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

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

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

pCi/L: picocuries per liter

S7: Sample did not achieve constant weight.

SU: standard unit

µg/L: micrograms per liter

**Table 1: Residence Time Calculation Summary
Mitchell Bottom Ash Ponds**

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2023-03		2023-05		2023-10	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Bottom Ash Pond	MW-1504 ^[1]	2.0	115.2	0.5	97.7	0.6	19.3	3.1
	MW-1505 ^[2]	2.0	111.1	0.5	73.5	0.8	47.9	1.3
	MW-1506 ^[2]	2.0	101.0	0.6	74.7	0.8	47.8	1.3
	MW-1507 ^[2]	2.0	53.5	1.1	34.7	1.8	23.4	2.6
	MW-1508 ^[3]	2.0	75.6	0.8	76.2	0.8	27.7	2.2
	MW-1509 ^[2]	2.0	62.4	1.0	73.8	0.8	36.8	1.7
	MW-1510 ^[1]	2.0	72.4	0.8	77.6	0.8	53.0	1.1

Notes:

- [1] - Sidegradient Well
- [2] - Downgradient Well
- [3] - Upgradient Well

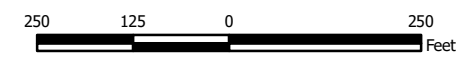


Monitoring Well Network

- ◆ Compliance Sampling Location
- ◆ Upgradient Sampling Location
- Bottom Ash Pond

Notes

- Monitoring well coordinates provided by AEP.
- Site features based on information available in the Groundwater Monitoring Network Evaluation (CEC, 2016) provided by AEP.



**Site Layout
Bottom Ash Pond**

Mitchell Power Generation Plant - Bottom Ash Pond
Marshall County, West Virginia

Geosyntec
consultants

Columbus, Ohio

2018/01/26

Figure

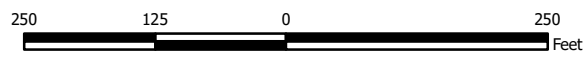
1



- Legend**
- ⊕ Groundwater Monitoring Well
 - Groundwater Elevation Contour
 - ➔ Groundwater Flow Direction

Notes

- Monitoring well coordinates and water level data (collected on March 21, 2023) provided by AEP.
- Approximate Ohio River elevation was 603.12 feet at Mitchell Power Plant on March 21, 2023. Data Source: USGS Ohio River gauge at Hannibal Lock and Dan (Lower), OH.
- Site features based on information available in the Groundwater Monitoring Network Evaluation (CEC, 2016) provided by AEP.
- Groundwater and river elevation units are feet above mean sea level (NAVD 88).

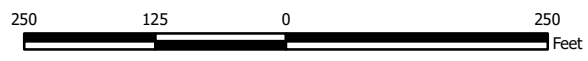


Potentiometric Surface Map - Uppermost Aquifer March 2023	
Mitchell Power Generation Plant - Bottom Ash Pond Marshall County, West Virginia	
Geosyntec consultants	
Columbus, Ohio	2023/10/17
Figure 2	



- Legend**
- Groundwater Monitoring Well
 - Groundwater Elevation Contour
 - Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on May 16, 2023) provided by AEP.
 2. Approximate Ohio River elevation was 602.19 feet at Mitchell Power Plant on May 16, 2023. Data Source: USGS Ohio River gauge at Hannibal Lock and Dan (Lower), OH.
 3. Site features based on information available in the Groundwater Monitoring Network Evaluation (CEC 2016) provided by AEP.
 4. Groundwater and river elevation units are feet above mean sea level (NAVD 88).

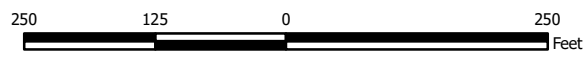


Potentiometric Surface Map - Uppermost Aquifer May 2023	
Mitchell Power Generation Plant - Bottom Ash Pond Marshall County, West Virginia	
Columbus, Ohio	2023/10/24
Figure 3	



- Legend**
- Groundwater Monitoring Well
 - Groundwater Elevation Contour
 - Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on October 10, 2023) provided by AEP.
 2. Approximate Ohio River elevation was 601.86 feet at Mitchell Power Plant on October 10, 2023. Data Source: USGS Ohio River gauge at Hannibal Lock and Dan (Lower), OH.
 3. Site features based on information available in the Groundwater Monitoring Network Evaluation (CEC 2016) provided by AEP.
 4. Groundwater and river elevation units are feet above mean sea level (NAVD 88).



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

Mitchell Power Generation Plant - Bottom Ash Pond
Marshall County, West Virginia



Columbus, Ohio 2023/10/27

Figure
4

APPENDIX 2 - Statistical Analyses

The February and August 2023 statistical analysis summaries follow. A memorandum that explains the reissuance of select analytical laboratory reports to correct laboratory equipment data quality assurance/quality control issues also follows.

STATISTICAL ANALYSIS SUMMARY
BOTTOM ASH POND
Mitchell Plant
Moundsville, West Virginia

Submitted to



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Columbus, Ohio 43215-2372

Submitted by



engineers | scientists | innovators

500 W. Wilson Bridge Road
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February 6, 2023

CHA8500B

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LIST OF ATTACHMENTS

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

LIST OF ACRONYMS AND ABBREVIATIONS

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

SECTION 1

EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257.90-257.98, "CCR rule"), groundwater monitoring has been conducted at the Bottom Ash Pond (BAP), an existing CCR unit at the Mitchell Power Plant located in Moundsville, West Virginia. Recent groundwater monitoring results were compared to the site-specific groundwater protection standards (GWPSs) to identify potential exceedances.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, calcium, chloride, and total dissolved solids (TDS) at the BAP. An alternative source was not identified following the detection monitoring events; thus, the BAP has been in assessment monitoring since 2018. During 2022, an annual sampling event for Appendix IV parameters required by 257.95(b) was completed in March, and semiannual sampling events for both Appendix III parameters and Appendix IV parameters, as required by 257.95(d)(1), were completed in May and October. Statistical analysis of the March and May 2022 events did not show statistically significant levels (SSLs) above GWPSs, but also did not show a return to background levels; thus, the CCR unit remained in assessment monitoring (Geosyntec, 2022a). This report summarizes the statistical analysis results of the October 2022 semiannual assessment monitoring event.

Prior to conducting the statistical analyses, 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 were identified which would impact the usability of the data.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. GWPSs were re-established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether any were present at concentrations above corresponding GWPSs. No SSLs were identified for the Mitchell BAP; however, concentrations of Appendix III parameters remained above background. Thus, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

SECTION 2

BOTTOM ASH POND EVALUATION

2.1 Data Validation & QA/QC

During the October 2022 assessment monitoring event, one set of samples was collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(d)(1). Samples from the October 2022 sample event were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during this assessment monitoring event may be found in Table 1.

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

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.36 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Statistical analyses for the BAP were conducted in accordance with the 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 October 2022 were screened for potential outliers; however, no outliers were identified in the data (Attachment B).

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 the maximum contaminant level (MCL) or risk-based level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events. GWPSs were previously established in January 2022 (Geosyntec, 2022b); this evaluation

incorporated data from the March 2022, May 2022, and October 2022 assessment monitoring events.

Tolerance limits were calculated parametrically with 95% coverage and 95% confidence for barium, chromium, cobalt, combined radium, and lead. Non-parametric tolerance limits were calculated for antimony, arsenic, cadmium, fluoride, lithium, molybdenum, and selenium due to apparent non-normal distributions and for beryllium, mercury, and thallium due to a high non-detect frequency. Upper tolerance limits and the final GWPSs are summarized in Table 2.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, non-parametric confidence limits were calculated in some cases (e.g., when the data were not normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B. The calculated confidence limits were compared to the GWPSs provided in Table 2.

No SSLs were identified at the Mitchell BAP.

2.2.3 Establishment of Appendix III Prediction Limits

Upper prediction limits (UPLs) were previously established for all Appendix III parameters following the background monitoring period (Geosyntec, 2018). Intrawell tests were used to evaluate potential SSIs for fluoride and sulfate, whereas interwell tests were used to evaluate potential SSIs for boron, calcium, chloride, pH, and TDS. Interwell and intrawell prediction limits are updated periodically during the assessment monitoring period as sufficient data became available. Insufficient data was available to update the intrawell prediction limits during this statistical evaluation. However, the interwell prediction limits for boron, calcium, chloride, pH, and TDS were updated using data through October 2022. Additionally, the intrawell prediction limit for fluoride at MW-1505 decreased from 0.2 mg/L to 0.06 mg/L due to a reporting limit change.

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

Interwell UPLs were updated for boron, calcium, chloride, pH, and TDS and lower prediction limits (LPLs) were also updated for pH using historical data through October 2022. The updated interwell prediction limits and the previously calculated intrawell prediction limits for fluoride and sulfate are summarized in Table 3. The prediction limits were calculated for a one-of-two retesting procedure; i.e., if at least one sample in a series of two does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, then it can be concluded that an SSI has not occurred. In practice, where the initial result does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, a second sample will not be collected. The retesting procedures allowed achieving an acceptably high statistical power to detect changes at compliance 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 exceeded background concentrations. Prediction limits were calculated for the Appendix III parameters to represent background values as described in Section 2.2.3. Data collected during the October 2022 assessment monitoring event from each compliance well were compared to the prediction limits to assess whether the results are above background values. The results from the October 2022 event and the prediction limits are summarized in Table 3. The following exceedances of the UPLs were noted:

- Boron concentrations exceeded the interwell UPL of 3.66 mg/L at MW-1505 (6.17 mg/L), MW-1506 (5.03 mg/L), MW-1507 (9.07 mg/L), MW-1509 (6.99 mg/L), and MW-1510 (6.50 mg/L).
- Calcium concentrations exceeded the interwell UPL of 255 mg/L at MW-1505 (271 mg/L), MW-1506 (272 mg/L), MW-1507 (360 mg/L), and MW-1509 (279 mg/L).
- Chloride concentrations exceeded the interwell UPL of 238 mg/L at MW-1505 (253 mg/L), MW-1507 (288 mg/L), and MW-1509 (251 mg/L).
- Sulfate concentrations exceeded the intrawell UPL of 408 mg/L at MW-1505 (983 mg/L), the intrawell UPL of 369 mg/L at MW-1506 (909 mg/L), the intrawell UPL of 373 mg/L at MW-1507 (1,040 mg/L), the intrawell UPL of 492 mg/L at MW-1509 (918 mg/L), and the intrawell UPL of 523 mg/L at MW-1510 (612 mg/L).
- TDS concentrations exceeded the interwell UPL of 1,310 mg/L at MW-1505 (1,760 mg/L), MW-1506 (1,640 mg/L), MW-1507 (1,900 mg/L), MW-1509 (1,730 mg/L), and MW-1510 (1,450 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the October 2022 sample was above the UPL. 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 October 2022 in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers in the October 2022 data. GWPSs were re-established 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 exceeded the GWPSs. No SSLs for Appendix IV parameters were identified.

The interwell prediction limits for boron, calcium, chloride, pH, and TDS were updated to incorporate more recent data. The Appendix III parameters were compared to prediction limits, with exceedances identified for boron, calcium, chloride, sulfate, and TDS.

Based on this evaluation, the Mitchell BAP CCR unit will remain in assessment monitoring.

SECTION 3

REFERENCES

Geosyntec Consultants (Geosyntec). 2018. Statistical Analysis Summary – Bottom Ash Pond, Mitchell Plant, Moundsville, West Virginia. January 15, 2018.

Geosyntec. 2020. Statistical Analysis Plan – Mitchell Plant. October.

Geosyntec. 2022a. Statistical Analysis Summary – Bottom Ash Pond, Mitchell Plant, Moundsville, West Virginia. August 23, 2022.

Geosyntec. 2022b. Statistical Analysis Summary – Bottom Ash Pond, Mitchell Plant, Moundsville, West Virginia. February 14, 2022.

TABLES

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

Geosyntec Consultants, Inc.

Parameter	Unit	MW-1504	MW-1505	MW-1506	MW-1507	MW-1508	MW-1509	MW-1510
		10/17/2022	10/17/2022	10/17/2022	10/17/2022	10/17/2022	10/17/2022	10/17/2022
Antimony	µg/L	0.03 J1	0.04 J1	0.03 J1	0.03 J1	0.1 U1	0.03 J1	0.03 J1
Arsenic	µg/L	0.34	0.57	0.38	0.32	0.28	0.54	0.35
Barium	µg/L	40.9	37.1	38.3	45.1	28.6	44.3	37.6
Beryllium	µg/L	0.05 U1	0.014 J1	0.007 J1	0.05 U1	0.05 U1	0.014 J1	0.05 U1
Boron	mg/L	2.86	6.17	5.03 M1, P3	9.07	4.06	6.99	6.50
Cadmium	µg/L	0.025	0.017 J1	0.011 J1	0.034	0.022	0.011 J1	0.005 J1
Calcium	mg/L	271	271	272 M1, P3	360	248	279	195
Chloride	mg/L	170	253	227	288	191	251	165
Chromium	µg/L	0.36	0.86	0.39	0.75	0.59	0.52	0.93
Cobalt	µg/L	0.124	0.404	0.154	0.102	0.147	0.279	0.275
Combined Radium	pCi/L	0.83	0.9	0.59	1.15	0.86	0.54	0.5
Fluoride	mg/L	0.20	0.15 U1	0.15 U1	0.15 U1	0.06 J1	0.06 J1	0.09 J1
Lead	µg/L	0.20	0.32	0.19 J1	0.2 U1	0.06 J1	0.29	0.12 J1
Lithium	mg/L	0.00600	0.00705	0.00814	0.00889	0.00473	0.00987	0.00760
Mercury	µg/L	0.02 U1	0.005	0.004 J1	0.004 J1	0.005 U1	0.006	0.019
Molybdenum	µg/L	0.3 J1	0.2 J1	0.3 J1	0.4 J1	0.2 J1	0.2 J1	0.3 J1
Selenium	µg/L	9.02	2.82	2.30	0.28 J1	3.34	1.10	7.10
Sulfate	mg/L	851	983	909	1,040	734	918	612
Thallium	µg/L	0.2 U1	0.07 J1	0.04 J1	0.07 J1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	1,630	1,760	1,640	1,900	1,360	1,730	1,450
pH	SU	6.92	7.11	7.07	6.96	6.98	7.22	7.22

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

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

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

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

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

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

Geosyntec Consultants, Inc.

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000100	0.00600
Arsenic, Total (mg/L)	0.0100		0.00165	0.0100
Barium, Total (mg/L)	2.00		0.0528	2.00
Beryllium, Total (mg/L)	0.00400		0.0000600	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000900	0.00500
Chromium, Total (mg/L)	0.100		0.00189	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00251	0.00600
Combined Radium, Total (pCi/L)	5.00		2.01	5.00
Fluoride, Total (mg/L)	4.00		0.250	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00344	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0150	0.0400
Mercury, Total (mg/L)	0.00200		0.00000800	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00231	0.100
Selenium, Total (mg/L)	0.0500		0.00902	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

MCL = Maximum Contaminant Level

CCR = Coal Combustion Residual

GWPS = Groundwater Protection Standard

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

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

Analyte	Unit	Description	MW-1505	MW-1506	MW-1507	MW-1509	MW-1510	
			10/17/2022	10/17/2022	10/17/2022	10/17/2022	10/17/2022	
Boron	mg/L	Interwell Background Value (UPL)	3.66					
		Analytical Result	6.17	5.03	9.07	6.99	6.50	
Calcium	mg/L	Interwell Background Value (UPL)	255					
		Analytical Result	271	272	360	279	195	
Chloride	mg/L	Interwell Background Value (UPL)	238					
		Analytical Result	253	227	288	251	165	
Fluoride	mg/L	Intrawell Background Value (UPL)	0.06	0.200	0.200	0.160	0.125	
		Analytical Result	0.05	0.05	0.05	0.06	0.09	
pH	SU	Interwell Background Value (UPL)	8.6					
		Interwell Background Value (LPL)	6.9					
		Analytical Result	7.1	7.1	7.0	7.2	7.2	
Sulfate	mg/L	Intrawell Background Value (UPL)	408	369	373	492	523	
		Analytical Result	983	909	1,040	918	612	
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	1,310					
		Analytical Result	1,760	1,640	1,900	1,730	1,450	

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

Bold values exceed the background value.

Background values are shaded gray.

ATTACHMENT A

Certification by a Qualified Professional Engineer

Certification by Qualified Professional Engineer

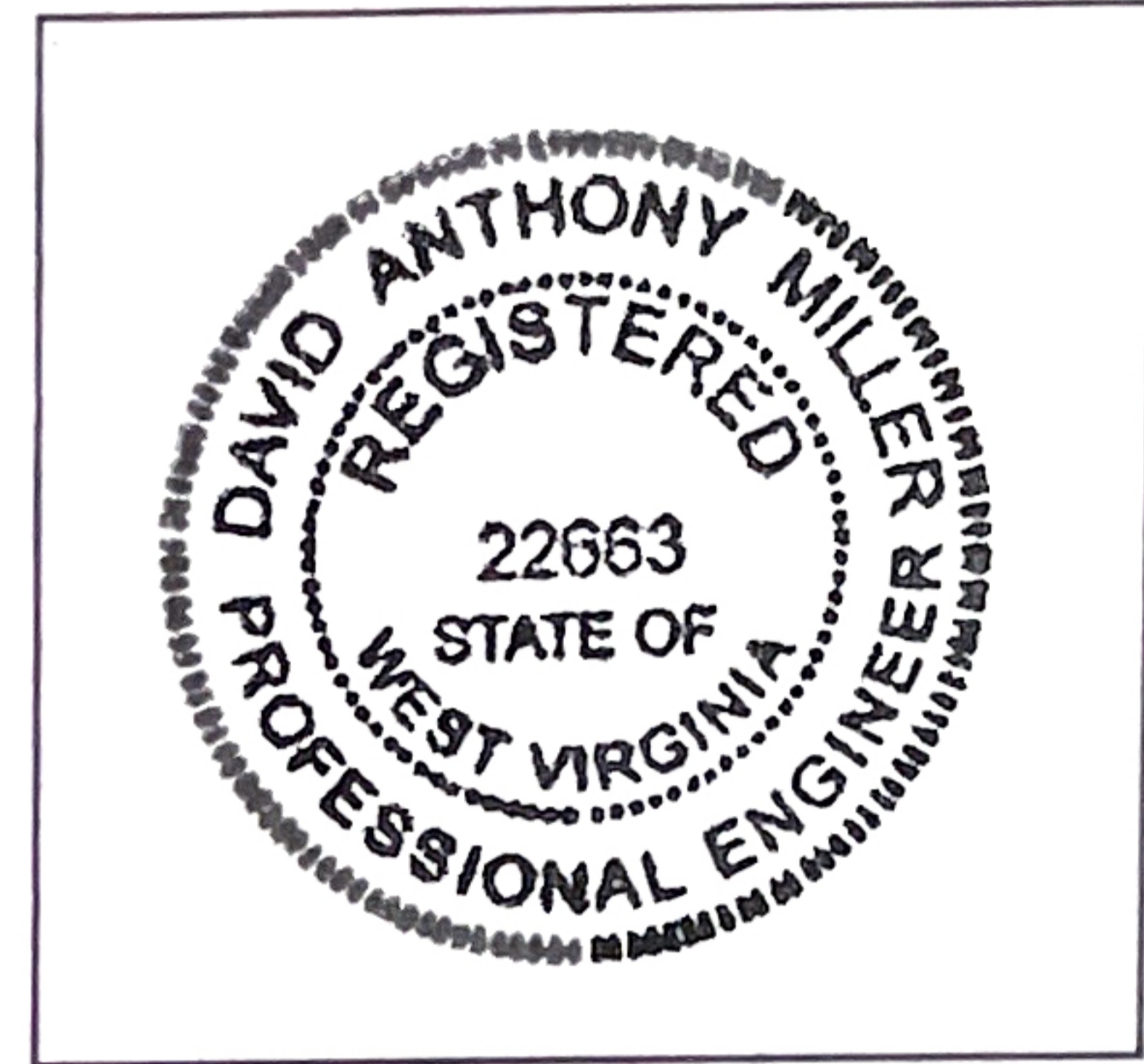
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Mitchell Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



22663

License Number

WEST VIRGINIA

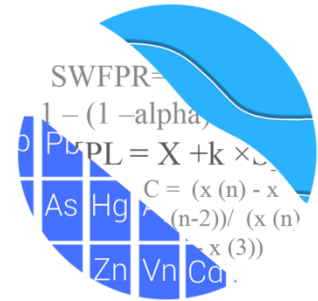
Licensing State

02-06-23

Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING



January 13, 2023

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

RE: Mitchell Bottom Ash Pond (BAP)
Background Update & October 2022 Assessment Monitoring Analysis

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis and background update of interwell statistical limits through 2022 for American Electric Power Company's Mitchell Bottom Ash Pond. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the USEPA Unified Guidance (2009).

Sampling at each of the wells below began at Mitchell Bottom Ash Pond for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** MW-1504 and MW-1508
- **Downgradient wells:** MW-1505, MW-1506, MW-1507, MW-1509, and MW-1510

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 analysis was reviewed by Kristina Rayner, Senior Statistician and Founder of Groundwater Stats Consulting.

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

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

Time series plots and box plots for Appendix III and IV parameters are provided for all wells (Figures A and B). Values which have been flagged as outliers may be seen in a lighter font and as a disconnected symbol on the time series plots. A summary of flagged values follows this letter (Figure C). The time series plots are used to evaluate concentrations over time and between wells, to initially screen for suspected outliers and trends; while the box plots provide visual representation of variation within individual wells and between wells.

Due to varying detection limits in background data sets due to improved laboratory practices, a substitution of the most recent reporting limit is used for all non-detects. 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. This generally gives the most conservative limit in each case.

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). Power curves were included with the previous update to demonstrate that the selected statistical method provides sufficient power to detect a change at any of the downgradient wells which complies with the USEPA Unified Guidance recommendation. 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, $c=7$

Downgradient wells, $w=5$

All data were initially screened for outliers and trends in December 2017. As a result of that screening, the statistical methods implemented at this site are listed below.

Summary of Statistical Methods – Appendix III Parameters

- 1) Intrawell prediction limits, combined with a 1-of-2 resample plan for fluoride and sulfate
- 2) Interwell prediction limits, combined with a 1-of-2 resample plan for boron, calcium, chloride, pH, 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 most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits are used on data containing greater than 50% non-detects.

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

that resulting statistical limits are conservative (i.e., lower) from a regulatory perspective and capable of rapidly detecting changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

Summary of Background Screening Conducted in December 2017

Intrawell prediction limits combined with a 1-of-2 verification strategy were recommended for fluoride and sulfate; and interwell prediction limits combined with a 1-of-2 verification strategy were recommended for boron, calcium, chloride, pH, and TDS. All proposed background data were screened for outliers and trends during the background screening. The findings of those reports were submitted at that time. Interwell prediction limits utilize pooled 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 utilize historical data within a given well for comparison of compliance data from the same well. As recommended in the EPA Unified Guidance (2009), the background data sets are periodically evaluated for the purpose of updating statistical limits, as described below.

Appendix III Background Update Summaries

December 2019

Samples from all wells for parameters using intrawell prediction limits and from all upgradient wells for parameters using interwell prediction limits were evaluated using Tukey's outlier test and visual screening. A summary of Tukey's test results and flagged outliers were included with the December 2019 background update.

For constituents requiring intrawell prediction limits (fluoride and sulfate), the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through June 2017 to the new compliance samples at each well through June 2019 to evaluate whether the groups are statistically similar at the 99% confidence level, in which case background data may be updated with compliance data. Although statistically significant differences were found among well/constituent pairs using intrawell statistical methods, all background data were updated with compliance data. A complete list of the Mann-Whitney test results and associated statistical explanations were included with the December 2019 Background Update report. Intrawell prediction limits were updated for each well and constituent using the updated background data through June 2019. A summary table and complete graphical results were included with the report.

For parameters tested using interwell analyses (boron, calcium, chloride, pH, and TDS), the Sen's Slope/Mann-Kendall trend test was used on upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. While increasing and decreasing trends were identified, no adjustments were required. The interwell prediction limits, combined with a 1-of-2 resample plan, were updated using all available data from upgradient wells for the same time period. Results were included with the December 2019 Background Update report.

February 2021

Prior to updating background data during the 2021 analysis, Tukey's outlier test and visual screening were used to re-evaluate data for outliers at all upgradient wells for parameters utilizing interwell prediction limits, i.e., boron, calcium, chloride, pH and TDS. Tukey's outlier test on pooled upgradient well data identified only two values outliers for pH. Those values were similar to each other and not dramatically higher than the remaining observations. Therefore, no values were flagged in upgradient wells for Appendix III parameters.

As mentioned above, in the intrawell case, data for all wells and constituents will be re-evaluated when a minimum of 4 new data points are available. Sulfate lacked sufficient data to update background during the February 2021 update; therefore, intrawell prediction limits for fluoride and sulfate were not updated at that time and continued to use historical data through June 2019 for constructing statistical limits.

For boron, calcium, chloride, pH, and TDS, which are tested using interwell prediction limits, the Sen's Slope/Mann-Kendall trend test was used to test data in upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. A statistically significant increasing trend was identified for pH in well MW-1504 and a statistically significant decreasing trend was noted for chloride in well MW-1508. The magnitude of these trends was fairly small relative to the range of concentrations in the pooled upgradient data. All reported data through January 2021 from upgradient wells were used to construct interwell prediction limits, combined with a 1-of-2 resample plan, for boron, calcium, chloride, pH, and TDS.

January 2022

Outlier Analysis

Prior to updating background data, Tukey's outlier test and visual screening were used to re-evaluate data through May 2021 at all wells for parameters using intrawell prediction

limits (fluoride and sulfate) and through October 2021 at all upgradient wells for parameters utilizing interwell prediction limits (boron, calcium, chloride, pH, and TDS). For parameters which use intrawell prediction limits, Tukey's outlier test on all wells identified one value for fluoride as an outlier; however, the identified value was a historic non-detect value and is less than the Maximum Containment Level (MCL). Therefore, this value was not flagged as an outlier.

For parameters which use interwell prediction limits, Tukey's outlier test identified two values for pH as outliers but these values were similar to remaining observations within their respective record and were, therefore, not flagged in the database. No new values were flagged as outliers and no changes were made to previously flagged outliers. The results were included with the report.

Intrawell - Mann-Whitney Evaluation

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through June 2019 to the new compliance samples through May 2021 at each well 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. Statistically significant differences (either an increase or decrease in median concentrations) were found between the two groups for the following well/constituent pairs:

Increase:

- Sulfate: MW-1505 and MW-1507

Decrease:

- Fluoride: MW-1504 (upgradient), MW-1505, and MW-1506

Typically, when the test concludes that the medians of the two groups are statistically significantly different, particularly in the downgradient wells, the background data are not updated to include the newer data, unless it can be reasonably justified that the change in concentrations reflects a naturally occurring shift unrelated to practices at the site. In studies such as the current one, in which at least one of the segments being compared is of short duration, the comparison is complicated by the fact that normal short-term variation may be mistaken for long-term change in medians.

Regarding well/constituent pairs with statistically significant increases in medians, newer observations are higher than historical concentrations and appear to be increasing.

Therefore, the background records for the following well/constituent pairs were not updated at this time and will be re-evaluated during the next background update:

- Sulfate: MW-1505 and MW-1507

Although not identified as statistically significant by the Mann-Whitney test of medians at the 99% confidence level, the two most recent reported concentrations for sulfate at well MW-1506 are also above historical concentrations and appear to be increasing. Therefore, this well/constituent pair was not updated at this time. A list of well/constituent pairs using a truncated portion of their record follows this report.

Regarding well/constituent pairs with statistically significant decreases in medians, for fluoride in downgradient wells MW-1505 and MW-1506, the statistically significant decrease in medians identified by the Mann-Whitney test was a result of historic non-detect values in the earlier portion of the record being compared to more recent trace values in the latter part of the record. While the non-detects at this level appear to be outliers, the remaining values in the data set are all trace values at very low levels where the measurement precision is also low. The non-detects are not flagged presently but may be re-evaluated in the future. For fluoride in upgradient well MW-1504, the decrease in concentrations was marginal to the overall record and remains below the Maximum Contaminant Level (MCL). In addition, these concentrations represent groundwater quality conditions upgradient of the facility. Therefore, all records for fluoride were updated through May 2021.

Interwell – Trend Test Evaluation

For parameters which are tested using interwell prediction limits, the Sen's Slope/Mann-Kendall trend test was used to test data in upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. Statistically significant trends were identified for the following well/constituent pairs:

Increasing

- pH: MW-1504 and MW-1508

Decreasing

- Chloride: MW-1508
- TDS: MW-1508

Since increasing trends were identified for pH in both upgradient wells and the magnitude of the increase is marginal relative to the concentrations, no adjustments were required

for these well/constituent pairs at that time. Similarly, no adjustments were required for TDS in upgradient well MW-1508 because the magnitude of the decrease was marginal relative to the concentrations. For chloride in upgradient well MW-1508, however, earlier concentrations were higher than more recent concentrations; therefore, the earlier portion of the record was deselected to remove the decreasing trend and construct statistical limits that are conservative (i.e., lower) from a regulatory perspective. As more data are collected, all upgradient well data will be re-evaluated for possible deselection of earlier portion of the record if the measurements no longer represent present-day groundwater quality conditions.

Appendix III Parameters – October 2022

Intrawell limits constructed from carefully screened background data from within each well serve to provide statistical limits that are representative of the background data population, and that will rapidly identify a change in more recent compliance data from within a given well. The most recent sample from the same well is compared to its respective background. This statistical method removes the element of variation from across wells and eliminates the chance of mistaking natural spatial variation for a release from the facility. Intrawell prediction limits are updated when a minimum of 4 compliance samples are available. Sufficient samples are not currently available; therefore, background limits will be updated during the Fall 2023 analysis.

Interwell prediction limits, which pool upgradient well data to establish a background limit for an individual constituent, were updated during this analysis after visual screening for new outliers and trends. No new outliers were identified. It was noted that the more recent reported data for chloride at upgradient well MW-1508 are similar to those reported earlier in the record. Therefore, all historical data were used in construction of the interwell prediction limit for this constituent. The most recent sample from each downgradient well is compared to the interwell prediction limits to determine whether initial exceedances are present. Formal outlier and trend testing will be performed on upgradient wells for Appendix III parameters during the Fall 2023 analysis.

For some well/constituent pairs containing <15% non-detects in background such as fluoride at well MW-1507, parametric prediction limits slightly changed compared to those established during the background update. An update was made to the Sanitas™ statistical software in October 2022 that determines the percentage of non-detects within a given background record rather than all records evaluated for a given constituent. Simple substitution of ½ the reporting limit is applied when the percentage of non-detects in background is <15% in accordance with the USEPA EPA Unified Guidance (2009). No significant changes resulted from this implementation.

Prediction Limits

Intrawell prediction limits, combined with a 1-of-2 resample plan, were constructed for fluoride and sulfate using screened background data through May 2021 at each well (Figure D). Previously flagged outliers may be seen in a lighter font and as a disconnected symbol on the graphs, and a summary of all flagged outliers follows this report (Figure C). Note that the intrawell prediction limit for fluoride at well MW-1505 decreased from 0.2 mg/L to 0.06 mg/L due to a reporting limit change.

The interwell prediction limits for boron, calcium, chloride, pH, and TDS, combined with a 1-of-2 resample plan, were constructed using all pooled upgradient data through October 2022 (Figure E).

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of one additional sample to determine whether the initial exceedance is confirmed. When the resample confirms the initial exceedance, a statistically significant increase (SSI) is identified, and further research is required to identify the cause of the exceedance (i.e., impact from the site, natural variation, or an off-site source). If a resample falls within the statistical limit, the initial exceedance is considered to be a false positive result; therefore, no further action is necessary.

Evaluation of Appendix IV Parameters – October 2022

Prior to evaluating Appendix IV parameters, upgradient well data are screened through both visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. Tukey's test and visual screening with time series graphs confirmed previously flagged outliers. All flagged values may be seen on the Outlier Summary following this letter (Figure C) and no changes to previously flagged outliers were made.

For the current analysis, Tukey's outlier test on pooled upgradient well data through October 2022 did not identify any outliers; therefore, no new outliers were flagged.

Additionally, downgradient well data through October 2022 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. No new outliers among downgradient wells were flagged during this analysis.

Interwell Upper Tolerance Limits

Interwell upper tolerance limits were used to calculate the site-specific background limits from pooled upgradient well data through October 2022 for the Appendix IV constituents discussed above (Figure F). Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution such as for barium, chromium, cobalt, combined radium 226 + 228, and lead. 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 Maximum Contaminant Levels (MCLs) and the CCR-Rule specified levels in the Groundwater Protection Standards (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure G).

Confidence Intervals

Confidence intervals were then constructed using all available data through October 2022 on downgradient wells for each of the Appendix IV parameters using the highest limit of either the MCL, CCR-Rule specified, or background as the GWPS as discussed above (Figure H). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete graphical results of the confidence intervals follow this report and no confidence interval exceedances were noted for any of the Appendix IV parameters.

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

For Groundwater Stats Consulting,



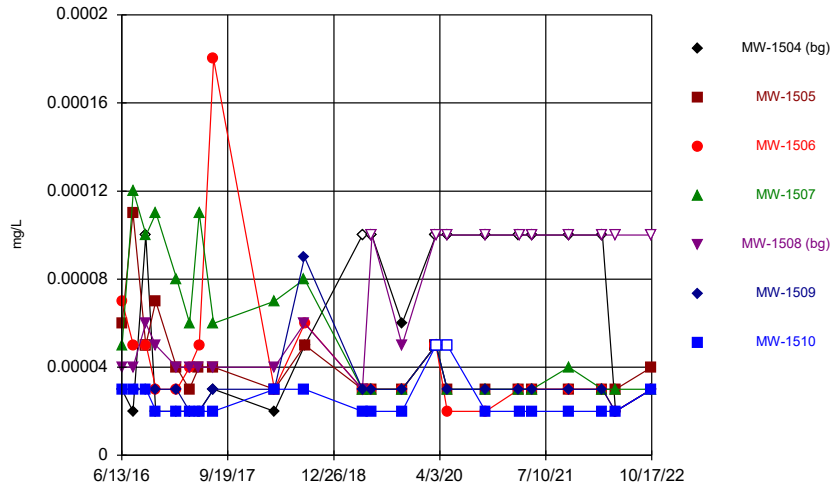
Andrew T. Collins
Project Manager



Kristina L. Rayner
Senior Statistician

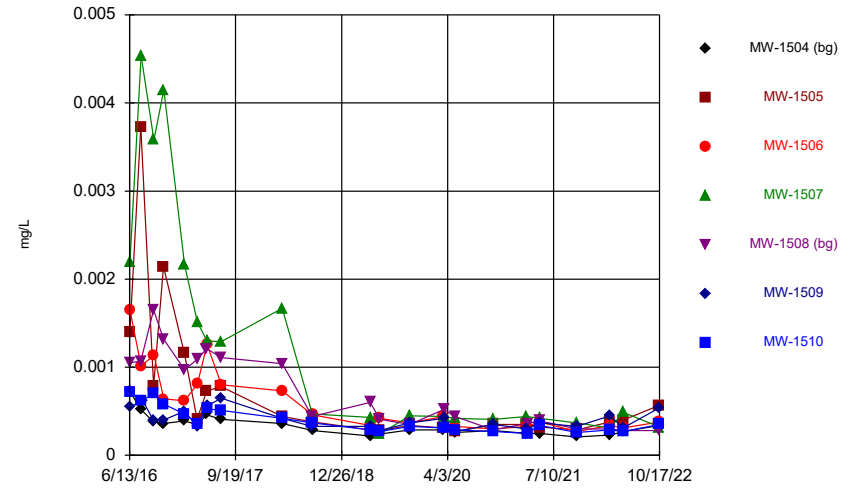
FIGURE A
Time Series

Time Series



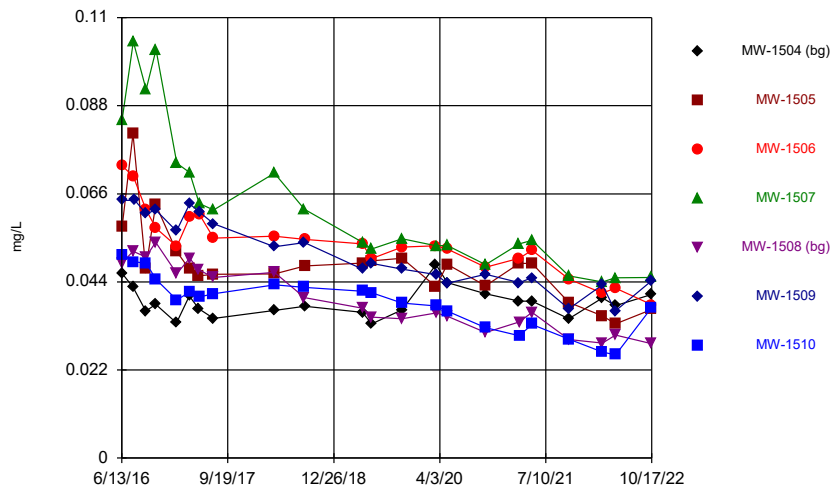
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



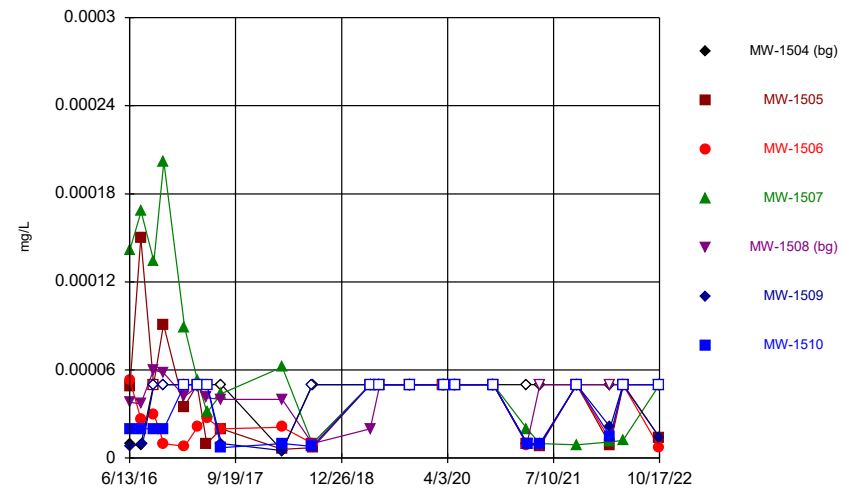
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



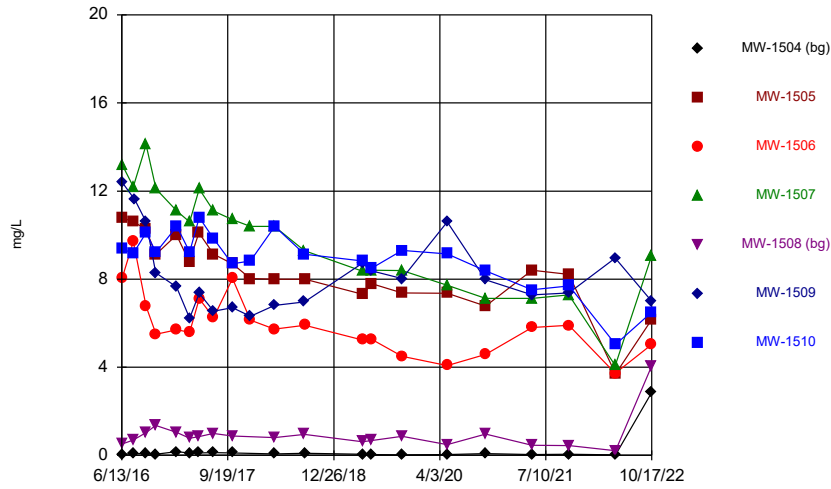
Constituent: Barium, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



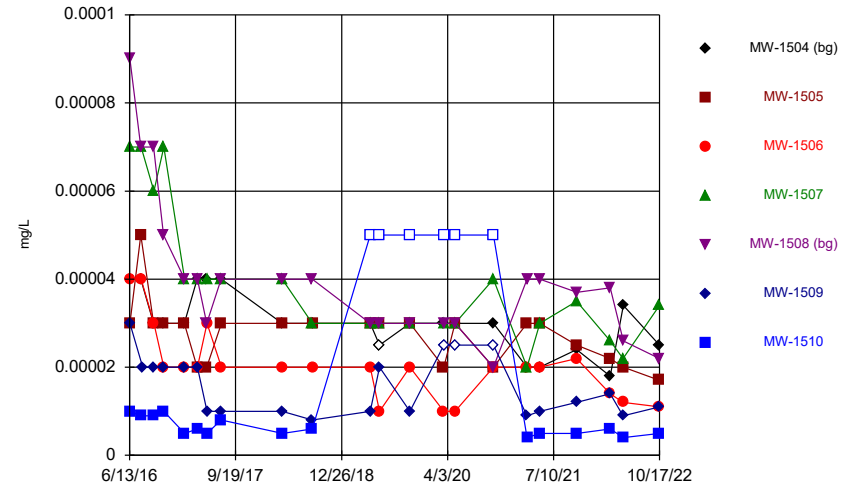
Constituent: Beryllium, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



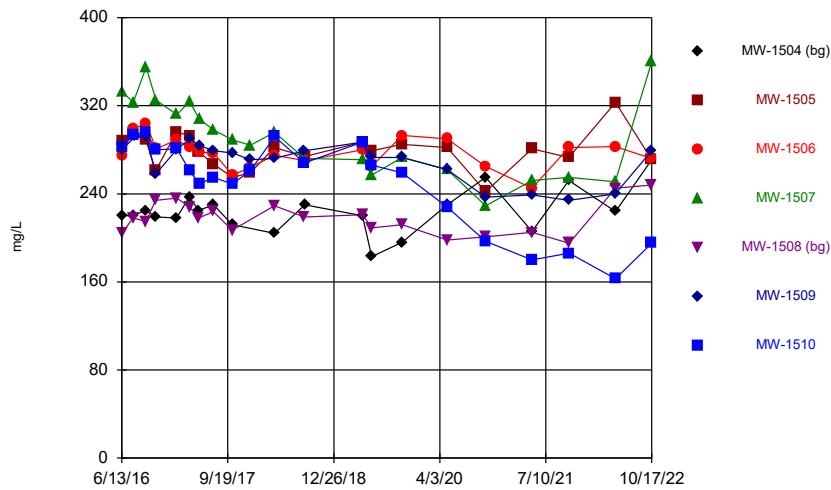
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



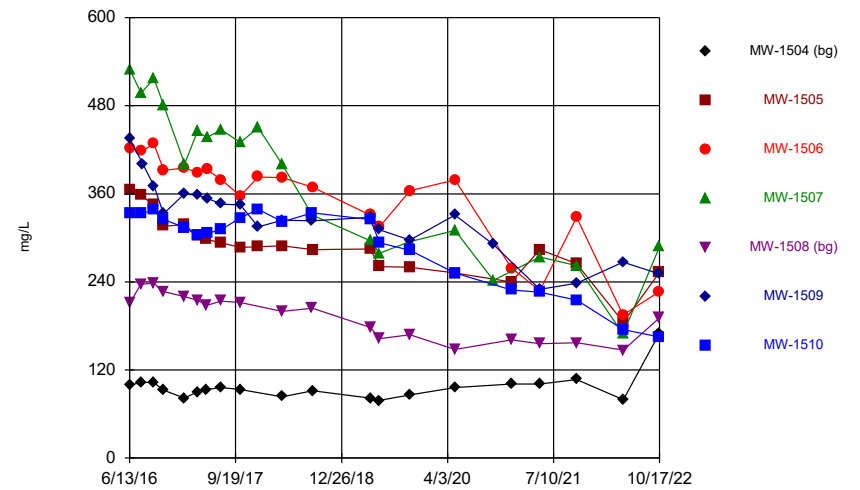
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



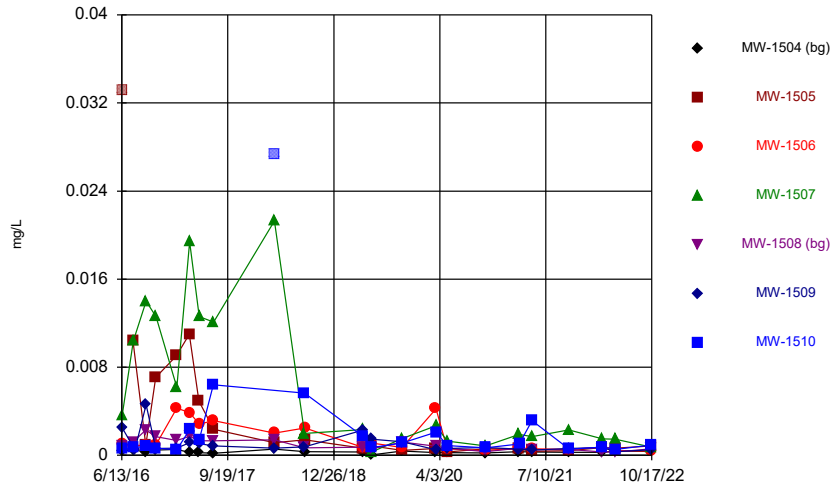
Constituent: Calcium, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



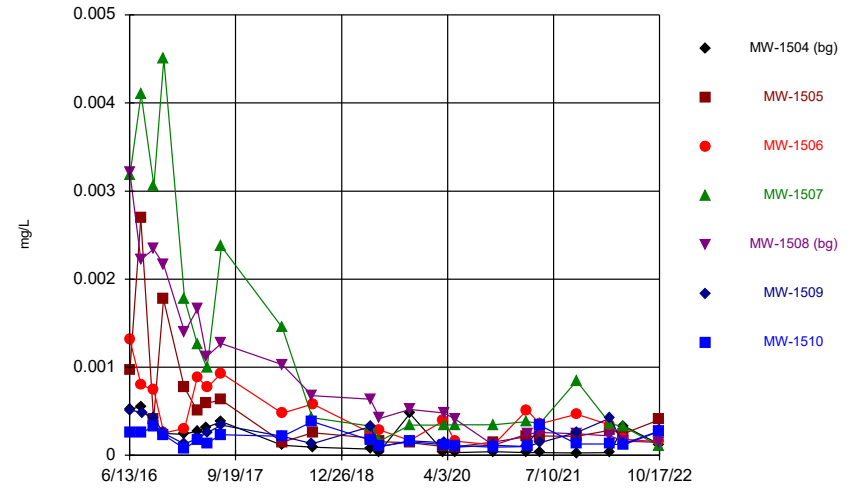
Constituent: Chloride, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



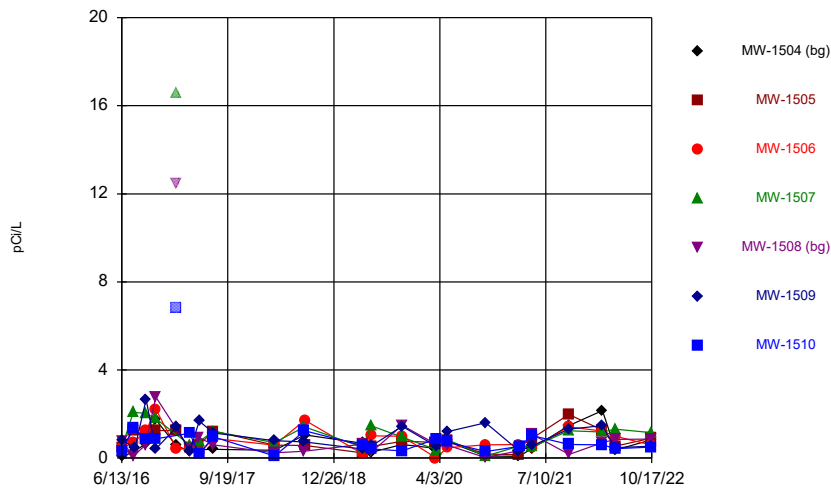
Constituent: Chromium, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



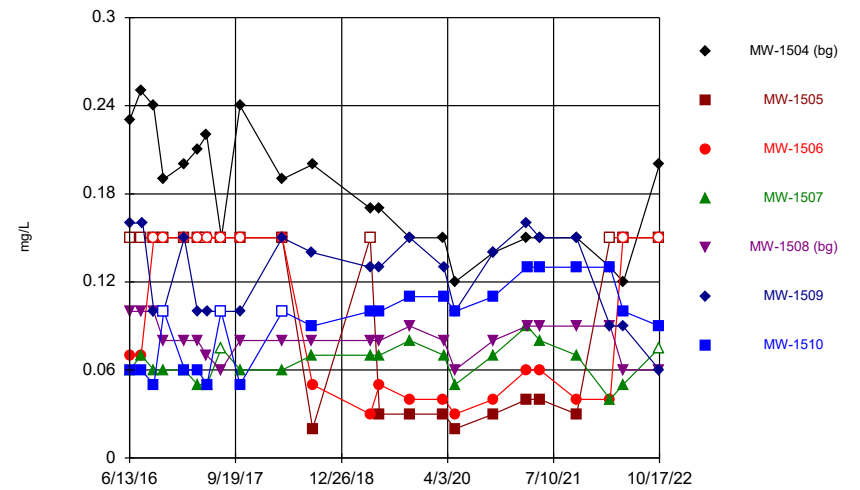
Constituent: Cobalt, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



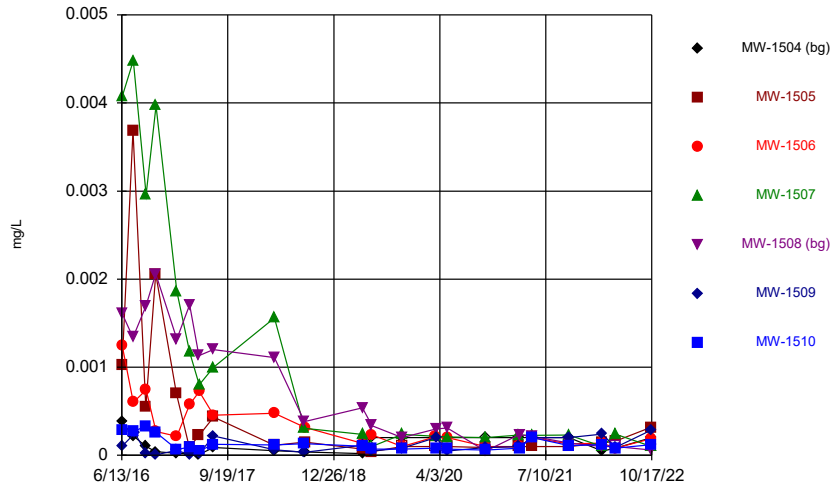
Constituent: Combined Radium 226 + 228 Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



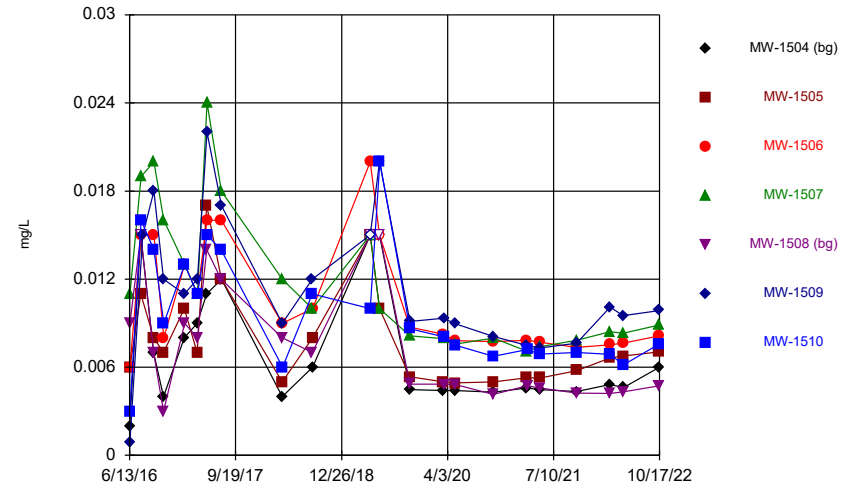
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



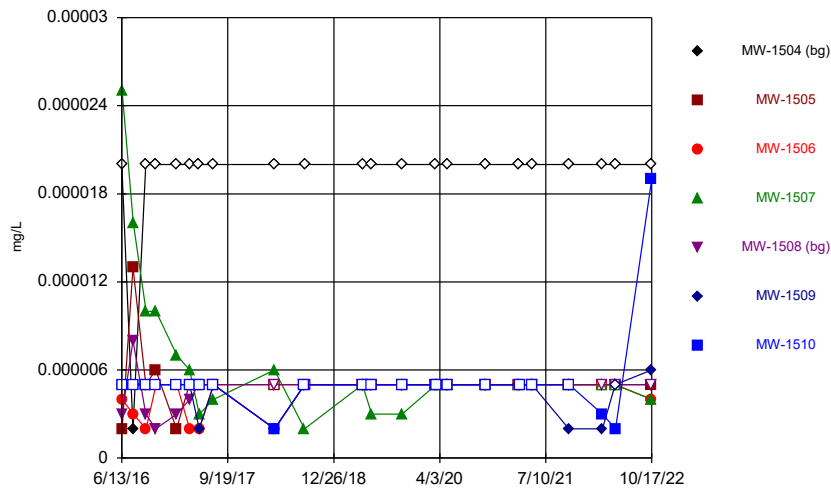
Constituent: Lead, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



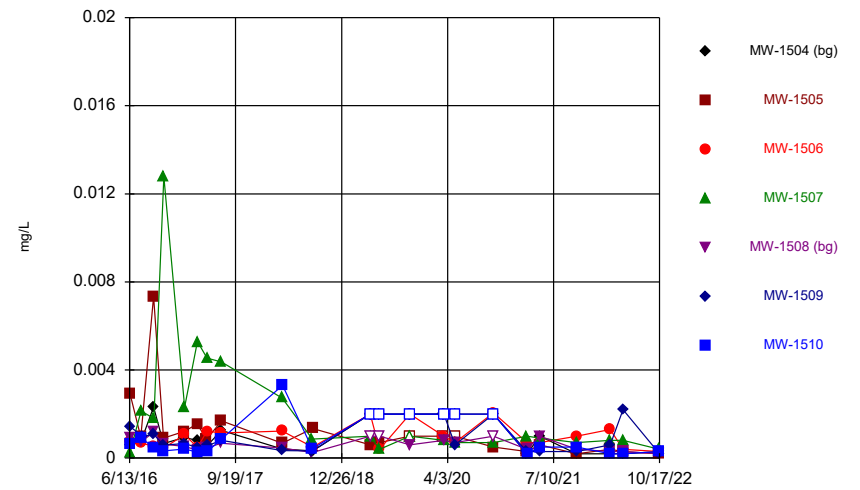
Constituent: Lithium, total Analysis Run 1/10/2023 3:31 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



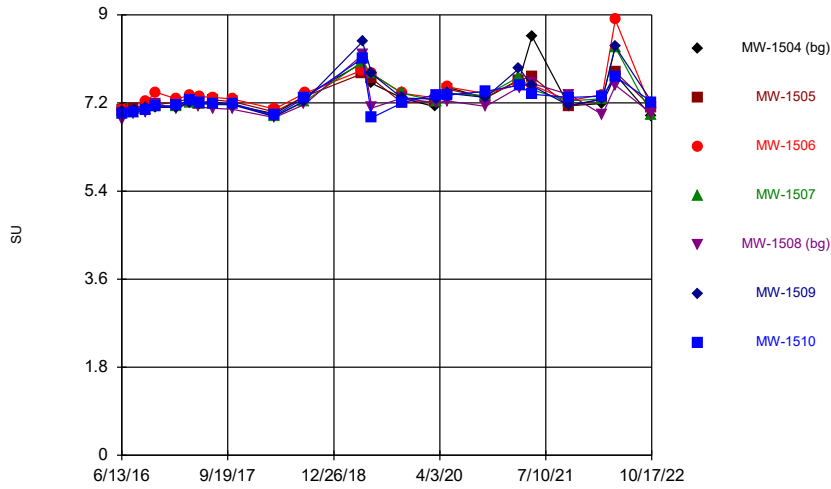
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



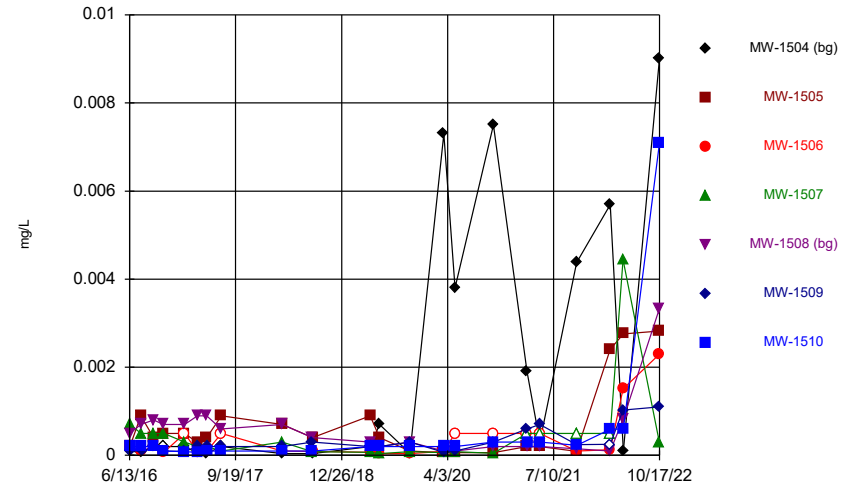
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



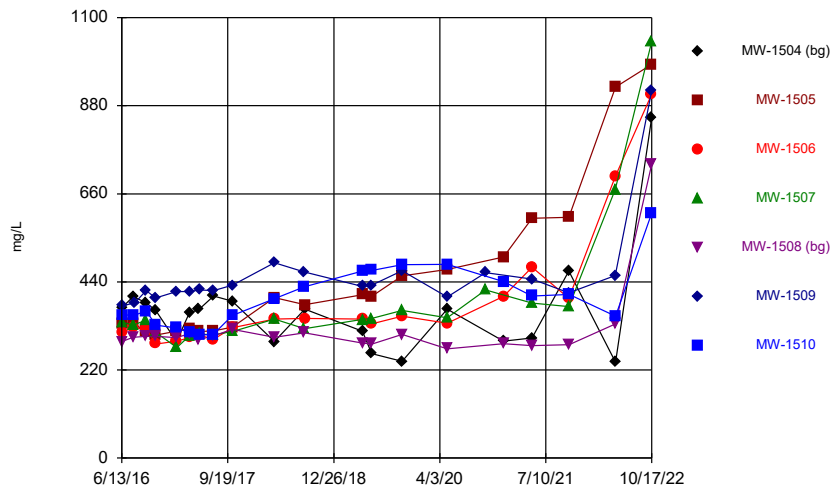
Constituent: pH, field Analysis Run 1/10/2023 3:32 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



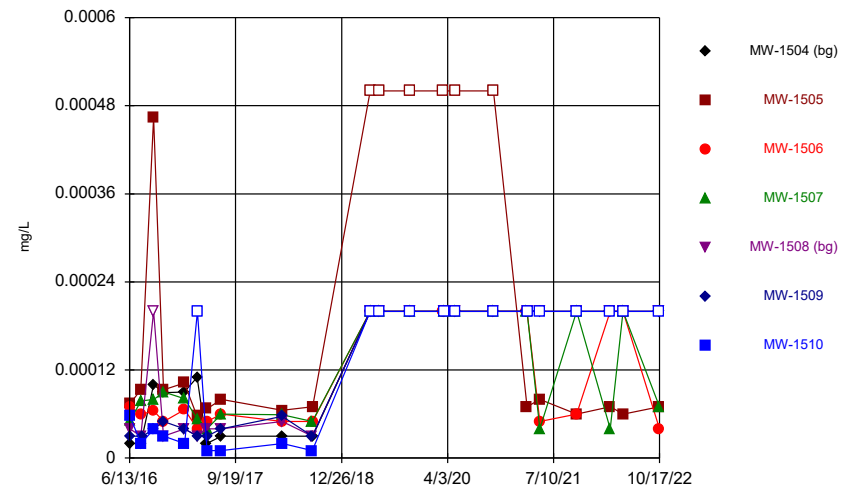
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 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



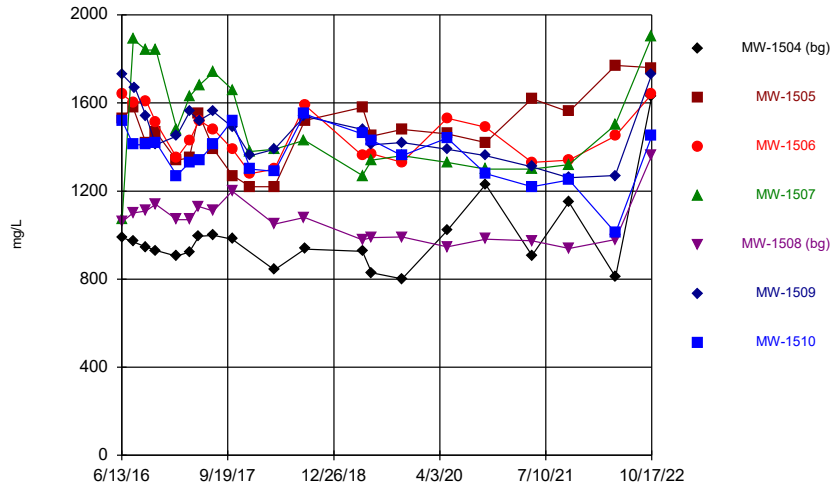
Constituent: Sulfate, total Analysis Run 1/10/2023 3:32 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



Constituent: Thallium, total Analysis Run 1/10/2023 3:32 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

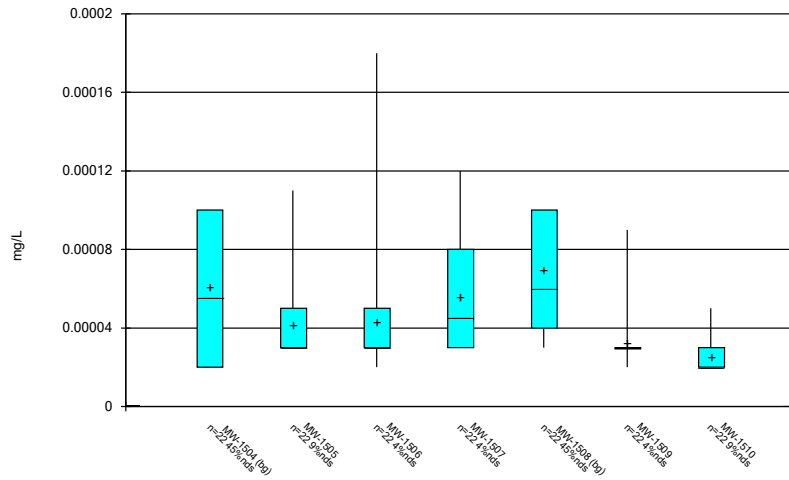
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/10/2023 3:32 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

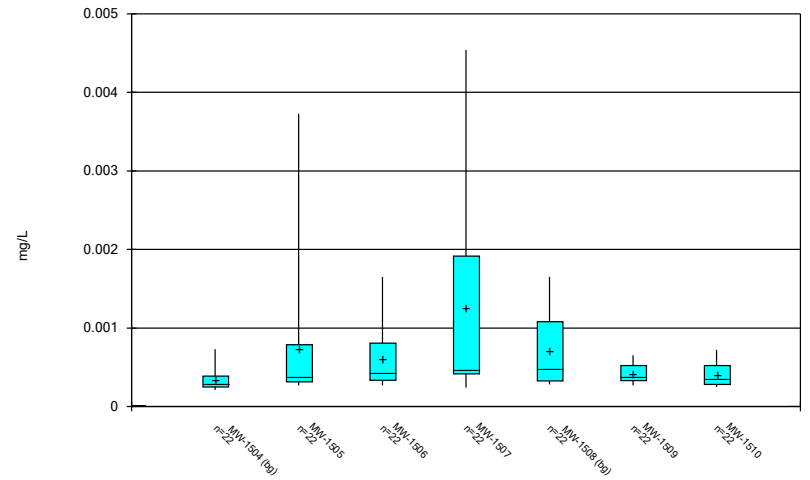
FIGURE B
Box Plots

Box & Whiskers Plot



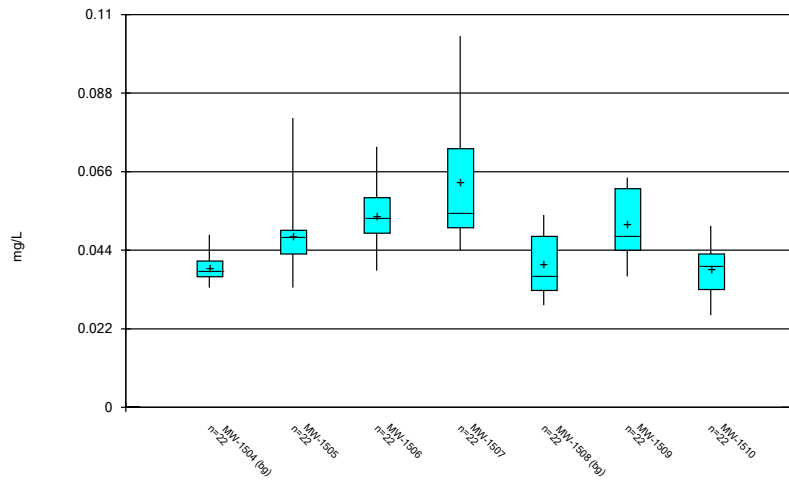
Constituent: Antimony, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



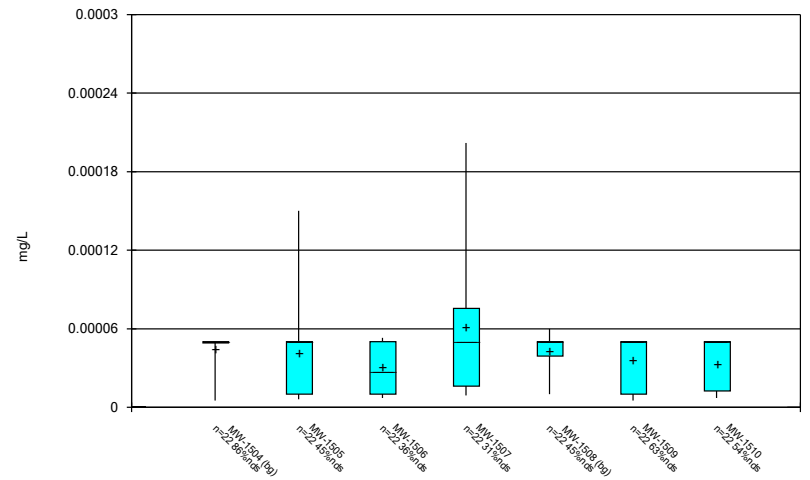
Constituent: Arsenic, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



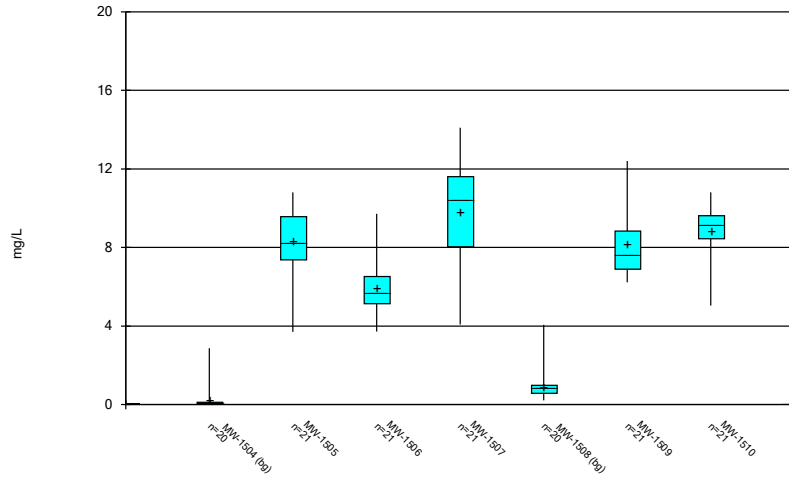
Constituent: Barium, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



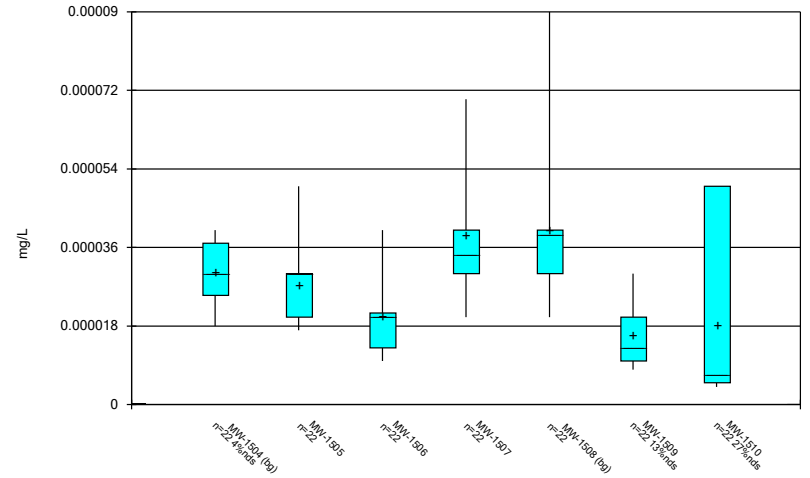
Constituent: Beryllium, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



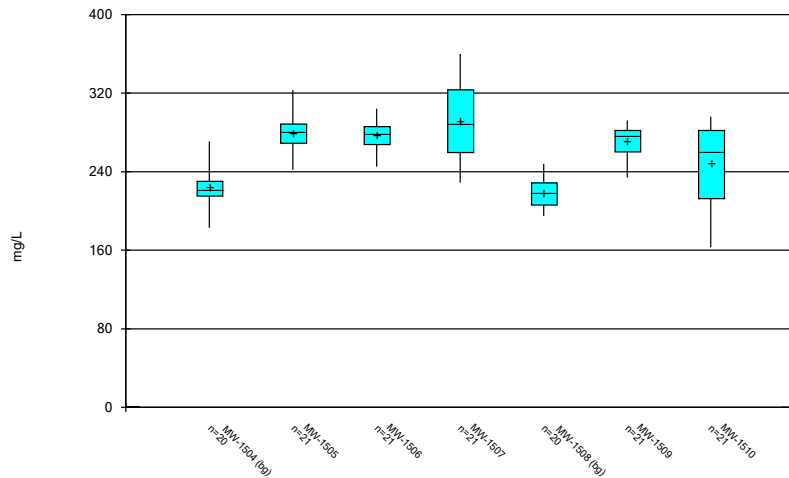
Constituent: Boron, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



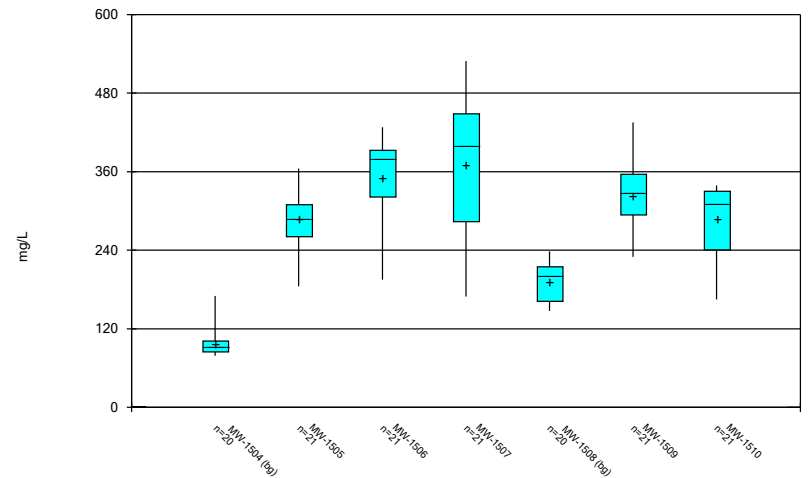
Constituent: Cadmium, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



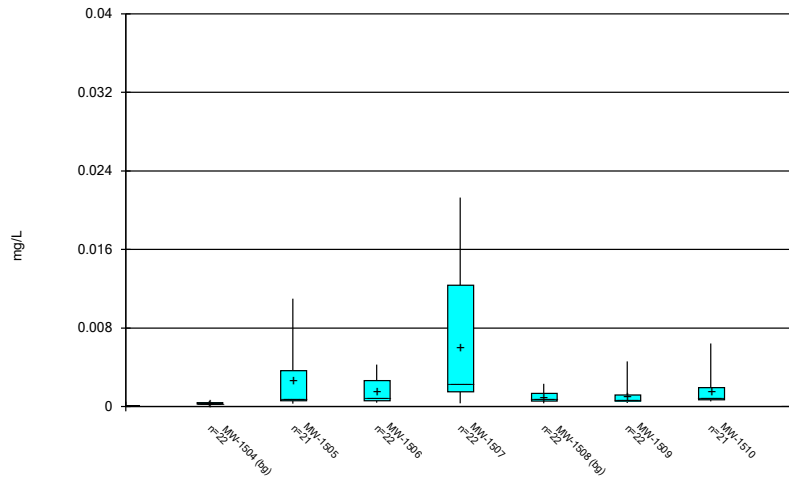
Constituent: Calcium, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



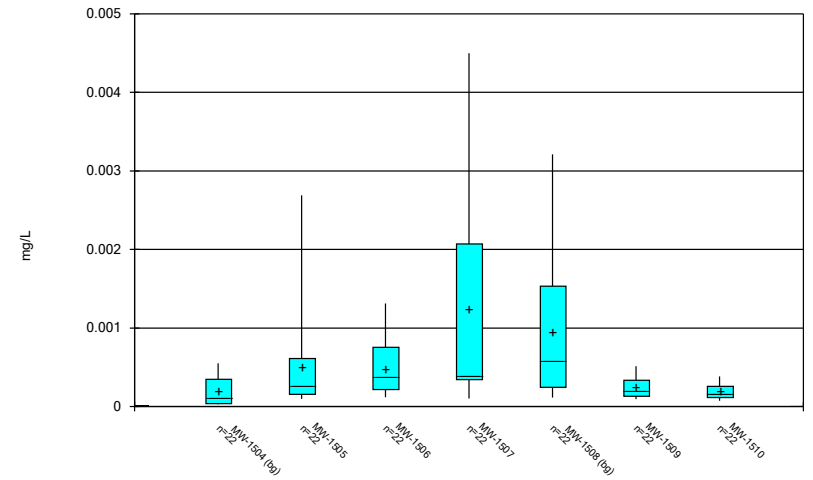
Constituent: Chloride, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



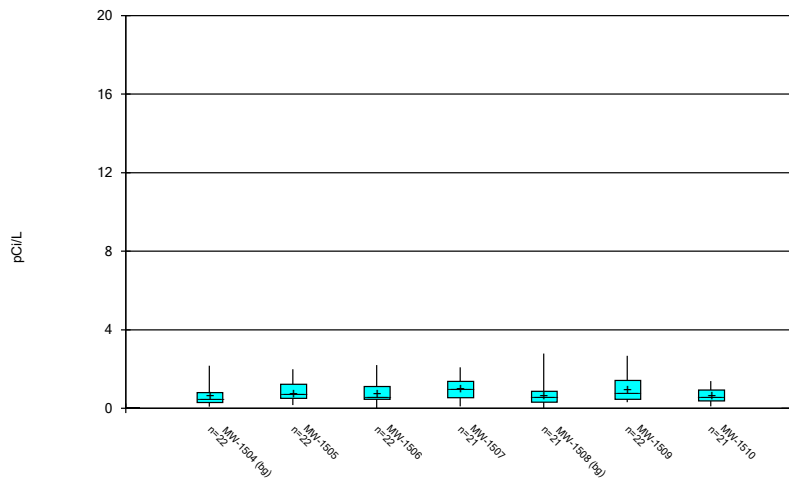
Constituent: Chromium, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



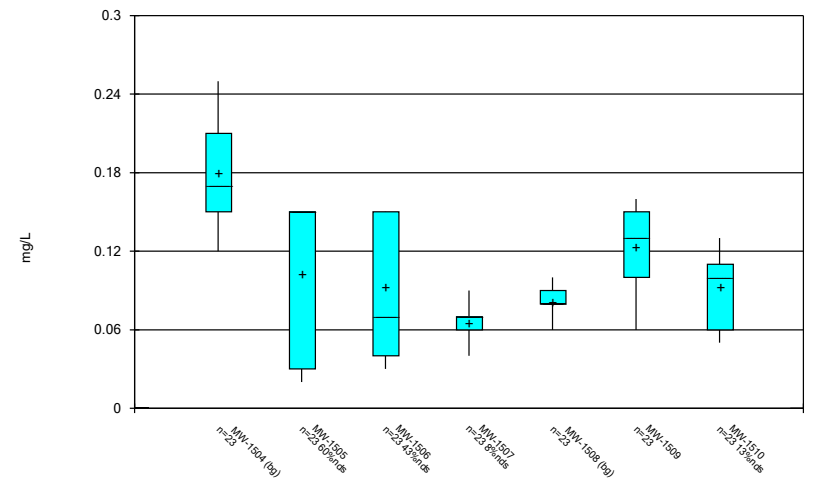
Constituent: Cobalt, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



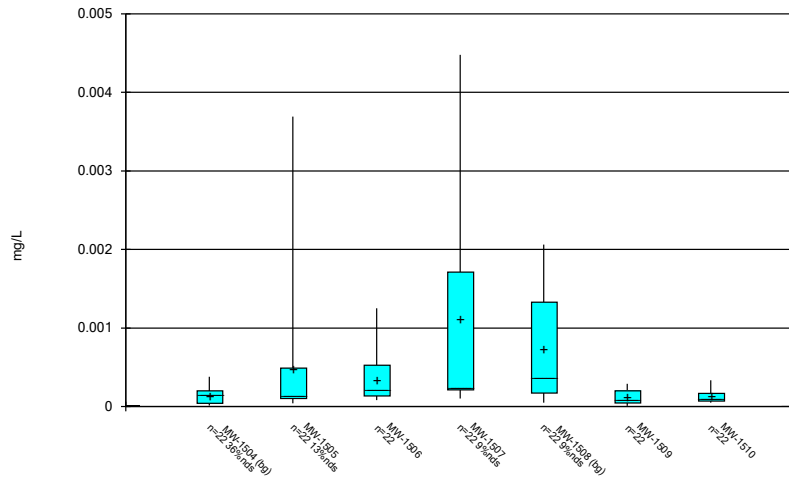
Constituent: Combined Radium 226 + 228 Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



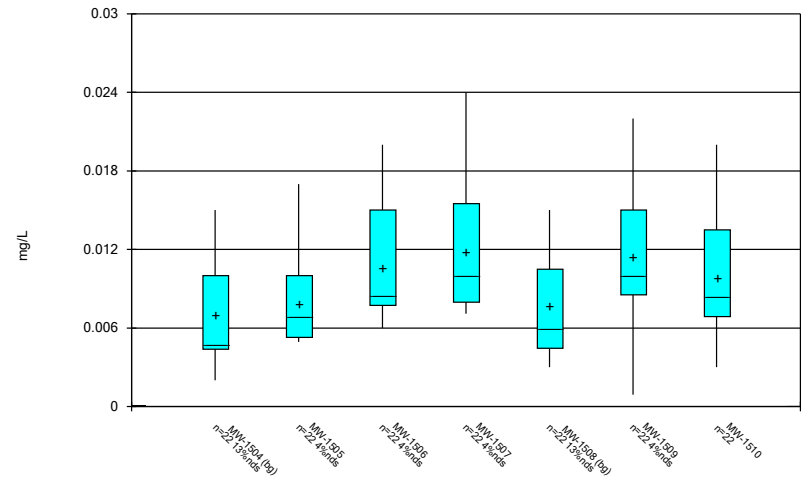
Constituent: Fluoride, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



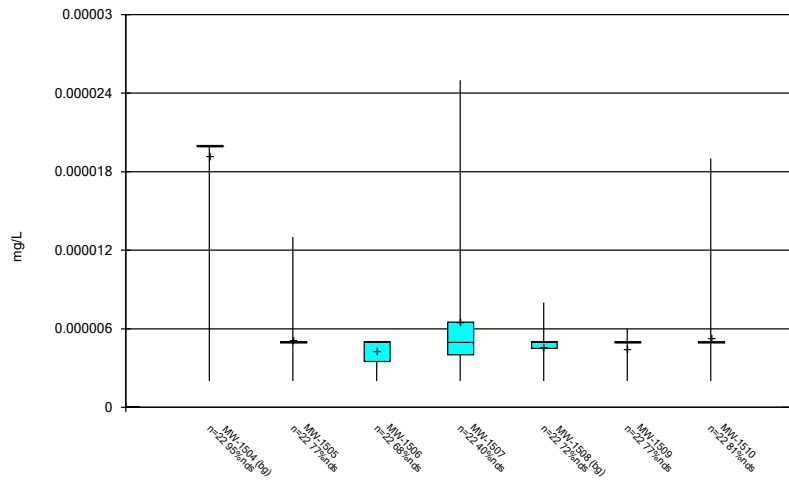
Constituent: Lead, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



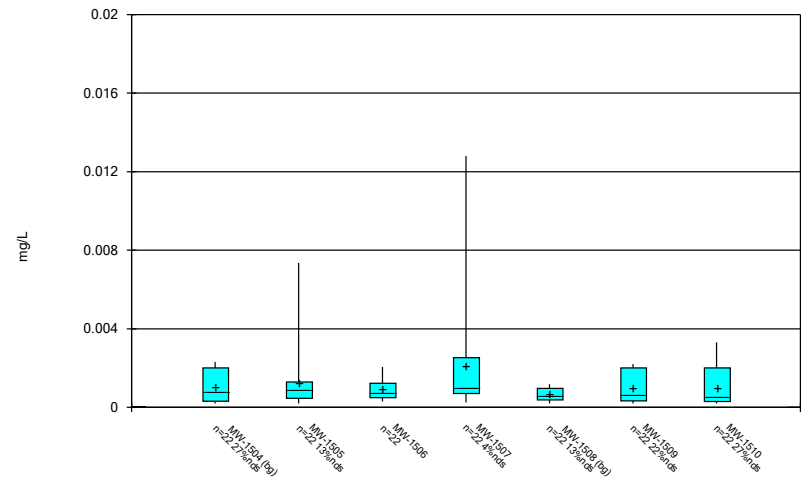
Constituent: Lithium, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



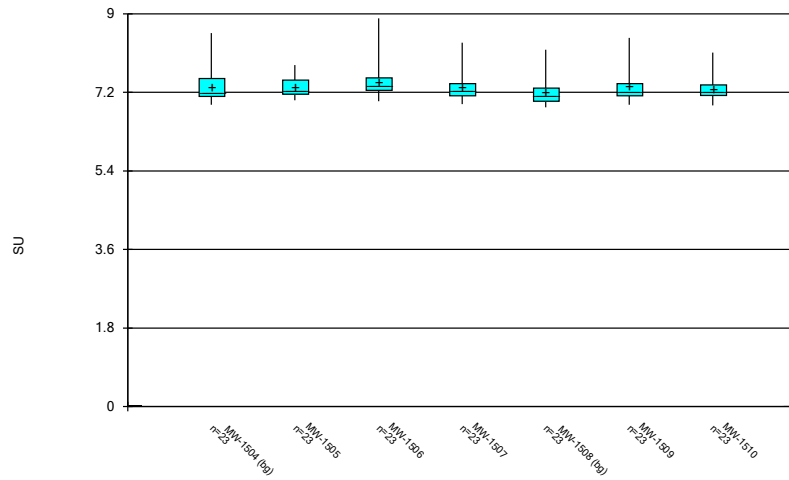
Constituent: Mercury, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



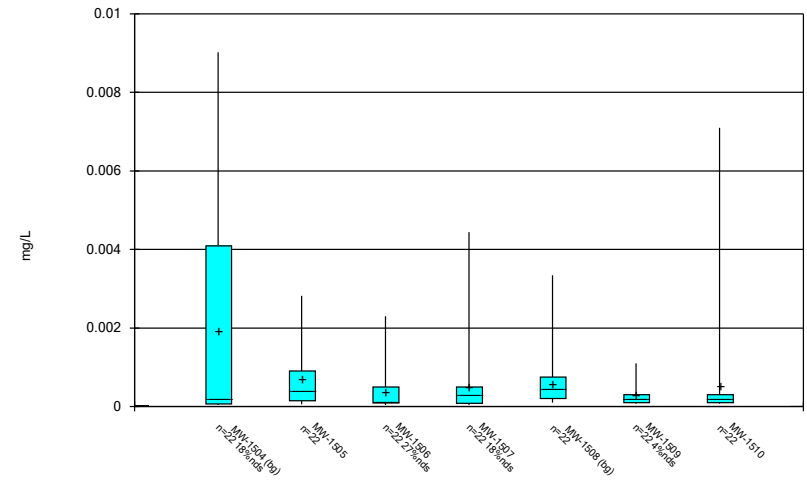
Constituent: Molybdenum, total Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



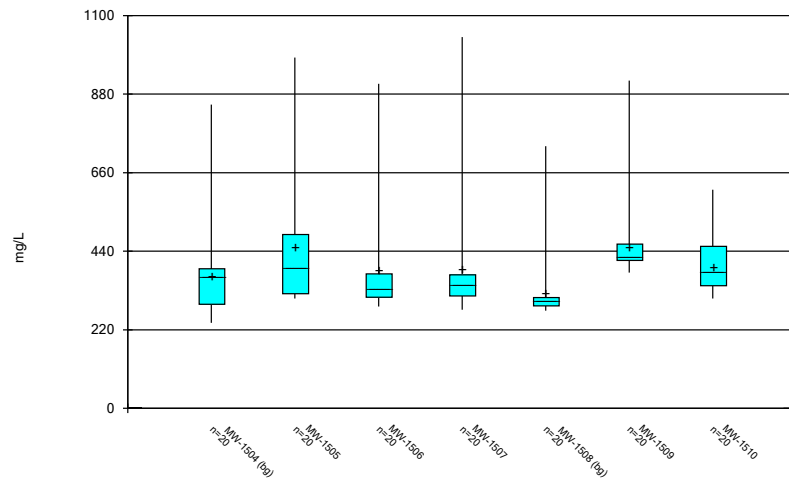
Constituent: pH, field Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



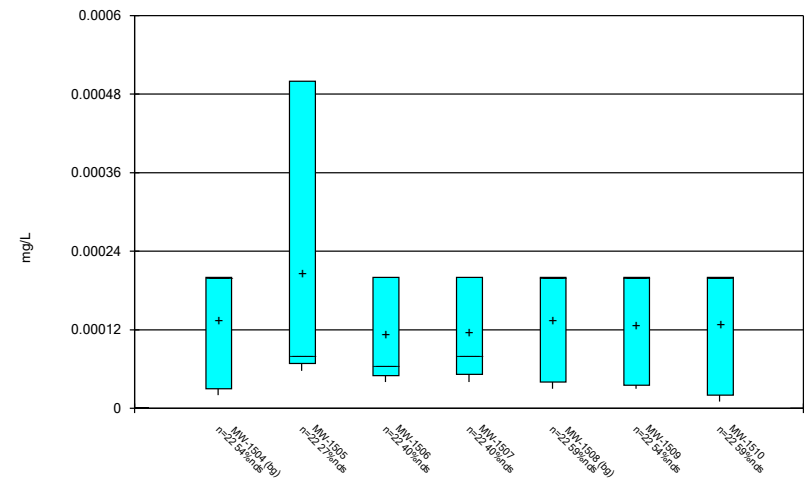
Constituent: Selenium, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



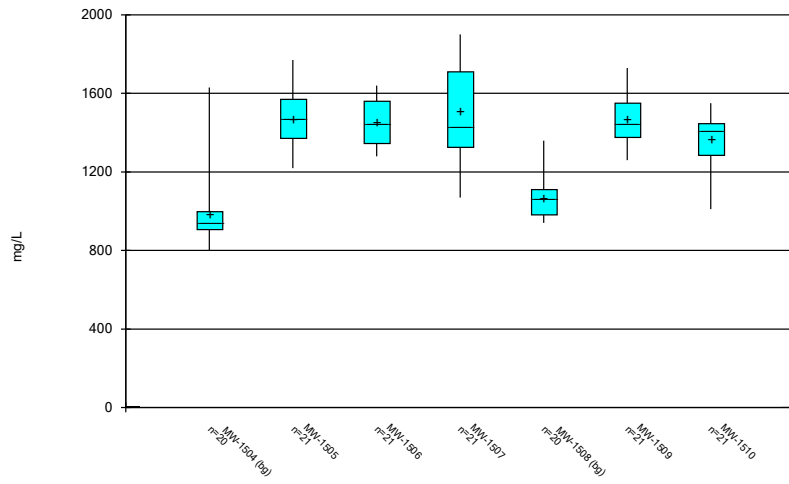
Constituent: Sulfate, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 1/10/2023 3:35 PM
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/10/2023 3:35 PM
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

FIGURE C

Outlier Summary and Tukey's Outlier Test

Outlier Summary

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/10/2023, 3:36 PM

	MW-1505 Chromium, total (mg/L)	MW-1510 Chromium, total (mg/L)	MW-1507 Combined Radium 226 + 228 (pCi/L)	MW-1508 Combined Radium 226 + 228 (pCi/L)	MW-1510 Combined Radium 226 + 228 (pCi/L)
6/14/2016	0.0332 (o)				
2/8/2017		16.587 (o)	12.465 (o)	6.828 (o)	
4/12/2018	0.0274 (o)				

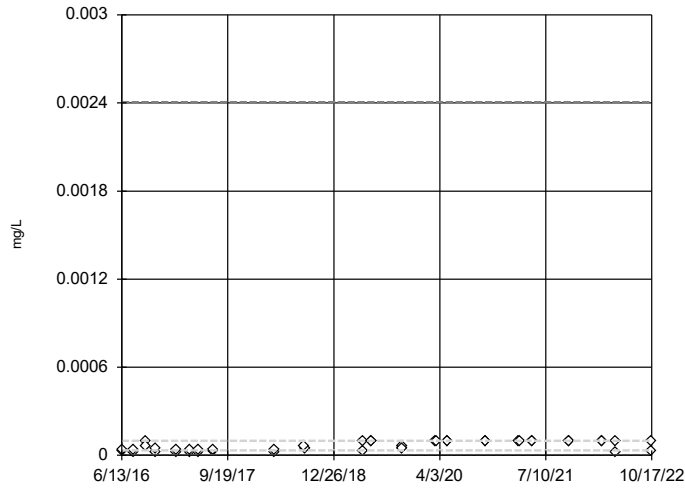
Tukey's Outlier Test - Upgradient Wells - All Results (No Significant)

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/10/2023, 3:31 PM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Antimony, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.00006523	0.00003365	ln(x)	ShapiroWilk
Arsenic, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.0005191	0.0003591	ln(x)	ShapiroWilk
Barium, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.03943	0.006363	ln(x)	ShapiroWilk
Beryllium, total (mg/L)	MW-1504,MW-1508	n/a	n/a	NP	NaN	44	0.00004361	0.00001401	unknown	ShapiroWilk
Cadmium, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.0000352	0.00001359	ln(x)	ShapiroWilk
Chromium, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.0006409	0.0004974	ln(x)	ShapiroWilk
Cobalt, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.0005758	0.0007316	ln(x)	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.9283	1.865	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	46	0.13	0.0577	ln(x)	ShapiroWilk
Lead, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.0004378	0.0005549	ln(x)	ShapiroWilk
Lithium, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.007317	0.004	ln(x)	ShapiroWilk
Mercury, total (mg/L)	MW-1504,MW-1508	n/a	n/a	NP	NaN	44	0.000004773	9.4e-7	unknown	ShapiroWilk
Molybdenum, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.0008995	0.0006742	ln(x)	ShapiroWilk
Selenium, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.001241	0.002213	ln(x)	ShapiroWilk
Thallium, total (mg/L)	MW-1504,MW-1508	No	n/a	NP	NaN	44	0.0001334	0.00007949	ln(x)	ShapiroWilk

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

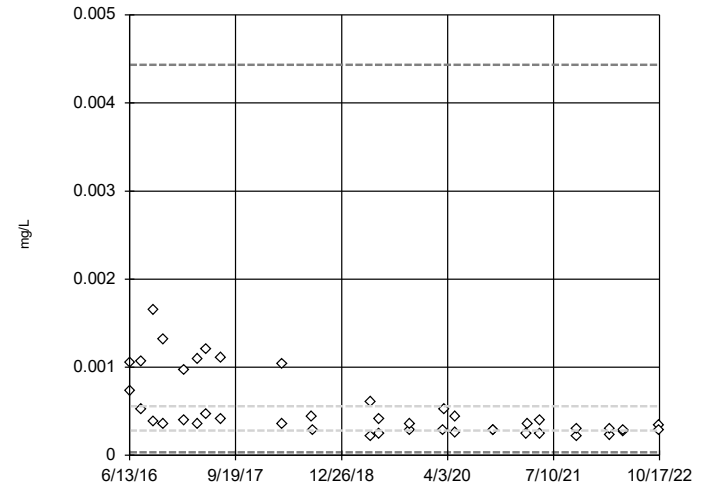


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.002406,
 low cutoff = 0.0000144,
 based on IQR multiplier of 3.

Constituent: Antimony, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

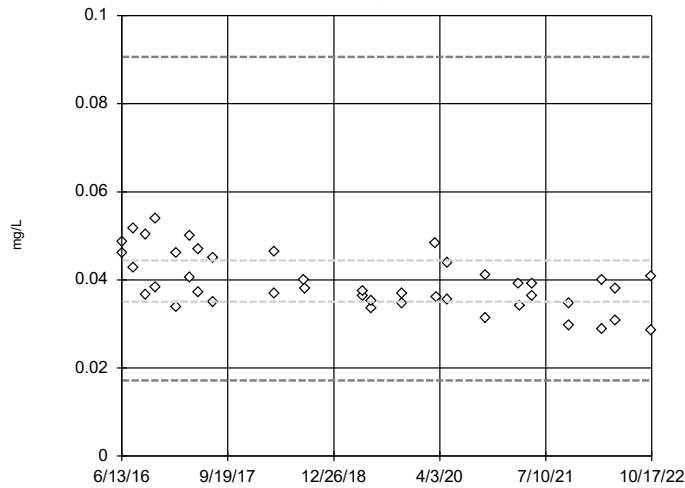


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.004434,
 low cutoff = 0.0003527,
 based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

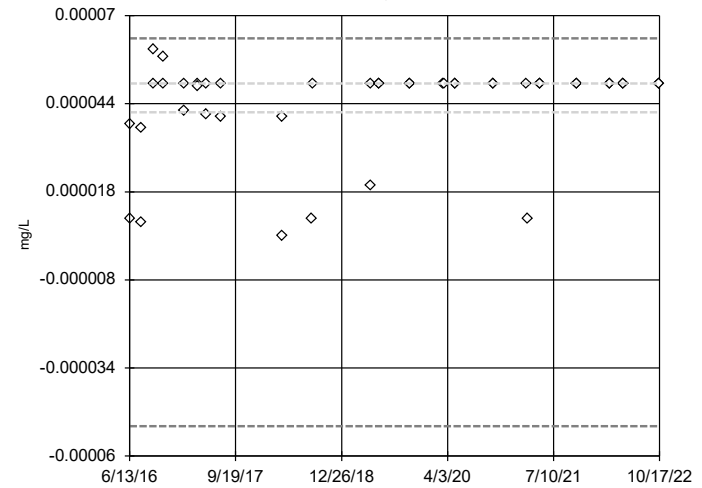


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.09063,
 low cutoff = 0.01719,
 based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

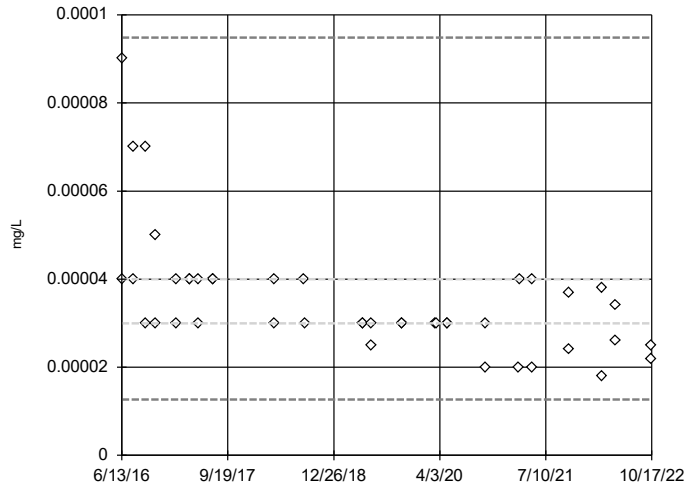


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were x⁴ transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Beryllium, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

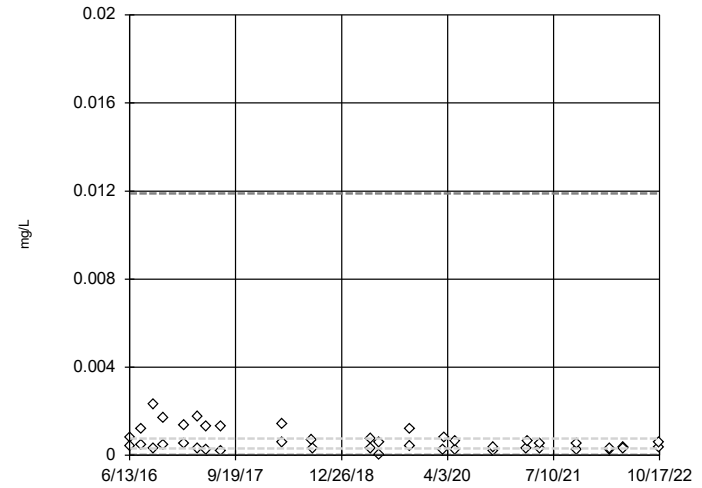


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.00009481,
 low cutoff = 0.00001266,
 based on IQR multiplier of 3.

Constituent: Cadmium, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

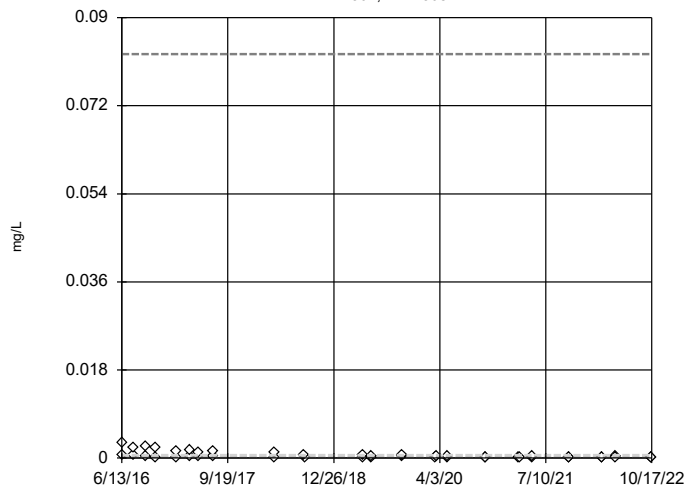


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.01189,
 low cutoff = 0.00001983,
 based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

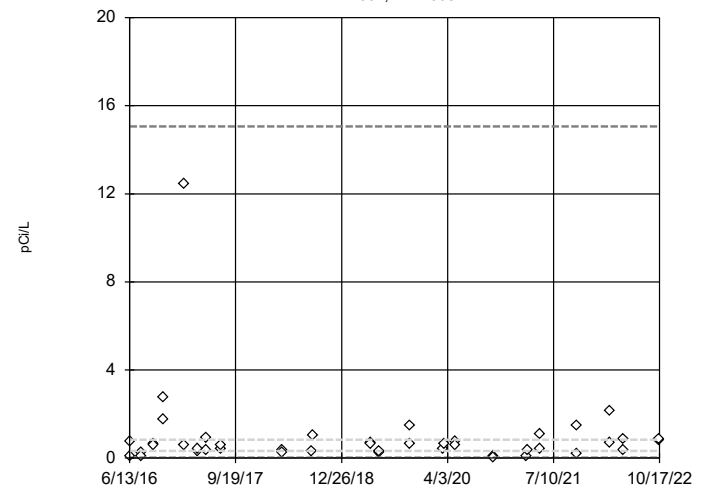


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.08255,
 low cutoff = 8.2e-7,
 based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

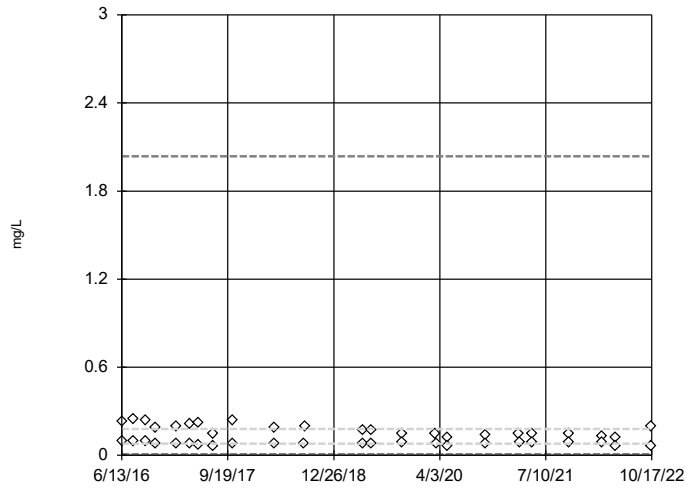


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 15.06,
 low cutoff = 0.0179,
 based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504, MW-1508

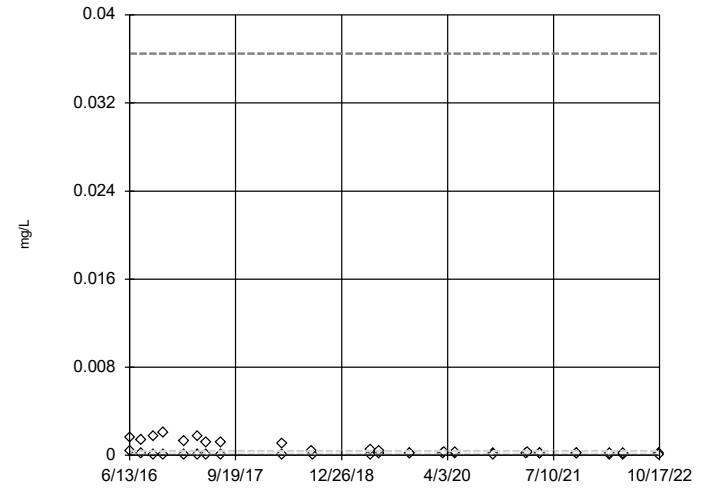


n = 46
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 2.038, low cutoff = 0.007056, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504, MW-1508

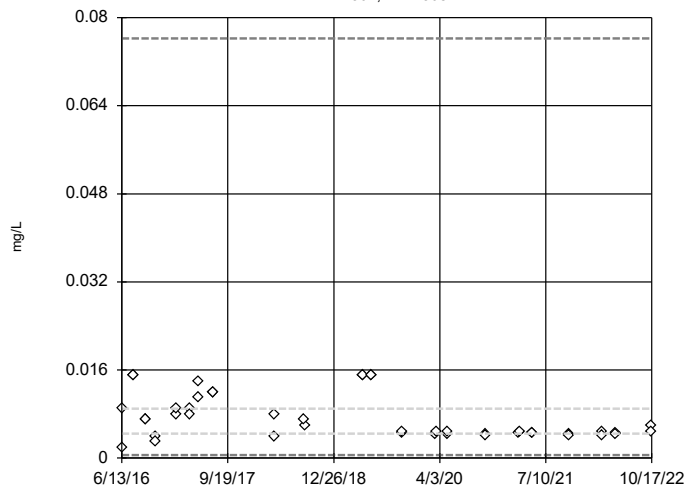


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.03648, low cutoff = 8.7e-7, based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504, MW-1508

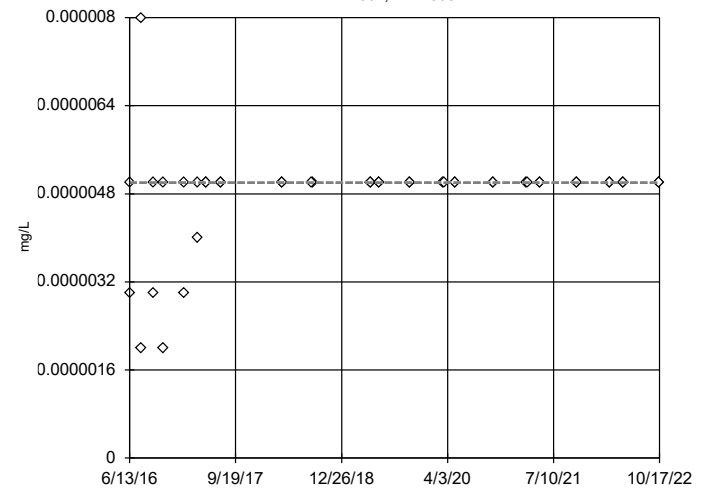


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.07624, low cutoff = 0.0005212, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504, MW-1508

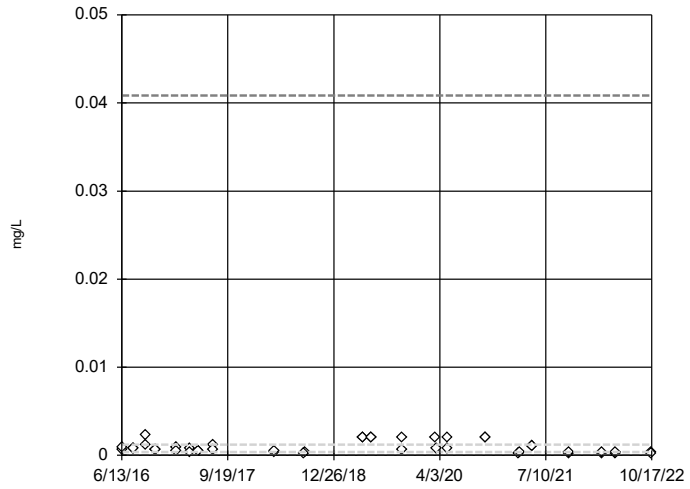


n = 44
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

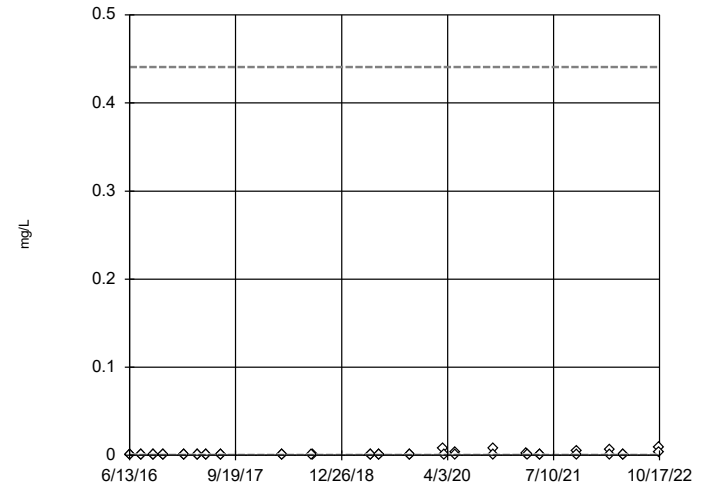


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.04083, low cutoff = 0.00001108, based on IQR multiplier of 3.

Constituent: Molybdenum, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508

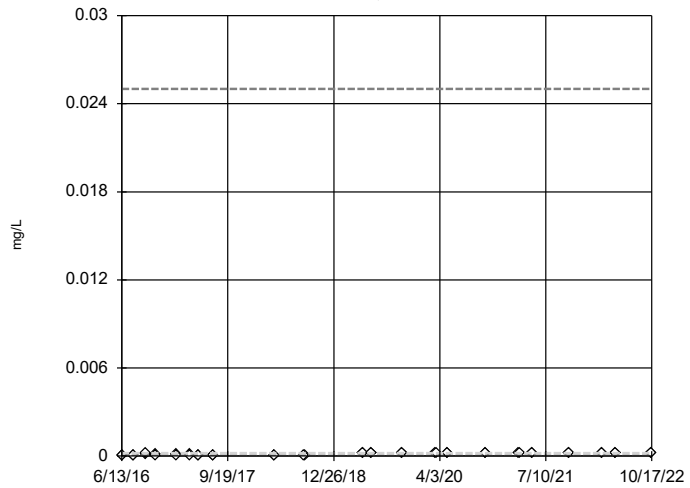


n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.4409, low cutoff = 1.8e-7, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tukey's Outlier Screening, Pooled Background

MW-1504,MW-1508



n = 44
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.025, low cutoff = 3.2e-7, based on IQR multiplier of 3.

Constituent: Thallium, total Analysis Run 1/10/2023 3:29 PM View: Upgradient Outlier Test
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

FIGURE D
Intrawell PL

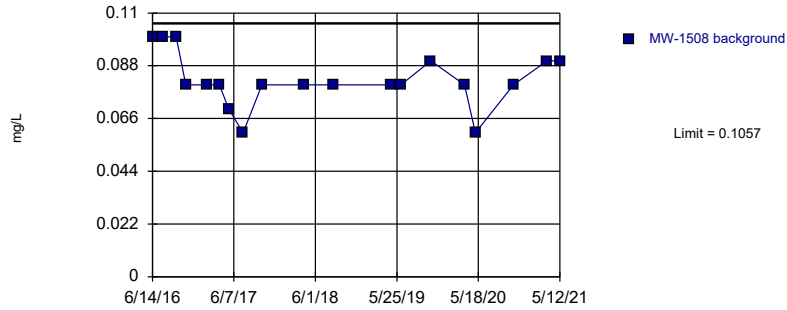
Intrawell Prediction Limits - All Results

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/13/2023, 2:48 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Fluoride, total (mg/L)	MW-1504	0.2666	n/a	n/a	1 future	n/a	19	0.1853	0.03907	0	None	No	0.001504	Param Intra 1 of 2	
Fluoride, total (mg/L)	MW-1505	0.06	n/a	n/a	1 future	n/a	19	n/a	n/a	57.89	n/a	n/a	0.004832	NP Intra (NDs) 1 of 2	
Fluoride, total (mg/L)	MW-1506	0.2	n/a	n/a	1 future	n/a	19	n/a	n/a	42.11	n/a	n/a	0.004832	NP Intra (normality) 1 of 2	
Fluoride, total (mg/L)	MW-1507	0.09498	n/a	n/a	1 future	n/a	19	0.06737	0.01327	5.263	None	No	0.001504	Param Intra 1 of 2	
Fluoride, total (mg/L)	MW-1508	0.1057	n/a	n/a	1 future	n/a	19	0.08211	0.01134	0	None	No	0.001504	Param Intra 1 of 2	
Fluoride, total (mg/L)	MW-1509	0.16	n/a	n/a	1 future	n/a	19	n/a	n/a	0	n/a	n/a	0.004832	NP Intra (normality) 1 of 2	
Fluoride, total (mg/L)	MW-1510	0.125	n/a	n/a	1 future	n/a	19	0.2564	0.04669	15.79	Kaplan-Meier	sqrt(x)	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	MW-1504	452.8	n/a	n/a	1 future	n/a	17	341.4	52.38	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	MW-1505	408	n/a	n/a	1 future	n/a	13	n/a	n/a	0	n/a	n/a	0.009692	NP Intra (normality) 1 of 2	
Sulfate, total (mg/L)	MW-1506	368.7	n/a	n/a	1 future	n/a	13	319.2	21.75	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	MW-1507	373.2	n/a	n/a	1 future	n/a	13	323.9	21.63	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	MW-1508	325.7	n/a	n/a	1 future	n/a	17	298.4	12.87	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	MW-1509	491.5	n/a	n/a	1 future	n/a	17	428.4	29.69	0	None	No	0.001504	Param Intra 1 of 2	
Sulfate, total (mg/L)	MW-1510	523.4	n/a	n/a	1 future	n/a	17	388.1	63.62	0	None	No	0.001504	Param Intra 1 of 2	

Prediction Limit

Intrawell Parametric, MW-1508 (bg)

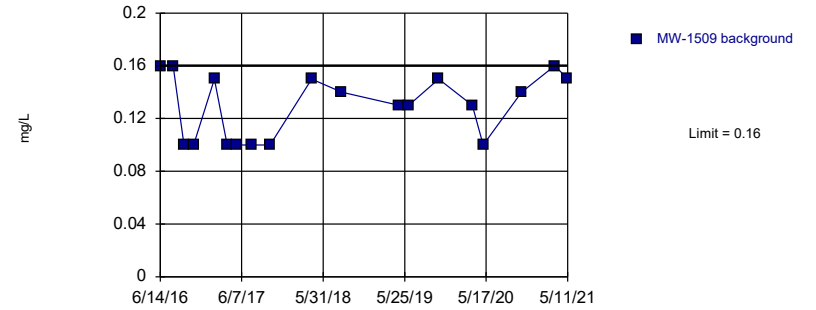


Background Data Summary: Mean=0.08211, Std. Dev.=0.01134, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8672, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Non-parametric, MW-1509

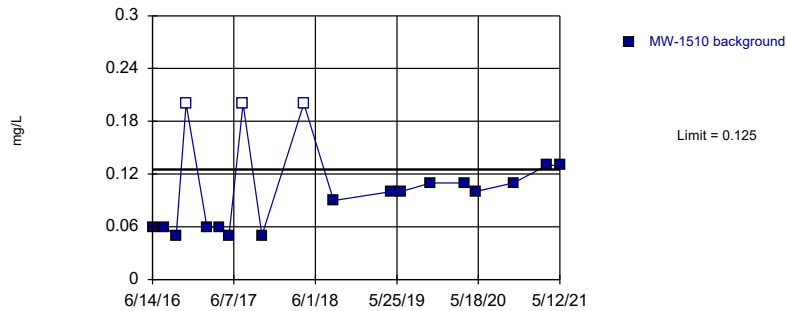


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 19 background values. Well-constituent pair annual alpha = 0.009641. Individual comparison alpha = 0.004832 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Parametric, MW-1510

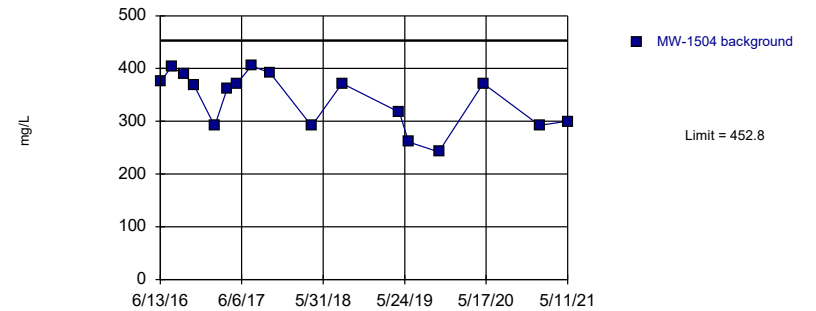


Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.2564, Std. Dev.=0.04669, n=19, 15.79% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8848, critical = 0.863. Kappa = 2.081 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Parametric, MW-1504 (bg)

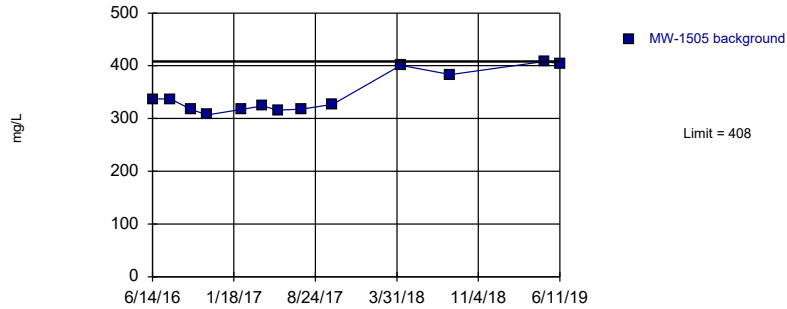


Background Data Summary: Mean=341.4, Std. Dev.=52.38, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8888, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Non-parametric, MW-1505

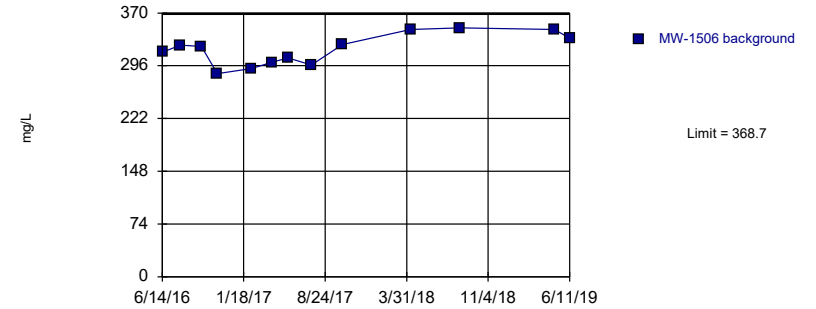


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 13 background values. Well-constituent pair annual alpha = 0.01929. Individual comparison alpha = 0.009692 (1 of 2). Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Parametric, MW-1506

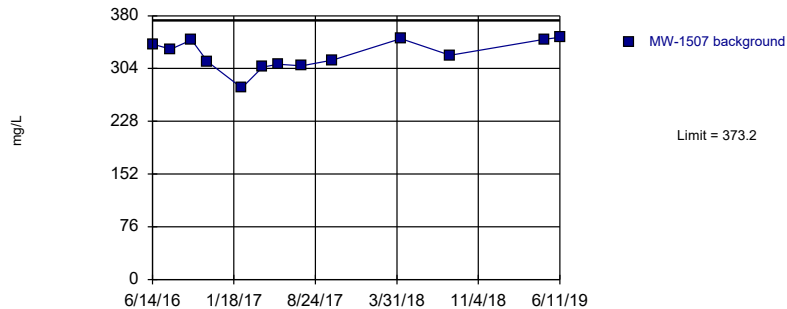


Background Data Summary: Mean=319.2, Std. Dev.=21.75, n=13. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9405, critical = 0.814. Kappa = 2.279 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Parametric, MW-1507

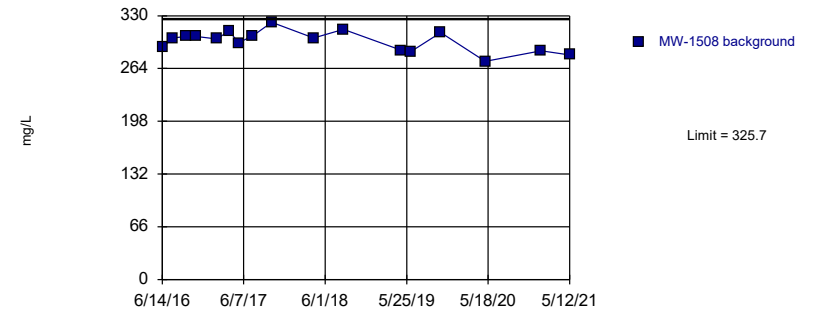


Background Data Summary: Mean=323.9, Std. Dev.=21.63, n=13. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9109, critical = 0.814. Kappa = 2.279 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Parametric, MW-1508 (bg)

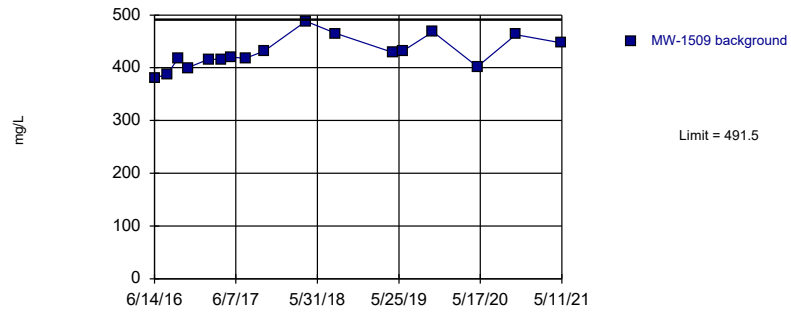


Background Data Summary: Mean=298.4, Std. Dev.=12.87, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9729, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Parametric, MW-1509

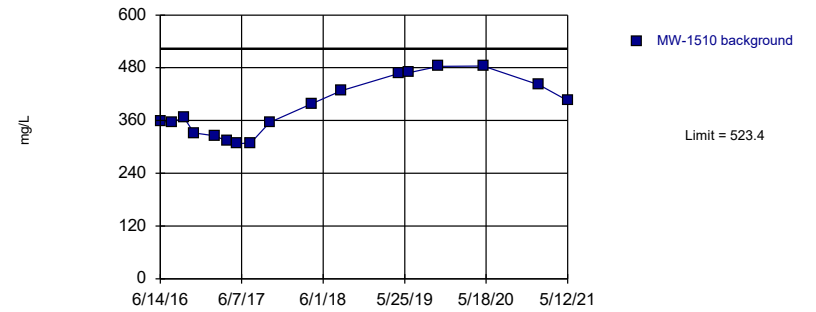


Background Data Summary: Mean=428.4, Std. Dev.=29.69, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9605, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Prediction Limit

Intrawell Parametric, MW-1510



Background Data Summary: Mean=388.1, Std. Dev.=63.62, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9067, critical = 0.851. Kappa = 2.127 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/13/2023 2:46 PM View: Appendix III - Intrawell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

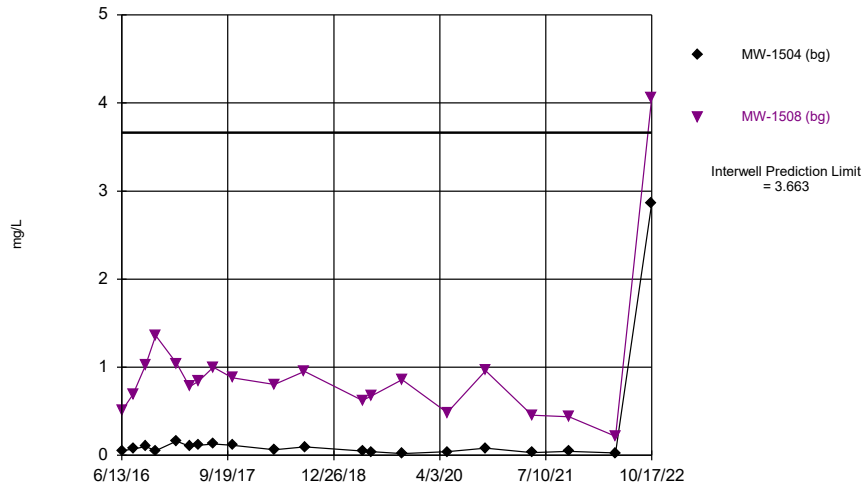
FIGURE E
Interwell PL

Interwell Prediction Limits - All Results

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/10/2023, 3:48 PM

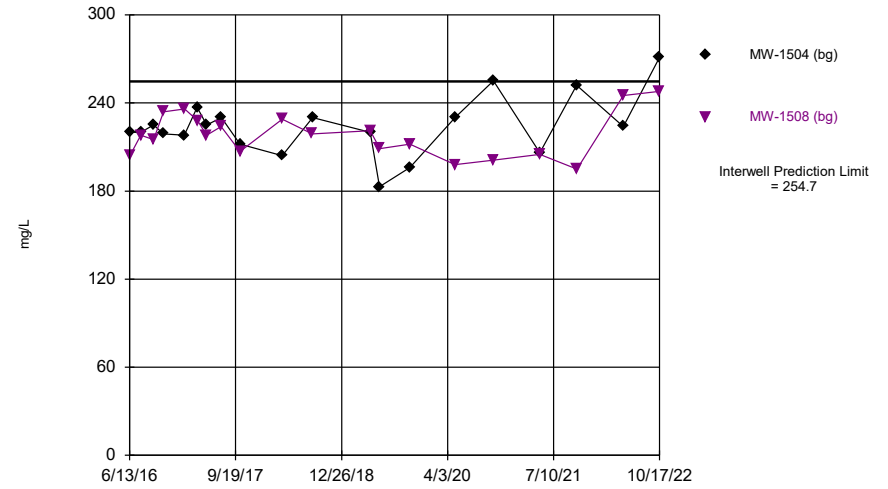
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron, total (mg/L)	n/a	3.663	n/a	n/a	5 future	n/a	40	-1.411	1.432	0	None	ln(x)	0.001504	Param Inter 1 of 2	
Calcium, total (mg/L)	n/a	254.7	n/a	n/a	5 future	n/a	40	221.1	17.75	0	None	No	0.001504	Param Inter 1 of 2	
Chloride, total (mg/L)	n/a	238	n/a	n/a	5 future	n/a	40	n/a	n/a	0	n/a	n/a	0.001136	NP Inter (normality) 1 of 2	
pH, field (SU)	n/a	8.56	6.86	n/a	5 future	n/a	46	n/a	n/a	0	n/a	n/a	0.0018	NP Inter (normality) 1 of 2	
Total Dissolved Solids [TDS] (mg/L)	n/a	1312	n/a	n/a	5 future	n/a	40	6.923	0.1356	0	None	ln(x)	0.001504	Param Inter 1 of 2	

Time Series



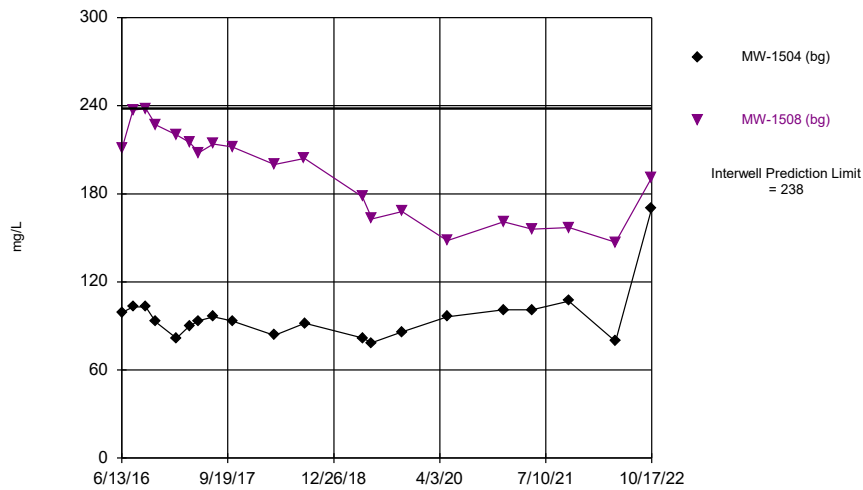
Constituent: Boron, total Analysis Run 1/10/2023 3:45 PM View: Appendix III - Interwell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



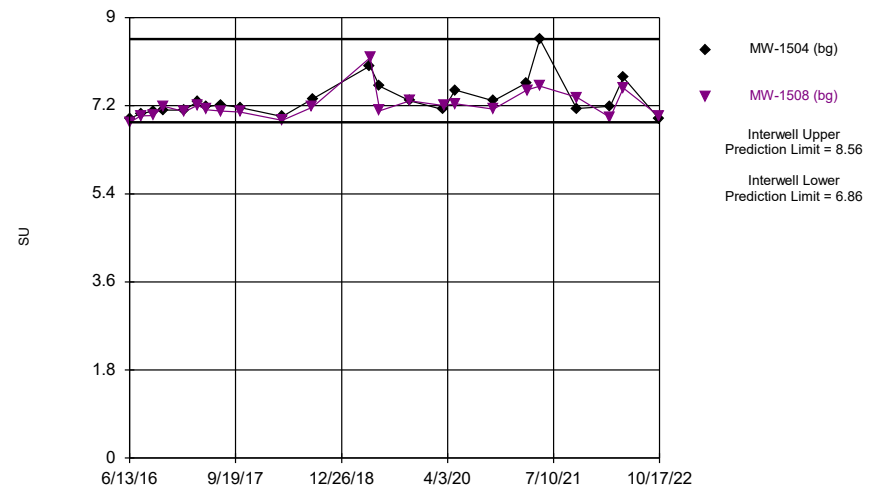
Constituent: Calcium, total Analysis Run 1/10/2023 3:46 PM View: Appendix III - Interwell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



Constituent: Chloride, total Analysis Run 1/10/2023 3:46 PM View: Appendix III - Interwell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



Constituent: pH, field Analysis Run 1/10/2023 3:46 PM View: Appendix III - Interwell Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series

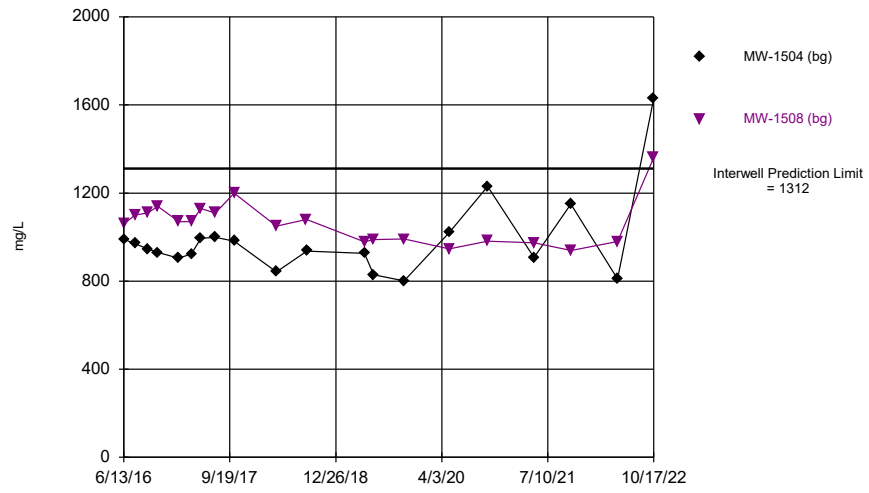


FIGURE F
UTL

Upper Tolerance Limit Summary Table

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/10/2023, 4:38 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.0001	n/a	n/a	n/a	n/a 44	n/a	n/a	45.45	n/a	n/a	0.1047	NP Inter(normality)
Arsenic, total (mg/L)	n/a	0.00165	n/a	n/a	n/a	n/a 44	n/a	n/a	0	n/a	n/a	0.1047	NP Inter(normality)
Barium, total (mg/L)	n/a	0.05279	n/a	n/a	n/a	n/a 44	0.03943	0.006363	0	None	No	0.05	Inter
Beryllium, total (mg/L)	n/a	0.00006	n/a	n/a	n/a	n/a 44	n/a	n/a	65.91	n/a	n/a	0.1047	NP Inter(NDs)
Cadmium, total (mg/L)	n/a	0.00009	n/a	n/a	n/a	n/a 44	n/a	n/a	2.273	n/a	n/a	0.1047	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.001892	n/a	n/a	n/a	n/a 44	0.08141	0.02015	0	None	x^(1/3)	0.05	Inter
Cobalt, total (mg/L)	n/a	0.002508	n/a	n/a	n/a	n/a 44	0.07102	0.0309	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	2.013	n/a	n/a	n/a	n/a 43	0.7492	0.318	0	None	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	n/a	0.25	n/a	n/a	n/a	n/a 46	n/a	n/a	0	n/a	n/a	0.09447	NP Inter(normality)
Lead, total (mg/L)	n/a	0.003443	n/a	n/a	n/a	n/a 44	-8.955	1.565	22.73	Kaplan-Meier	ln(x)	0.05	Inter
Lithium, total (mg/L)	n/a	0.015	n/a	n/a	n/a	n/a 44	n/a	n/a	13.64	n/a	n/a	0.1047	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.000008	n/a	n/a	n/a	n/a 44	n/a	n/a	84.09	n/a	n/a	0.1047	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.00231	n/a	n/a	n/a	n/a 44	n/a	n/a	20.45	n/a	n/a	0.1047	NP Inter(normality)
Selenium, total (mg/L)	n/a	0.00902	n/a	n/a	n/a	n/a 44	n/a	n/a	9.091	n/a	n/a	0.1047	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.0002	n/a	n/a	n/a	n/a 44	n/a	n/a	56.82	n/a	n/a	0.1047	NP Inter(NDs)

FIGURE G
GWPS

MITCHELL BAP GWPS				
Constituent Name	Compliance Limit	CCR-Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.0001	0.006
Arsenic, Total (mg/L)	0.01		0.0017	0.01
Barium, Total (mg/L)	2		0.053	2
Beryllium, Total (mg/L)	0.004		0.00006	0.004
Cadmium, Total (mg/L)	0.005		0.00009	0.005
Chromium, Total (mg/L)	0.1		0.0019	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.0025	0.006
Combined Radium, Total (pCi/L)	5		2.01	5
Fluoride, Total (mg/L)	4		0.25	4
Lead, Total (mg/L)	n/a	0.015	0.0034	0.015
Lithium, Total (mg/L)	n/a	0.04	0.015	0.04
Mercury, Total (mg/L)	0.002		0.000008	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0023	0.1
Selenium, Total (mg/L)	0.05		0.009	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**GWPS = Groundwater Protection Standard*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

FIGURE H
Confidence Intervals

Confidence Intervals - All Results (No Significant)

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/10/2023, 4:41 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	MW-1505	0.00005	0.00003	0.006	No	22	0.00004136	0.0000191	9.091	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1506	0.00005	0.00003	0.006	No	22	0.00004273	0.00003341	4.545	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1507	0.00008	0.00003	0.006	No	22	0.00005591	0.00003112	4.545	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1509	0.00005	0.00002	0.006	No	22	0.00003227	0.00001412	4.545	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1510	0.00003	0.00002	0.006	No	22	0.00002545	0.000009117	9.091	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1505	0.00078	0.00032	0.01	No	22	0.0007323	0.0008101	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1506	0.0007302	0.000399	0.01	No	22	0.0006059	0.0003711	0	None	x^(1/3)	0.01	Param.
Arsenic, total (mg/L)	MW-1507	0.00167	0.00041	0.01	No	22	0.001255	0.00131	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1509	0.0004722	0.0003523	0.01	No	22	0.0004123	0.0001117	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1510	0.000466	0.0003177	0.01	No	22	0.0004	0.0001477	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1505	0.05262	0.04273	2	No	22	0.04808	0.009937	0	None	x^(1/3)	0.01	Param.
Barium, total (mg/L)	MW-1506	0.05813	0.04905	2	No	22	0.05359	0.008465	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1507	0.07153	0.05318	2	No	22	0.06314	0.01814	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1509	0.05603	0.04646	2	No	22	0.05125	0.008918	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1510	0.04249	0.03512	2	No	22	0.0388	0.006857	0	None	No	0.01	Param.
Beryllium, total (mg/L)	MW-1505	0.00005	0.00001	0.004	No	22	0.00004132	0.0000033	45.45	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	MW-1506	0.00005	0.00001	0.004	No	22	0.00003014	0.0000183	36.36	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	MW-1507	0.00007016	0.00002103	0.004	No	22	0.00006123	0.00005372	31.82	Kaplan-Meier	sqrt(x)	0.01	Param.
Beryllium, total (mg/L)	MW-1509	0.00005	0.00001	0.004	No	22	0.00003577	0.00001946	63.64	Kaplan-Meier	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1510	0.00005	0.000015	0.004	No	22	0.00003364	0.0000187	54.55	Kaplan-Meier	No	0.01	NP (NDs)
Cadmium, total (mg/L)	MW-1505	0.00003	0.000022	0.005	No	22	0.00002745	0.000006954	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1506	0.000022	0.000014	0.005	No	22	0.00002041	0.000008399	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1507	0.00004419	0.00003033	0.005	No	22	0.00003895	0.00001505	0	None	ln(x)	0.01	Param.
Cadmium, total (mg/L)	MW-1509	0.00002	0.00001	0.005	No	22	0.00001582	0.000006752	13.64	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1510	0.00001	0.000005	0.005	No	22	0.00001827	0.00001996	27.27	None	No	0.01	NP (normality)
Chromium, total (mg/L)	MW-1505	0.00493	0.000567	0.1	No	21	0.002635	0.003563	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	MW-1506	0.001703	0.0007231	0.1	No	22	0.001529	0.001318	0	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-1507	0.007274	0.001997	0.1	No	22	0.006038	0.006493	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	MW-1509	0.001179	0.0006038	0.1	No	22	0.001064	0.0009655	0	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-1510	0.0021	0.000655	0.1	No	21	0.001585	0.001633	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	MW-1505	0.0005242	0.0002021	0.006	No	22	0.0005075	0.0006195	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1506	0.0006433	0.0003071	0.006	No	22	0.0004752	0.0003131	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1507	0.001282	0.0003978	0.006	No	22	0.001243	0.001345	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1509	0.0003074	0.0001662	0.006	No	22	0.0002368	0.0001315	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1510	0.0002356	0.0001399	0.006	No	22	0.0001877	0.00008915	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1505	1.031	0.5613	5	No	22	0.7963	0.4377	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1506	1.076	0.5101	5	No	22	0.7929	0.5268	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1507	1.315	0.7128	5	No	21	1.014	0.5458	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1509	1.181	0.6023	5	No	22	0.9476	0.5945	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1510	0.8616	0.4704	5	No	21	0.666	0.3546	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1505	0.15	0.03	4	No	23	0.103	0.06003	60.87	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	MW-1506	0.15	0.04	4	No	23	0.09217	0.05283	43.48	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	MW-1507	0.07102	0.05855	4	No	23	0.06478	0.01192	8.696	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1509	0.1386	0.1084	4	No	23	0.1235	0.02886	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1510	0.1085	0.08156	4	No	23	0.09217	0.02746	13.04	None	x^2	0.01	Param.
Lead, total (mg/L)	MW-1505	0.000434	0.0001	0.015	No	22	0.0004749	0.0008515	13.64	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1506	0.0004349	0.0001779	0.015	No	22	0.000339	0.0002904	0	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1507	0.00156	0.000217	0.015	No	22	0.001114	0.001437	9.091	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1509	0.0001603	0.0000661	0.015	No	22	0.0001132	0.00008772	0	None	No	0.01	Param.
Lead, total (mg/L)	MW-1510	0.000159	0.00008538	0.015	No	22	0.0001316	0.00008228	0	None	x^(1/3)	0.01	Param.
Lithium, total (mg/L)	MW-1505	0.008933	0.006009	0.04	No	22	0.007867	0.003353	4.545	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	MW-1506	0.015	0.00774	0.04	No	22	0.01058	0.003887	4.545	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1507	0.01369	0.009039	0.04	No	22	0.01175	0.004847	4.545	None	x^(1/3)	0.01	Param.
Lithium, total (mg/L)	MW-1509	0.014	0.008846	0.04	No	22	0.01142	0.004803	4.545	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1510	0.01194	0.007574	0.04	No	22	0.009758	0.00407	0	None	No	0.01	Param.

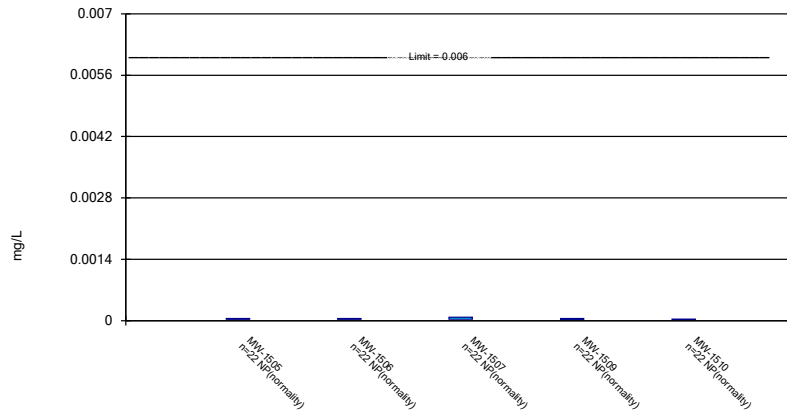
Confidence Intervals - All Results (No Significant)

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/10/2023, 4:41 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Mercury, total (mg/L)	MW-1505	0.000005	0.000002	0.002	No	22	0.000005136	0.000001983	77.27	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1506	0.000005	0.000003	0.002	No	22	0.000004273	0.000001202	68.18	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1507	0.000005107	0.000002348	0.002	No	22	0.000006545	0.000005106	40.91	Kaplan-Meier	ln(x)	0.01	Param.
Mercury, total (mg/L)	MW-1509	0.000005	0.000002	0.002	No	22	0.0000045	0.000001225	77.27	Kaplan-Meier	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1510	0.000019	0.000003	0.002	No	22	0.000005273	0.00000321	81.82	Kaplan-Meier	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	MW-1505	0.001263	0.000511	0.1	No	22	0.001193	0.001506	13.64	None	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1506	0.001154	0.0006294	0.1	No	22	0.0009373	0.0005299	0	None	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1507	0.002118	0.0007567	0.1	No	22	0.002105	0.002786	4.545	None	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1509	0.0007818	0.0003685	0.1	No	22	0.0009886	0.0007152	22.73	Kaplan-Meier	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	MW-1510	0.0005845	0.000289	0.1	No	22	0.0009909	0.0008948	27.27	Kaplan-Meier	ln(x)	0.01	Param.
Selenium, total (mg/L)	MW-1505	0.000826	0.0002224	0.05	No	22	0.0006936	0.0008477	0	None	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	MW-1506	0.0001429	0.00004547	0.05	No	22	0.0003732	0.0005423	27.27	Kaplan-Meier	ln(x)	0.01	Param.
Selenium, total (mg/L)	MW-1507	0.0002279	0.00006688	0.05	No	22	0.0004764	0.0009087	18.18	Kaplan-Meier	ln(x)	0.01	Param.
Selenium, total (mg/L)	MW-1509	0.0003408	0.00015	0.05	No	22	0.0003082	0.000289	4.545	None	ln(x)	0.01	Param.
Selenium, total (mg/L)	MW-1510	0.0003	0.0001	0.05	No	22	0.0005305	0.001474	0	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1505	0.000464	0.000067	0.002	No	22	0.000208	0.000201	27.27	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1506	0.0002	0.00005	0.002	No	22	0.0001141	0.00007351	40.91	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1507	0.0002	0.000053	0.002	No	22	0.0001178	0.0000712	40.91	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1509	0.0002	0.00004	0.002	No	22	0.0001262	0.00008296	54.55	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1510	0.0002	0.00002	0.002	No	22	0.000128	0.00008905	59.09	None	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

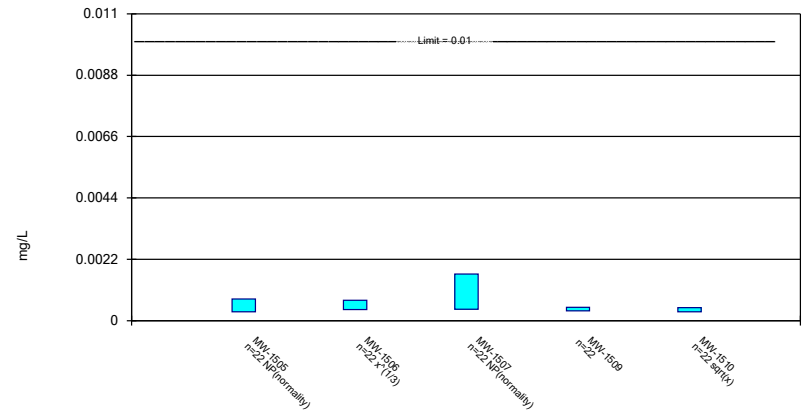
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

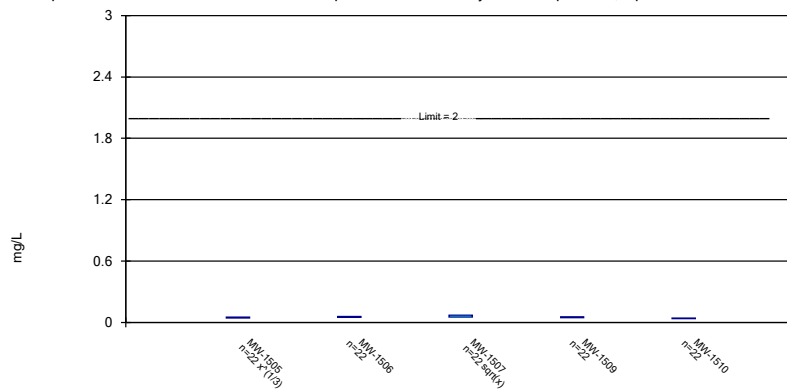
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric Confidence Interval

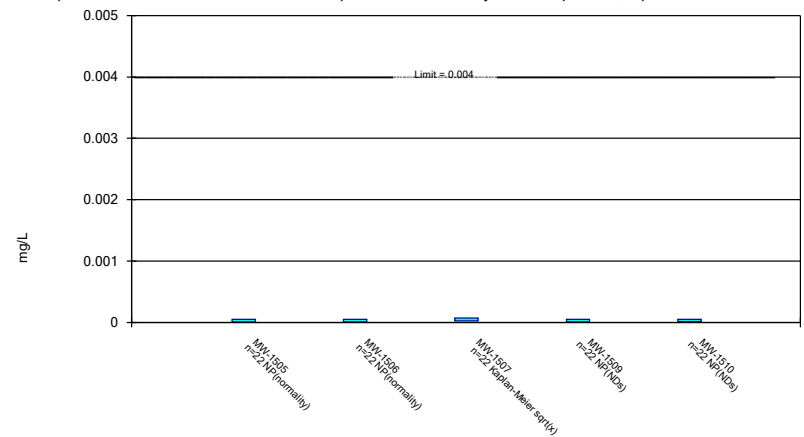
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

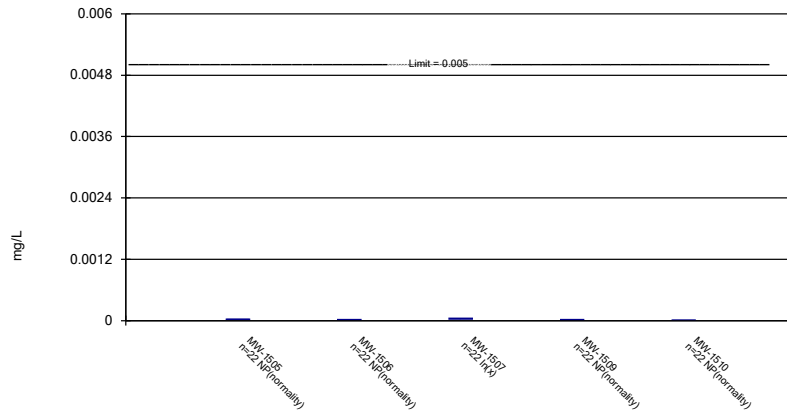
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

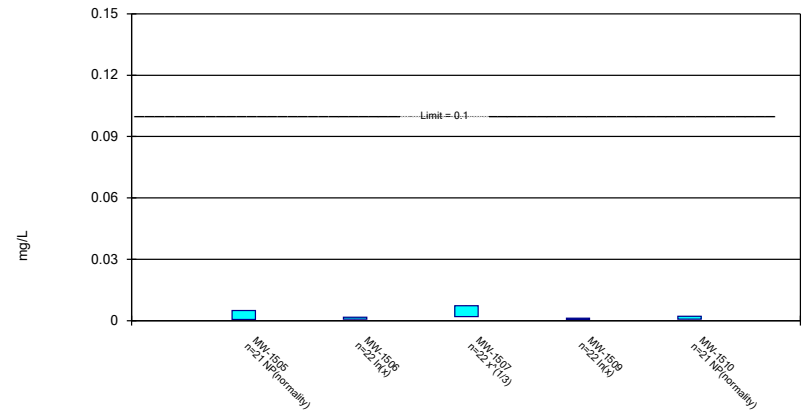
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

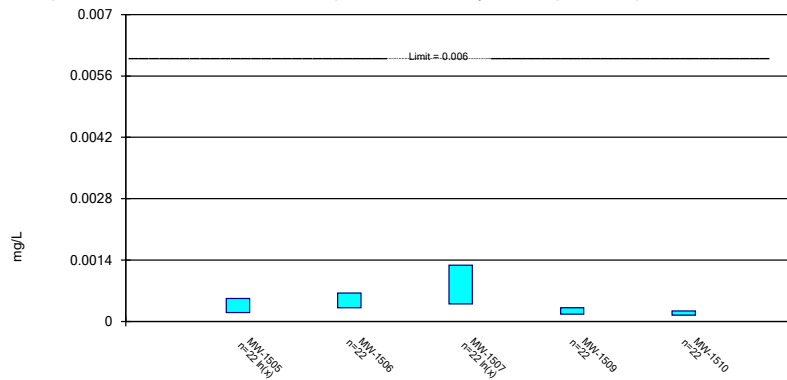
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric Confidence Interval

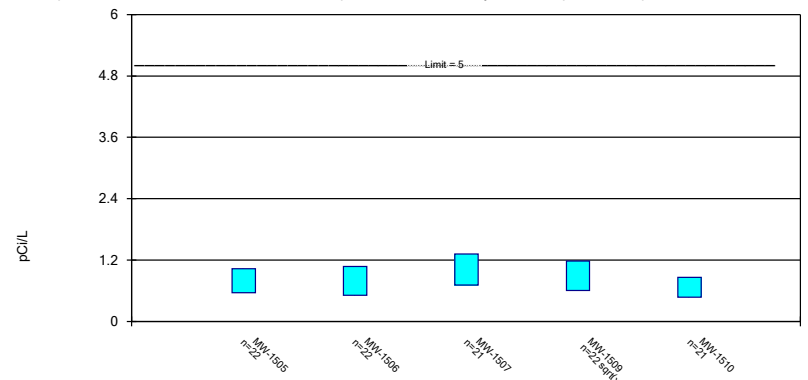
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric Confidence Interval

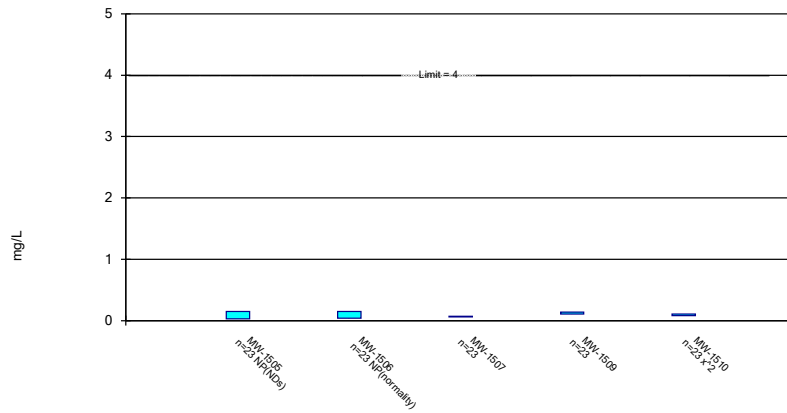
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Constituent: Combined Radium 226 + 228 Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

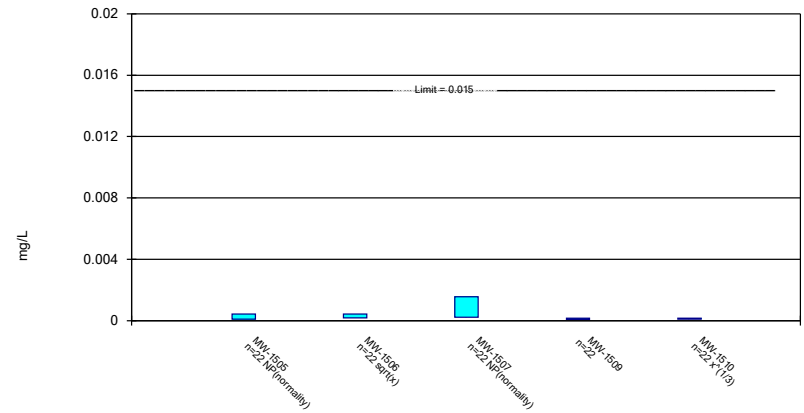
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Constituent: Fluoride, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

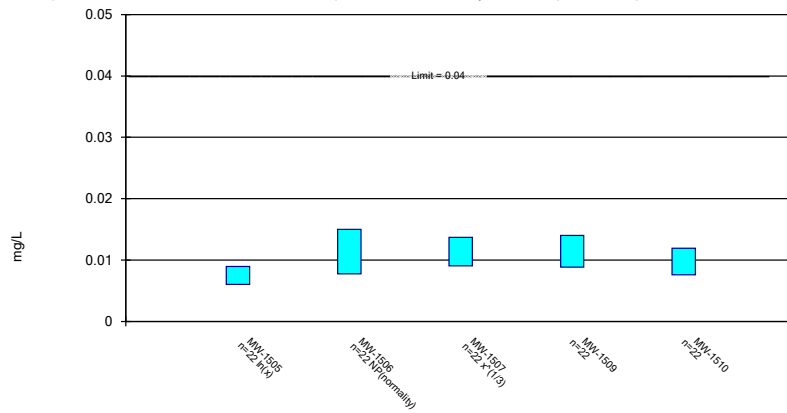
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

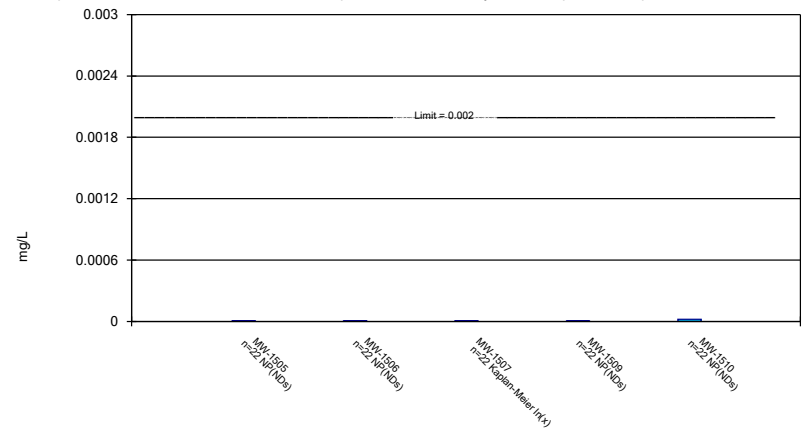
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

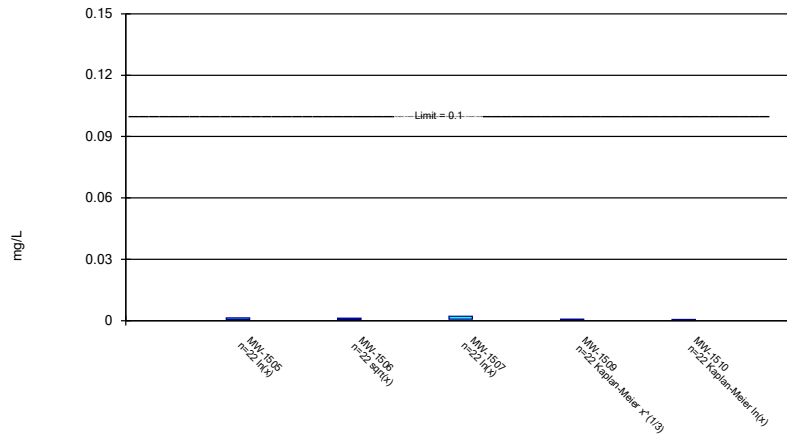
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric Confidence Interval

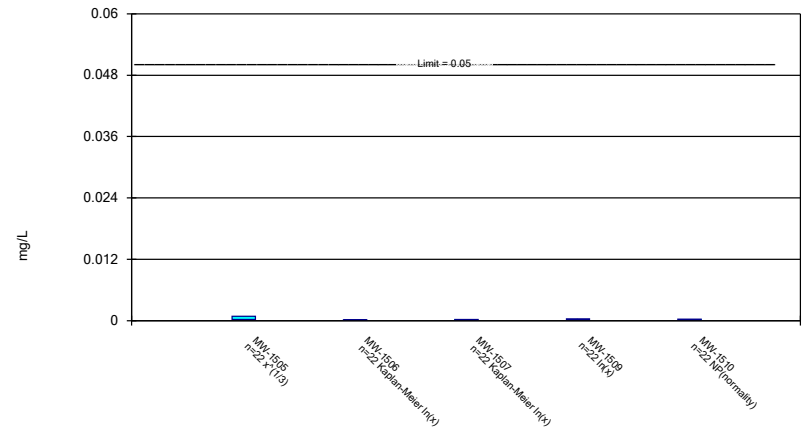
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

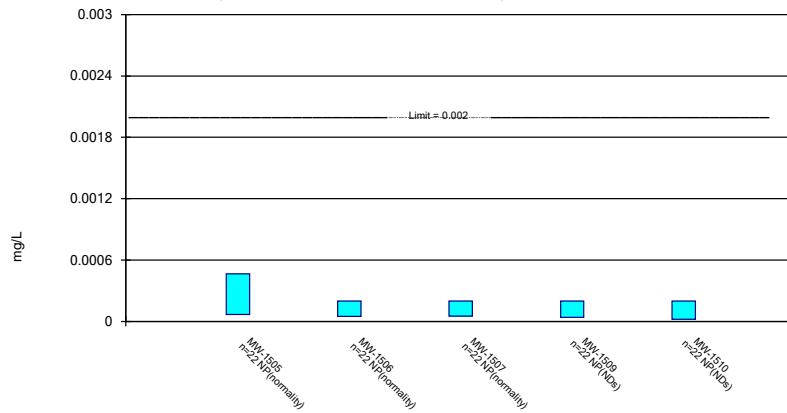
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 1/10/2023 4:40 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 1/10/2023 4:41 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

STATISTICAL ANALYSIS SUMMARY, BOTTOM ASH POND

Mitchell Plant

Moundsville, West Virginia

Prepared for

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Columbus, Ohio 43215-2372

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August 29, 2023

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LIST OF ATTACHMENTS

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

ACRONYMS AND ABBREVIATIONS

BAP	bottom ash pond
CCR	coal combustion residuals
CFR	code of federal regulations
GWPS	groundwater protection standard
LCL	lower confidence limit
LPL	lower prediction limit
mg/L	milligrams per liter
pCi/L	picocuries per liter
QA/QC	quality assurance/quality control
SSI	statistically significant increase
SSL	statistically significant level
SU	standard units
TDS	total dissolved solids
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (Code of Federal Regulations [CFR] Title 40, Section 257, Subpart D), groundwater monitoring has been conducted at the Bottom Ash Pond (BAP), an existing CCR unit at the Mitchell Power Plant in Moundsville, West Virginia. Recent groundwater monitoring results were used to identify 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, and total dissolved solids (TDS), at the BAP. An alternative source was not identified following the detection monitoring events; thus, the BAP has been in assessment monitoring since 2018. During the most recent assessment monitoring event, completed in October 2022, Appendix III detections of boron, calcium, chloride, pH, and TDS were observed above background levels and the unit remained in assessment monitoring (Geosyntec 2023).

An annual sampling event for Appendix IV parameters required by 40 CFR 257.95(b) was completed in March 2023, and a semiannual sampling event for Appendix III and Appendix IV parameters required by 40 CFR 257.95(d)(1) was completed in May 2023. The results of these annual and semiannual assessment monitoring events are documented in this report.

Prior to conducting the statistical analyses, 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 the usability of the data were identified.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether any were present at concentrations above previously established GWPSs. No statistically significant levels (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. BOTTOM ASH POND EVALUATION

2.1 Data Validation and QA/QC

During the assessment monitoring program in 2023, two sets of samples were collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(b) (March 2023) and 40 CFR 257.95(d)(1) (May 2023). Samples from the May 2023 sample event were analyzed for all Appendix III and Appendix IV parameters, whereas samples from the March 2023 event were analyzed for Appendix IV parameters only. A summary of data collected during these assessment monitoring events may be found in Table 1.

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

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.36 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 BAP were conducted in accordance with the October 2020 *Statistical Analysis Plan* (Geosyntec Consultants, Inc. [Geosyntec] 2020). Time series plots and results for all completed statistical tests are provided in Attachment B.

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

2.2.1 Evaluation of Potential Appendix IV SSLs

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

No SSLs were identified at the Mitchell BAP.

2.2.2 Evaluation of Potential Appendix III SSIs

A review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data

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

- Boron concentrations were above the interwell UPL of 3.66 mg/L at MW-1506 (6.13 mg/L), MW-1507 (4.65 mg/L), MW-1509 (5.55 mg/L), and MW-1510 (4.00 mg/L).
- Chloride concentrations were above the interwell UPL of 238 mg/L at MW-1510 (258 mg/L).
- Sulfate concentrations were above the intrawell UPL of 408 mg/L at MW-1505 (538 mg/L), the intrawell UPL of 369 mg/L at MW-1506 (840 mg/L), the intrawell UPL of 373 mg/L at MW-1507 (592 mg/L), the intrawell UPL of 492 mg/L at MW-1509 (776 mg/L), and the intrawell UPL of 523 mg/L at MW-1510 (859 mg/L).
- TDS concentrations were above the interwell UPL of 1,310 mg/L at MW-1506 (1,620 mg/L), MW-1509 (1,550 mg/L), and MW-1510 (1,810 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the May 2023 sample was above the UPL or below the lower prediction limit for the case of pH. 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

An annual and a semiannual assessment monitoring event were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. A review of outliers identified no potential outliers in the March 2023 and May 2023 data. 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.

The Appendix III results were evaluated to assess whether concentrations of Appendix III parameters exceeded background levels. Boron, chloride, sulfate, and TDS results were above background levels at select downgradient wells. Based on this evaluation, the Mitchell BAP CCR unit will remain in assessment monitoring.

3. REFERENCES

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

Geosyntec. 2023. Statistical Analysis Summary – Bottom Ash Pond, Mitchell Plant, Moundsville, West Virginia. Geosyntec Consultants, Inc. February.

TABLES

**Table 1: Groundwater Data Summary
Statistical Analysis Summary
Mitchell Plant - Bottom Ash Pond**

Parameter	Unit	MW-1504		MW-1505		MW-1506		MW-1507		MW-1508		MW-1509		MW-1510	
		3/21/2023	5/17/2023	3/22/2023	5/17/2023	3/22/2023	5/17/2023	3/22/2023	5/16/2023	3/21/2023	5/16/2023	3/21/2023	5/16/2023	3/21/2023	5/16/2023
Antimony	µg/L	0.02 J1	0.018 J1	0.036 J1	0.026 J1	0.030 J1	0.028 J1	0.028 J1	0.026 J1	0.1 U1	0.017 J1	0.03 J1	0.026 J1	0.02 J1	0.019 J1
Arsenic	µg/L	0.36	0.26	0.43	0.22	0.27	0.22	0.24	0.19	0.24	0.32	0.25	0.37	0.22	0.26
Barium	µg/L	24.4	23.4	25.6	17.8	35.3	26.8	25.2	19.8	23.1	21.5	28.2	24.8	32.9	31.8
Beryllium	µg/L	0.011 J1	0.05 U1	0.011 J1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.010 J1	0.05 U1	0.05 U1
Boron	mg/L	--	4.16	--	3.39	--	6.13	--	4.65	--	5.11	--	5.55	--	4.00
Cadmium	µg/L	0.061	0.030	0.013 J1	0.009 J1	0.024	0.010 J1	0.015 J1	0.011 J1	0.036	0.030	0.009 J1	0.010 J1	0.007 J1	0.007 J1
Calcium	mg/L	--	171	--	147	--	247	--	167	--	265	--	171	--	222
Chloride	mg/L	--	245	--	150	--	157	--	145	--	173	--	177	--	258
Chromium	µg/L	0.53	0.35	0.49	0.29 J1	0.32	0.40	0.79	0.94	0.38	0.58	0.64	0.45	0.40	0.39
Cobalt	µg/L	--	0.189	0.178	0.074	0.133	0.093	0.051	0.050	--	0.634	--	0.286	--	0.168
Combined Radium	pCi/L	0.55	0.55	2.22	0.95	1.48	0.26	0.73	0.85	0.55	0.61	1.10	0.59	1.32	0.22
Fluoride	mg/L	0.20	0.17	0.02 J1	0.15 U1	0.05 J1	0.05 J1	0.03 J1	0.04 J1	0.08	0.08	0.09	0.1 J1	0.08 J1	0.09 J1
Lead	µg/L	0.24	0.12 J1	0.27	0.08 J1	0.30	0.2 U1	0.2 U1	0.2 U1	0.07 J1	0.11 J1	0.05 J1	0.22	0.52	0.06 J1
Lithium	mg/L	0.00575	0.0047	0.0076	0.0056	0.0087	0.0074	0.0092	0.0077	0.00506	0.0045	0.0118	0.0087	0.00818	0.0077
Mercury	µg/L	0.0020 J1	0.005 U1	0.0052	0.003 J1	0.0042 J1	0.005 U1	0.0036 J1	0.005 U1	0.0016 J1	0.005 U1	0.003 J1	0.005 U1	0.0134	0.014
Molybdenum	µg/L	0.3 J1	0.3 J1	0.1 J1	0.5 U1	0.4 J1	0.2 J1	0.8	0.3 J1	0.2 J1	0.4 J1	0.4 J1	0.3 J1	0.2 J1	0.2 J1
Selenium	µg/L	8.75	9.17	1.29	3.76	0.45 J1	0.28 J1	0.79	0.71	2.90	2.70	0.22 J1	0.17 J1	3.68	2.13
Sulfate	mg/L	--	705	--	538	--	840	--	592	--	859	--	776	--	859
Thallium	µg/L	0.2 U1	0.2 U1	0.05 J1	0.03 J1	0.04 J1	0.03 J1	0.04 J1	0.03 J1	0.2 U1	0.2 U1	0.2 U1	0.05 J1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	--	1,510	--	1,190	--	1,620	--	1,250	--	1,670	--	1,550	--	1,810
pH	SU	7.26	7.02	7.08	7.13	7.32	7.06	7.15	7.18	6.95	6.77	7.33	6.98	7.28	7.07

Notes:

--: not sampled

µg/L: micrograms per liter

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

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

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

**Table 2: Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Mitchell Plant - Bottom Ash Pond**

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000100	0.00600
Arsenic, Total (mg/L)	0.0100		0.00165	0.0100
Barium, Total (mg/L)	2.00		0.0528	2.00
Beryllium, Total (mg/L)	0.00400		0.0000600	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000900	0.00500
Chromium, Total (mg/L)	0.100		0.00189	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00251	0.00600
Combined Radium, Total (pCi/L)	5.00		2.01	5.00
Fluoride, Total (mg/L)	4.00		0.250	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00344	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0150	0.0400
Mercury, Total (mg/L)	0.00200		0.00000800	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00231	0.100
Selenium, Total (mg/L)	0.0500		0.00902	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

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

CCR: Coal Combustion Residual

GWPS: Groundwater Protection Standard

MCL: Maximum Contaminant Level

mg/L: milligrams per liter

pCi/L: picocuries per liter

Table 3: Appendix III Data Summary
Statistical Analysis Summary
Mitchell Plant - Bottom Ash Pond

Analyte	Unit	Description	MW-1505	MW-1506	MW-1507	MW-1509	MW-1510	
			5/17/2023	5/17/2023	5/16/2023	5/16/2023	5/16/2023	
Boron	mg/L	Interwell Background Value (UPL)	3.66					
		Analytical Result	3.39	6.13	4.65	5.55	4.00	
Calcium	mg/L	Interwell Background Value (UPL)	255					
		Analytical Result	147	247	167	171	222	
Chloride	mg/L	Interwell Background Value (UPL)	238					
		Analytical Result	150	157	145	177	258	
Fluoride	mg/L	Intrawell Background Value (UPL)	0.0600	0.200	0.0950	0.160	0.125	
		Analytical Result	0.05	0.05	0.04	0.1	0.09	
pH	SU	Interwell Background Value (UPL)	8.6					
		Interwell Background Value (LPL)	6.9					
		Analytical Result	7.1	7.1	7.2	7.0	7.1	
Sulfate	mg/L	Intrawell Background Value (UPL)	408	369	373	492	523	
		Analytical Result	538	840	592	776	859	
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	1,310					
		Analytical Result	1,190	1,620	1,250	1,550	1,810	

Notes:

1. Bold values exceed the background value.

2. Background values are shaded gray.

mg/L: milligrams per liter

LPL: Lower prediction limit

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 Mitchell Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



22663

License Number

West Virginia

Licensing State

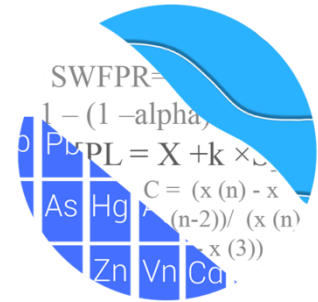
08.30.2023

Date

ATTACHMENT B

Statistical Analysis Output

GROUNDWATER STATS CONSULTING



August 25, 2023

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

RE: Mitchell Bottom Ash Pond (BAP)
Assessment Monitoring Summary – March & May 2023

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the Assessment Monitoring statistical analysis of groundwater data for the March and May 2023 sample events for American Electric Power Company's Mitchell BAP. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling at each of the wells below began at Mitchell Bottom Ash Pond for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** MW-1504 and MW-1508
- **Downgradient wells:** MW-1505, MW-1506, MW-1507, MW-1509, and MW-1510

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 analysis was reviewed by Andrew Collins, Project Manager of GSC.

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 graphs and box plots for Appendix IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record as well as to view variation within and across wells (Figures A and B). All data were initially screened for outliers and trends in December 2017.

Summary of Statistical Methods – Appendix IV Parameters

Parametric tolerance limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (USEPA, 2009), data are analyzed using either parametric or non-parametric tolerance limits as appropriate.

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

For all constituents, a substitution of the most recent reporting limit is used for non-detect data. In the time series plots, a single reporting limit substitution is used across all wells for a given parameter since the wells are plotted as a group. For calculating confidence intervals, the substitution is performed for individual wells and may differ across wells. This generally gives the most conservative limit in each case. Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. All downgradient well/constituent pairs contained detected measurements

and were, therefore, analyzed in this report. If records contain 100% non-detects in future analyses, a summary of those well/constituent pairs will be provided.

Summary of Background Screening – Conducted in January 2023

Outlier Screening

Prior to evaluating Appendix IV parameters, upgradient well data are screened through both visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. Tukey's test and visual screening with time series graphs confirmed previously flagged outliers. Tukey's outlier test on pooled upgradient well data through October 2022 did not identify any new outliers; therefore, no additional measurements were flagged. All flagged values may be seen on the Outlier Summary following this letter (Figure C) and no changes to previously flagged outliers were made.

Additionally, downgradient well data through October 2022 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. No additional outliers among downgradient wells were flagged.

Interwell Upper Tolerance Limits

Interwell upper tolerance limits were used to calculate the site-specific background limits from pooled upgradient well data through October 2022 for the Appendix IV constituents discussed above (Figure D). Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution such as for barium, chromium, cobalt, combined radium 226 + 228, and lead. 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. These limits will be updated on an annual basis at the end of each year and will be updated again at the end of 2023.

Groundwater Protection Standards

These limits were compared to the Maximum Contaminant Levels (MCLs) and the CCR-Rule specified levels in the Groundwater Protection Standards (GWPS) table following this

letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure E). GWPS will be updated on an annual basis at the end of each year.

Evaluation of Appendix IV Parameters – March & May 2023

Prior to evaluating Appendix IV parameters, background data are screened through visual screening for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. No additional values were flagged as outliers during this analysis.

Confidence Intervals

Confidence intervals were then constructed on downgradient wells with data through May 2023 for each of the Appendix IV parameters using the highest limit of the MCL or background limit as discussed above for the GWPS (Figure F). As mentioned above, the most recent reporting limit is substituted for historical non-detects within a given well, and the reporting limits vary among individual wells. These intervals were constructed as either parametric or nonparametric confidence intervals depending on the data distribution and percentage of non-detects.

When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. Nonparametric confidence intervals, which use the largest and smallest 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.

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

For Groundwater Stats Consulting,



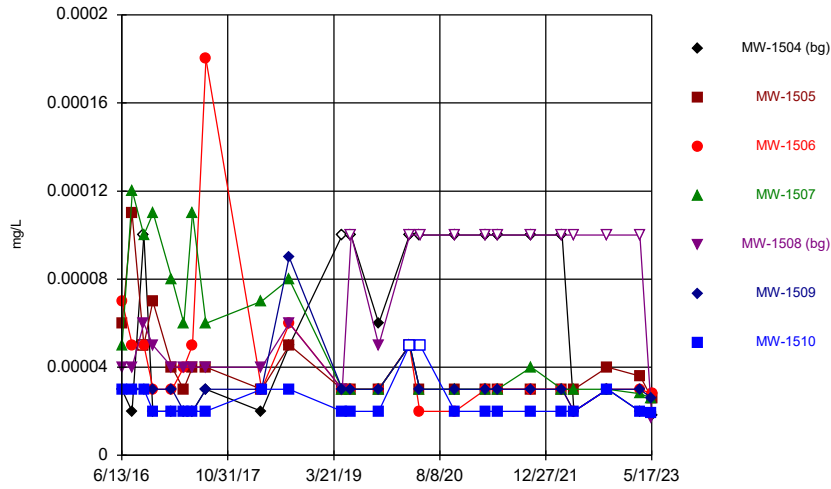
Tristan Clark
Groundwater Analyst



Andrew Collins
Project Manager

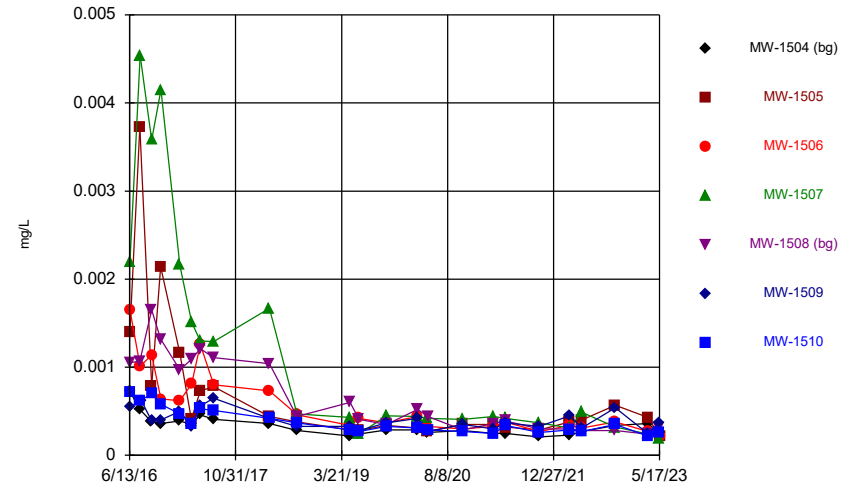
FIGURE A
Time Series

Time Series



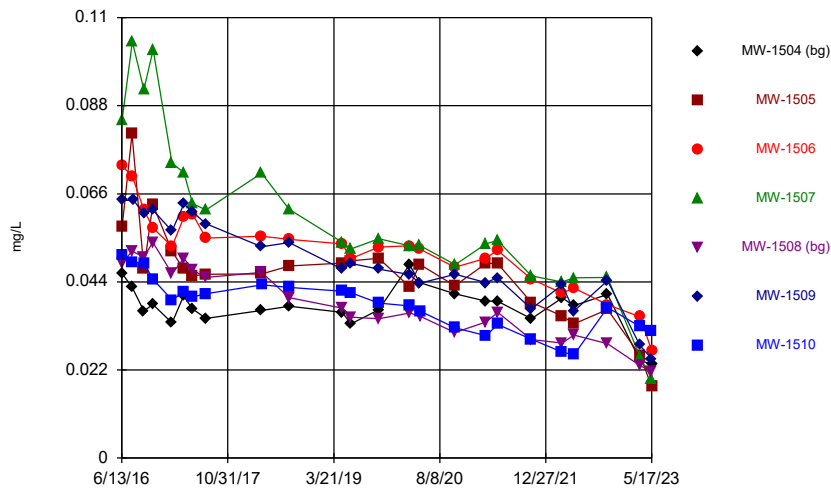
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



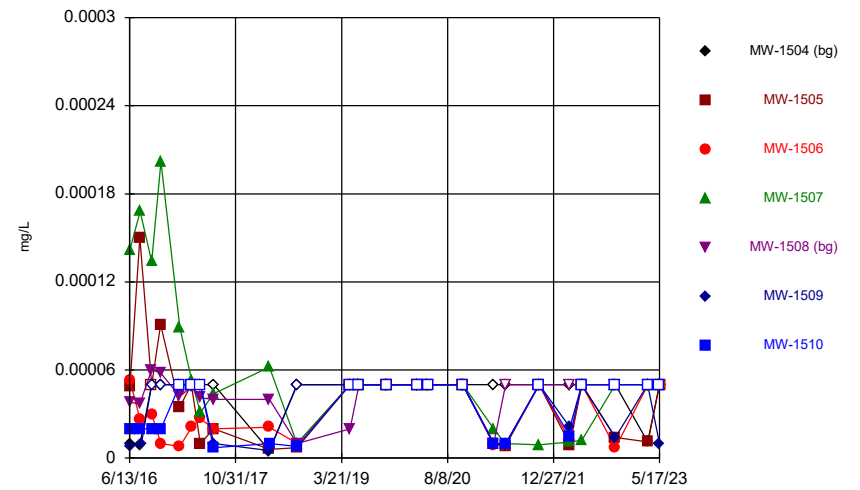
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Time Series



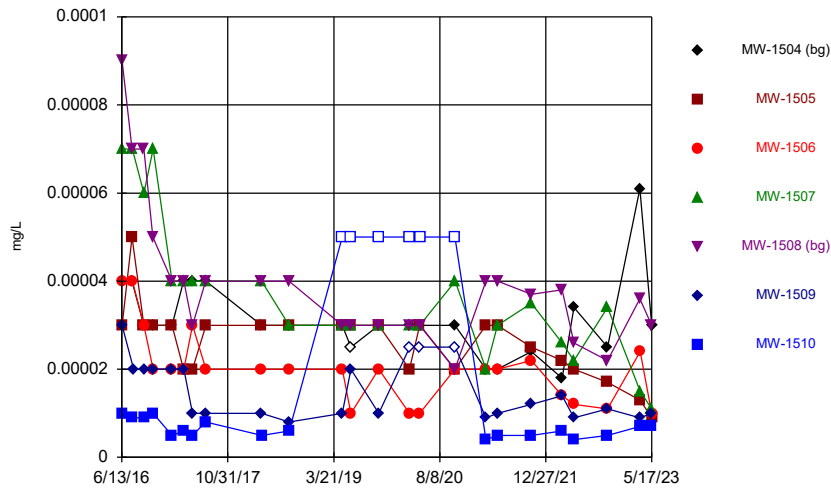
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Time Series



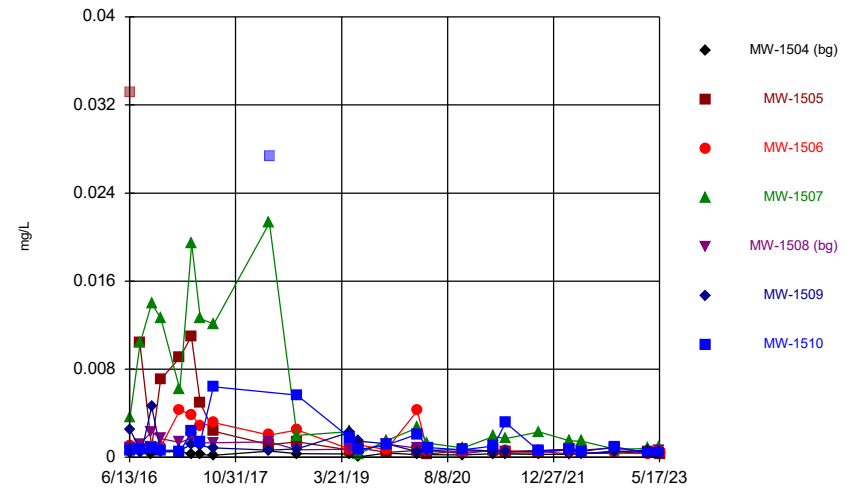
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Time Series



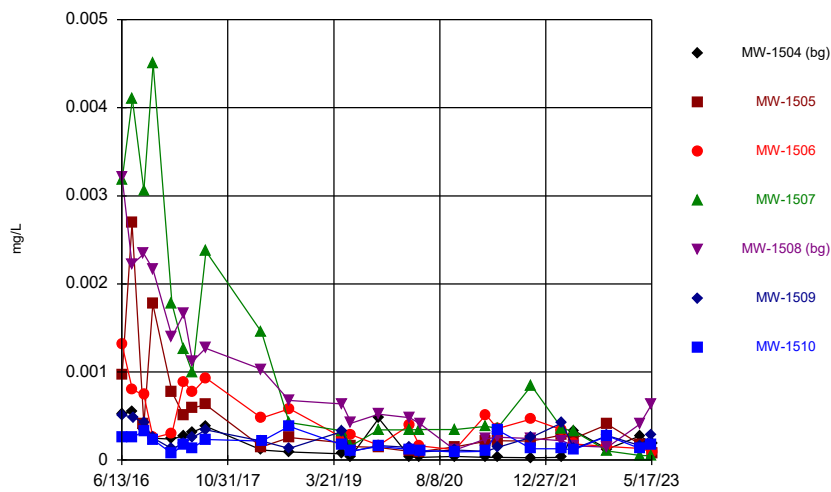
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Time Series



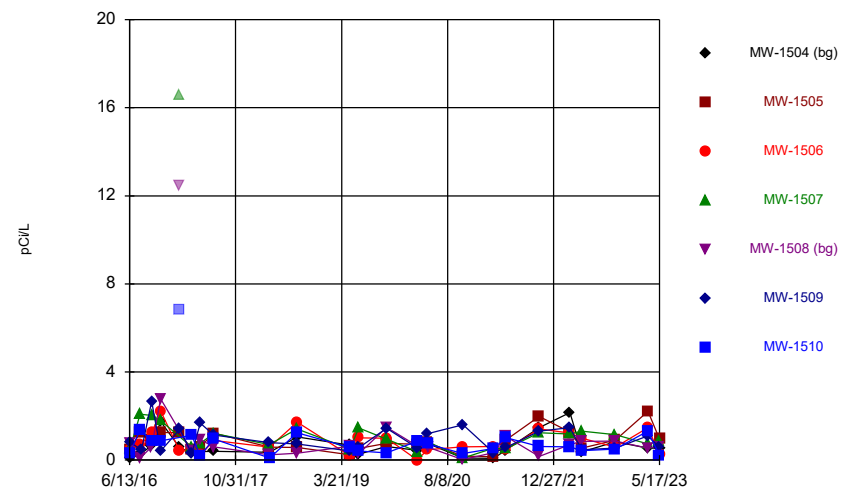
Constituent: Chromium, total Analysis Run 8/24/2023 4:35 PM View: Appendix IV
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Time Series



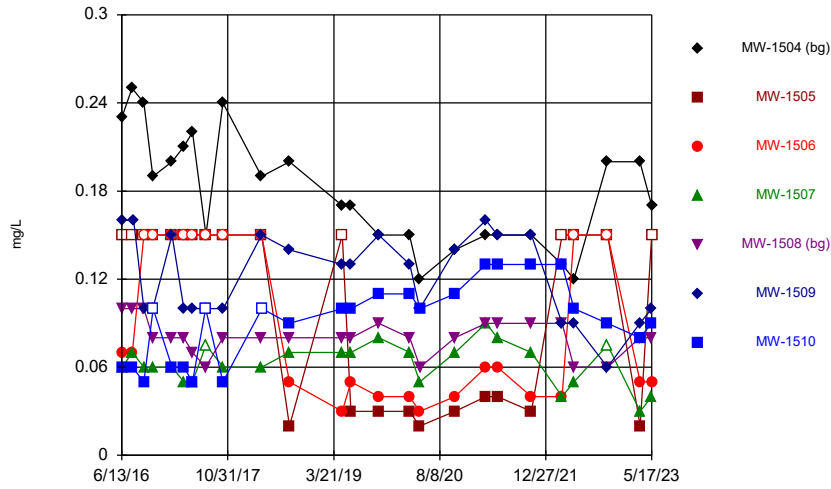
Constituent: Cobalt, total Analysis Run 8/24/2023 4:35 PM View: Appendix IV
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



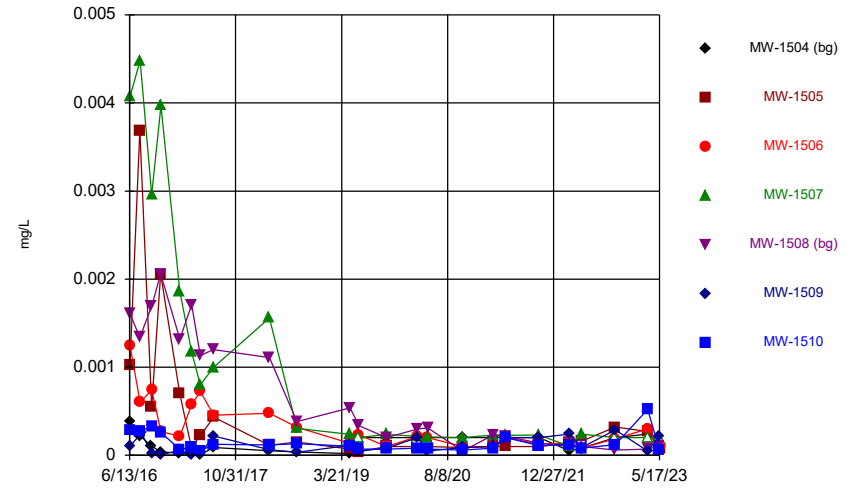
Constituent: Combined Radium 226 + 228 Analysis Run 8/24/2023 4:35 PM View: Appendix IV
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



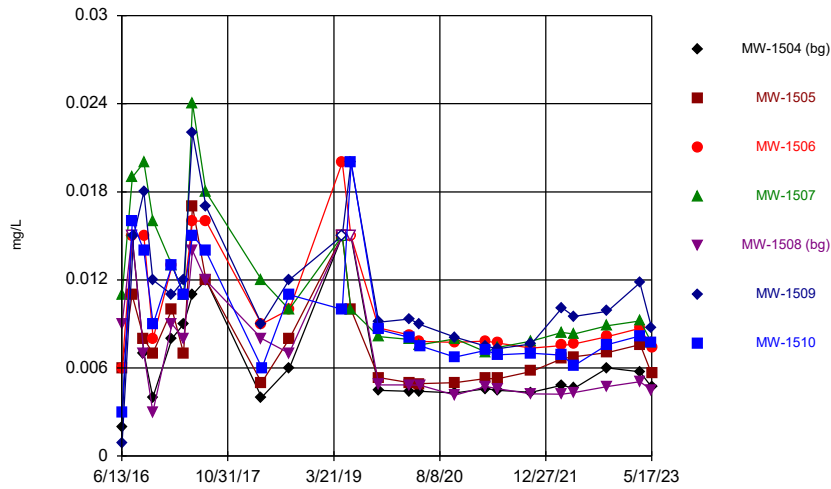
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



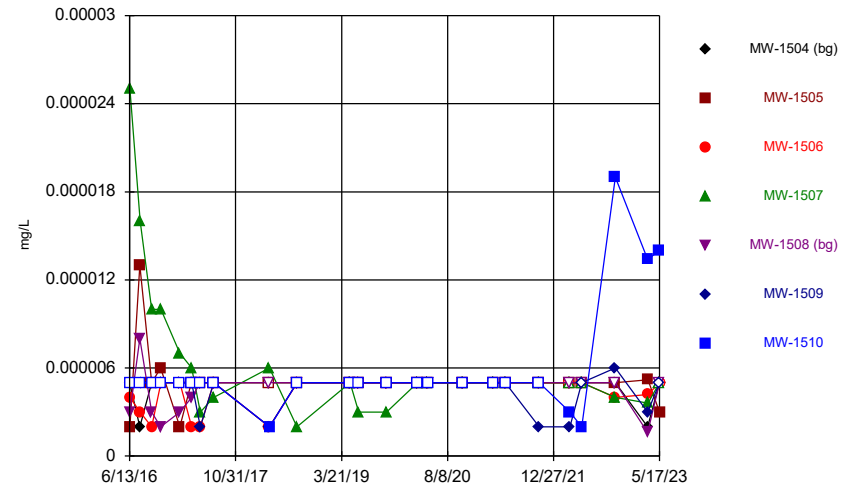
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Time Series



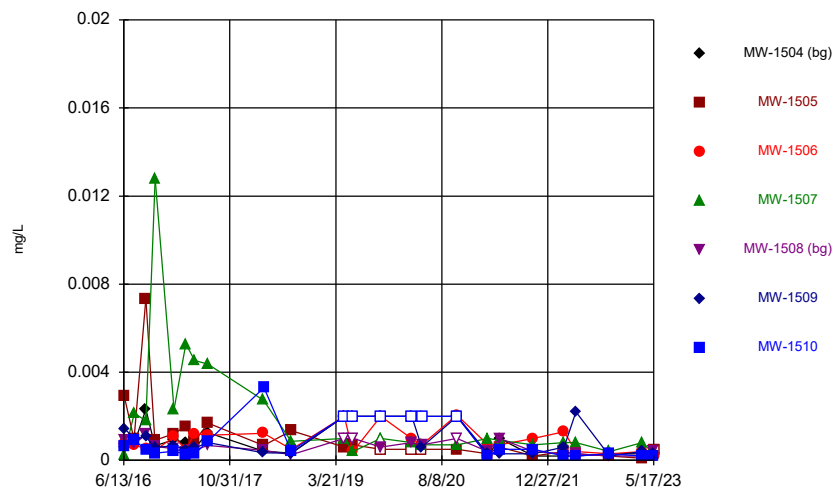
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Time Series



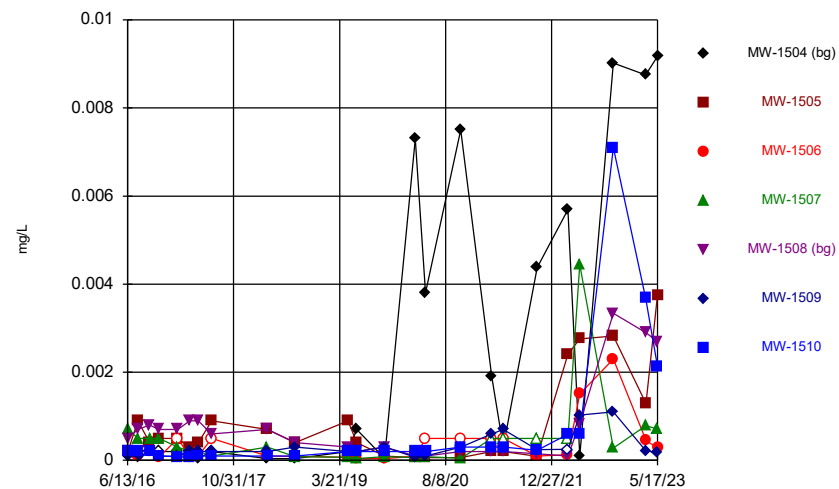
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



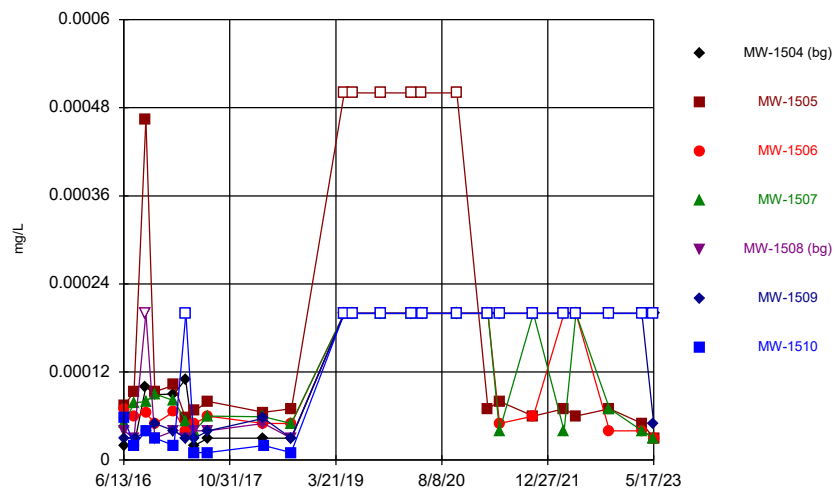
Constituent: Molybdenum, total Analysis Run 8/24/2023 4:35 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Time Series



Constituent: Selenium, total Analysis Run 8/24/2023 4:35 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

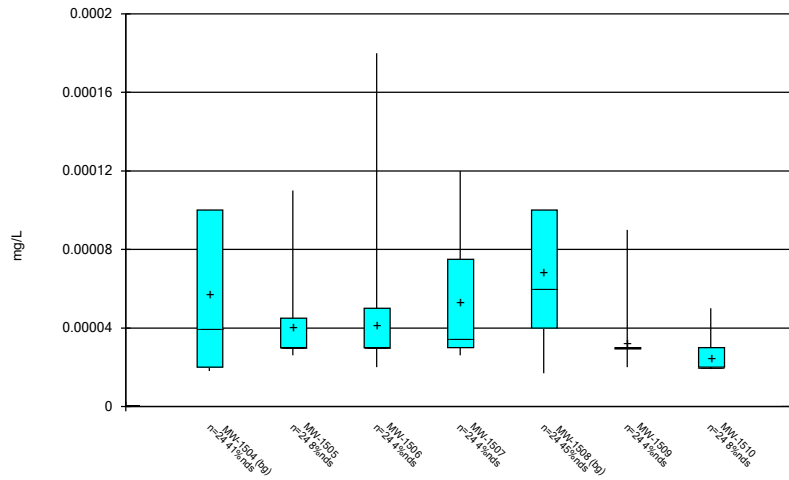
Time Series



Constituent: Thallium, total Analysis Run 8/24/2023 4:35 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

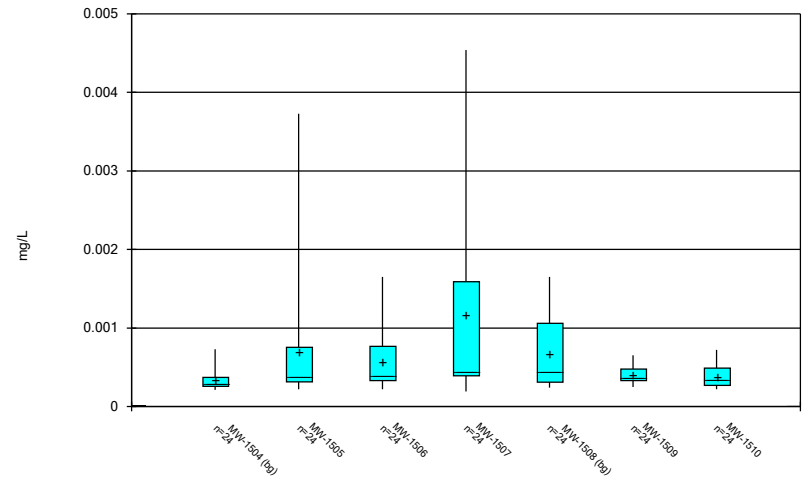
FIGURE B
Box Plots

Box & Whiskers Plot



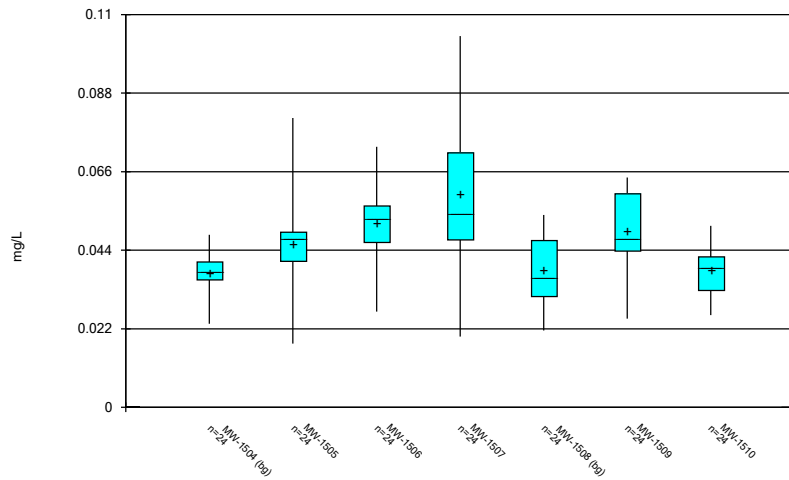
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Box & Whiskers Plot



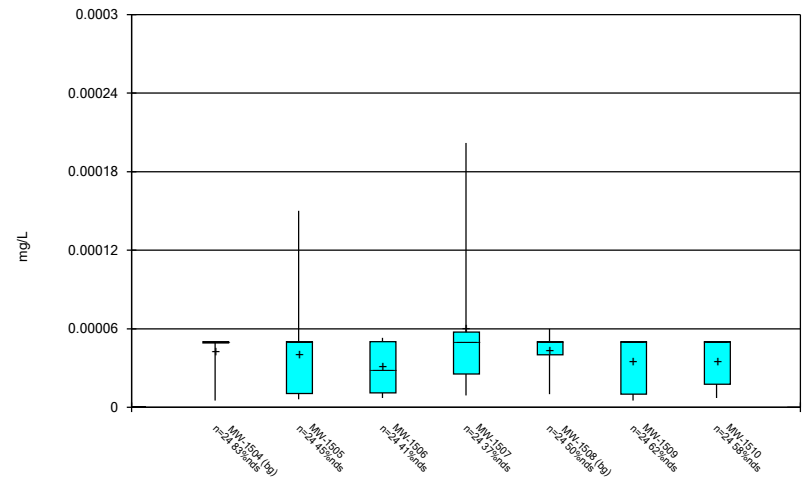
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 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



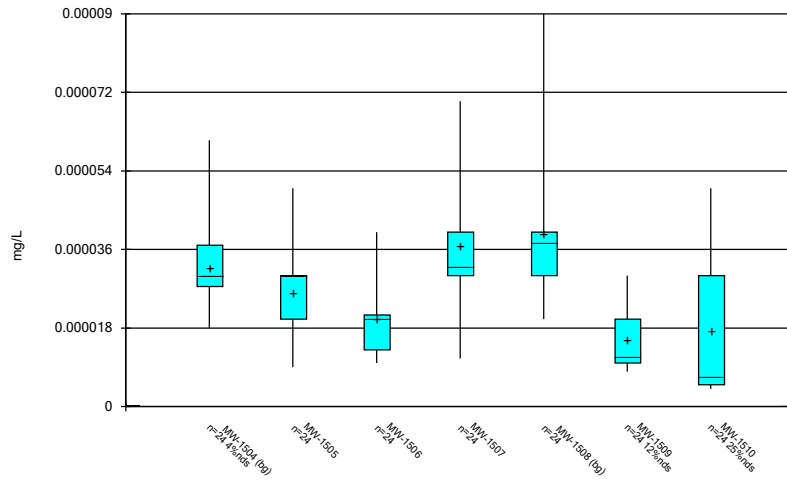
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 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



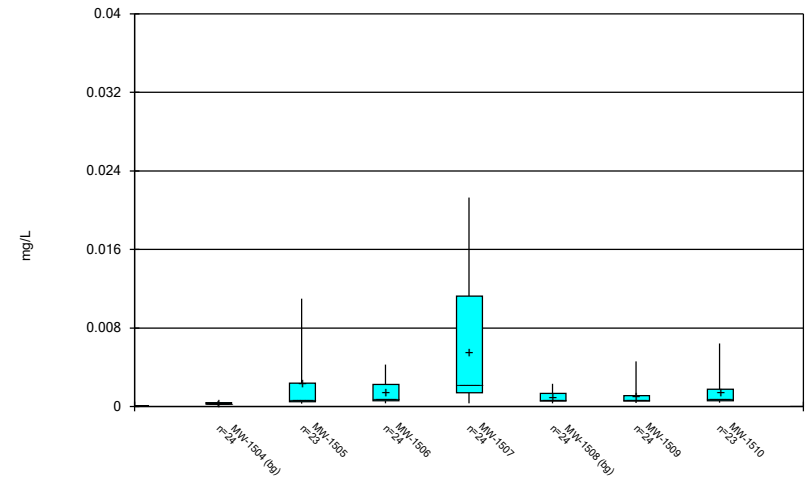
Constituent: Beryllium, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



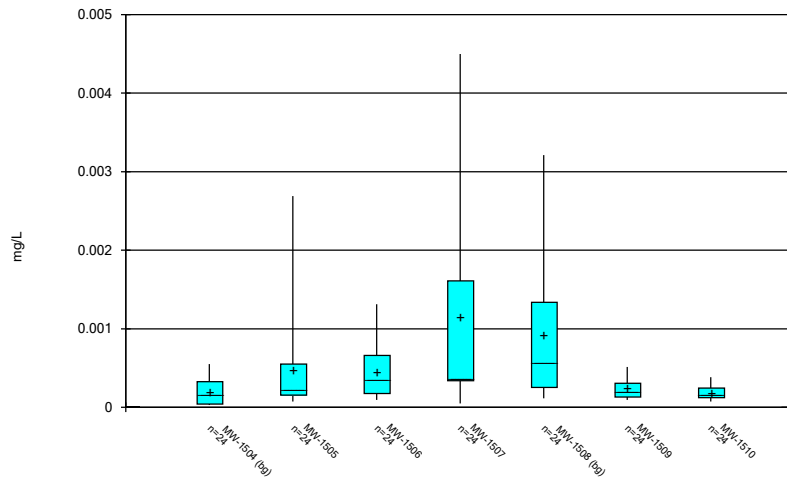
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



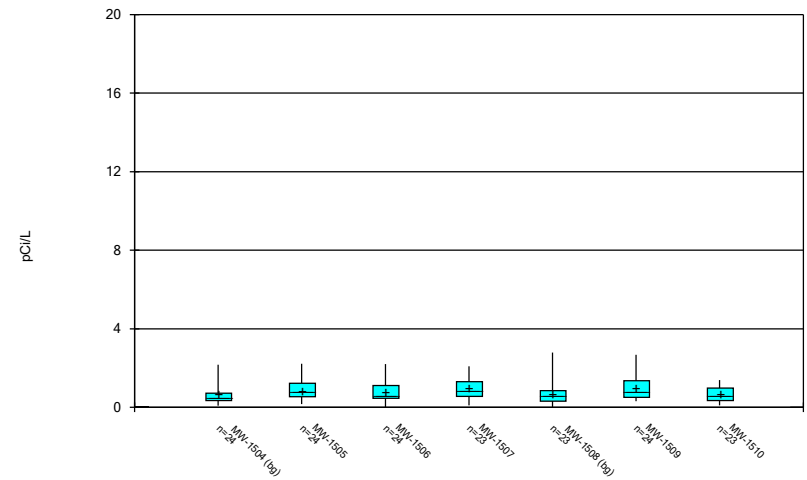
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Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



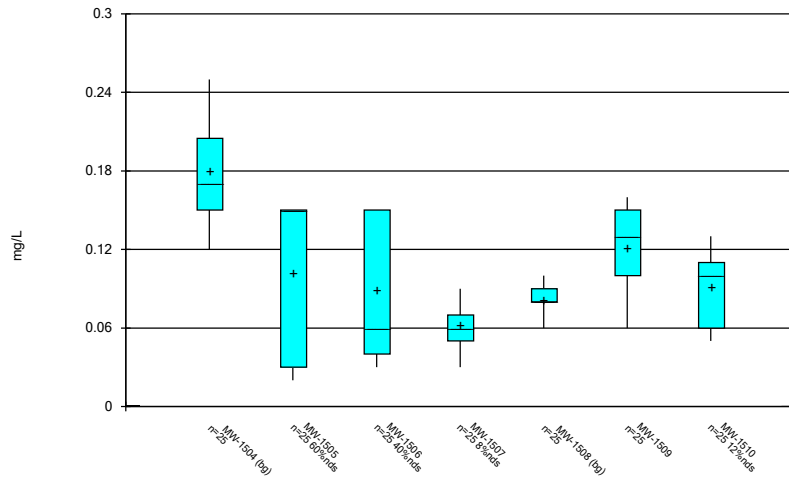
Constituent: Cobalt, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



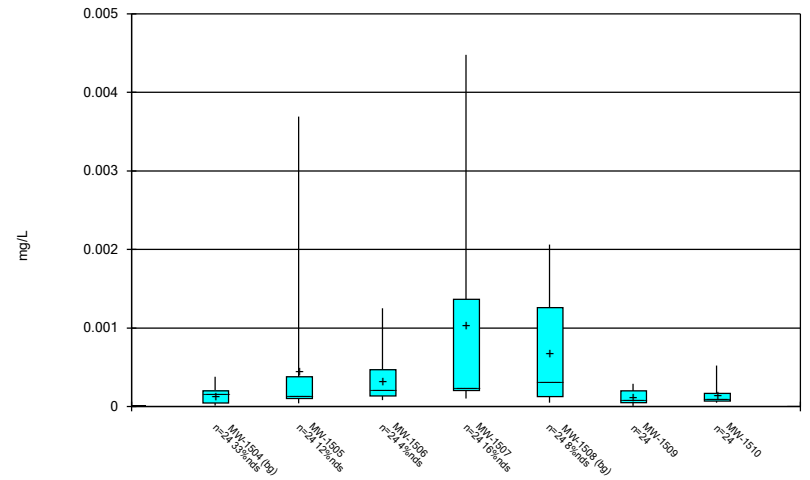
Constituent: Combined Radium 226 + 228 Analysis Run 8/24/2023 4:36 PM View: Appendix IV
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



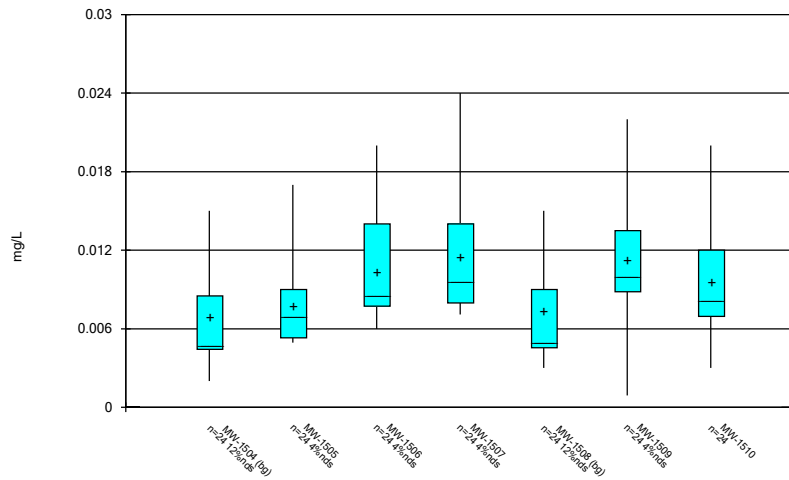
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 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



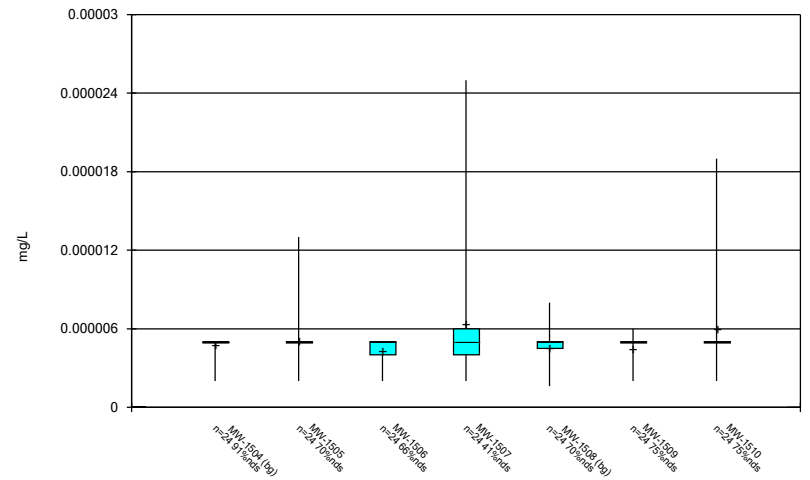
Constituent: Lead, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
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Box & Whiskers Plot



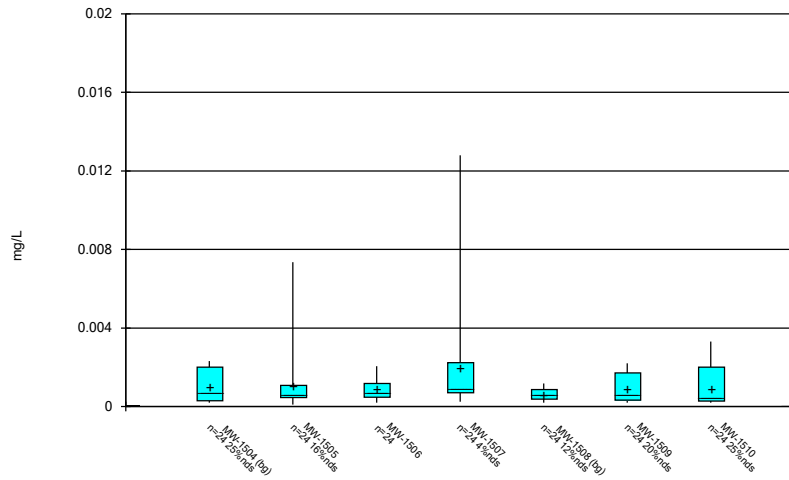
Constituent: Lithium, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



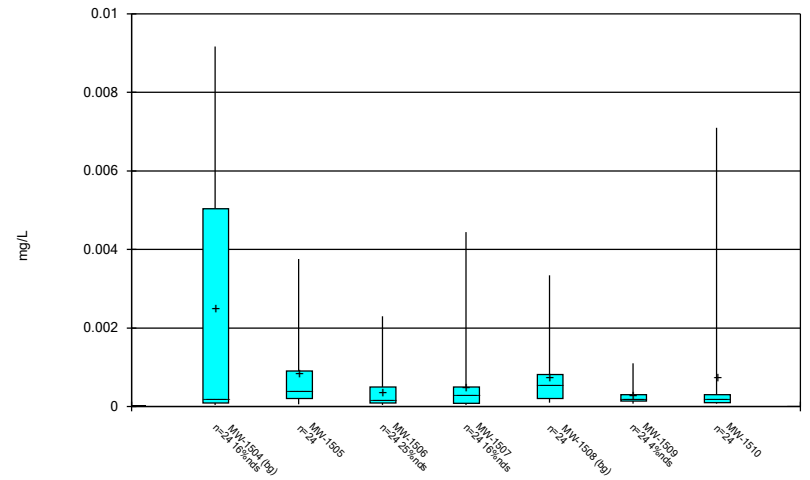
Constituent: Mercury, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



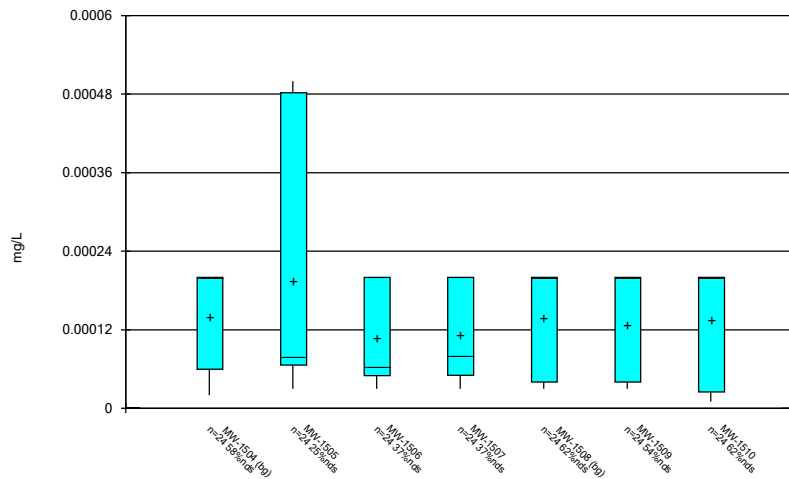
Constituent: Molybdenum, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 8/24/2023 4:36 PM View: Appendix IV
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

FIGURE C
Outlier Summary

Outlier Summary

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 8/24/2023, 4:37 PM

	MW-1505 Chromium, total (mg/L)	MW-1510 Chromium, total (mg/L)	MW-1507 Combined Radium 226 + 228 (pCi/L)	MW-1508 Combined Radium 226 + 228 (pCi/L)	MW-1510 Combined Radium 226 + 228 (pCi/L)
6/14/2016	0.0332 (o)				
2/8/2017		16.587 (o)	12.465 (o)	6.828 (o)	
4/12/2018	0.0274 (o)				

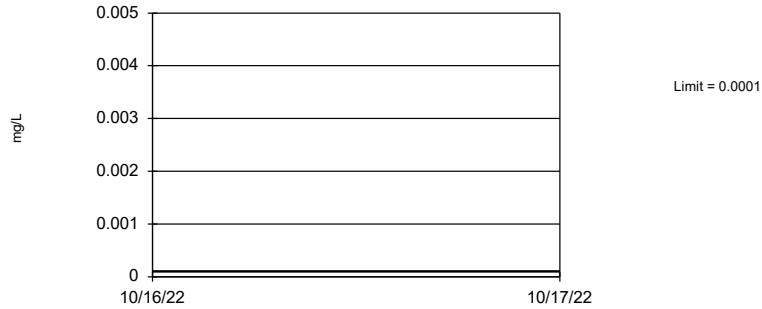
FIGURE D
UTLs

Upper Tolerance Limit Summary Table

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 1/10/2023, 4:38 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.0001	n/a	n/a	n/a	n/a 44	n/a	n/a	45.45	n/a	n/a	0.1047	NP Inter(normality)
Arsenic, total (mg/L)	n/a	0.00165	n/a	n/a	n/a	n/a 44	n/a	n/a	0	n/a	n/a	0.1047	NP Inter(normality)
Barium, total (mg/L)	n/a	0.05279	n/a	n/a	n/a	n/a 44	0.03943	0.006363	0	None	No	0.05	Inter
Beryllium, total (mg/L)	n/a	0.00006	n/a	n/a	n/a	n/a 44	n/a	n/a	65.91	n/a	n/a	0.1047	NP Inter(NDs)
Cadmium, total (mg/L)	n/a	0.00009	n/a	n/a	n/a	n/a 44	n/a	n/a	2.273	n/a	n/a	0.1047	NP Inter(normality)
Chromium, total (mg/L)	n/a	0.001892	n/a	n/a	n/a	n/a 44	0.08141	0.02015	0	None	x^(1/3)	0.05	Inter
Cobalt, total (mg/L)	n/a	0.002508	n/a	n/a	n/a	n/a 44	0.07102	0.0309	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	2.013	n/a	n/a	n/a	n/a 43	0.7492	0.318	0	None	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	n/a	0.25	n/a	n/a	n/a	n/a 46	n/a	n/a	0	n/a	n/a	0.09447	NP Inter(normality)
Lead, total (mg/L)	n/a	0.003443	n/a	n/a	n/a	n/a 44	-8.955	1.565	22.73	Kaplan-Meier	ln(x)	0.05	Inter
Lithium, total (mg/L)	n/a	0.015	n/a	n/a	n/a	n/a 44	n/a	n/a	13.64	n/a	n/a	0.1047	NP Inter(normality)
Mercury, total (mg/L)	n/a	0.000008	n/a	n/a	n/a	n/a 44	n/a	n/a	84.09	n/a	n/a	0.1047	NP Inter(NDs)
Molybdenum, total (mg/L)	n/a	0.00231	n/a	n/a	n/a	n/a 44	n/a	n/a	20.45	n/a	n/a	0.1047	NP Inter(normality)
Selenium, total (mg/L)	n/a	0.00902	n/a	n/a	n/a	n/a 44	n/a	n/a	9.091	n/a	n/a	0.1047	NP Inter(normality)
Thallium, total (mg/L)	n/a	0.0002	n/a	n/a	n/a	n/a 44	n/a	n/a	56.82	n/a	n/a	0.1047	NP Inter(NDs)

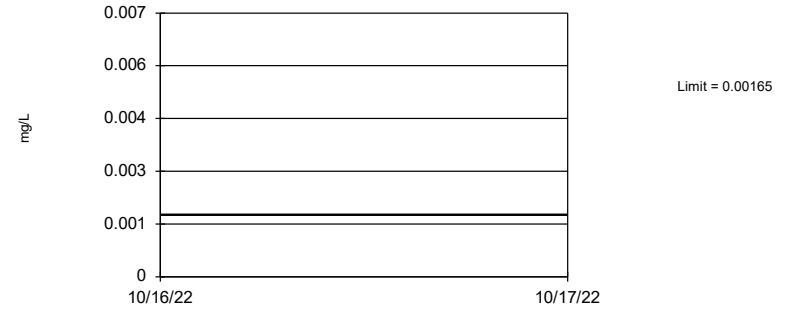
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 44 background values. 45.45% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Antimony, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

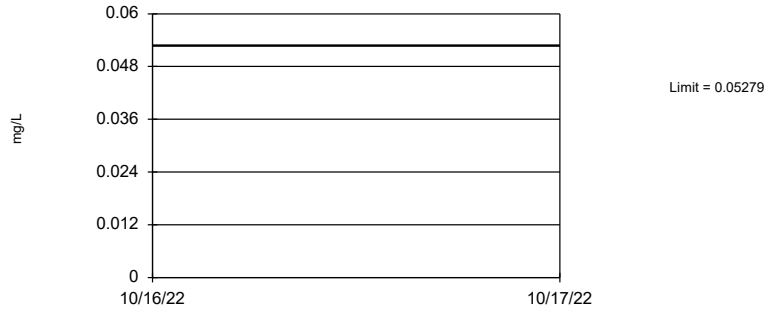
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 44 background values. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Arsenic, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

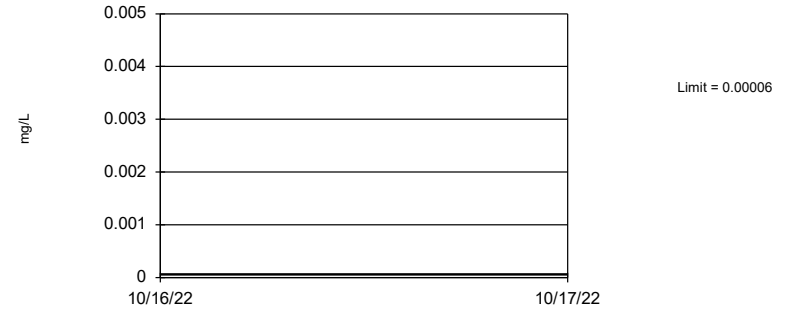
Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=0.03943, Std. Dev.=0.006363, n=44. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.954, critical = 0.924. Report alpha = 0.05.

Constituent: Barium, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 44 background values. 65.91% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Beryllium, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

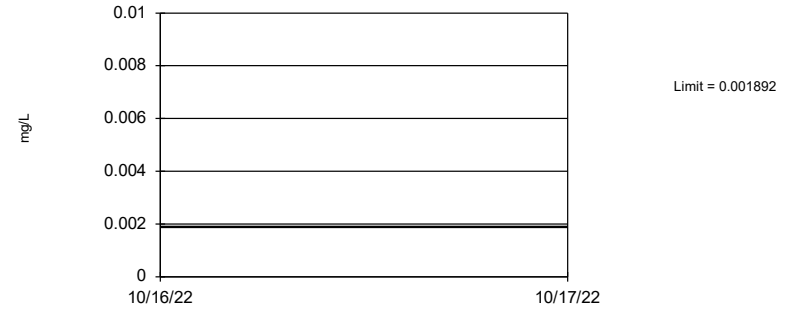
Tolerance Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 44 background values. 2.273% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Cadmium, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

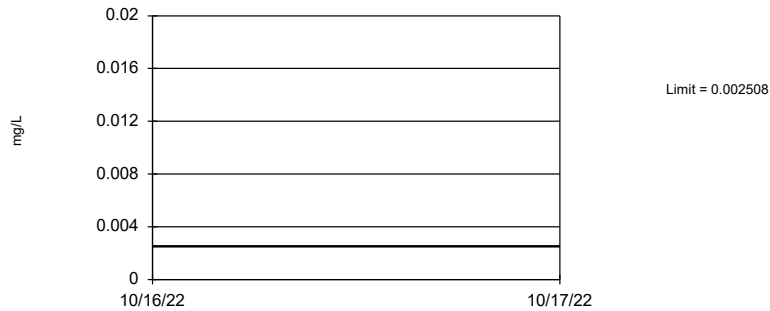
Tolerance Limit
Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation): Mean=0.08141, Std. Dev.=0.02015, n=44. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9429, critical = 0.924. Report alpha = 0.05.

Constituent: Chromium, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

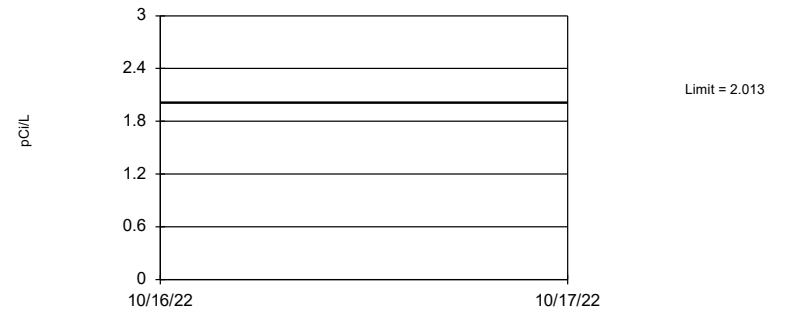
Tolerance Limit
Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation): Mean=0.07102, Std. Dev.=0.0309, n=44. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9281, critical = 0.924. Report alpha = 0.05.

Constituent: Cobalt, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

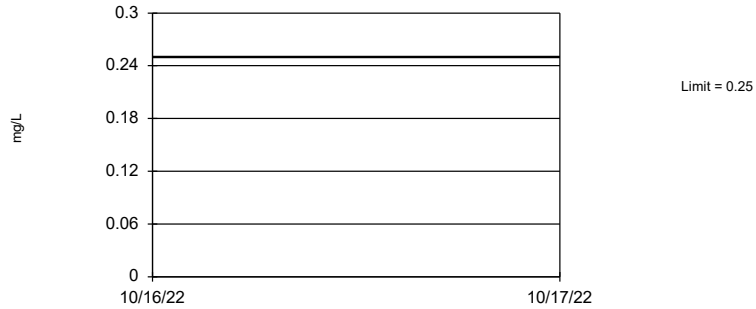
Tolerance Limit
Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=0.7492, Std. Dev.=0.318, n=43. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9618, critical = 0.923. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

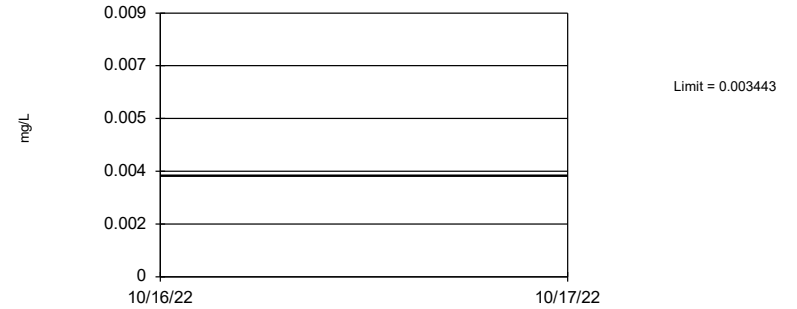
Tolerance Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 46 background values. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Constituent: Fluoride, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

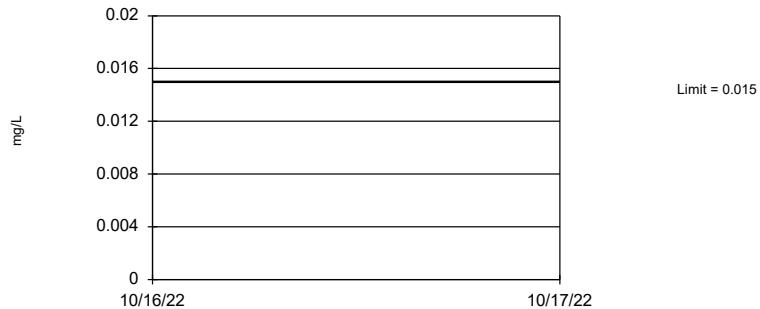
Tolerance Limit
Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-8.955, Std. Dev.=1.565, n=44, 22.73% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.943, critical = 0.924. Report alpha = 0.05.

Constituent: Lead, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

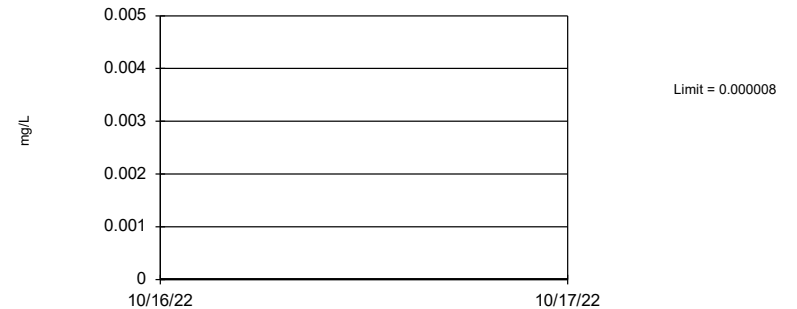
Tolerance Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 44 background values. 13.64% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Lithium, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

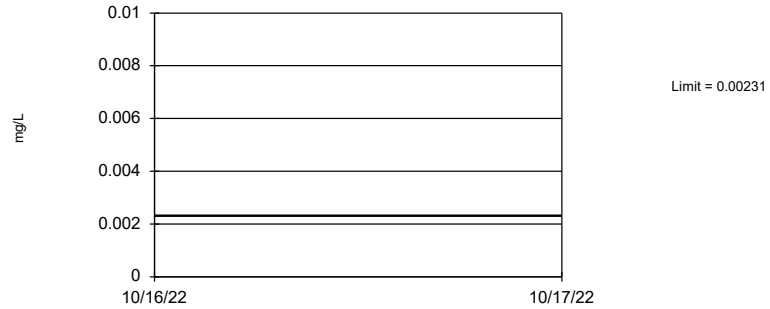
Tolerance Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 44 background values. 84.09% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Mercury, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

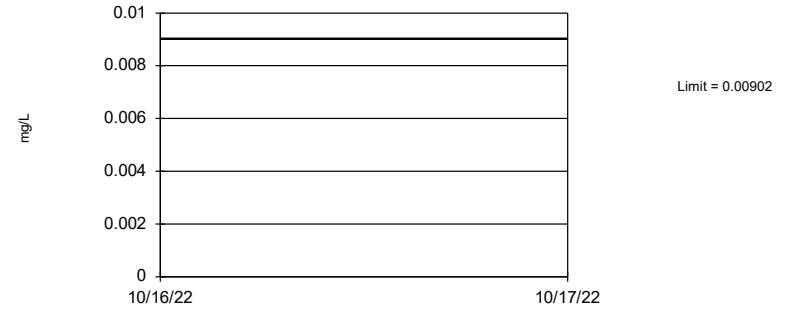
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 44 background values. 20.45% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Molybdenum, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

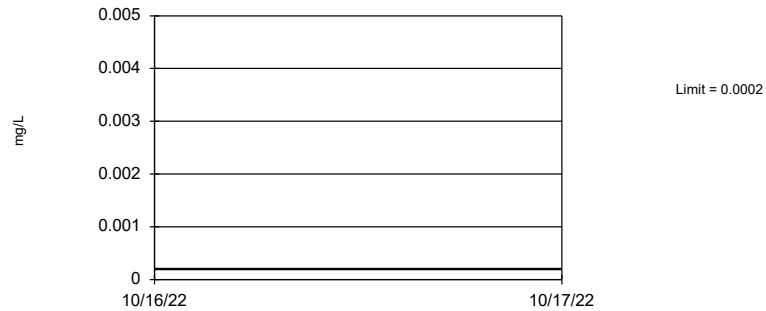
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 44 background values. 9.091% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Selenium, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 44 background values. 56.82% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Constituent: Thallium, total Analysis Run 1/10/2023 4:30 PM View: Appendix IV - UTLs
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

FIGURE E
GWPS

MITCHELL BAP GWPS				
Constituent Name	Compliance Limit	CCR-Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.0001	0.006
Arsenic, Total (mg/L)	0.01		0.0017	0.01
Barium, Total (mg/L)	2		0.053	2
Beryllium, Total (mg/L)	0.004		0.00006	0.004
Cadmium, Total (mg/L)	0.005		0.00009	0.005
Chromium, Total (mg/L)	0.1		0.0019	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.0025	0.006
Combined Radium, Total (pCi/L)	5		2.01	5
Fluoride, Total (mg/L)	4		0.25	4
Lead, Total (mg/L)	n/a	0.015	0.0034	0.015
Lithium, Total (mg/L)	n/a	0.04	0.015	0.04
Mercury, Total (mg/L)	0.002		0.000008	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0023	0.1
Selenium, Total (mg/L)	0.05		0.009	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**GWPS = Groundwater Protection Standard*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

FIGURE F
Confidence Interval

Confidence Intervals - All Results (No Significant)

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 8/24/2023, 4:42 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	MW-1505	0.00005	0.00003	0.006	No	24	8.333	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1506	0.00005	0.000028	0.006	No	24	4.167	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1507	0.00007	0.00003	0.006	No	24	4.167	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1509	0.00005	0.000026	0.006	No	24	4.167	None	No	0.01	NP (normality)
Antimony, total (mg/L)	MW-1510	0.00003	0.00002	0.006	No	24	8.333	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1505	0.00078	0.00031	0.01	No	24	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1506	0.000686	0.0003772	0.01	No	24	0	None	x^(1/3)	0.01	Param.
Arsenic, total (mg/L)	MW-1507	0.00167	0.00037	0.01	No	24	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	MW-1509	0.0004609	0.0003466	0.01	No	24	0	None	No	0.01	Param.
Arsenic, total (mg/L)	MW-1510	0.0004481	0.0003075	0.01	No	24	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	MW-1505	0.05207	0.0397	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1506	0.057	0.04642	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1507	0.07037	0.04914	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1509	0.05481	0.04355	2	No	24	0	None	No	0.01	Param.
Barium, total (mg/L)	MW-1510	0.04174	0.0348	2	No	24	0	None	No	0.01	Param.
Beryllium, total (mg/L)	MW-1505	0.00005	0.000011	0.004	No	24	45.83	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	MW-1506	0.00005	0.000012	0.004	No	24	41.67	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	MW-1507	0.00006421	0.00002003	0.004	No	24	37.5	Kaplan-Meier	sqrt(x)	0.01	Param.
Beryllium, total (mg/L)	MW-1509	0.00005	0.00001	0.004	No	24	62.5	Kaplan-Meier	No	0.01	NP (NDs)
Beryllium, total (mg/L)	MW-1510	0.00005	0.000015	0.004	No	24	58.33	Kaplan-Meier	No	0.01	NP (NDs)
Cadmium, total (mg/L)	MW-1505	0.00003	0.00002	0.005	No	24	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1506	0.000022	0.000012	0.005	No	24	0	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1507	0.00004348	0.00002774	0.005	No	24	0	None	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	MW-1509	0.00002	0.00001	0.005	No	24	12.5	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	MW-1510	0.00001	0.000005	0.005	No	24	25	None	No	0.01	NP (normality)
Chromium, total (mg/L)	MW-1505	0.00238	0.00049	0.1	No	23	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	MW-1506	0.00154	0.000662	0.1	No	24	0	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-1507	0.005374	0.001597	0.1	No	24	0	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	MW-1509	0.00115	0.00052	0.1	No	24	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	MW-1510	0.001564	0.0006935	0.1	No	23	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1505	0.0004741	0.0001879	0.006	No	24	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	MW-1506	0.0006064	0.0002836	0.006	No	24	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1507	0.001324	0.0003591	0.006	No	24	0	None	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	MW-1509	0.0003006	0.000171	0.006	No	24	0	None	No	0.01	Param.
Cobalt, total (mg/L)	MW-1510	0.0002284	0.0001406	0.006	No	24	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1505	1.122	0.602	5	No	24	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1506	1.072	0.5263	5	No	24	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1507	1.269	0.72	5	No	23	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1509	1.15	0.6191	5	No	24	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1510	0.8726	0.4774	5	No	23	0	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1505	0.15	0.03	4	No	25	60	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	MW-1506	0.15	0.04	4	No	25	40	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	MW-1507	0.06945	0.05535	4	No	25	8	None	No	0.01	Param.
Fluoride, total (mg/L)	MW-1509	0.15	0.1	4	No	25	0	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	MW-1510	0.1048	0.07844	4	No	25	12	None	No	0.01	Param.
Lead, total (mg/L)	MW-1505	0.000434	0.0001	0.015	No	24	12.5	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1506	0.0004122	0.0001773	0.015	No	24	4.167	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	MW-1507	0.00156	0.000201	0.015	No	24	16.67	None	No	0.01	NP (normality)
Lead, total (mg/L)	MW-1509	0.0001598	0.00007025	0.015	No	24	0	None	No	0.01	Param.
Lead, total (mg/L)	MW-1510	0.000161	0.00008502	0.015	No	24	0	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	MW-1505	0.008707	0.006047	0.04	No	24	4.167	None	ln(x)	0.01	Param.
Lithium, total (mg/L)	MW-1506	0.015	0.00771	0.04	No	24	4.167	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1507	0.015	0.00794	0.04	No	24	4.167	None	No	0.01	NP (normality)
Lithium, total (mg/L)	MW-1509	0.01369	0.008967	0.04	No	24	4.167	None	No	0.01	Param.
Lithium, total (mg/L)	MW-1510	0.01161	0.007605	0.04	No	24	0	None	No	0.01	Param.
Mercury, total (mg/L)	MW-1505	0.000005	0.000003	0.002	No	24	70.83	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1506	0.000005	0.000004	0.002	No	24	66.67	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1507	0.000006	0.000004	0.002	No	24	41.67	None	No	0.01	NP (normality)
Mercury, total (mg/L)	MW-1509	0.000005	0.000003	0.002	No	24	75	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	MW-1510	0.0000134	0.000003	0.002	No	24	75	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	MW-1505	0.0009896	0.0003198	0.1	No	24	16.67	Kaplan-Meier	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1506	0.001084	0.0005786	0.1	No	24	0	None	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1507	0.001915	0.0007147	0.1	No	24	4.167	None	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1509	0.0006749	0.0003383	0.1	No	24	20.83	Kaplan-Meier	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	MW-1510	0.00092	0.00027	0.1	No	24	25	None	No	0.01	NP (normality)
Selenium, total (mg/L)	MW-1505	0.000976	0.0002669	0.05	No	24	0	None	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	MW-1506	0.000163	0.0000526	0.05	No	24	25	Kaplan-Meier	ln(x)	0.01	Param.
Selenium, total (mg/L)	MW-1507	0.0002649	0.00007771	0.05	No	24	16.67	Kaplan-Meier	ln(x)	0.01	Param.

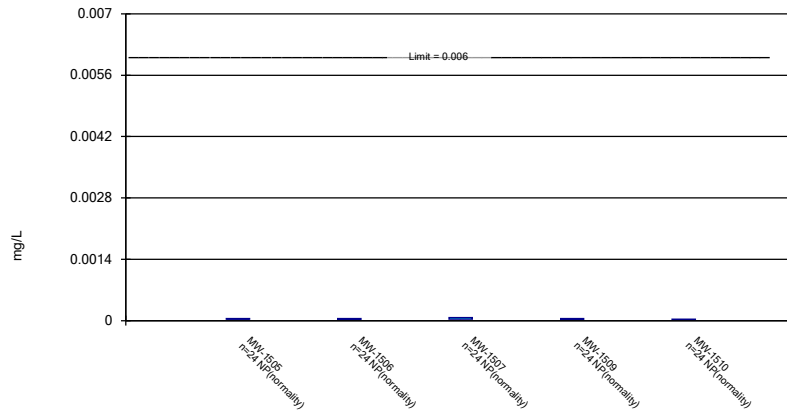
Confidence Intervals - All Results (No Significant)

Mitchell BAP Client: Geosyntec Data: Mitchell BAP Printed 8/24/2023, 4:42 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Selenium, total (mg/L)	MW-1509	0.0003244	0.0001535	0.05	No	24	4.167	None	ln(x)	0.01	Param.
Selenium, total (mg/L)	MW-1510	0.0003	0.0001	0.05	No	24	0	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1505	0.000464	0.000065	0.002	No	24	25	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1506	0.0002	0.00005	0.002	No	24	37.5	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1507	0.0002	0.00005	0.002	No	24	37.5	None	No	0.01	NP (normality)
Thallium, total (mg/L)	MW-1509	0.0002	0.00004	0.002	No	24	54.17	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	MW-1510	0.0002	0.00003	0.002	No	24	62.5	None	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

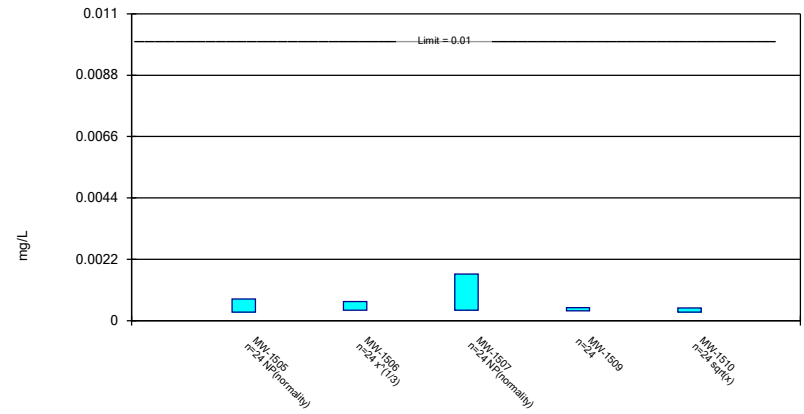
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

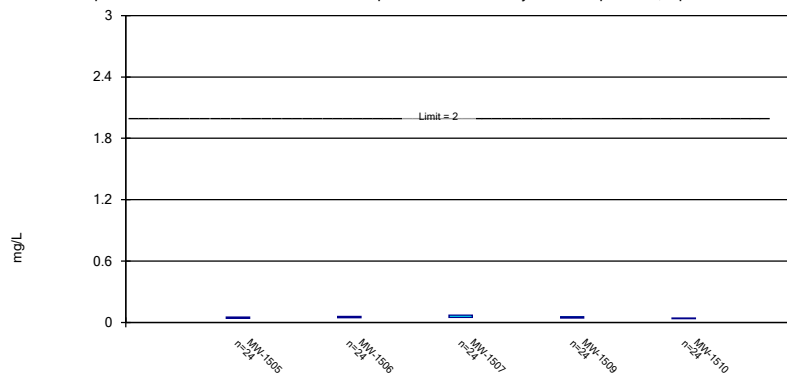
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric Confidence Interval

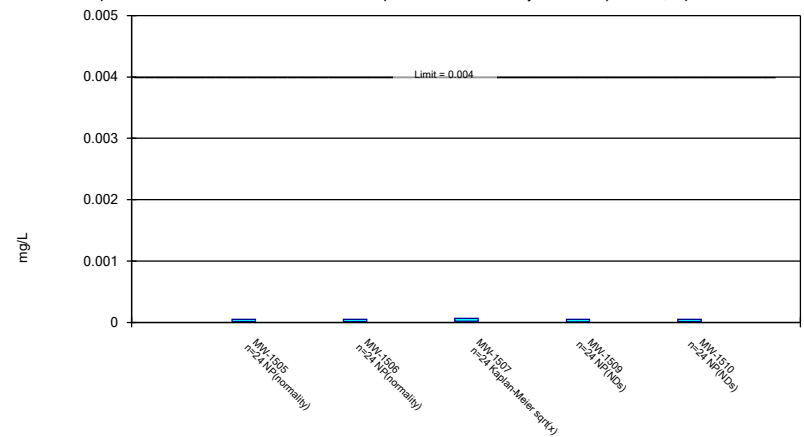
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

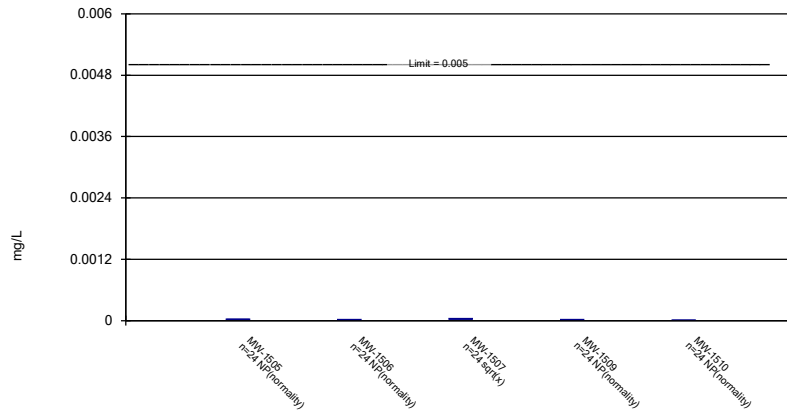
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

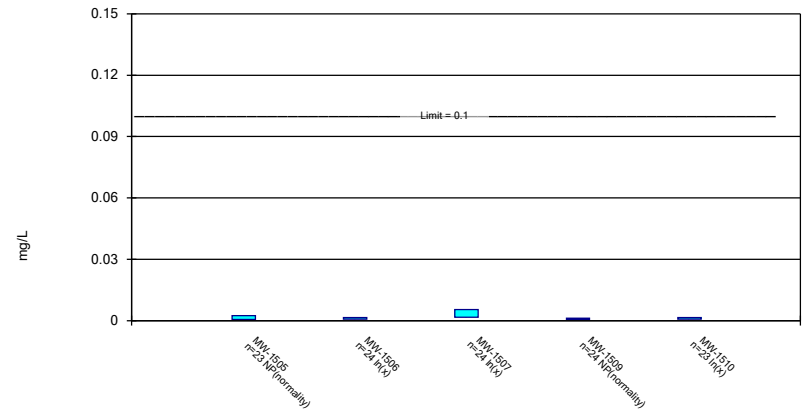
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

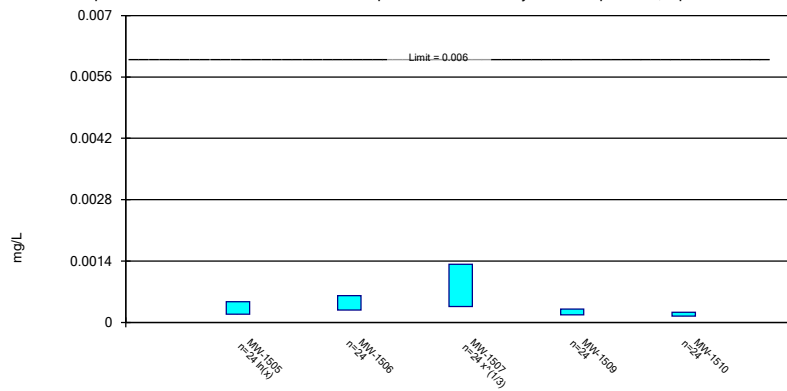
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric Confidence Interval

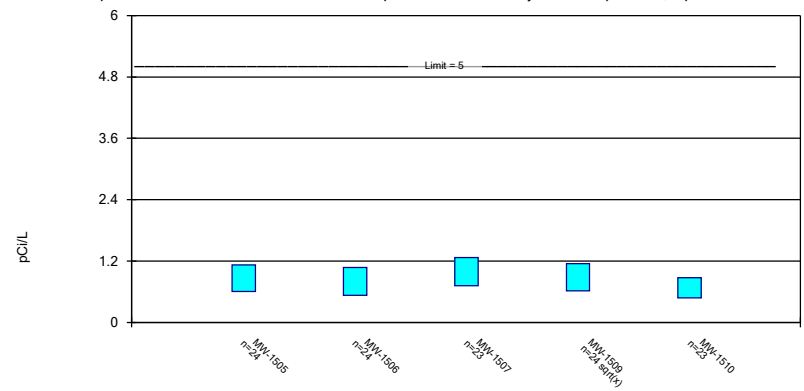
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric Confidence Interval

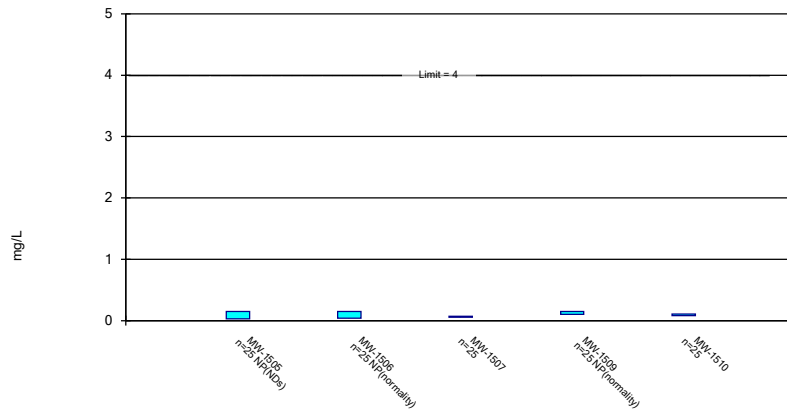
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

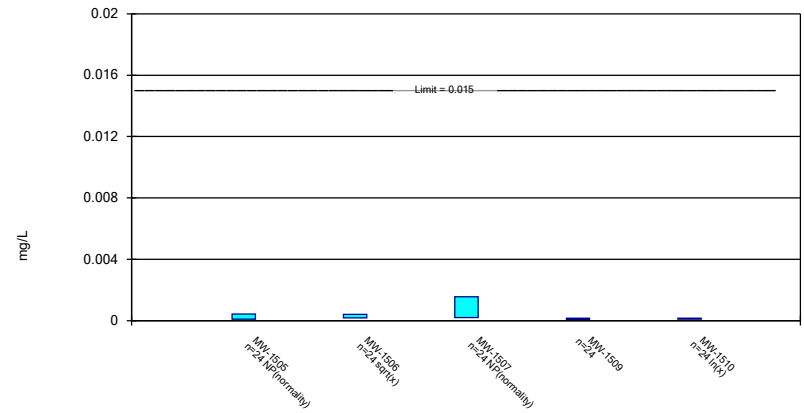
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

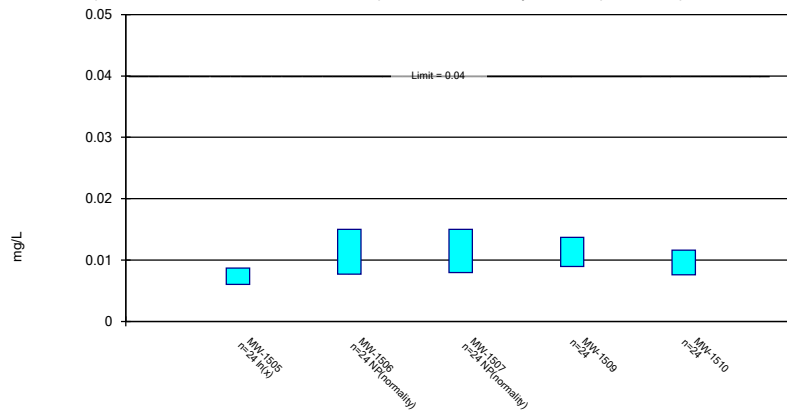
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

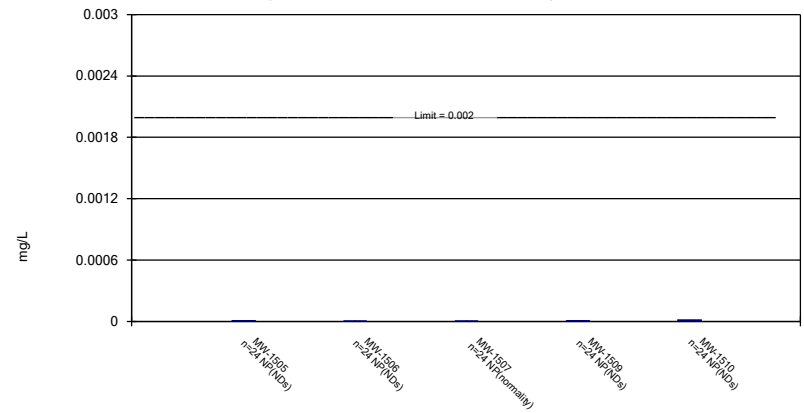
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Non-Parametric Confidence Interval

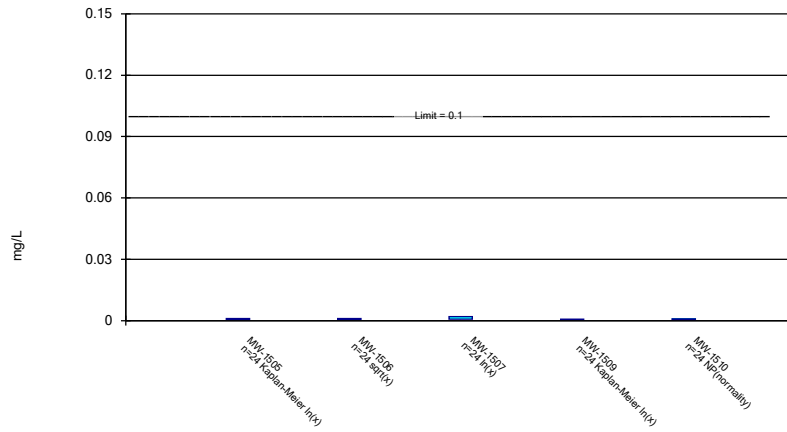
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

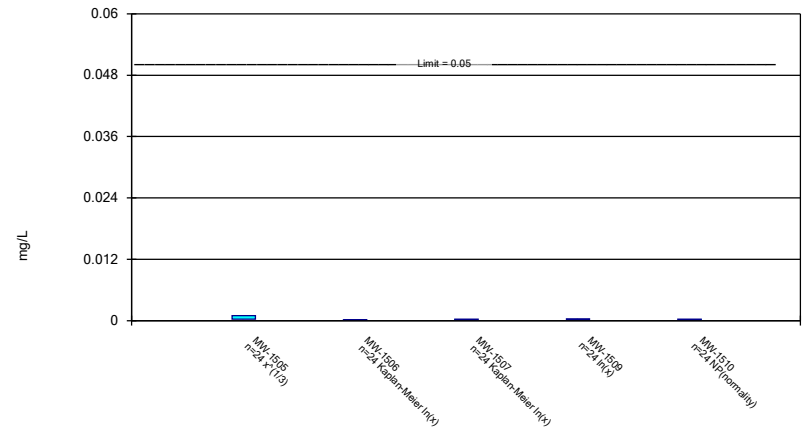
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Parametric and Non-Parametric (NP) Confidence Interval

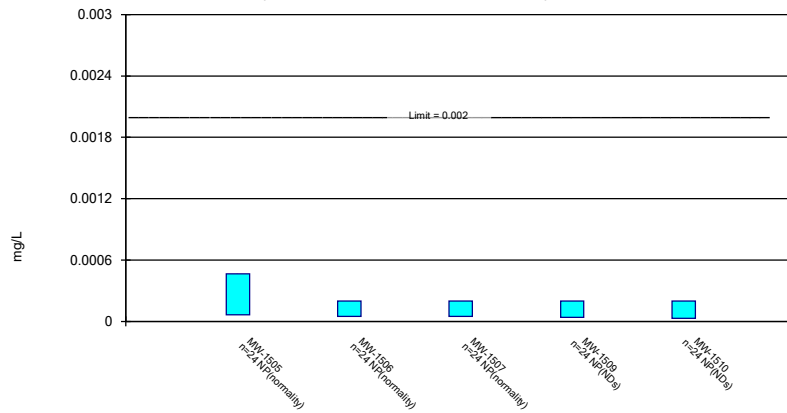
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 8/24/2023 4:42 PM View: Confidence Interval
 Mitchell BAP Client: Geosyntec Data: Mitchell BAP

Memorandum

Date: January 11, 2024

To: Bill Smith (AEP)

Copies to: Brian Newton (AEP)

From: Allison Kreinberg (Geosyntec)

Subject: Evaluation of 2023 Reissued Analytical Laboratory Data for Mitchell Power Plant's Bottom Ash Pond (BAP)

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

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

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

¹ Geosyntec. 2023. *Statistical Analysis Summary – Bottom Ash Pond. Mitchell Plant, Moundsville, West Virginia.* Geosyntec Consultants, Inc. August.

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

Geosyntec Consultants, Inc.

Sample Date	Well ID	CCR Unit	Well Location	Constituent	Units	Initial Reported Value	Revised Value
5/17/2023	MW-1504	Bottom Ash Pond	Background	Lithium	mg/L	0.0047	0.00472
5/16/2023	MW-1508	Bottom Ash Pond	Background	Lithium	mg/L	0.0045	0.00445
5/17/2023	MW-1505	Bottom Ash Pond	Downgradient	Lithium	mg/L	0.0056	0.00555
5/17/2023	MW-1506	Bottom Ash Pond	Downgradient	Lithium	mg/L	0.0074	0.00744
5/16/2023	MW-1507	Bottom Ash Pond	Downgradient	Lithium	mg/L	0.0077	0.00773
5/16/2023	MW-1509	Bottom Ash Pond	Downgradient	Lithium	mg/L	0.0087	0.00871
5/16/2023	MW-1510	Bottom Ash Pond	Downgradient	Lithium	mg/L	0.0077	0.00774

Notes:

1. All results are shown in milligrams per liter (mg/L).
2. Non-detect values are shown as less than the method detection limit.

APPENDIX 3 – Alternative Source Demonstrations

Alternative source demonstrations relative to Appendix IV SSLs above the groundwater protection standard were not necessary because no SSLs above the groundwater protection standards were identified in 2023. Alternative source demonstrations are not applicable at this time.

APPENDIX 4 - Notices for Monitoring Program Transitions

No transition between monitoring requirements occurred in 2023; the CCR unit remained in assessment monitoring. Notices for monitoring program transitions are not applicable at this time.

APPENDIX 5 - Well Installation/Decommissioning Logs

No monitoring wells installed or decommissioned in 2023. Well installation/decommissioning logs are not applicable at this time.