Annual Groundwater Monitoring Report

Appalachian Power Company

John E. Amos Plant

Bottom Ash Pond CCR Management Unit

Winfield, West Virginia

January 2024

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APPALACHIAN POWER℠

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BOUNDLESS ENERGY℠

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Abbreviations:
ASD – Alternate Source Demonstration
CCR – Coal Combustion Residual
GWPS – Groundwater Protection Standard
SSI – Statistically Significant Increase
SSL – Statistically Significant Level
AMBAP – Amos Bottom Ash Pond

I. Overview

This *Annual Groundwater Monitoring and Corrective Action Report* (Report) has been prepared to report the status of activities for the preceding year for an existing Bottom Ash Pond (BAP) CCR unit at Appalachian Power Company's, a wholly-owned subsidiary of American Electric Power Company (AEP) John E. Amos 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 31.

In general, the following activities were completed:

- An assessment monitoring program was established for the Amos Bottom Ash Pond (AMBAP) on April 13, 2018.
- The CCR unit began 2023 in assessment monitoring and remained in assessment monitoring throughout all of 2023.
- Groundwater samples were collected and analyzed for Appendix III and Appendix IV constituents, as specified in 40 CFR 257.95 *et seq.* and AEP's *Groundwater Sampling and Analysis Plan (2016)* in February, May, and October 2023.
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units.
- Analytical results of the October/November 2022, February 2023, and May 2023 rounds of sampling are listed in the tables in **Appendix 1**. Also shown are the groundwater flow rates and flow directions for the 2023 sampling events.
- Statistical analysis of the October/November 2022 sampling event was completed in February 2023 and is included in **Appendix 2**. There were no statistically significant levels (SSLs) above established groundwater protection standards (GWPS's) so the unit remains in assessment monitoring. However, the following statistically significant increases (SSI's) occurred for Appendix III indicator parameters:
    - MW-1: Calcium, chloride, sulfate, and total dissolved solids (TDS)
    - MW-5: Calcium, sulfate
    - MW-1605: Calcium, chloride, sulfate, and TDS
    - MW-1606: Calcium, chloride, sulfate, and TDS
- Statistical analysis of the May 2023 sampling event was completed in September 2023 and is included in **Appendix 2**. There were no SSLs above established GWPS's so the unit remains in assessment monitoring. However, the following SSIs occurred for Appendix III indicator parameters:
    - MW-1: Calcium, chloride, sulfate, and TDS

- MW-5: Calcium
- MW-1605: Calcium, chloride, sulfate, and TDS
- MW-1606: Calcium, chloride, sulfate, and TDS

- October 2023 sampling event data has been received; however, statistical analysis is not yet completed. The statistical analysis will be completed in early 2024. If no SSLs are identified, the unit will remain in assessment monitoring. If SSLs are identified, the unit will either:
  - Attempt an alternative source demonstration, or
  - Transition to the Assessment of Corrective Measures program and make the appropriate transition notifications.

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

- A map/aerial photograph showing the AMBAP Complex CCR 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 (**Appendix 1**).
- Statistical analysis reports completed in 2023 (**Appendix 2**).
- Discussion of any alternative source demonstrations completed (Appendix 3). This is not applicable.
- The notification of the establishment of an assessment monitoring program (**Appendix 4**).
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened, if applicable (Appendix 5). This is not applicable.
- Other information required to be included in the annual report such as 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

Figure 1 depicts the PE-certified groundwater monitoring network, the monitoring well locations, and their corresponding identification numbers. The monitoring well distribution adequately covers downgradient and upgradient areas as detailed in the *Groundwater Monitoring Well Network Evaluation Report* that was updated in October 2020 and placed on the American Electric Power CCR public internet site. The CCR groundwater quality monitoring network includes the following:

- Four upgradient wells MW-6, MW-1601, MW-1602A, and MW-1603A; and
- Six downgradient wells MW-1, MW-4, MW-5, MW-1604, MW-1605, and MW-1606.

Legend

Monitoring Well Network

- Upgradient Sampling Location
- Downgradient Sampling Location
- Ash Pond System

Notes

- Monitoring well coordinates provided by AEP.
- Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis, 2016) provided by AEP.
- Rev. 1: Updated CCR Unit boundary. September 13, 2018

1,000 500 0 1,000 Feet

Site Layout
Ash Pond System

AEP Amos Generating Plant
Winfield, West Virginia

Geosyntec consultants

Columbus, Ohio | 2018/12/24

Figure **1**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Amos\2018\AEP-Amos_BAP_Site_Layout.mxd. ARevezzo. 12/24/2018. CHA8423.

III. Monitoring Wells Installed or Decommissioned

There were no new monitoring wells installed or decommissioned in 2023. The network design, as summarized in the revised *Groundwater Monitoring Well Network Evaluation Report* (2020) and as posted as the CCR website for Amos' Bottom Ash Pond, did not change. That network 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 Calculations and Discussion

Appendix 1 contains tables showing the groundwater quality data collected and received during the establishment of background quality and the groundwater monitoring samples collected and received through 2023. Static water elevation data from each monitoring event in 2023 are also shown in **Appendix 1**, along with the groundwater velocity calculations, groundwater flow direction and potentiometric maps developed after each sampling event.

The sampling event conducted in February 2023 satisfies the requirement of 257.95(b).

V. Groundwater Quality Data Statistical Analysis

Appendix 2 contains the statistical analysis reports. **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. Statistical analysis of the assessment monitoring samples from the October/November 2022 event was completed in February 2023 (**Appendix 2**). No SSLs above a GWPS were identified. However, the following statistically significant increases occurred for Appendix III indicator parameters:

- MW-1: Calcium, chloride, sulfate, and total dissolved solids (TDS)
- MW-5: Calcium, sulfate
- MW-1605: Calcium, chloride, sulfate, and TDS
- MW-1606: Calcium, chloride, sulfate, and TDS

Statistical analysis of the May 2023 sampling event was completed in September 2023 and is included in **Appendix 2**. There were no SSLs above an established GWPS so the unit remains in assessment monitoring. However, the following SSIs occurred for Appendix III indicator parameters:

- MW-1: Calcium, chloride, sulfate, and TDS

- MW-5: Calcium
- MW-1605: Calcium, chloride, sulfate, and TDS
- MW-1606: Calcium, chloride, sulfate, and TDS

Statistical analysis of the October 2023 second semi-annual assessment monitoring event is ongoing and will be completed in early 2024.

VI. Alternative Source Demonstration

No alternative source demonstrations (ASD) were performed in 2023 since no SSLs were identified.

An ASD investigation was completed in April 2018. That demonstration concluded that SSIs identified in the statistical evaluations were potentially influenced by a release from the Amos BAP to the groundwater. An alternate source could not be identified. Therefore, an ASD investigation was not undertaken for the current SSIs.

Because either there were no SSLs or because an ASD for the SSLs was identified, but no alternate source for the SSIs was identified, Amos BAP remained in Assessment Monitoring.

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

The Amos BAP transitioned from detection monitoring to assessment monitoring on April 13, 2018. The notification per 40 CFR 257.94(e)(3) is included in **Appendix 4**. Assessment monitoring continued through the 2023 calendar year.

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

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

VIII. Other Information Required

The BAP has progressed from detection monitoring to its current status in assessment monitoring since April 2018. 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. The low flow sampling effort went smoothly and the schedule was met to support the 2023 annual groundwater report preparation.

X. A Projection of Key Activities for the Upcoming Year

Key activities for 2024 include:

- Assessment monitoring will continue.
- Complete statistical analysis on the sampling results from the October 2023 assessment monitoring event.
- Conduct the annual groundwater sampling event for all constituents listed in appendix III and IV as required by 40 CFR 257.95(b).
- Perform statistical analysis on the sampling results for the Appendix III and Appendix IV parameters as required by 40 CFR 257.95(d)(1).
- Determine applicable GWPSs for the Appendix IV parameters, and compare the results of Appendix IV concentrations in downgradient wells to the GWPSs.
- If no GWPSs are exceeded, the Amos Bottom Ash Pond will remain in assessment monitoring.
- If a GWPS is exceeded in a downgradient well the following activities will be undertaken:
    - Characterize the nature and extent of a release by installing additional GW wells as necessary, estimate the quantity of material released and the concentrations of Appendix IV parameters that are in the material, and sample all wells to characterize the nature and extent of the release.
    - If contaminants have migrated off-site, notify all persons who own land that directly overlies any part of the plume of contamination.
    - Perform an alternate source demonstration (ASD) investigating whether the exceedance was caused by a source other than the BAP or was a result of an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.
    - If a successful ASD cannot be made, initiate an assessment of corrective measures and follow all of those requirements.
- Respond to any new data received in light of what the CCR rule requires.
- Preparation of the 2024 annual groundwater report.

APPENDIX 1

Tables follow, showing a summary of the number of samples collected per monitoring well and the groundwater monitoring data collected, the groundwater velocity, and the direction of groundwater flow. The dates that the samples were collected also is shown.

Table 1. Groundwater Data Summary: MW-1
Amos - 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
7/26/2016	Background	0.042	41.6	61.6	< 0.05 U1	5.0	146	320
8/22/2016	Background	0.051	41.6	60.3	< 0.05 U1	4.9	148	320
10/19/2016	Background	0.031	43.7	64.9	< 0.05 U1	5.1	150	348
11/7/2016	Background	--	--	--	--	5.1	--	--
12/13/2016	Background	0.053	42.9	69.0	< 0.05 U1	5.0	153	318
2/7/2017	Background	0.056	40.4	62.9	0.03 J1	5.5	139	314
3/13/2017	Background	0.108	38.1	64.2	0.02 J1	5.2	140	330
5/22/2017	Background	0.082	35.7	62.6	0.03 J1	6.1	138	316
6/20/2017	Background	0.092	38.2	65.1	< 0.02 U1	5.2	147	348
11/1/2017	Detection	0.039	43.7	75.8	0.03 J1	5.0	156	358
1/9/2018	Detection	--	43.2	83.2	--	4.9	164	362
5/3/2018	Assessment	0.095	39.9	71.8	0.02 J1	7.3	154	328
9/4/2018	Assessment	0.094	38.3	67.9	0.03 J1	5.1	145	338
3/14/2019	Assessment	0.2 J1	38.4	55.2	0.03 J1	5.2	138	321
6/10/2019	Assessment	0.08 J1	35.9	64.4	0.03 J1	10.2	141	330
7/22/2019	Assessment	0.05 J1	36.8	57.4	0.02 J1	4.9	143	362
2/12/2020	Assessment	--	--	--	0.03 J1	5.3	--	--
5/7/2020	Assessment	0.126	32.9	53.4	0.02 J1	5.0	137	336
10/27/2020	Assessment	0.04 J1	39.9	64.0	0.03 J1	4.8	161	374
3/16/2021	Assessment	--	--	--	0.04 J1	5.0	--	--
5/11/2021	Assessment	0.117	31.6	51.2	0.03 J1	5.2	142	332
11/9/2021	Assessment	0.023 J1	40.9 M1, P3	76.1	0.03 J1	5.2	166	410
3/2/2022	Assessment	--	--	--	0.02 J1	5.4	--	--
5/18/2022	Assessment	0.082	36.4	54.2	0.02 J1	5.7	145	340 L1
10/27/2022	Assessment	0.067	35.6	56.8	0.03 J1	4.9	154	350
2/9/2023	Assessment	0.056	32.2 M1	54.4	0.02 J1	5.1	148	350
5/26/2023	Assessment	0.088	29.4	48.8	0.02 J1	5.0	144	330
10/24/2023	Assessment	0.103	32.2	50.3	0.03 J1	4.9	147	340

Table 1. Groundwater Data Summary: MW-1
Amos - 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.02 J1	0.13	30.2	0.107	2.09	0.1	10.7	0.528	< 0.05 U1	0.134	0.004	< 0.002 U1	1.67	0.09 J1	0.04 J1
8/22/2016	Background	0.01 J1	0.12	28.5	0.105	2.02	0.1	12.3	0.725	< 0.05 U1	0.081	0.003	< 0.002 U1	1.48	0.1	0.04 J1
10/19/2016	Background	0.02 J1	0.15	31.1	0.119	2.33	0.510	13.9	1.86	< 0.05 U1	0.133	0.0008 J1	< 0.002 U1	2.33	0.1	0.066
11/7/2016	Background	--	--	--	--	--	--	--	0.615	--	--	--	--	--	--	--
12/13/2016	Background	0.01 J1	0.16	28.9	0.115	2.55	1.24	14.6	0.136	< 0.05 U1	0.102	0.014	< 0.002 U1	1.38	0.2	0.04 J1
2/7/2017	Background	0.01 J1	0.20	25.4	0.115	2.43	0.141	14.9	0.609	0.03 J1	0.093	0.004	< 0.002 U1	0.79	0.1	0.056
3/13/2017	Background	0.02 J1	0.14	26.3	0.112	2.36	0.566	12.5	0.675	0.02 J1	0.129	0.002	< 0.002 U1	1.15	0.1	0.03 J1
5/22/2017	Background	0.03 J1	0.09	25.8	0.114	2.54	0.113	9.69	0.707	0.03 J1	0.066	0.006	0.002 J1	0.31	0.1 J1	0.04 J1
6/20/2017	Background	0.02 J1	0.10	27.7	0.123	2.65	0.173	9.38	0.587	< 0.02 U1	0.062	0.005	< 0.002 U1	0.34	0.09 J1	0.04 J1
5/3/2018	Assessment	0.01 J1	0.13	27.8	0.143	3.12	0.093	15.1	1.74	0.02 J1	0.068	0.004	< 0.002 U1	0.62	0.2	0.04 J1
9/4/2018	Assessment	0.22	0.18	29.4	0.130	2.97	0.548	17.7	0.575	0.03 J1	1.16	0.003	--	0.34	0.2	0.05 J1
3/14/2019	Assessment	0.05 J1	0.12	26.9	0.131	3.48	0.255	10.3	0.887	0.03 J1	0.252	< 0.09 U1	--	0.5 J1	0.09 J1	< 0.1 U1
6/10/2019	Assessment	0.02 J1	0.11	27.5	0.125	2.14	0.2 J1	12.8	0.998	0.03 J1	0.08 J1	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
7/22/2019	Assessment	< 0.02 U1	0.09 J1	26.4	0.136	2.47	0.06 J1	13.5	0.825	0.02 J1	0.08 J1	0.00257	--	< 0.4 U1	0.2 J1	< 0.1 U1
2/12/2020	Assessment	< 0.02 U1	0.09 J1	25.7	0.139	2.22	0.2 J1	18.6	1.100	0.03 J1	0.07 J1	0.00259	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
5/7/2020	Assessment	< 0.02 U1	0.06 J1	25.7	0.126	2.43	0.1 J1	13.9	0.499	0.02 J1	< 0.05 U1	0.00239	--	< 0.4 U1	0.08 J1	< 0.1 U1
10/27/2020	Assessment	< 0.02 U1	0.09 J1	25.4	0.130	2.42	0.1 J1	20.5	1.722	0.03 J1	< 0.05 U1	0.00270	--	< 0.4 U1	0.1 J1	< 0.1 U1
3/16/2021	Assessment	0.03 J1	0.09 J1	25.4	0.129	3.14	0.2 J1	13.9	0.705	0.04 J1	0.06 J1	0.00266	< 0.002 U1	< 0.1 U1	0.1 J1	< 0.04 U1
5/11/2021	Assessment	< 0.02 U1	0.10	24.1	0.127	1.96	0.2 J1	14.0	0.845	0.03 J1	0.05 J1	0.00258	--	0.2 J1	0.09 J1	--
11/9/2021	Assessment	< 0.02 U1	0.14	24.9	0.102	0.881	0.15 J1	11.0	0.45	0.03 J1	0.13 J1	0.00270	--	0.3 J1	0.10 J1	< 0.04 U1
3/2/2022	Assessment	< 0.02 U1	0.08 J1	24.0	0.120	2.32	0.53	19.9	1.98	0.02 J1	0.08 J1	0.00259	< 0.002 U1	0.1 J1	< 0.09 U1	< 0.04 U1
5/18/2022	Assessment	< 0.02 U1	0.12	25.1	0.131	2.79	0.52	15.0	2.00	0.02 J1	0.14 J1	0.00275	--	< 0.1 U1	< 0.09 U1	< 0.04 U1
10/27/2022	Assessment	< 0.02 U1	0.11	24.8	0.140	1.99	0.39	18.3	1.75	0.03 J1	0.1 J1	0.00315	--	0.2 J1	0.1 J1	0.04 J1
2/9/2023	Assessment	< 0.02 U1	0.08 J1	22.5	0.131	1.57	0.17 J1	17.3	1.17	0.02 J1	0.12 J1	0.00286	--	0.1 J1	< 0.09 U1	< 0.04 U1
5/26/2023	Assessment	0.020 J1	0.06 J1	21.5	0.128	1.71	0.58	11.2	0.98	0.02 J1	0.06 J1	0.00280	< 0.002 U1	< 0.1 U1	0.04 J1	0.02 J1
10/24/2023	Assessment	< 0.008 U1	0.11	23.6	0.122	1.67	0.32	15.9	0.96	0.03 J1	0.06 J1	0.00272	< 0.002 U1	0.1 J1	0.13 J1	0.03 P2, J1

Table 1. Groundwater Data Summary: MW-4
Amos - 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
7/25/2016	Background	0.074	16.2	11.7	0.07 J1	5.9	44.8	190
8/23/2016	Background	0.054	17.9	10.9	0.04 J1	5.5	39.2	184
10/18/2016	Background	0.070	15.2	12.2	< 0.05 U1	5.7	44.5	206
11/8/2016	Background	--	--	12.8	0.03 J1	5.7	47.3	170
12/12/2016	Background	0.079	16.3	14.0	0.04 J1	5.5	48.0	348
2/8/2017	Background	0.087	15.3	13.4	0.06 J1	5.6	46.1	176
3/14/2017	Background	0.093	15.8	12.9	0.05 J1	5.8	43.5	185
5/22/2017	Background	0.099	15.3	13.2	0.04 J1	6.3	43.9	192
6/19/2017	Background	0.097	15.0	13.3	0.03 J1	5.5	50.9	196
11/1/2017	Detection	0.073	14.2	12.3	0.06	5.5	43.0	210
5/3/2018	Assessment	0.100	15.9	14.4	0.06 J1	5.9	49.2	178
9/5/2018	Assessment	0.067	13.3	13.4	0.06	7.0	42.4	179
3/15/2019	Assessment	< 0.2 U1	14.5	13.3	0.06 J1	5.5	42.8	184
6/10/2019	Assessment	0.06 J1	14.4	13.0	0.06	6.8	43.3	172
7/23/2019	Assessment	0.06 J1	14.8	13.4	0.04 J1	5.4	44.5	186
2/11/2020	Assessment	--	--	--	0.04 J1	5.9	--	--
5/6/2020	Assessment	0.135	17.6	16.9	0.04 J1	5.5	54.6	213
10/30/2020	Assessment	0.085	16.0	12.9	0.05 J1	5.4	39.0	187
3/17/2021	Assessment	--	--	--	0.06	5.5	--	--
5/10/2021	Assessment	0.073	16.4	18.7	0.07	5.9	38.6	190
11/3/2021	Assessment	0.068	14.9	18.6	0.06	5.3	39.9	190
3/1/2022	Assessment	--	--	--	0.04 J1	6.2	--	--
5/19/2022	Assessment	0.040 J1	13.9	21.4	0.06	5.9	14.7	170 L1
10/26/2022	Assessment	0.081	16.5 M1	17.5	0.04 J1	5.3	53.8	210
2/9/2023	Assessment	0.077	17.3	18.3	0.05 J1	5.7	51.2	190
5/24/2023	Assessment	0.105	19.1	25.7	0.03 J1	5.6	69.2	220
10/20/2023	Assessment	0.086 M1	20.7 M1	25.7	0.05 J1	5.7	80.8	240

Table 1. Groundwater Data Summary: MW-4
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/25/2016	Background	0.05 J1	13.6	101	0.068	0.18	0.5	26.6	0.539	0.07 J1	0.502	0.007	< 0.002 U1	11.1	0.07 J1	0.055
8/23/2016	Background	0.02 J1	4.34	90.8	0.051	0.03	0.3	5.55	0.405	0.04 J1	0.275	0.002	< 0.002 U1	19.2	0.08 J1	0.01 J1
10/18/2016	Background	0.11	15.8	84.1	0.055	0.53	0.600	85.9	1.884	< 0.05 U1	0.395	0.002	< 0.002 U1	2.44	0.1	0.156
11/8/2016	Background	--	--	--	--	--	--	--	0.457	0.03 J1	--	--	--	--	--	--
12/12/2016	Background	0.03 J1	3.35	96.0	0.049	0.09	1.18	10.9	2.116	0.04 J1	0.255	0.012	< 0.002 U1	0.75	0.1 J1	0.090
2/8/2017	Background	0.02 J1	8.17	82.5	0.045	0.12	0.290	18.9	0.46	0.06 J1	0.306	0.001	< 0.002 U1	0.93	0.07 J1	0.099
3/14/2017	Background	0.03 J1	5.36	91.0	0.043	0.16	0.327	23.3	1.339	0.05 J1	0.192	0.0005 J1	< 0.002 U1	0.51	0.07 J1	0.072
5/22/2017	Background	0.04 J1	6.38	96.2	0.053	0.09	0.226	20.8	0.55	0.04 J1	0.188	0.008	< 0.002 U1	0.49	0.08 J1	0.068
6/19/2017	Background	0.02 J1	5.65	88.5	0.049	0.08	0.216	22.1	0.929	0.03 J1	0.247	0.002	< 0.002 U1	0.31	0.1	0.069
5/3/2018	Assessment	< 0.01 U1	1.15	93.1	0.046	0.04	0.175	7.93	1.569	0.06 J1	0.153	0.0008 J1	< 0.002 U1	0.31	0.06 J1	0.01 J1
9/5/2018	Assessment	0.05 J1	11.0	89.1	0.037	0.21	0.200	25.8	0.623	0.06	0.083	0.003	--	0.28	0.06 J1	0.109
3/15/2019	Assessment	< 0.02 U1	1.63	80.4	0.05 J1	0.05	0.2 J1	9.81	0.501	0.06 J1	0.219	< 0.09 U1	--	< 0.4 U1	0.06 J1	< 0.1 U1
6/10/2019	Assessment	< 0.02 U1	2.50	90.5	0.06 J1	0.07	0.274	10.5	0.787	0.06	0.406	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.08 J1	< 0.1 U1
7/23/2019	Assessment	0.03 J1	2.48	84.6	0.07 J1	0.05	0.236	7.24	0.486	0.04 J1	0.430	0.00162	--	< 0.4 U1	0.1 J1	< 0.1 U1
2/11/2020	Assessment	< 0.02 U1	0.92	96.9	0.04 J1	0.05 J1	0.2 J1	8.30	1.883	0.04 J1	0.2 J1	0.00151	< 0.002 U1	0.9 J1	0.06 J1	< 0.1 U1
5/6/2020	Assessment	< 0.02 U1	5.20	110	0.09 J1	0.05	0.367	8.17	2.176	0.04 J1	0.545	0.00139	--	1 J1	0.2 J1	< 0.1 U1
10/30/2020	Assessment	0.08 J1	21.7	83.5	0.07 J1	0.61	0.308	42.4	0.2618	0.05 J1	0.416	0.00166	--	< 0.4 U1	0.09 J1	0.2 J1
3/17/2021	Assessment	< 0.02 U1	2.15	94.0	0.05 J1	0.06	0.331	8.82	0.515	0.06	0.2 J1	0.00177	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
5/10/2021	Assessment	< 0.02 U1	1.40	92.6	0.04 J1	0.03 J1	0.334	7.23	0.534	0.07	0.2 J1	0.00172	--	0.2 J1	< 0.09 U1	--
11/3/2021	Assessment	< 0.02 U1	1.42	89.8 M1	0.050	0.040	0.42	7.38	0.76	0.06	0.23	0.00164	--	0.1 J1	< 0.09 U1	< 0.04 U1
3/1/2022	Assessment	< 0.02 U1	1.65	87.6	0.040 J1	0.110	0.67	7.53	1.74	0.04 J1	0.21	0.00147	< 0.002 U1	0.1 J1	< 0.09 U1	< 0.04 U1
5/19/2022	Assessment	< 0.02 U1	1.12	93.4	0.040 J1	0.040	0.32	8.84	1.00	0.06	0.05 J1	0.00198	--	0.2 J1	< 0.09 U1	< 0.04 U1
10/26/2022	Assessment	0.09 J1	16.3	108	0.116	0.225	0.56	13.6	1.89	0.04 J1	0.88	0.00170	--	0.2 J1	0.11 J1	0.06 J1
2/9/2023	Assessment	< 0.02 U1	1.19	88.9	0.045 J1	0.040	0.40	6.66	1.22	0.05 J1	0.20	0.00163	--	0.1 J1	< 0.09 U1	< 0.04 U1
5/24/2023	Assessment	0.185	8.08	83.8	0.086	0.201	0.73	22.3	1.42 M1	0.03 J1	0.90	0.00145	< 0.002 U1	0.2 J1	0.09 J1	0.19 J1
10/20/2023	Assessment	0.166	9.21	81.7	0.038 J1	0.287	0.42	13.2	1.33	0.05 J1	0.54	0.00108	< 0.002 U1	0.2 J1	0.08 J1	0.28

Table 1. Groundwater Data Summary: MW-5
Amos - 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
7/26/2016	Background	0.051	19.7	21.4	0.04 J1	5.8	57.7	156
8/23/2016	Background	0.014	18.4	21.3	0.04 J1	5.4	57.5	136
10/18/2016	Background	0.018	18.6	20.0	< 0.05 U1	5.9	56.0	188
11/8/2016	Background	--	--	20.1	0.05 J1	5.8	56.5	176
12/12/2016	Background	0.002 J1	18.1	20.4	0.03 J1	5.7	54.1	154
2/8/2017	Background	0.032	16.3	19.6	0.05 J1	5.8	51.1	158
3/14/2017	Background	0.028	16.5	19.5	0.03 J1	5.9	51.5	172
5/22/2017	Background	0.046	16.8	18.9	0.04 J1	6.6	51.1	180
6/19/2017	Background	0.060	11.4	19.1	0.03 J1	5.6	57.3	170
11/1/2017	Detection	0.033	15.7	17.5	0.05 J1	5.7	53.9	190
5/3/2018	Assessment	0.156	16.6	17.8	0.04 J1	6.3	51.9	166
9/4/2018	Assessment	0.028	15.2	17.8	0.05 J1	5.8	45.4	151
3/15/2019	Assessment	< 0.2 U1	16.2	18.5	0.05 J1	5.7	51.3	180
6/10/2019	Assessment	0.04 J1	15.7	16.9	0.05 J1	5.9	48.4	178
7/23/2019	Assessment	< 0.04 U1	14.9	15.3	0.04 J1	5.6	45.2	162
2/11/2020	Assessment	--	--	--	0.04 J1	6.0	--	--
5/6/2020	Assessment	--	--	--	--	5.5	--	--
7/7/2020	Assessment	0.055	14.7	14.6	0.03 J1	6.1	45.7	156
10/27/2020	Assessment	0.04 J1	14.3	14.3	0.04 J1	5.5	43.5	177
3/17/2021	Assessment	--	--	--	0.05 J1	5.7	--	--
5/11/2021	Assessment	0.050	12.6	11.2	0.05 J1	5.9	42.7	156
11/3/2021	Assessment	0.024 J1	12.1	9.88	0.04 J1	5.4	42.2	150
3/1/2022	Assessment	--	--	--	0.03 J1	5.5	--	--
5/19/2022	Assessment	0.047 J1	25.4	21.8	0.03 J1	5.9	115	270 L1
10/27/2022	Assessment	0.040 J1	25.8	25.9	0.03 J1	5.5	111	250
2/8/2023	Assessment	0.037 J1	18.1	20.2	0.03 J1	5.5	68.1	200
5/24/2023	Assessment	0.019 J1	22.0	39.8	0.03 J1	5.6	72.1	220
10/18/2023	Assessment	0.018 J1	44.8	105	0.04 J1	5.5	172	400

Table 1. Groundwater Data Summary: MW-5
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.03 J1	2.71	170	0.039	0.01 J1	0.2	0.966	1.264	0.04 J1	0.123	0.0005 J1	< 0.002 U1	2.15	< 0.03 U1	0.04 J1
8/23/2016	Background	0.01 J1	2.42	157	0.029	0.007 J1	0.2	1.01	0.406	0.04 J1	0.056	0.004	< 0.002 U1	2.57	< 0.03 U1	0.01 J1
10/18/2016	Background	0.05	4.00	166	0.079	0.007 J1	0.841	1.45	1.123	< 0.05 U1	0.667	0.004	< 0.002 U1	2.20	0.09 J1	0.01 J1
11/8/2016	Background	--	--	--	--	--	--	--	1.099	0.05 J1	--	--	--	--	--	--
12/12/2016	Background	0.08	3.41	166	0.053	0.006 J1	0.892	1.14	1.46	0.03 J1	0.264	0.006	< 0.002 U1	1.01	0.04 J1	0.02 J1
2/8/2017	Background	0.04 J1	3.26	141	0.051	0.006 J1	0.237	0.981	3.676	0.05 J1	0.216	0.003	< 0.002 U1	0.99	< 0.03 U1	0.01 J1
3/14/2017	Background	0.03 J1	2.79	152	0.033	0.007 J1	0.170	0.949	1.055	0.03 J1	0.022	0.002	< 0.002 U1	0.49	< 0.03 U1	0.01 J1
5/22/2017	Background	0.04 J1	2.74	151	0.052	0.007 J1	0.195	1.11	1.062	0.04 J1	0.236	0.013	< 0.002 U1	0.31	0.03 J1	< 0.01 U1
6/19/2017	Background	0.02 J1	3.25	155	0.053	0.006 J1	0.237	0.997	1.099	0.03 J1	0.207	0.002	< 0.002 U1	0.22	0.05 J1	< 0.01 U1
5/3/2018	Assessment	0.02 J1	3.18	149	0.049	0.006 J1	0.237	1.03	1.631	0.04 J1	0.147	0.0004 J1	< 0.002 U1	0.31	0.05 J1	< 0.01 U1
9/4/2018	Assessment	0.02 J1	2.34	157	0.034	0.01 J1	0.122	1.03	0.3383	0.05 J1	0.038	0.002	--	0.15	< 0.03 U1	0.03 J1
3/15/2019	Assessment	0.02 J1	3.63	162	0.06 J1	< 0.01 U1	0.344	1.21	0.853	0.05 J1	0.124	< 0.09 U1	--	< 0.4 U1	< 0.03 U1	< 0.1 U1
6/10/2019	Assessment	< 0.02 U1	2.85	155	0.04 J1	< 0.01 U1	0.1 J1	1.13	0.89	0.05 J1	0.04 J1	< 0.009 U1	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
7/23/2019	Assessment	0.10	6.74	158	0.121	< 0.01 U1	0.291	1.12	0.811	0.04 J1	0.762	0.00153	--	< 0.4 U1	0.08 J1	< 0.1 U1
2/11/2020	Assessment	0.03 J1	4.35	130	0.06 J1	< 0.01 U1	0.273	1.21	1.855	0.04 J1	0.201	0.00147	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
7/7/2020	Assessment	< 0.02 U1	2.77	140	0.04 J1	< 0.01 U1	0.1 J1	1.39	1.12	0.03 J1	0.08 J1	0.00157	--	0.5 J1	0.06 J1	< 0.1 U1
10/27/2020	Assessment	< 0.02 U1	3.18	134	0.04 J1	< 0.01 U1	0.214	1.42	2.254	0.04 J1	< 0.05 U1	0.00138	--	< 0.4 U1	< 0.03 U1	< 0.1 U1
3/17/2021	Assessment	< 0.02 U1	3.36	128	0.04 J1	< 0.004 U1	0.222	1.23	0.845	0.05 J1	0.06 J1	0.00138	< 0.002 U1	0.1 J1	< 0.09 U1	< 0.04 U1
5/11/2021	Assessment	< 0.02 U1	2.77	132	0.04 J1	0.005 J1	0.236	1.34	0.96	0.05 J1	< 0.05 U1	0.00136	--	0.2 J1	< 0.09 U1	--
11/3/2021	Assessment	< 0.02 U1	3.07	120	0.036 J1	0.004 J1	0.45	1.03	0.55	0.04 J1	< 0.05 U1	0.00132	--	0.2 J1	< 0.09 U1	< 0.04 U1
3/1/2022	Assessment	< 0.02 U1	3.41	171	0.040 J1	0.006 J1	0.37	0.833	1.28	0.03 J1	0.06 J1	0.00142	< 0.002 U1	0.1 J1	< 0.09 U1	< 0.04 U1
5/19/2022	Assessment	< 0.02 U1	3.58	272 M1, P3	0.066	< 0.004 U1	0.25	0.862	1.85	0.03 J1	0.06 M1, P3, J1	0.00201	--	3.5	< 0.09 U1	< 0.04 U1
10/27/2022	Assessment	< 0.02 U1	3.05	258	0.065	0.007 J1	0.31	1.28	1.24	0.03 J1	0.06 J1	0.00190	--	0.1 J1	< 0.09 U1	< 0.04 U1
2/8/2023	Assessment	< 0.02 U1	3.08	176	0.049 J1	0.006 J1	0.37	0.973	1.67	0.03 J1	0.05 J1	0.00159	--	0.1 J1	< 0.09 U1	< 0.04 U1
5/24/2023	Assessment	0.018 J1	2.89	202	0.053	< 0.004 U1	0.31	0.276	1.09	0.03 J1	< 0.05 U1	0.00184	< 0.002 U1	< 0.1 U1	< 0.04 U1	< 0.02 U1
10/18/2023	Assessment	0.011 J1	3.01	349	0.083	< 0.004 U1	0.28 J1	0.429	1.68	0.04 J1	0.06 J1	0.00239	< 0.002 U1	< 0.1 U1	0.04 J1	< 0.02 U1

Table 1. Groundwater Data Summary: MW-6
Amos - 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
7/26/2016	Background	0.117	12.2	8.88	0.08 J1	6.2	2.8	204
8/24/2016	Background	0.023	12.2	10.7	0.03 J1	5.5	6.1	244
10/19/2016	Background	0.006	11.3	8.67	0.04 J1	6.1	3.7	196
11/8/2016	Background	--	--	--	--	6.0	--	--
12/13/2016	Background	< 0.002 U1	12.4	9.79	0.04 J1	5.9	2.1	190
2/8/2017	Background	0.051	11.6	10.3	0.06 J1	6.0	2.8	170
3/14/2017	Background	0.048	11.5	9.90	0.05 J1	6.1	2.1	203
5/23/2017	Background	0.037	11.9	11.5	0.04 J1	6.2	4.4	238
6/20/2017	Background	0.183	11.6	9.61	0.07	6.0	2.5	222
11/1/2017	Detection	0.017	12.2	11.6	0.07	5.9	5.5	258
5/3/2018	Assessment	0.056	12.0	10.1	0.07	6.3	2.9	188
9/4/2018	Assessment	< 0.002 U1	11.3	8.97	0.09	6.0	1.3	176
3/15/2019	Assessment	< 0.2 U1	12.4	10.4	0.05 J1	5.9	1.6	226
6/10/2019	Assessment	< 0.02 U1	11.8	9.68	0.08	9.3	2.2	205
7/24/2019	Assessment	0.04 J1	12.1	9.71	0.05 J1	5.9	2.2	199
2/12/2020	Assessment	--	--	--	0.06	6.2	--	--
5/5/2020	Assessment	0.04 J1	11.7	8.55	0.09	5.5	1.3	202
10/28/2020	Assessment	< 0.02 U1	12.8	10.8	0.06 J1	5.8	2.6	244
3/16/2021	Assessment	--	--	--	0.09	6.0	--	--
5/11/2021	Assessment	0.02 J1	11.6	9.71	0.07	6.0	2.1	180
11/2/2021	Assessment	< 0.009 U1	10.8	9.11	0.05 J1	7.0	0.75	230
3/2/2022	Assessment	--	--	--	0.05 J1	7.0	--	--
5/23/2022	Assessment	0.01 J1	11.9	10.9	0.05 J1	6.5	3.31	190 L1
10/26/2022	Assessment	0.014 J1	13.8	13.6	0.04 J1	5.7	4.34	280
2/9/2023	Assessment	0.011 J1	13.6	11.7	0.04 J1	5.7	3.29	200
5/25/2023	Assessment	0.010 J1	12.1	11.9	0.04 J1	5.7	3.5	250
10/23/2023	Assessment	0.012 J1	13.4	11.0	0.05 J1	5.8	2.6	250

Table 1. Groundwater Data Summary: MW-6
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.03 J1	33.6	191	0.065	0.01 J1	1.5	13.6	1.3779	0.08 J1	1.25	0.002	< 0.002 U1	1.77	0.2	0.075
8/24/2016	Background	0.01 J1	33.4	185	0.037	0.01 J1	1.0	12.4	0.961	0.03 J1	0.581	0.003	< 0.002 U1	0.97	0.2	0.070
10/19/2016	Background	0.01 J1	34.4	171	0.026	0.006 J1	0.647	11.0	1.941	0.04 J1	0.281	0.0005 J1	< 0.002 U1	0.78	0.2	0.185
11/8/2016	Background	--	--	--	--	--	--	--	1.026	--	--	--	--	--	--	--
12/13/2016	Background	0.02 J1	33.9	169	0.038	0.007 J1	1.88	10.6	1.635	0.04 J1	0.515	0.006	< 0.002 U1	0.53	0.2	0.060
2/8/2017	Background	0.02 J1	32.8	157	0.038	0.007 J1	0.817	12.3	20.83	0.06 J1	0.574	0.004	< 0.002 U1	0.60	0.2	0.055
3/14/2017	Background	0.02 J1	36.3	168	0.037	0.006 J1	1.54	12.0	1.178	0.05 J1	0.416	< 0.0002 U1	< 0.002 U1	0.62	0.2	0.054
5/23/2017	Background	0.04 J1	33.6	183	0.032	0.006 J1	0.748	13.1	1.013	0.04 J1	0.305	0.006	< 0.002 U1	0.41	0.2	0.053
6/20/2017	Background	0.02 J1	32.4	169	0.022	< 0.005 U1	0.496	10.7	1.345	0.07	0.157	0.0003 J1	< 0.002 U1	0.44	0.1	0.055
5/3/2018	Assessment	0.01 J1	34.1	163	0.028	< 0.005 U1	0.455	11.9	2.0087	0.07	0.216	< 0.0002 U1	< 0.002 U1	0.50	0.2	0.092
9/4/2018	Assessment	0.16	29.8	147	0.01 J1	0.03	0.380	9.16	0.769	0.09	0.214	< 0.0002 U1	--	0.46	0.1	0.084
3/15/2019	Assessment	0.06 J1	32.0	184	0.106	0.02 J1	1.82	14.0	0.865	0.05 J1	1.72	< 0.09 U1	--	0.5 J1	0.4	0.1 J1
6/10/2019	Assessment	0.03 J1	34.3	161	< 0.02 U1	< 0.01 U1	0.309	9.72	0.688	0.08	0.104	< 0.009 U1	< 0.002 U1	0.5 J1	0.1 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	34.2	164	0.03 J1	< 0.01 U1	0.418	8.97	0.657	0.05 J1	0.2 J1	0.00114	--	0.4 J1	0.1 J1	< 0.1 U1
2/12/2020	Assessment	< 0.02 U1	38.5	165	< 0.02 U1	< 0.01 U1	0.433	9.52	1.539	0.06	0.07 J1	0.00118	< 0.002 U1	0.5 J1	0.09 J1	< 0.1 U1
5/5/2020	Assessment	0.17	37.2	149	< 0.02 U1	< 0.01 U1	0.429	8.80	2.62	0.09	0.390	0.00102	--	1 J1	0.09 J1	< 0.1 U1
10/28/2020	Assessment	< 0.02 U1	33.5	152	< 0.02 U1	< 0.01 U1	0.406	8.57	0.573	0.06 J1	< 0.05 U1	0.00113	--	0.4 J1	0.05 J1	< 0.1 U1
3/16/2021	Assessment	< 0.02 U1	36.8	164	0.02 J1	< 0.004 U1	0.519	9.08	0.78	0.09	0.07 J1	0.00121	< 0.002 U1	0.5 J1	0.1 J1	< 0.04 U1
5/11/2021	Assessment	0.02 J1	34.1	155	0.02 J1	< 0.004 U1	0.562	8.54	1.105	0.07	0.2 J1	0.00108	--	0.5 J1	0.1 J1	--
11/2/2021	Assessment	< 0.02 U1	35.4	146	0.013 J1	< 0.004 U1	0.45	8.03	1.33	0.05 J1	0.05 J1	0.00097	--	0.4 J1	0.1 J1	< 0.04 U1
3/2/2022	Assessment	< 0.02 U1	33.7	170	0.016 J1	< 0.004 U1	0.83	10.6	1.93	0.05 J1	< 0.05 U1	0.00108	< 0.002 U1	0.4 J1	< 0.09 U1	< 0.04 U1
5/23/2022	Assessment	0.05 J1	37.2	169	0.022 J1	0.005 J1	1.03	11.7	2.88	0.05 J1	0.24	0.00118	--	0.6	< 0.09 U1	0.06 J1
10/26/2022	Assessment	< 0.02 U1	38.0	213	0.017 J1	< 0.004 U1	0.72	15.0	2.89	0.04 J1	< 0.05 U1	0.00134	--	0.4 J1	< 0.09 U1	< 0.04 U1
2/9/2023	Assessment	< 0.02 U1	39.4	199	0.019 J1	< 0.004 U1	0.60	12.8	1.57	0.04 J1	< 0.05 U1	0.00125	--	0.4 J1	< 0.09 U1	< 0.04 U1
5/25/2023	Assessment	0.020 J1	31.3	174	0.015 J1	< 0.004 U1	0.43	11.3	1.80	0.04 J1	0.07 J1	0.00122	< 0.002 U1	0.4 J1	0.08 J1	0.06 J1
10/23/2023	Assessment	0.022 J1	36.1	193	0.016 J1	< 0.004 U1	0.91	12.4	1.14	0.05 J1	0.11 J1	0.00117	< 0.002 U1	0.4 J1	0.16 J1	0.03 P2, J1

Table 1. Groundwater Data Summary: MW-1601
Amos - 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
7/26/2016	Background	0.070	11.8	7.17	0.06 J1	5.8	54.5	120
8/24/2016	Background	0.035	10.9	6.54	0.05 J1	5.6	49.1	142
10/18/2016	Background	< 0.002 U1	10.1	6.56	0.05 J1	6.0	39.6	136
11/7/2016	Background	--	--	6.79	0.05 J1	5.9	39.7	122
12/13/2016	Background	< 0.002 U1	10.4	7.79	0.04 J1	5.8	43.6	140
2/7/2017	Background	0.109	11.6	9.09	0.05 J1	6.0	55.6	168
3/13/2017	Background	0.107	11.2	9.89	0.04 J1	6.0	57.4	169
5/23/2017	Background	0.170	11.2	9.75	0.04 J1	5.9	52.8	182
6/20/2017	Background	0.107	10.4	8.59	0.04 J1	5.9	51.3	184
11/2/2017	Detection	0.087	8.91	9.91	0.05 J1	5.8	39.1	164
5/4/2018	Assessment	0.070	11.0	10.3	0.05 J1	6.1	53.0	159
9/5/2018	Assessment	< 0.002 U1	11.6	10.4	0.04 J1	7.8	52.2	157
3/19/2019	Assessment	0.05 J1	11.9	8.80	< 0.01 U1	5.8	52.7	176
6/12/2019	Assessment	< 0.02 U1	11.0	10.0	0.05 J1	6.7	48.8	185
7/24/2019	Assessment	< 0.04 U1	10.3	10.3	0.05 J1	5.9	44.6	154
2/12/2020	Assessment	--	--	--	0.05 J1	5.9	--	--
5/6/2020	Assessment	0.03 J1	9.42	19.0	0.04 J1	5.6	25.9	143
10/28/2020	Assessment	< 0.02 U1	10.8	28.3	0.05 J1	5.6	24.1	156
3/17/2021	Assessment	--	--	--	0.06 J1	5.9	--	--
5/10/2021	Assessment	0.01 J1	9.66	25.6	0.05 J1	6.1	27.2	116
11/9/2021	Assessment	0.052	19.4	42.9	0.04 J1	5.8	75.7	250
3/2/2022	Assessment	--	--	--	0.03 J1	5.5	--	--
5/24/2022	Assessment	0.009 J1	15.1	28.1	0.02 J1	6.1	60.2	170 L1
10/25/2022	Assessment	< 0.009 U1	10.8	12.7	0.04 J1	5.6	50.5	160
2/8/2023	Assessment	0.009 J1	9.84	13.7	0.03 J1	5.5	47.1	150
5/25/2023	Assessment	< 0.007 U1	10.7	24.9	0.03 J1	5.4	51.2	210
10/20/2023	Assessment	0.016 J1	11.1	19.9	0.04 J1	5.5	46.7	140

Table 1. Groundwater Data Summary: MW-1601
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.01 J1	4.57	128	0.030	0.02	0.4	7.24	0.106	0.06 J1	0.366	0.003	< 0.002 U1	0.32	0.07 J1	0.01 J1
8/24/2016	Background	< 0.01 U1	5.14	120	0.02 J1	0.02 J1	0.3	6.19	0.975	0.05 J1	0.109	0.007	< 0.002 U1	0.62	0.09 J1	0.02 J1
10/18/2016	Background	0.01 J1	5.64	118	0.027	0.02 J1	0.688	4.04	2.413	0.05 J1	0.265	0.003	< 0.002 U1	0.26	0.1 J1	0.065
11/7/2016	Background	--	--	--	--	--	--	--	0.842	0.05 J1	--	--	--	--	--	--
12/13/2016	Background	0.02 J1	5.38	113	0.027	0.02 J1	1.35	4.67	1.101	0.04 J1	0.272	0.009	< 0.002 U1	0.16	0.1	0.02 J1
2/7/2017	Background	< 0.01 U1	5.09	107	0.025	0.02 J1	0.224	6.20	35.021	0.05 J1	0.227	0.004	< 0.002 U1	0.21	0.1	0.01 J1
3/13/2017	Background	< 0.01 U1	5.54	117	0.023	0.02 J1	0.588	6.47	0.7405	0.04 J1	0.161	0.004	< 0.002 U1	0.16	0.05 J1	0.01 J1
5/23/2017	Background	0.02 J1	7.08	122	0.051	0.02	0.740	5.48	0.573	0.04 J1	0.687	0.007	< 0.002 U1	0.21	0.2	0.02 J1
6/20/2017	Background	0.02 J1	5.57	113	0.02 J1	0.02 J1	0.215	4.72	1.037	0.04 J1	0.142	0.003	< 0.002 U1	0.17	0.06 J1	0.02 J1
5/4/2018	Assessment	0.01 J1	6.44	112	0.038	0.02	0.353	4.43	1.723	0.05 J1	0.397	0.010	< 0.002 U1	0.20	0.1	0.02 J1
9/5/2018	Assessment	0.02 J1	5.39	90.4	0.01 J1	0.02	0.270	6.73	0.252	0.04 J1	0.045	0.002	--	0.08 J1	< 0.03 U1	0.02 J1
3/19/2019	Assessment	< 0.02 U1	6.55	122	0.02 J1	0.01 J1	0.1 J1	3.41	0.666	< 0.01 U1	0.105	0.02 J1	--	< 0.4 U1	0.04 J1	< 0.1 U1
6/12/2019	Assessment	< 0.02 U1	6.02	118	0.04 J1	0.02 J1	0.2 J1	2.75	0.533	0.05 J1	0.154	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.08 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	6.63	130	0.02 J1	0.01 J1	0.2 J1	3.01	1.005	0.05 J1	0.2 J1	0.00141	--	< 0.4 U1	0.06 J1	< 0.1 U1
2/12/2020	Assessment	0.03 J1	8.26	122	0.05 J1	0.02 J1	0.938	3.19	0.398	0.05 J1	0.602	0.00159	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
5/6/2020	Assessment	< 0.02 U1	7.83	115	< 0.02 U1	0.01 J1	0.272	2.78	2.682	0.04 J1	0.2 J1	0.00121	--	0.5 J1	0.04 J1	< 0.1 U1
10/28/2020	Assessment	< 0.02 U1	8.68	127	0.03 J1	0.01 J1	0.369	3.04	0.447	0.05 J1	0.227	0.00138	--	< 0.4 U1	0.07 J1	< 0.1 U1
3/17/2021	Assessment	< 0.02 U1	7.76	133	0.03 J1	0.01 J1	0.488	3.44	0.869	0.06 J1	0.271	0.00153	< 0.002 U1	0.2 J1	< 0.09 U1	< 0.04 U1
5/10/2021	Assessment	< 0.02 U1	10.9	127	0.03 J1	0.02 J1	0.375	2.82	0.717	0.05 J1	0.211	0.00134	--	0.4 J1	< 0.09 U1	--
11/9/2021	Assessment	< 0.02 U1	7.64	168	0.042 J1	0.028	0.73	8.34	1.33	0.04 J1	0.43	0.00201	--	0.2 J1	0.1 J1	< 0.04 U1
3/2/2022	Assessment	< 0.02 U1	5.78	131	0.016 J1	0.021	0.45	7.03	1.69	0.03 J1	0.06 J1	0.00189	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
5/24/2022	Assessment	< 0.02 U1	6.57	113	0.031 J1	0.021	0.46	6.60	0.79	0.02 J1	0.28	0.00195	--	< 0.1 U1	< 0.09 U1	< 0.04 U1
10/25/2022	Assessment	0.02 J1	8.62	105	0.091	0.021	1.42	5.03	1.84	0.04 J1	0.98	0.00247	--	0.1 J1	0.12 J1	< 0.04 U1
2/8/2023	Assessment	< 0.02 U1	8.79	99.3	0.034 J1	0.019 J1	0.59	4.56	1.35	0.03 J1	0.31	0.00183	--	< 0.1 U1	< 0.09 U1	< 0.04 U1
5/25/2023	Assessment	0.093 J1	7.50	109	0.018 J1	0.017 J1	0.28 J1	4.83	0.65	0.03 J1	0.13 J1	0.00169	< 0.002 U1	< 0.1 U1	0.04 J1	< 0.02 U1
10/20/2023	Assessment	0.011 J1	7.00	119	0.039 J1	0.015 J1	0.79	4.44	1.10	0.04 J1	0.37	0.00196	< 0.002 U1	0.1 J1	0.10 J1	< 0.02 U1

Table 1. Groundwater Data Summary: MW-1602A
Amos - 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
7/26/2016	Background	0.063	18.2	38.4	0.18	7.0	18.7	172
8/24/2016	Background	0.015	18.2	37.9	0.17	6.1	17.7	200
10/19/2016	Background	0.003 J1	17.3	37.2	0.1 J1	6.7	15.0	242
11/9/2016	Background	--	--	--	--	6.3	--	--
12/13/2016	Background	< 0.002 U1	18.8	39.1	0.1 J1	6.5	10.7	170
2/8/2017	Background	0.051	17.7	37.3	0.1 J1	6.7	9.8	144
3/15/2017	Background	0.039	16.1	38.1	0.1 J1	6.8	11.4	209
5/23/2017	Background	0.081	18.5	38.8	0.1 J1	6.7	11.4	224
6/20/2017	Background	0.090	18.5	38.3	0.1 J1	6.5	13.5	178
11/2/2017	Detection	0.050	18.6	38.0	0.1 J1	6.5	12.8	254
5/10/2018	Assessment	0.127	19.5	39.1	0.16	7.2	13.2	184
9/5/2018	Assessment	< 0.002 U1	18.1	40.0	0.14	6.4	12.7	176
3/19/2019	Assessment	0.03 J1	19.6	41.0	0.14	6.6	13.2	232
6/11/2019	Assessment	< 0.02 U1	18.8	41.9	0.16	9.5	13.8	217
7/23/2019	Assessment	< 0.04 U1	16.7	39.4	0.13	6.3	10.3	201
2/12/2020	Assessment	--	--	--	0.14	6.7	--	--
5/6/2020	Assessment	0.03 J1	19.3	43.2	0.11	6.3	12.7	209
10/30/2020	Assessment	< 0.02 U1	20.5	42.8	0.13	6.4	12.3	220
3/17/2021	Assessment	--	--	--	0.17	6.6	--	--
5/7/2021	Assessment	< 0.009 U1	19.7	43.0	0.15	6.5	12.7	202
11/10/2021	Assessment	0.012 J1	19.0	43.4	0.13	6.5	11.9	190
3/2/2022	Assessment	--	--	--	0.14	6.5	--	--
5/23/2022	Assessment	0.01 J1	19.5	39.5	0.14	6.5	13.6	190 L1
10/27/2022	Assessment	0.017 J1	20.0	39.8	0.14	6.4	16.3	190
2/6/2023	Assessment	0.024 J1	19.1	40.4	0.12	6.5	17.3	210
5/25/2023	Assessment	0.011 J1	16.9	39.7	0.12	6.4	18.9	230
10/23/2023	Assessment	0.011 J1	18.9	39.1	0.12	6.3	19.6	220

Table 1. Groundwater Data Summary: MW-1602A
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.12	17.6	220	0.085	0.02 J1	1.7	4.19	7.914	0.18	7.94	0.004	< 0.002 U1	3.62	0.2	0.02 J1
8/24/2016	Background	0.04 J1	18.1	209	0.036	0.006 J1	1.1	3.04	0.569	0.17	2.80	0.003	< 0.002 U1	2.80	0.2	0.01 J1
10/19/2016	Background	0.10	18.3	213	0.064	0.01 J1	1.46	2.38	2.65	0.1 J1	6.56	0.003	0.003 J1	2.00	0.2	0.063
11/9/2016	Background	--	--	--	--	--	--	--	0.874	--	--	--	--	--	--	--
12/13/2016	Background	0.08	19.3	217	0.048	0.01 J1	2.24	2.00	0.989	0.1 J1	4.53	0.006	0.002 J1	1.90	0.2	0.02 J1
2/8/2017	Background	0.05	19.1	194	0.051	0.009 J1	0.981	1.87	6.853	0.1 J1	4.07	0.005	< 0.002 U1	1.68	0.2	0.224
3/15/2017	Background	0.04 J1	21.5	198	0.055	0.008 J1	0.951	1.47	1.094	0.1 J1	2.65	0.0005 J1	0.002 J1	1.22	0.2	0.01 J1
5/23/2017	Background	0.04 J1	20.8	221	0.029	0.006 J1	0.568	1.23	1.833	0.1 J1	2.11	0.005	< 0.002 U1	1.22	0.1	< 0.01 U1
6/20/2017	Background	0.07	20.3	224	0.043	0.01 J1	0.807	1.30	0.901	0.1 J1	2.68	< 0.0002 U1	< 0.002 U1	1.55	0.2	0.01 J1
5/10/2018	Assessment	0.03 J1	20.4	223	0.022	< 0.005 U1	0.437	0.940	0.438	0.16	0.982	0.004	< 0.002 U1	0.91	0.1	< 0.01 U1
9/5/2018	Assessment	0.08	20.5	223	0.055	0.01 J1	0.855	1.05	0.941	0.14	5.99	0.001	--	0.71	0.2	0.03 J1
3/19/2019	Assessment	0.04 J1	19.7	217	0.04 J1	< 0.01 U1	0.472	0.691	0.5231	0.14	2.64	< 0.009 U1	--	0.7 J1	0.09 J1	< 0.1 U1
6/11/2019	Assessment	< 0.04 U1	20.6	229	< 0.04 U1	< 0.02 U1	0.3 J1	0.523	1.144	0.16	0.677	< 0.009 U1	< 0.002 U1	< 0.8 U1	< 0.06 U1	< 0.2 U1
7/23/2019	Assessment	< 0.02 U1	21.7	213	< 0.02 U1	< 0.01 U1	0.297	0.545	0.888	0.13	1.08	0.000908	--	0.7 J1	0.06 J1	< 0.1 U1
2/12/2020	Assessment	0.03 J1	21.9	234	0.03 J1	< 0.01 U1	0.758	0.632	0.699	0.14	1.23	0.00127	< 0.002 U1	0.7 J1	0.05 J1	< 0.1 U1
5/6/2020	Assessment	0.02 J1	21.8	238	< 0.02 U1	< 0.01 U1	0.361	0.468	1.429	0.11	1.22	0.000954	--	0.9 J1	0.07 J1	< 0.1 U1
10/30/2020	Assessment	0.05 J1	22.1	229	0.02 J1	< 0.01 U1	0.749	0.587	1.067	0.13	1.20	0.00117	--	0.8 J1	< 0.03 U1	< 0.1 U1
3/17/2021	Assessment	0.03 J1	20.5	235	0.01 J1	< 0.004 U1	0.458	0.338	0.84	0.17	0.491	0.000988	< 0.002 U1	0.7 J1	< 0.09 U1	< 0.04 U1
5/7/2021	Assessment	< 0.02 U1	21.2	228	0.009 J1	0.008 J1	0.366	0.290	1.103	0.15	0.240	0.000930	--	0.8 J1	< 0.09 U1	--
11/10/2021	Assessment	0.07 J1	17.5	222	0.044 J1	0.021	1.65	0.920	0.86	0.13	2.21	0.00122	--	0.8	0.14 J1	< 0.04 U1
3/2/2022	Assessment	0.07 J1	20.3	242	0.027 J1	0.006 J1	1.19	0.516	1.33	0.14	1.17	0.00107	< 0.002 U1	0.8	< 0.09 U1	< 0.04 U1
5/23/2022	Assessment	< 0.02 U1	19.6	241	0.010 J1	< 0.004 U1	0.41	0.244	1.59	0.14	0.42	0.00090	--	0.8	< 0.09 U1	< 0.04 U1
10/27/2022	Assessment	< 0.02 U1	21.0	240	0.01 J1	< 0.004 U1	0.39	0.174	1.48	0.14	0.23	0.00104	--	0.7	< 0.09 U1	< 0.04 U1
2/6/2023	Assessment	0.02 J1	21.0	228	0.028 J1	< 0.004 U1	0.67	0.246	1.27	0.12	0.83	0.00115	--	0.7	< 0.09 U1	< 0.04 U1
5/25/2023	Assessment	0.014 J1	17.7	201	0.008 J1	< 0.004 U1	0.31	0.131	0.58	0.12	0.20	0.00095	< 0.002 U1	0.6	< 0.04 U1	< 0.02 U1
10/23/2023	Assessment	0.065 J1	20.1	229	< 0.007 U1	< 0.004 U1	1.33	0.127	1.56	0.12	0.13 J1	0.00097	< 0.002 U1	0.6	0.04 J1	< 0.02 P2, U1

Table 1. Groundwater Data Summary: MW-1603A
Amos - 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
7/26/2016	Background	0.051	17.4	4.76	0.29	7.3	0.9	116
8/24/2016	Background	0.012	16.9	5.62	0.28	6.2	0.1	84
10/19/2016	Background	< 0.002 U1	17.2	5.11	0.29	7.0	< 0.04 U1	168
11/9/2016	Background	--	--	5.60	0.28	6.5	< 0.04 U1	90
12/13/2016	Background	< 0.002 U1	16.6	5.41	0.20	6.7	< 0.04 U1	93
2/9/2017	Background	0.038	15.5	5.00	0.22	7.0	< 0.04 U1	80
3/15/2017	Background	0.025	15.6	5.12	0.24	7.1	< 0.04 U1	102
5/24/2017	Background	0.061	15.2	5.35	0.23	6.8	< 0.04 U1	108
6/20/2017	Background	0.069	14.6	4.93	0.23	6.7	< 0.04 U1	100
11/2/2017	Detection	0.035	15.2	5.61	0.24	6.7	< 0.04 U1	150
5/2/2018	Assessment	0.051	17.2	5.18	0.28	6.8	< 0.04 U1	100
9/5/2018	Assessment	< 0.002 U1	15.8	4.99	0.28	6.7	< 0.04 U1	89
3/15/2019	Assessment	< 0.2 U1	15.5	5.65	0.27	7.1	< 0.06 U1	95
6/11/2019	Assessment	< 0.02 U1	15.5	5.70	0.31	8.8	< 0.06 U1	95
7/24/2019	Assessment	< 0.04 U1	14.4	5.73	0.28	6.8	< 0.06 U1	102
2/11/2020	Assessment	--	--	--	0.24	6.9	--	--
5/6/2020	Assessment	0.02 J1	15.5	5.87	0.23	6.5	< 0.06 U1	121
10/30/2020	Assessment	< 0.02 U1	16.3	6.03	0.25	6.9	< 0.06 U1	115
3/15/2021	Assessment	--	--	--	0.30	6.9	--	--
5/10/2021	Assessment	0.02 J1	13.8	6.28	0.26	6.8	< 0.06 U1	40 J1
11/5/2021	Assessment	0.011 J1	15.1	6.54	0.25	6.7	< 0.06 U1	90
3/1/2022	Assessment	--	--	--	0.23	6.6	--	--
5/19/2022	Assessment	0.017 J1	14.7	8.26	0.23	6.6	< 0.06 U1	110 L1
10/27/2022	Assessment	0.017 J1	15.2	6.46	0.25	6.6	0.19 J1	80
2/7/2023	Assessment	0.020 J1	14.9	6.61	0.23	6.6	< 0.06 U1	100
5/25/2023	Assessment	0.01 J1	13.4	7.17	0.23	6.5	< 0.1 U1	130
10/23/2023	Assessment	0.011 J1	14.6	7.14	0.22	6.5	< 0.1 U1	120

Table 1. Groundwater Data Summary: MW-1603A
Amos - 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.04 J1	78.0	303	0.052	0.01 J1	1.2	1.04	1.619	0.29	1.35	0.002	< 0.002 U1	2.11	0.09 J1	0.01 J1
8/24/2016	Background	0.03 J1	77.6	264	0.044	0.008 J1	1.0	0.725	0.726	0.28	1.07	0.007	< 0.002 U1	1.36	0.1 J1	< 0.01 U1
10/19/2016	Background	0.04 J1	73.7	258	0.096	0.01 J1	1.94	1.23	2.39	0.29	2.18	< 0.0002 U1	< 0.002 U1	1.34	0.2	0.02 J1
11/9/2016	Background	--	--	--	--	--	--	--	1.039	0.28	--	--	--	--	--	--
12/13/2016	Background	0.05 J1	78.3	270	0.102	0.01 J1	3.27	1.13	0.524	0.20	1.81	0.009	< 0.002 U1	1.22	0.2	0.03 J1
2/9/2017	Background	0.01 J1	78.3	229	0.055	0.008 J1	0.915	0.746	0.693	0.22	1.19	0.0005 J1	< 0.002 U1	1.15	0.2	0.075
3/15/2017	Background	0.04 J1	83.4	245	0.070	0.01 J1	1.42	1.02	0.974	0.24	1.25	0.002	0.002 J1	1.27	0.1	0.01 J1
5/24/2017	Background	0.05	63.3	233	0.033	0.009 J1	0.999	0.619	0.72	0.23	0.900	0.011	< 0.002 U1	1.56	0.09 J1	< 0.01 U1
6/20/2017	Background	0.03 J1	81.3	257	0.054	0.02	1.12	0.846	0.603	0.23	0.970	0.004	< 0.002 U1	1.11	0.1	0.01 J1
5/2/2018	Assessment	0.04 J1	80.0	251	0.093	0.01 J1	1.82	1.52	0.23065	0.28	1.60	0.0008 J1	< 0.002 U1	1.21	0.3	0.02 J1
9/5/2018	Assessment	0.02 J1	87.1	242	0.006 J1	0.007 J1	0.180	0.246	0.577	0.28	0.045	0.002	--	1.07	0.04 J1	0.01 J1
3/15/2019	Assessment	< 0.02 U1	89.9	252	< 0.02 U1	< 0.01 U1	0.407	0.360	1.261	0.27	0.232	< 0.09 U1	--	1 J1	0.05 J1	< 0.1 U1
6/11/2019	Assessment	< 0.02 U1	90.3	255	< 0.02 U1	< 0.01 U1	0.280	0.288	0.3562	0.31	0.163	< 0.009 U1	< 0.002 U1	1 J1	0.04 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	85.8	249	0.04 J1	< 0.01 U1	0.650	0.517	0.439	0.28	0.580	0.000870	--	1 J1	0.07 J1	< 0.1 U1
2/11/2020	Assessment	< 0.02 U1	87.7	241	0.03 J1	< 0.01 U1	0.663	0.376	0.984	0.24	0.347	0.000630	< 0.002 U1	1 J1	0.06 J1	< 0.1 U1
5/6/2020	Assessment	< 0.02 U1	90.2	241	< 0.02 U1	< 0.01 U1	0.362	0.255	2.242	0.23	0.2 J1	0.000339	--	1 J1	< 0.03 U1	< 0.1 U1
10/30/2020	Assessment	0.03 J1	88.9	239	< 0.02 U1	< 0.01 U1	0.293	0.209	0.384	0.25	0.1 J1	0.000324	--	1 J1	< 0.03 U1	< 0.1 U1
3/15/2021	Assessment	< 0.02 U1	86.1	224	< 0.007 U1	< 0.004 U1	0.339	0.152	0.584	0.30	< 0.05 U1	0.000283	< 0.002 U1	1 J1	< 0.09 U1	< 0.04 U1
5/10/2021	Assessment	0.03 J1	86.8	240	0.01 J1	< 0.004 U1	0.335	0.212	0.703	0.26	0.2 J1	0.000303	--	1 J1	< 0.09 U1	--
11/5/2021	Assessment	0.04 J1	85.2	234	0.017 J1	< 0.004 U1	0.67	0.269	1.13	0.25	0.36	0.00037	--	1.0	< 0.09 U1	< 0.04 U1
3/1/2022	Assessment	0.03 J1	87.2	241	0.011 J1	< 0.004 U1	0.71	0.228	1.13	0.23	0.19 J1	0.00027	< 0.002 U1	1	< 0.09 U1	< 0.04 U1
5/19/2022	Assessment	0.03 J1	83.2	239	< 0.007 U1	0.009 J1	0.43	0.175	1.38	0.23	0.06 J1	0.00026	--	1.3	< 0.09 U1	< 0.04 U1
10/27/2022	Assessment	< 0.02 U1	87.9	245	0.008 J1	< 0.004 U1	0.51	0.205	2.45	0.25	0.08 J1	0.00030	--	1.0	< 0.09 U1	< 0.04 U1
2/7/2023	Assessment	0.03 J1	88.1	238	0.023 J1	< 0.004 U1	0.86	0.353	2.20	0.23	0.30	0.00049	--	1	< 0.09 U1	< 0.04 U1
5/25/2023	Assessment	0.026 J1	75.9	220	0.015 J1	< 0.004 U1	0.48	0.250	1.30	0.23	0.20	0.00073	< 0.002 U1	0.9	< 0.04 U1	< 0.02 U1
10/23/2023	Assessment	0.013 J1	81.0	242	0.007 J1	< 0.004 U1	0.58	0.197	0.72	0.22	0.1 J1	0.00029 J1	< 0.002 U1	0.9	0.05 J1	< 0.02 P2, U1

Table 1. Groundwater Data Summary: MW-1604
Amos - 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
7/26/2016	Background	0.116	20.5	23.0	0.1 J1	6.2	2.2	236
8/22/2016	Background	0.074	18.0	22.9	0.05 J1	6.2	0.3	168
10/18/2016	Background	0.059	18.2	22.6	0.05 J1	6.3	0.3	196
11/8/2016	Background	--	--	22.5	0.05 J1	6.2	0.3	206
12/13/2016	Background	0.042	17.9	24.0	0.05 J1	6.1	0.9	182
2/8/2017	Background	0.094	16.6	23.1	0.09	6.2	0.7	172
3/14/2017	Background	0.083	16.1	24.1	0.08	6.4	0.9	204
5/23/2017	Background	0.129	17.4	26.1	0.08	6.1	2.2	222
6/20/2017	Background	0.152	16.2	25.2	0.09	6.2	1.2	224
11/1/2017	Detection	0.153	16.8	23.4	0.10	6.1	0.5	228
5/3/2018	Assessment	0.200	17.8	25.5	0.13	6.4	< 0.04 U1	210
9/5/2018	Assessment	0.043	15.1	22.8	0.12	7.2	< 0.04 U1	180
3/15/2019	Assessment	< 0.2 U1	13.1	16.6	0.09	6.3	< 0.06 U1	170
6/10/2019	Assessment	0.09 J1	16.5	24.4	0.11	8.7	< 0.06 U1	60
7/24/2019	Assessment	0.132	18.7	27.0	0.07	5.9	< 0.06 U1	242
2/12/2020	Assessment	--	--	--	0.08	6.3	--	--
5/6/2020	Assessment	0.175	20.8	29.4	0.06 J1	6.0	< 0.06 U1	241
10/28/2020	Assessment	0.200	19.5	27.7	0.08	6.0	< 0.06 U1	266
3/16/2021	Assessment	--	--	--	0.08	6.2	--	--
5/11/2021	Assessment	0.186	18.1	28.0	0.09	6.2	< 0.06 U1	237
11/4/2021	Assessment	0.143	17.7	25.7	0.06	6.2	< 0.06 U1	210
3/2/2022	Assessment	--	--	--	0.06	6.4	--	--
5/24/2022	Assessment	0.218	23.1	56.6	0.21	5.9	456	1,090 L1
10/26/2022	Assessment	0.132	17.1	--	--	5.9	--	--
11/2/2022	Assessment	--	--	25.1	0.05 J1	6.1	< 0.06 U1	200
2/9/2023	Assessment	0.093	16.1	22.6	0.06	5.9	< 0.06 U1	180
5/26/2023	Assessment	0.153	20.0	23.2	0.06	6.2	< 0.1 U1	230
10/24/2023	Assessment	0.196	23.7	20.9	0.09	6.1	2.6	240

Table 1. Groundwater Data Summary: MW-1604
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.05 J1	4.43	139	0.087	0.007 J1	1.9	2.06	3.5822	0.1 J1	1.58	0.002	< 0.002 U1	0.74	0.2	0.02 J1
8/22/2016	Background	0.04 J1	5.15	147	0.063	0.02 J1	1.4	1.06	0.695	0.05 J1	1.14	0.004	0.002 J1	0.64	0.2	0.02 J1
10/18/2016	Background	0.03 J1	4.60	134	0.048	0.005 J1	1.27	0.805	1.387	0.05 J1	0.869	< 0.0002 U1	< 0.002 U1	0.30	0.2	0.01 J1
11/8/2016	Background	--	--	--	--	--	--	--	0.512	0.05 J1	--	--	--	--	--	--
12/13/2016	Background	0.02 J1	4.58	137	0.038	< 0.004 U1	1.20	0.632	1.743	0.05 J1	0.603	0.004	< 0.002 U1	0.25	0.2	0.02 J1
2/8/2017	Background	0.02 J1	4.52	125	0.039	< 0.004 U1	0.814	0.638	1.239	0.09	0.719	0.004	< 0.002 U1	0.32	0.2	0.05 J1
3/14/2017	Background	0.02 J1	4.46	132	0.038	< 0.004 U1	0.824	0.570	0.892	0.08	0.482	0.0008 J1	< 0.002 U1	0.22	0.2	< 0.01 U1
5/23/2017	Background	0.04 J1	3.90	142	0.042	< 0.005 U1	0.836	0.647	0.859	0.08	0.444	0.006	< 0.002 U1	0.21	0.2	< 0.01 U1
6/20/2017	Background	0.02 J1	4.44	146	0.040	< 0.005 U1	0.706	0.601	1.459	0.09	0.406	0.003	< 0.002 U1	0.20	0.2	< 0.01 U1
5/3/2018	Assessment	0.02 J1	6.33	146	0.047	< 0.005 U1	0.556	0.494	1.334	0.13	0.230	< 0.0002 U1	< 0.002 U1	0.25	0.2	0.01 J1
9/5/2018	Assessment	0.03 J1	6.11	135	0.043	< 0.005 U1	0.649	0.533	0.248	0.12	0.349	0.0008 J1	--	0.22	0.3	0.01 J1
3/15/2019	Assessment	0.04 J1	6.78	118	0.07 J1	< 0.01 U1	0.931	0.406	0.596	0.09	1.19	< 0.09 U1	--	< 0.4 U1	0.2	< 0.1 U1
6/10/2019	Assessment	0.05 J1	4.88	142	0.142	< 0.01 U1	0.360	0.306	0.831	0.11	0.148	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	4.76	170	0.06 J1	< 0.01 U1	1.33	0.415	0.943	0.07	0.294	0.000485	--	0.4 J1	0.1 J1	< 0.1 U1
2/12/2020	Assessment	< 0.02 U1	3.88	174	0.05 J1	< 0.01 U1	0.798	0.538	1.375	0.08	0.319	0.000626	< 0.002 U1	< 0.4 U1	0.2 J1	< 0.1 U1
5/6/2020	Assessment	< 0.02 U1	4.04	175	0.04 J1	< 0.01 U1	0.484	0.406	1.647	0.06 J1	0.1 J1	0.000430	--	< 0.4 U1	0.2 J1	< 0.1 U1
10/28/2020	Assessment	< 0.02 U1	3.98	156	0.05 J1	< 0.01 U1	0.595	0.387	0.261	0.08	0.232	0.000515	--	< 0.4 U1	0.1 J1	< 0.1 U1
3/16/2021	Assessment	< 0.02 U1	4.89	168	0.04 J1	< 0.004 U1	0.590	0.295	0.66	0.08	0.1 J1	0.000475	< 0.002 U1	0.2 J1	0.2 J1	< 0.04 U1
5/11/2021	Assessment	< 0.02 U1	4.45	163	0.04 J1	< 0.004 U1	0.537	0.256	0.809	0.09	0.08 J1	0.000433	--	0.3 J1	0.1 J1	--
11/4/2021	Assessment	< 0.02 U1	4.38	138	0.054	< 0.004 U1	1.02	0.469	1.18	0.06	0.38	0.00058	--	0.2 J1	0.13 J1	< 0.04 U1
3/2/2022	Assessment	< 0.02 U1	3.56	131	0.042 J1	< 0.004 U1	0.87	0.507	1.36	0.06	0.23	0.00044	< 0.002 U1	0.2 J1	0.10 J1	< 0.04 U1
5/24/2022	Assessment	< 0.02 U1	3.66	172	0.036 J1	< 0.004 U1	0.60	0.422	1.29	0.21	0.15 J1	0.00040	--	0.4 J1	0.13 J1	< 0.04 U1
10/26/2022	Assessment	< 0.02 U1	3.41	133	0.040 J1	< 0.004 U1	0.67	0.469	0.86	--	0.11 J1	0.00039	--	0.3 J1	0.16 J1	< 0.04 U1
11/2/2022	Assessment	--	--	--	--	--	--	--	--	0.05 J1	--	--	--	--	--	--
2/9/2023	Assessment	0.03 J1	4.14	128	0.059	< 0.004 U1	1.77	0.540	1.31	0.06	0.58	0.00068	--	0.2 J1	0.12 J1	< 0.04 U1
5/26/2023	Assessment	0.013 J1	4.82	138	0.042 J1	< 0.004 U1	0.59	0.464	1.31	0.06	0.17 J1	0.00037	< 0.002 U1	0.3 J1	0.11 J1	< 0.02 U1
10/24/2023	Assessment	0.035 J1	5.87	162	0.070	0.009 J1	1.51	0.994	1.44	0.09	0.89	0.00070	< 0.002 U1	0.4 J1	0.34 J1	< 0.02 P2, U1

Table 1. Groundwater Data Summary: MW-1605
Amos - 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
7/26/2016	Background	0.091	63.6	111	0.09	6.2	170	490
8/22/2016	Background	0.038	50.8	114	0.08	5.9	174	440
10/17/2016	Background	0.025	57.5	108	0.06 J1	6.1	161	446
11/8/2016	Background	--	--	116	0.06 J1	5.9	162	456
12/12/2016	Background	< 0.002 U1	53.9	125	< 0.05 U1	5.8	164	920
2/7/2017	Background	0.055	47.6	110	< 0.05 U1	5.9	161	472
3/13/2017	Background	0.039	45.7	106	0.03 J1	5.8	173	455
5/22/2017	Background	0.071	46.4	109	0.03 J1	6.6	171	458
6/19/2017	Background	0.103	48.1	111	< 0.02 U1	5.5	193	462
11/1/2017	Detection	0.076	50.0	113	0.03 J1	5.6	212	488
1/9/2018	Detection	--	45.9	108	--	5.5	202	462
5/3/2018	Assessment	0.109	47.0	97.7	< 0.02 U1	6.1	246	434
9/5/2018	Assessment	< 0.002 U1	49.4	97.1	0.03 J1	5.6	213	483
3/14/2019	Assessment	< 0.2 U1	45.4	92.5	< 0.01 U1	5.6	222	507
6/11/2019	Assessment	0.06 J1	45.5	91.8	0.02 J1	5.7	226	530
7/24/2019	Assessment	0.06 J1	46.5	91.6	0.02 J1	5.4	226	517
2/11/2020	Assessment	--	--	--	0.02 J1	5.7	--	--
5/5/2020	Assessment	0.051	49.6	85.6	0.03 J1	5.3	236	526
10/27/2020	Assessment	0.051	49.7	84.2	0.02 J1	5.3	234	521
3/16/2021	Assessment	--	--	--	0.03 J1	5.5	--	--
5/7/2021	Assessment	0.05 J1	45.4	85.1	< 0.01 U1	5.5	231	504
11/9/2021	Assessment	0.053	46.4	85.3	0.02 J1	5.6	226	520
3/2/2022	Assessment	--	--	--	< 0.02 U1	5.4	--	--
5/18/2022	Assessment	0.055	50.1	92.3	< 0.02 U1	5.9	225	520 L1
10/25/2022	Assessment	0.052	43.9	89.9	< 0.02 U1	5.5	218	490
2/8/2023	Assessment	0.049 J1	39.1	81.8	< 0.02 U1	5.4	178	430
5/25/2023	Assessment	0.041 J1	37.7	80.3	< 0.02 U1	5.5	200	450
10/23/2023	Assessment	0.041 J1	37.5	70.1	0.03 J1	5.4	188	430

Table 1. Groundwater Data Summary: MW-1605
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/26/2016	Background	0.04 J1	5.70	83.2	0.035	< 0.004 U1	0.4	32.1	1.722	0.09	0.201	0.008	< 0.002 U1	0.66	0.05 J1	< 0.01 U1
8/22/2016	Background	0.03 J1	4.96	69.1	0.027	< 0.004 U1	0.1	24.5	0.683	0.08	0.062	0.004	< 0.002 U1	0.39	0.06 J1	< 0.01 U1
10/17/2016	Background	0.02 J1	4.98	67.3	0.034	< 0.004 U1	0.244	15.8	5.063	0.06 J1	0.038	0.005	< 0.002 U1	0.27	0.06 J1	< 0.01 U1
11/8/2016	Background	--	--	--	--	--	--	--	1.249	0.06 J1	--	--	--	--	--	--
12/12/2016	Background	0.03 J1	4.33	73.8	0.060	0.005 J1	0.645	11.5	0.853	< 0.05 U1	0.159	0.011	< 0.002 U1	0.30	0.1	0.062
2/7/2017	Background	0.03 J1	4.03	68.8	0.063	< 0.004 U1	0.381	10.3	0.586	< 0.05 U1	0.298	0.004	< 0.002 U1	0.36	0.1	0.04 J1
3/13/2017	Background	0.01 J1	3.70	75.1	0.056	< 0.004 U1	0.456	9.14	1.073	0.03 J1	0.059	0.005	< 0.002 U1	0.12	0.03 J1	< 0.01 U1
5/22/2017	Background	0.03 J1	3.38	80.5	0.062	< 0.005 U1	0.193	8.77	0.852	0.03 J1	0.071	0.003	< 0.002 U1	0.15	0.04 J1	0.02 J1
6/19/2017	Background	0.01 J1	3.64	82.2	0.061	< 0.005 U1	0.250	9.07	0.746	< 0.02 U1	0.050	0.004	< 0.002 U1	0.12	0.08 J1	< 0.01 U1
5/3/2018	Assessment	0.01 J1	3.34	80.4	0.069	0.009 J1	0.176	9.75	1.068	< 0.02 U1	0.148	0.006	< 0.002 U1	0.10	0.1	0.01 J1
9/5/2018	Assessment	0.02 J1	3.19	103	0.074	0.02 J1	0.260	10.7	0.916	0.03 J1	0.080	0.003	--	0.1 J1	0.07 J1	0.02 J1
3/14/2019	Assessment	< 0.02 U1	2.95	88.1	0.08 J1	< 0.01 U1	0.2 J1	8.83	0.3036	< 0.01 U1	0.161	< 0.09 U1	--	< 0.4 U1	0.05 J1	< 0.1 U1
6/11/2019	Assessment	< 0.02 U1	3.01	93.2	0.07 J1	0.01 J1	0.2 J1	9.09	1.061	0.02 J1	0.06 J1	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.06 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	2.82	108	0.09 J1	< 0.01 U1	0.306	8.57	0.739	0.02 J1	0.2 J1	0.00255	--	< 0.4 U1	0.08 J1	< 0.1 U1
2/11/2020	Assessment	< 0.02 U1	2.75	89.3	0.08 J1	< 0.01 U1	0.205	9.47	2.668	0.02 J1	0.1 J1	0.00259	< 0.002 U1	< 0.4 U1	0.07 J1	< 0.1 U1
5/5/2020	Assessment	0.27	2.99	97.8	0.08 J1	0.01 J1	0.363	9.99	1.427	0.03 J1	0.973	0.00232	--	< 0.4 U1	0.09 J1	< 0.1 U1
10/27/2020	Assessment	< 0.02 U1	2.69	92.3	0.09 J1	< 0.01 U1	0.334	9.65	0.81	0.02 J1	0.230	0.00234	--	< 0.4 U1	0.1 J1	< 0.1 U1
3/15/2021	Assessment	0.04 J1	2.85	104	0.126	0.007 J1	0.865	9.21	3.565	0.03 J1	0.676	0.00269	< 0.002 U1	< 0.1 U1	0.2 J1	< 0.04 U1
5/7/2021	Assessment	< 0.02 U1	3.46	94.9	0.08 J1	0.005 J1	0.390	9.69	0.773	< 0.01 U1	0.2 J1	0.00236	--	< 0.1 U1	< 0.09 U1	--
11/9/2021	Assessment	0.04 J1	4.96	116	0.117	0.012 J1	0.58	9.41	0.78	0.02 J1	0.60	0.00205	--	0.2 J1	0.16 J1	< 0.04 U1
3/2/2022	Assessment	< 0.02 U1	2.98	99.9	0.099	0.006 J1	0.70	9.63	0.87	< 0.02 U1	0.41	0.00222	< 0.002 U1	< 0.1 U1	0.12 J1	< 0.04 U1
5/18/2022	Assessment	< 0.02 U1	3.07	104	0.113	0.006 J1	0.75	9.82	0.61	< 0.02 U1	0.53	0.00257	--	< 0.1 U1	0.09 J1	< 0.04 U1
10/25/2022	Assessment	< 0.02 U1	3.01	108	0.097	0.007 J1	0.51	9.28	1.45	< 0.02 U1	0.23	0.00243	--	< 0.1 U1	0.11 J1	< 0.04 U1
2/8/2023	Assessment	0.02 J1	3.09	101	0.167	0.007 J1	1.01	8.17	1.83	< 0.02 U1	0.73	0.00275	--	< 0.1 U1	0.12 J1	< 0.04 U1
5/25/2023	Assessment	0.017 J1	2.69	73.5	0.071	0.072	0.25 J1	13.1	1.04	< 0.02 U1	0.14 J1	0.00238	< 0.002 U1	< 0.1 U1	0.06 J1	< 0.02 U1
10/23/2023	Assessment	0.012 J1	2.90	64.8	0.091	0.106	0.53	14.4	0.87	0.03 J1	0.28	0.00229	< 0.002 U1	< 0.1 U1	0.10 J1	< 0.02 P2, U1

Table 1. Groundwater Data Summary: MW-1606
Amos - 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
7/25/2016	Background	0.084	43.4	55.5	0.03 J1	5.7	189	410
8/23/2016	Background	0.023	45.6	56.8	< 0.05 U1	5.3	186	372
10/17/2016	Background	0.013	47.3	61.5	< 0.05 U1	5.6	202	390
11/7/2016	Background	--	--	--	--	5.5	--	--
12/12/2016	Background	< 0.002 U1	50.4	27.0	< 0.02 U1	5.3	215	418
2/7/2017	Background	0.048	42.2	57.9	< 0.05 U1	5.7	179	370
3/14/2017	Background	0.036	42.2	59.5	< 0.05 U1	5.6	180	384
5/23/2017	Background	0.061	49.2	75.0	< 0.05 U1	5.6	199	442
6/19/2017	Background	0.108	48.3	78.8	< 0.05 U1	5.3	219	440
11/1/2017	Detection	0.055	51.6	91.4	< 0.05 U1	5.3	227	462
1/8/2018	Detection	--	43.9	88.3	--	8.4	190	400
5/4/2018	Assessment	0.077	53.0	119	0.03 J1	7.5	232	478
9/5/2018	Assessment	0.032	51.7	133	< 0.02 U1	5.4	202	507
3/15/2019	Assessment	< 0.2 U1	59.0	157	< 0.01 U1	5.4	232	597
6/11/2019	Assessment	0.04 J1	56.6	177	0.02 J1	6.7	204	571
7/24/2019	Assessment	0.04 J1	52.8	186	0.02 J1	5.4	191	597
2/12/2020	Assessment	--	--	--	0.02 J1	5.4	--	--
5/6/2020	Assessment	0.03 J1	36.7	116	0.02 J1	5.2	108	372
10/26/2020	Assessment	0.03 J1	32.4	100	0.02 J1	5.6	98.5	335
3/16/2021	Assessment	--	--	--	--	5.4	--	--
3/17/2021	Assessment	--	--	--	0.03 J1	--	--	--
5/7/2021	Assessment	0.03 J1	23.7	73.4	0.03 J1	5.5	79.3	275
11/4/2021	Assessment	0.032 J1	17.7	81.5	0.03 J1	5.4	78.6	290
2/28/2022	Assessment	--	--	--	< 0.02 U1	6.8	--	--
5/23/2022	Assessment	0.031 J1	47.0 M1, P3	134	< 0.02 U1	6.0	109	380 L1
10/25/2022	Assessment	0.042 J1	46.1	175	< 0.02 U1	5.4	168	520
2/8/2023	Assessment	0.043 J1	43.2 M1	153	< 0.02 U1	5.2	186	540
5/25/2023	Assessment	0.039 J1	46.8	170	< 0.02 U1	5.2	183	550
10/18/2023	Assessment	0.067	32.3	78.5	0.02 J1	5.3	198	420

Table 1. Groundwater Data Summary: MW-1606
Amos - BAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
7/25/2016	Background	0.04 J1	2.89	71.8	0.112	0.12	1.3	14.9	0.2045	0.03 J1	1.01	0.005	< 0.002 U1	0.26	0.09 J1	0.03 J1
8/23/2016	Background	0.02 J1	2.58	67.2	0.087	0.14	0.6	14.5	1.039	< 0.05 U1	0.483	0.007	< 0.002 U1	0.14	0.1 J1	0.01 J1
10/17/2016	Background	0.03 J1	2.58	69.5	0.131	0.14	1.58	13.1	1.347	< 0.05 U1	1.20	0.006	0.002 J1	0.15	0.2	0.02 J1
11/7/2016	Background	--	--	--	--	--	--	--	1.331	--	--	--	--	--	--	--
12/12/2016	Background	0.03 J1	2.55	65.8	0.100	0.17	1.03	13.9	0.651	< 0.02 U1	0.588	0.010	< 0.002 U1	0.12	0.2	0.04 J1
2/7/2017	Background	0.03 J1	3.50	57.5	0.134	0.31	1.76	14.2	0.886	< 0.05 U1	1.55	0.003	< 0.002 U1	0.29	0.3	0.05 J1
3/14/2017	Background	0.02 J1	3.52	56.3	0.091	0.16	0.920	13.4	2.45	< 0.05 U1	0.572	0.003	< 0.002 U1	0.14	0.1	0.01 J1
5/23/2017	Background	0.02 J1	2.83	59.8	0.085	0.12	0.286	14.2	0.236	< 0.05 U1	0.448	0.007	< 0.002 U1	0.1 J1	0.1	0.01 J1
6/19/2017	Background	0.03 J1	3.42	61.8	0.097	0.13	0.596	13.7	0.769	< 0.05 U1	0.666	< 0.0002 U1	< 0.002 U1	0.13	0.09 J1	0.02 J1
5/4/2018	Assessment	0.01 J1	2.81	58.7	0.088	0.15	0.289	16.9	1.012	0.03 J1	0.286	0.003	< 0.002 U1	0.07 J1	0.1	0.02 J1
9/5/2018	Assessment	0.01 J1	2.21	61.0	0.073	0.17	0.249	16.4	0.1805	< 0.02 U1	0.088	0.003	--	0.04 J1	0.06 J1	0.01 J1
3/15/2019	Assessment	0.03 J1	2.94	74.6	0.152	0.19	1.24	18.2	0.295	< 0.01 U1	1.06	< 0.09 U1	--	< 0.4 U1	0.2 J1	< 0.1 U1
6/11/2019	Assessment	< 0.02 U1	2.44	64.1	0.08 J1	0.18	0.2 J1	16.5	0.4433	0.02 J1	0.181	< 0.009 U1	< 0.002 U1	< 0.4 U1	0.06 J1	< 0.1 U1
7/24/2019	Assessment	0.03 J1	3.44	72.9	0.140	0.21	1.14	16.2	0.743	0.02 J1	1.11	0.00340	--	< 0.4 U1	0.2 J1	< 0.1 U1
2/12/2020	Assessment	0.04 J1	2.82	50.2	0.112	0.19	0.680	10.1	1.515	0.02 J1	0.644	0.00256	< 0.002 U1	< 0.4 U1	0.07 J1	< 0.1 U1
5/6/2020	Assessment	0.03 J1	3.43	51.3	0.08 J1	0.18	0.645	11.7	1.529	0.02 J1	0.549	0.00239	--	< 0.4 U1	0.09 J1	< 0.1 U1
10/26/2020	Assessment	< 0.02 U1	2.26	41.8	0.06 J1	0.26	0.286	11.6	0.2071	0.02 J1	0.1 J1	0.00228	--	< 0.4 U1	< 0.03 U1	< 0.1 U1
3/17/2021	Assessment	< 0.02 U1	2.62	39.9	0.06 J1	0.24	0.490	9.34	0.824	0.03 J1	0.319	0.00221	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
5/7/2021	Assessment	< 0.02 U1	2.66	38.9	0.06 J1	0.21	0.302	8.71	0.766	0.03 J1	0.280	0.00217	--	< 0.1 U1	< 0.09 U1	--
11/4/2021	Assessment	< 0.02 U1	2.68	41.2	0.064	0.221	0.38	8.18	0.67	0.03 J1	0.20	0.00229	--	< 0.1 U1	< 0.09 U1	< 0.04 U1
2/28/2022	Assessment	0.03 J1	3.03	58.7	0.110	0.390	0.57	11.8	1.50	< 0.02 U1	0.58	0.00217	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
5/23/2022	Assessment	0.06 J1	8.83	75.1	0.145	0.359	0.79	14.6	1.46	< 0.02 U1	1.23	0.00260	--	0.1 J1	< 0.09 U1	< 0.04 U1
10/25/2022	Assessment	0.03 J1	5.65	75.9	0.113	0.275	0.58	14.1	2.32	< 0.02 U1	0.62	0.00276	--	0.1 J1	< 0.09 U1	< 0.04 U1
2/8/2023	Assessment	0.05 J1	7.01	71.8	0.155	0.293	1.59	13.4	1.39	< 0.02 U1	1.54	0.00332	--	0.1 J1	0.14 J1	< 0.04 U1
5/25/2023	Assessment	0.035 J1	6.21	65.8	0.099	0.759	0.48	13.3	1.37	< 0.02 U1	0.82	0.00275	< 0.002 U1	< 0.1 U1	0.06 J1	0.02 J1
10/18/2023	Assessment	0.039 J1	9.50	49.0	0.103	0.097	0.67	6.50	1.45	0.02 J1	0.98	0.00221	< 0.002 U1	0.2 J1	0.14 J1	< 0.02 U1

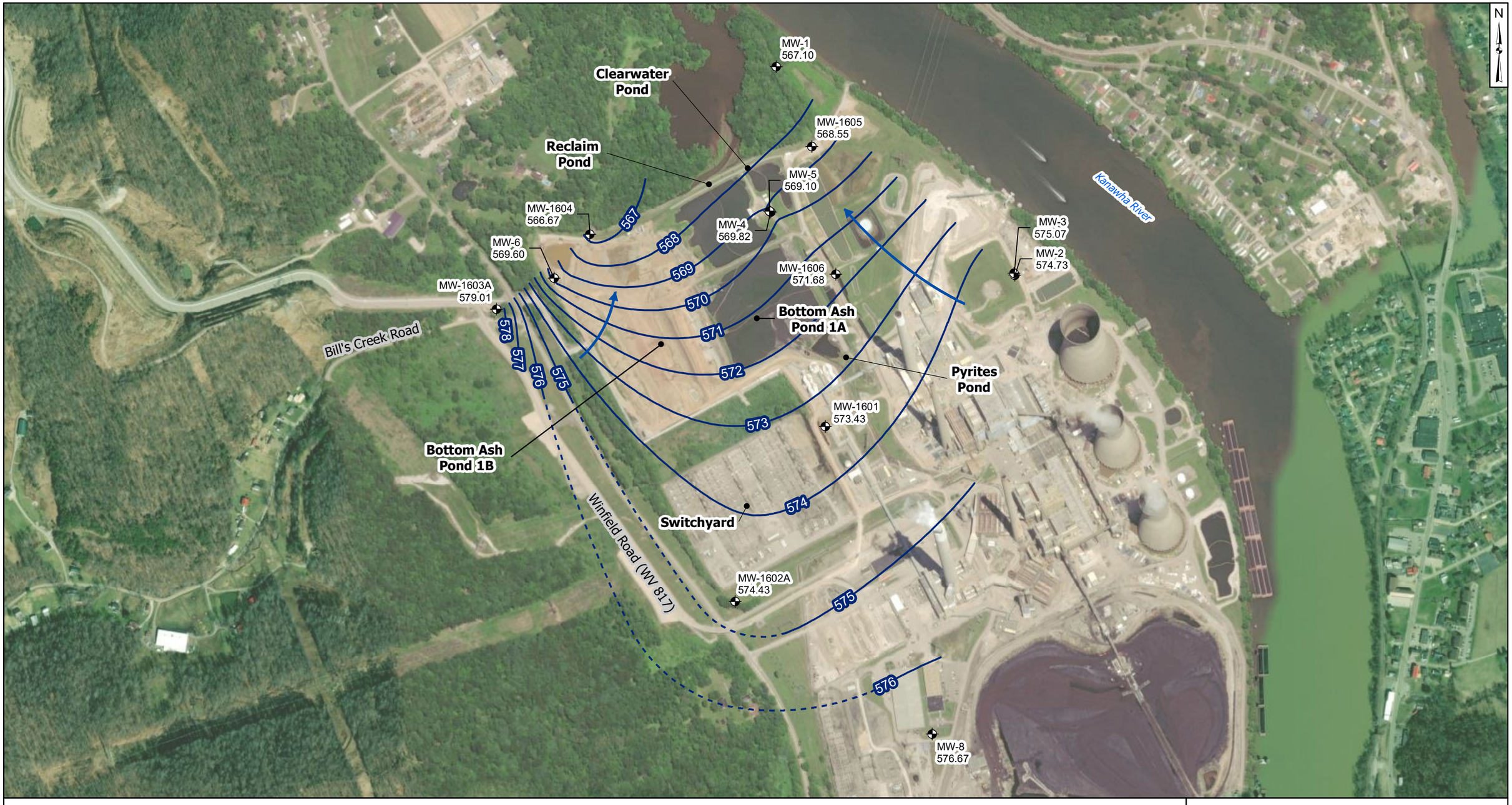
Notes:
- -: Not analyzed
<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag.
In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.
J1: Concentration estimated. Analyte was detected 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
P2: The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.
P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.
pCi/L: picocuries per liter
SU: standard unit
µg/L: micrograms per liter

Table 2: Residence Time Calculation Summary
Amos Bottom Ash Pond

Geosyntec Consultants, Inc.

			2023-02		2023-05		2023-10	
CCR Management Unit	Monitoring Well	Well Diameter (inches)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Bottom Ash Pond	MW-1 [2]	2.0	25.4	2.4	10.9	5.6	14.2	4.3
	MW-4 [2]	2.0	16.5	3.7	NC	NC	NC	NC
	MW-5 [2]	2.0	100.3	0.6	NC	NC	NC	NC
	MW-6 [1]	2.0	60.1	1.0	65.2	0.9	63.7	1.0
	MW-1601 [1]	2.0	17.3	3.5	21.9	2.8	16.1	3.8
	MW-1602A [1]	2.0	6.1	10.0	9.3	6.5	7.6	8.0
	MW-1603A [1]	2.0	168.2	0.4	202.7	0.3	176.6	0.3
	MW-1604 [2]	2.0	68.4	0.9	72.8	0.8	71.2	0.9
	MW-1605 [2]	2.0	39.6	1.5	15.5	3.9	19.4	3.1
	MW-1606 [2]	2.0	26.3	2.3	25.9	2.3	17.5	3.5

Notes:
[1] - Background Well
[2] - Downgradient Well
NC - Not calculated



Legend

- Monitoring Well Location
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on February 6, 2023) provided by AEP.
2. Groundwater elevation units are feet above mean sea level.
3. Construction at Pond 1B started in 2021. CCR material was removed and a liner was put in place to repurpose Pond 1B as a wastewater pond. The remaining ponds are undergoing a similar process as of 2023.
4. Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis 2016) provided by AEP.

Potentiometric Surface Map - Uppermost Aquifer February 2023

AEP Amos Generating Plant - Ash Pond System
Winfield, West Virginia

Geosyntec consultants

Columbus, Ohio | 2023/12/13

Figure 2

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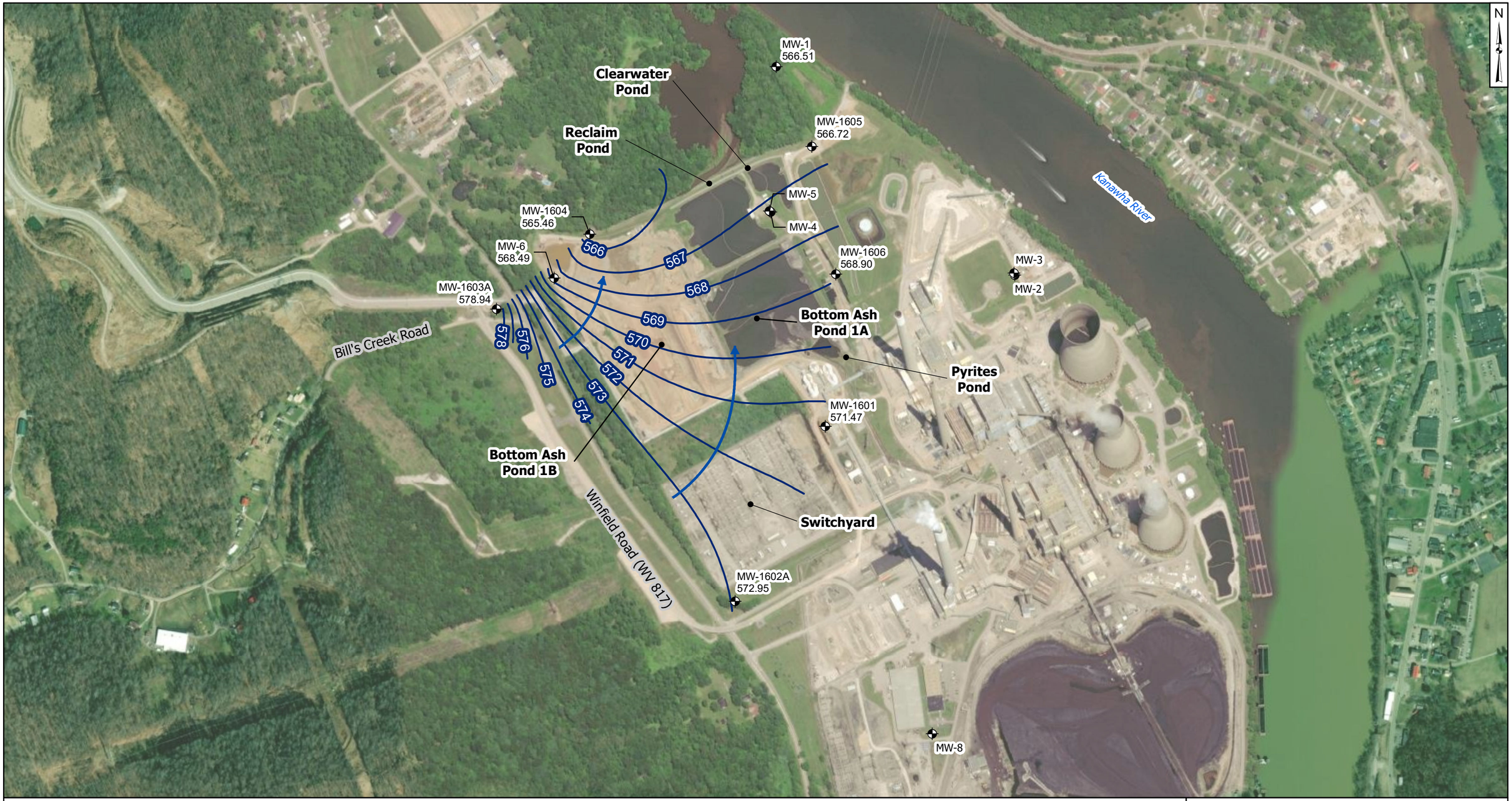

Legend

- Monitoring Well Location
- Groundwater Elevation Contour
- Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on May 24, 2023) provided by AEP.
2. MW-4 (561.28 ft msl) and MW-5 (563.89 ft msl) were not used for contouring due to anomalous readings.
3. Wells MW-2, MW-3, and MW-8 were not gauged during the May 2023 event.
4. Groundwater elevation units are feet above mean sea level.
5. Construction at Pond 1B started in 2021. CCR material was removed and a liner was put in place to repurpose Pond 1B as a wastewater pond. The remaining ponds are undergoing a similar process as of 2023.
6. Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis 2016) provided by AEP.

500 250 0 500
Feet

Potentiometric Surface Map - Uppermost Aquifer
May 2023

AEP Amos Generating Plant - Ash Pond System
Winfield, West Virginia

Geosyntec consultants

Columbus, Ohio | 2023/12/13

Figure 3

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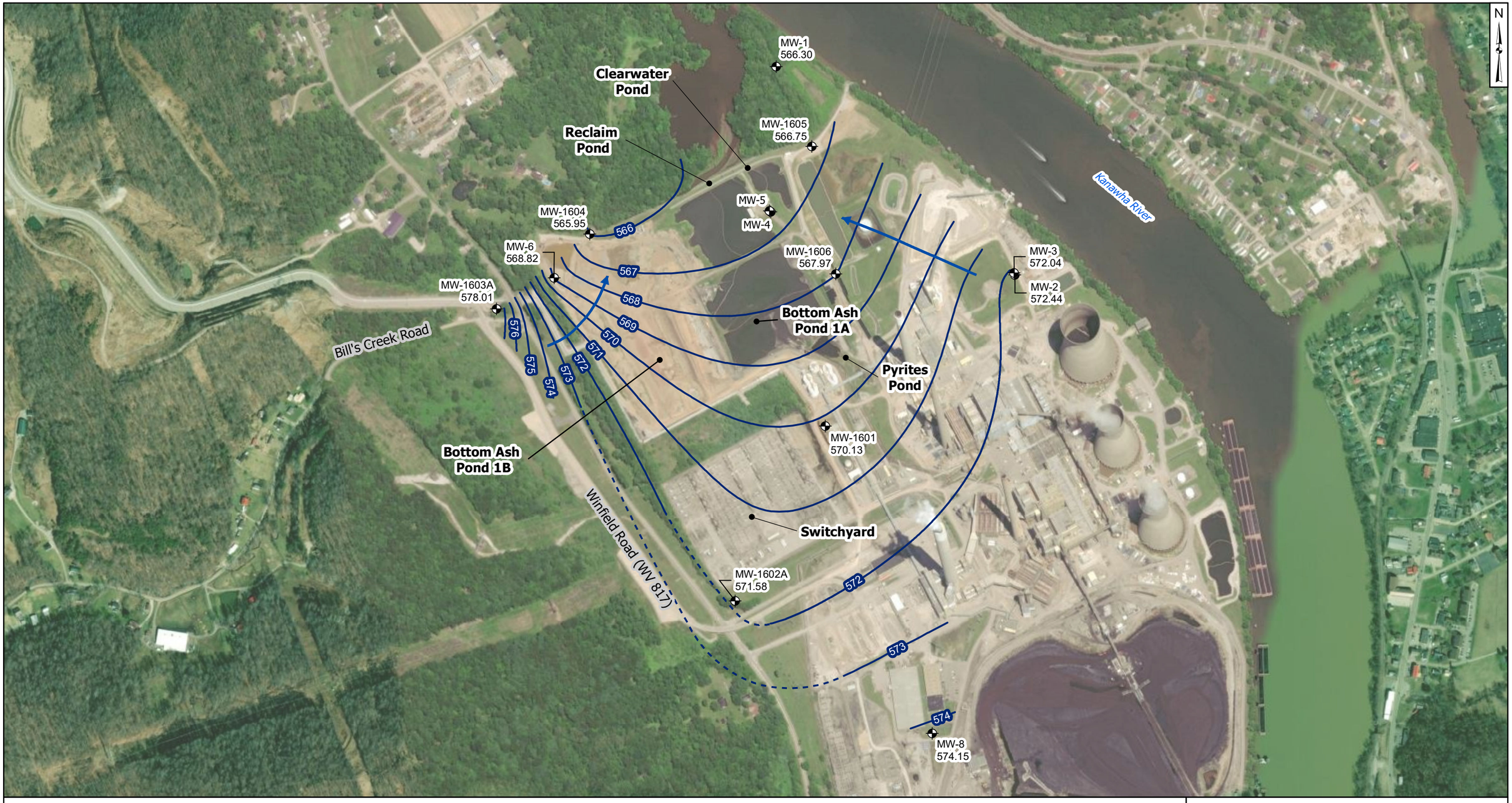

Legend

- Monitoring Well Location
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on October 16, 2023) provided by AEP.
2. MW-4 (563.16 ft msl) and MW-5 (564.96 ft msl) were not used for contouring due to anomalous readings.
3. Groundwater elevation units are feet above mean sea level.
4. Construction at Pond 1B started in 2021. CCR material was removed and a liner was put in place to repurpose Pond 1B as a wastewater pond. The remaining ponds are undergoing a similar process as of 2023.
5. Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis 2016) provided by AEP.

500 250 0 500
Feet

Potentiometric Surface Map - Uppermost Aquifer
October 2023

AEP Amos Generating Plant - Ash Pond System
Winfield, West Virginia

Geosyntec consultants

Columbus, Ohio | 2024/01/12

Figure 4

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Amos\2023\AEP-Amos_BAP_GW_2023_Oct.mxd. ASoltero. 1/12/2024. CHA8423/04/08.

APPENDIX 2

The statistical analysis reports completed in 2023 follow.

Geosyntec consultants

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PH 614.468.0415
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Memorandum

Date:	January 11, 2024
To:	Marie Gildow (AEP)
Copies to:	Brian Newton (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of 2023 Reissued Analytical Laboratory Data for Amos 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 Amos Power Plant in Winfield, 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 laboratory equipment data quality assurance/quality control issues.

A review of the reissued analytical laboratory reports identified several reported lithium results that had 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. Amos Plant, Winfield, West Virginia*. Geosyntec Consultants, Inc. September.

Table 1. 2023 Revised Analytical Results
Amos Power Plant - Bottom Ash Pond

Geosyntec Consultants, Inc.

Sample Date	Well ID	Well Location	Constituent	Units	Initial Reported Value	Revised Value
5/25/2023	MW-6	Background	Lithium	mg/L	0.0012	0.00122
5/25/2023	MW-1601	Background	Lithium	mg/L	0.0017	0.00169
5/25/2023	MW-1602A	Background	Lithium	mg/L	0.0009	0.00095
5/25/2023	MW-1603A	Background	Lithium	mg/L	0.0007	0.00073
5/26/2023	MW-1	Downgradient	Lithium	mg/L	0.0028	0.0028
5/24/2023	MW-4	Downgradient	Lithium	mg/L	0.0015	0.00145
5/24/2023	MW-5	Downgradient	Lithium	mg/L	0.0018	0.00184
5/25/2023	MW-1605	Downgradient	Lithium	mg/L	0.0024	0.00238
5/25/2023	MW-1606	Downgradient	Lithium	mg/L	0.0028	0.00275
5/26/2023	MW-1604	Downgradient	Lithium	mg/L	<0.0006	0.00037

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.

STATISTICAL ANALYSIS SUMMARY
BOTTOM ASH POND
Amos Plant
Winfield, West Virginia

Submitted to

1 Riverside Plaza
Columbus, Ohio 43215-2372

Submitted by

Geosyntec consultants

engineers | scientists | innovators

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February 17, 2023
CHA8500B

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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
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
SU	Standard Units
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency
UTL	Upper Tolerance Limit

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 Amos Power Plant located in Winfield, West Virginia. Recent groundwater monitoring results were compared to 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 calcium, chloride, total dissolved solids (TDS), and sulfate at the BAP. An alternative source was not identified at the time, so the BAP initiated assessment monitoring in 2018. GWPSs were set in accordance with 40 CFR 257.95(d)(2) and a statistical evaluation of the assessment monitoring data was conducted. During 2022, an annual sampling event for Appendix IV parameters required by 257.95(b) was completed in March, and semiannual sampling events for all Appendix III parameters and select Appendix IV parameters, as required by 257.95(d)(1), were completed in May and October. During the March and May 2022 assessment monitoring events, no statistically significant levels (SSLs) were observed, and the unit remained in assessment monitoring (Geosyntec, 2022a). The results of the October 2022 assessment event 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 were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. GWPSs were re-established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether SSLs of Appendix IV parameters were present above the GWPS. No SSLs were identified. 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 assessment monitoring program, one set of samples was collected for analysis from the upgradient and downgradient wells to meet the requirements of 257.95(d)(1) in October 2022. Samples from October 2022 were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during this assessment monitoring event is presented in Table 1.

Chemical analysis was completed by 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. No outliers were identified for this event.

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. Tolerance limits were calculated parametrically with 95% coverage and 95% confidence for beryllium, chromium, combined radium, lead, and molybdenum. Non-parametric tolerance limits were calculated for antimony, arsenic, barium, cadmium, cobalt, fluoride, lithium, and

selenium due to apparent non-normal distributions and for 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 did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B.

No SSLs were identified at the Amos 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. Intrawell tests were used to evaluate potential SSIs for fluoride and pH. Interwell tests were used to evaluate potential SSIs for boron, calcium, chloride, sulfate, and TDS. Interwell and intrawell prediction limits are updated periodically during the assessment monitoring period as sufficient data become available.

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

The complete Mann-Whitney test results and a summary of the significant findings can be found in Attachment B. No statistically significant differences were found. Thus, the background datasets were updated to include all available data through May 2022.

Prediction limits for the interwell tests were recalculated using data collected during the 2022 assessment monitoring events. New upgradient well data were tested for outliers prior to being added to the background dataset. Upgradient well data were also evaluated for statistically significant trends using the Sen's Slope/Mann-Kendall trend test, and the results are included in

Attachment B. The revised interwell prediction limits were used to evaluate potential SSIs for boron, calcium, chloride, sulfate, and TDS.

After the revised background set was established, a parametric or non-parametric analysis was selected based on the distribution of the data and the frequency of non-detect data. Estimated results less than the reporting limit (practical quantitation limit, [PQL]) but above the method detection limit (MDL) – i.e., "J-flagged" data – were considered detections and the estimated results were used in the statistical analyses. Non-parametric analyses were selected for datasets with at least 50% non-detect data or datasets that could not be normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk / Shapiro-Francía 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, sulfate, and TDS using historical data through November 2022. Intrawell UPLs for fluoride and pH and intrawell lower prediction limits (LPLs) for pH were updated using all the historical data through May 2022 to represent background values. The updated prediction limits are summarized in Table 3. The prediction limits were calculated for a one-of-two retesting procedure; i.e., if at least one sample in a series of two does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, then it can be concluded that an SSI has not occurred. In practice, where the initial result does not exceed the UPL, or in the case of pH, is neither less than the LPL nor greater than the UPL, a second sample will not be collected. The retesting procedures allowed achieving an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated using intrawell prediction limits.

2.2.4 Evaluation of Potential Appendix III SSIs

While no SSLs were identified for the Appendix IV parameters, a review of the Appendix III results was completed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations.

Data collected during the October 2022 assessment monitoring event from each compliance well were compared to the re-calculated prediction limits to evaluate results above background values. The results from this event and the prediction limits are summarized in Table 3. The following exceedances of the UPLs were noted:

- Calcium concentrations exceeded the interwell UPL of 20.5 mg/L at MW-1 (35.6 mg/L), MW-5 (25.8 mg/L), MW-1605 (43.9 mg/L), and MW-1606 (46.1 mg/L).

- Chloride concentrations exceeded the interwell UPL of 43.4 mg/L at MW-1 (56.8 mg/L), MW-1605 (89.9 mg/L), and MW-1606 (175 mg/L).

- Sulfate concentrations exceeded the interwell UPL of 75.7 mg/L at MW-1 (154 mg/L), MW-5 (111 mg/L), MW-1605 (218 mg/L), and MW-1606 (168 mg/L).

- TDS concentrations exceeded the interwell UPL of 263 mg/L at MW-1 (350 mg/L), MW-1605 (490 mg/L), and MW-1606 (520 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 or, in the case of pH, below the LPL. Based on these results, concentrations of Appendix III constituents appear to be above background levels at compliance wells.

2.3 Conclusions

A semiannual assessment monitoring event was conducted at the BAP 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 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 GWPS. No SSLs were identified.

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

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

SECTION 3

REFERENCES

Geosyntec Consultants (Geosyntec). 2020. Statistical Analysis Plan. October 2020.

Geosyntec. 2022a. Statistical Analysis Summary – Bottom Ash Pond, Amos Plant, Winfield, West Virginia. September 13, 2022.

Geosyntec. 2022b. Statistical Analysis Summary – Bottom Ash Pond, Amos Plant, Winfield, West Virginia. September 13, 2022.

TABLES

Table 1 - Groundwater Data Summary
Amos Plant - Bottom Ash Pond

Geosyntec Consultants, Inc.

Parameter	Unit	MW-1	MW-4	MW-5	MW-6	MW-1601	MW-1602	MW-1603	MW-1604		MW-1605	MW-1606
		10/27/2022	10/26/2022	10/27/2022	10/26/2022	10/25/2022	10/27/2022	10/27/2022	10/26/2022	11/2/2022	10/25/2022	10/25/2022
Antimony	µg/L	0.1 U1	0.09 J1	0.1 U1	0.1 U1	0.02 J1	0.1 U1	0.1 U1	0.1 U1	--	0.1 U1	0.03 J1
Arsenic	µg/L	0.11	16.3	3.05	38.0	8.62	21.0	87.9	3.41	--	3.01	5.65
Barium	µg/L	24.8	108	258	213	105	240	245	133	--	108	75.9
Beryllium	µg/L	0.140	0.116	0.065	0.017 J1	0.091	0.01 J1	0.008 J1	0.040 J1	--	0.097	0.113
Boron	mg/L	0.067	0.081	0.040 J1	0.014 J1	0.05 U1	0.017 J1	0.017 J1	0.132	--	0.052	0.042 J1
Cadmium	µg/L	1.99	0.225	0.007 J1	0.02 U1	0.021	0.02 U1	0.02 U1	0.02 U1	--	0.007 J1	0.275
Calcium	mg/L	35.6	16.5 M1	25.8	13.8	10.8	20.0	15.2	17.1	--	43.9	46.1
Chloride	mg/L	56.8	17.5	25.9	13.6	12.7	39.8	6.46	--	25.1	89.9	175
Chromium	µg/L	0.39	0.56	0.31	0.72	1.42	0.39	0.51	0.67	--	0.51	0.58
Cobalt	µg/L	18.3	13.6	1.28	15.0	5.03	0.174	0.205	0.469	--	9.28	14.1
Combined Radium	pCi/L	1.75	1.89	1.24	2.89	1.84	1.48	2.45	0.86	--	1.45	2.32
Fluoride	mg/L	0.03 J1	0.04 J1	0.03 J1	0.04 J1	0.04 J1	0.14	0.25	--	0.05 J1	0.06 U1	0.06 U1
Lead	µg/L	0.1 J1	0.88	0.06 J1	0.2 U1	0.98	0.23	0.08 J1	0.11 J1	--	0.23	0.62
Lithium	mg/L	0.00315	0.00170	0.00190	0.00134	0.00247	0.00104	0.00030	0.00039	--	0.00243	0.00276
Molybdenum	µg/L	0.2 J1	0.2 J1	0.1 J1	0.4 J1	0.1 J1	0.7	1.0	0.3 J1	--	0.5 U1	0.1 J1
Selenium	µg/L	0.1 J1	0.11 J1	0.5 U1	0.5 U1	0.12 J1	0.5 U1	0.5 U1	0.16 J1	--	0.11 J1	0.5 U1
Sulfate	mg/L	154	53.8	111	4.34	50.5	16.3	0.19 J1	--	0.4 U1	218	168
Thallium	µg/L	0.04 J1	0.06 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	--	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	350	210	250	280	160	190	80	--	200	490	520
pH	SU	4.93	5.29	5.5	5.73	5.57	6.39	6.62	5.92	--	5.46	5.36

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 method detection limit (MDL). For statistical analysis, parameters which were not detected were replaced with the reporting limit.
J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
--: Not measured

Table 2: Appendix IV Groundwater Protection Standards
Amos Plant - Bottom Ash Pond

Geosyntec Consultants, Inc.

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000170	0.00600
Arsenic, Total (mg/L)	0.0100		0.0903	0.0903
Barium, Total (mg/L)	2.00		0.303	2.00
Beryllium, Total (mg/L)	0.00400		0.0000822	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000300	0.00500
Chromium, Total (mg/L)	0.100		0.00183	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.0150	0.0150
Combined Radium, Total (pCi/L)	5.00		2.55	5.00
Fluoride, Total (mg/L)	4.00		0.310	4.00
Lead, Total (mg/L)	0.0150		0.00485	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0200	0.0400
Mercury, Total (mg/L)	0.00200		0.00000500	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00208	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000224	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.
Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.

Table 3: Appendix III Data Summary
Amos Plant - Bottom Ash Pond

Geosyntec Consultants, Inc.

Analyte	Unit	Description	MW-1	MW-4	MW-5	MW-1604	MW-1605	MW-1606
			10/27/2022	10/26/2022	10/27/2022	10/26/2022*	10/25/2022	10/25/2022
Boron	mg/L	Interwell Background Value (UPL)	0.183					
		Analytical Result	0.067	0.081	0.040	0.132	0.052	0.042
Calcium	mg/L	Interwell Background Value (UPL)	20.5					
		Analytical Result	**35.6**	16.5	**25.8**	17.1	**43.9**	**46.1**
Chloride	mg/L	Interwell Background Value (UPL)	43.4					
		Analytical Result	**56.8**	17.5	25.9	25.1	**89.9**	**175**
Fluoride	mg/L	Intrawell Background Value (UPL)	0.0600	0.0700	0.0500	0.160	0.0900	0.0600
		Analytical Result	0.03	0.04	0.03	0.05	0.02	0.02
pH	SU	Intrawell Background Value (UPL)	7.3	7.0	6.3	7.2	6.4	6.8
		Intrawell Background Value (LPL)	4.8	5.3	5.2	5.9	5.1	5.2
		Analytical Result	4.9	5.3	5.5	5.9	5.5	5.4
Sulfate	mg/L	Interwell Background Value (UPL)	75.7					
		Analytical Result	**154**	53.8	**111**	0.06	**218**	**168**
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	263					
		Analytical Result	**350**	210	250	200	**490**	**520**

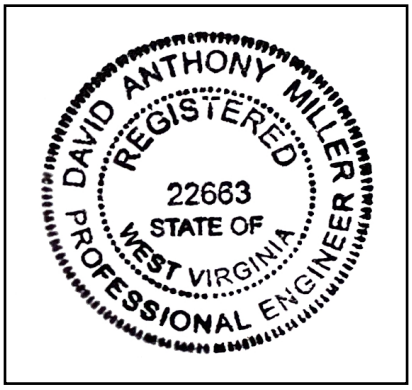
Notes:
UPL: Upper prediction limit
LPL: Lower prediction limit
Bold values exceed the background value.
Background values are shaded gray.
*MW-1604 resampled on 11/2/2022 for anions and total dissolved solids.

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 Amos 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	West Virginia	02.17.2023
License Number	Licensing State	Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

January 30, 2023

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

Re: Amos Bottom Ash Pond
Background Update & Statistical Analysis – November 2022

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background update and the statistical analysis of the of 2022 groundwater data at American Electric Power Company's Amos 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 began at the site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** BAP-MW-1601, BAP-MW-1602A, BAP-MW-1603A, and BAP-MW-6
- **Downgradient wells:** BAP-MW-1, BAP-MW-1604, BAP-MW-1605, BAP-MW-1606, BAP-MW-4, and BAP-MW-5

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 Kirk Cameron, PhD, statistician and owner of MacStat Consulting, primary author of the USEPA Unified Guidance and Senior Advisor for GSC. The analysis was reviewed by Andrew Collins, Project Manager of Groundwater Stats Consulting.

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

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

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

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

For regulatory comparison of current observations against statistical limits for Appendix III constituents, the annual site-wide false positive rate is based on the USEPA Unified Guidance (2009) recommendation of 10% (5% for each semi-annual sample event). Power curves were included with the original background screening conducted in December 2017 and demonstrated 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=6

Summary of Statistical Methods:

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

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. 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. Non-detects are handled as follows.

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

Note that values shown on data pages reflect raw data as reported by the laboratory. Any non-detects that have been substituted with one-half of the reporting limit due to data sets containing <15% non-detects as described above are shown as the original reporting limit (for example: fluoride in wells BAP-MW-4 and BAP-MW-5).

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

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

Appendix III Background Update Summaries

November 2019

Prior to updating background data for the 2019 analysis, samples were re-evaluated at all wells for constituents utilizing intrawell prediction limits and at all upgradient wells for parameters utilizing interwell prediction limits using Tukey's outlier test and visual screening with the July 2019 samples. Note that the reporting limit during the March 2019 event for boron in wells BAP-MW-1603A, BAP-MW-1604, BAP-MW-1605, BAP-MW-1606, BAP-MW-4, BAP-MW-5, and BAP-MW-6 was 1.0 mg/L compared to a historical reporting limit of 0.005 mg/L. Additionally, the reporting limit for fluoride during the October 2016 sample event in wells BAP-MW-4 and BAP-MW-5 was 0.2 mg/L compared to a historical reporting limit of 0.06 mg/L. Therefore, non-detects that were censored at these higher reporting limits were flagged as outliers and excluded from the prediction limits to avoid setting a statistical limit that would not be conservative from a regulatory perspective.

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test at the 99% confidence level was used to compare the medians of historical data through June 2017 to the medians of new compliance samples at each well through March 2019. No statistically significant differences were found between the two groups for any of the well/constituent pairs; therefore, all records were updated through March 2019.

For parameters tested using interwell analyses, the Sen's Slope/Mann-Kendall trend test was used to evaluate data through March 2019 at upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. No adjustments were required.

February 2021

Prior to updating background data for the 2020 analysis, Tukey's outlier test and visual screening were used to evaluate data for outliers at all wells for fluoride and pH, which utilize intrawell prediction limits. Outliers were evaluated at all upgradient wells, using pooled data, for boron, calcium, chloride, sulfate, and TDS which utilize interwell prediction limits. Outliers were noted for pH in a number of upgradient and downgradient

wells. The highest values were flagged for wells BAP-MW-1, BAP-MW-1602A, BAP-MW-1603A, BAP-MW-1604, BAP-MW-1606, and BAP-MW-6. Tukey's outlier test on pooled upgradient well data for boron, calcium, chloride, sulfate, and TDS which are tested using interwell limits identified potential outliers for boron; however, other than high non-detect values, none of these values were flagged as outliers as they appeared to represent natural variation in groundwater quality.

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test at the 99% confidence level was used to compare the medians of historical data through March 2019 to the new compliance samples at each well through May 2020. A statistically significant differences was found for fluoride in well BAP-MW-1606; however, the significant difference noted for fluoride resulted from recent reported trace values (less than the reporting limit) compared to mostly non-detects in background, censored at the reporting limit. Therefore, the record, along with all other records, was updated using all available data through May 2020.

For parameters tested using interwell analyses, the Sen's Slope/Mann-Kendall trend test was used to evaluate data through October 2020 in upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. No adjustments were required.

January 2022

Interwell and intrawell prediction limits were updated during Spring 2021, and the results of those findings were submitted with the February 26, 2021 report. In January 2022, upgradient well data through November 2021 were re-screened for the purpose of updating the interwell prediction limits for boron, calcium, chloride, sulfate, and TDS. Intrawell prediction limits were not updated due to insufficient samples. A summary of the January 2022 update is described below and the results of the update were included with that report.

Prior to updating background data, Tukey's outlier test and visual screening were used to evaluate data at all upgradient wells, using pooled data through November 2021, for boron, calcium, chloride, sulfate, and TDS, which utilize interwell prediction limits. Tukey's outlier test on pooled upgradient well data for these constituents identified potential outliers; however, none of these values were flagged as outliers as they appear to represent natural variation in groundwater quality.

Additionally, a spike in concentrations for TDS in downgradient wells BAP-MW-1605 and BAP-MW-4 during the December 2016 sample event was followed by lower

concentrations throughout the rest of the record. Therefore, these values were flagged as outliers, but these values do not impact constructing statistical limits since they are in downgradient wells.

No changes to values flagged in previous background updates occurred. As mentioned above, any flagged data are displayed in a lighter font and as a disconnected symbol on the time series reports, as well as in a lighter font on the accompanying data pages.

Intrawell – Prediction Limits

Intrawell prediction limits, combined with a 1-of-2 resample plan, are constructed using historical data through May 2020 for fluoride and pH. As discussed earlier, background data sets for all parameters utilizing intrawell prediction limits were not updated at that time.

Interwell – Trend Test Evaluation

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron, calcium, chloride, sulfate, and TDS to identify statistically significant increasing or decreasing trends. Statistically significant trends were identified for the following well/constituent pairs:

Increasing

- Chloride: BAP-MW-1601, BAP-MW-1602A, and BAP-MW-1603A

Decreasing

- Calcium: BAP-MW-1603A

Since the magnitudes of the trends were low relative to the average concentrations in these wells; therefore, no adjustments were required at that time.

Interwell – Prediction Limits

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

January 2023

Interwell and intrawell prediction limits were last updated during January 2022, and the results of those findings were submitted with the January 2022 report. During this analysis, upgradient well data through November 2022 were re-screened for the purpose of updating the interwell prediction limits for boron, calcium, chloride, sulfate, and TDS. Background data for pH and sulfate were also re-screened through May 2022 in order to update intrawell prediction limits during this analysis.

Outlier Analysis

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

Tukey's outlier test confirmed previously flagged outliers for pH at wells BAP-MW-1, BAP-MW-1602A, BAP-MW-1603A, BAP-MW-1604, BAP-MW-1606, and BAP-MW-6, and identified a more recent measurement of 6.81 SU as an outlier in downgradient well BAP-MW-1606. This measurement was not flagged as an outlier as it is similar to another historical measurement within the same well which appears to represent natural variation in groundwater quality. No new outliers were identified for fluoride and previously flagged non-detect measurements with high reporting limits remain flagged.

Tukey's outlier test on pooled upgradient well data identified no new outliers for boron, calcium, chloride, sulfate, and TDS which are tested using interwell limits. Previously flagged high reporting limits for boron from the March 2019 event remain flagged.

Additionally, as described above, a spike in concentrations for TDS in downgradient wells BAP-MW-1605 and BAP-MW-4 during the December 2016 sample event was followed by lower concentrations throughout the rest of the record. Therefore, these values were previously flagged as outliers, but do not impact the statistical analysis since TDS is evaluated using interwell prediction limits constructed from pooled upgradient well data.

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

Mann-Whitney Evaluation

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test at the 99% confidence level was used to compare the medians of historical data through May 2020 to the new compliance samples at each well through May 2022 (Figure D). No statistically significant differences in medians were found. Therefore, all other records were updated using all available data through May 2022.

Intrawell – Prediction Limits

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

Interwell – Trend Test Evaluation

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

Increasing

- Calcium: GAP-MW-1602A
- Chloride: BAP-MW-1601, BAP-MW-1602A, and BAP-MW-1603A

Decreasing

- Calcium: BAP-MW-1603A

Since the magnitudes of the trends were low relative to the average concentrations in these wells with the exception of chloride at well MW-1601, no adjustments were required at this time. The record for chloride at MW-1601 was not adjusted as a result of the trend not influencing the nonparametric interwell limit constructed using pooled upgradient well data. Additionally, more recent concentrations for this well/constituent pair have returned to historic levels.

Interwell – Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were updated using all available data from upgradient wells through November 2022 for boron, calcium, chloride, sulfate, and TDS. Interwell prediction limits pool upgradient well data to establish

a background limit for an individual constituent. A summary table and graphical results for the updated limits follow this letter (Figure G).

Evaluation of Appendix IV Parameters – November 2022

Prior to evaluating Appendix IV parameters, background (upgradient) data are screened through visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. Tukey's outlier test and visual screening confirmed the previously flagged values and no new outliers were flagged during this analysis.

For the current analysis, Tukey's outlier test on pooled upgradient well data through November 2022 identified outliers for combined radium 226 + 228. These values were flagged during previous background updates and will remain flagged. In addition, the two highest values for combined in radium 226 + 228 in upgradient well BAP-MW-1602A were also previously flagged in order to construct statistical limits that are conservative (i.e., lower) from a regulatory perspective. Although not identified by Tukey's, visual screening confirmed the previously flagged highest value for chromium at upgradient well BAP-MW-1603A. This measurement remains flagged in order to maintain conservative statistical limits.

Additionally, downgradient well data through November 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 the measurements. The two highest values for molybdenum at downgradient BAP-MW-4 and the highest value for beryllium in well BAP-MW-1604 were previously flagged as outliers since these values were an order of magnitude higher than concentrations found within each respective well. The measurements also were reported early in the record and, therefore, do not appear to represent present-day groundwater quality conditions. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

Interwell Upper Tolerance Limits

Interwell upper tolerance limits were used to calculate background limits from all available pooled upgradient well data through November 2022 for each Appendix IV parameter (Figure H). For parametric limits a target of 95% confidence and 95% coverage is 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 CCR-Rule specified levels in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure I).

Confidence Intervals

Confidence intervals were then constructed on downgradient wells using all data through November 2022 for each of the Appendix IV parameters and compared to the GWPS as discussed above (Figure J). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. No exceedances were noted for any of the well/constituent pairs. A summary of the confidence interval results follows this letter.

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

For Groundwater Stats Consulting,

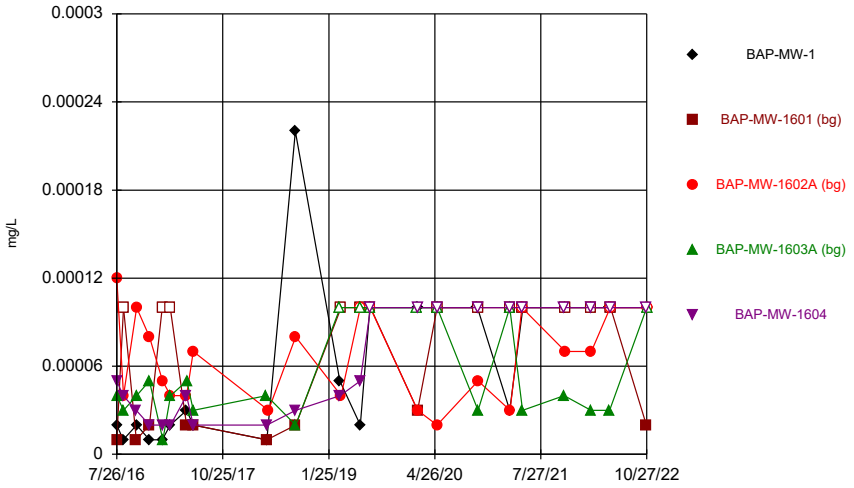
Abdul Diane
Groundwater Analyst

Andrew T. Collins
Project Manager

FIGURE A
Time Series

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

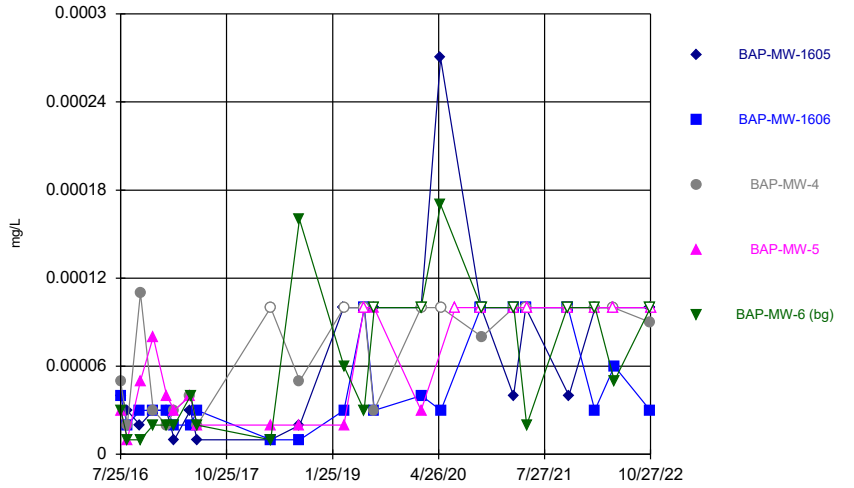
Time Series



Constituent: Antimony, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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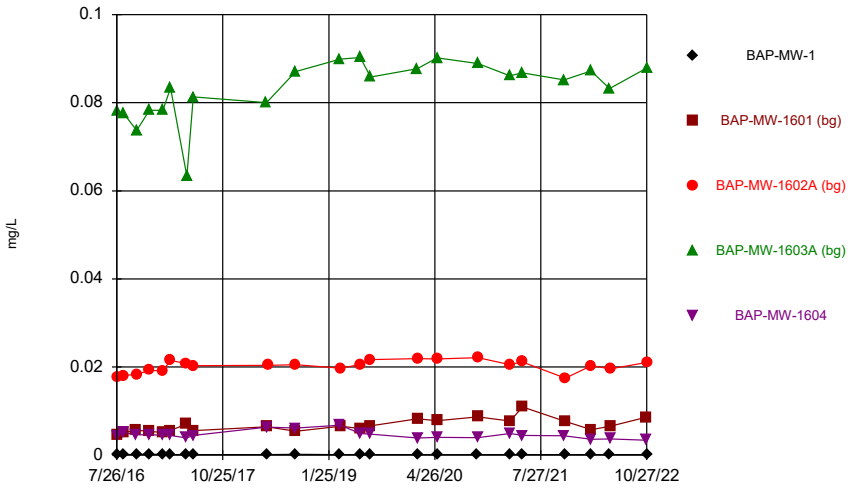
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

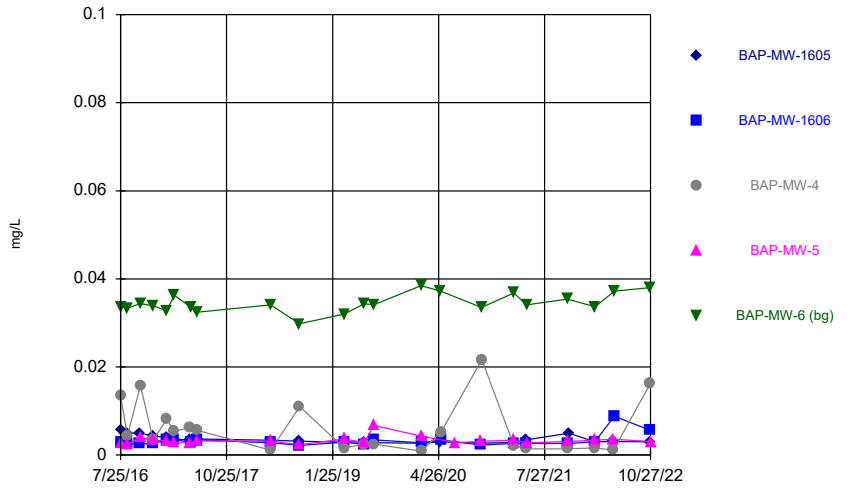
Time Series



Constituent: Arsenic, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

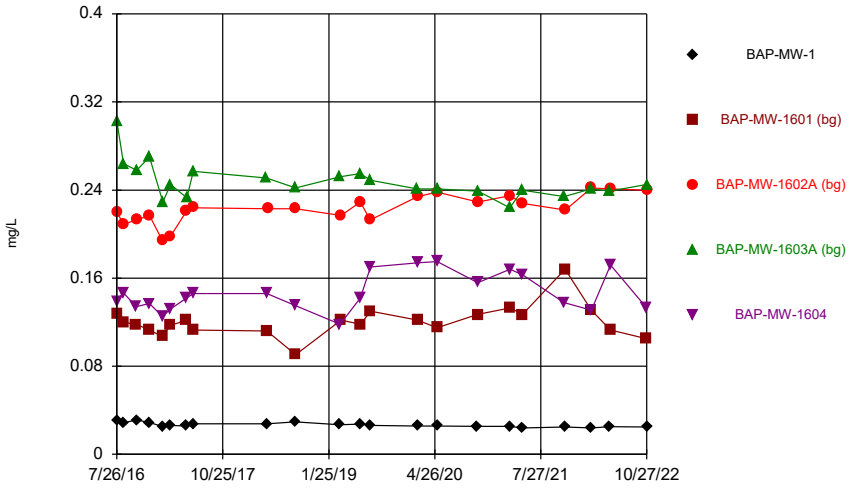
Time Series



Constituent: Arsenic, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

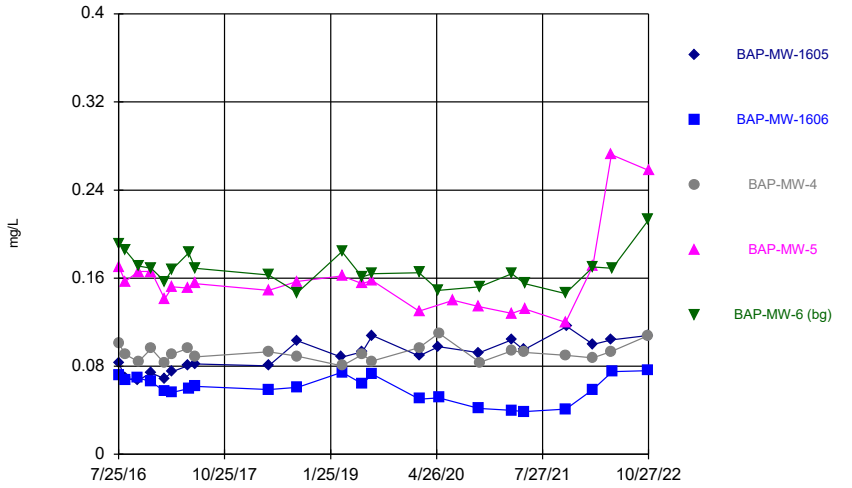


Constituent: Barium, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series



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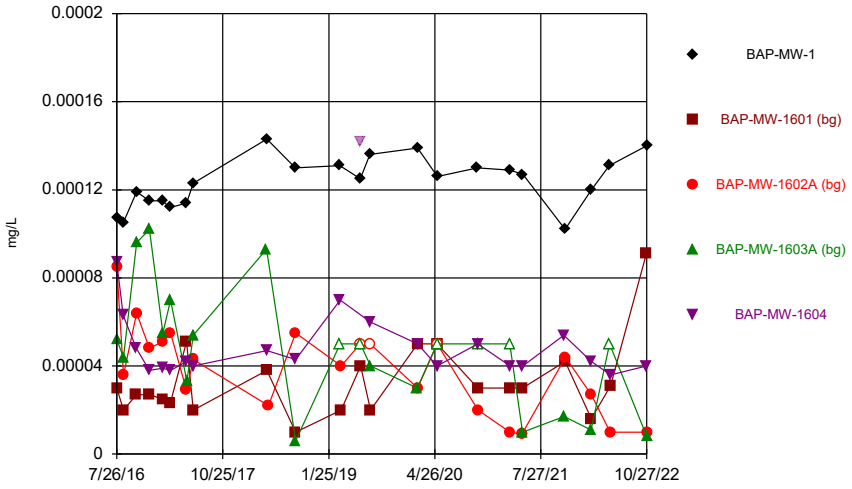
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series



Constituent: Beryllium, total Analysis Run 1/27/2023 2:55 PM

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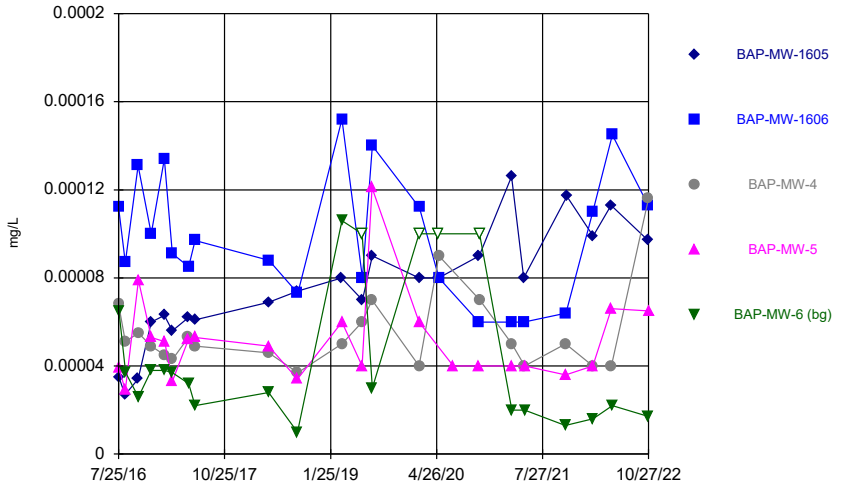
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series



Constituent: Beryllium, total Analysis Run 1/27/2023 2:55 PM

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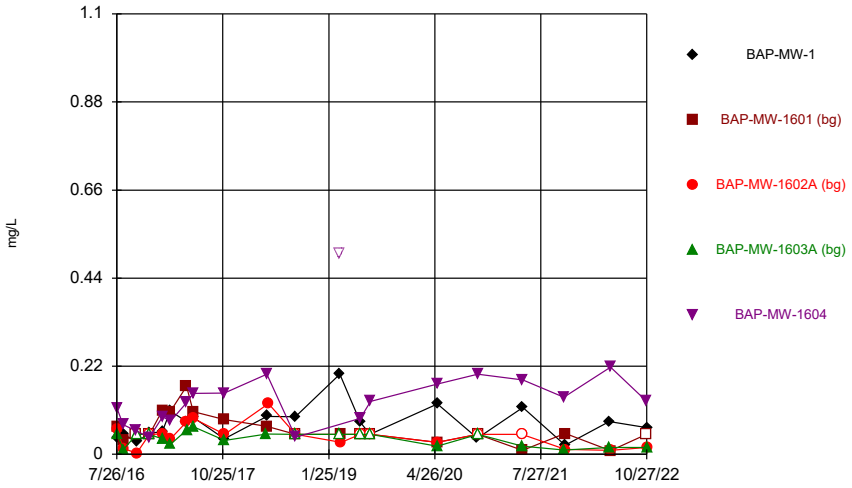
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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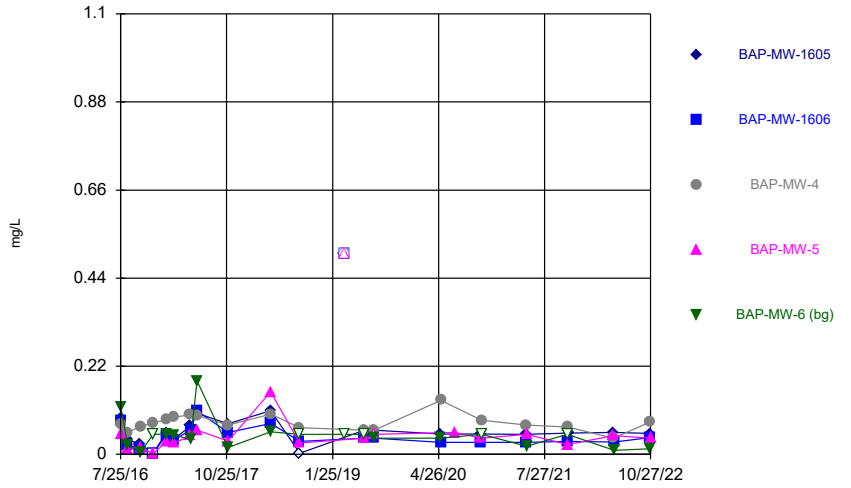
Hollow symbols indicate censored values.

Time Series



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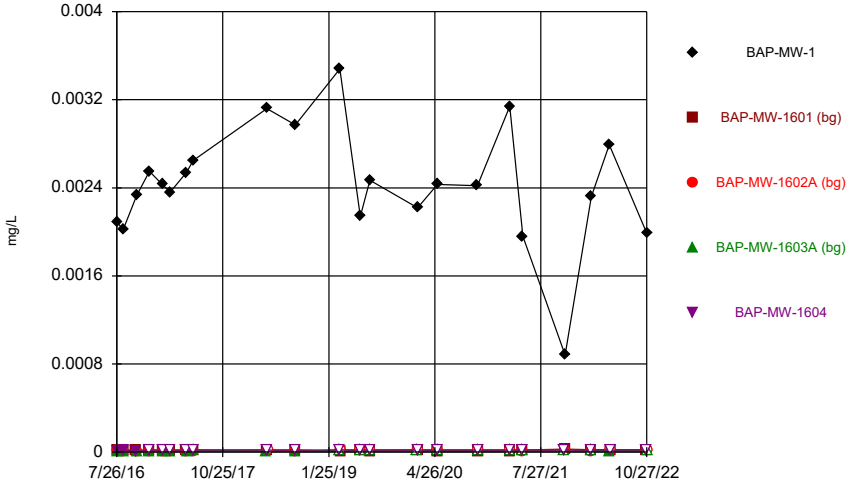
Hollow symbols indicate censored values.

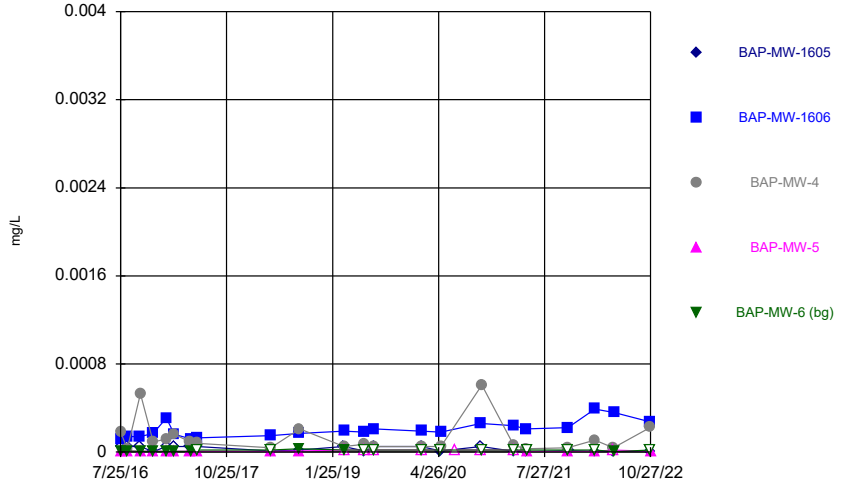
Time Series



Constituent: Cadmium, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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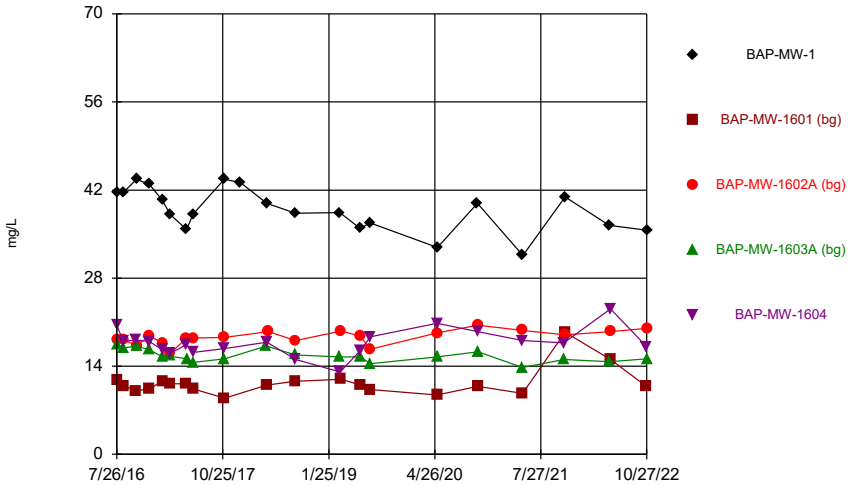
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series



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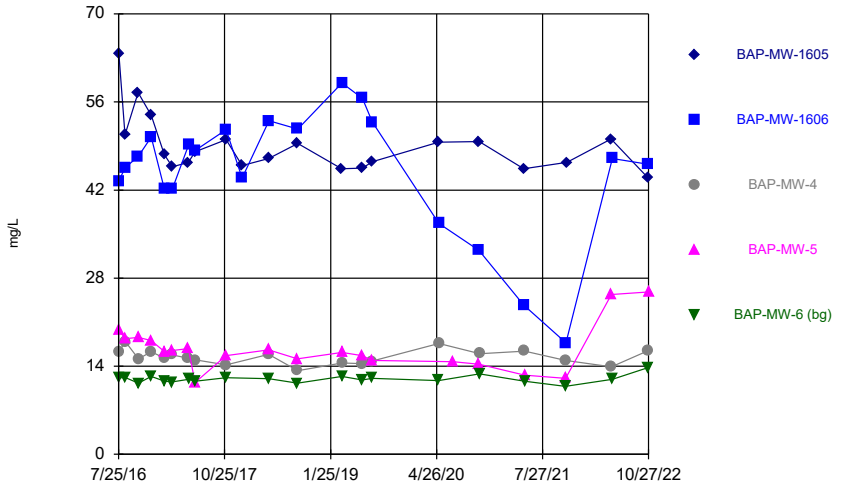
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series



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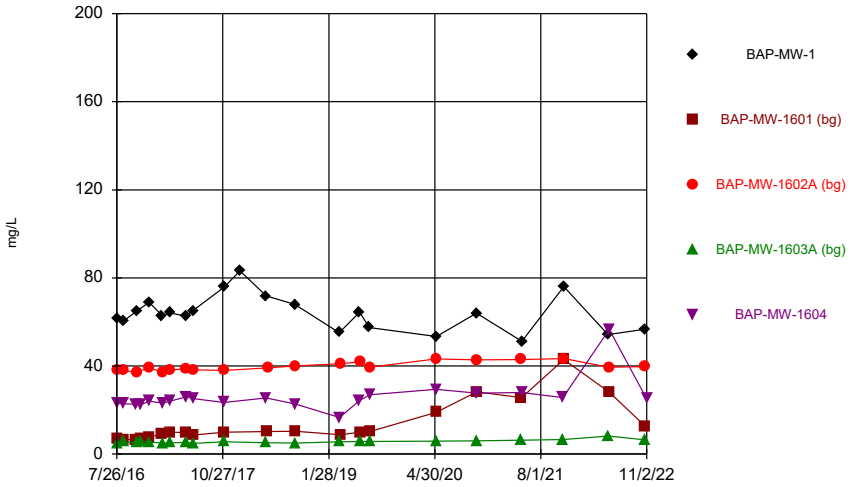
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

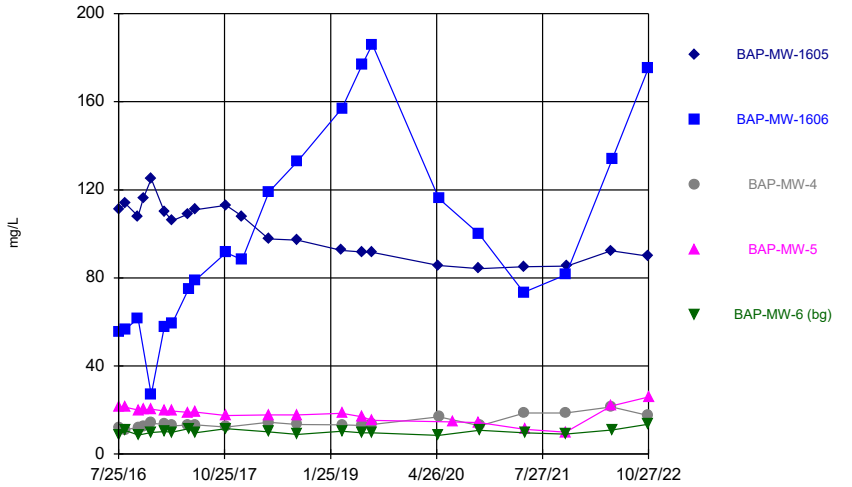


Constituent: Chloride, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series



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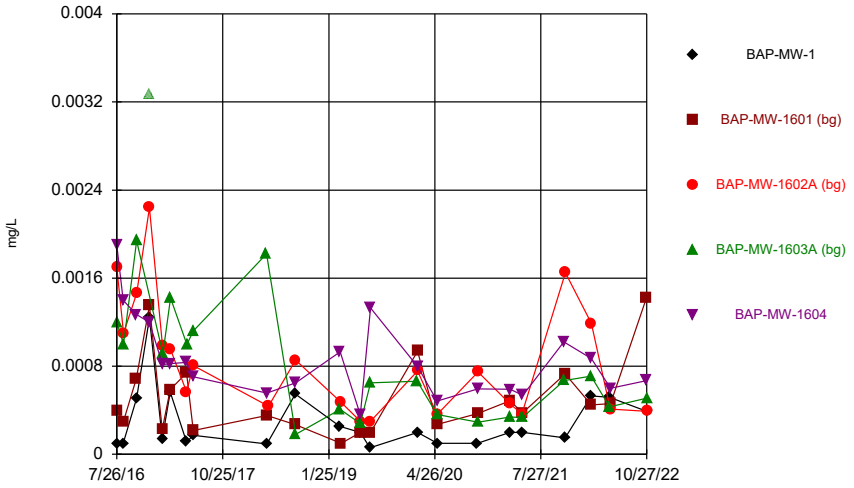
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

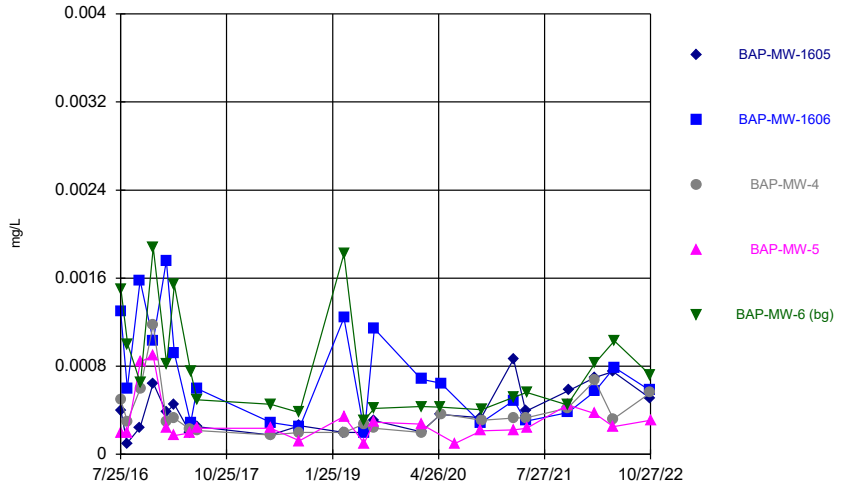


Constituent: Chromium, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series



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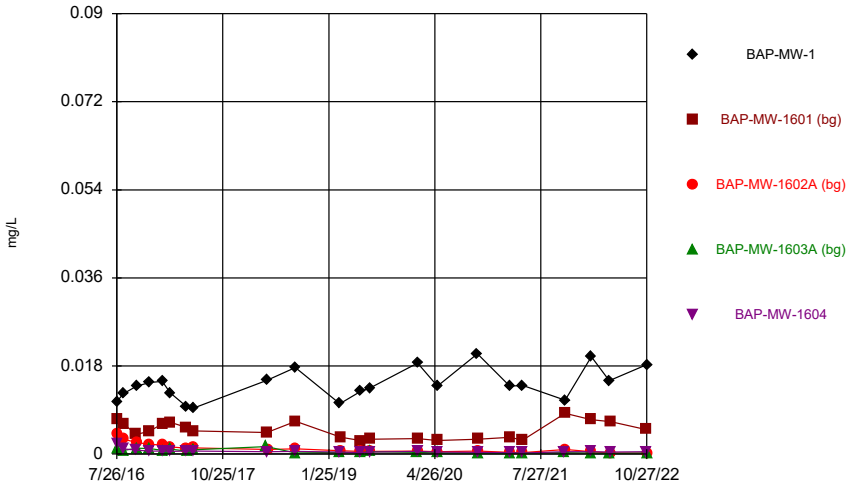
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

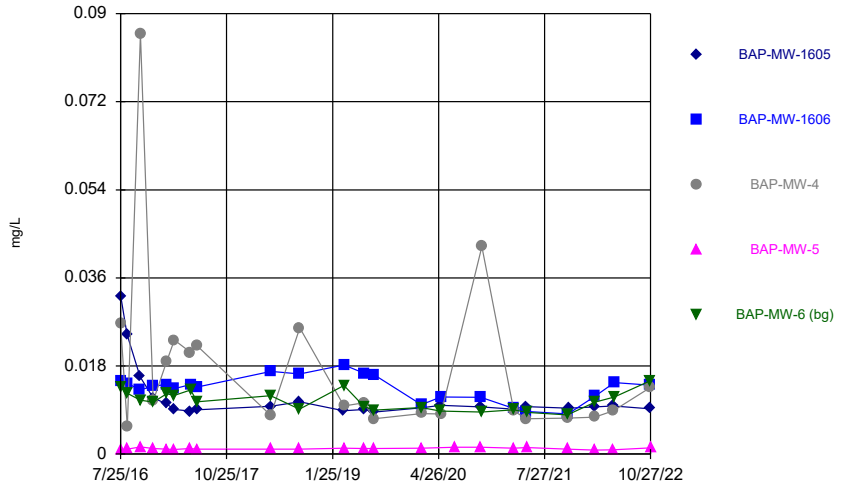


Constituent: Cobalt, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

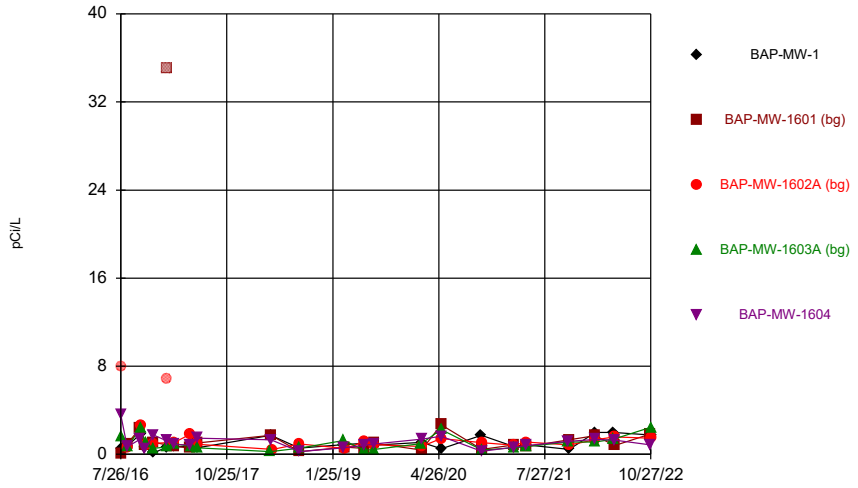


Constituent: Cobalt, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

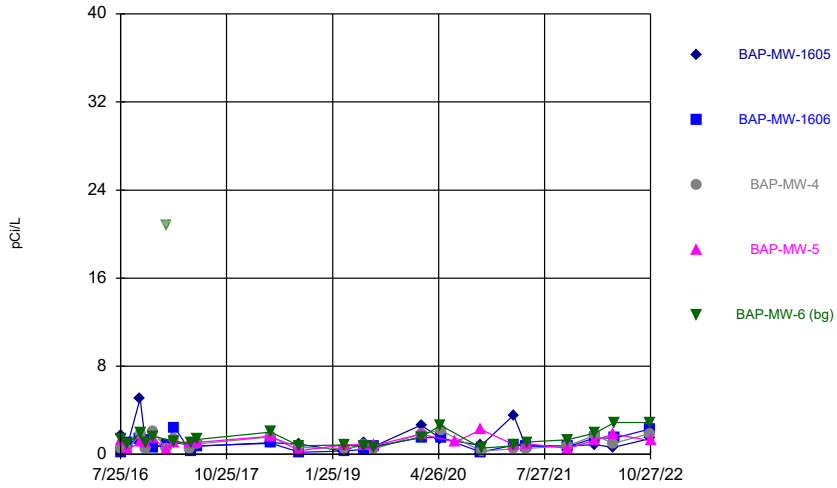


Constituent: Combined Radium 226 + 228 Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series



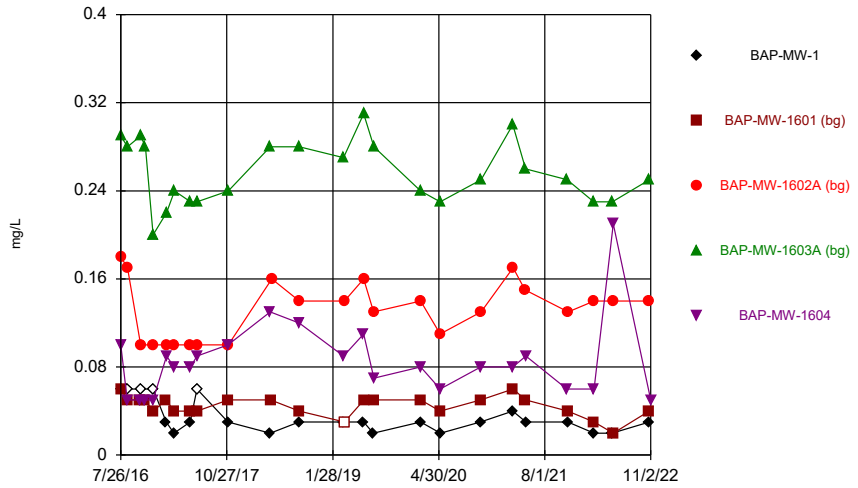
Constituent: Combined Radium 226 + 228 Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series



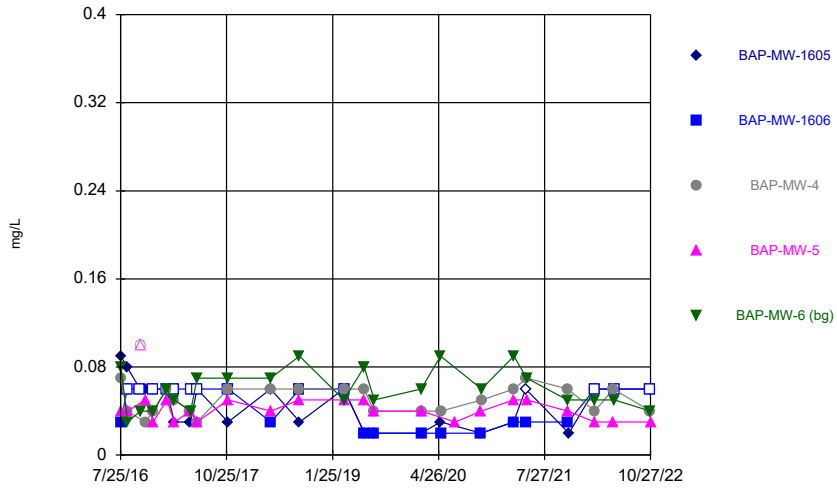
Constituent: Fluoride, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series

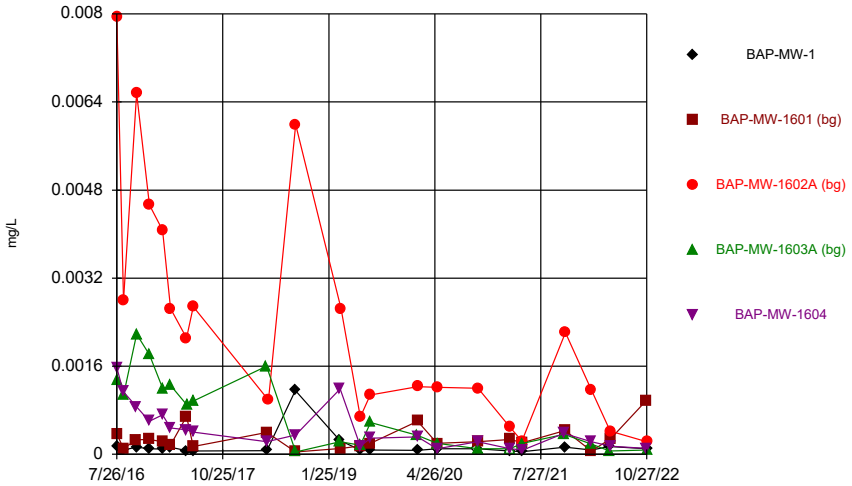


Constituent: Fluoride, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

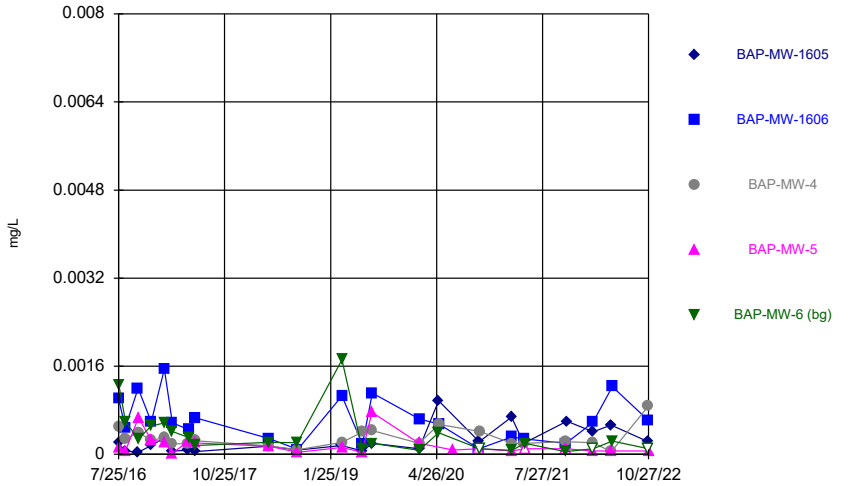
Time Series



Constituent: Lead, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

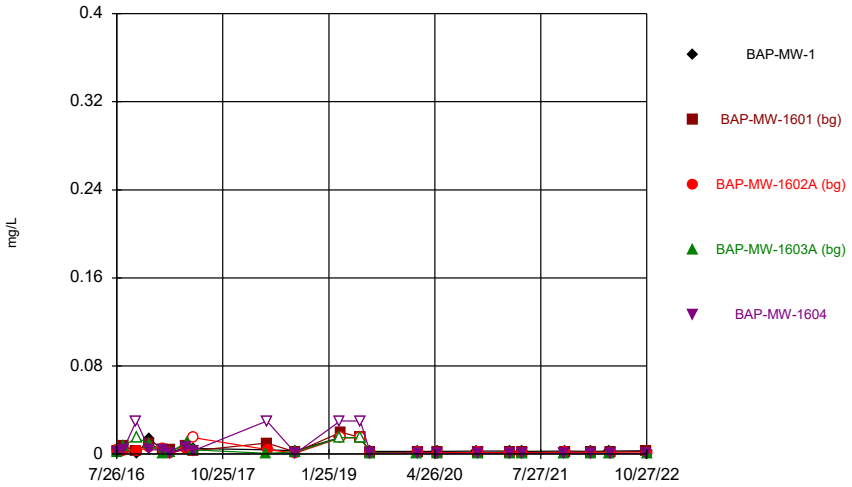
Time Series



Constituent: Lead, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

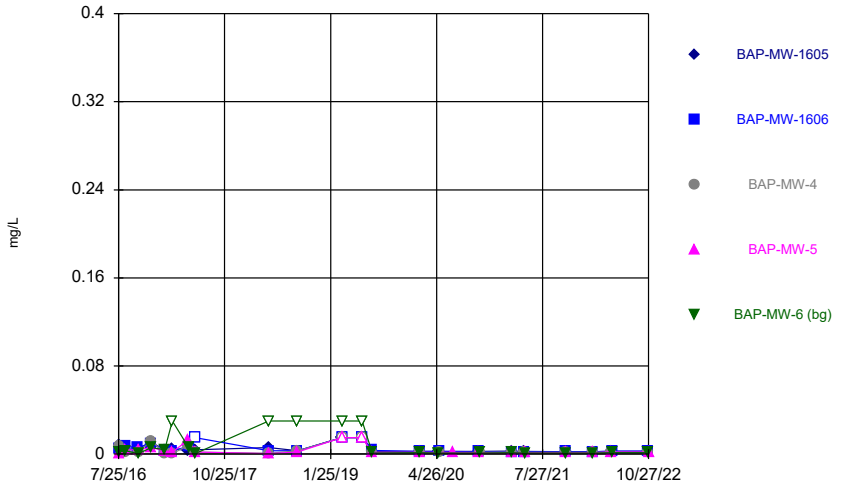
Time Series



Constituent: Lithium, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

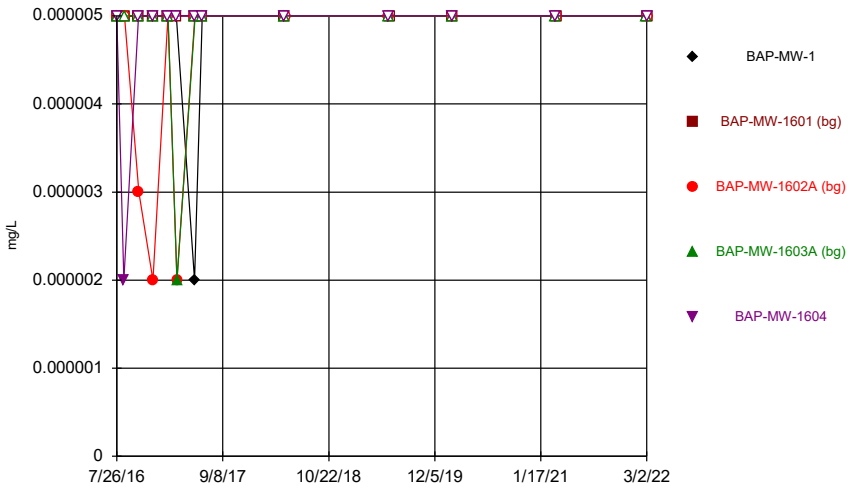
Time Series



Constituent: Lithium, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

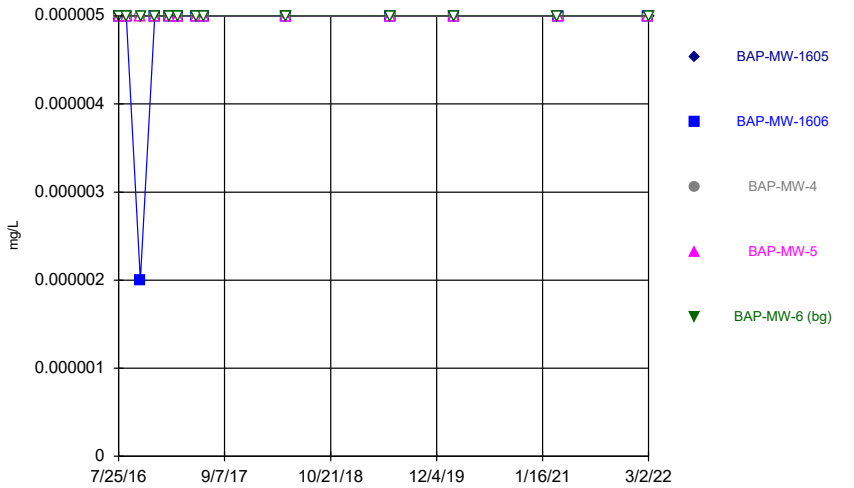
Time Series



Constituent: Mercury, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

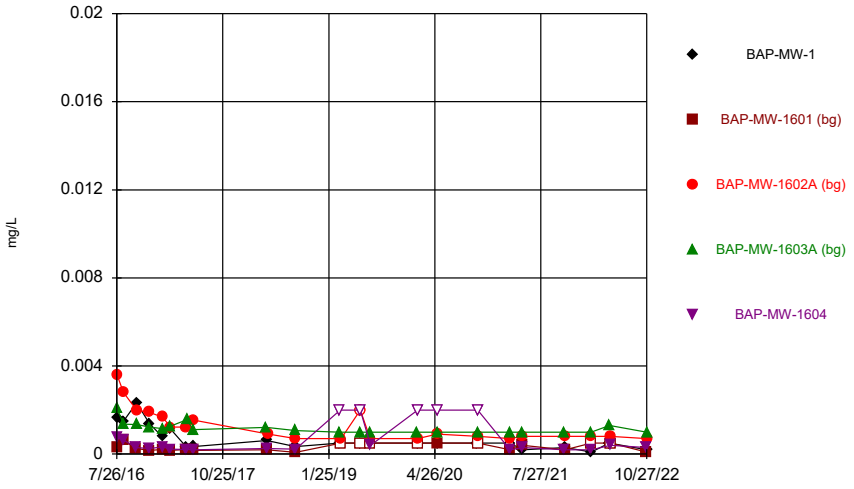
Time Series



Constituent: Mercury, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

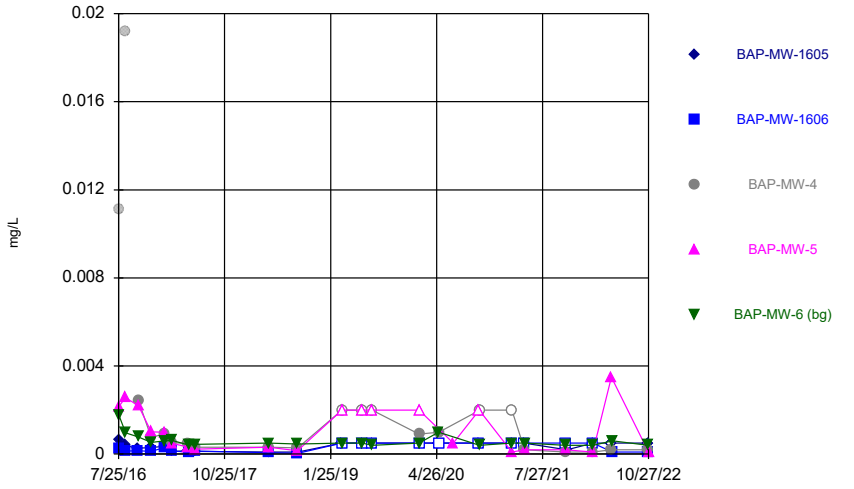
Time Series



Constituent: Molybdenum, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

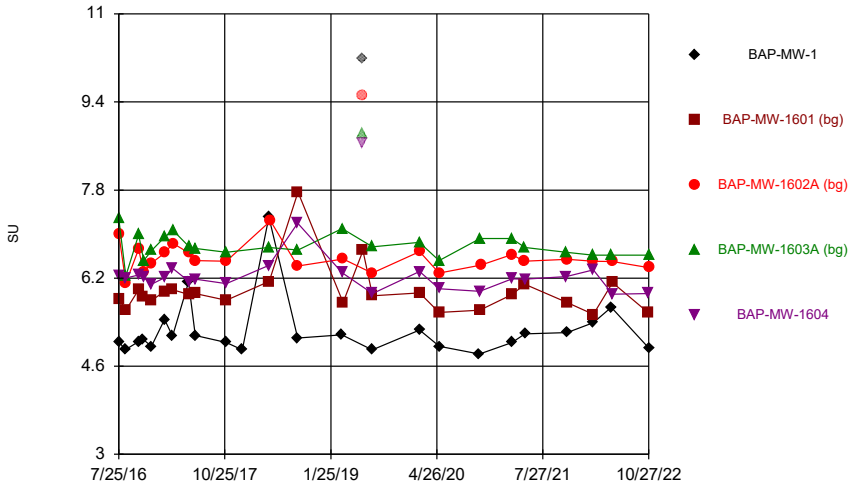
Time Series



Constituent: Molybdenum, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

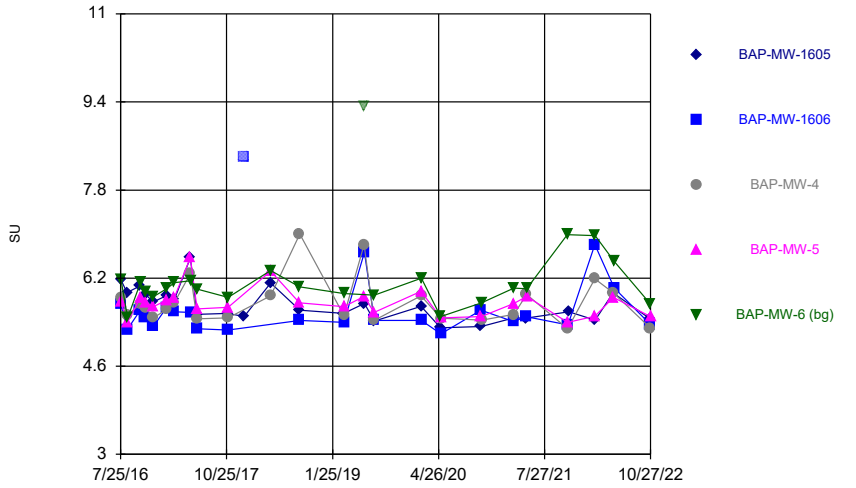


Constituent: pH, field Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Time Series

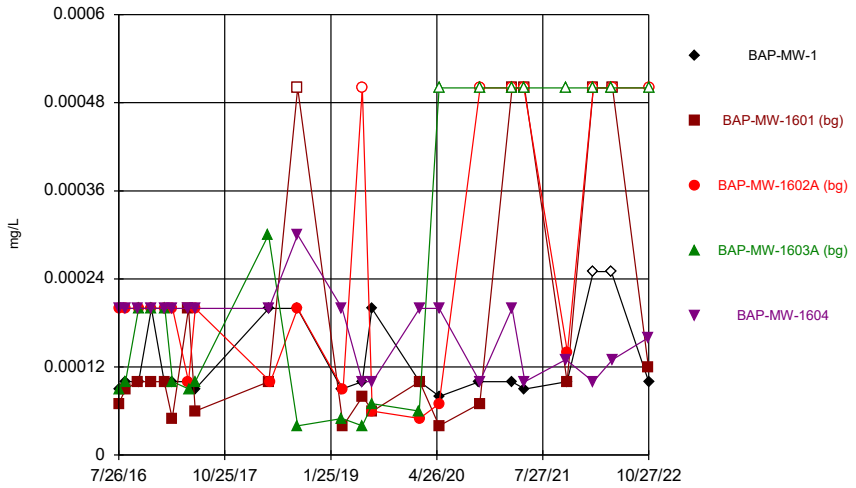


Constituent: pH, field Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series

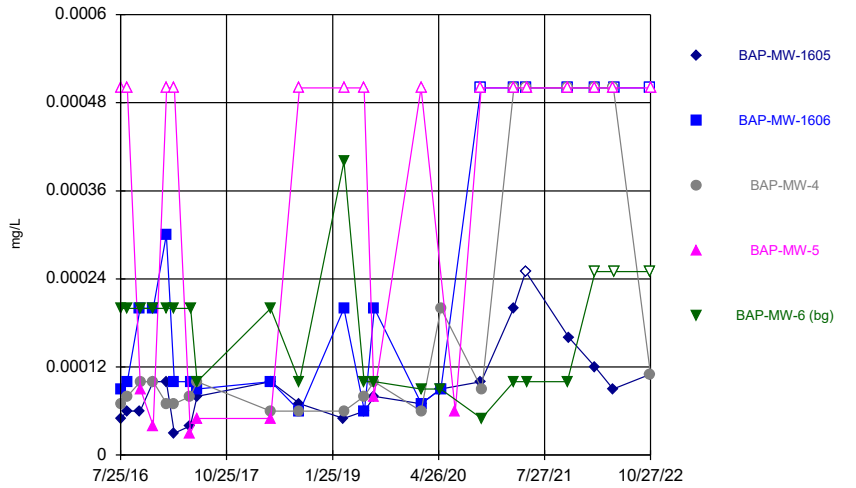


Constituent: Selenium, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series

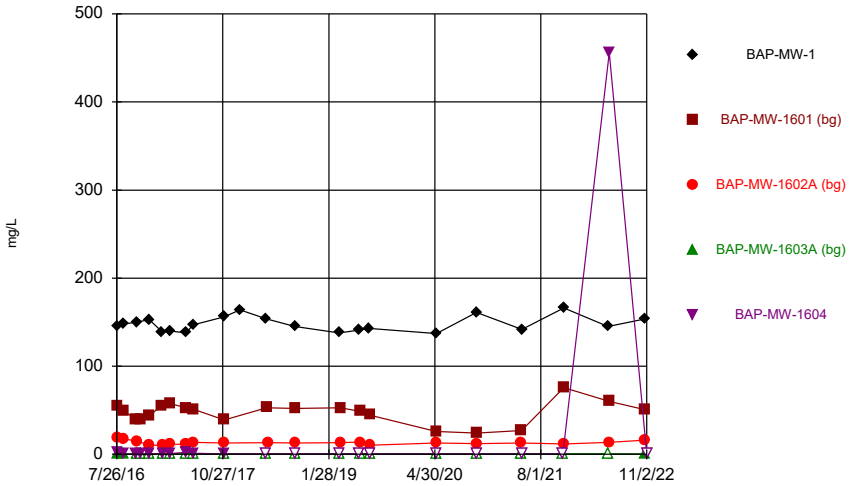


Constituent: Selenium, total Analysis Run 1/27/2023 2:55 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

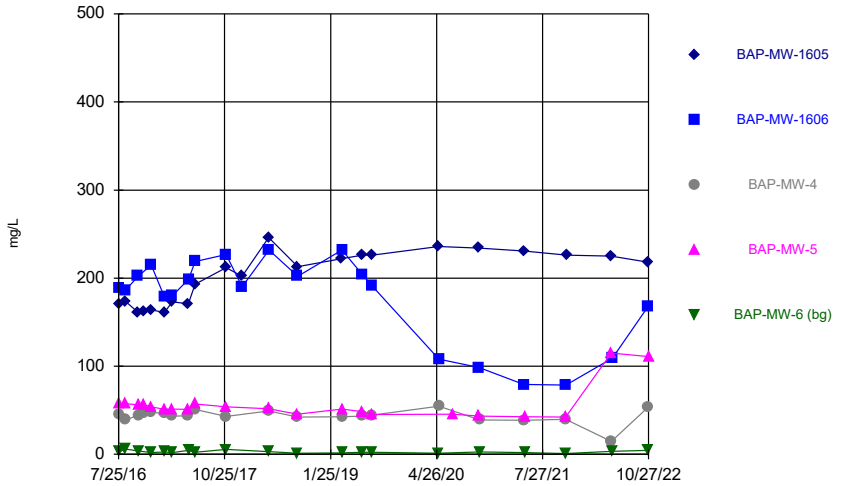
Time Series



Constituent: Sulfate, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

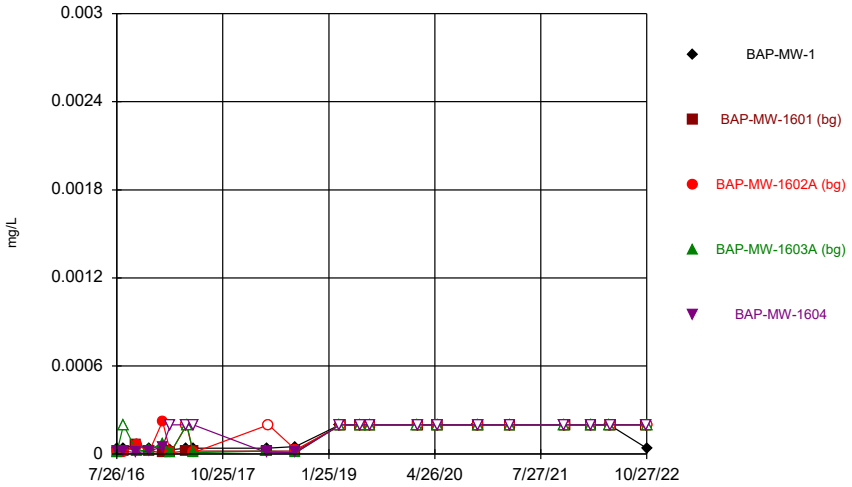
Time Series



Constituent: Sulfate, total Analysis Run 1/27/2023 2:55 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

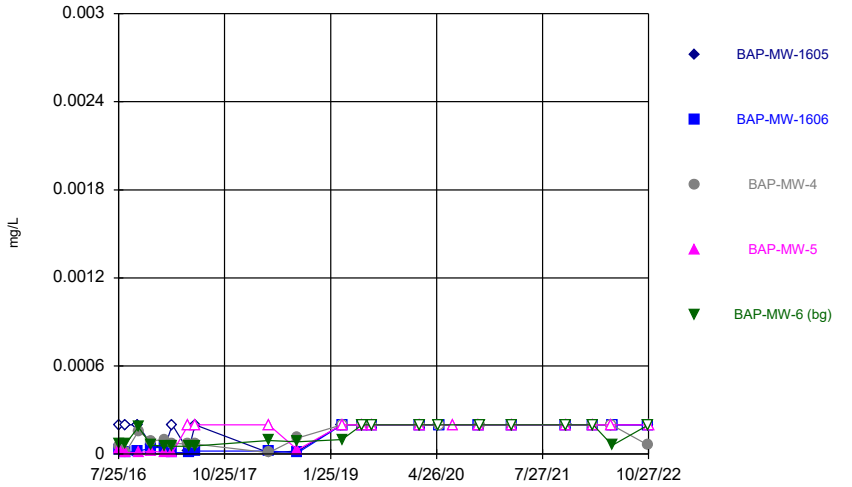
Time Series



Constituent: Thallium, total Analysis Run 1/27/2023 2:56 PM
Amos BAP Client: Geosyntec Data: Amos BAP

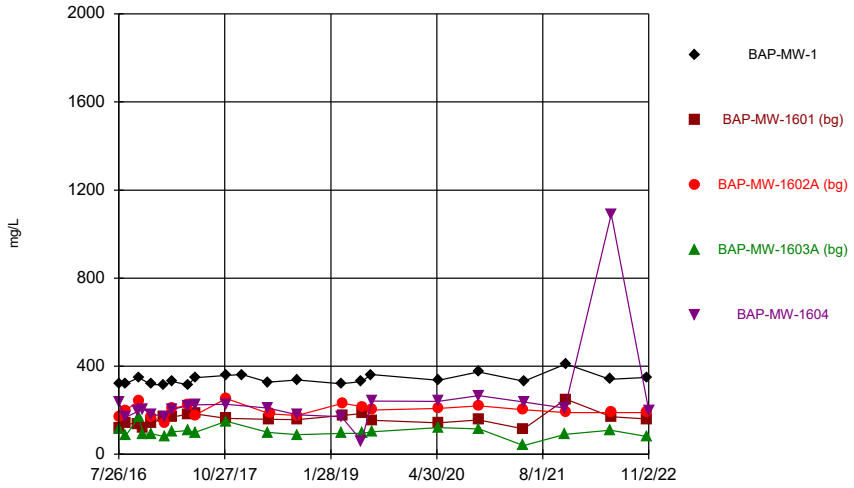
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium, total Analysis Run 1/27/2023 2:56 PM
Amos BAP Client: Geosyntec Data: Amos BAP

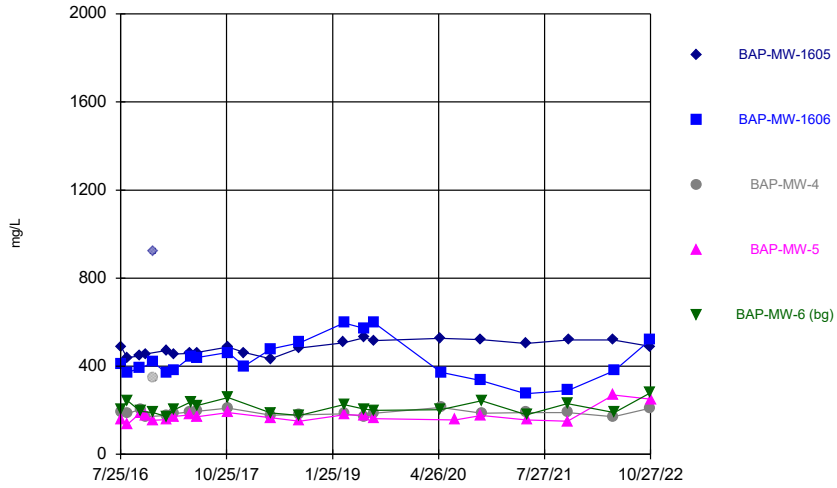
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/27/2023 2:56 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

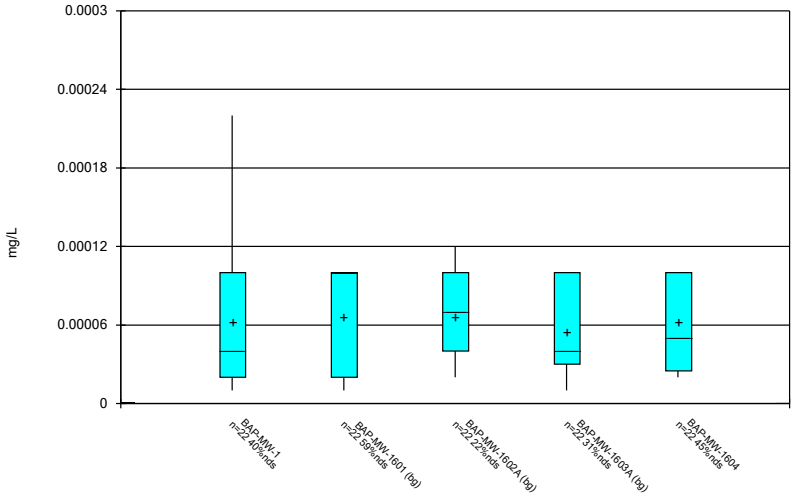
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/27/2023 2:56 PM
Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE B
Box Plots

Box & Whiskers Plot

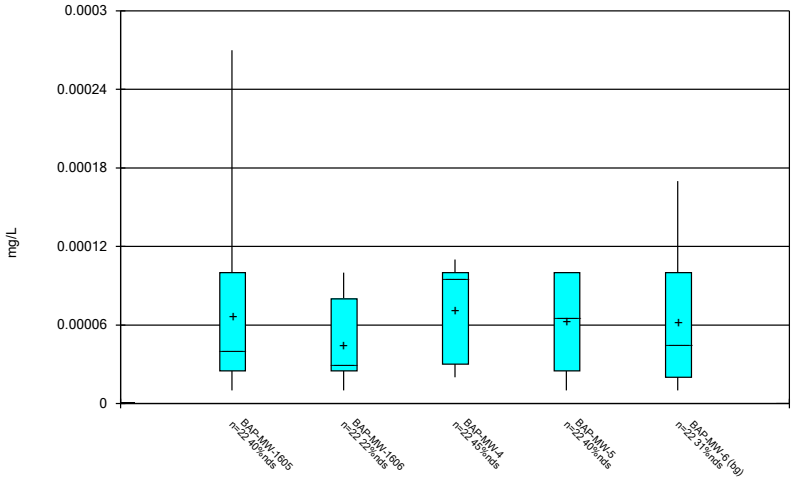


Constituent: Antimony, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

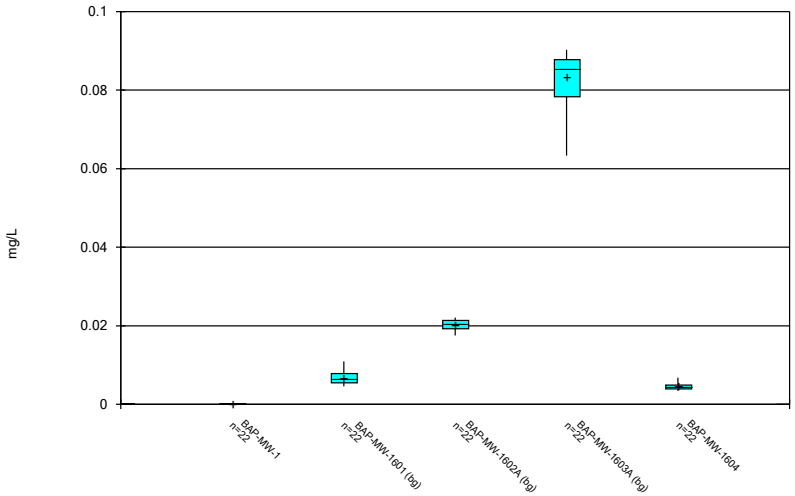


Constituent: Antimony, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

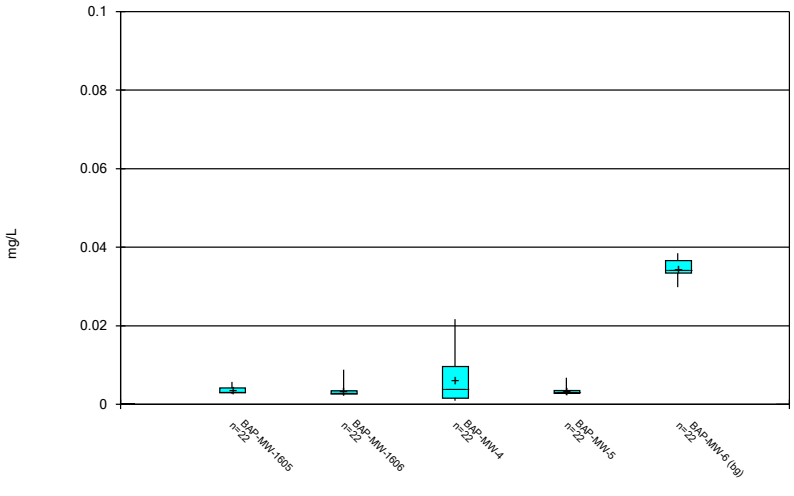


Constituent: Arsenic, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

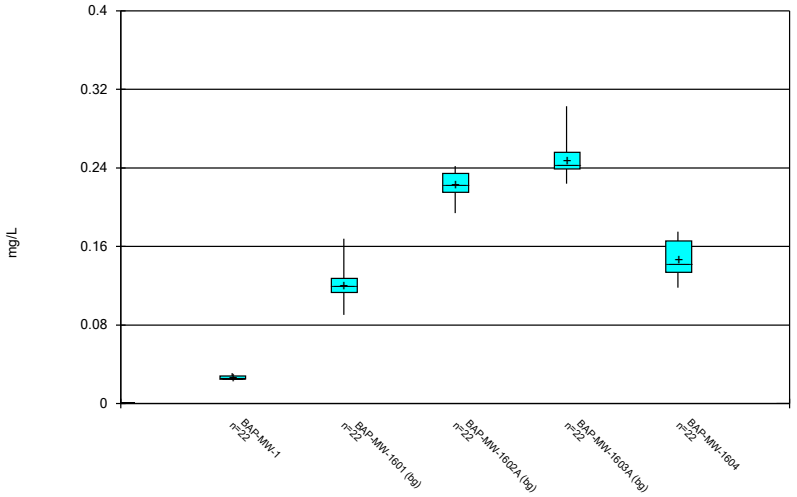
Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

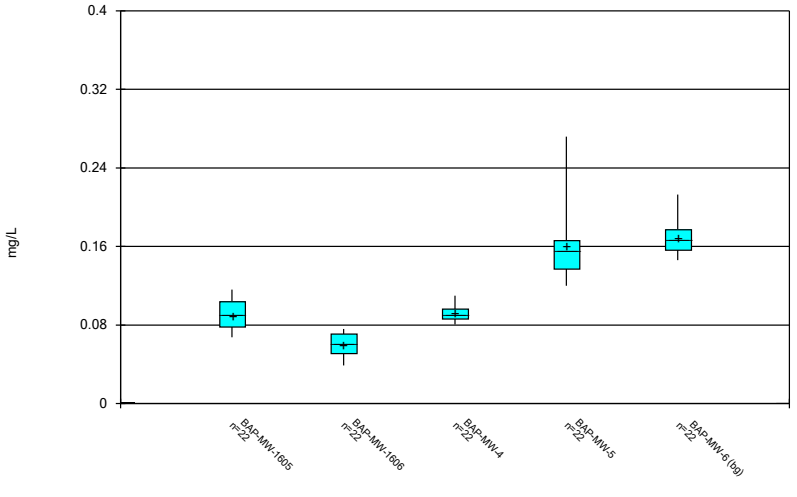


Constituent: Barium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

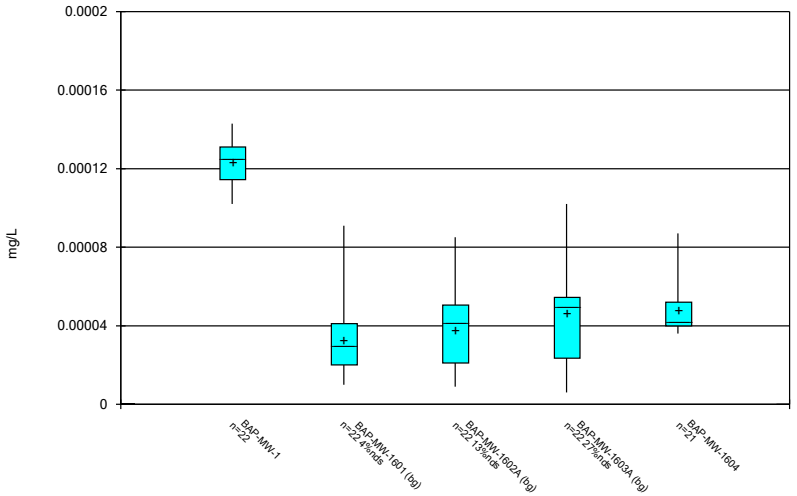


Constituent: Barium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

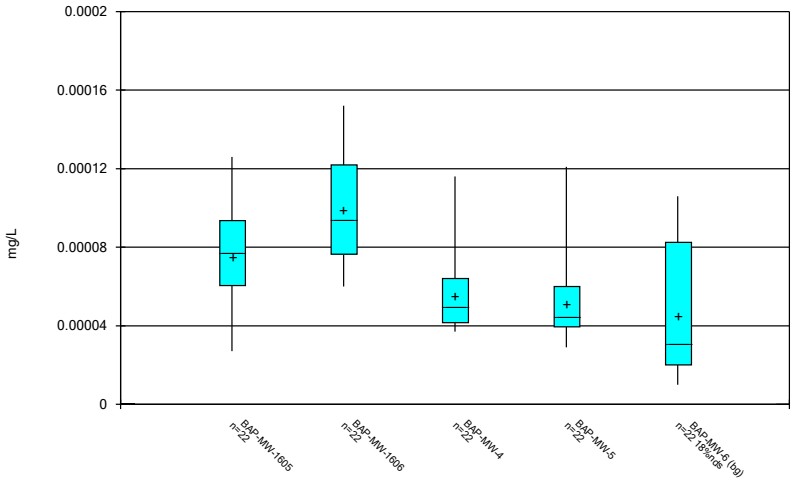


Constituent: Beryllium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

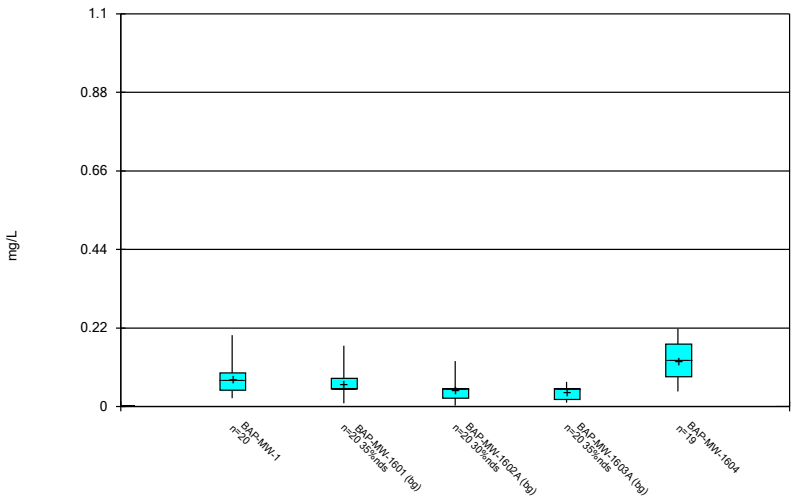
Box & Whiskers Plot



Constituent: Beryllium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

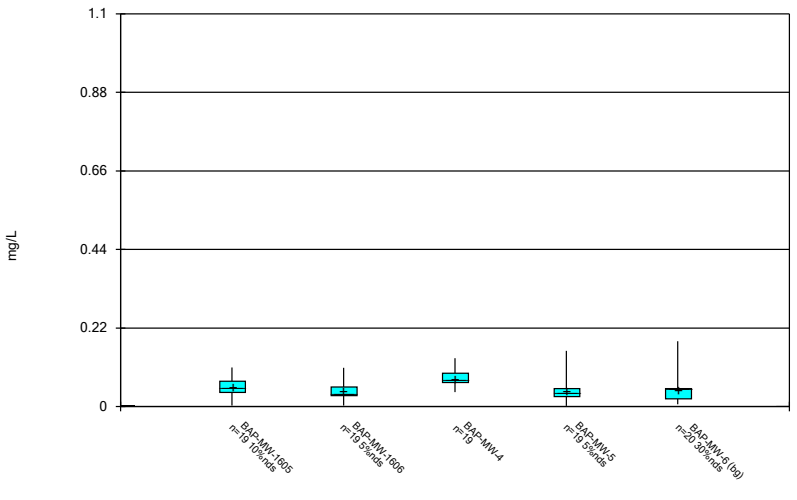


Constituent: Boron, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

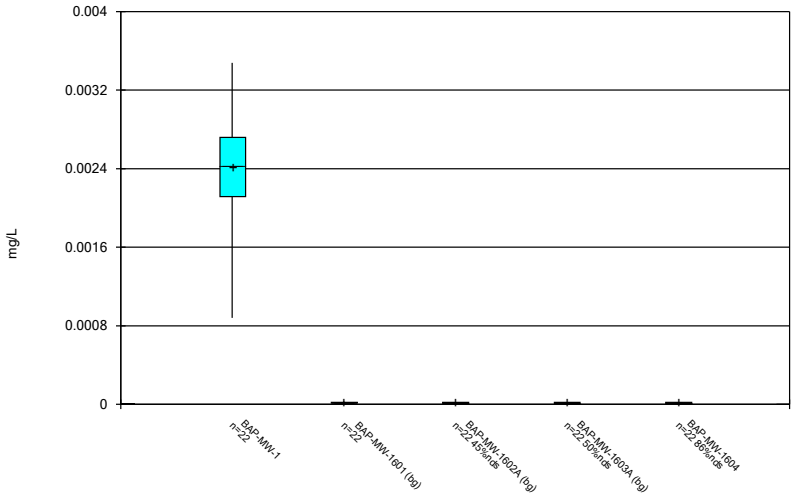


Constituent: Boron, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

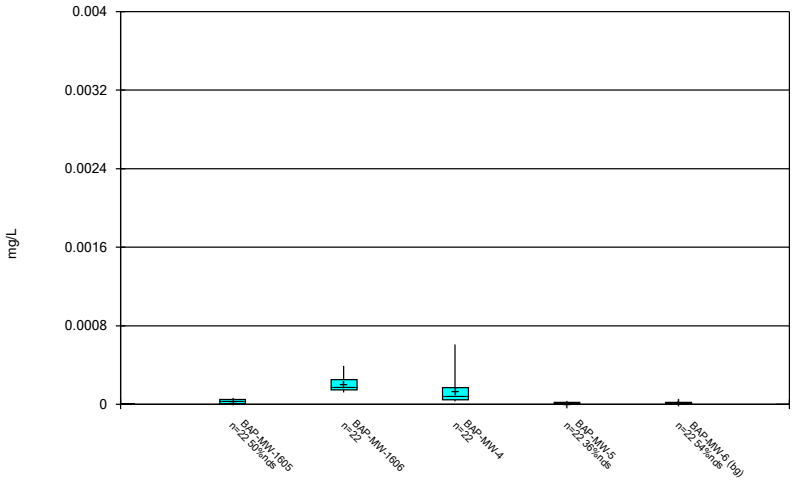


Constituent: Cadmium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

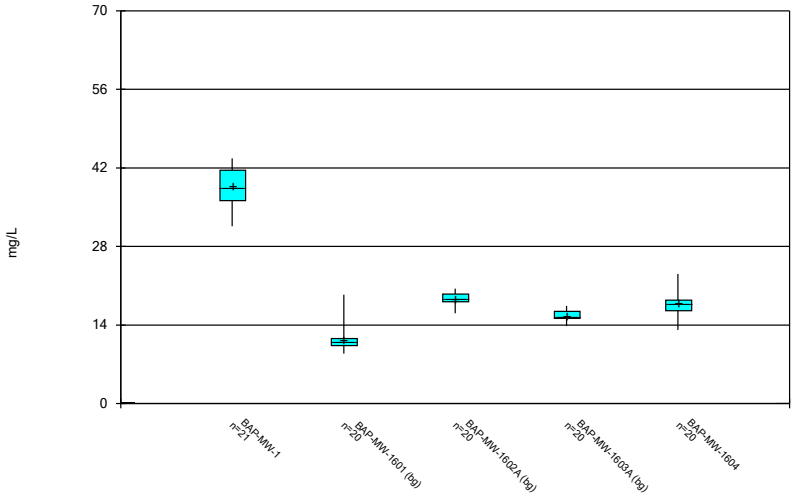
Box & Whiskers Plot



Constituent: Cadmium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

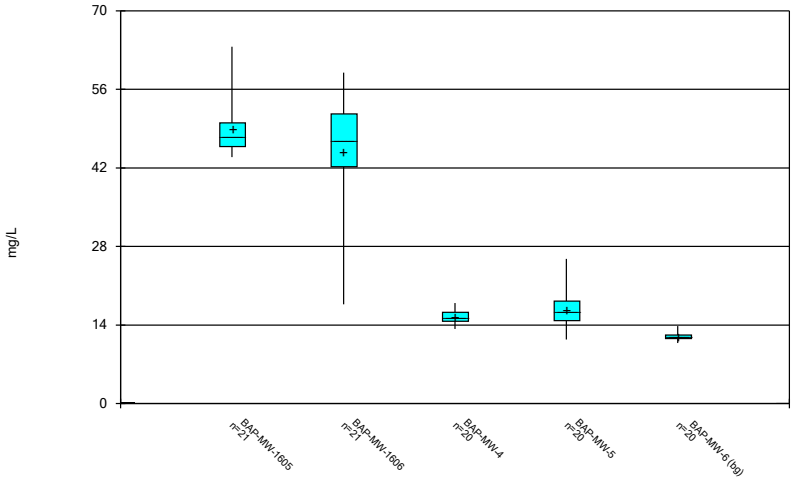


Constituent: Calcium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

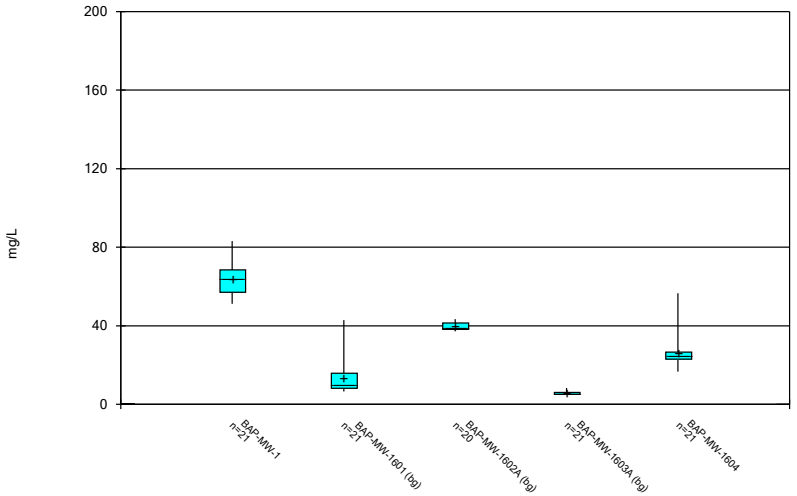


Constituent: Calcium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

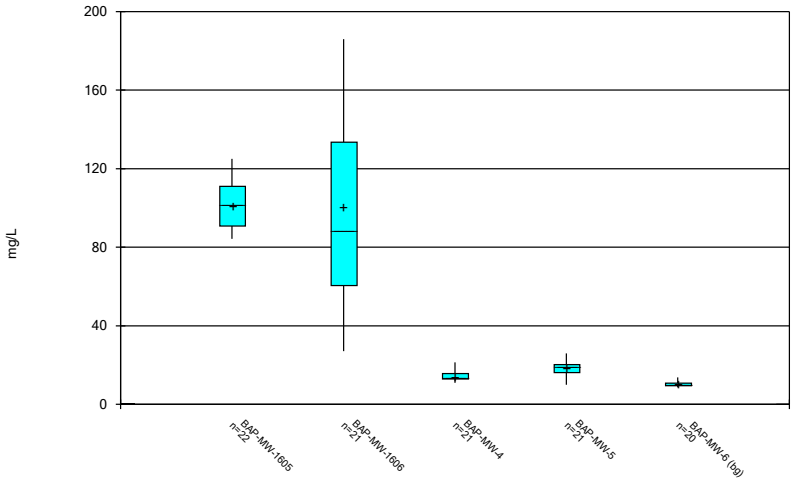


Constituent: Chloride, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

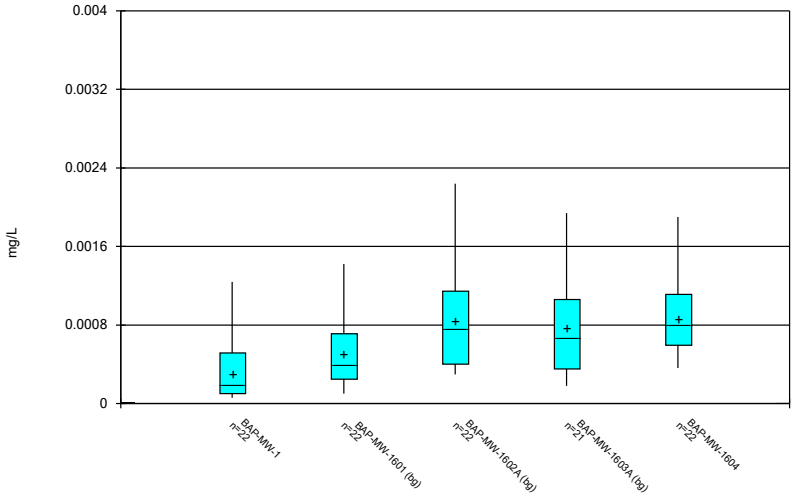


Constituent: Chloride, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

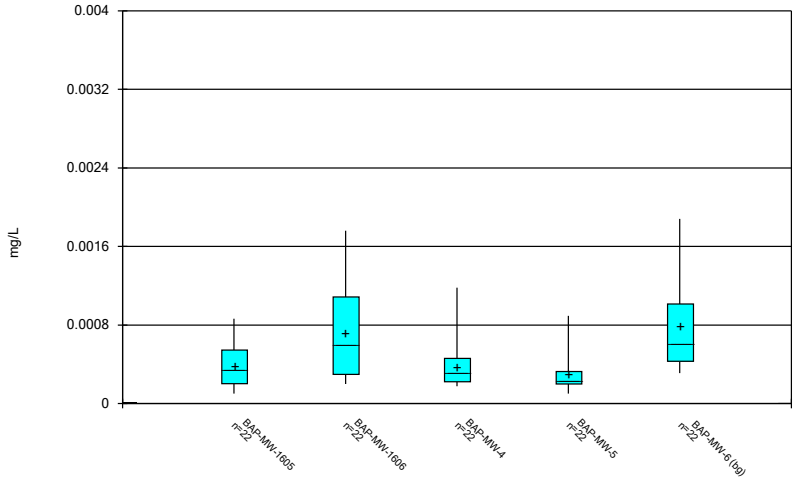


Constituent: Chromium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

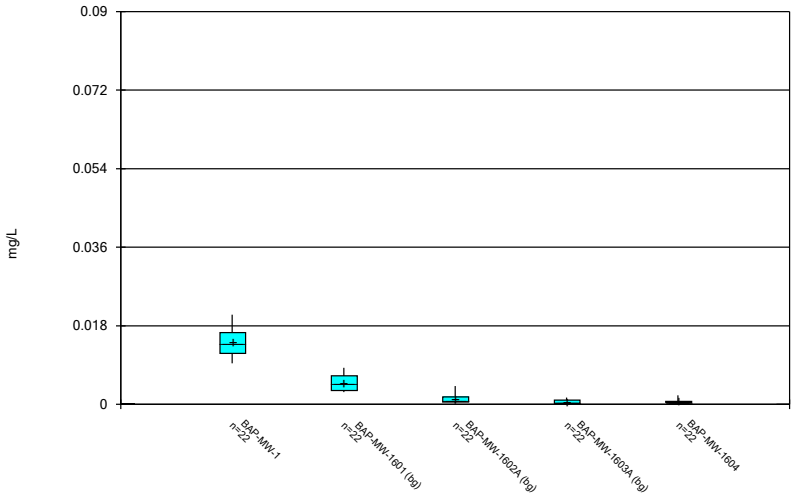


Constituent: Chromium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

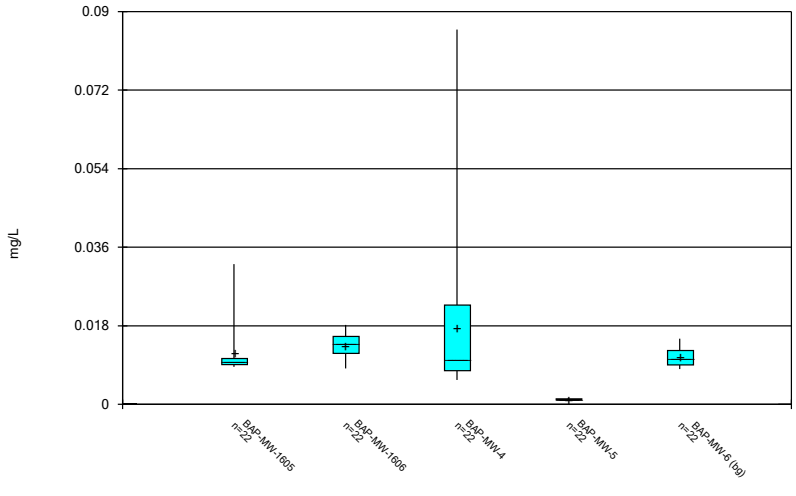


Constituent: Cobalt, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

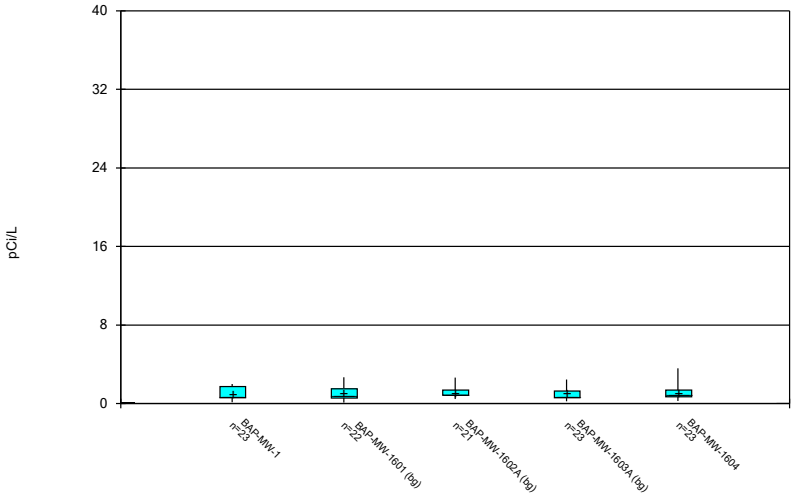
Box & Whiskers Plot



Constituent: Cobalt, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

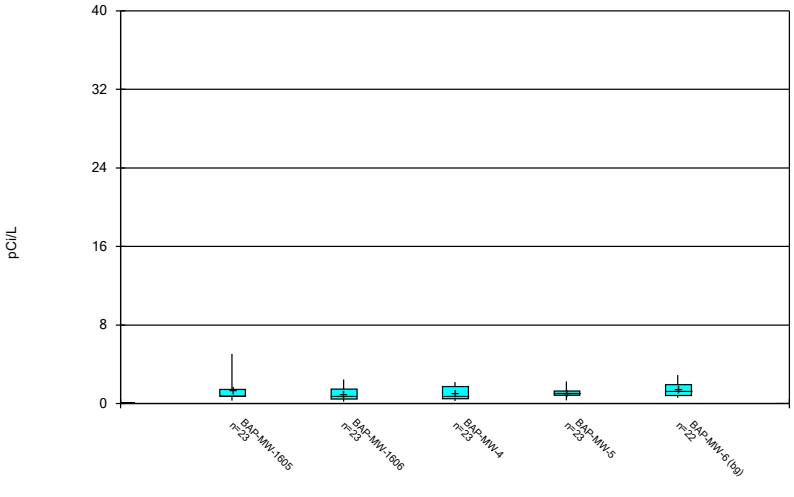
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

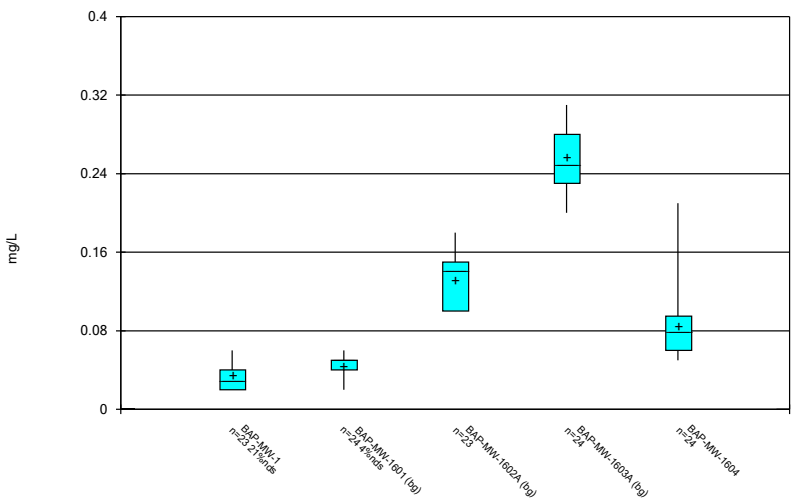
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

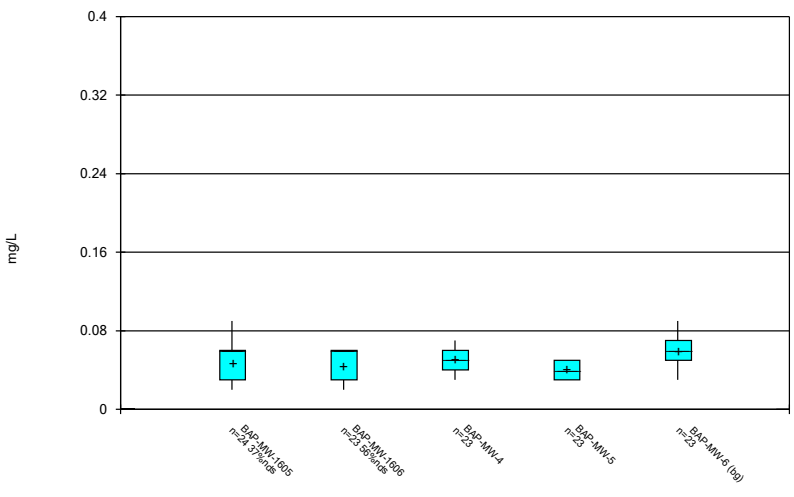
Box & Whiskers Plot



Constituent: Fluoride, total Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

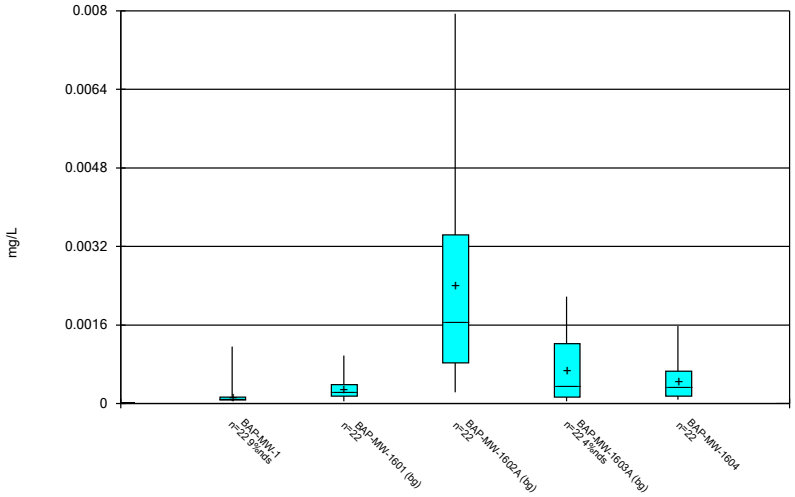
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Fluoride, total Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

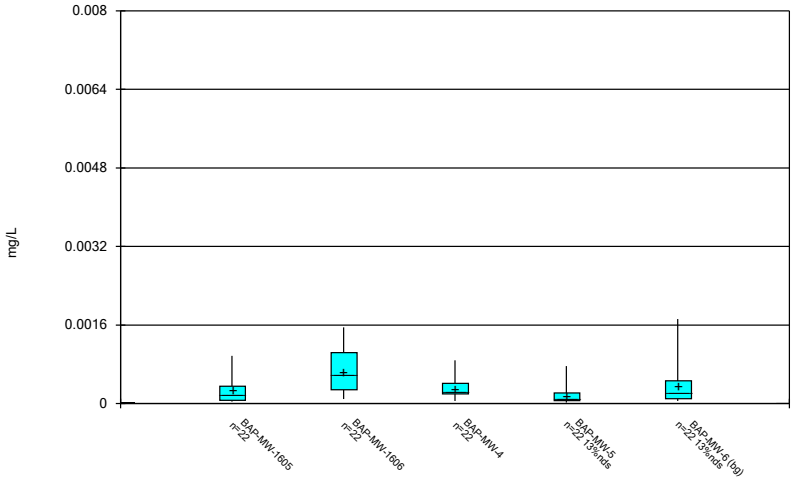


Constituent: Lead, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

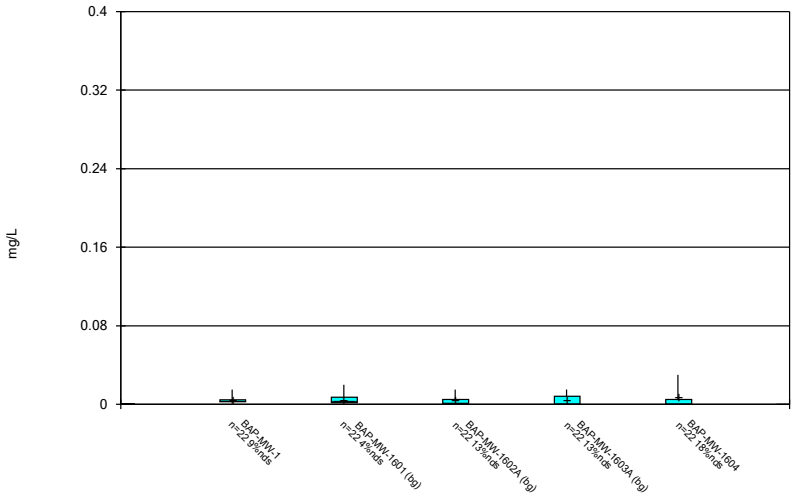


Constituent: Lead, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

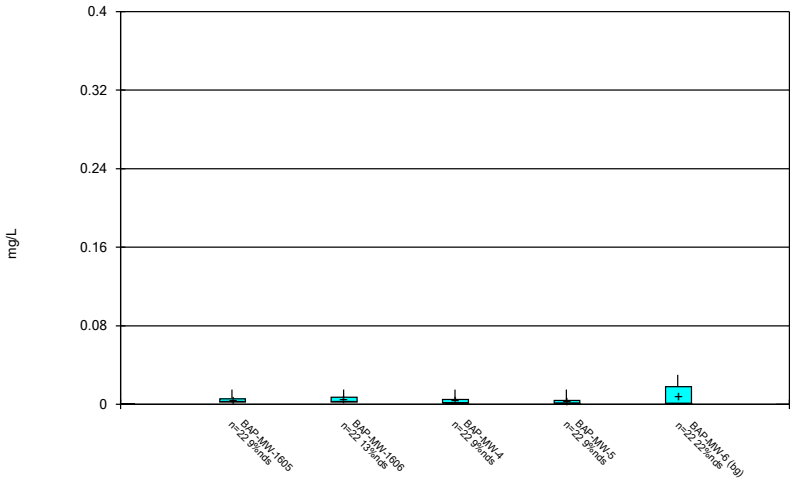


Constituent: Lithium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

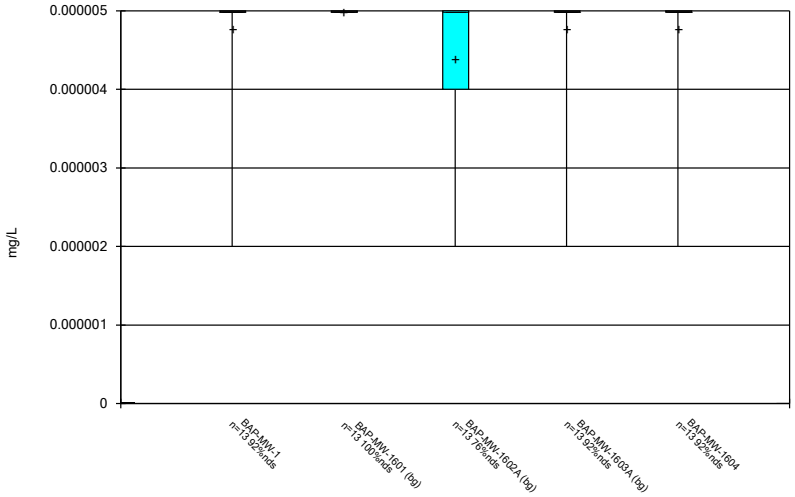
Box & Whiskers Plot



Constituent: Lithium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

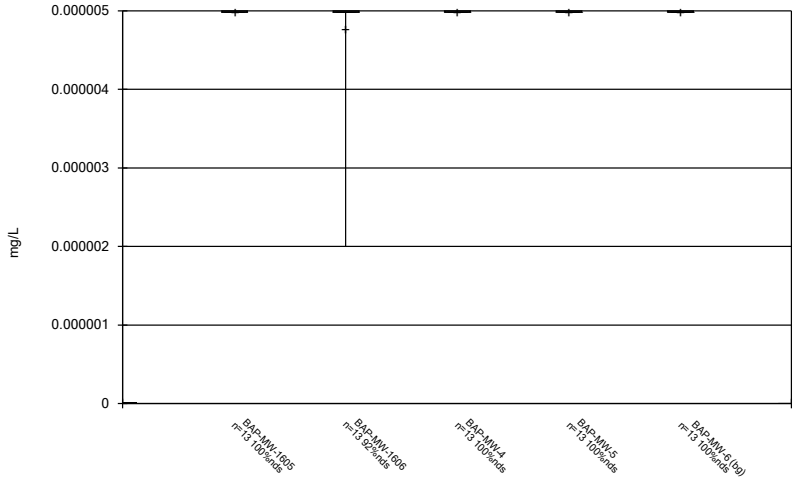


Constituent: Mercury, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

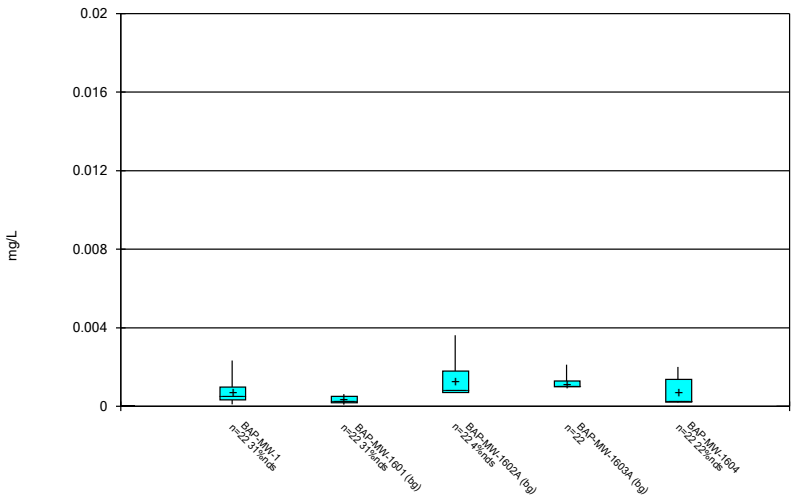


Constituent: Mercury, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

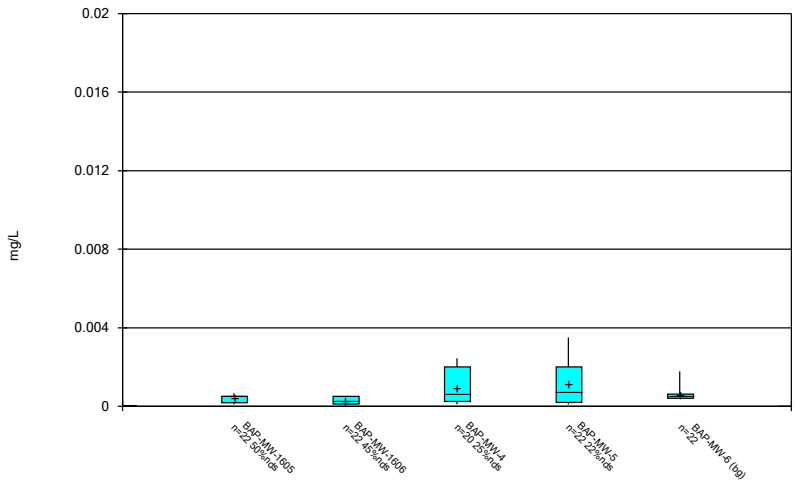


Constituent: Molybdenum, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

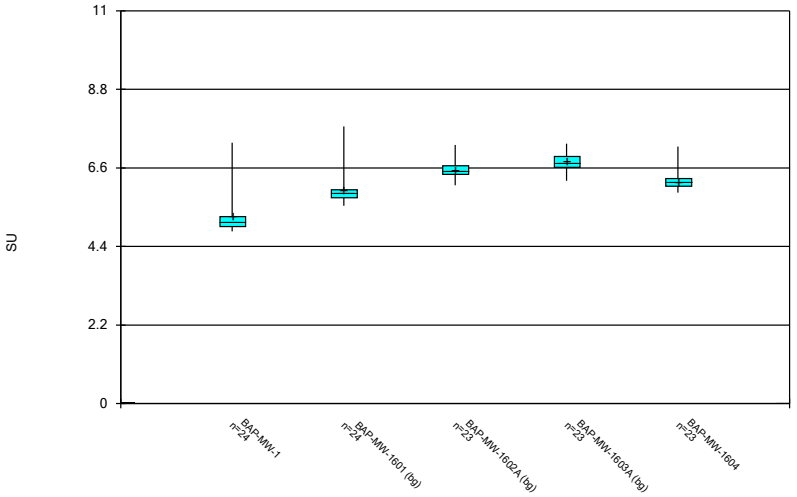
Box & Whiskers Plot



Constituent: Molybdenum, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

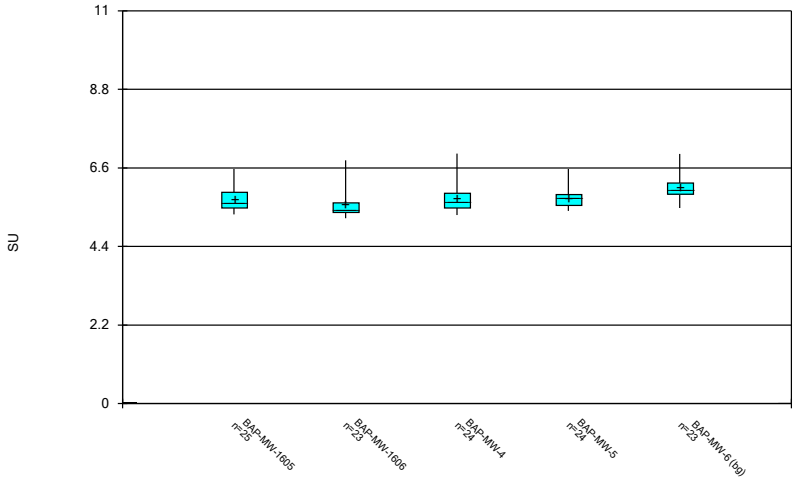
Box & Whiskers Plot



Constituent: pH, field Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

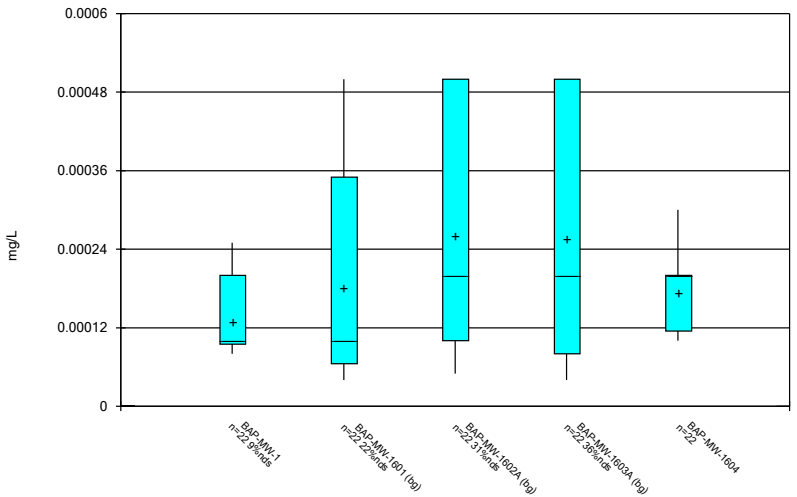
Box & Whiskers Plot



Constituent: pH, field Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

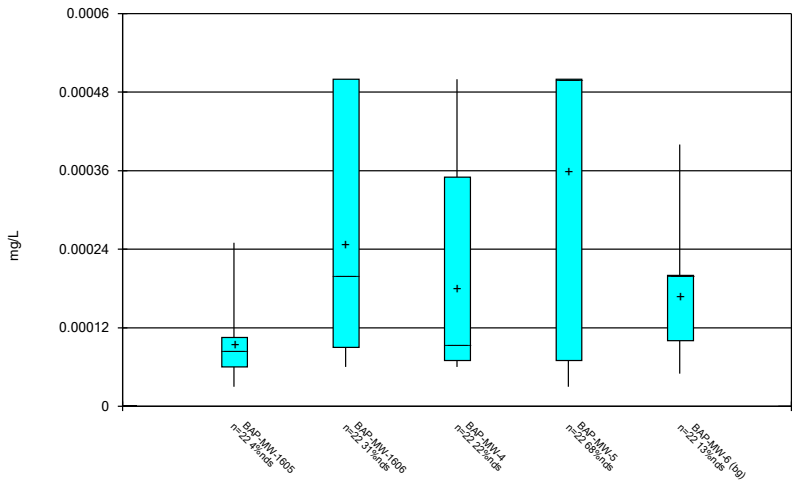
Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

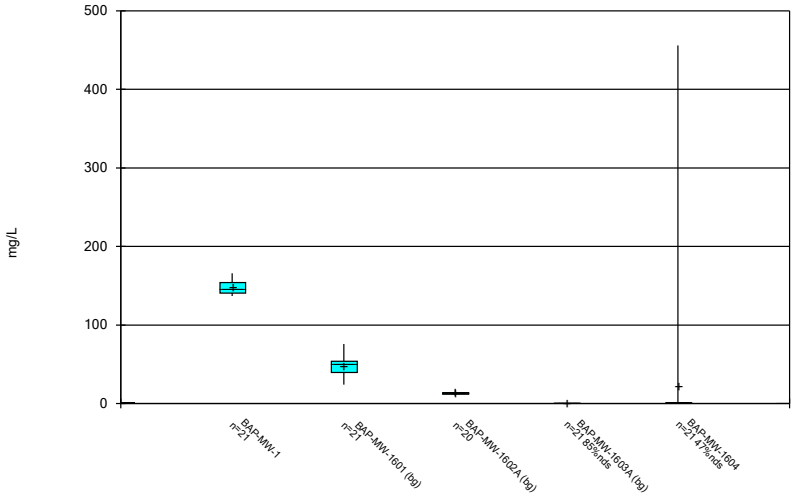
Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

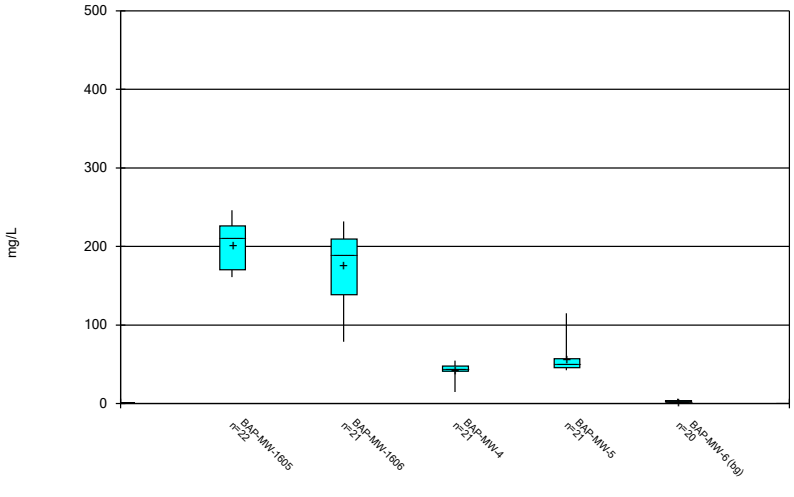


Constituent: Sulfate, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

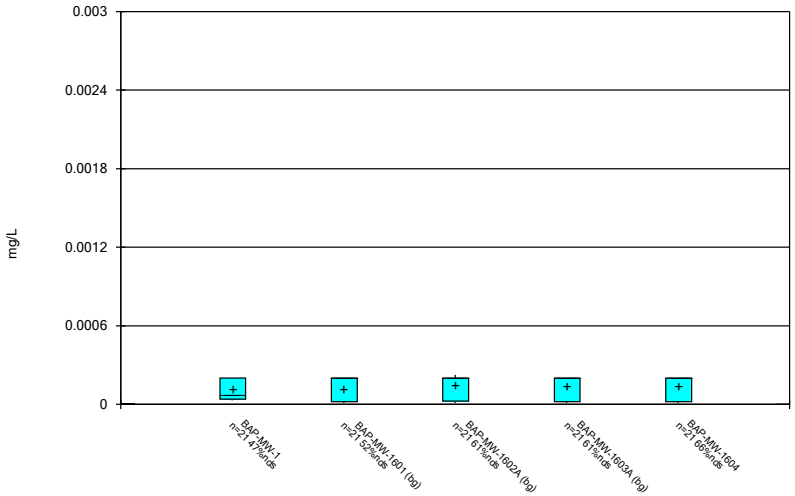


Constituent: Sulfate, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot

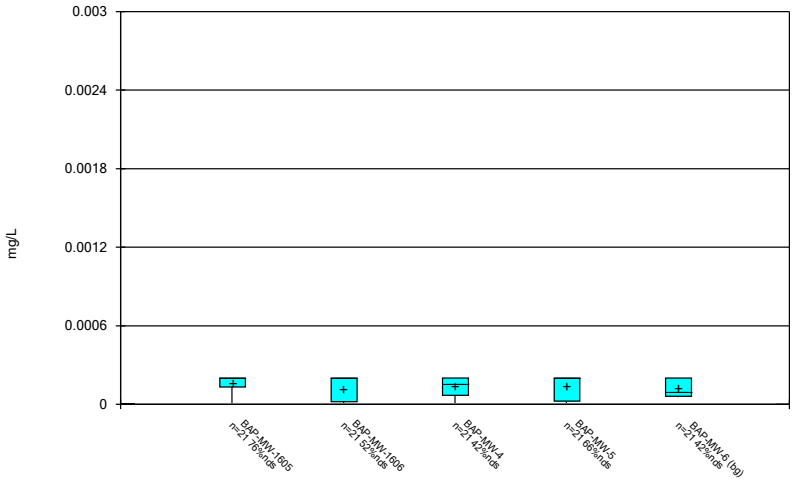


Constituent: Thallium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

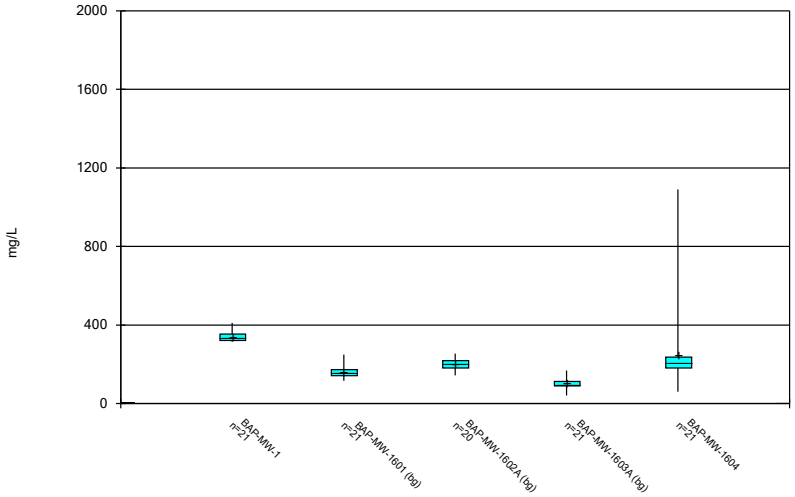
Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 1/27/2023 2:57 PM

Amos BAP Client: Geosyntec Data: Amos BAP

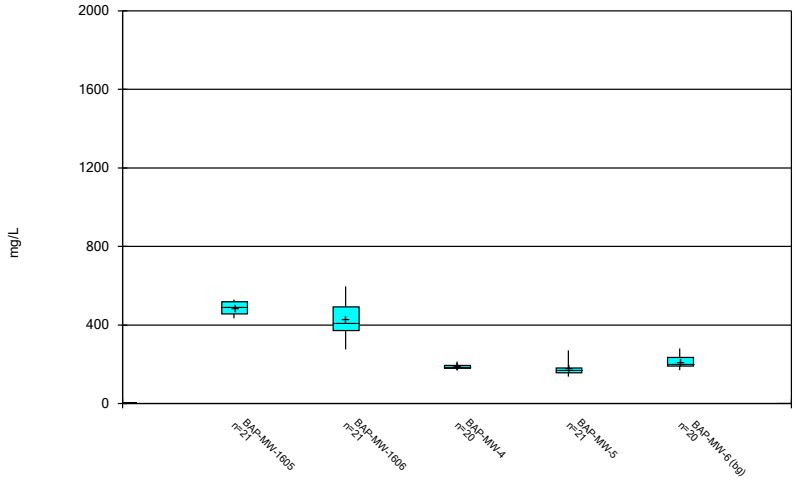
Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/27/2023 2:57 PM
Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE C

Outlier Summary and Tukey's Outlier Test

Outlier Summary

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/27/2023, 2:54 PM

	BAP-MW-1604 Beryllium, total (mg/L)	BAP-MW-1604 Boron, total (mg/L)	BAP-MW-1605 Boron, total (mg/L)	BAP-MW-1606 Boron, total (mg/L)	BAP-MW-4 Boron, total (mg/L)	BAP-MW-5 Boron, total (mg/L)	BAP-MW-1603A Chromium, total (mg/L)	BAP-MW-1601 Combined Radium 226 + 228 (pCi/L)	BAP-MW-1602A Combined Radium 226 + 228 (pCi/L)	BAP-MW-6 Combined Radium 226 + 228 (pCi/L)	BAP-MW-4 Fluoride, total (mg/L)
7/25/2016											
7/26/2016								7.914 (o)			
8/23/2016											
10/18/2016										<0.2 (o)	
12/12/2016											
12/13/2016						0.00327 (o)					
2/7/2017							35.021 (o)				
2/8/2017								6.853 (o)	20.83 (o)		
1/8/2018											
3/14/2019			<1 (o)								
3/15/2019		<1 (o)		<1 (o)	<1 (o)	<1 (o)					
6/10/2019	0.000142 (o)										
6/11/2019											

	BAP-MW-5 Fluoride, total (mg/L)	BAP-MW-4 Molybdenum, total (mg/L)	BAP-MW-1 pH, field (SU)	BAP-MW-1602A pH, field (SU)	BAP-MW-1603A pH, field (SU)	BAP-MW-1604 pH, field (SU)	BAP-MW-1606 pH, field (SU)	BAP-MW-6 pH, field (SU)	BAP-MW-1605 Total Dissolved Solids [TDS] (mg/L)	BAP-MW-4 Total Dissolved Solids [TDS] (mg/L)
7/25/2016		0.0111 (o)								
7/26/2016										
8/23/2016		0.0192 (o)								
10/18/2016	<0.2 (o)									
12/12/2016									920 (o)	348 (o)
12/13/2016										
2/7/2017										
2/8/2017										
1/8/2018						8.4 (o)				
3/14/2019										
3/15/2019										
6/10/2019			10.19 (o)		8.65 (o)		9.32 (o)			
6/11/2019				9.51 (o)	8.82 (o)					

Tukey's Outlier Analysis - Significant Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/24/2023, 3:47 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	N	Mean	Std. Dev.	Distribution	Normality Test
pH, field (SU)	**BAP-MW-1**	**Yes**	**7.31,10.19**	**5/3/2018,6/10/2019**	**NP**	**24**	**5.461**	**1.134**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1601 (bg)**	**Yes**	**7.76**	**9/5/2018**	**NP**	**23**	**5.976**	**0.4566**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1602A (bg)**	**Yes**	**9.51**	**6/11/2019**	**NP**	**23**	**6.692**	**0.6599**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1603A (bg)**	**Yes**	**8.82**	**6/11/2019**	**NP**	**23**	**6.868**	**0.4792**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1604**	**Yes**	**7.2,8.65**	**9/4/2018,6/10/2019**	**NP**	**23**	**6.333**	**0.5647**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1606**	**Yes**	**8.4,6.81**	**1/8/2018,2/28/2022**	**NP**	**23**	**5.715**	**0.7125**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-6 (bg)**	**Yes**	**9.32**	**6/10/2019**	**NP**	**23**	**6.225**	**0.7661**	**ln(x)**	**ShapiroWilk**

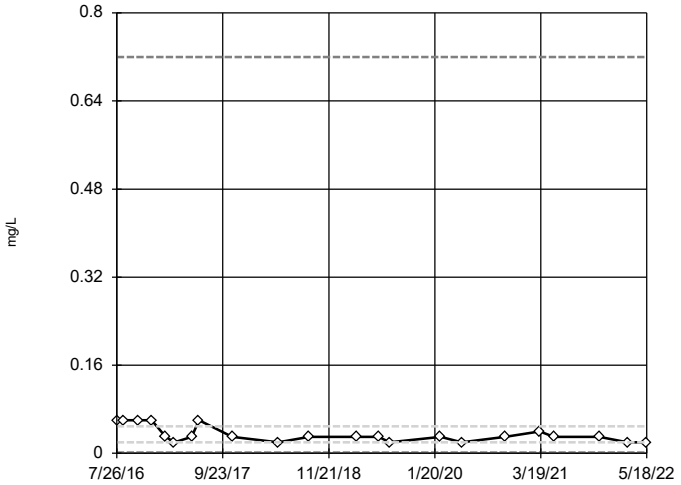
Tukey's Outlier Analysis - All Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/24/2023, 3:47 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	N	Mean	Std. Dev.	Distribution	Normality Test
Fluoride, total (mg/L)	BAP-MW-1	No	n/a	n/a	NP	22	0.03455	0.01503	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-1601 (bg)	No	n/a	n/a	NP	23	0.04478	0.009472	x^2	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-1602A (bg)	No	n/a	n/a	NP	22	0.1314	0.02678	x^2	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-1603A (bg)	No	n/a	n/a	NP	23	0.257	0.0293	sqrt(x)	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-1604	No	n/a	n/a	NP	23	0.08609	0.03513	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-1605	No	n/a	n/a	NP	23	0.04565	0.02128	sqrt(x)	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-1606	No	n/a	n/a	NP	22	0.04409	0.01817	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-4	No	n/a	n/a	NP	23	0.05304	0.01579	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-5	No	n/a	n/a	NP	23	0.04348	0.01465	ln(x)	ShapiroWilk
Fluoride, total (mg/L)	BAP-MW-6 (bg)	No	n/a	n/a	NP	22	0.06091	0.0177	x^(1/3)	ShapiroWilk
pH, field (SU)	**BAP-MW-1**	**Yes**	**7.31,10.19**	**5/3/2018,6/10/2019**	**NP**	**24**	**5.461**	**1.134**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1601 (bg)**	**Yes**	**7.76**	**9/5/2018**	**NP**	**23**	**5.976**	**0.4566**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1602A (bg)**	**Yes**	**9.51**	**6/11/2019**	**NP**	**23**	**6.692**	**0.6599**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1603A (bg)**	**Yes**	**8.82**	**6/11/2019**	**NP**	**23**	**6.868**	**0.4792**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	**BAP-MW-1604**	**Yes**	**7.2,8.65**	**9/4/2018,6/10/2019**	**NP**	**23**	**6.333**	**0.5647**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	BAP-MW-1605	No	n/a	n/a	NP	24	5.724	0.3052	ln(x)	ShapiroWilk
pH, field (SU)	**BAP-MW-1606**	**Yes**	**8.4,6.81**	**1/8/2018,2/28/2022**	**NP**	**23**	**5.715**	**0.7125**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	BAP-MW-4	No	n/a	n/a	NP	23	5.789	0.4327	ln(x)	ShapiroWilk
pH, field (SU)	BAP-MW-5	No	n/a	n/a	NP	23	5.761	0.2703	ln(x)	ShapiroWilk
pH, field (SU)	**BAP-MW-6 (bg)**	**Yes**	**9.32**	**6/10/2019**	**NP**	**23**	**6.225**	**0.7661**	**ln(x)**	**ShapiroWilk**

Tukey's Outlier Screening

BAP-MW-1



n = 22

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

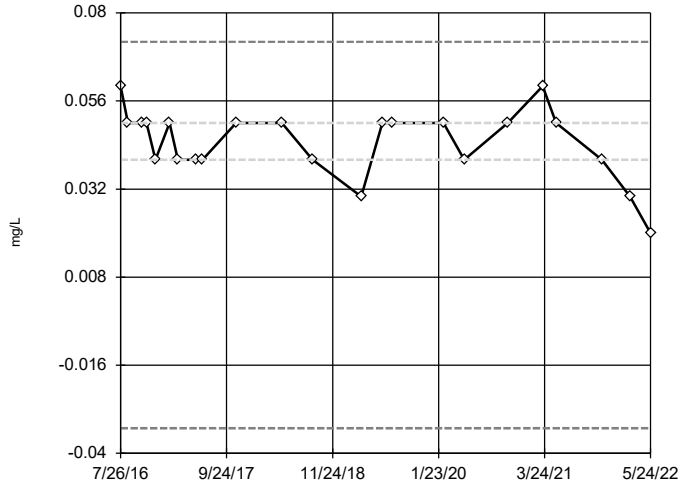
High cutoff = 0.72, low cutoff = 0.001361, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1601 (bg)



n = 23

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

Data were square transformed to achieve best W statistic (graph shown in original units).

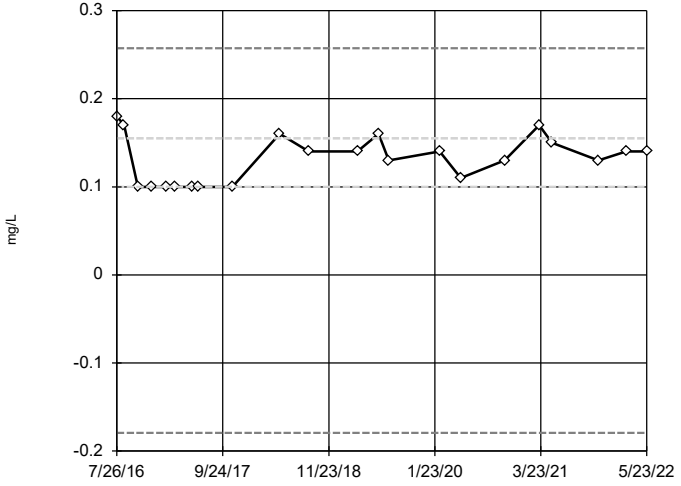
High cutoff = 0.07211, low cutoff = -0.03317, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1602A (bg)



n = 22

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

Data were square transformed to achieve best W statistic (graph shown in original units).

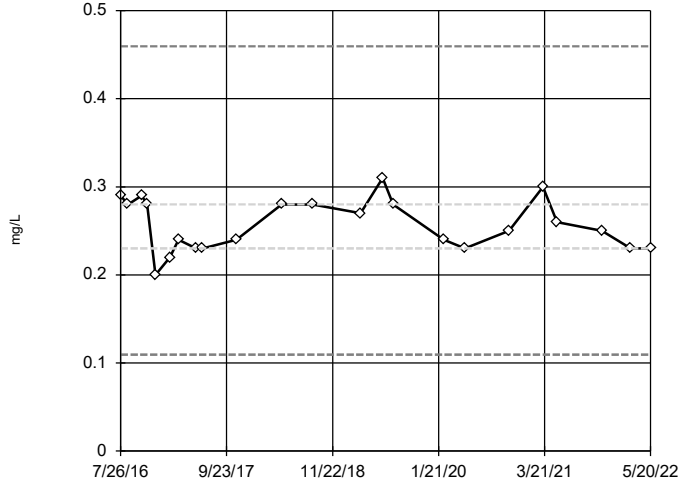
High cutoff = 0.2573, low cutoff = -0.1793, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1603A (bg)



n = 23

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

Data were square root transformed to achieve best W statistic (graph shown in original units).

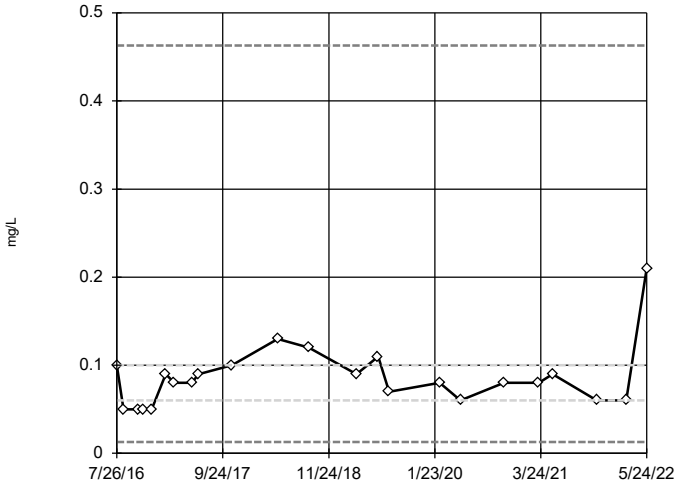
High cutoff = 0.4595, low cutoff = 0.1095, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1604



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

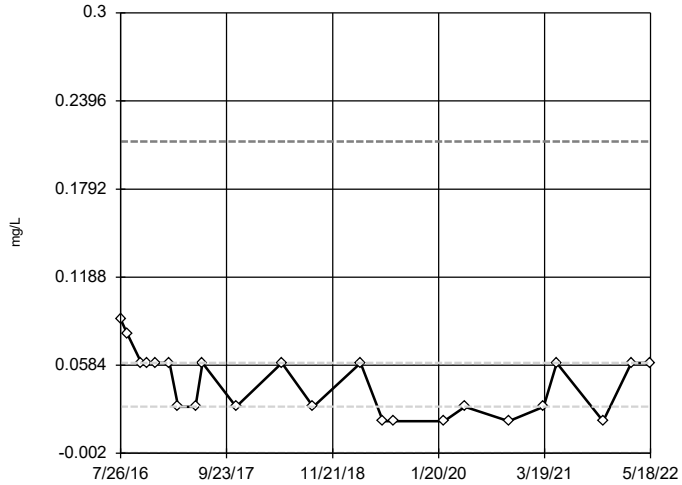
High cutoff = 0.463, low cutoff = 0.01296, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1605



n = 23

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

Data were square root transformed to achieve best W statistic (graph shown in original units).

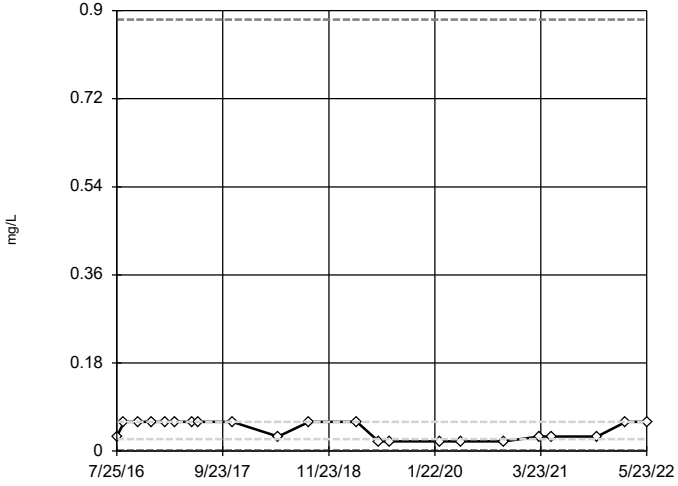
High cutoff = 0.2118, low cutoff = -0.001766, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1606



n = 22

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

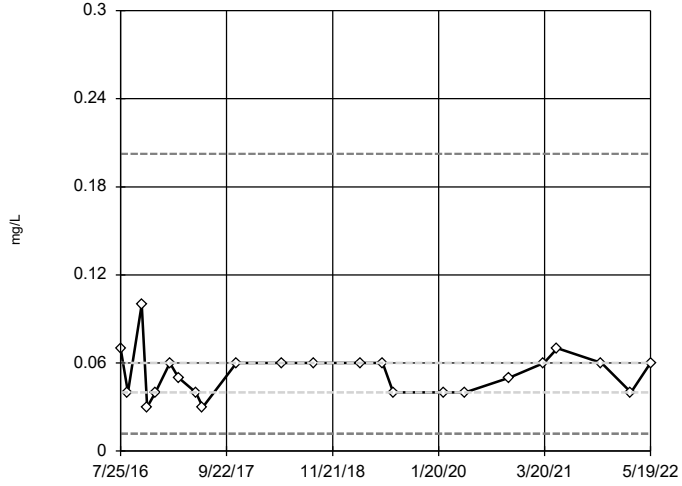
High cutoff = 0.8818, low cutoff = 0.001667, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-4



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

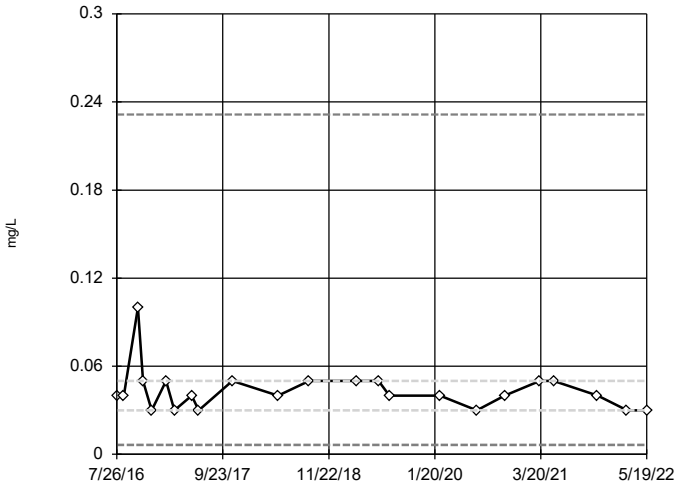
High cutoff = 0.2025, low cutoff = 0.01185, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-5



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

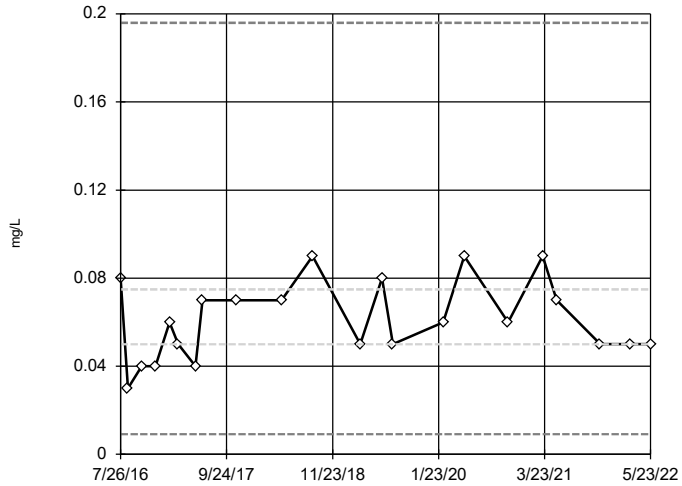
High cutoff = 0.2315, low cutoff = 0.00648, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-6 (bg)



n = 22

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

Data were cube root transformed to achieve best W statistic (graph shown in original units).

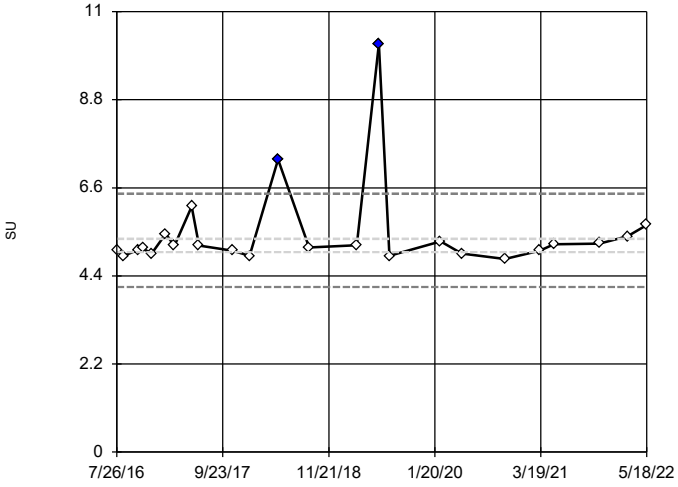
High cutoff = 0.1959, low cutoff = 0.009141, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All W
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1



n = 24

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

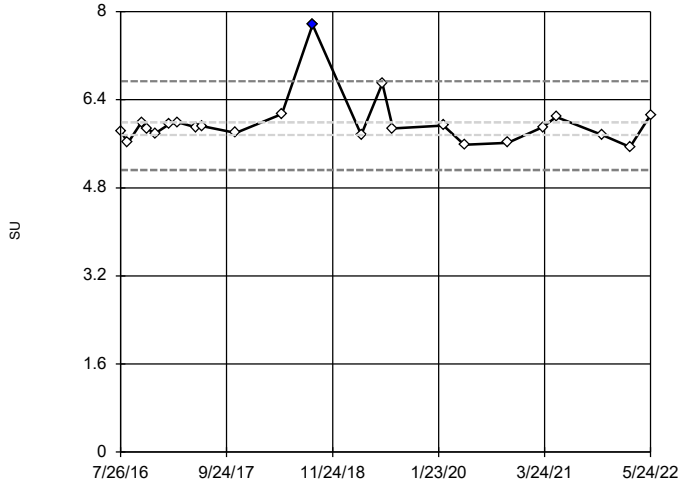
High cutoff = 6.45, low cutoff = 4.123, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1601 (bg)



n = 23

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

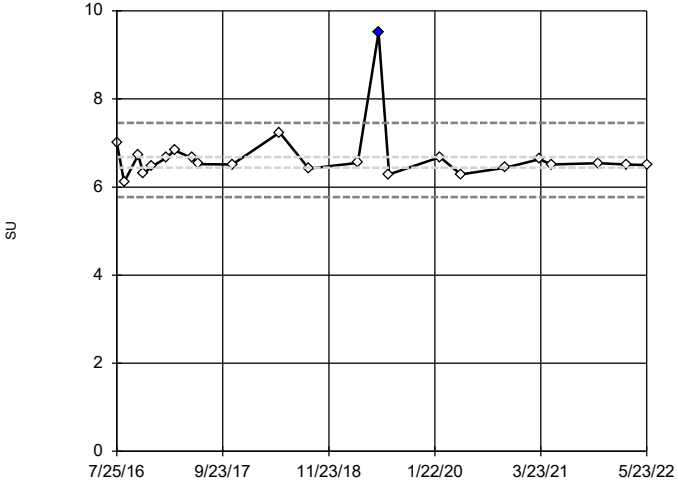
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6.737, low cutoff = 5.122, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening

BAP-MW-1602A (bg)



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

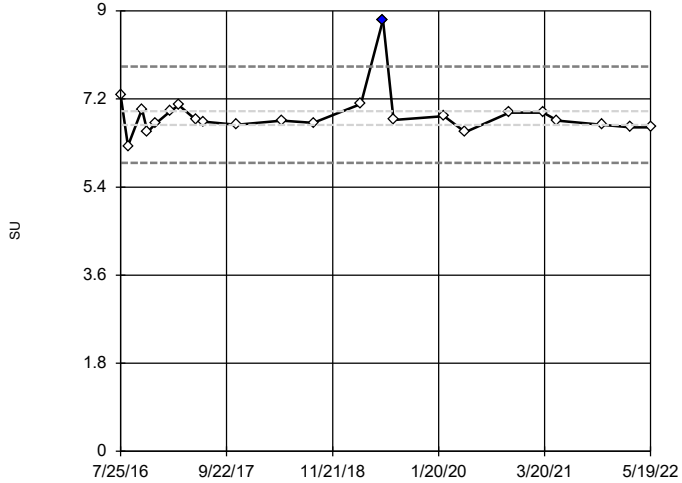
High cutoff = 7.455, low cutoff = 5.771, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1603A (bg)



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

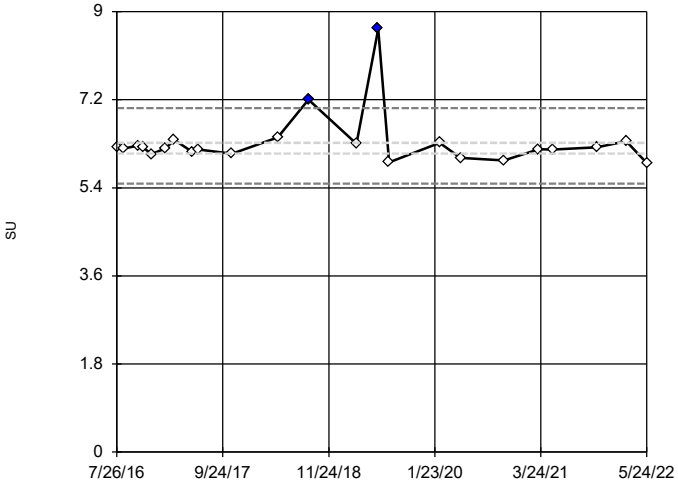
High cutoff = 7.863, low cutoff = 5.896, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1604



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

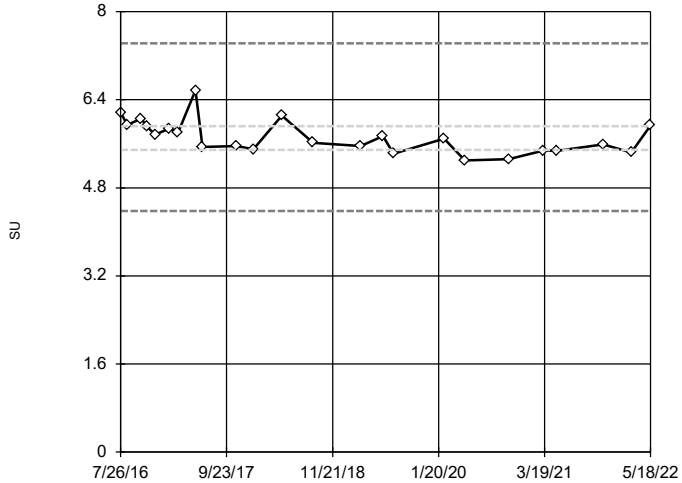
High cutoff = 7.029, low cutoff = 5.485, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-1605



n = 24

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

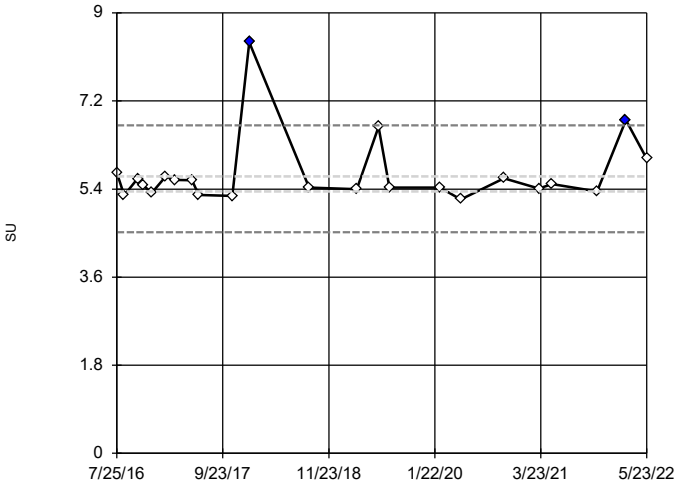
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 7.423, low cutoff = 4.378, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening

BAP-MW-1606



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

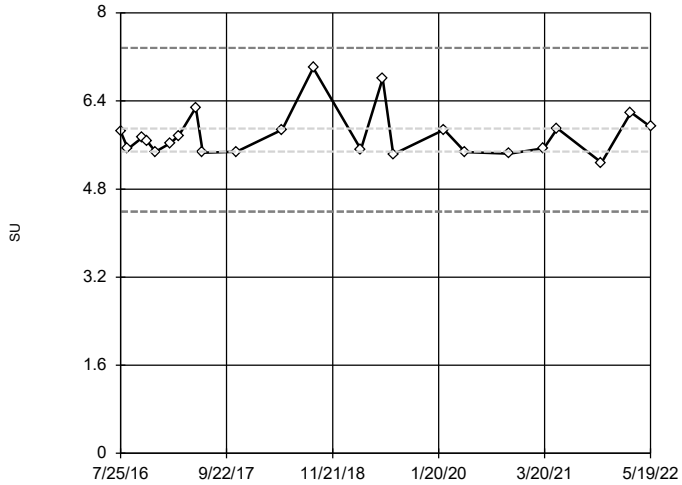
High cutoff = 6.702, low cutoff = 4.518, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-4



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

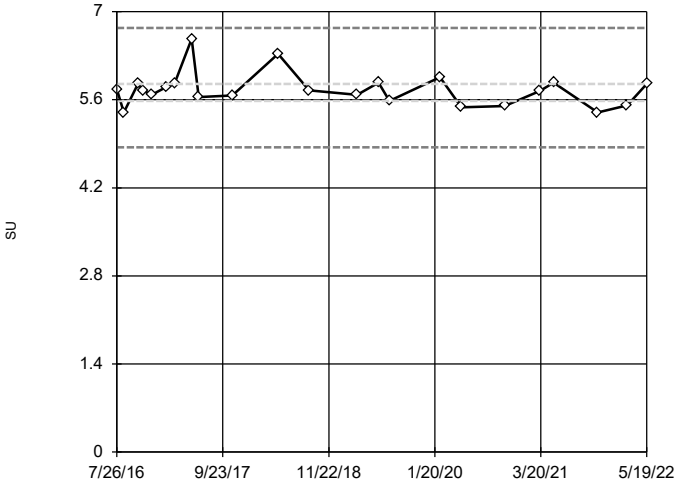
High cutoff = 7.363, low cutoff = 4.391, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-5



n = 23

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

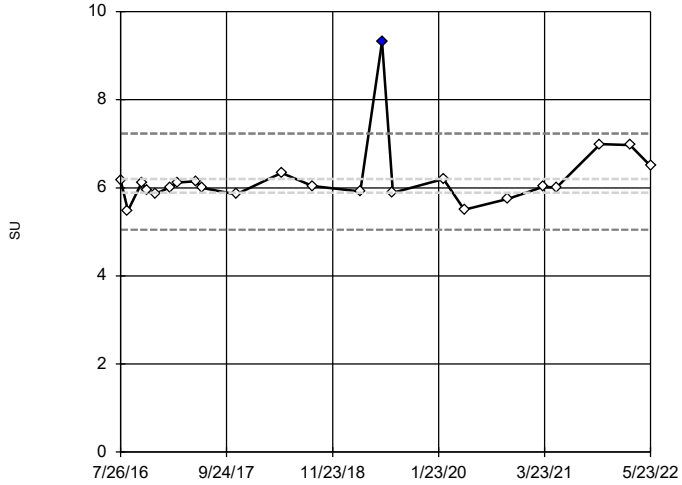
High cutoff = 6.741, low cutoff = 4.842, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Tukey's Outlier Screening

BAP-MW-6 (bg)



n = 23

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

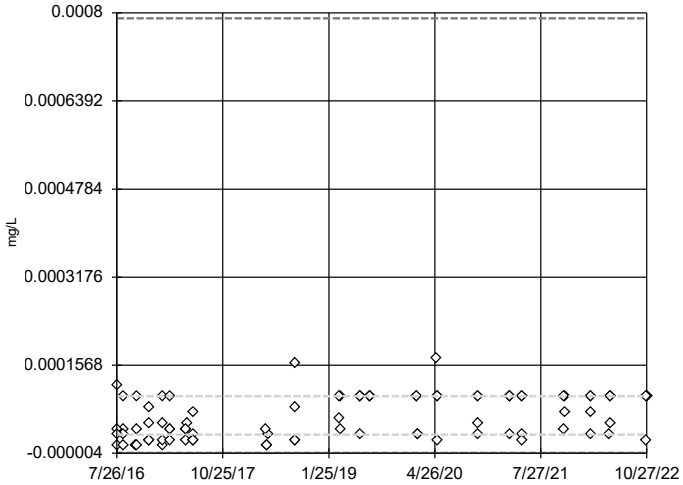
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 7.231, low cutoff = 5.05, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 1/24/2023 3:46 PM View: Figure C. Tukey's Outlier Test on All Wells
Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were cube root transformed to achieve best W statistic (graph shown in original units).

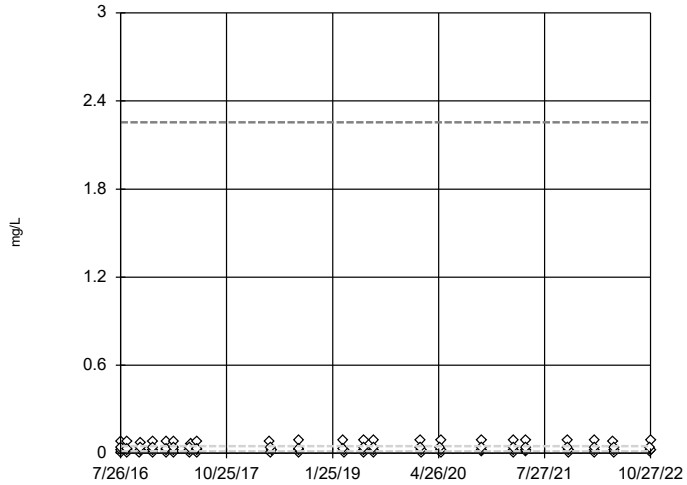
High cutoff = 0.0007901, low cutoff = -0.000003347, based on IQR multiplier of 3.

Constituent: Antimony, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

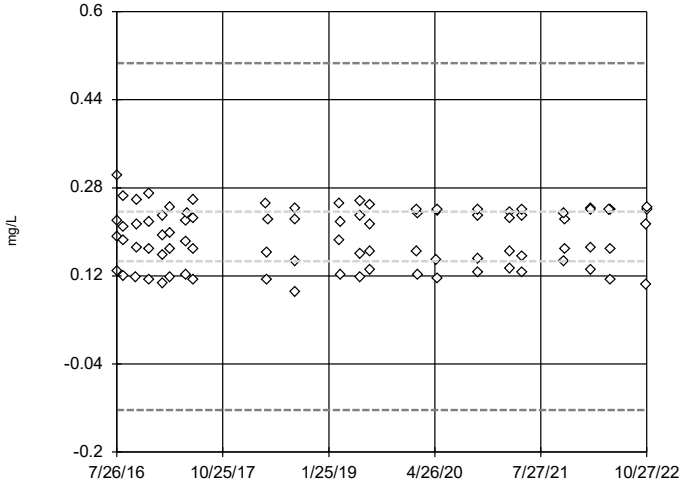
High cutoff = 2.254, low cutoff = 0.0003024, based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

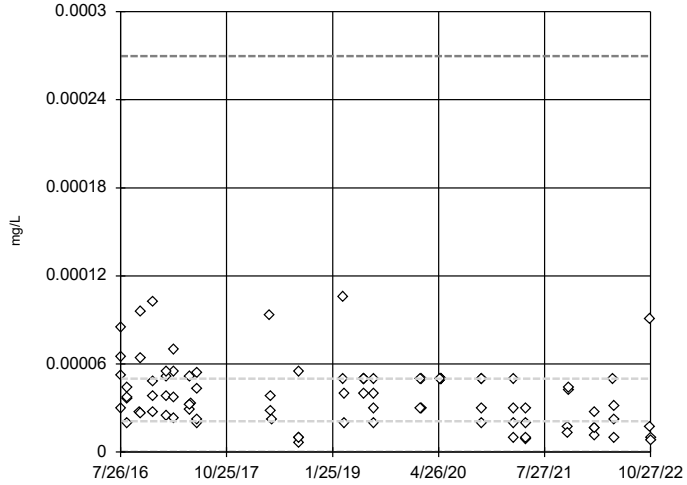
High cutoff = 0.5065, low cutoff = -0.1235, based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

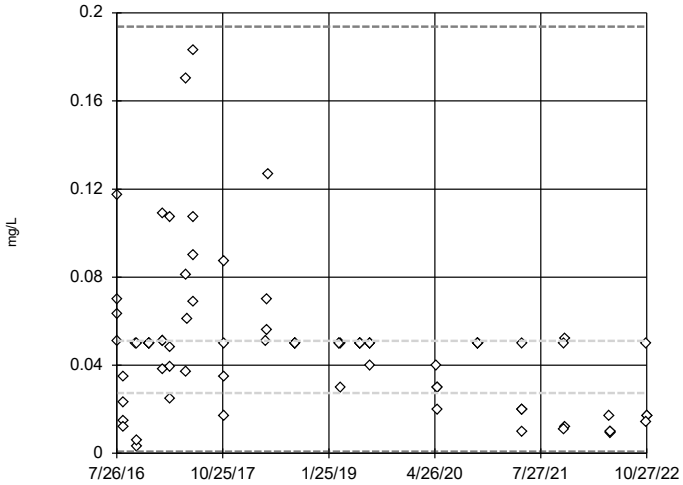
Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.0002698, low cutoff = -7.1e-12, based on IQR multiplier of 3.

Constituent: Beryllium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 80

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

Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.1938, low cutoff = 0.0008232, based on IQR multiplier of 3.

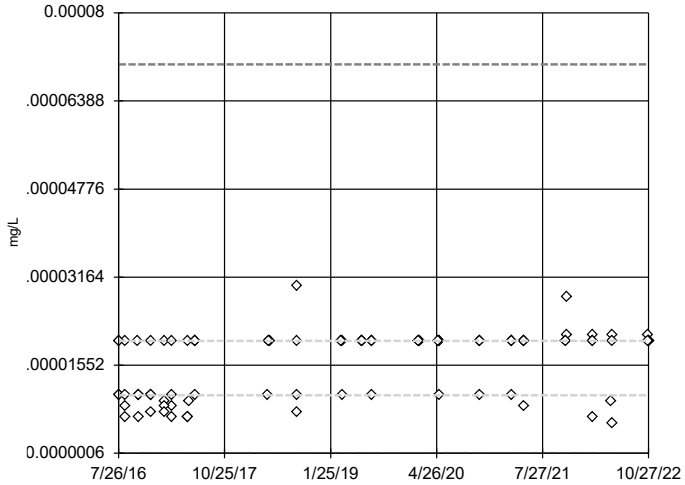
Constituent: Boron, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.00007059, low cutoff = -5.9e-7, based on IQR multiplier of 3.

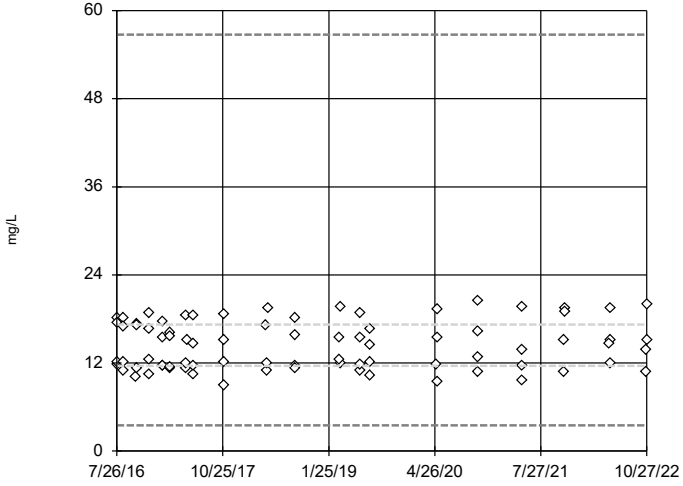
Constituent: Cadmium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 80

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 = 56.73, low cutoff = 3.528, based on IQR multiplier of 3.

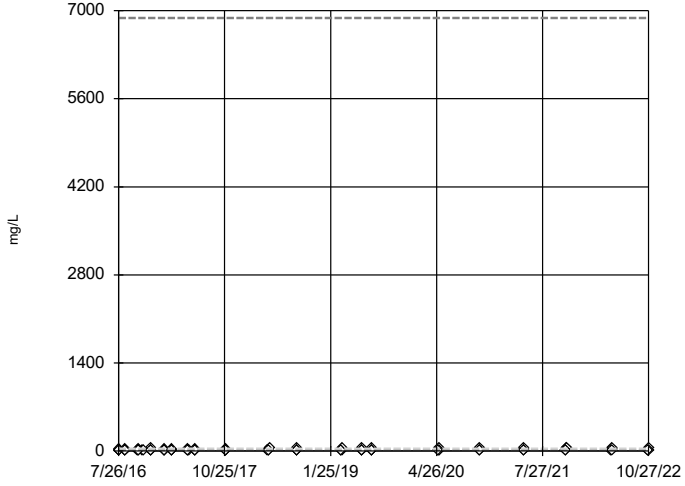
Constituent: Calcium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 82

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

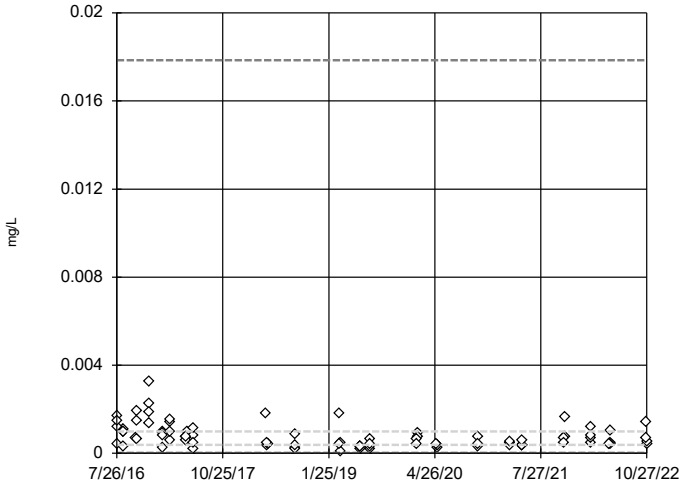
High cutoff = 6883, low cutoff = 0.03539, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

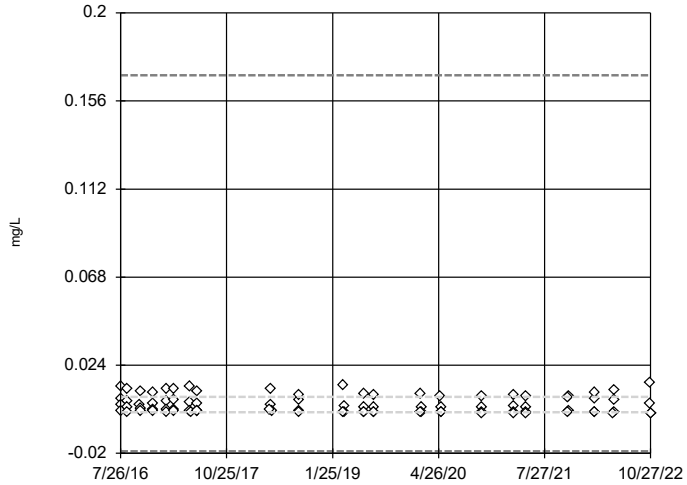
High cutoff = 0.01785, low cutoff = 0.00002093, based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were cube root transformed to achieve best W statistic (graph shown in original units).

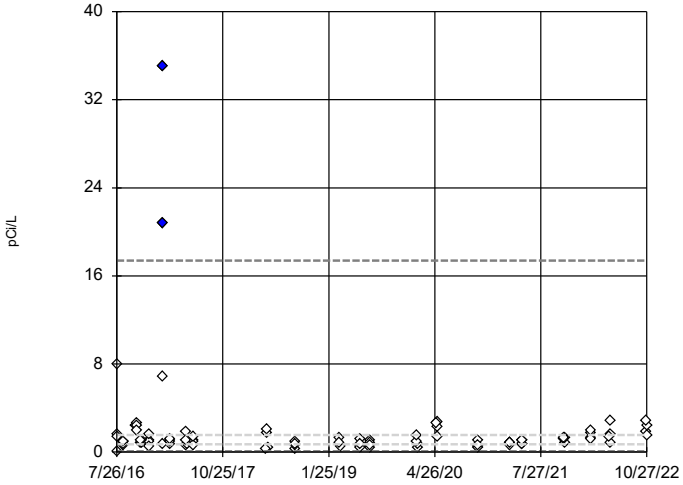
High cutoff = 0.1688, low cutoff = -0.01896, based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 92

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

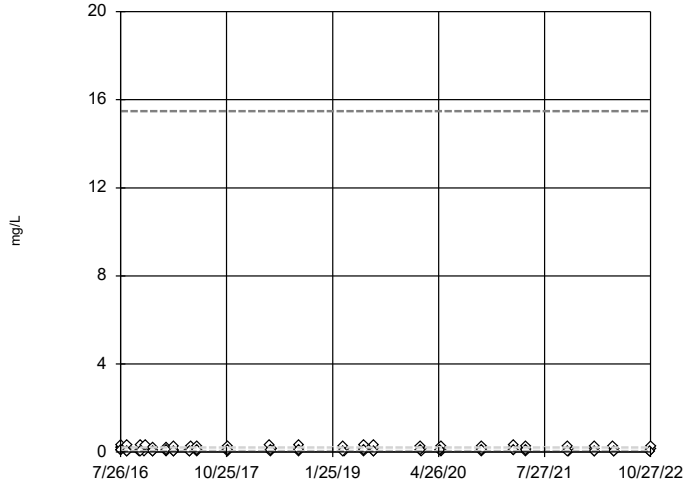
High cutoff = 17.38, low cutoff = 0.06308, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 94

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

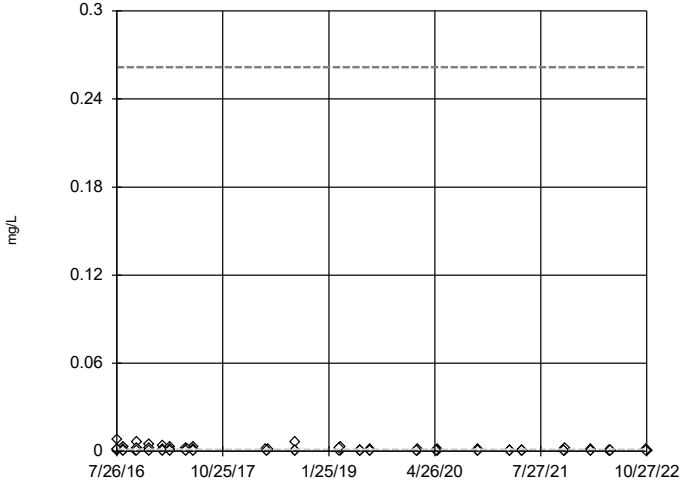
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 15.49, low cutoff = 0.0006772, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

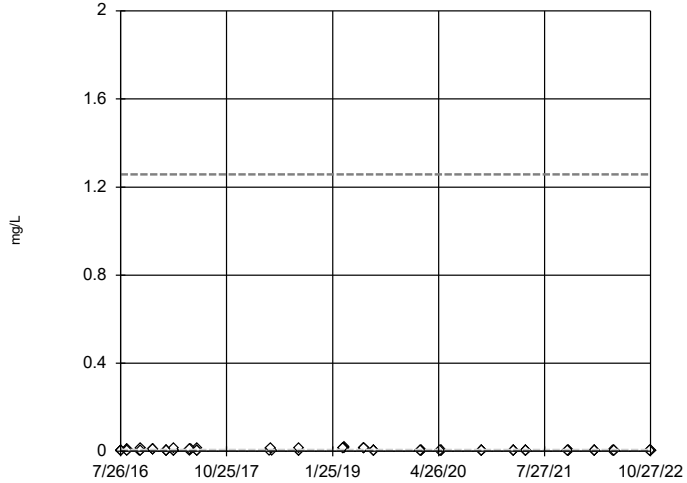
High cutoff = 0.2617, low cutoff = 8.8e-7, based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

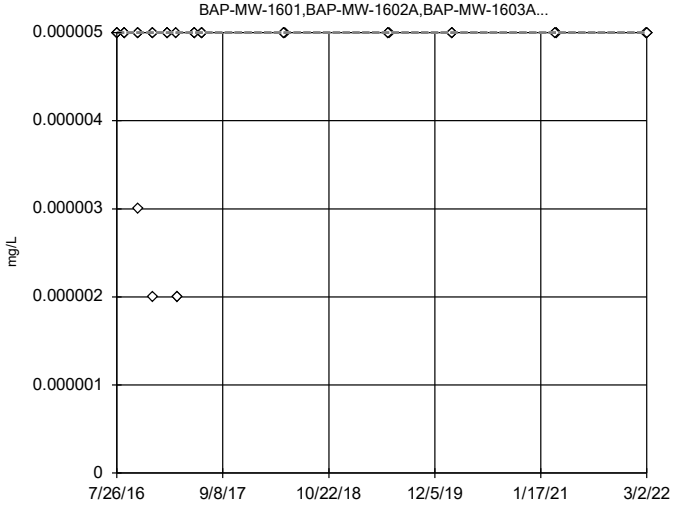
High cutoff = 1.258, low cutoff = 0.000004817, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 52

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

Data were square transformed to achieve best W statistic (graph shown in original units).

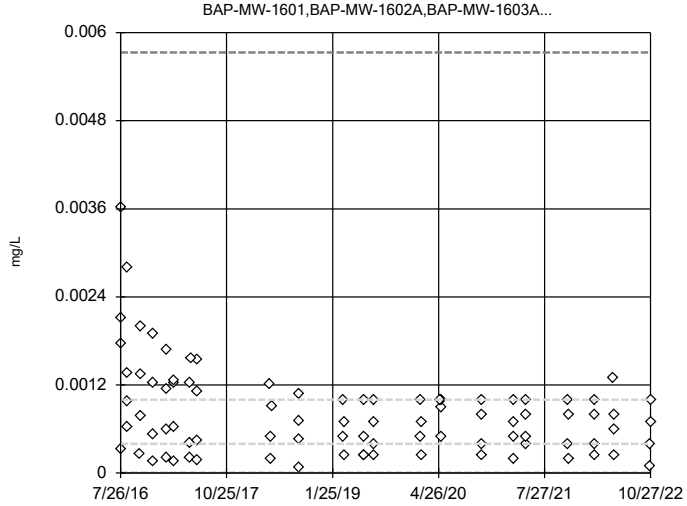
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

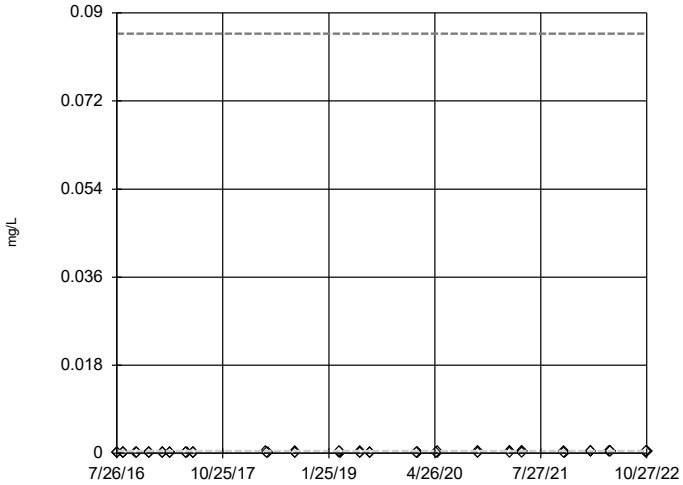
Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.005731, low cutoff = -1.5e-7, based on IQR multiplier of 3.

Constituent: Molybdenum, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient
Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 88

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

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.08573, low cutoff = 5.2e-7, based on IQR multiplier of 3.

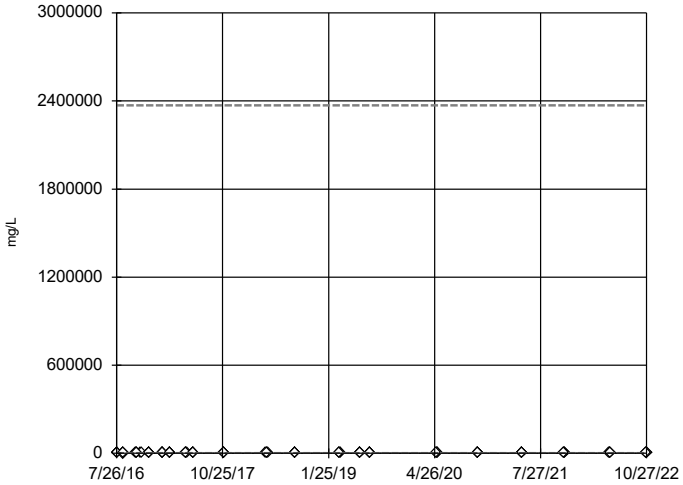
Constituent: Selenium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 82

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 = 2371110, low cutoff = 0.000005771, based on IQR multiplier of 3.

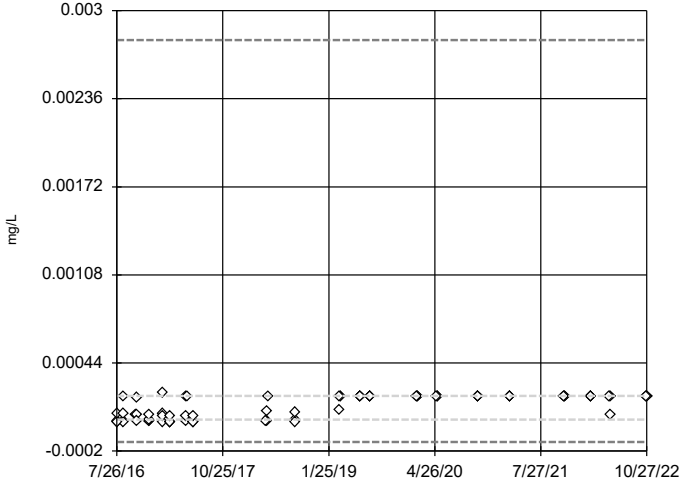
Constituent: Sulfate, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 84

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

Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.002786, low cutoff = -0.0001338, based on IQR multiplier of 3.

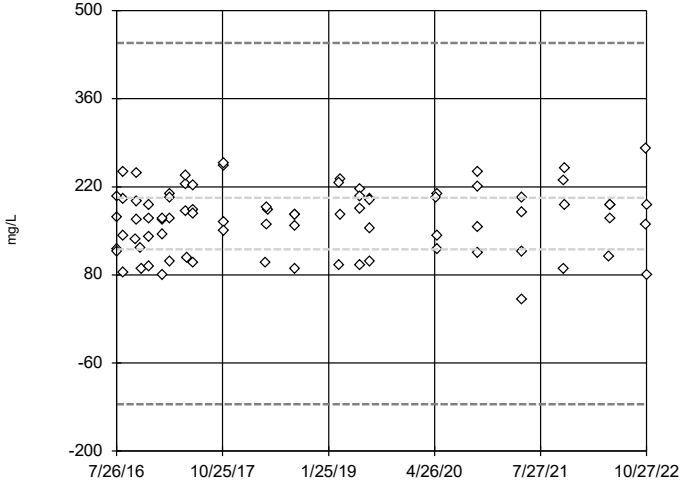
Constituent: Thallium, total Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 Groundwater Stats Consulting. UG

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 82

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 448.5, low cutoff = -125.5, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/27/2023 2:43 PM View: Outliers - Upgradient

Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE D

Mann-Whitney

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

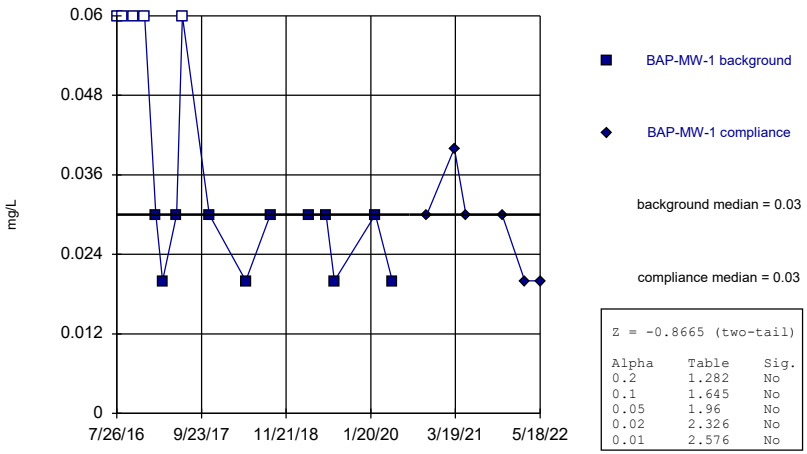
Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/26/2023, 10:50 AM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Method
Fluoride, total (mg/L)	BAP-MW-1	-0.8665	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-1601 (bg)	-0.5275	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-1602A (bg)	1.208	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-1603A (bg)	-0.3187	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-1604	0	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-1605	-0.8345	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-1606	-0.7753	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-4	1.283	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-5	-0.9364	No	No	No	No	Mann-W
Fluoride, total (mg/L)	BAP-MW-6 (bg)	0.1124	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-1	0.6311	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-1601 (bg)	-0.7709	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-1602A (bg)	-0.5538	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-1603A (bg)	-0.7015	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-1604	-1.032	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-1605	-1.9	Yes	No	No	No	Mann-W
pH, field (SU)	BAP-MW-1606	1.218	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-4	-0.1051	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-5	-1.017	No	No	No	No	Mann-W
pH, field (SU)	BAP-MW-6 (bg)	1.401	No	No	No	No	Mann-W

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1



Z = -0.8665 (two-tail)

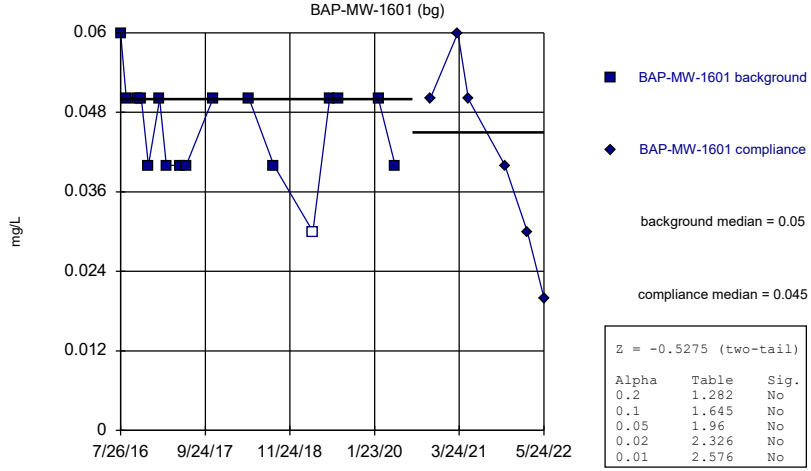
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1601 (bg)



Z = -0.5275 (two-tail)

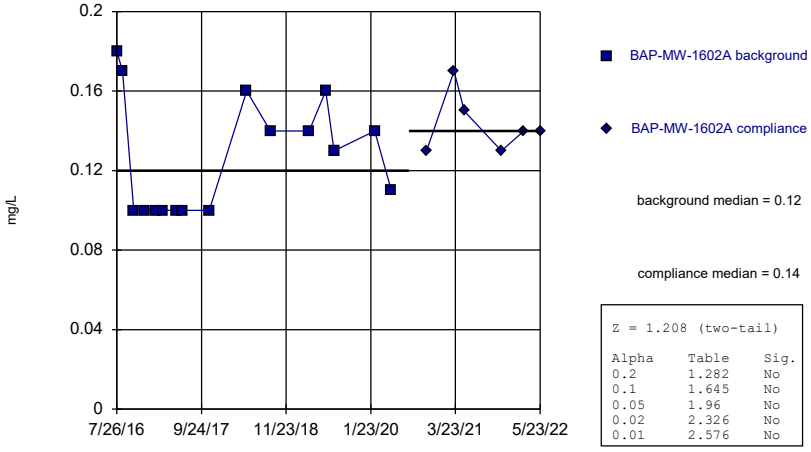
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1602A (bg)



Z = 1.208 (two-tail)

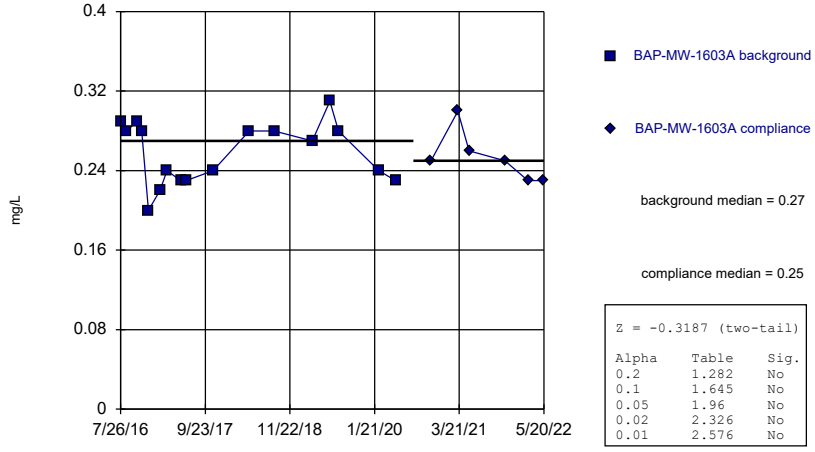
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1603A (bg)



Z = -0.3187 (two-tail)

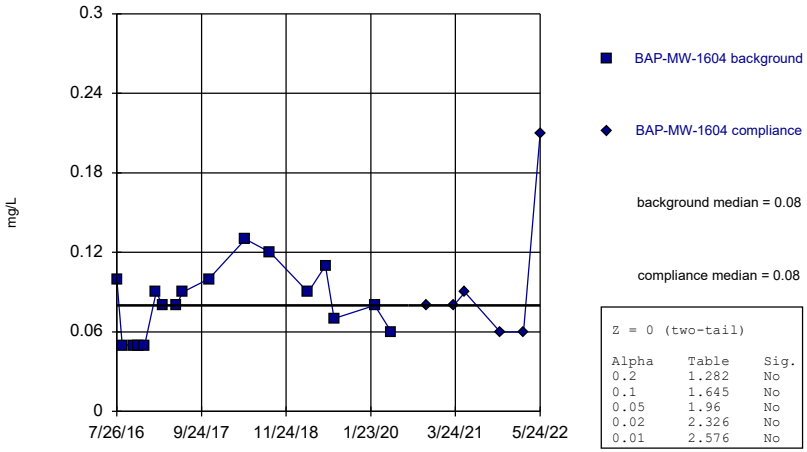
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1604



Z = 0 (two-tail)

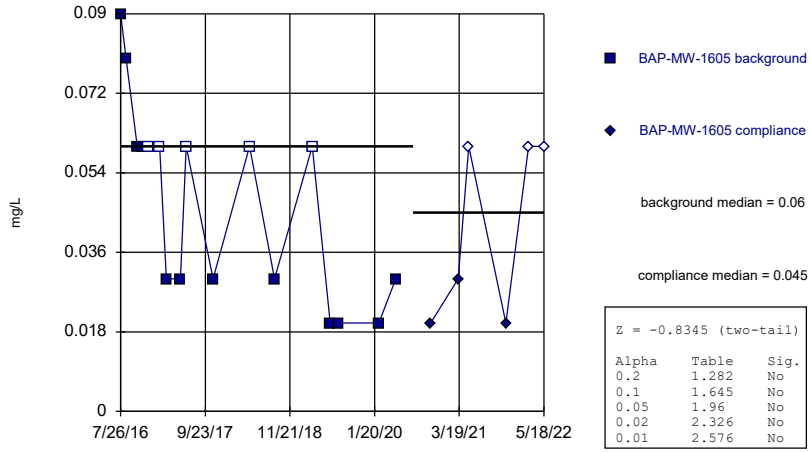
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1605



Z = -0.8345 (two-tail)

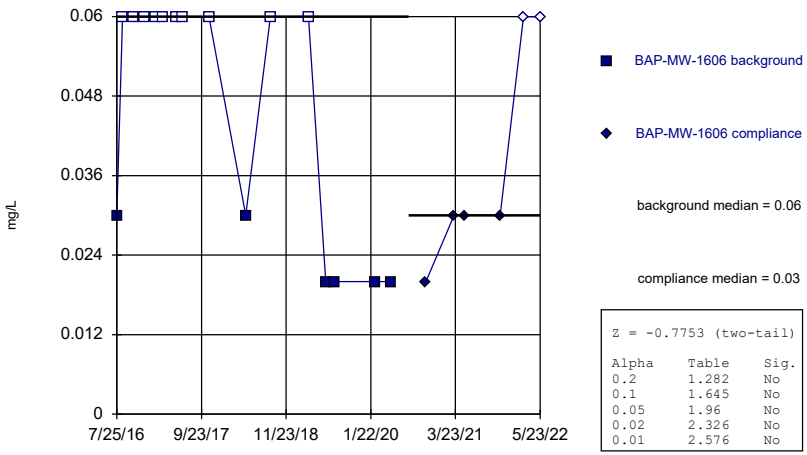
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1606



Z = -0.7753 (two-tail)

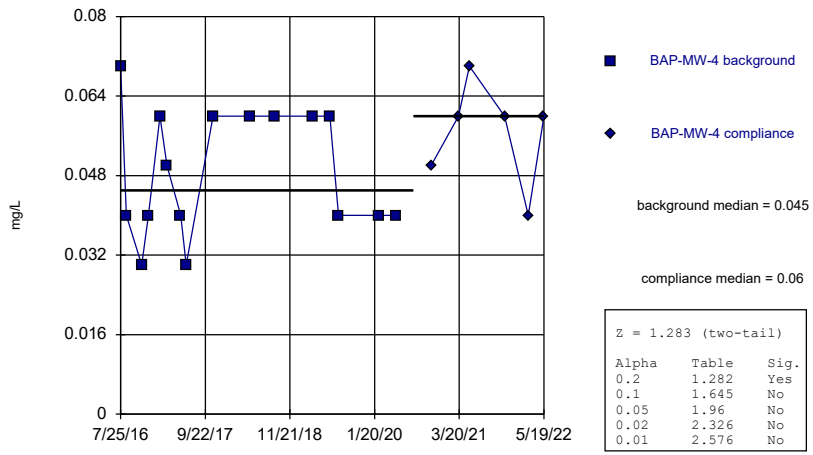
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-4



Z = 1.283 (two-tail)

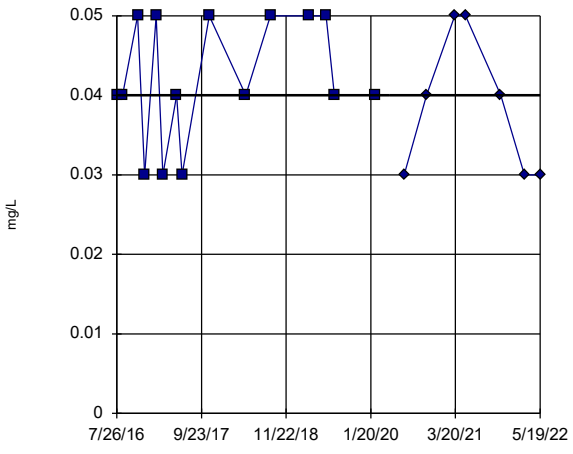
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-5



BAP-MW-5 background

BAP-MW-5 compliance

background median = 0.04

compliance median = 0.04

Z = -0.9364 (two-tail)

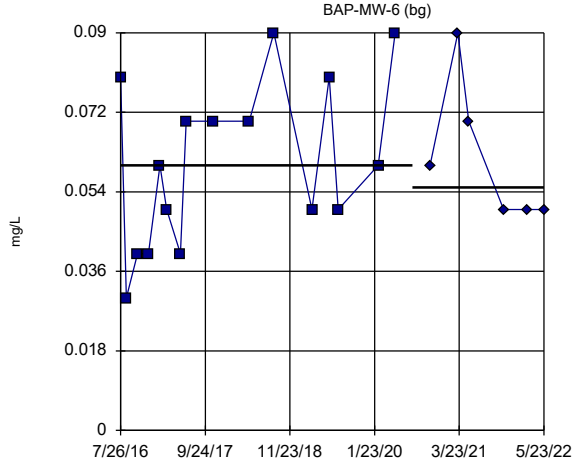
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-6 (bg)



BAP-MW-6 background

BAP-MW-6 compliance

background median = 0.06

compliance median = 0.055

Z = 0.1124 (two-tail)

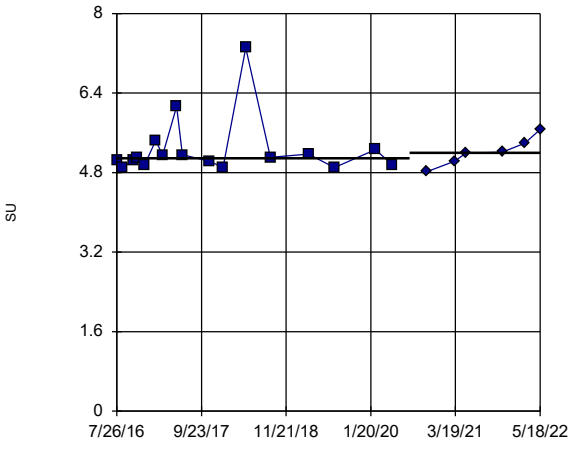
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride, total Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1



BAP-MW-1 background

BAP-MW-1 compliance

background median = 5.09

compliance median = 5.2

Z = 0.6311 (two-tail)

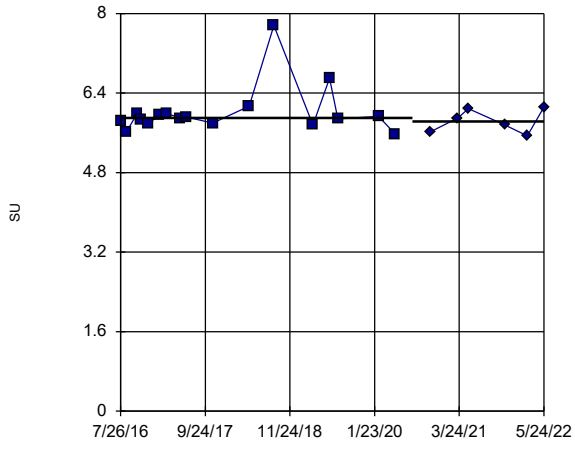
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1601 (bg)



BAP-MW-1601 background

BAP-MW-1601 compliance

background median = 5.9

compliance median = 5.83

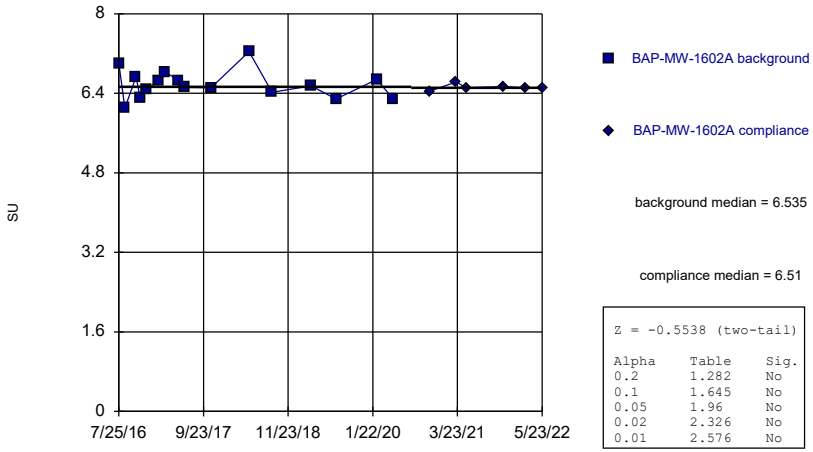
Z = -0.7709 (two-tail)

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

Constituent: pH, field Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1602A (bg)

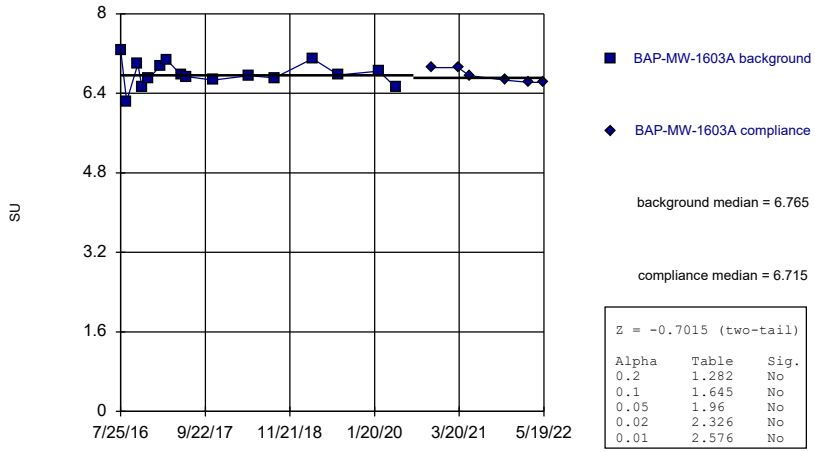


Constituent: pH, field Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1603A (bg)

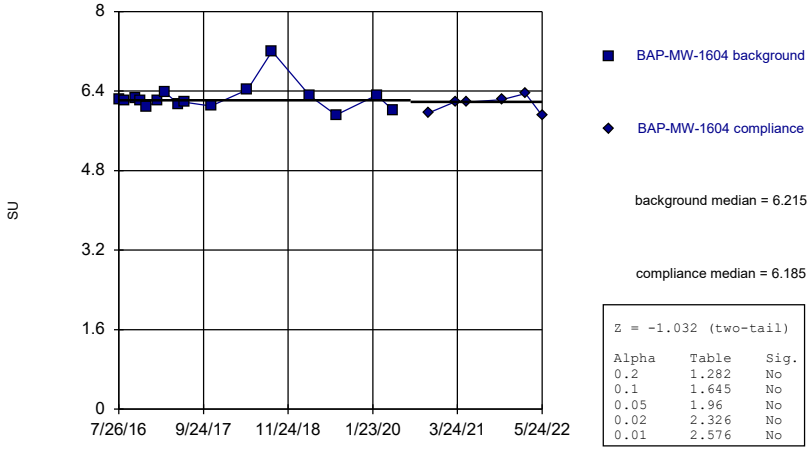


Constituent: pH, field Analysis Run 1/26/2023 10:48 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1604

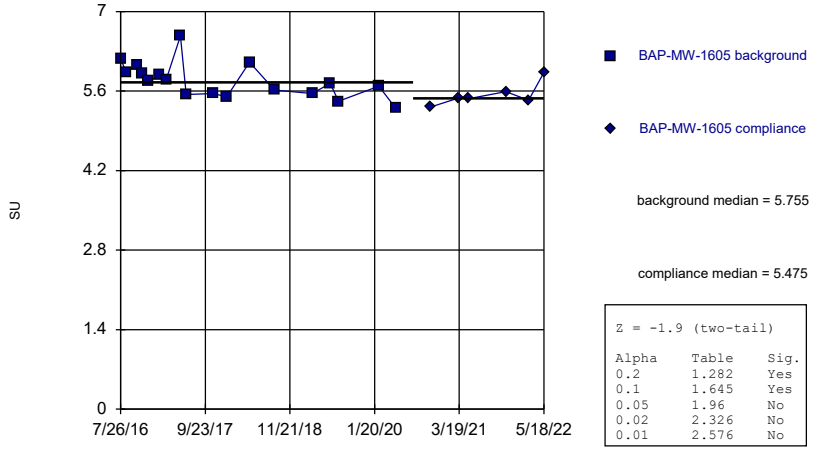


Constituent: pH, field Analysis Run 1/26/2023 10:49 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1605

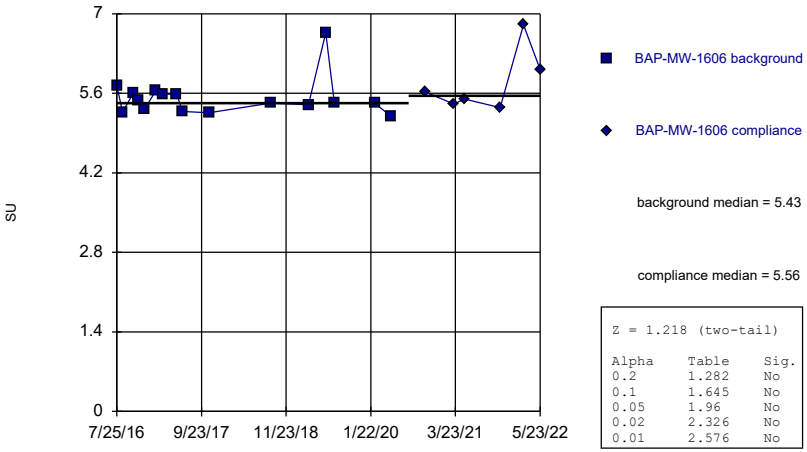


Constituent: pH, field Analysis Run 1/26/2023 10:49 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-1606

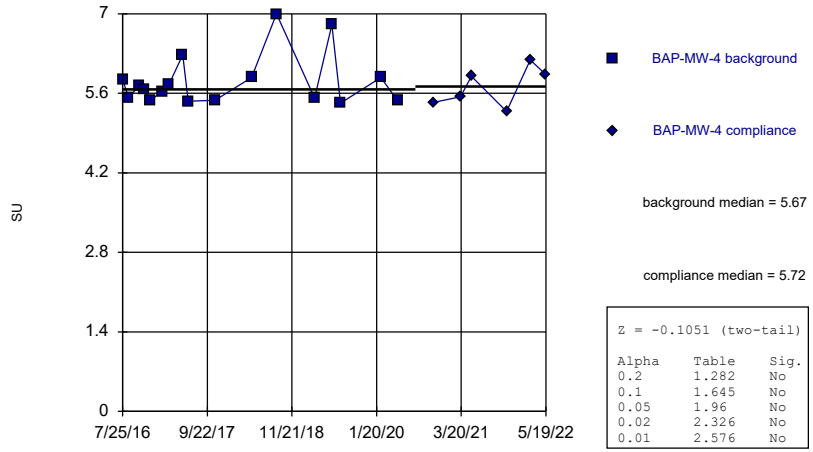


Constituent: pH, field Analysis Run 1/26/2023 10:49 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-4

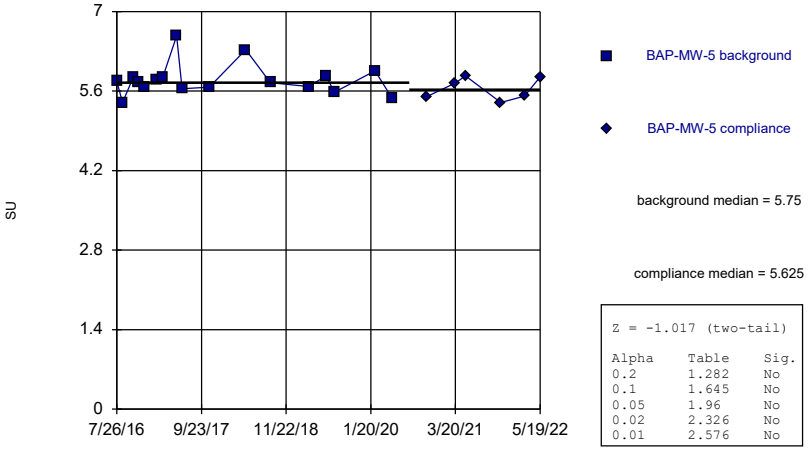


Constituent: pH, field Analysis Run 1/26/2023 10:49 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-5

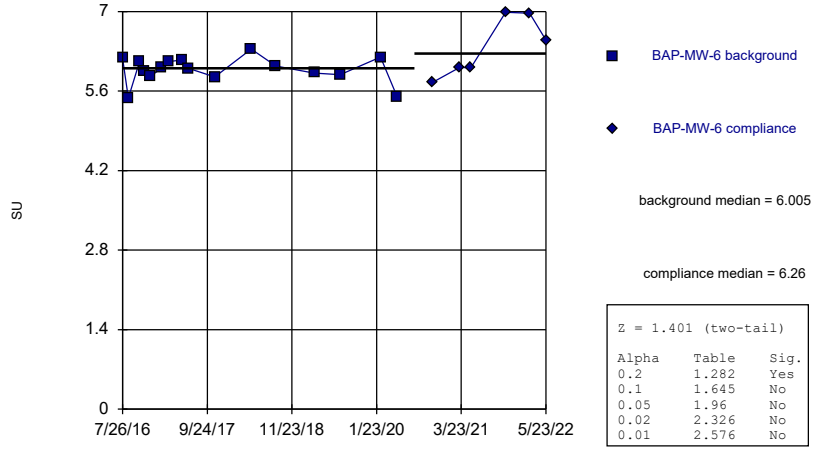


Constituent: pH, field Analysis Run 1/26/2023 10:49 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Mann-Whitney (Wilcoxon Rank Sum)

BAP-MW-6 (bg)



Constituent: pH, field Analysis Run 1/26/2023 10:49 AM View: Mann-Whitney
Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE E

Intrawell PL

Appendix III - Intrawell Prediction Limits - All Results

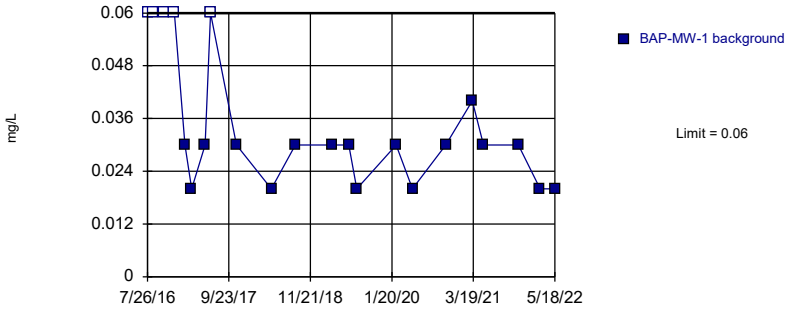
Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/24/2023, 4:16 PM

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)	BAP-MW-1	0.06	n/a	n/a	1 future	n/a	22	n/a	n/a	22.73	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-1601	0.06104	n/a	n/a	1 future	n/a	23	0.002091	0.0007914	4.348	None	x^2	0.001254	Param Intra 1 of 2
Fluoride, total (mg/L)	BAP-MW-1602A	0.187	n/a	n/a	1 future	n/a	22	0.1314	0.02678	0	None	No	0.001254	Param Intra 1 of 2
Fluoride, total (mg/L)	BAP-MW-1603A	0.3175	n/a	n/a	1 future	n/a	23	0.257	0.0293	0	None	No	0.001254	Param Intra 1 of 2
Fluoride, total (mg/L)	BAP-MW-1604	0.1604	n/a	n/a	1 future	n/a	23	0.2886	0.05417	0	None	sqrt(x)	0.001254	Param Intra 1 of 2
Fluoride, total (mg/L)	BAP-MW-1605	0.09	n/a	n/a	1 future	n/a	23	n/a	n/a	34.78	n/a	n/a	0.003415	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-1606	0.06	n/a	n/a	1 future	n/a	22	n/a	n/a	54.55	n/a	n/a	0.003707	NP Intra (NDs) 1 of 2
Fluoride, total (mg/L)	BAP-MW-4	0.07	n/a	n/a	1 future	n/a	22	n/a	n/a	0	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-5	0.05	n/a	n/a	1 future	n/a	22	n/a	n/a	0	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-6	0.09772	n/a	n/a	1 future	n/a	22	0.06091	0.0177	0	None	No	0.001254	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1	7.31	4.82	n/a	1 future	n/a	23	n/a	n/a	0	n/a	n/a	0.006831	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-1601	7.76	5.54	n/a	1 future	n/a	23	n/a	n/a	0	n/a	n/a	0.006831	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-1602A	7.076	6.051	n/a	1 future	n/a	22	6.564	0.2466	0	None	No	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1603A	7.249	6.31	n/a	1 future	n/a	22	6.78	0.2257	0	None	No	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1604	7.2	5.91	n/a	1 future	n/a	22	n/a	n/a	0	n/a	n/a	0.007415	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-1605	6.35	5.098	n/a	1 future	n/a	24	5.724	0.3052	0	None	No	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1606	6.81	5.19	n/a	1 future	n/a	22	n/a	n/a	0	n/a	n/a	0.007415	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-4	7	5.28	n/a	1 future	n/a	23	n/a	n/a	0	n/a	n/a	0.006831	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-5	6.322	5.226	n/a	1 future	n/a	23	1.792	0.02752	0	None	x^(1/3)	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-6	6.857	5.312	n/a	1 future	n/a	22	6.085	0.3716	0	None	No	0.0006268	Param Intra 1 of 2

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, BAP-MW-1



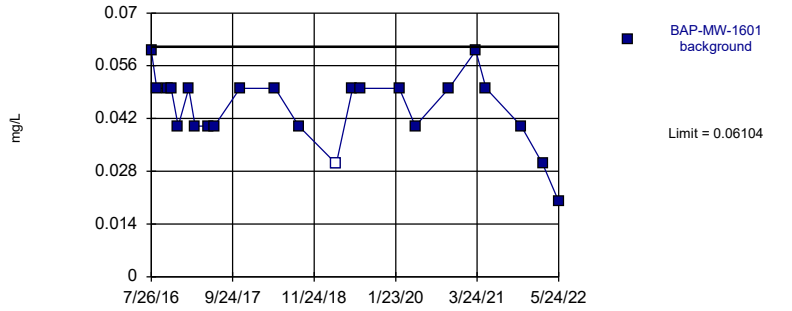
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. 22.73% NDs. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, BAP-MW-1601 (bg)



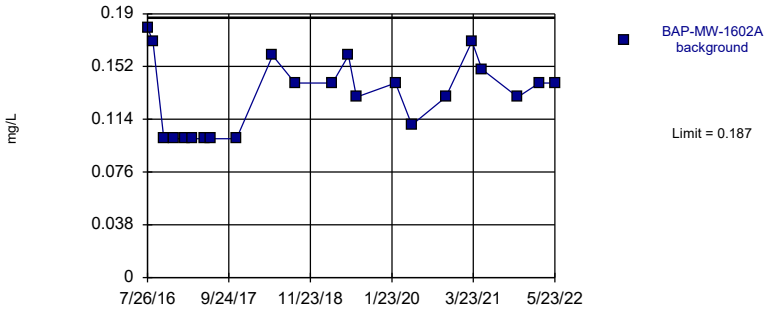
Background Data Summary (based on square transformation): Mean=0.002091, Std. Dev.=0.0007914, n=23, 4.348% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8844, critical = 0.881. Kappa = 2.065 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-1602A (bg)



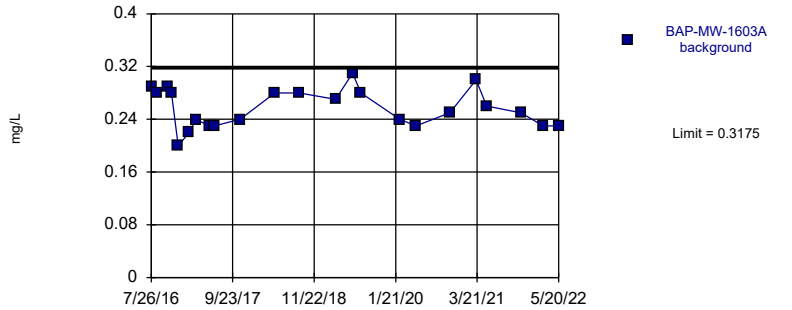
Background Data Summary: Mean=0.1314, Std. Dev.=0.02678, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8895, critical = 0.878. Kappa = 2.079 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-1603A (bg)



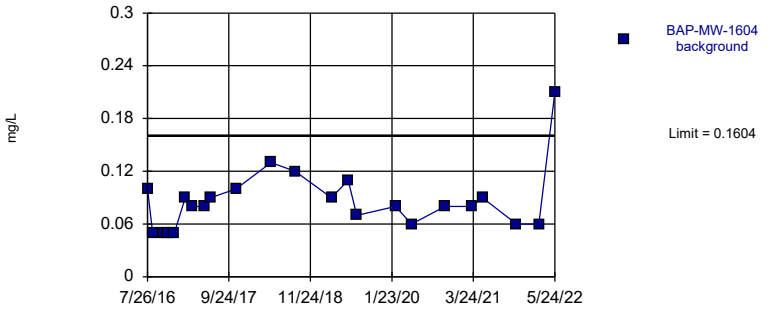
Background Data Summary: Mean=0.257, Std. Dev.=0.0293, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9461, critical = 0.881. Kappa = 2.065 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-1604



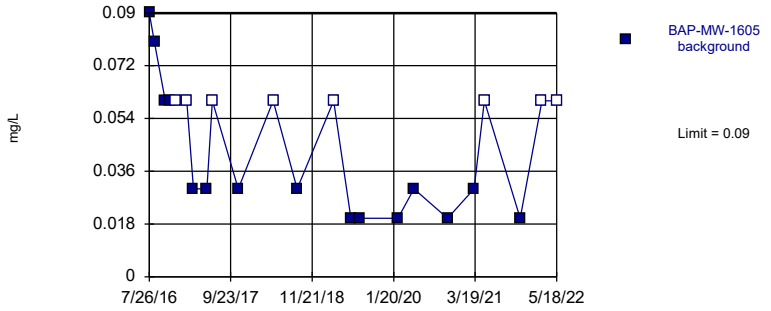
Background Data Summary (based on square root transformation): Mean=0.2886, Std. Dev.=0.05417, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8862, critical = 0.881. Kappa = 2.065 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, BAP-MW-1605



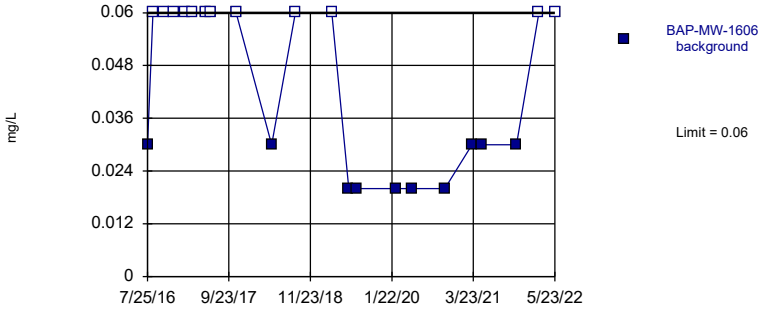
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 23 background values. 34.78% NDs. Well-constituent pair annual alpha = 0.006819. Individual comparison alpha = 0.003415 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, BAP-MW-1606



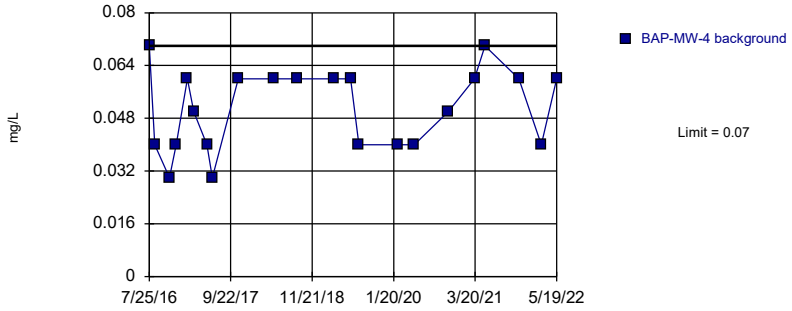
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 22 background values. 54.55% NDs. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Non-parametric, BAP-MW-4

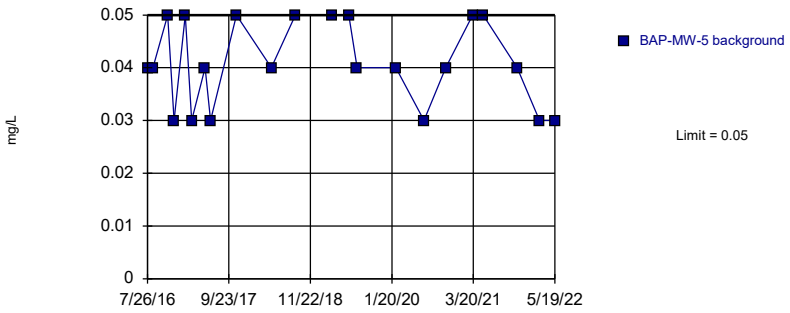


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Prediction Limit

Intrawell Non-parametric, BAP-MW-5



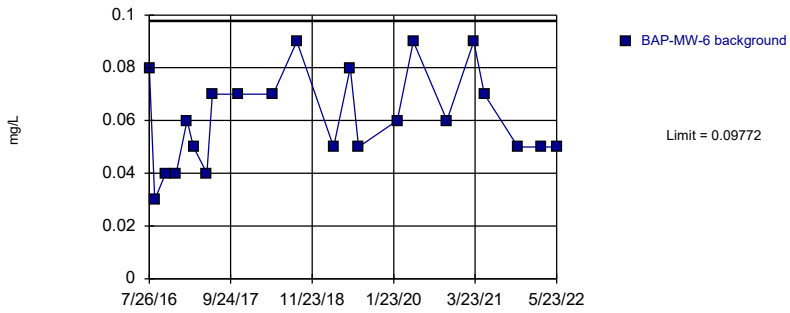
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-6 (bg)



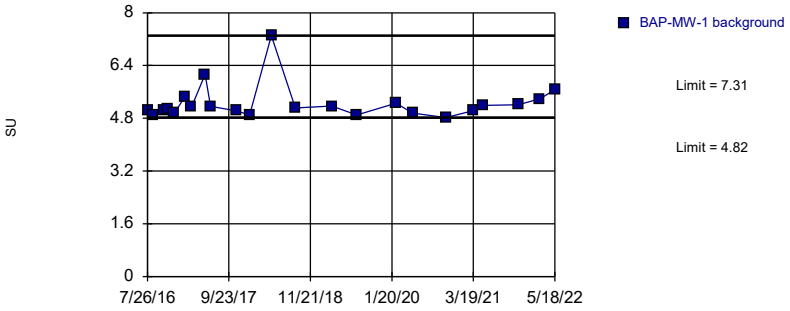
Background Data Summary: Mean=0.06091, Std. Dev.=0.0177, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9371, critical = 0.878. Kappa = 2.079 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Non-parametric, BAP-MW-1



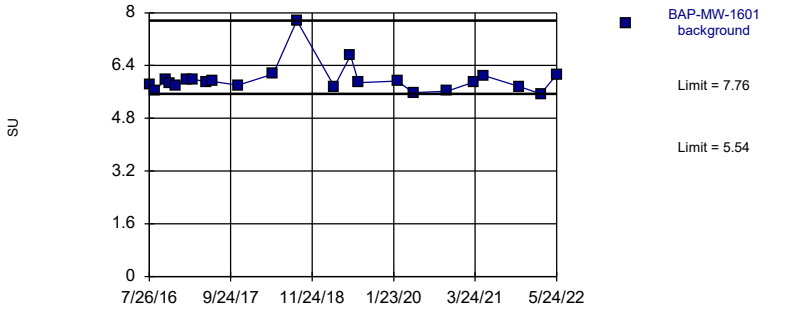
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 23 background values. Well-constituent pair annual alpha = 0.01364. Individual comparison alpha = 0.006831 (1 of 2). Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Non-parametric, BAP-MW-1601 (bg)

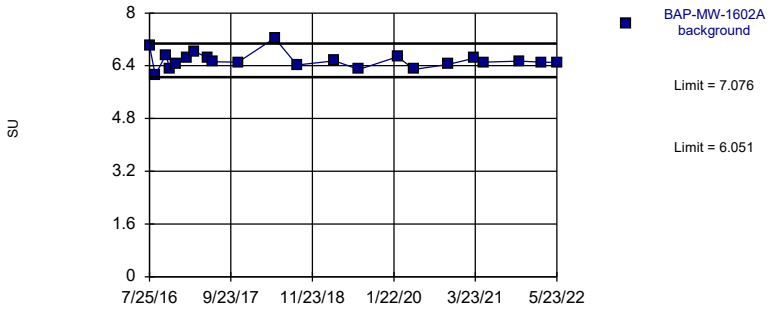


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 23 background values. Well-constituent pair annual alpha = 0.01364. Individual comparison alpha = 0.006831 (1 of 2). Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Prediction Limit

Intrawell Parametric, BAP-MW-1602A (bg)



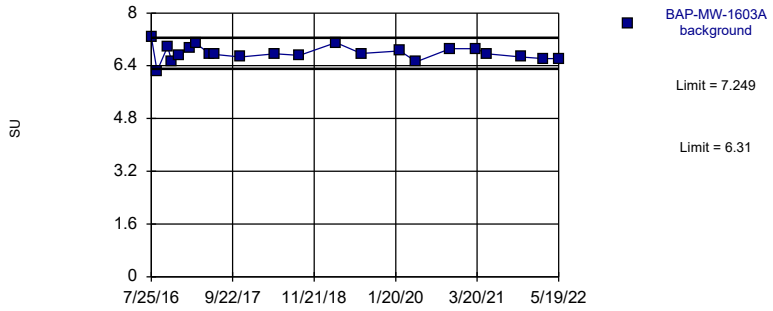
Background Data Summary: Mean=6.564, Std. Dev.=0.2466, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9321, critical = 0.878. Kappa = 2.079 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-1603A (bg)



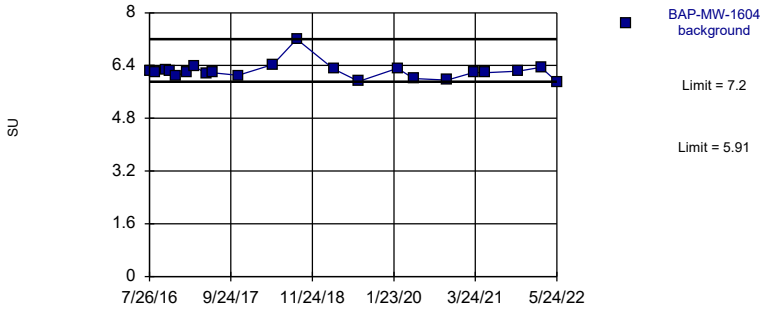
Background Data Summary: Mean=6.78, Std. Dev.=0.2257, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9758, critical = 0.878. Kappa = 2.079 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Non-parametric, BAP-MW-1604



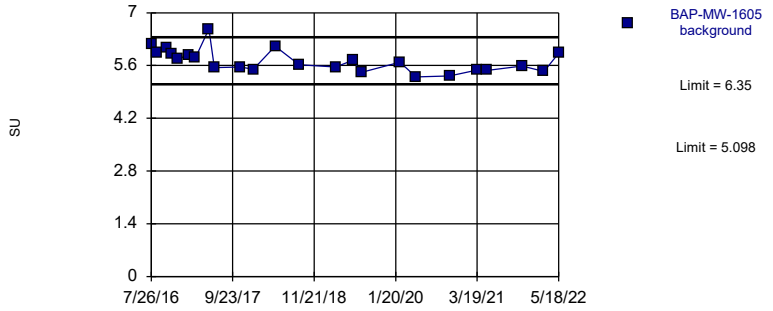
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 22 background values. Well-constituent pair annual alpha = 0.0148. Individual comparison alpha = 0.007415 (1 of 2). Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-1605

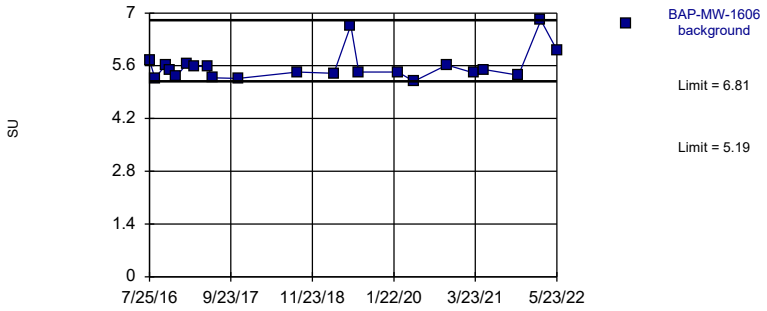


Background Data Summary: Mean=5.724, Std. Dev.=0.3052, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9374, critical = 0.884. Kappa = 2.051 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Prediction Limit

Intrawell Non-parametric, BAP-MW-1606



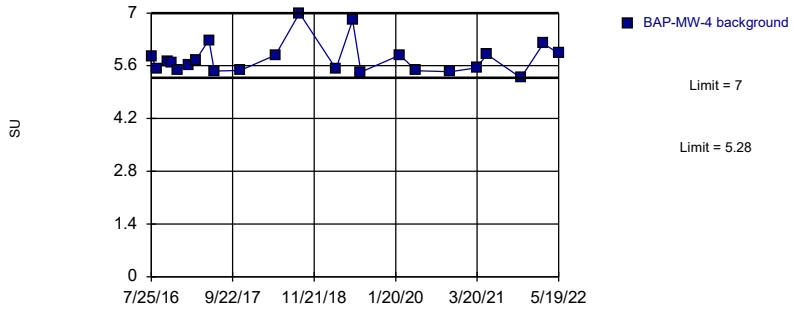
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 22 background values. Well-constituent pair annual alpha = 0.0148. Individual comparison alpha = 0.007415 (1 of 2). Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Non-parametric, BAP-MW-4



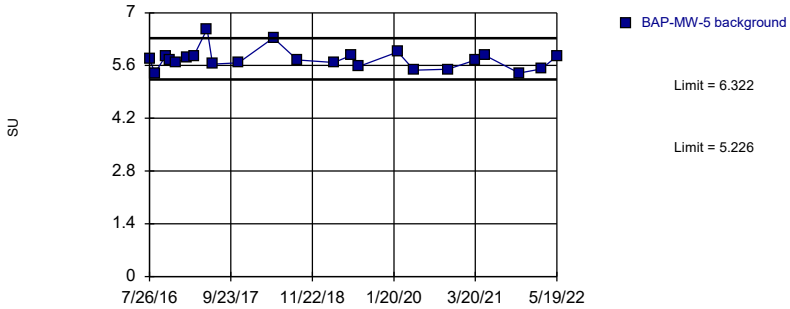
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 23 background values. Well-constituent pair annual alpha = 0.01364. Individual comparison alpha = 0.006831 (1 of 2). Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-5



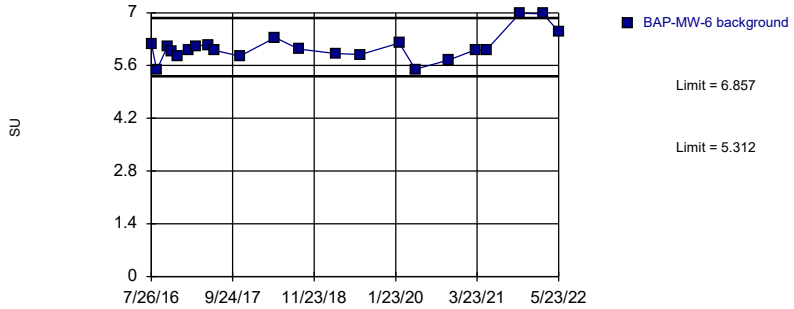
Background Data Summary (based on cube root transformation): Mean=1.792, Std. Dev.=0.02752, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8839, critical = 0.881. Kappa = 2.065 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Intrawell Parametric, BAP-MW-6 (bg)



Background Data Summary: Mean=6.085, Std. Dev.=0.3716, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8884, critical = 0.878. Kappa = 2.079 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/24/2023 4:14 PM View: Appendix III - Intrawell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE F
Upgradient Well Trend Test

Appendix III Trend Test Summary - Significant Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/10/2023, 12:20 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Calcium, total (mg/L)	**BAP-MW-1602A (bg)**	**0.2943**	**94**	**81**	**Yes**	**20**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Calcium, total (mg/L)	**BAP-MW-1603A (bg)**	**-0.3478**	**-88**	**-81**	**Yes**	**20**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	**BAP-MW-1601 (bg)**	**3.04**	**161**	**87**	**Yes**	**21**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	**BAP-MW-1602A (bg)**	**0.9189**	**117**	**81**	**Yes**	**20**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	**BAP-MW-1603A (bg)**	**0.2376**	**134**	**87**	**Yes**	**21**	**0**	**n/a**	**n/a**	**0.01**	**NP**

Appendix III Trend Test Summary - All Results

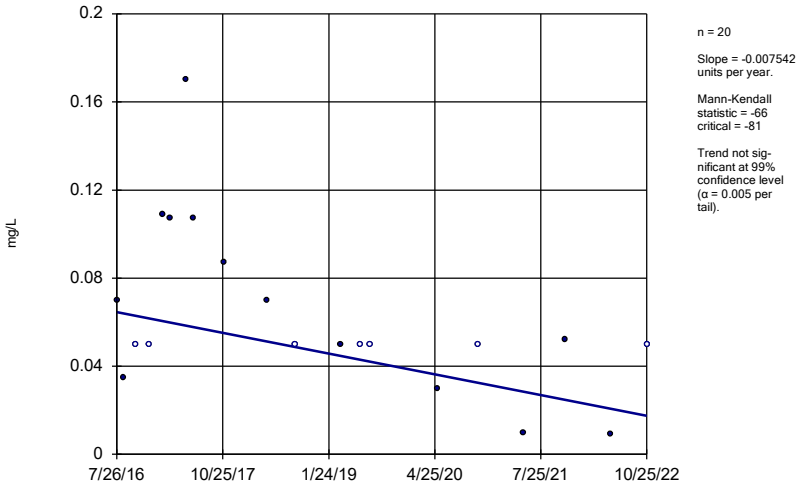
Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/10/2023, 12:20 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	BAP-MW-1601 (bg)	-0.007542	-66	-81	No	20	35	n/a	n/a	0.01	NP
Boron, total (mg/L)	BAP-MW-1602A (bg)	-0.002955	-42	-81	No	20	30	n/a	n/a	0.01	NP
Boron, total (mg/L)	BAP-MW-1603A (bg)	-0.002908	-62	-81	No	20	35	n/a	n/a	0.01	NP
Boron, total (mg/L)	BAP-MW-6 (bg)	-0.002476	-40	-81	No	20	30	n/a	n/a	0.01	NP
Calcium, total (mg/L)	BAP-MW-1601 (bg)	0	-1	-81	No	20	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	**BAP-MW-1602A (bg)**	**0.2943**	**94**	**81**	**Yes**	**20**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Calcium, total (mg/L)	**BAP-MW-1603A (bg)**	**-0.3478**	**-88**	**-81**	**Yes**	**20**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Calcium, total (mg/L)	BAP-MW-6 (bg)	0	7	81	No	20	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	**BAP-MW-1601 (bg)**	**3.04**	**161**	**87**	**Yes**	**21**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	**BAP-MW-1602A (bg)**	**0.9189**	**117**	**81**	**Yes**	**20**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	**BAP-MW-1603A (bg)**	**0.2376**	**134**	**87**	**Yes**	**21**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	BAP-MW-6 (bg)	0.1004	25	81	No	20	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-1601 (bg)	-0.4731	-14	-87	No	21	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-1602A (bg)	-0.03416	-7	-81	No	20	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-1603A (bg)	0	-19	-87	No	21	85.71	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-6 (bg)	-0.2273	-40	-81	No	20	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-1601 (bg)	5.162	50	87	No	21	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-1602A (bg)	1.414	12	81	No	20	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-1603A (bg)	-1.353	-15	-87	No	21	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-6 (bg)	1.604	14	81	No	20	0	n/a	n/a	0.01	NP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

BAP-MW-1601 (bg)



n = 20

Slope = -0.007542 units per year.

Mann-Kendall statistic = -66
critical = -81

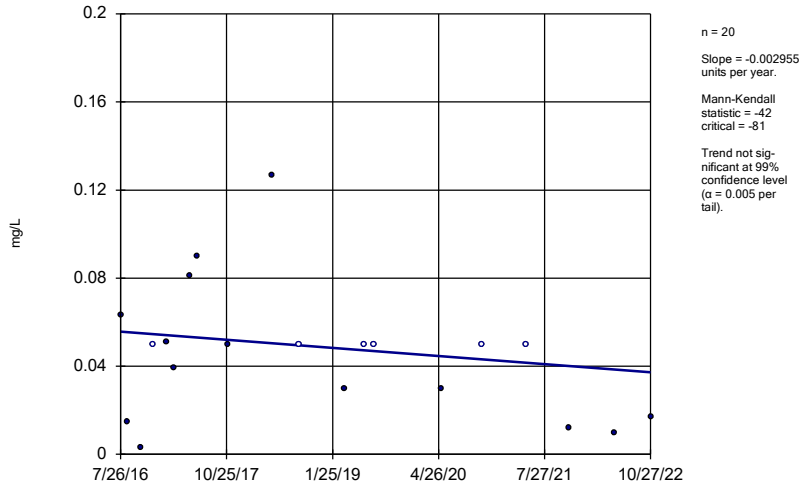
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

BAP-MW-1602A (bg)



n = 20

Slope = -0.002955 units per year.

Mann-Kendall statistic = -42
critical = -81

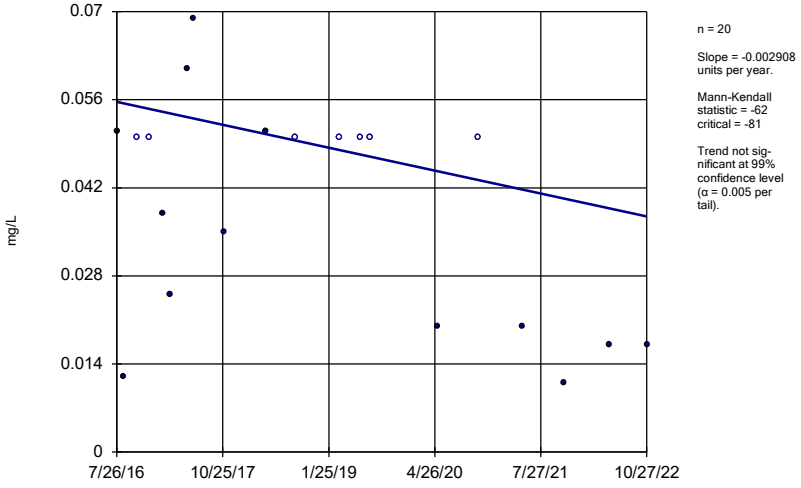
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

BAP-MW-1603A (bg)



n = 20

Slope = -0.002908 units per year.

Mann-Kendall statistic = -62
critical = -81

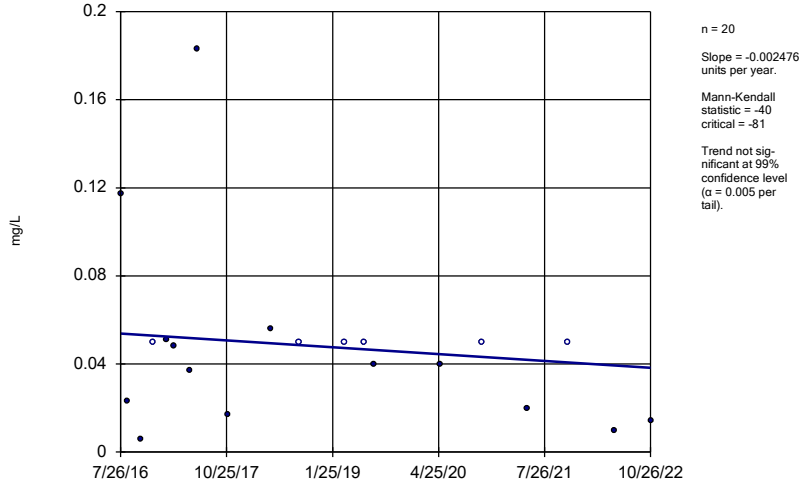
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

BAP-MW-6 (bg)



n = 20

Slope = -0.002476 units per year.

Mann-Kendall statistic = -40
critical = -81

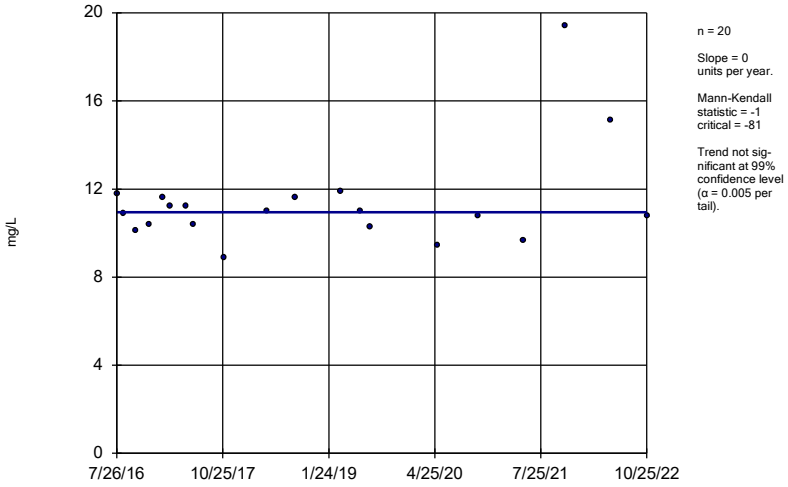
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1601 (bg)



n = 20

Slope = 0 units per year.

Mann-Kendall statistic = -1 critical = -81

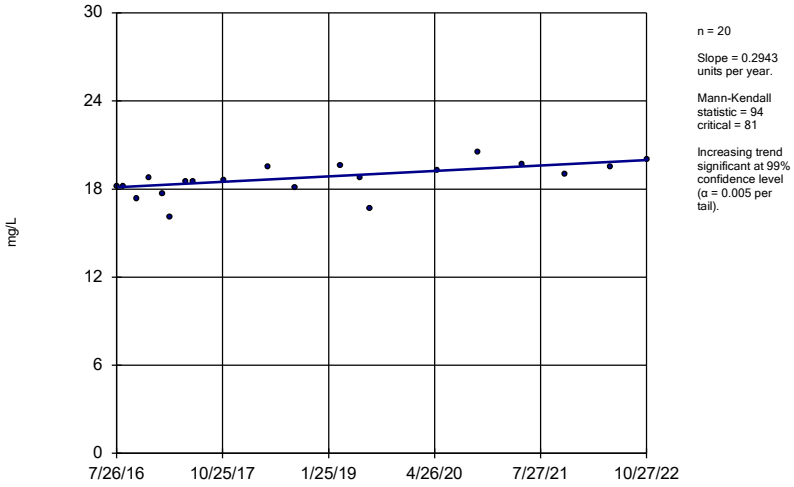
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1602A (bg)



n = 20

Slope = 0.2943 units per year.

Mann-Kendall statistic = 94 critical = 81

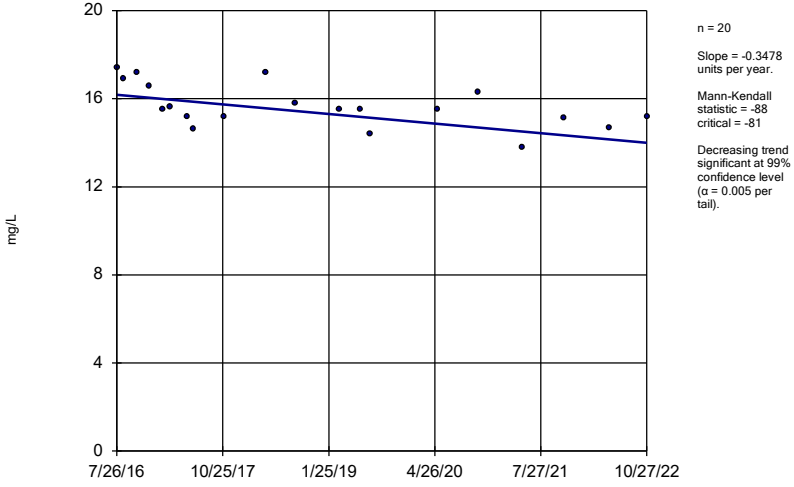
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1603A (bg)



n = 20

Slope = -0.3478 units per year.

Mann-Kendall statistic = -88 critical = -81

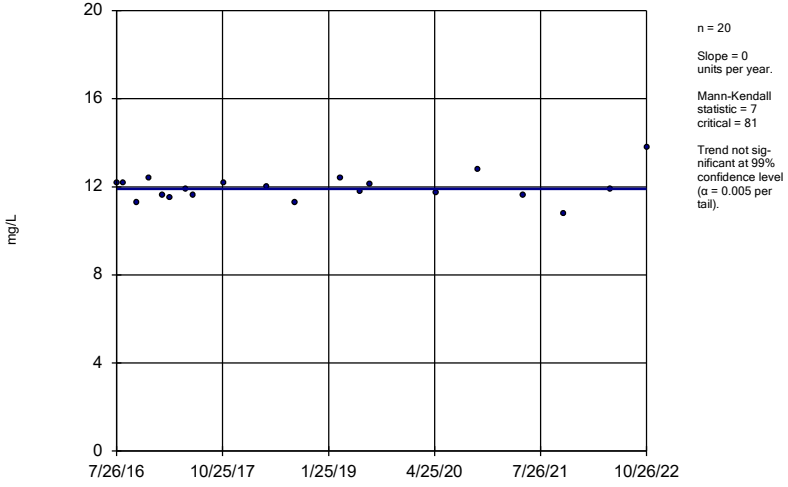
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-6 (bg)



n = 20

Slope = 0 units per year.

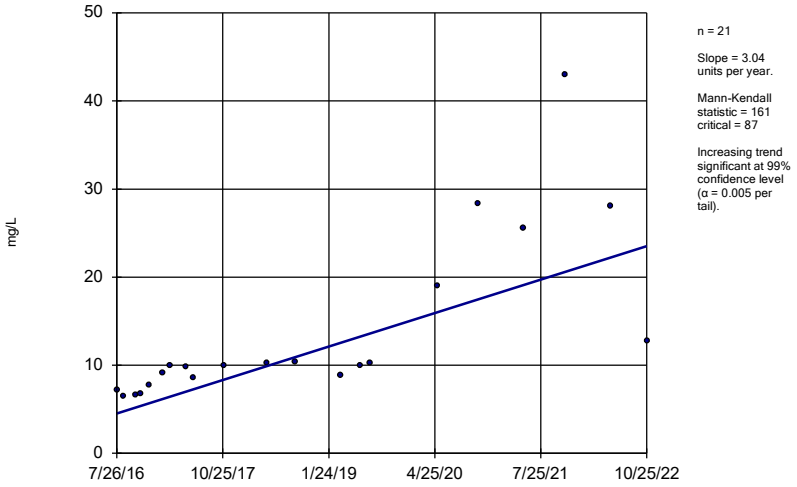
Mann-Kendall statistic = 7 critical = 81

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

Constituent: Calcium, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sen's Slope Estimator

BAP-MW-1601 (bg)



n = 21

Slope = 3.04 units per year.

Mann-Kendall statistic = 161 critical = 87

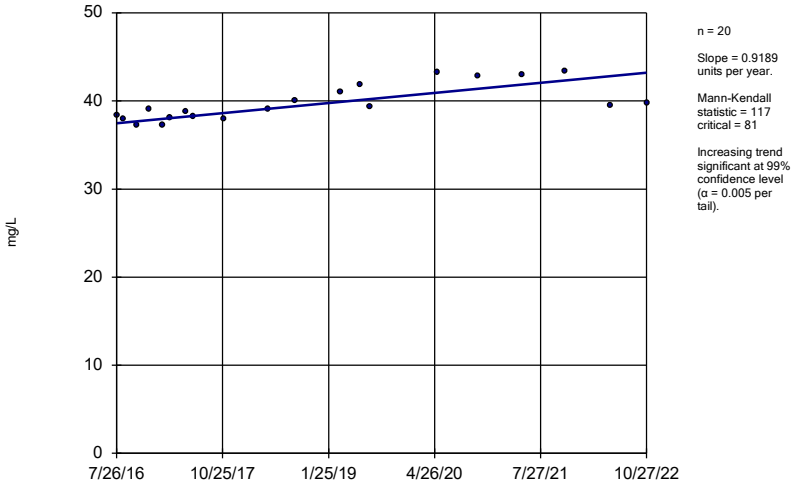
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1602A (bg)



n = 20

Slope = 0.9189 units per year.

Mann-Kendall statistic = 117 critical = 81

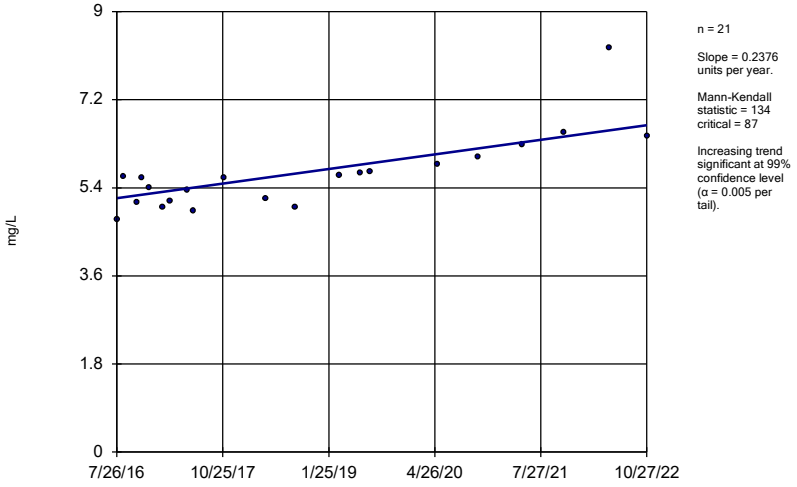
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1603A (bg)



n = 21

Slope = 0.2376 units per year.

Mann-Kendall statistic = 134 critical = 87

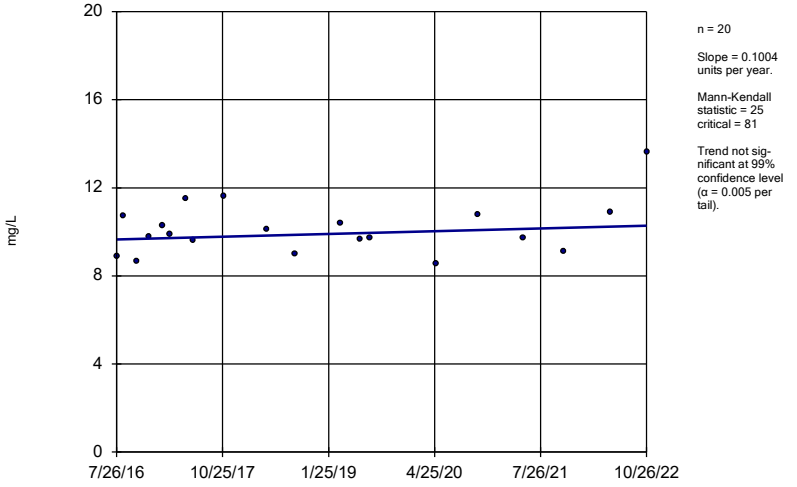
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-6 (bg)



n = 20

Slope = 0.1004 units per year.

Mann-Kendall statistic = 25 critical = 81

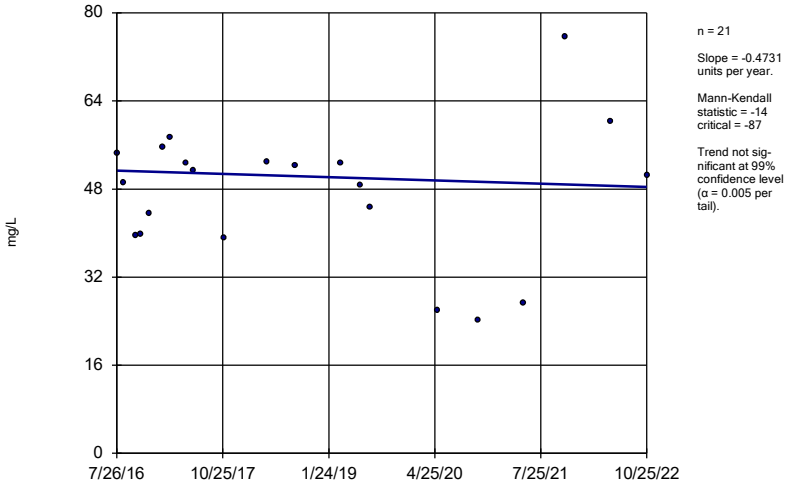
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1601 (bg)



n = 21

Slope = -0.4731 units per year.

Mann-Kendall statistic = -14 critical = -87

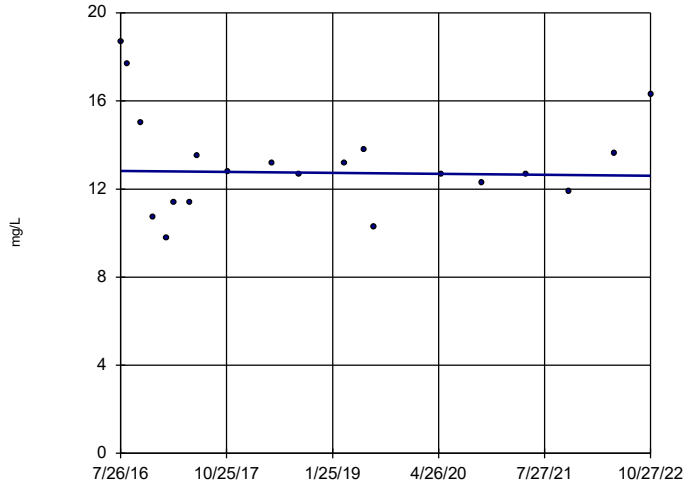
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1602A (bg)



n = 20

Slope = -0.03416 units per year.

Mann-Kendall statistic = -7 critical = -81

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

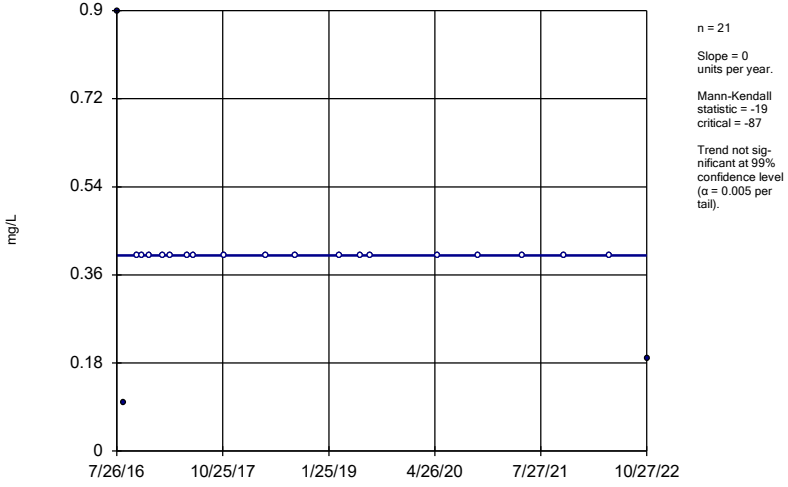
Constituent: Sulfate, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

BAP-MW-1603A (bg)



n = 21

Slope = 0 units per year.

Mann-Kendall statistic = -19 critical = -87

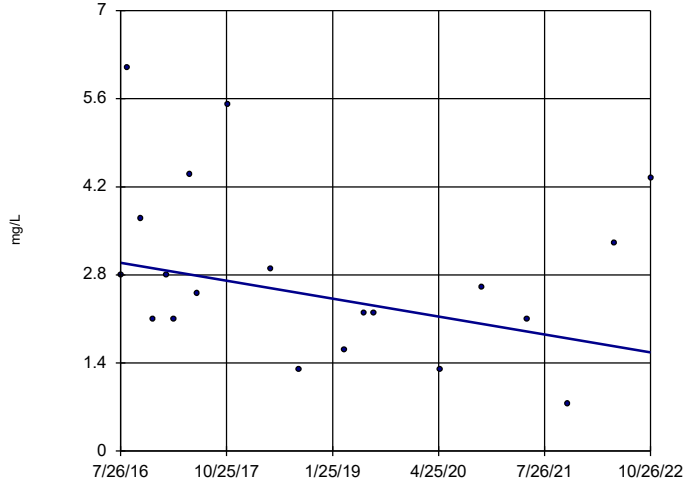
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-6 (bg)



n = 20

Slope = -0.2273 units per year.

Mann-Kendall statistic = -40 critical = -81

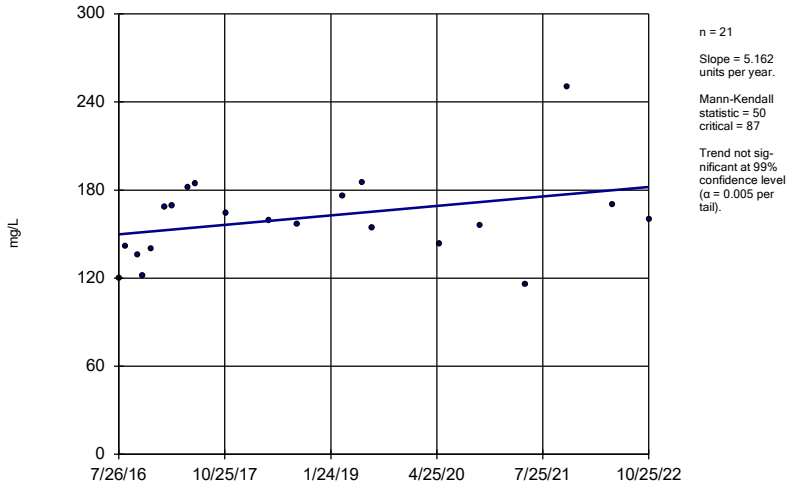
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate, total Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1601 (bg)



n = 21

Slope = 5.162 units per year.

Mann-Kendall statistic = 50 critical = 87

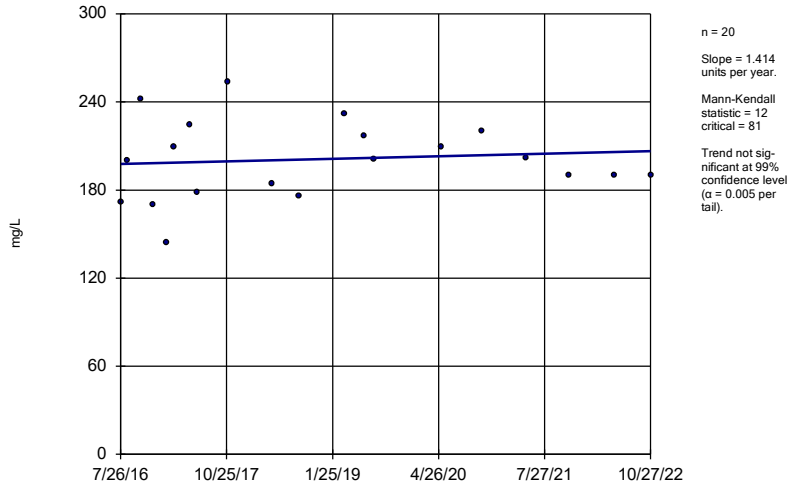
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1602A (bg)



n = 20

Slope = 1.414 units per year.

Mann-Kendall statistic = 12 critical = 81

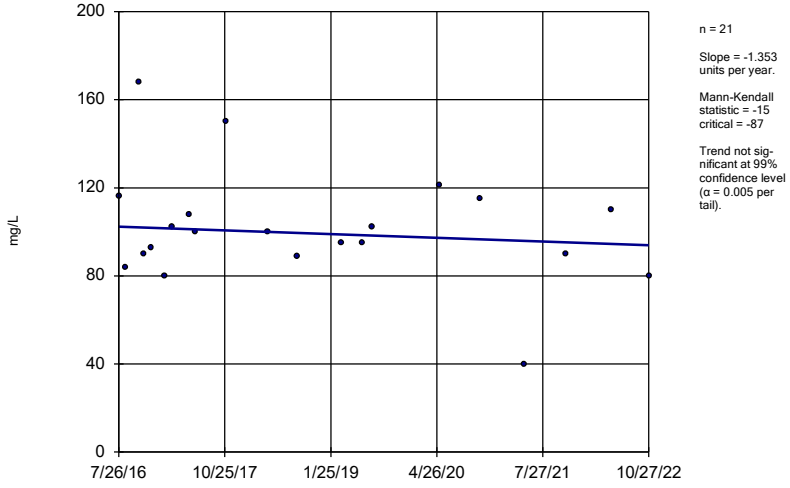
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-1603A (bg)



n = 21

Slope = -1.353 units per year.

Mann-Kendall statistic = -15 critical = -87

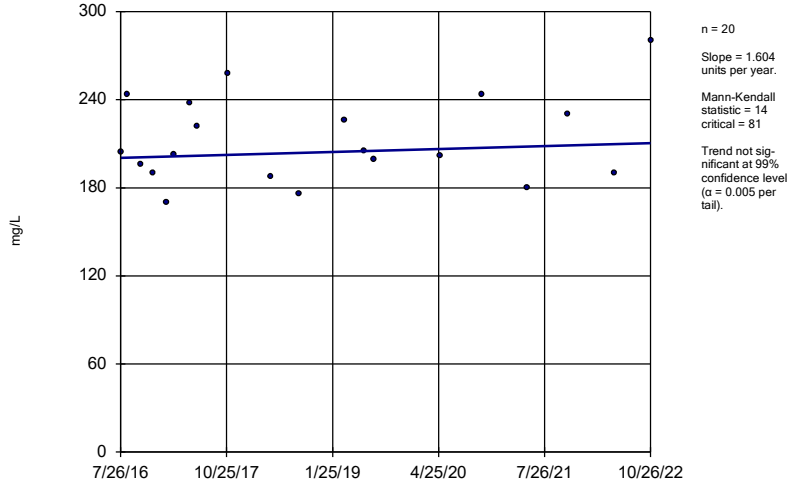
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Sen's Slope Estimator

BAP-MW-6 (bg)



n = 20

Slope = 1.604 units per year.

Mann-Kendall statistic = 14 critical = 81

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

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/10/2023 12:19 AM View: Appendix III - Interwell
Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE G
Interwell PL

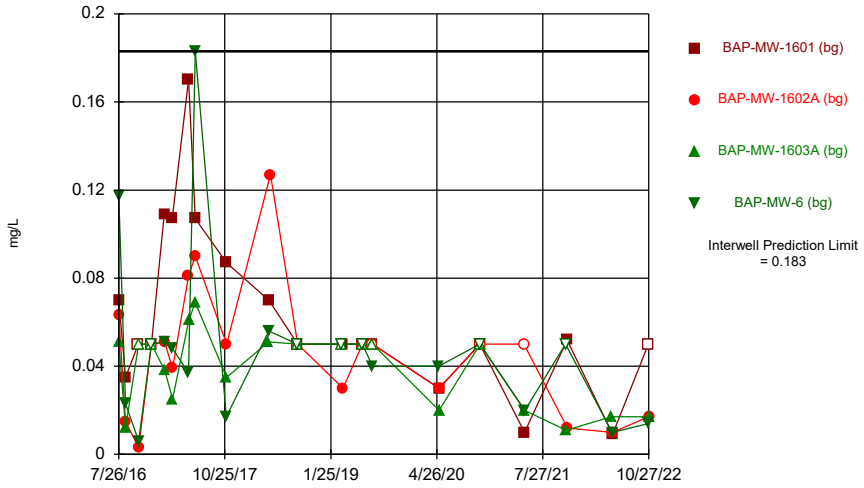
Appendix III - Interwell Prediction Limits - All Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/18/2023, 5:09 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	0.183	n/a	n/a	6 future	n/a	80	n/a	n/a	32.5	n/a	n/a	0.0002988	NP Inter (normality) 1 of 2
Calcium, total (mg/L)	n/a	20.5	n/a	n/a	6 future	n/a	80	n/a	n/a	0	n/a	n/a	0.0002988	NP Inter (normality) 1 of 2
Chloride, total (mg/L)	n/a	43.4	n/a	n/a	6 future	n/a	82	n/a	n/a	0	n/a	n/a	0.0002865	NP Inter (normality) 1 of 2
Sulfate, total (mg/L)	n/a	75.7	n/a	n/a	6 future	n/a	82	n/a	n/a	21.95	n/a	n/a	0.0002865	NP Inter (normality) 1 of 2
Total Dissolved Solids [TDS] (mg/L)	n/a	263	n/a	n/a	6 future	n/a	82	167.4	51.5	0	None	No	0.001254	Param Inter 1 of 2

Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

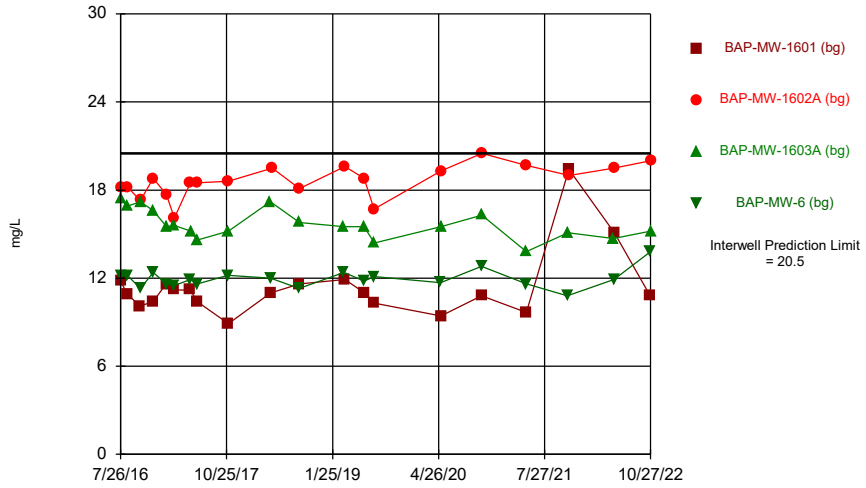
Time Series



Constituent: Boron, total Analysis Run 1/18/2023 5:07 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

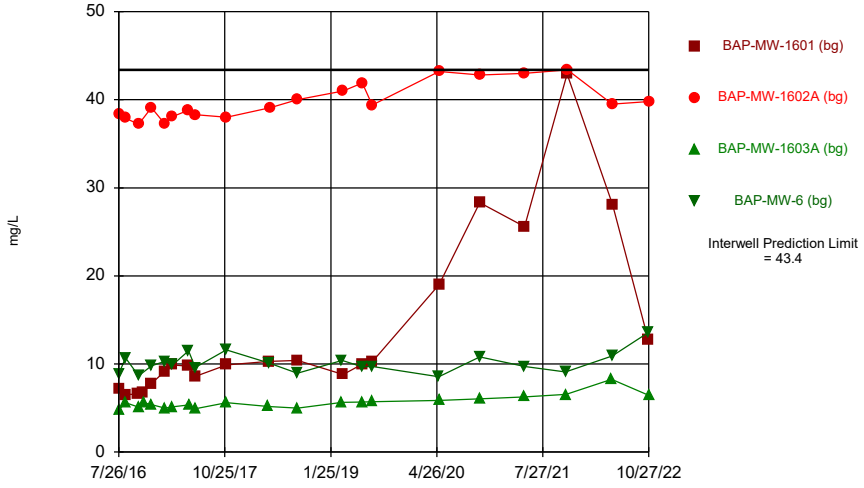
Time Series



Constituent: Calcium, total Analysis Run 1/18/2023 5:07 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

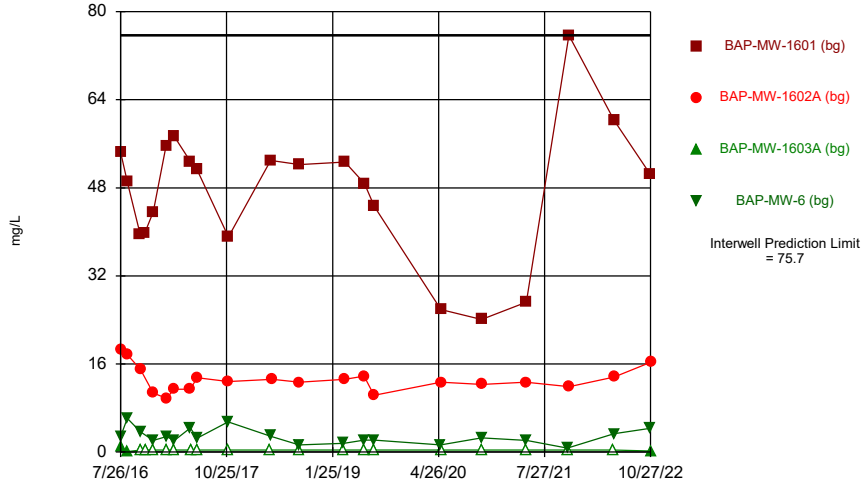
Time Series



Constituent: Chloride, total Analysis Run 1/18/2023 5:07 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

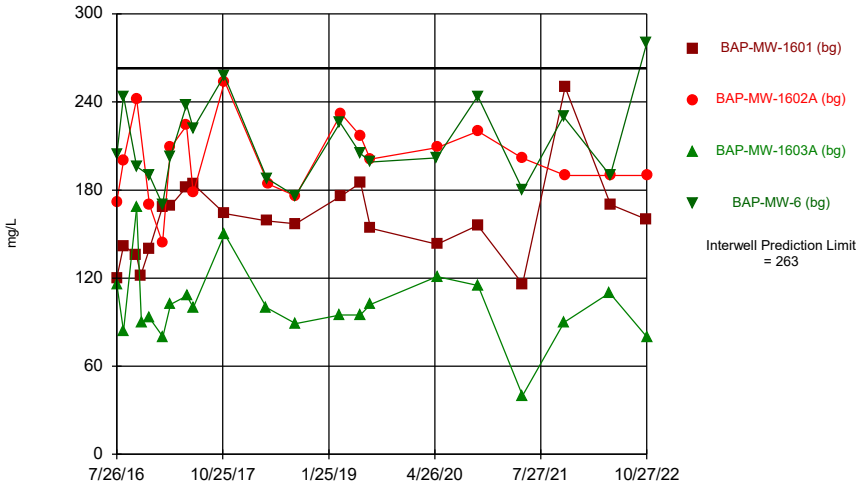
Sanitas™ v.9.6.36 . UG
Hollow symbols indicate censored values.

Time Series



Constituent: Sulfate, total Analysis Run 1/18/2023 5:07 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Time Series

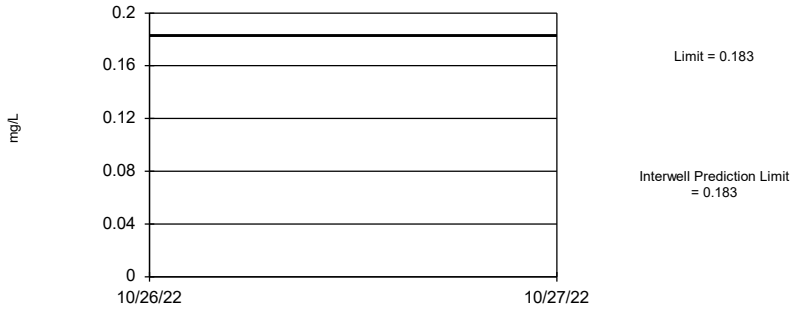


Constituent: Total Dissolved Solids [TDS] Analysis Run 1/18/2023 5:07 PM View: Appendix III - Interwell P
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Interwell Non-parametric



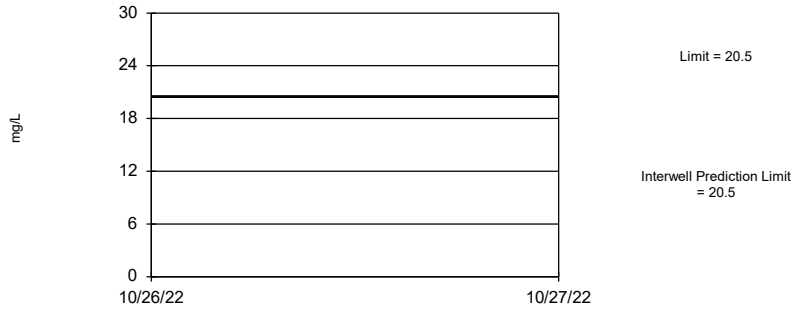
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 80 background values. 32.5% NDs. Annual per-constituent alpha = 0.00358. Individual comparison alpha = 0.0002988 (1 of 2). Assumes 6 future values.

Constituent: Boron, total Analysis Run 1/18/2023 5:08 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Interwell Non-parametric



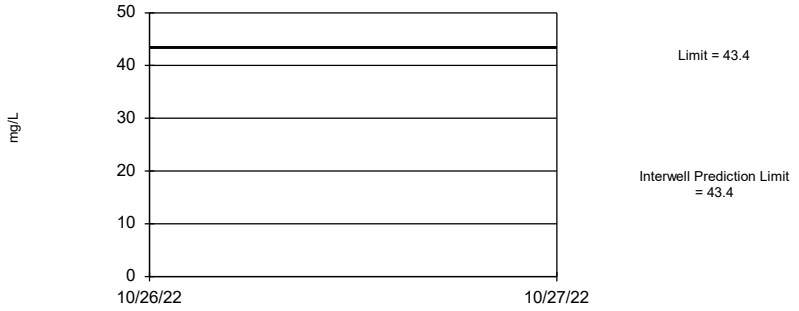
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 80 background values. Annual per-constituent alpha = 0.00358. Individual comparison alpha = 0.0002988 (1 of 2). Assumes 6 future values.

Constituent: Calcium, total Analysis Run 1/18/2023 5:08 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Interwell Non-parametric



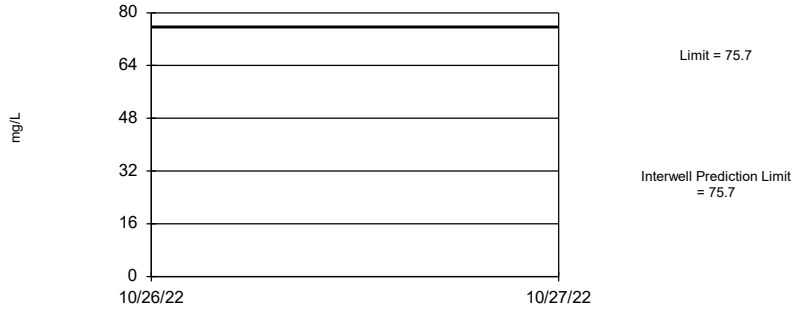
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 82 background values. Annual per-constituent alpha = 0.003433. Individual comparison alpha = 0.0002865 (1 of 2). Assumes 6 future values.

Constituent: Chloride, total Analysis Run 1/18/2023 5:08 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Prediction Limit

Interwell Non-parametric

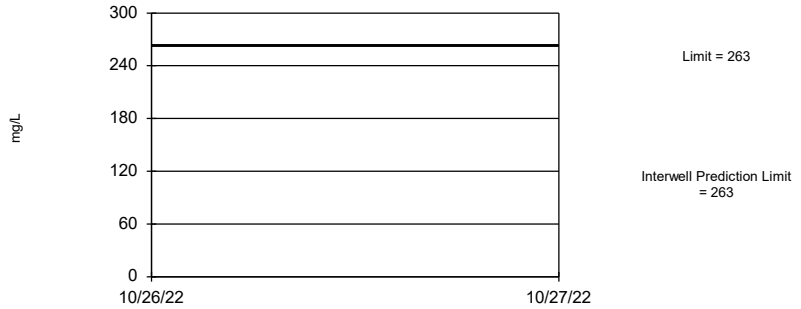


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 82 background values. 21.95% NDs. Annual per-constituent alpha = 0.003433. Individual comparison alpha = 0.0002865 (1 of 2). Assumes 6 future values.

Constituent: Sulfate, total Analysis Run 1/18/2023 5:08 PM View: Appendix III - Interwell PLs
Amos BAP Client: Geosyntec Data: Amos BAP

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=167.4, Std. Dev.=51.5, n=82. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9821, critical = 0.959. Kappa = 1.855 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Assumes 6 future values.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/18/2023 5:08 PM View: Appendix III - Interwell P

Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE H
UTL

Upper Tolerance Limits Summary Table

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/13/2023, 3:49 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	0.00017	n/a	n/a	n/a	n/a	88	36.36	n/a	0.01096	NP Inter(normality)
Arsenic, total (mg/L)	0.0903	n/a	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Barium, total (mg/L)	0.303	n/a	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Beryllium, total (mg/L)	0.00008217	n/a	n/a	n/a	n/a	88	15.91	sqrt(x)	0.05	Inter
Cadmium, total (mg/L)	0.00003	n/a	n/a	n/a	n/a	88	37.5	n/a	0.01096	NP Inter(normality)
Chromium, total (mg/L)	0.001826	n/a	n/a	n/a	n/a	87	0	x^(1/3)	0.05	Inter
Cobalt, total (mg/L)	0.015	n/a	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.546	n/a	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.31	n/a	n/a	n/a	n/a	94	1.064	n/a	0.008054	NP Inter(normality)
Lead, total (mg/L)	0.004853	n/a	n/a	n/a	n/a	88	4.545	ln(x)	0.05	Inter
Lithium, total (mg/L)	0.02	n/a	n/a	n/a	n/a	88	13.64	n/a	0.01096	NP Inter(normality)
Mercury, total (mg/L)	0.000005	n/a	n/a	n/a	n/a	52	92.31	n/a	0.06944	NP Inter(NDs)
Molybdenum, total (mg/L)	0.002082	n/a	n/a	n/a	n/a	88	9.091	sqrt(x)	0.05	Inter
Selenium, total (mg/L)	0.0005	n/a	n/a	n/a	n/a	88	26.14	n/a	0.01096	NP Inter(normality)
Thallium, total (mg/L)	0.000224	n/a	n/a	n/a	n/a	84	54.76	n/a	0.01345	NP Inter(NDs)

FIGURE I

GWPS

AMOS BAP GWPS				
Constituent Name	**MCL**	**CCR Rule-Specified**	**Background**	**GWPS**
Antimony, Total (mg/L)	0.006		0.00017	0.006
Arsenic, Total (mg/L)	0.01		0.09	0.09
Barium, Total (mg/L)	2		0.3	2
Beryllium, Total (mg/L)	0.004		0.000082	0.004
Cadmium, Total (mg/L)	0.005		0.00003	0.005
Chromium, Total (mg/L)	0.1		0.0018	0.1
Cobalt, Total (mg/L)		0.006	0.015	0.015
Combined Radium, Total (pCi/L)	5		2.55	5
Fluoride, Total (mg/L)	4		0.31	4
Lead, Total (mg/L)	0.015		0.0049	0.015
Lithium, Total (mg/L)		0.04	0.02	0.04
Mercury, Total (mg/L)	0.002		0.000005	0.002
Molybdenum, Total (mg/L)		0.1	0.0021	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.00022	0.002

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

MCL = Maximum Contaminant Level

CCR = Coal Combustion Residual

GWPS - Groundwater Protection Standard

FIGURE J
Confidence Intervals

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

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/17/2023, 9:50 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Std. Dev.	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	BAP-MW-1	0.0001	0.00002	0.006	No	22	0.00005336	40.91	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-1604	0.0001	0.00003	0.006	No	22	0.00003588	45.45	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-1605	0.0000308	0.000009619	0.006	No	22	0.00005889	40.91	x^(1/3)	0.01	Param.
Antimony, total (mg/L)	BAP-MW-1606	0.00001961	0.00001068	0.006	No	22	0.00003218	22.73	ln(x)	0.01	Param.
Antimony, total (mg/L)	BAP-MW-4	0.0001	0.00003	0.006	No	22	0.00003454	45.45	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-5	0.0001	0.00003	0.006	No	22	0.00003695	40.91	No	0.01	NP (normality)
Arsenic, total (mg/L)	BAP-MW-1	0.0001364	0.00009999	0.09	No	22	0.0000339	0	No	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1604	0.005064	0.004135	0.09	No	22	0.0008662	0	No	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1605	0.003937	0.003098	0.09	No	22	0.0008706	0	ln(x)	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1606	0.00343	0.00258	0.09	No	22	0.001433	0	No	0.01	NP (normality)
Arsenic, total (mg/L)	BAP-MW-4	0.00787	0.002599	0.09	No	22	0.005936	0	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-5	0.00358	0.00277	0.09	No	22	0.0009042	0	No	0.01	NP (normality)
Barium, total (mg/L)	BAP-MW-1	0.02774	0.02562	2	No	22	0.001969	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1604	0.1556	0.1374	2	No	22	0.01698	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1605	0.0976	0.0823	2	No	22	0.01425	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1606	0.06606	0.05339	2	No	22	0.0118	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-4	0.09602	0.08794	2	No	22	0.007528	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-5	0.166	0.14	2	No	22	0.03686	0	No	0.01	NP (normality)
Beryllium, total (mg/L)	BAP-MW-1	0.0001298	0.0001174	0.004	No	22	0.00001149	0	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-1604	0.000054	0.000039	0.004	No	21	0.00001277	0	No	0.01	NP (normality)
Beryllium, total (mg/L)	BAP-MW-1605	0.00008953	0.00006166	0.004	No	22	0.00002596	0	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-1606	0.0001142	0.00008345	0.004	No	22	0.00002864	0	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-4	0.00006146	0.00004533	0.004	No	22	0.00001865	0	ln(x)	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-5	0.00005863	0.00004038	0.004	No	22	0.00002009	0	x^(1/3)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-1	0.002706	0.00214	0.005	No	22	0.000527	0	No	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-1604	0.00002	0.000007	0.005	No	22	0.000004131	86.36	No	0.01	NP (NDs)
Cadmium, total (mg/L)	BAP-MW-1605	0.00005	0.000007	0.005	No	22	0.00002129	50	No	0.01	NP (normality)
Cadmium, total (mg/L)	BAP-MW-1606	0.0002451	0.0001653	0.005	No	22	0.00007437	0	No	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-4	0.0001388	0.00005552	0.005	No	22	0.0001533	0	ln(x)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-5	0.00002	0.000006	0.005	No	22	0.000006667	36.36	No	0.01	NP (normality)
Chromium, total (mg/L)	BAP-MW-1	0.0003612	0.0001463	0.1	No	22	0.0002734	0	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1604	0.001058	0.0006642	0.1	No	22	0.0003664	0	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1605	0.0004988	0.0002747	0.1	No	22	0.0002087	0	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1606	0.000964	0.0004826	0.1	No	22	0.0004484	0	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-4	0.0004267	0.0002574	0.1	No	22	0.000226	0	ln(x)	0.01	Param.
Chromium, total (mg/L)	BAP-MW-5	0.0003374	0.0001872	0.1	No	22	0.0002029	0	ln(x)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1	0.01591	0.01249	0.015	No	22	0.003187	0	No	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1604	0.0006646	0.0004115	0.015	No	22	0.0003738	0	ln(x)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1605	0.0103	0.00914	0.015	No	22	0.005738	0	No	0.01	NP (normality)
Cobalt, total (mg/L)	BAP-MW-1606	0.01492	0.01201	0.015	No	22	0.002708	0	No	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-4	0.01927	0.009166	0.015	No	22	0.0178	0	ln(x)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-5	0.001218	0.001029	0.015	No	22	0.0001755	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1	1.204	0.6476	5	No	23	0.5612	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1604	1.373	0.7494	5	No	23	0.6763	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1605	1.447	0.761	5	No	23	1.088	0	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1606	1.304	0.6414	5	No	23	0.6338	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-4	1.234	0.6252	5	No	23	0.6424	0	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-5	1.357	0.8519	5	No	23	0.4833	0	No	0.01	Param.
Fluoride, total (mg/L)	BAP-MW-1	0.04	0.02	4	No	23	0.01472	21.74	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-1604	0.09723	0.0664	4	No	24	0.03514	0	x^(1/3)	0.01	Param.
Fluoride, total (mg/L)	BAP-MW-1605	0.06	0.03	4	No	24	0.02102	37.5	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-1606	0.06	0.03	4	No	23	0.01806	56.52	No	0.01	NP (NDs)
Fluoride, total (mg/L)	BAP-MW-4	0.06	0.04	4	No	23	0.01224	0	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-5	0.05	0.03	4	No	23	0.008245	0	No	0.01	NP (normality)
Lead, total (mg/L)	BAP-MW-1	0.00013	0.00007	0.015	No	22	0.00023	9.091	No	0.01	NP (normality)
Lead, total (mg/L)	BAP-MW-1604	0.0005951	0.0002285	0.015	No	22	0.0004054	0	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-1605	0.0003261	0.0001146	0.015	No	22	0.0002434	0	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-1606	0.0008435	0.0004078	0.015	No	22	0.0004059	0	No	0.01	Param.
Lead, total (mg/L)	BAP-MW-4	0.0003711	0.0001945	0.015	No	22	0.0001824	0	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-5	0.000205	0.00007274	0.015	No	22	0.0001903	13.64	x^(1/3)	0.01	Param.
Lithium, total (mg/L)	BAP-MW-1	0.005	0.00258	0.04	No	22	0.004208	9.091	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1604	0.006	0.000475	0.04	No	22	0.01131	18.18	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1605	0.006	0.00243	0.04	No	22	0.003928	9.091	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1606	0.007	0.00239	0.04	No	22	0.004432	13.64	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-4	0.003	0.00151	0.04	No	22	0.004529	9.091	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-5	0.003827	0.001379	0.04	No	22	0.004499	9.091	ln(x)	0.01	Param.
Mercury, total (mg/L)	BAP-MW-1	0.000005	0.000002	0.002	No	13	8.3e-7	92.31	No	0.01	NP (NDs)
Mercury, total (mg/L)	BAP-MW-1604	0.000005	0.000002	0.002	No	13	8.3e-7	92.31	No	0.01	NP (NDs)

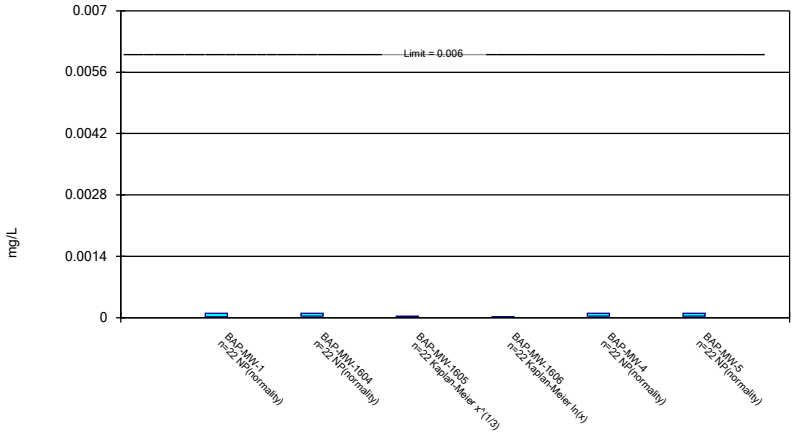
Appendix IV - Confidence Intervals - All Results (No Significant)

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/17/2023, 9:50 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Std. Dev.	%NDs	Transform	Alpha	Method
Mercury, total (mg/L)	BAP-MW-1606	0.000005	0.000002	0.002	No	13	8.3e-7	92.31	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	BAP-MW-1	0.0009018	0.0003179	0.1	No	22	0.0005621	31.82	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-1604	0.00074	0.00021	0.1	No	22	0.0007357	22.73	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-1605	0.0005	0.0002	0.1	No	22	0.0001736	50	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-1606	0.0005	0.00012	0.1	No	22	0.0001924	45.45	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-4	0.0006907	0.0002119	0.1	No	20	0.0008137	25	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-5	0.0008648	0.0002142	0.1	No	22	0.001036	22.73	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1	0.0002	0.00009	0.05	No	22	0.00005656	9.091	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1604	0.0002	0.00013	0.05	No	22	0.00005169	0	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1605	0.0001148	0.00006542	0.05	No	22	0.00005207	4.545	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1606	0.0005	0.00009	0.05	No	22	0.0001853	31.82	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-4	0.0002	0.00007	0.05	No	22	0.0001793	22.73	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-5	0.0005	0.00008	0.05	No	22	0.0002114	68.18	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1	0.0002	0.00004	0.002	No	21	0.00008023	47.62	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-1604	0.0002	0.00002	0.002	No	21	0.00008729	66.67	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1605	0.0002	0.000062	0.002	No	21	0.0000746	76.19	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1606	0.0002	0.00002	0.002	No	21	0.00009158	52.38	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-4	0.0002	0.000068	0.002	No	21	0.00007166	42.86	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-5	0.0002	0.00002	0.002	No	21	0.00008789	66.67	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

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

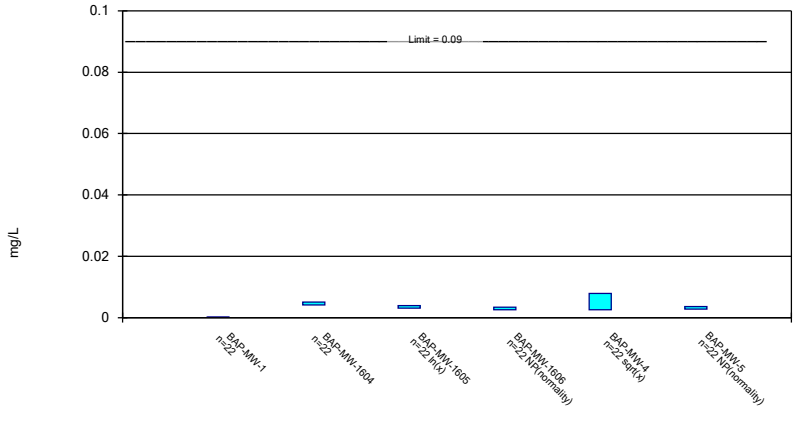


Constituent: Antimony, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

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

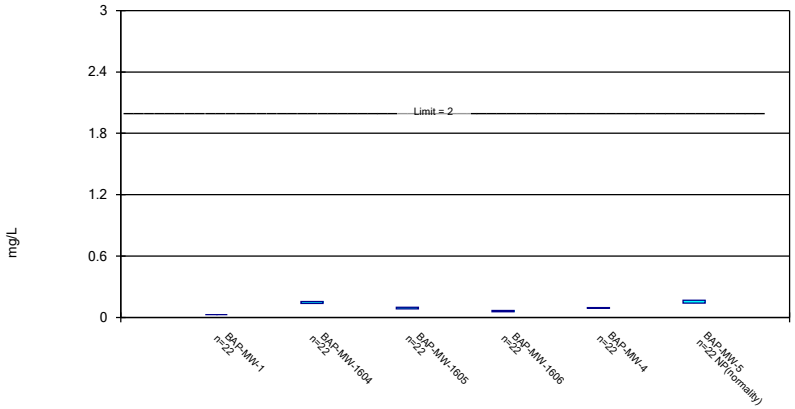


Constituent: Arsenic, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

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

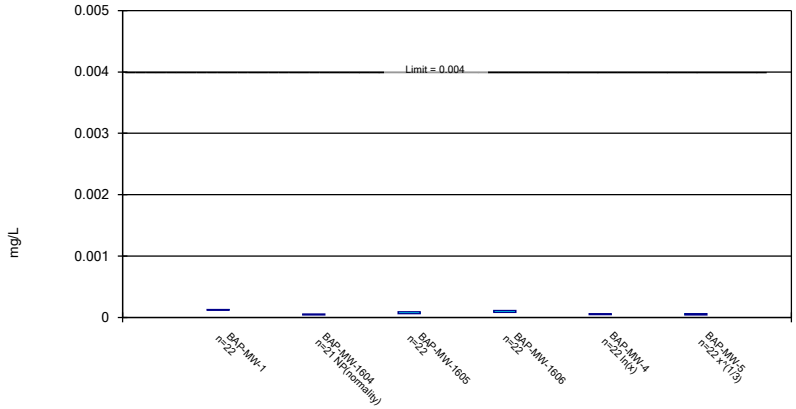


Constituent: Barium, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

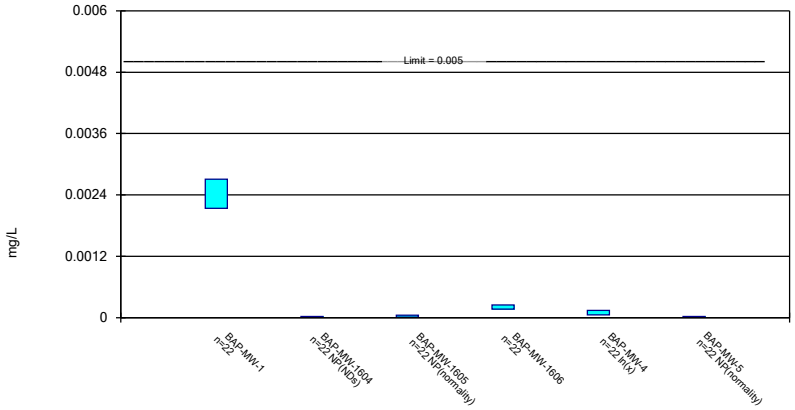
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

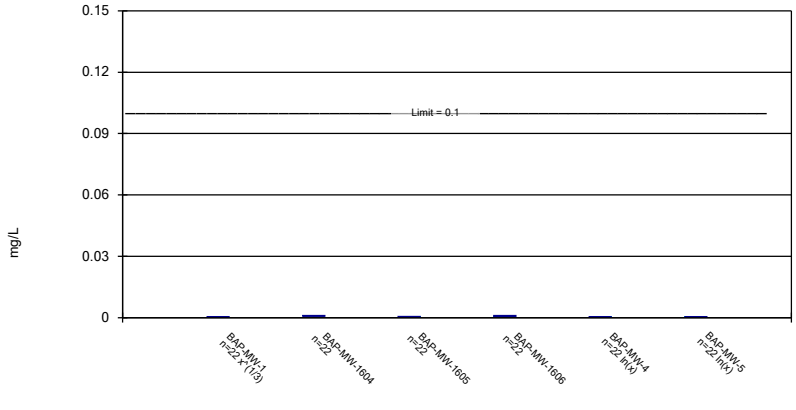
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric Confidence Interval

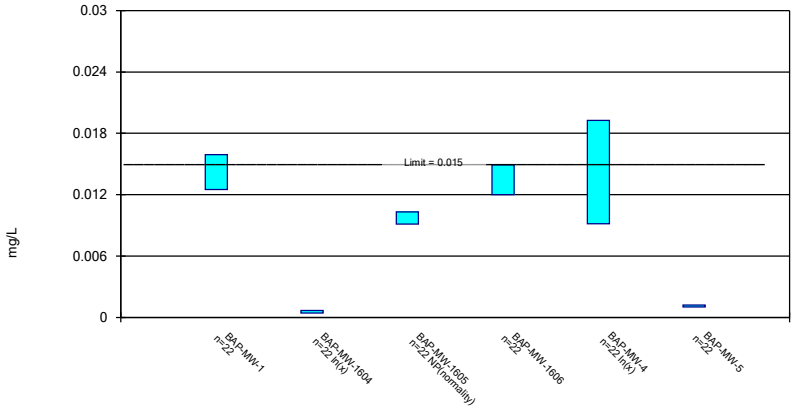
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

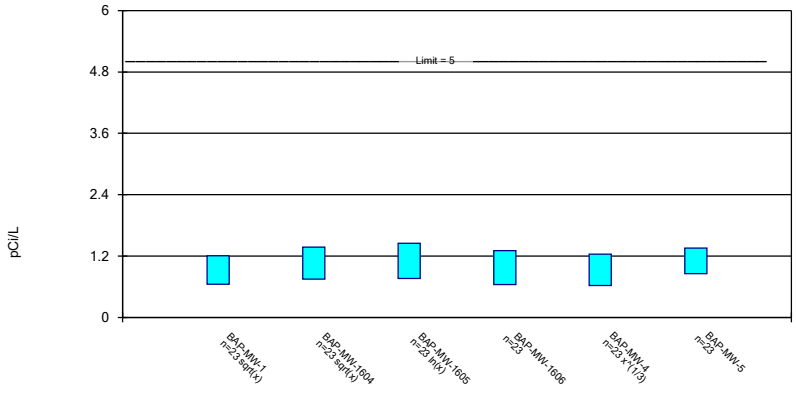
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric Confidence Interval

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

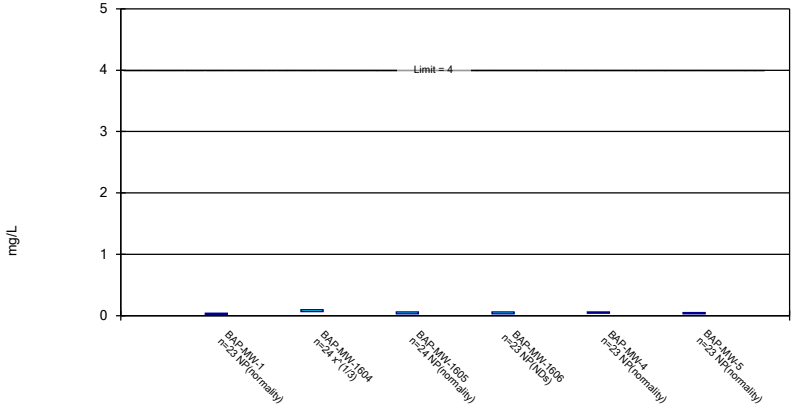


Constituent: Combined Radium 226 + 228 Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

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

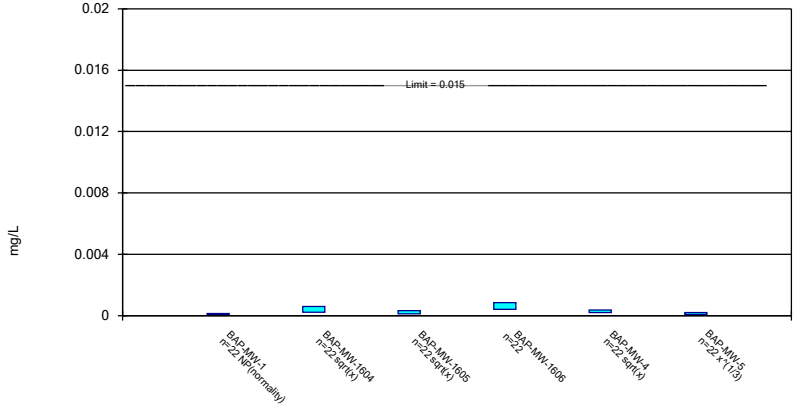


Constituent: Fluoride, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

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

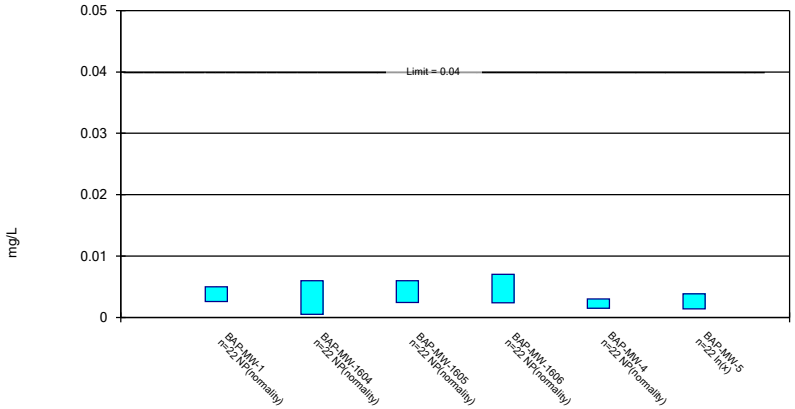


Constituent: Lead, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

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

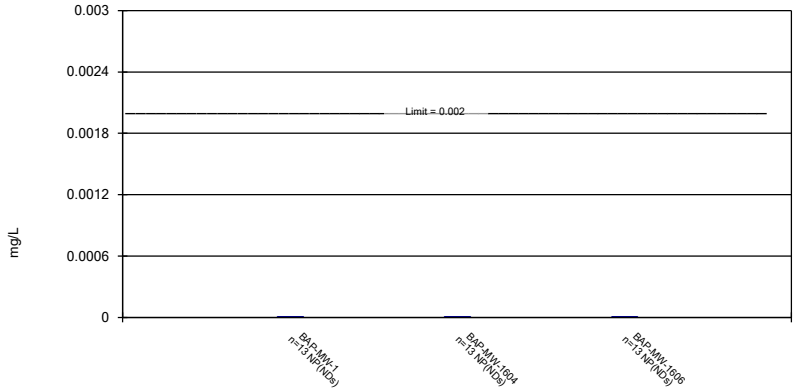


Constituent: Lithium, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Non-Parametric Confidence Interval

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

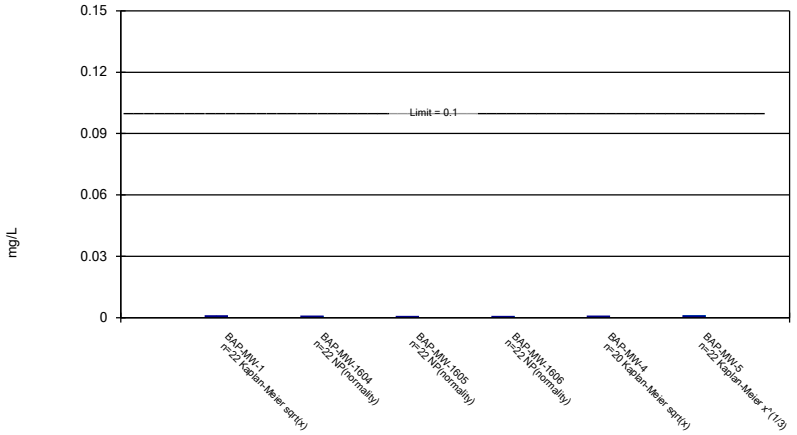


Constituent: Mercury, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

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

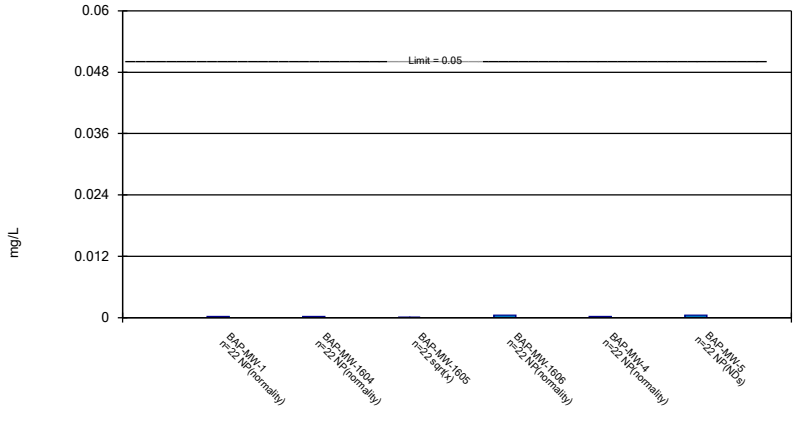


Constituent: Molybdenum, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Parametric and Non-Parametric (NP) Confidence Interval

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

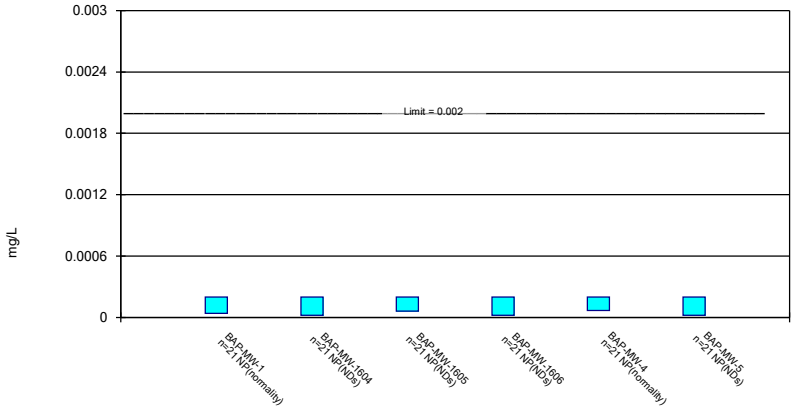


Constituent: Selenium, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.36 . UG

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 1/17/2023 9:49 PM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY, BOTTOM ASH POND

Amos Plant

Winfield, West Virginia

Prepared for

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

Prepared by

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

Project Number: CHA8500B

September 11, 2023

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LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

BAP	Bottom Ash Pond
CCR	coal combustion residuals
CFR	Code of Federal Regulations
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/L	milligrams per liter
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
TDS	total dissolved solids
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 Amos Power Plant in Winfield, West Virginia. Recent groundwater monitoring results were used to identify concentrations of Appendix IV constituents that are above site-specific groundwater protection standards (GWPSs).

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for calcium, chloride, total dissolved solids (TDS), and sulfate at the BAP. An alternative source was not identified following the detection monitoring events, so the BAP has been in assessment monitoring since 2018. During the most recent assessment monitoring event, completed in October 2022, no statistically significant levels (SSLs) were identified and the unit remained in assessment monitoring (Geosyntec 2023).

An annual sampling event at the BAP for the Appendix IV parameters required by 40 CFR 257.95(b) was completed in February 2023, and a semiannual sampling event for the 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.

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

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

2. BOTTOM ASH POND EVALUATION

2.1 Data Validation and QA/QC

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

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

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas v.9.6.33 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 2020), except where noted below. Time series plots and results for all completed statistical tests are provided in Attachment B.

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

2.2.1 Evaluation of Potential Appendix IV SSLs

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

No SSLs were identified at the Amos BAP.

2.2.2 Evaluation of Potential Appendix III SSIs

The Appendix III results were analyzed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data collected during the 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 concentrations were above the upper prediction limits (UPLs) as noted:

- Calcium concentrations were above the interwell UPL of 20.5 milligrams per liter (mg/L) at MW-1 (29.4 mg/L), MW-5 (22.0 mg/L), MW-1605 (37.7 mg/L), and MW-1606 (46.8 mg/L).
- Chloride concentrations were above the interwell UPL of 43.4 mg/L at MW-1 (48.8 mg/L), MW-1605 (80.3 mg/L), and MW-1606 (170 mg/L).
- Sulfate concentrations were above the interwell UPL of 75.7 mg/L at MW-1 (144 mg/L), MW-1605 (200 mg/L), and MW-1606 (183 mg/L).
- TDS concentrations were above the interwell UPL of 263 mg/L at MW-1 (330 mg/L), MW-1605 (450 mg/L), and MW-1606 (550 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 in 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 February 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 GWPS. No SSLs were identified. Appendix III parameters were compared to prediction limits; concentrations of calcium, chloride, sulfate, and TDS were identified above the prediction limits.

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

3. REFERENCES

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

Geosyntec. 2023. *Statistical Analysis Summary – Bottom Ash Pond, Amos Plant, Winfield, West Virginia*. Geosyntec Consultants, Inc. February.

TABLES

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

Parameter	Unit	MW-1		MW-4		MW-5		MW-6		MW-1601	
		2/9/2023	5/26/2023	2/9/2023	5/24/2023	2/8/2023	5/24/2023	2/9/2023	5/25/2023	2/8/2023	5/25/2023
Antimony	µg/L	0.1 U1	0.020 J1	0.1 U1	0.185	0.1 U1	0.018 J1	0.1 U1	0.020 J1	0.1 U1	0.093 J1
Arsenic	µg/L	0.08 J1	0.06 J1	1.19	8.08	3.08	2.89	39.4	31.3	8.79	7.50
Barium	µg/L	22.5	21.5	88.9	83.8	176	202	199	174	99.3	109
Beryllium	µg/L	0.131	0.128	0.045 J1	0.086	0.049 J1	0.053	0.019 J1	0.015 J1	0.034 J1	0.018 J1
Boron	mg/L	0.056	0.088	0.077	0.105	0.037 J1	0.019 J1	0.011 J1	0.010 J1	0.009 J1	0.05 U1
Cadmium	µg/L	1.57	1.71	0.040	0.201	0.006 J1	0.02 U1	0.02 U1	0.02 U1	0.019 J1	0.017 J1
Calcium	mg/L	32.2 M1	29.4	17.3	19.1	18.1	22.0	13.6	12.1	9.84	10.7
Chloride	mg/L	54.4	48.8	18.3	25.7	20.2	39.8	11.7	11.9	13.7	24.9
Chromium	µg/L	0.17 J1	0.58	0.40	0.73	0.37	0.31	0.60	0.43	0.59	0.28 J1
Cobalt	µg/L	17.3	11.2	6.66	22.3	0.973	0.276	12.8	11.3	4.56	4.83
Combined Radium	pCi/L	1.17	0.98	1.22	1.42	1.67	1.09	1.57	1.80	1.35	0.65
Fluoride	mg/L	0.02 J1	0.02 J1	0.05 J1	0.03 J1	0.03 J1	0.03 J1	0.04 J1	0.04 J1	0.03 J1	0.03 J1
Lead	µg/L	0.12 J1	0.06 J1	0.20	0.90	0.05 J1	0.2 U1	0.2 U1	0.07 J1	0.31	0.13 J1
Lithium	mg/L	0.00286	0.0028	0.00163	0.0015	0.00159	0.0018	0.00125	0.0012	0.00183	0.0017
Mercury	µg/L	--	0.005 U1	--	0.005 U1	--	0.005 U1	--	0.005 U1	--	0.005 U1
Molybdenum	µg/L	0.1 J1	0.5 U1	0.1 J1	0.2 J1	0.1 J1	0.5 U1	0.4 J1	0.4 J1	0.5 U1	0.5 U1
Selenium	µg/L	0.5 U1	0.04 J1	0.5 U1	0.09 J1	0.5 U1	0.5 U1	0.5 U1	0.08 J1	0.5 U1	0.04 J1
Sulfate	mg/L	148	144	51.2	69.2	68.1	72.1	3.29	3.5	47.1	51.2
Thallium	µg/L	0.2 U1	0.02 J1	0.2 U1	0.19 J1	0.2 U1	0.2 U1	0.2 U1	0.06 J1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	350	330	190	220	200	220	200	250	150	210
pH	SU	5.13	4.95	5.66	5.57	5.48	5.61	5.74	5.71	5.49	5.38

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

Parameter	Unit	MW-1602		MW-1603		MW-1604		MW-1605		MW-1606	
		2/6/2023	5/25/2023	2/7/2023	5/25/2023	2/9/2023	5/26/2023	2/8/2023	5/25/2023	2/8/2023	5/25/2023
Antimony	µg/L	0.02 J1	0.014 J1	0.03 J1	0.026 J1	0.03 J1	0.013 J1	0.02 J1	0.017 J1	0.05 J1	0.035 J1
Arsenic	µg/L	21.0	17.7	88.1	75.9	4.14	4.82	3.09	2.69	7.01	6.21
Barium	µg/L	228	201	238	220	128	138	101	73.5	71.8	65.8
Beryllium	µg/L	0.028 J1	0.008 J1	0.023 J1	0.015 J1	0.059	0.042 J1	0.167	0.071	0.155	0.099
Boron	mg/L	0.024 J1	0.011 J1	0.020 J1	0.01 J1	0.093	0.153	0.049 J1	0.041 J1	0.043 J1	0.039 J1
Cadmium	µg/L	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.007 J1	0.072	0.293	0.759
Calcium	mg/L	19.1	16.9	14.9	13.4	16.1	20.0	39.1	37.7	43.2 M1	46.8
Chloride	mg/L	40.4	39.7	6.61	7.17	22.6	23.2	81.8	80.3	153	170
Chromium	µg/L	0.67	0.31	0.86	0.48	1.77	0.59	1.01	0.25 J1	1.59	0.48
Cobalt	µg/L	0.246	0.131	0.353	0.250	0.540	0.464	8.17	13.1	13.4	13.3
Combined Radium	pCi/L	1.27	0.58	2.20	1.30	1.31	1.31	1.83	1.04	1.39	1.37
Fluoride	mg/L	0.12	0.12	0.23	0.23	0.06	0.06	0.06 U1	0.06 U1	0.06 U1	0.06 U1
Lead	µg/L	0.83	0.20	0.30	0.20	0.58	0.17 J1	0.73	0.14 J1	1.54	0.82
Lithium	mg/L	0.00115	0.0009	0.00049	0.0007	0.00068	0.0003 U1	0.00275	0.0024	0.00332	0.0028
Mercury	µg/L	--	0.005 U1	--	0.005 U1	--	0.005 U1	--	0.005 U1	--	0.005 U1
Molybdenum	µg/L	0.7	0.6	1	0.9	0.2 J1	0.3 J1	0.5 U1	0.5 U1	0.1 J1	0.5 U1
Selenium	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.12 J1	0.11 J1	0.12 J1	0.06 J1	0.14 J1	0.06 J1
Sulfate	mg/L	17.3	18.9	0.4 U1	0.6 U1	0.4 U1	0.6 U1	178	200	186	183
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.02 J1
Total Dissolved Solids	mg/L	210	230	100	130	180	230	430	450	540	550
pH	SU	6.54	6.44	6.64	6.53	5.94	6.16	5.35	5.47	5.2	5.23

Notes:
µg/L: micrograms per liter
J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U1: Not detected at or above method detection limit (MDL). For statistical analysis, parameters that were not detected were replaced with the reporting limit.
--: Not measured

Table 2. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Amos Plant - Bottom Ash Pond

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000170	0.00600
Arsenic, Total (mg/L)	0.0100		0.0903	0.0903
Barium, Total (mg/L)	2.00		0.303	2.00
Beryllium, Total (mg/L)	0.00400		0.0000822	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000300	0.00500
Chromium, Total (mg/L)	0.100		0.00183	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.0150	0.0150
Combined Radium, Total (pCi/L)	5.00		2.55	5.00
Fluoride, Total (mg/L)	4.00		0.310	4.00
Lead, Total (mg/L)	0.0150		0.00485	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0200	0.0400
Mercury, Total (mg/L)	0.00200		0.00000500	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00208	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000224	0.00200

Notes:
1. Calculated UTL (Upper Tolerance Limit) represents site-specific background values.
2. Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.
CCR: Coal Combustion Residuals
GWPS: Groundwater Protection Standard
MCL: Maximum Contaminant Level
mg/l: milligrams per liter
pCi/L: picocuries per liter

Table 3. Appendix III Data Summary
Statistical Analysis Summary
Amos Plant - Bottom Ash Pond

Geosyntec Consultants, Inc.

Analyte	Unit	Description	MW-1	MW-4	MW-5	MW-1604	MW-1605	MW-1606
			5/26/2023	5/24/2023	5/24/2023	5/26/2023	5/25/2023	5/25/2023
Boron	mg/L	Interwell Background Value (UPL)	0.183					
		Analytical Result	0.088	0.105	0.019	0.153	0.041	0.039
Calcium	mg/L	Interwell Background Value (UPL)	20.5					
		Analytical Result	**29.4**	19.1	**22.0**	20.0	**37.7**	**46.8**
Chloride	mg/L	Interwell Background Value (UPL)	43.4					
		Analytical Result	**48.8**	25.7	39.8	23.2	**80.3**	**170**
Fluoride	mg/L	Intrawell Background Value (UPL)	0.0600	0.0700	0.0500	0.160	0.0900	0.0600
		Analytical Result	0.02	0.03	0.03	0.06	0.02	0.02
pH	SU	Intrawell Background Value (UPL)	7.3	7.0	6.3	7.2	6.4	6.8
		Intrawell Background Value (LPL)	4.8	5.3	5.2	5.9	5.1	5.2
		Analytical Result	5.0	5.6	5.6	6.2	5.5	5.2
Sulfate	mg/L	Interwell Background Value (UPL)	75.7					
		Analytical Result	**144**	69.2	72.1	0.1	**200**	**183**
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	263					
		Analytical Result	**330**	220	220	230	**450**	**550**

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Amos 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	West Virginia	09.12.2023
License Number	Licensing State	Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

July 21, 2023

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

Re: Amos Bottom Ash Pond
Assessment Monitoring Summary – 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 through May 2023 at American Electric Power Company's Amos Bottom Ash Pond. 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 began at the site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** BAP-MW-1601, BAP-MW-1602A, BAP-MW-1603A, and BAP-MW-6
- **Downgradient wells:** BAP-MW-1, BAP-MW-1604, BAP-MW-1605, BAP-MW-1606, BAP-MW-4, and BAP-MW-5

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, Groundwater Statistician and Founder of Groundwater Stats Consulting.

The CCR 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

Note that mercury was not sampled during the February 2023 sample event, but was sampled during the May 2023 sample event.

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

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 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.

History of Initial Background Screening Conducted in December 2017

Outlier Analysis

Time series plots were used to identify suspected outliers, or extreme values that would result in limits that are not conservative from a regulatory perspective, in proposed background data. Suspected outliers at all wells for Appendix IV parameters were formally tested using Tukey's box plot method and, when identified, flagged in the computer database with "o" and deselected prior to construction of statistical limits.

Tukey's outlier test noted a few outliers and a summary of that report was submitted with the screening at that time. Any values flagged as outliers may be seen on the summary table following this letter and are plotted in a lighter font on the time series graph. The test identified an outlier for arsenic in well BAP-MW-1604; however, these concentrations were similar to concentrations in neighboring wells and were not flagged as outliers. A substitution of the most recent reporting limit was applied when varying detection limits existed in data.

Seasonality

No true seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made to the data. When seasonal patterns are observed, data may be deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release.

Trend Tests

While trends may be visual, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed a couple statistically significant increasing trends and several statistically significant decreasing trends and a summary of those results were included with the screening. All trends were relatively low in magnitude when compared to average concentrations and data; therefore, no adjustments were required.

Background Update – Conducted in November 2022

Outlier Analysis

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

Tukey's outlier test results and a discussion of flagged values for Appendix IV parameters were included with the background update conducted in November 2022. As mentioned above, a list of flagged values follows this report (Figure C).

Interwell Upper Tolerance Limits

Interwell upper tolerance limits were used to calculate background limits from all available pooled upgradient well data through November 2022 for each Appendix IV parameter (Figure D). For parametric limits a target of 95% confidence and 95% coverage is 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 CCR-Rule specified levels in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure E). The GWPS will be updated during Fall 2023.

Evaluation of Appendix IV Parameters – May 2023

Confidence intervals were then constructed with data through May 2023 on downgradient wells for each of the Appendix IV parameters using the highest limit of the MCL, CCR-Rule specified levels, or background limit as the GWPS as discussed above (Figure F). These intervals were 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 highest and lowest values in background 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. No exceedances were noted for any of the well/constituent pairs. A summary of the confidence interval results follows this letter.

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

Andrew Collins
Project Manager

Kristina Rayner
Senior Statistician

100% Non-Detects

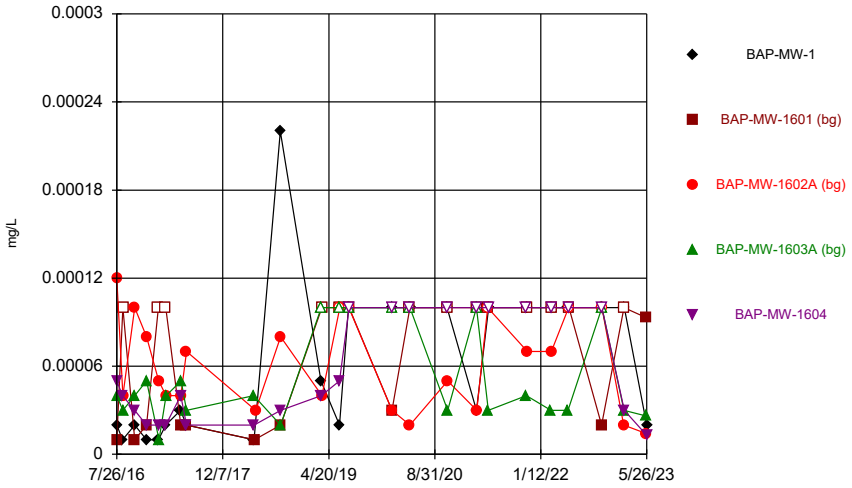
Analysis Run 7/20/2023 7:33 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Mercury, total (mg/L)
BAP-MW-1605, BAP-MW-4, BAP-MW-5

FIGURE A
Time Series

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

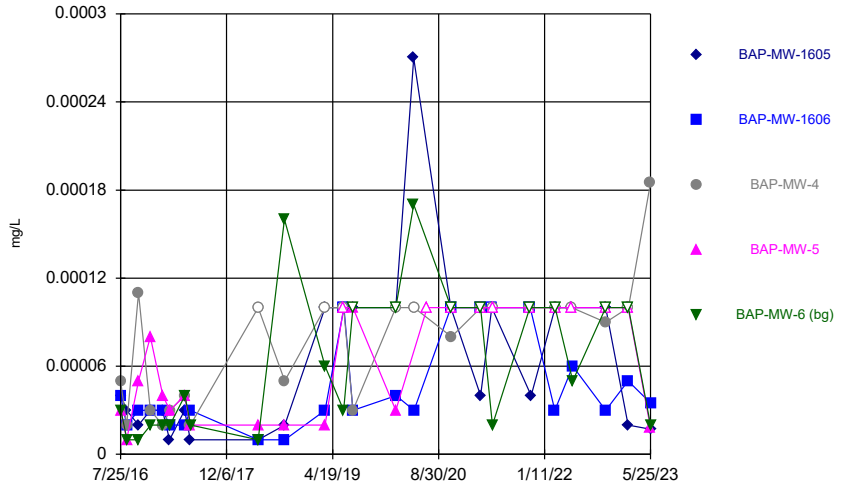
Time Series



Constituent: Antimony, total Analysis Run 7/20/2023 7:27 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

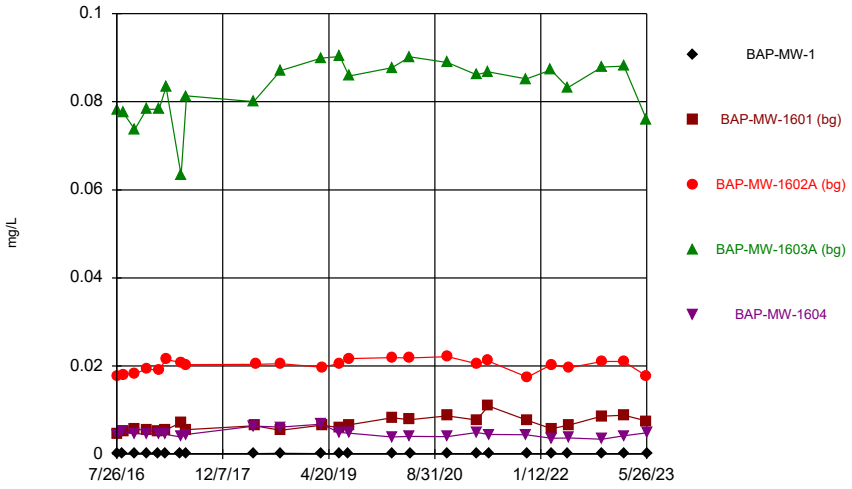
Time Series



Constituent: Antimony, total Analysis Run 7/20/2023 7:27 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series



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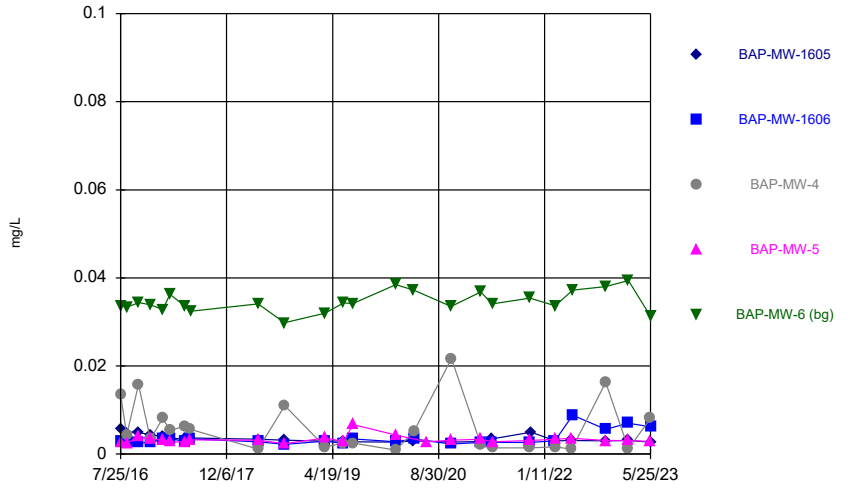
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series



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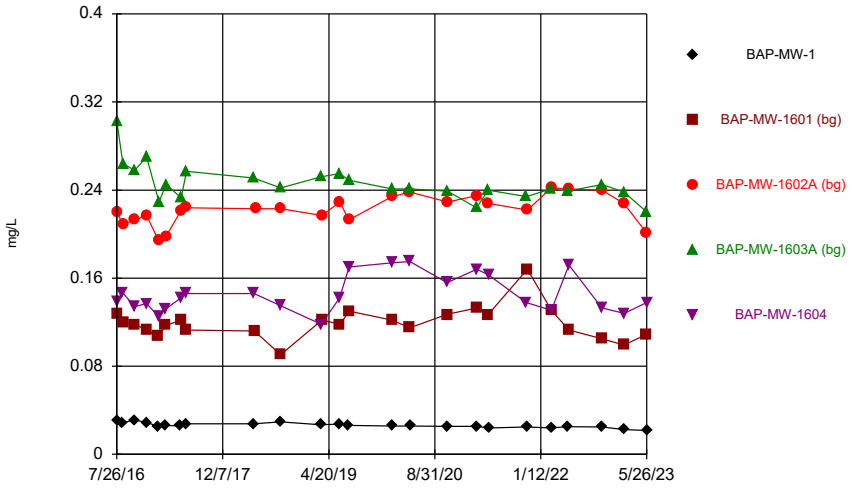
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series



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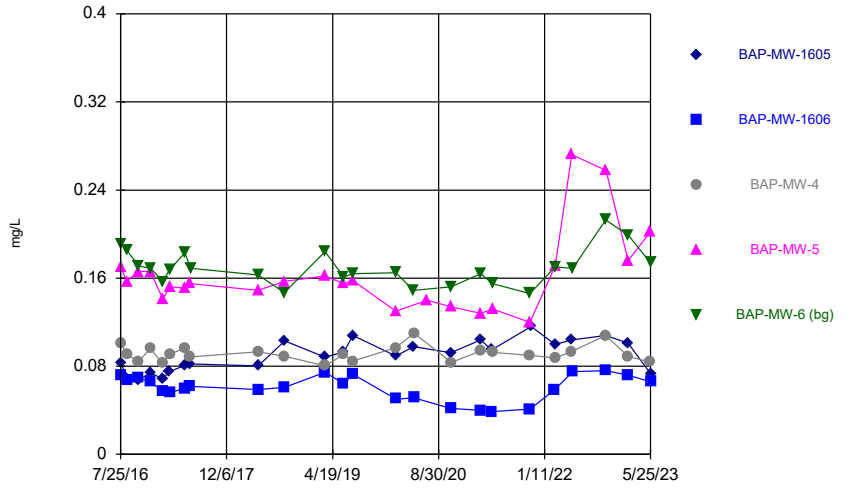
Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series



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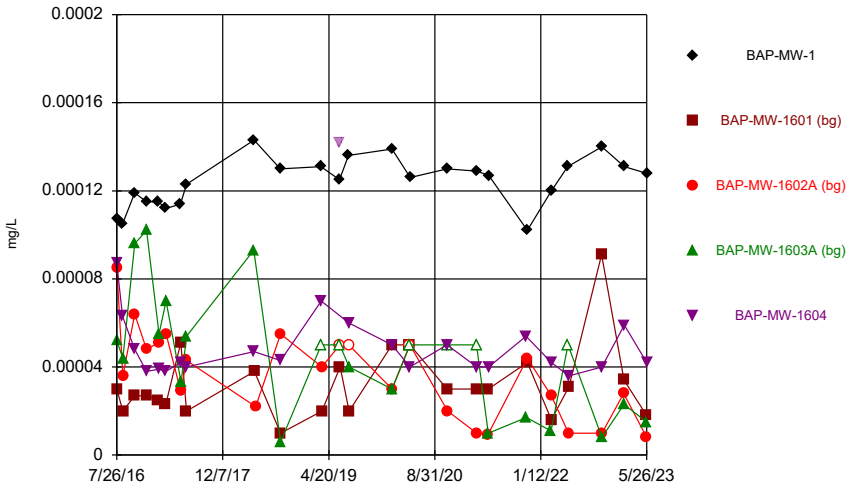
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series



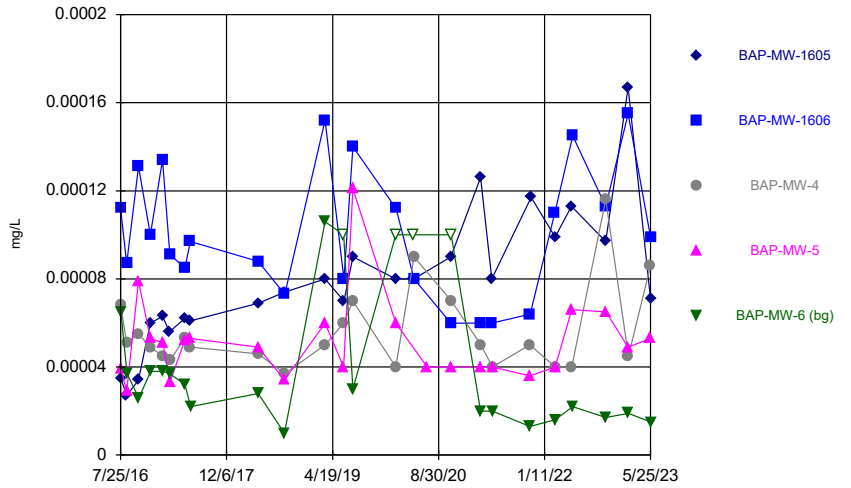
Constituent: Beryllium, total Analysis Run 7/20/2023 7:27 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series



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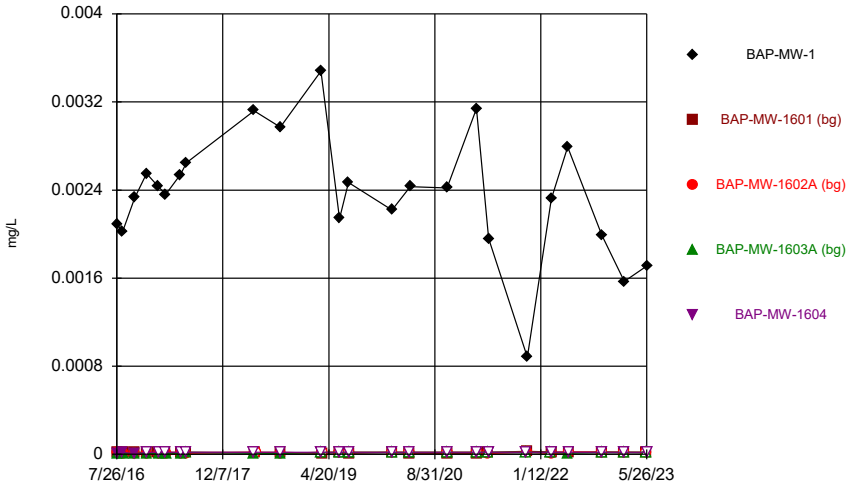
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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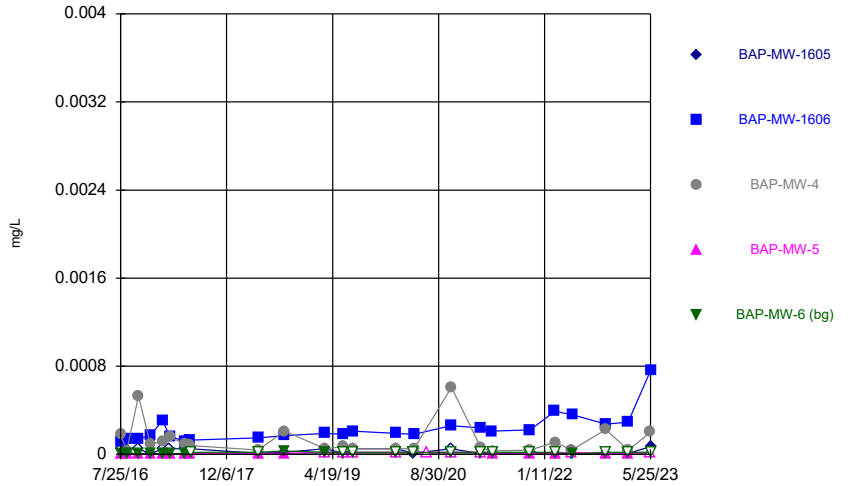
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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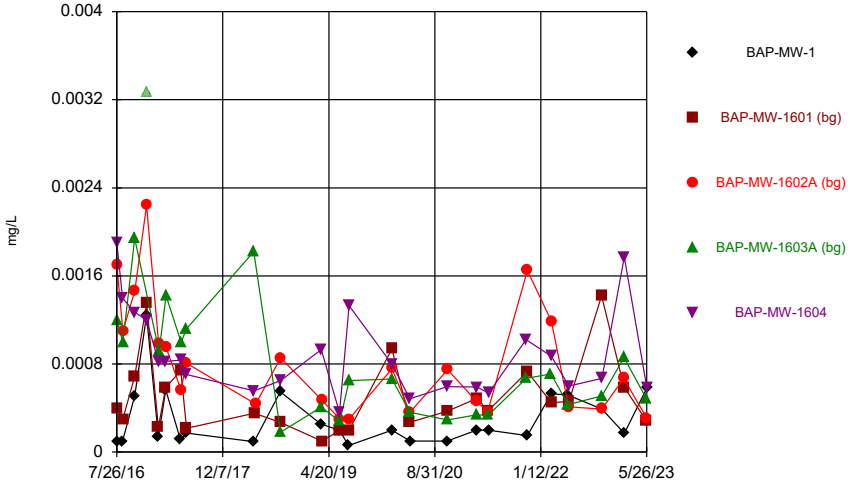
Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

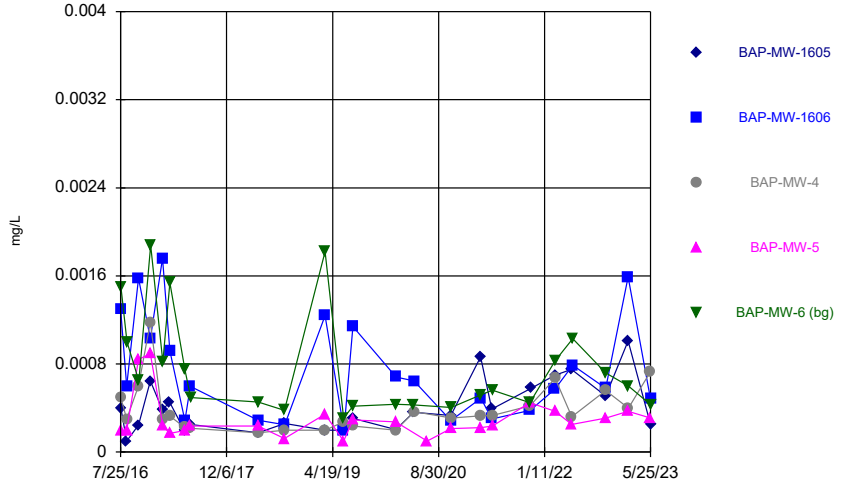
Time Series



Constituent: Chromium, total Analysis Run 7/20/2023 7:27 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

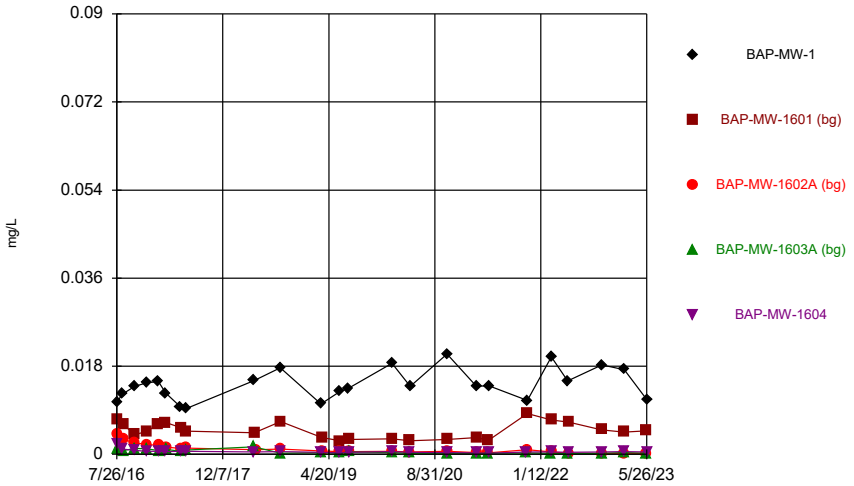
Time Series



Constituent: Chromium, total Analysis Run 7/20/2023 7:27 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series

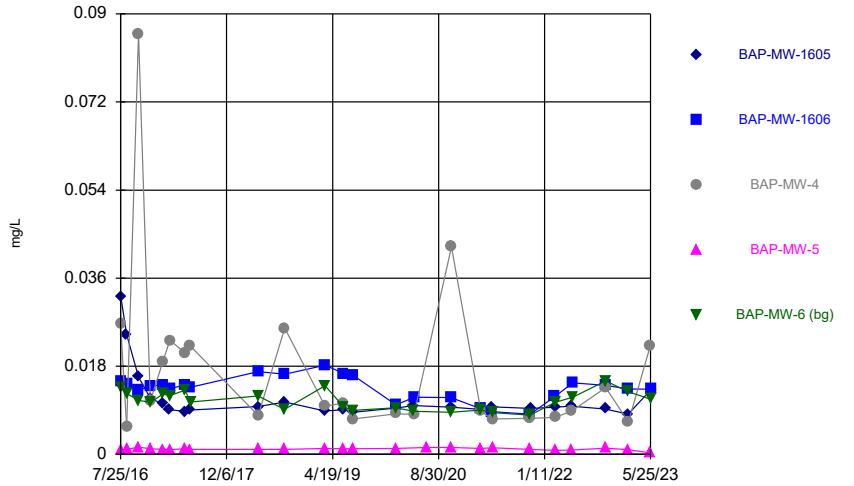


Constituent: Cobalt, total Analysis Run 7/20/2023 7:28 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series

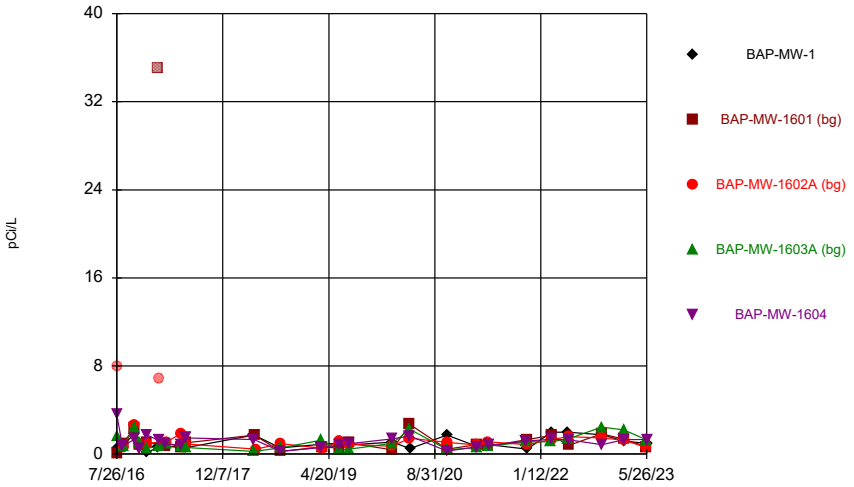


Constituent: Cobalt, total Analysis Run 7/20/2023 7:28 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series

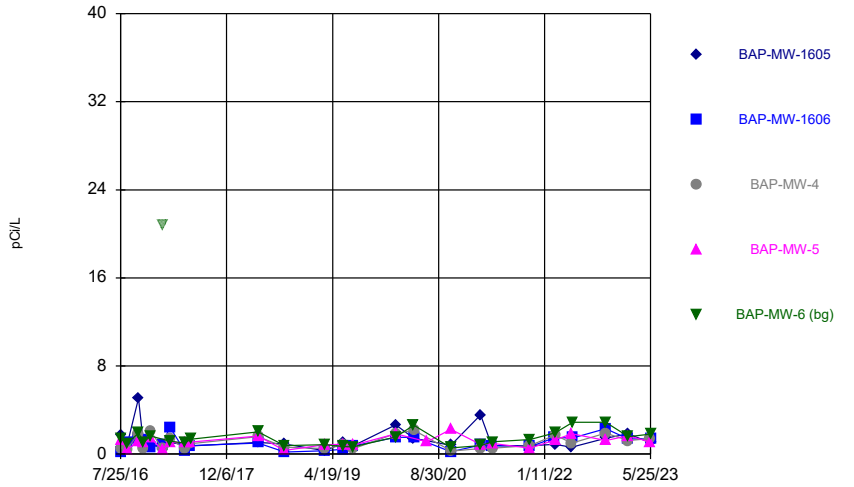


Constituent: Combined Radium 226 + 228 Analysis Run 7/20/2023 7:28 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Time Series

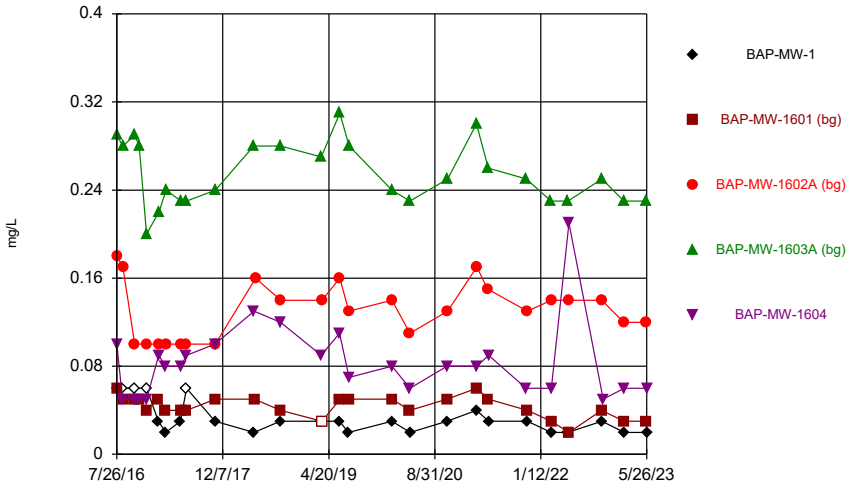


Constituent: Combined Radium 226 + 228 Analysis Run 7/20/2023 7:28 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

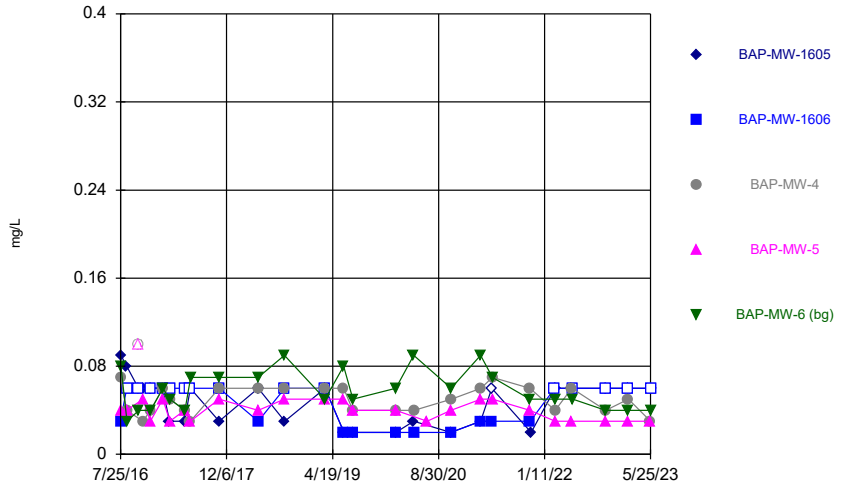
Time Series



Constituent: Fluoride, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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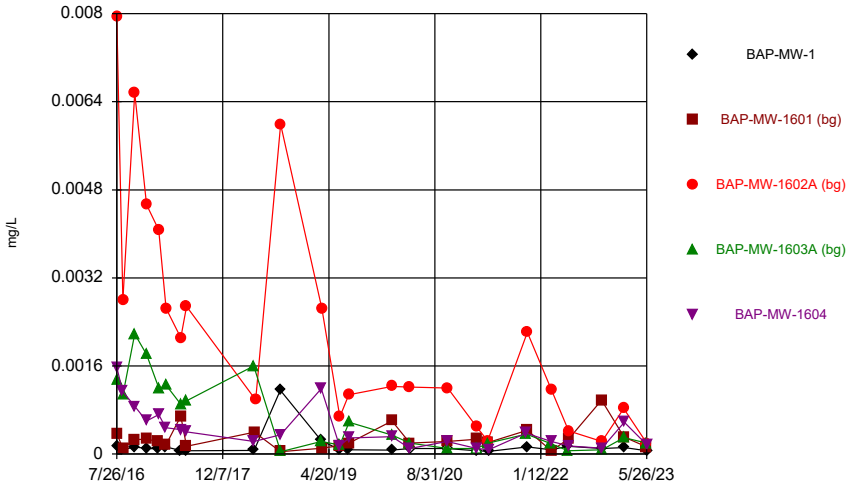
Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

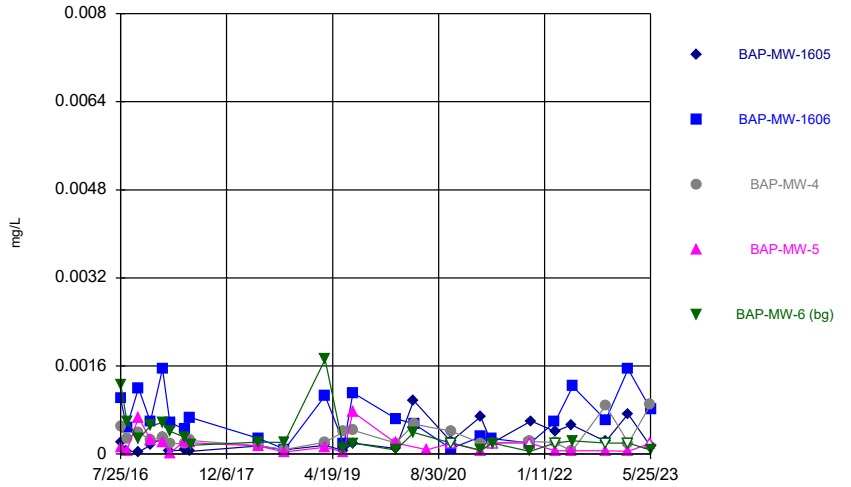
Time Series



Constituent: Lead, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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Amos BAP Client: Geosyntec Data: Amos BAP

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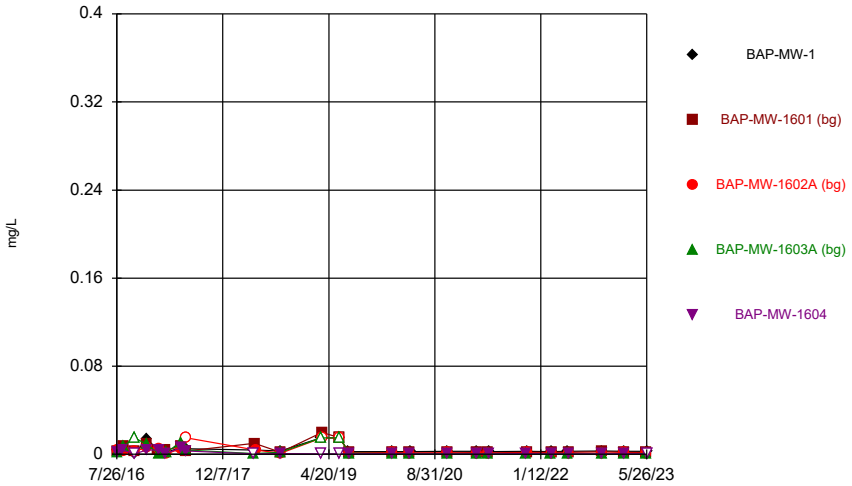
Hollow symbols indicate censored values.

Time Series



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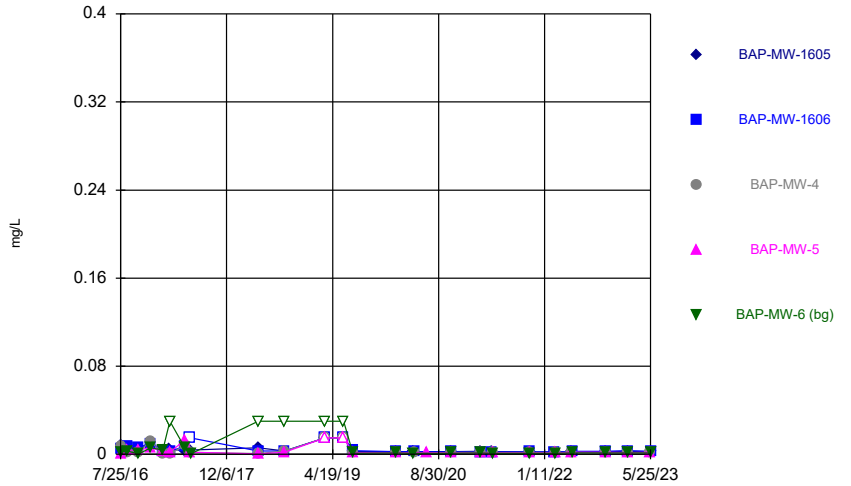
Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

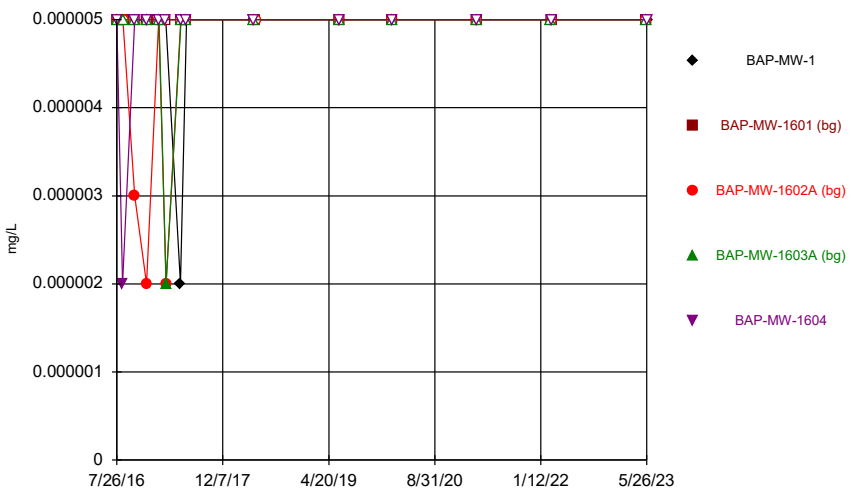
Time Series



Constituent: Lithium, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

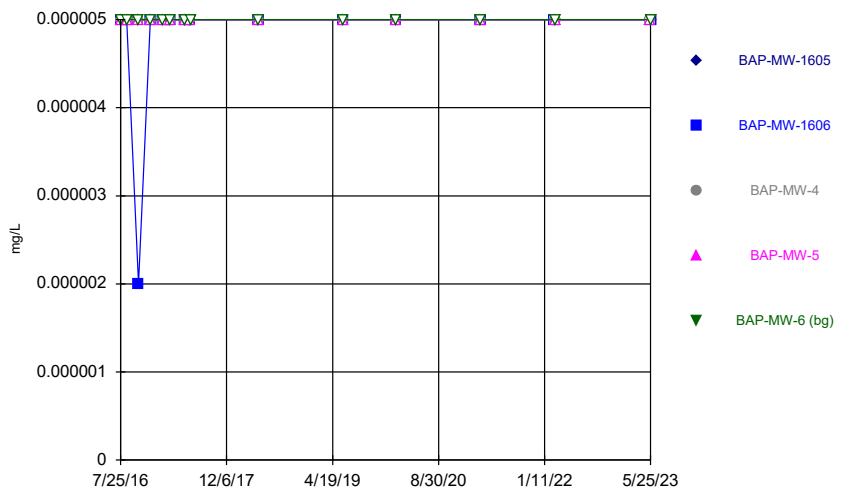
Time Series



Constituent: Mercury, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

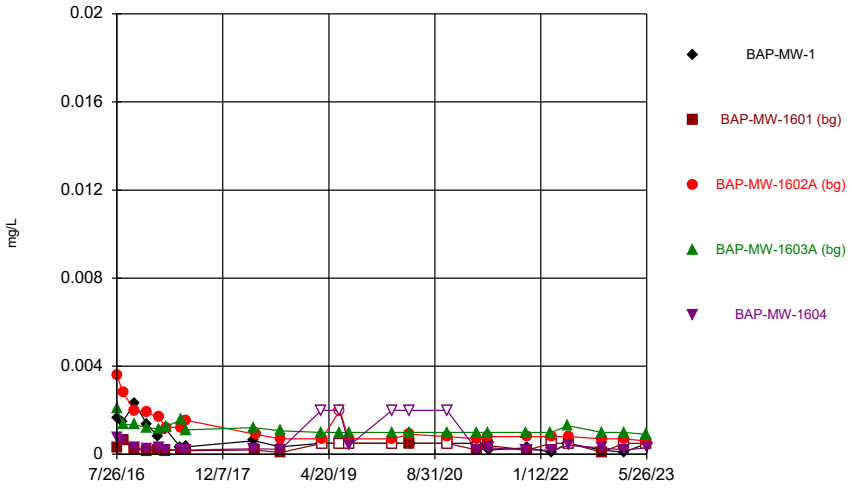
Time Series



Constituent: Mercury, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

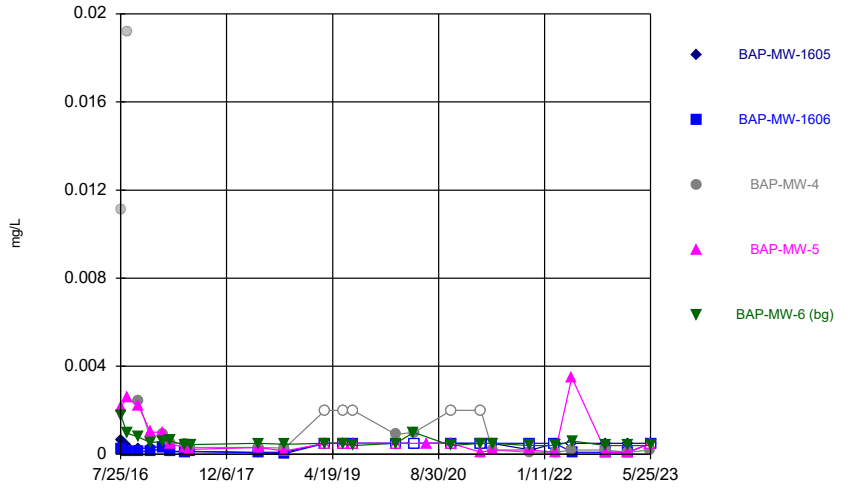
Time Series



Constituent: Molybdenum, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

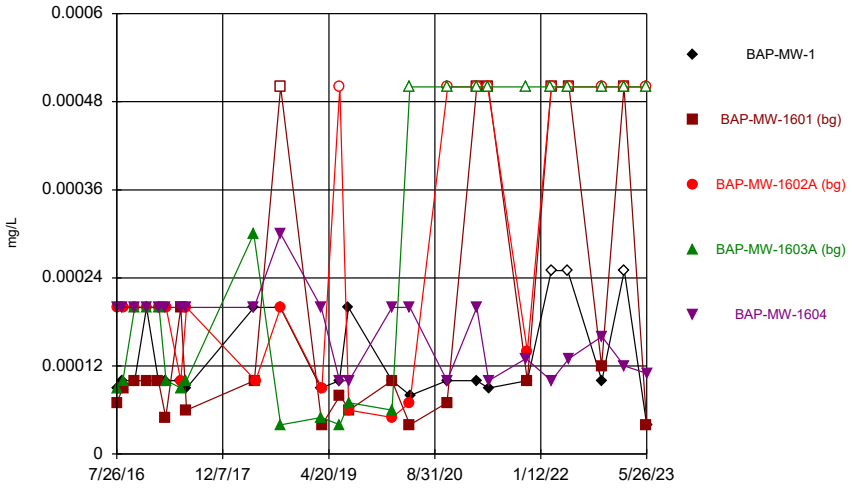
Time Series



Constituent: Molybdenum, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

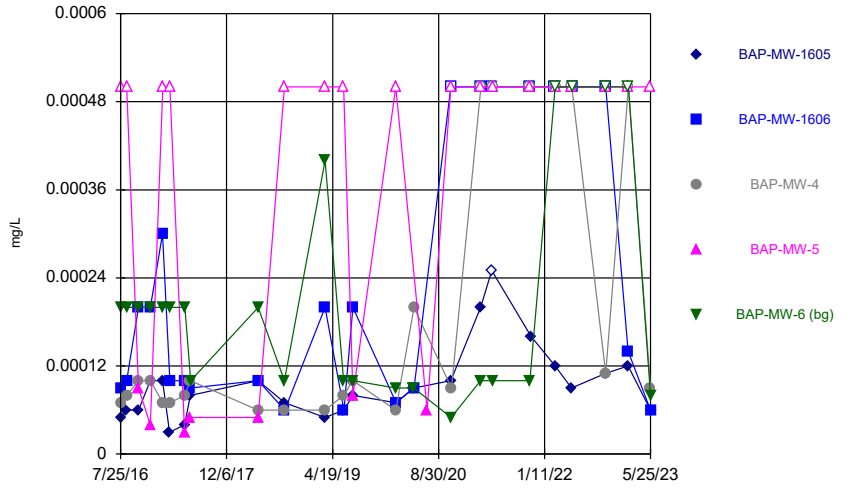
Time Series



Constituent: Selenium, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

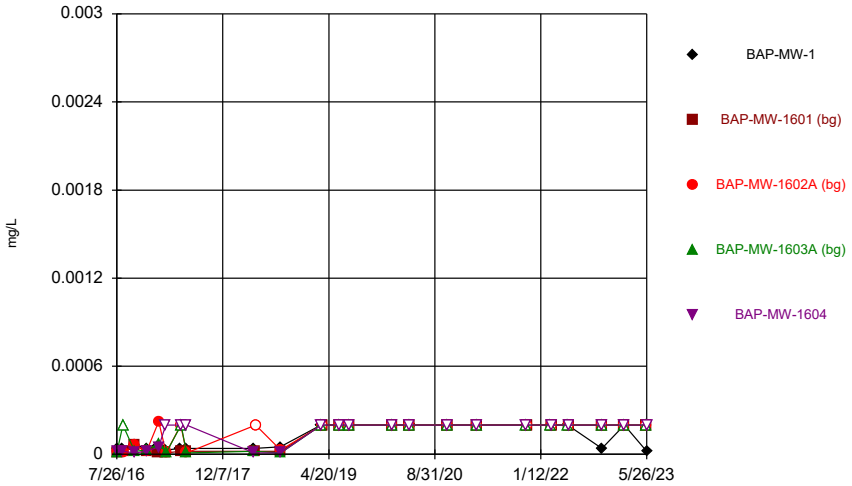
Time Series



Constituent: Selenium, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

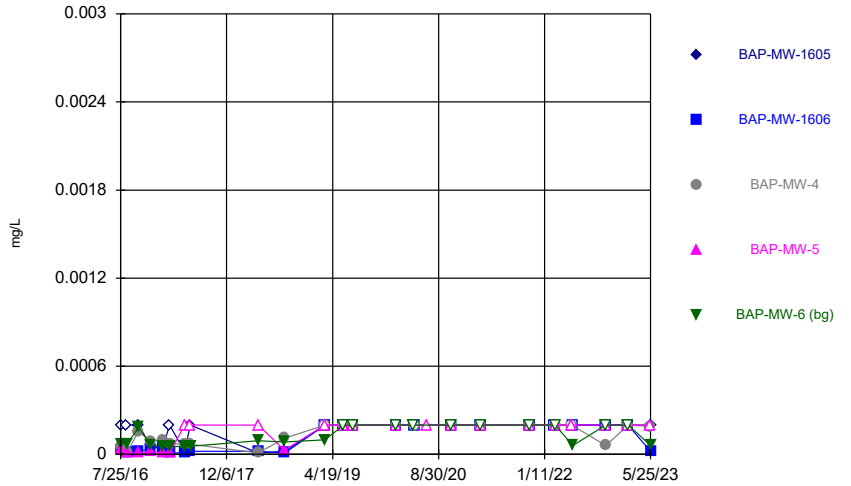
Time Series



Constituent: Thallium, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

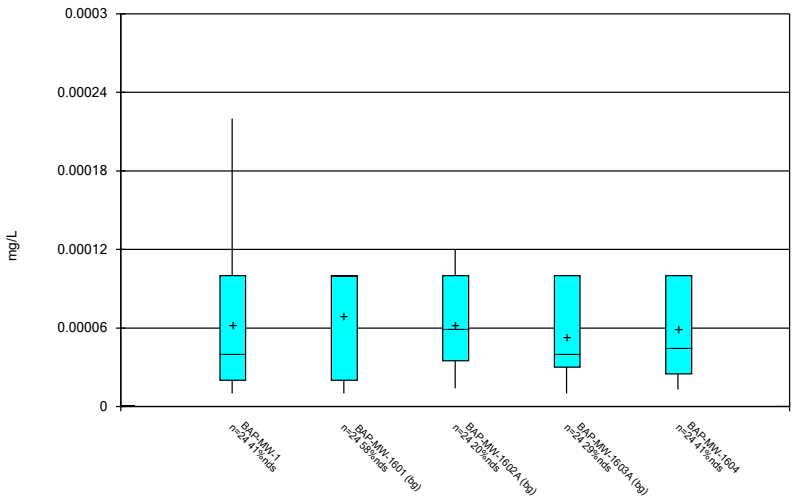
Time Series



Constituent: Thallium, total Analysis Run 7/20/2023 7:28 AM
Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE B
Box Plots

Box & Whiskers Plot

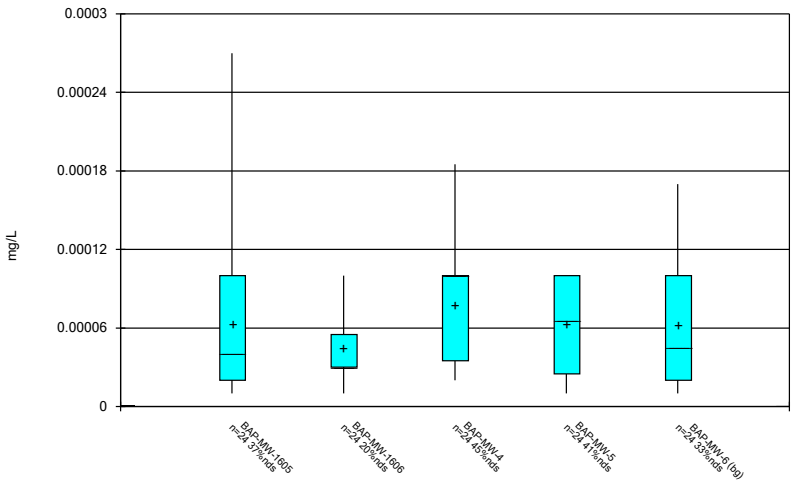


Constituent: Antimony, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

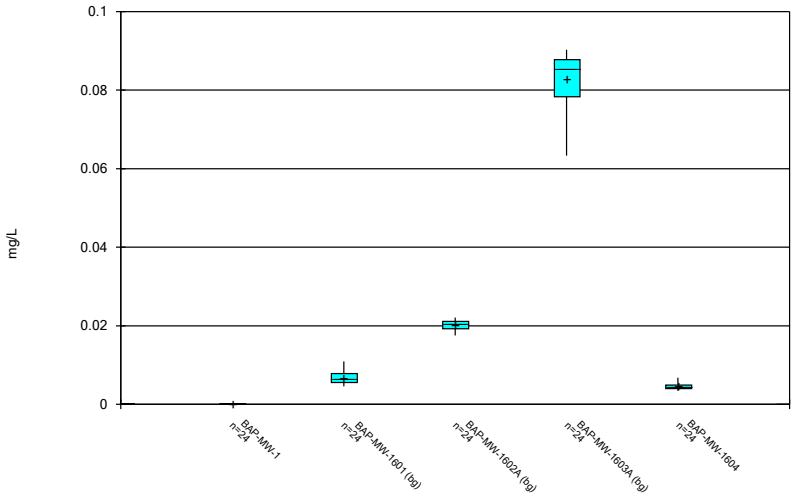


Constituent: Antimony, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

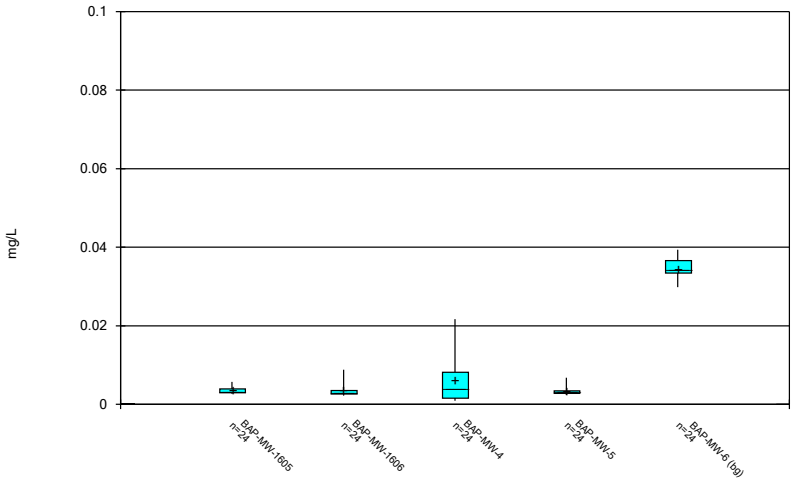


Constituent: Arsenic, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

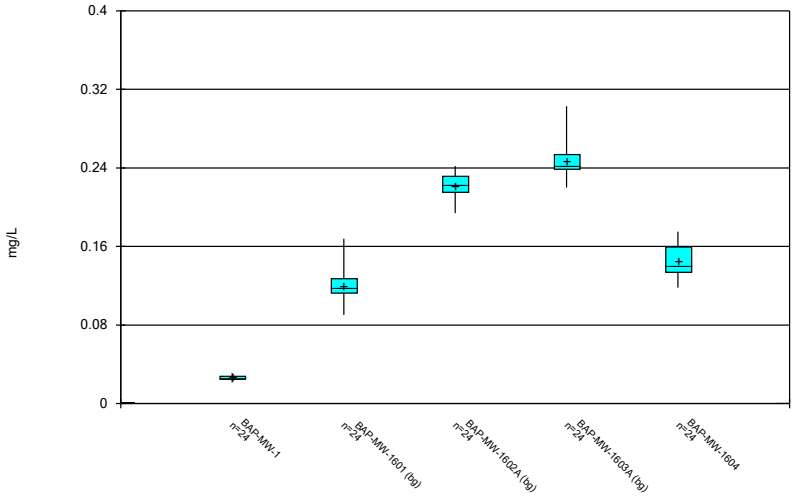


Constituent: Arsenic, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

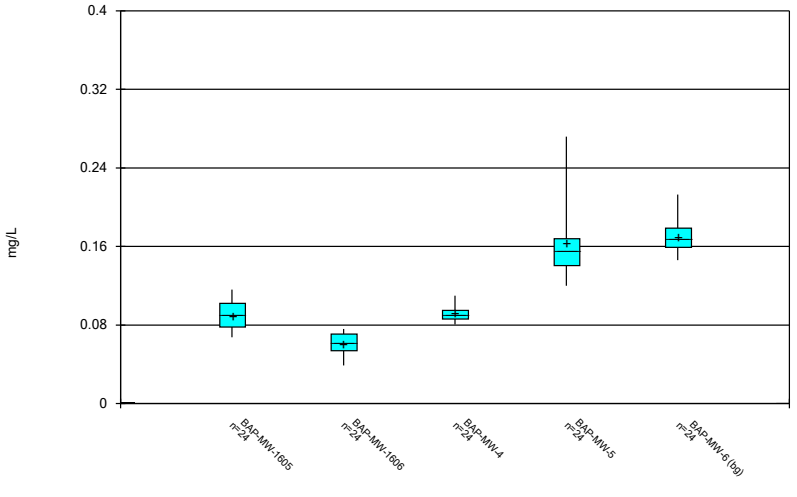


Constituent: Barium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

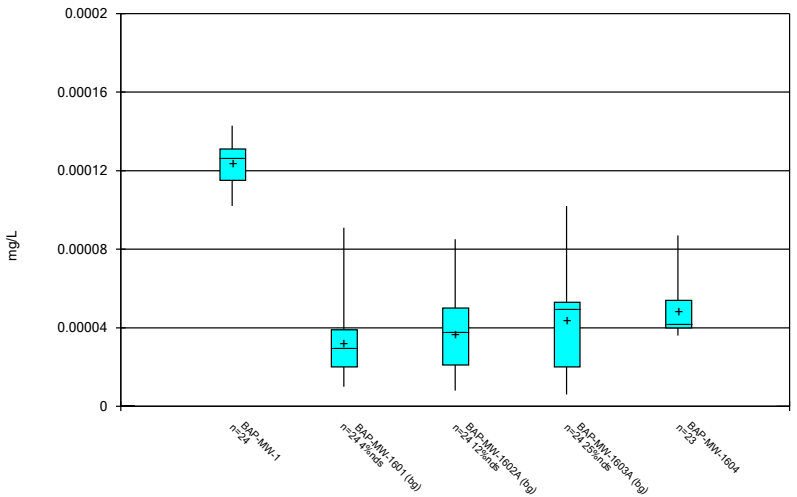


Constituent: Barium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

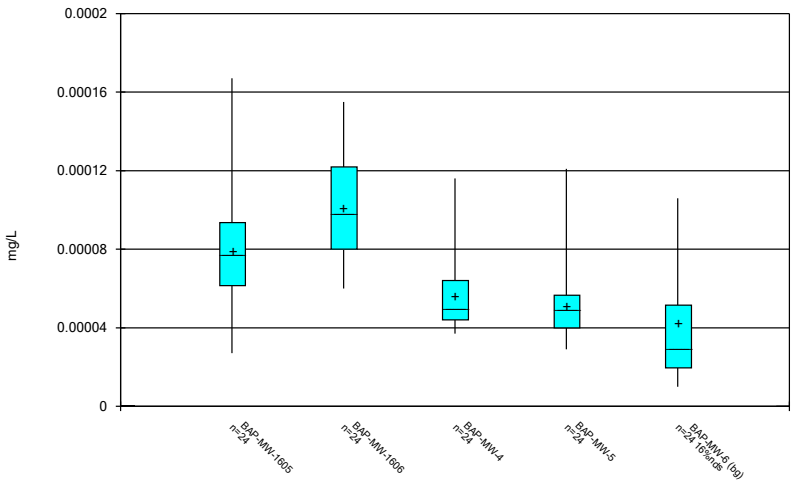


Constituent: Beryllium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

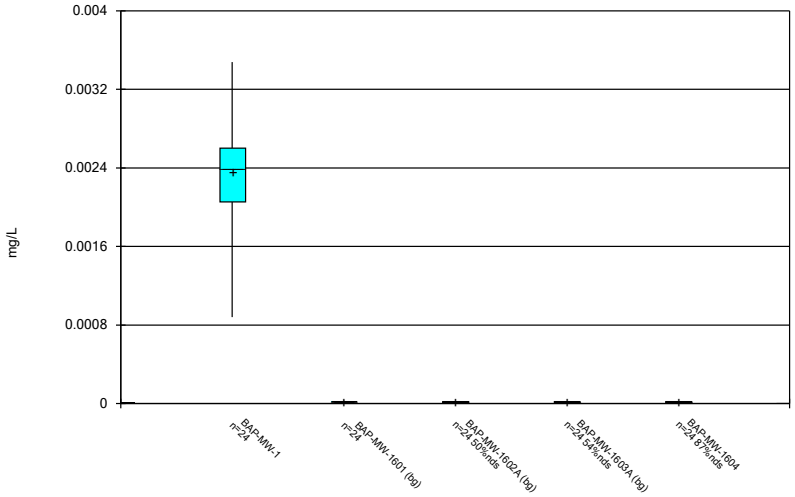
Box & Whiskers Plot



Constituent: Beryllium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

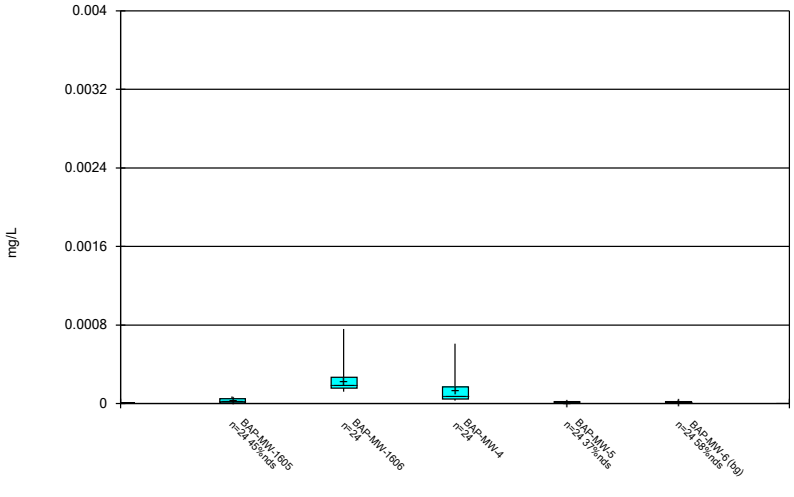


Constituent: Cadmium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

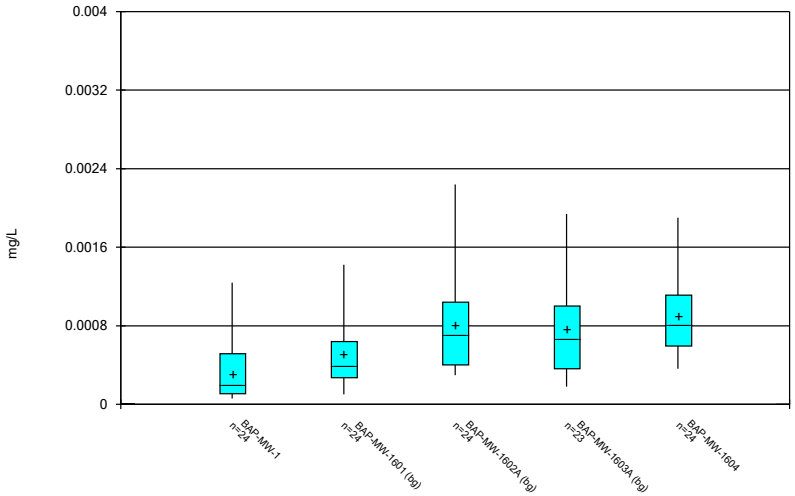


Constituent: Cadmium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

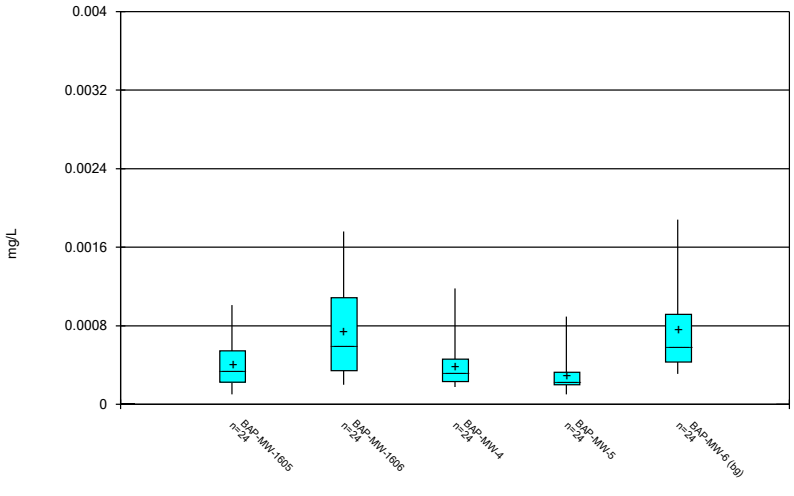


Constituent: Chromium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

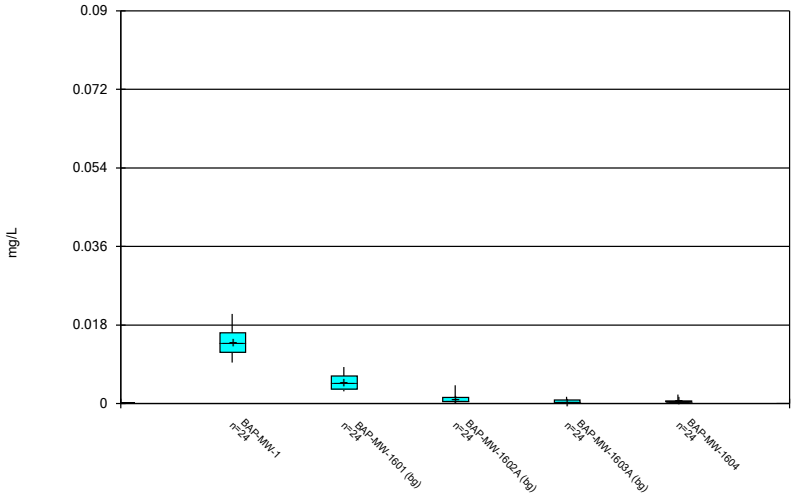
Box & Whiskers Plot



Constituent: Chromium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

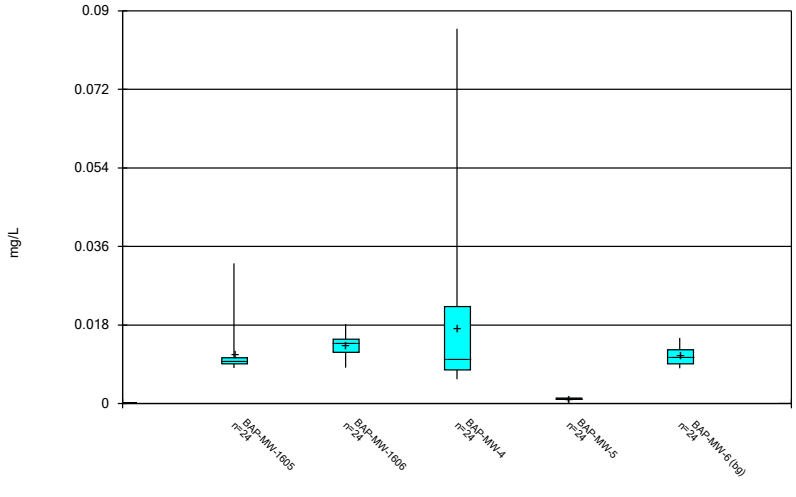


Constituent: Cobalt, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

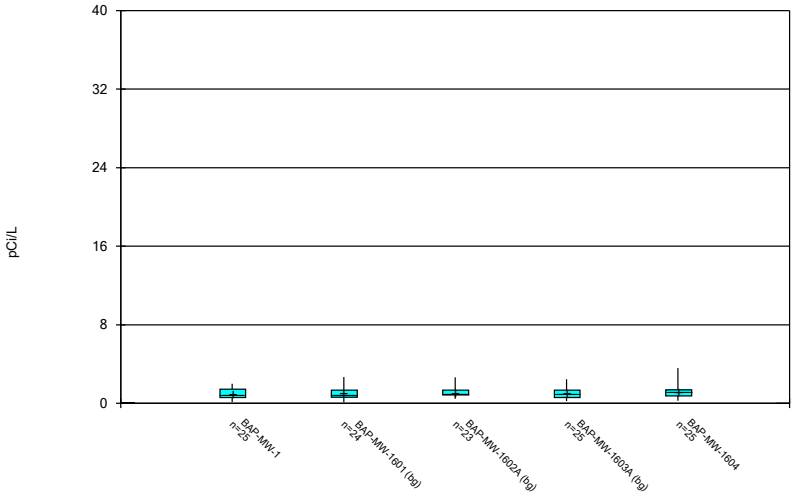


Constituent: Cobalt, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

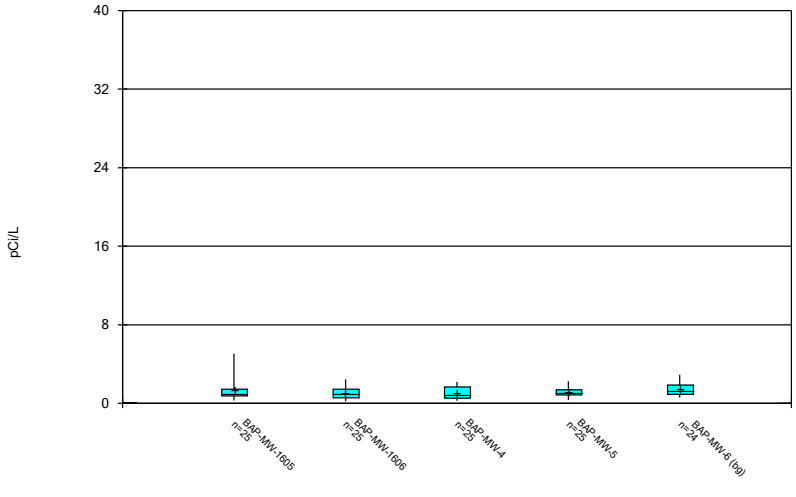


Constituent: Combined Radium 226 + 228 Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

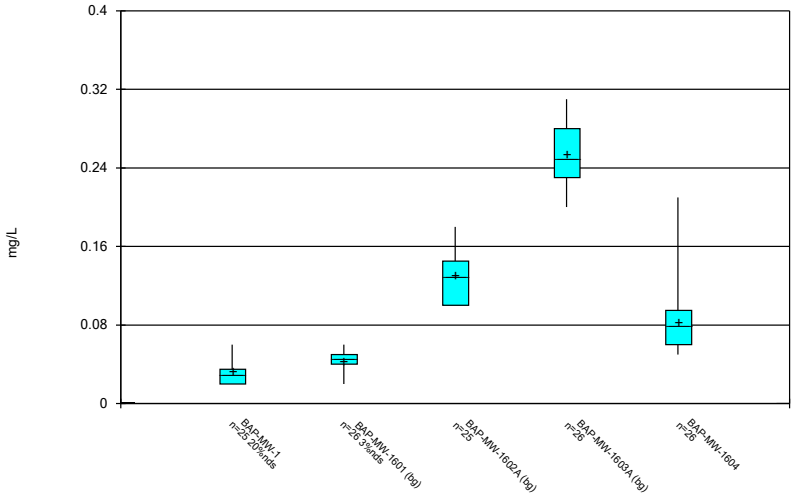
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

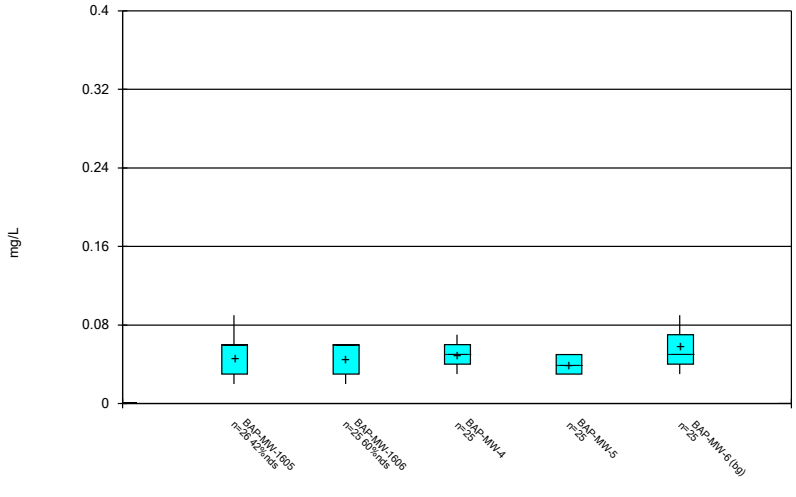
Box & Whiskers Plot



Constituent: Fluoride, total Analysis Run 7/20/2023 7:30 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

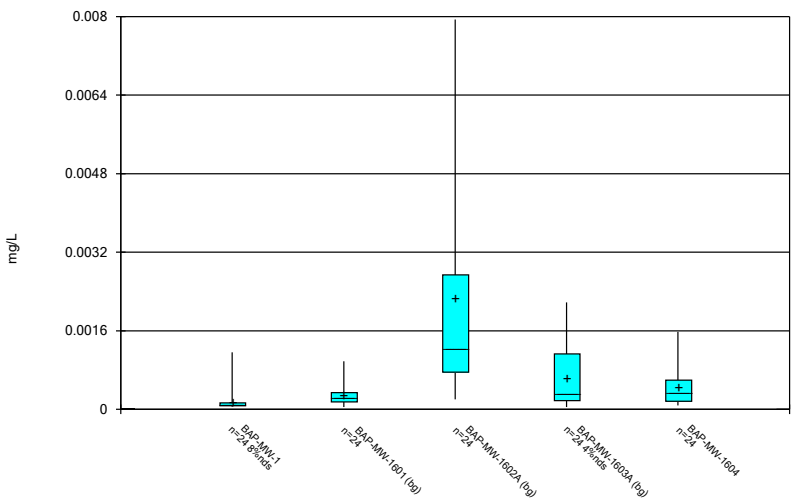
Box & Whiskers Plot



Constituent: Fluoride, total Analysis Run 7/20/2023 7:30 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

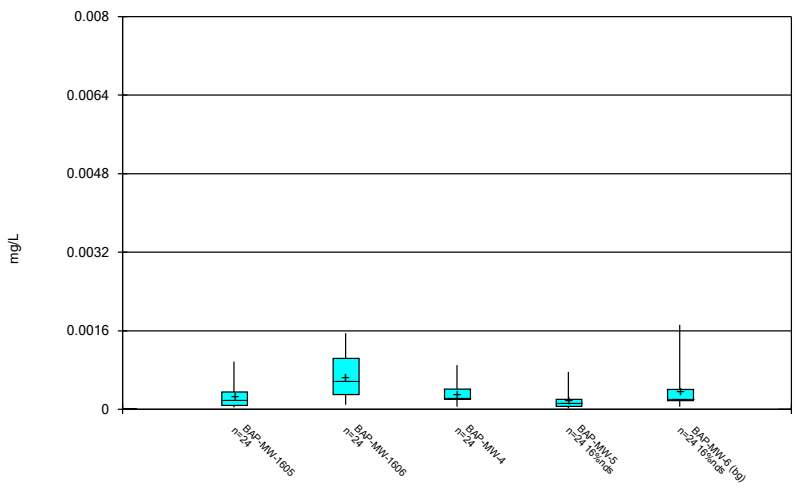
Box & Whiskers Plot



Constituent: Lead, total Analysis Run 7/20/2023 7:30 AM
Amos BAP Client: Geosyntec Data: Amos BAP

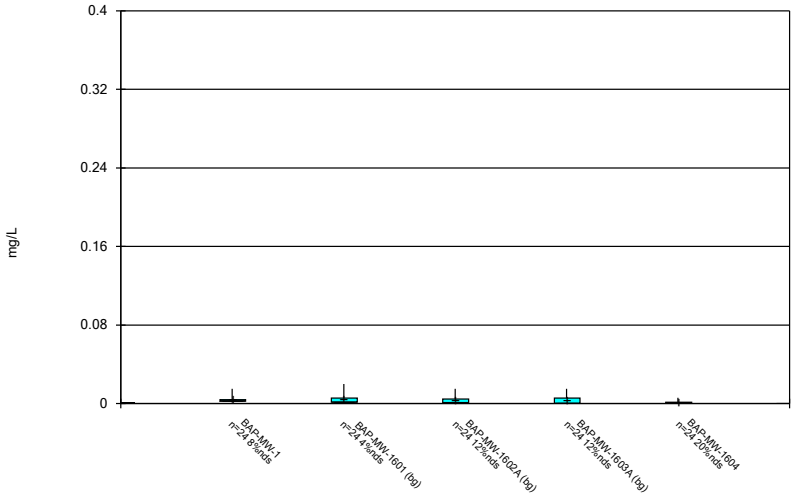
Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Lead, total Analysis Run 7/20/2023 7:30 AM
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

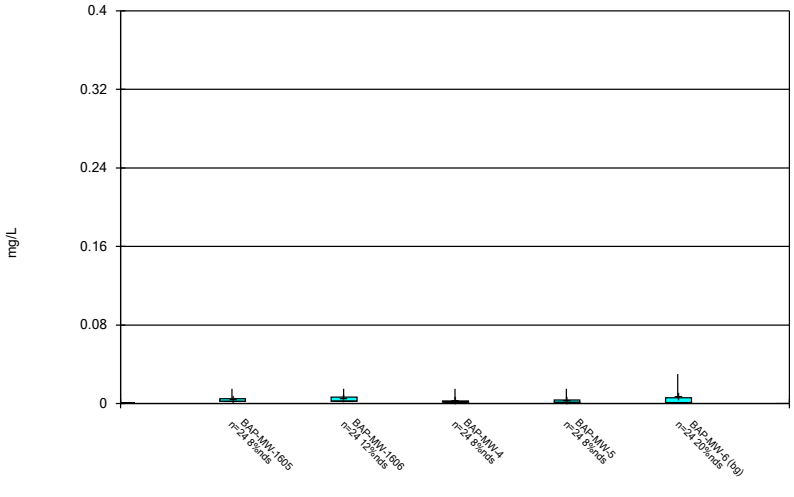


Constituent: Lithium, total Analysis Run 7/20/2023 7:30 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

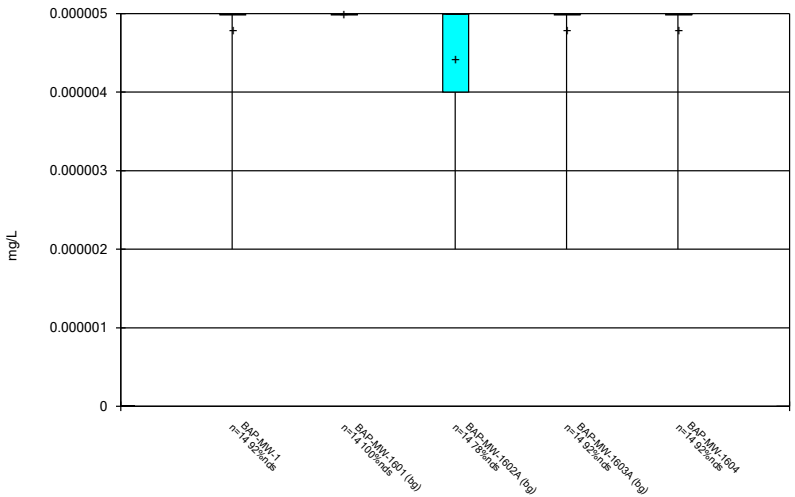


Constituent: Lithium, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

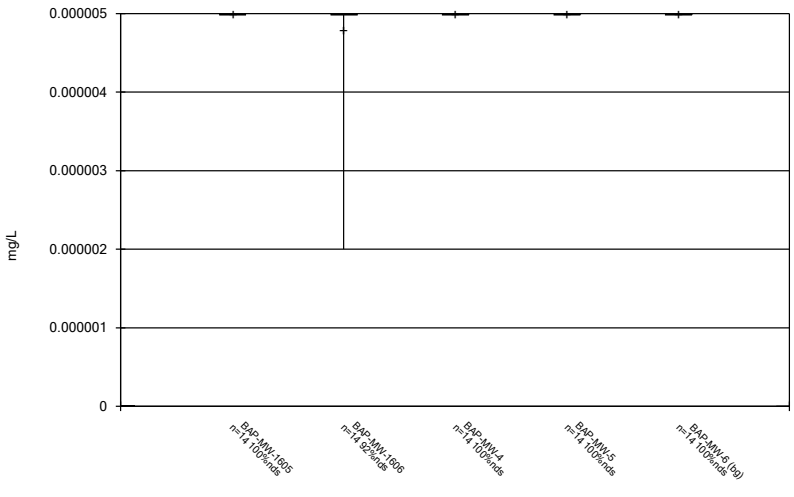


Constituent: Mercury, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

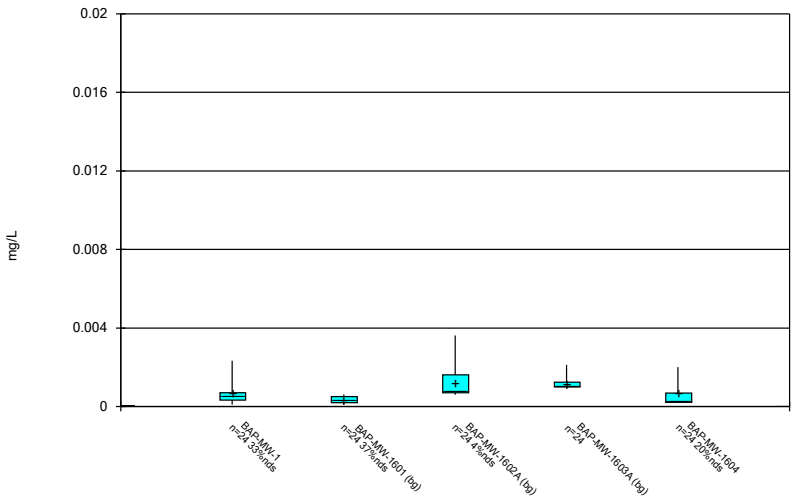
Box & Whiskers Plot



Constituent: Mercury, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

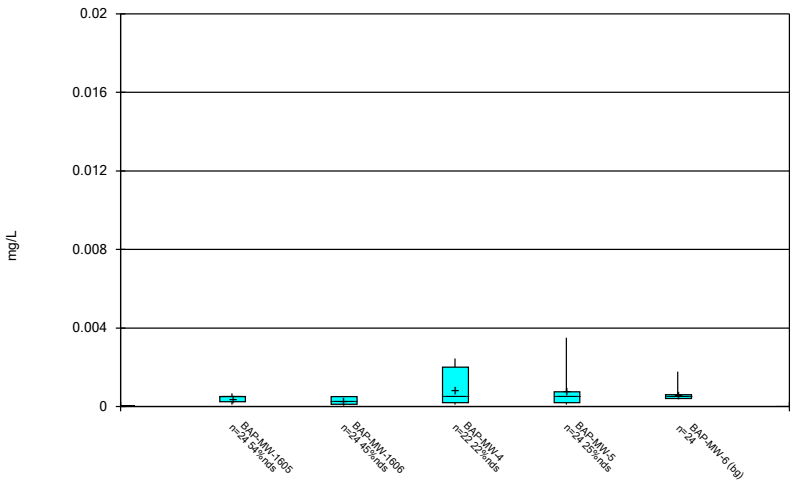


Constituent: Molybdenum, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

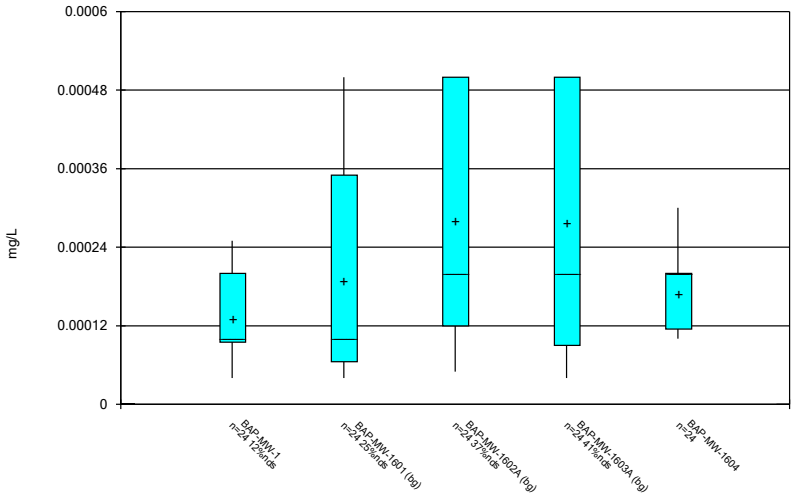


Constituent: Molybdenum, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot

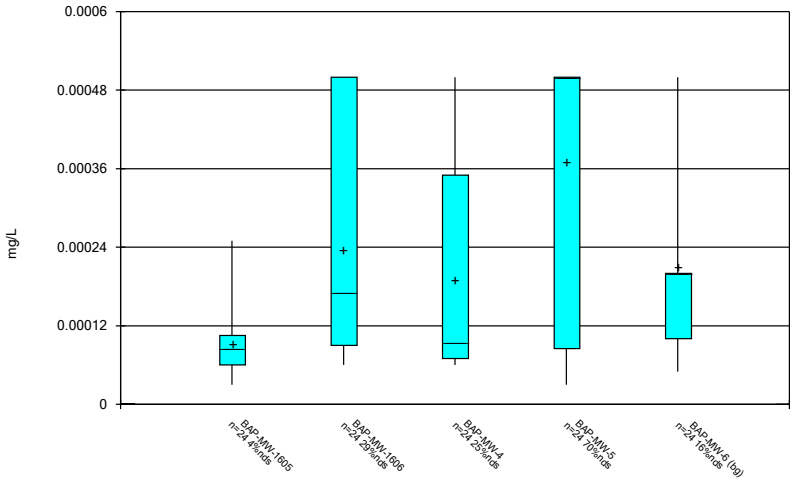


Constituent: Selenium, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

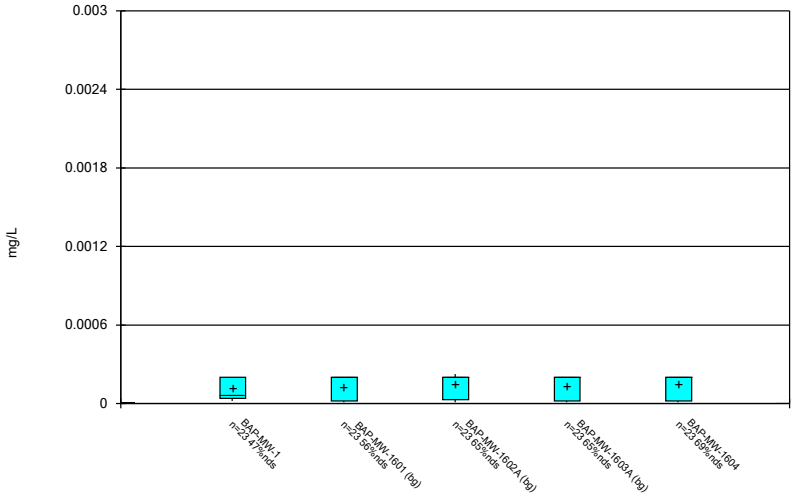
Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot

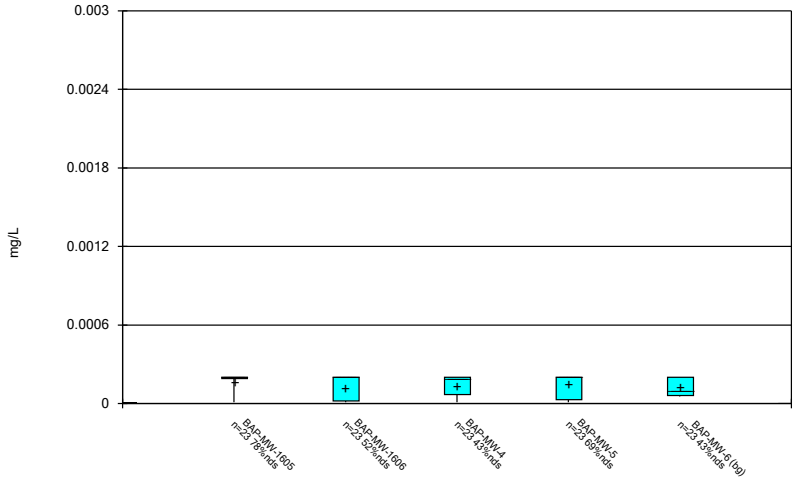


Constituent: Thallium, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 7/20/2023 7:31 AM

Amos BAP Client: Geosyntec Data: Amos BAP

FIGURE C
Outlier Summary

Outlier Summary

Amos BAP Client: Geosyntec Data: Amos BAP Printed 7/20/2023, 7:32 AM

	BAP-MW-1604 Beryllium, total (mg/L)	BAP-MW-1603A Chromium, total (mg/L)	BAP-MW-1601 Combined Radium 226 + 228 (pCi/L)	BAP-MW-1602A Combined Radium 226 + 228 (pCi/L)	BAP-MW-6 Combined Radium 226 + 228 (pCi/L)	BAP-MW-4 Fluoride, total (mg/L)	BAP-MW-5 Fluoride, total (mg/L)	BAP-MW-4 Molybdenum, total (mg/L)
7/25/2016								0.0111 (o)
7/26/2016			7.914 (o)					
8/23/2016								0.0192 (o)
10/18/2016						<0.2 (o)	<0.2 (o)	
12/13/2016		0.00327 (o)						
2/7/2017			35.021 (o)					
2/8/2017			6.853 (o)	20.83 (o)				
6/10/2019	0.000142 (o)							

FIGURE D

UTLs

Upper Tolerance Limits Summary Table

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/13/2023, 3:49 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	0.00017	n/a	n/a	n/a	n/a	88	36.36	n/a	0.01096	NP Inter(normality)
Arsenic, total (mg/L)	0.0903	n/a	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Barium, total (mg/L)	0.303	n/a	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Beryllium, total (mg/L)	0.00008217	n/a	n/a	n/a	n/a	88	15.91	sqrt(x)	0.05	Inter
Cadmium, total (mg/L)	0.00003	n/a	n/a	n/a	n/a	88	37.5	n/a	0.01096	NP Inter(normality)
Chromium, total (mg/L)	0.001826	n/a	n/a	n/a	n/a	87	0	x^(1/3)	0.05	Inter
Cobalt, total (mg/L)	0.015	n/a	n/a	n/a	n/a	88	0	n/a	0.01096	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.546	n/a	n/a	n/a	n/a	88	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.31	n/a	n/a	n/a	n/a	94	1.064	n/a	0.008054	NP Inter(normality)
Lead, total (mg/L)	0.004853	n/a	n/a	n/a	n/a	88	4.545	ln(x)	0.05	Inter
Lithium, total (mg/L)	0.02	n/a	n/a	n/a	n/a	88	13.64	n/a	0.01096	NP Inter(normality)
Mercury, total (mg/L)	0.000005	n/a	n/a	n/a	n/a	52	92.31	n/a	0.06944	NP Inter(NDs)
Molybdenum, total (mg/L)	0.002082	n/a	n/a	n/a	n/a	88	9.091	sqrt(x)	0.05	Inter
Selenium, total (mg/L)	0.0005	n/a	n/a	n/a	n/a	88	26.14	n/a	0.01096	NP Inter(normality)
Thallium, total (mg/L)	0.000224	n/a	n/a	n/a	n/a	84	54.76	n/a	0.01345	NP Inter(NDs)

FIGURE E

GWPS

AMOS BAP GWPS				
Constituent Name	**MCL**	**CCR Rule-Specified**	**Background**	**GWPS**
Antimony, Total (mg/L)	0.006		0.00017	0.006
Arsenic, Total (mg/L)	0.01		0.09	0.09
Barium, Total (mg/L)	2		0.3	2
Beryllium, Total (mg/L)	0.004		0.000082	0.004
Cadmium, Total (mg/L)	0.005		0.00003	0.005
Chromium, Total (mg/L)	0.1		0.0018	0.1
Cobalt, Total (mg/L)		0.006	0.015	0.015
Combined Radium, Total (pCi/L)	5		2.55	5
Fluoride, Total (mg/L)	4		0.31	4
Lead, Total (mg/L)	0.015		0.0049	0.015
Lithium, Total (mg/L)		0.04	0.02	0.04
Mercury, Total (mg/L)	0.002		0.000005	0.002
Molybdenum, Total (mg/L)		0.1	0.0021	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.00022	0.002

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

MCL = Maximum Contaminant Level

CCR = Coal Combustion Residual

GWPS - Groundwater Protection Standard

FIGURE F

Confidence Interval

Confidence Intervals - All Results (No Significant)

Amos BAP Client: Geosyntec Data: Amos BAP Printed 7/21/2023, 8:33 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	BAP-MW-1	0.0001	0.00002	0.006	No	24	0.00006208	0.00005233	41.67	None	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-1604	0.0001	0.00003	0.006	No	24	0.00005929	0.00003629	41.67	None	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-1605	0.00002947	0.00001037	0.006	No	24	0.00006321	0.00005794	37.5	Kaplan-Meier	x^(1/3)	0.01	Param.
Antimony, total (mg/L)	BAP-MW-1606	0.00002241	0.00001178	0.006	No	24	0.00004479	0.00003084	20.83	Kaplan-Meier	ln(x)	0.01	Param.
Antimony, total (mg/L)	BAP-MW-4	0.0001	0.00004	0.006	No	24	0.00007729	0.00004062	45.83	None	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-5	0.0001	0.00003	0.006	No	24	0.00006283	0.00003734	41.67	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	BAP-MW-1	0.0001322	0.00009618	0.09	No	24	0.0001142	0.00003525	0	None	No	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1604	0.005015	0.004164	0.09	No	24	0.00459	0.0008344	0	None	No	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1605	0.00403	0.00295	0.09	No	24	0.003524	0.0008565	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	BAP-MW-1606	0.0035	0.00262	0.09	No	24	0.003538	0.001669	0	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	BAP-MW-4	0.007548	0.002656	0.09	No	24	0.005939	0.005776	0	None	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-5	0.00341	0.00279	0.09	No	24	0.003285	0.0008693	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	BAP-MW-1	0.02747	0.02512	2	No	24	0.02629	0.002304	0	None	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1604	0.1539	0.1368	2	No	24	0.1454	0.01673	0	None	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1605	0.09698	0.08247	2	No	24	0.08973	0.01423	0	None	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1606	0.0664	0.05457	2	No	24	0.06048	0.0116	0	None	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-4	0.09529	0.08773	2	No	24	0.09151	0.007405	0	None	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-5	0.17	0.14	2	No	24	0.1626	0.03635	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	BAP-MW-1	0.0001298	0.0001184	0.004	No	24	0.0001241	0.00001112	0	None	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-1604	0.000054	0.00004	0.004	No	23	0.00004817	0.00001246	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	BAP-MW-1605	0.00009507	0.00006335	0.004	No	24	0.00007921	0.00003108	0	None	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-1606	0.0001163	0.00008603	0.004	No	24	0.0001012	0.00002967	0	None	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-4	0.00006208	0.00004613	0.004	No	24	0.00005596	0.00001905	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-5	0.00005789	0.00004126	0.004	No	24	0.00005092	0.0000192	0	None	x^(1/3)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-1	0.002638	0.002077	0.005	No	24	0.002358	0.0005503	0	None	No	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-1604	0.00002	0.000007	0.005	No	24	0.00001883	0.000003964	87.5	None	No	0.01	NP (NDs)
Cadmium, total (mg/L)	BAP-MW-1605	0.00005	0.000007	0.005	No	24	0.00003025	0.00002267	45.83	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	BAP-MW-1606	0.0002602	0.0001678	0.005	No	24	0.000232	0.0001341	0	None	ln(x)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-4	0.0001357	0.00005701	0.005	No	24	0.0001315	0.0001485	0	None	ln(x)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-5	0.00002	0.000006	0.005	No	24	0.00001167	0.000006709	37.5	None	No	0.01	NP (normality)
Chromium, total (mg/L)	BAP-MW-1	0.0003627	0.000156	0.1	No	24	0.0003016	0.0002691	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1604	0.001048	0.0006709	0.1	No	24	0.0008875	0.0004012	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1605	0.0005289	0.0002851	0.1	No	24	0.000407	0.0002389	0	None	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1606	0.0009876	0.000511	0.1	No	24	0.0007493	0.000467	0	None	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-4	0.0004601	0.0002732	0.1	No	24	0.0003902	0.0002278	0	None	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	BAP-MW-5	0.0003547	0.0001999	0.1	No	24	0.0002988	0.0001945	0	None	x^(1/3)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1	0.01583	0.01259	0.015	No	24	0.01421	0.003175	0	None	No	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1604	0.000648	0.000419	0.015	No	24	0.00058	0.0003581	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1605	0.0107	0.00909	0.015	No	24	0.01148	0.005537	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	BAP-MW-1606	0.01478	0.01213	0.015	No	24	0.01346	0.002588	0	None	No	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-4	0.01872	0.0093	0.015	No	24	0.01736	0.01719	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-5	0.001205	0.0009585	0.015	No	24	0.001082	0.000242	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1	1.192	0.6784	5	No	25	0.9867	0.5386	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1604	1.368	0.7887	5	No	25	1.135	0.6496	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1605	1.445	0.7958	5	No	25	1.31	1.049	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1606	1.313	0.6978	5	No	25	1.005	0.6172	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-4	1.271	0.6822	5	No	25	1.042	0.6214	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-5	1.364	0.8892	5	No	25	1.127	0.4764	0	None	No	0.01	Param.
Fluoride, total (mg/L)	BAP-MW-1	0.04	0.02	4	No	25	0.0332	0.01464	20	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-1604	0.09417	0.0657	4	No	26	0.08269	0.03436	0	None	x^(1/3)	0.01	Param.
Fluoride, total (mg/L)	BAP-MW-1605	0.06	0.03	4	No	26	0.04731	0.02051	42.31	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-1606	0.06	0.03	4	No	25	0.046	0.0178	60	None	No	0.01	NP (NDs)
Fluoride, total (mg/L)	BAP-MW-4	0.06	0.04	4	No	25	0.0496	0.01241	0	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-5	0.05	0.03	4	No	25	0.0396	0.008406	0	None	No	0.01	NP (normality)

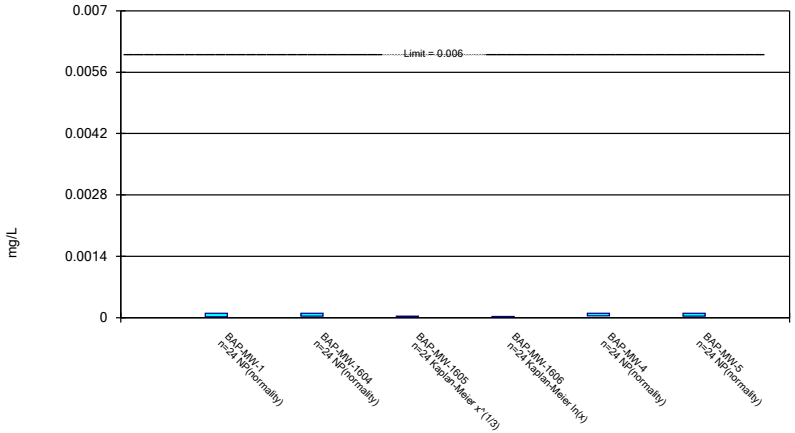
Confidence Intervals - All Results (No Significant)

Amos BAP Client: Geosyntec Data: Amos BAP Printed 7/21/2023, 8:33 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Lead, total (mg/L)	BAP-MW-1	0.00013	0.000068	0.015	No	24	0.0001437	0.0002205	8.333	None	No	0.01	NP (normality)
Lead, total (mg/L)	BAP-MW-1604	0.0005738	0.0002358	0.015	No	24	0.0004544	0.0003928	0	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-1605	0.0003388	0.0001254	0.015	No	24	0.0002669	0.0002536	0	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-1606	0.000892	0.0004516	0.015	No	24	0.0006718	0.0004315	0	None	No	0.01	Param.
Lead, total (mg/L)	BAP-MW-4	0.0003947	0.0002032	0.015	No	24	0.0003201	0.0002145	0	None	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-5	0.0001777	0.00006094	0.015	No	24	0.000178	0.000182	16.67	Kaplan-Meier	x^(1/3)	0.01	Param.
Lithium, total (mg/L)	BAP-MW-1	0.004	0.00259	0.04	No	24	0.004506	0.004054	8.333	None	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1604	0.002	0.00039	0.04	No	24	0.001315	0.001616	20.83	None	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1605	0.005	0.0024	0.04	No	24	0.004678	0.003809	8.333	None	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1606	0.006	0.00239	0.04	No	24	0.005123	0.004283	12.5	None	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-4	0.003	0.0015	0.04	No	24	0.003662	0.004375	8.333	None	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-5	0.003	0.00142	0.04	No	24	0.003568	0.004337	8.333	None	No	0.01	NP (normality)
Mercury, total (mg/L)	BAP-MW-1	0.000005	0.000002	0.002	No	14	0.000004786	8.0e-7	92.86	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	BAP-MW-1604	0.000005	0.000002	0.002	No	14	0.000004786	8.0e-7	92.86	None	No	0.01	NP (NDs)
Mercury, total (mg/L)	BAP-MW-1606	0.000005	0.000002	0.002	No	14	0.000004786	8.0e-7	92.86	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	BAP-MW-1	0.0008069	0.0002779	0.1	No	24	0.0006588	0.0005515	33.33	Kaplan-Meier	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-1604	0.00074	0.00021	0.1	No	24	0.0006604	0.0007144	20.83	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-1605	0.0005	0.0002	0.1	No	24	0.0003863	0.0001695	54.17	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	BAP-MW-1606	0.0005	0.00012	0.1	No	24	0.0003017	0.000193	45.83	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-4	0.0005671	0.0001797	0.1	No	22	0.0008645	0.0008079	22.73	Kaplan-Meier	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-5	0.0005986	0.0001785	0.1	No	24	0.0007583	0.0009062	25	Kaplan-Meier	ln(x)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1	0.0002	0.00009	0.05	No	24	0.0001304	0.00006245	12.5	None	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1604	0.0002	0.00011	0.05	No	24	0.0001688	0.00005211	0	None	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1605	0.0001127	0.00006691	0.05	No	24	0.00009375	0.00005055	4.167	None	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1606	0.0003	0.00009	0.05	No	24	0.0002358	0.0001823	29.17	None	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-4	0.0002	0.00007	0.05	No	24	0.0001908	0.0001845	25	None	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-5	0.0005	0.00008	0.05	No	24	0.0003708	0.0002059	70.83	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1	0.0002	0.00004	0.002	No	23	0.0001175	0.0000812	47.83	None	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-1604	0.0002	0.00002	0.002	No	23	0.0001452	0.00008501	69.57	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1605	0.0002	0.000062	0.002	No	23	0.0001631	0.00007207	78.26	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1606	0.0002	0.00002	0.002	No	23	0.0001148	0.00009145	52.17	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-4	0.0002	0.000069	0.002	No	23	0.0001386	0.00007062	43.48	None	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-5	0.0002	0.00003	0.002	No	23	0.0001448	0.00008559	69.57	None	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

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

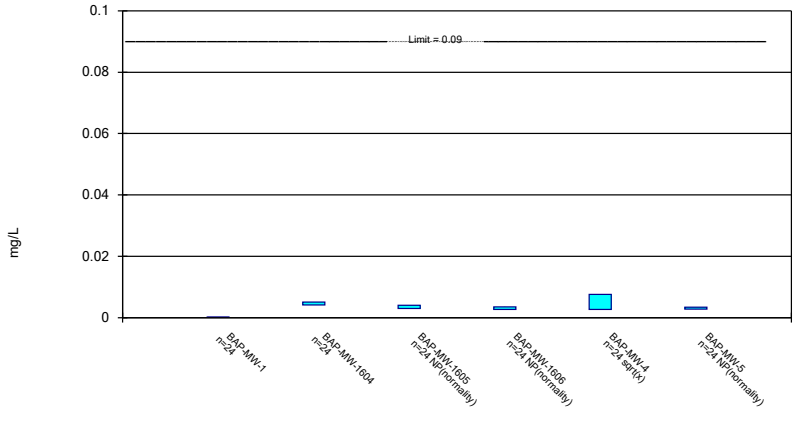


Constituent: Antimony, total Analysis Run 7/21/2023 8:29 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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

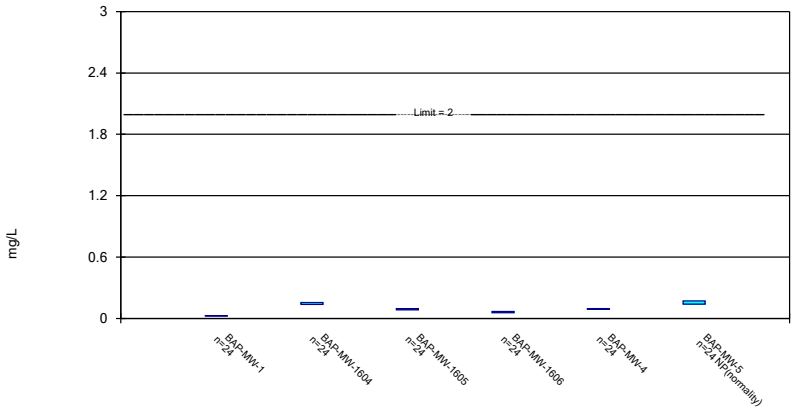


Constituent: Arsenic, total Analysis Run 7/21/2023 8:29 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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

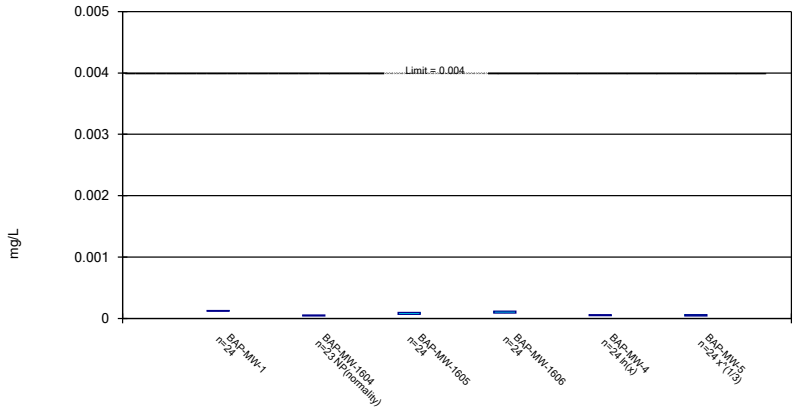


Constituent: Barium, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

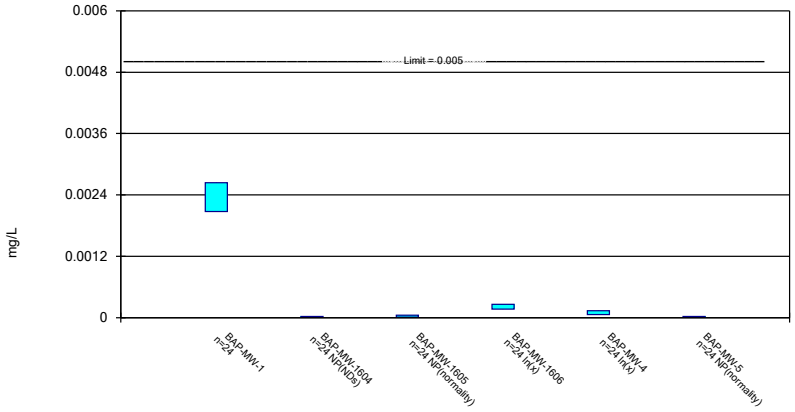
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

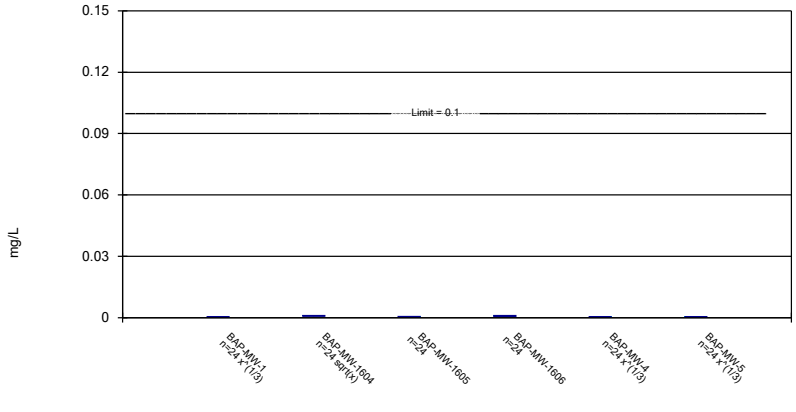
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric Confidence Interval

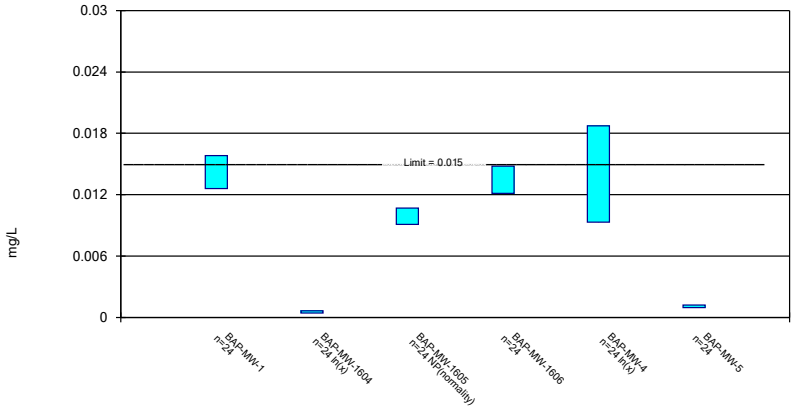
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

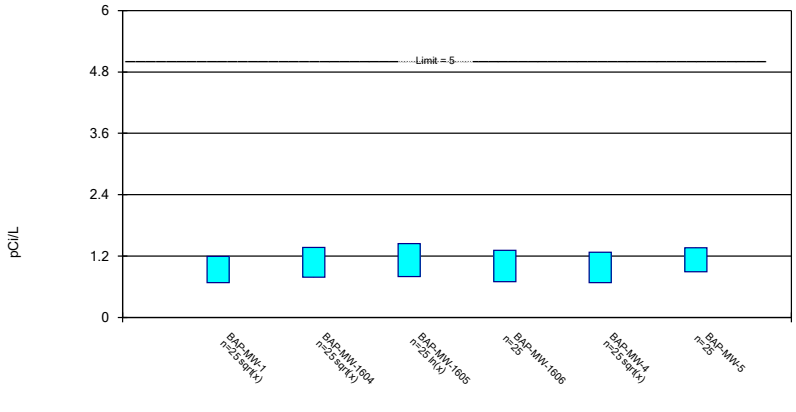
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric Confidence Interval

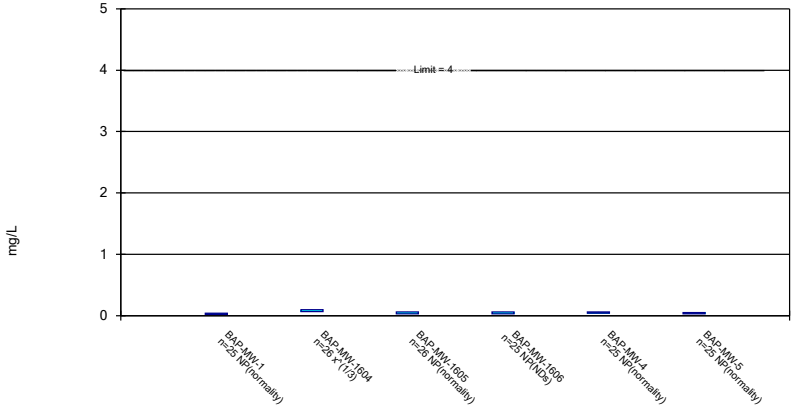
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos 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 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

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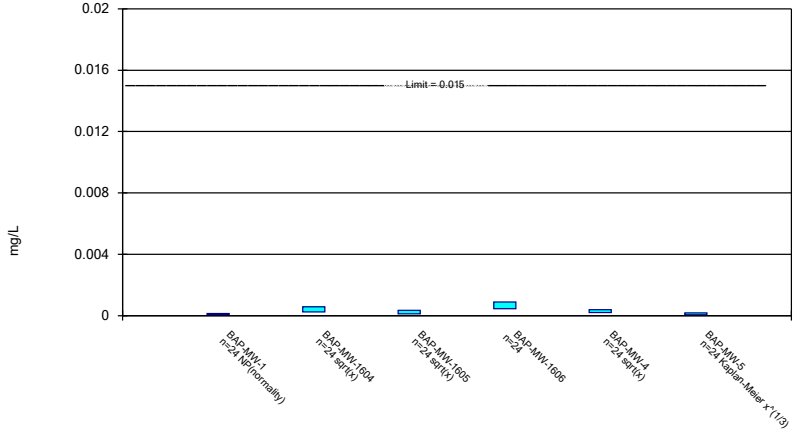
Parametric and Non-Parametric (NP) Confidence Interval

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

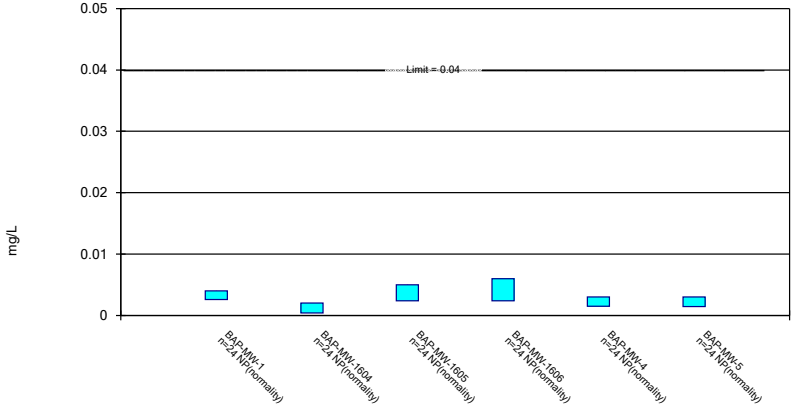


Constituent: Lead, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

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

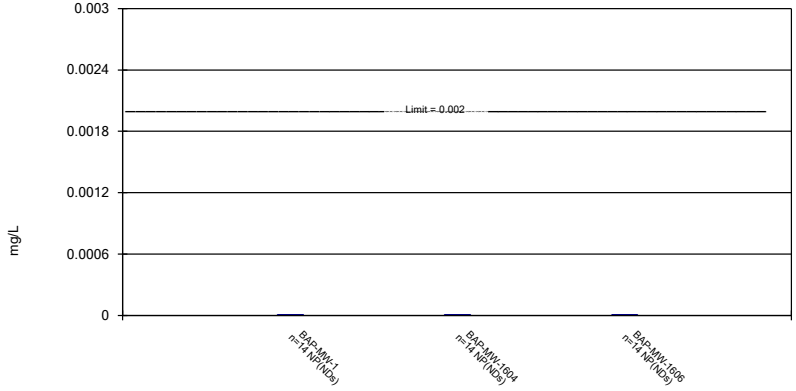


Constituent: Lithium, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

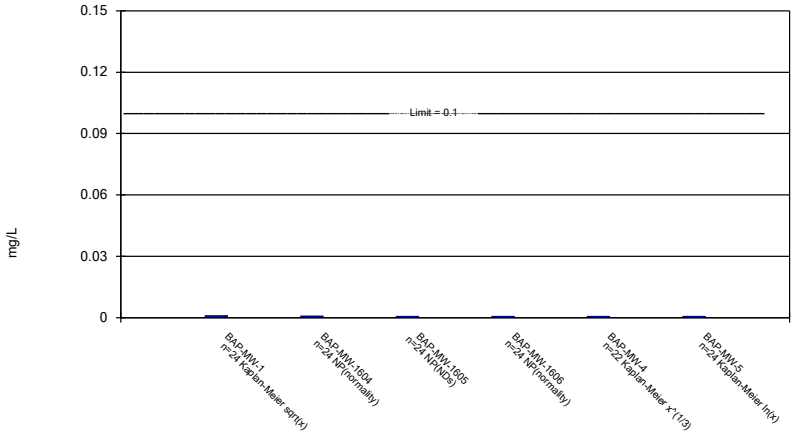
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos 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.

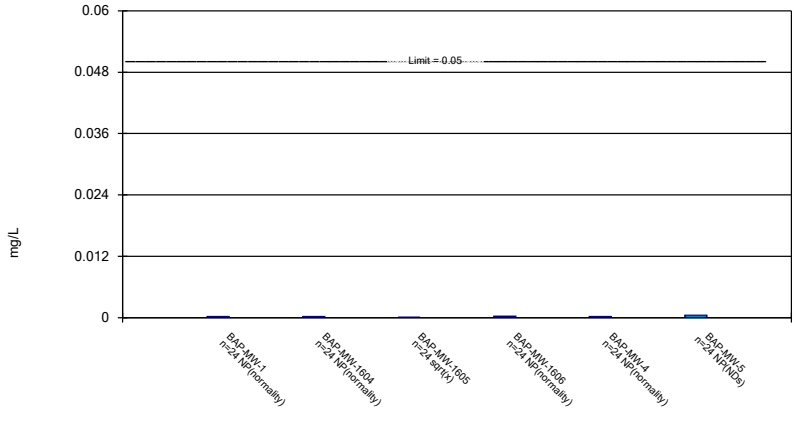


Constituent: Molybdenum, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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

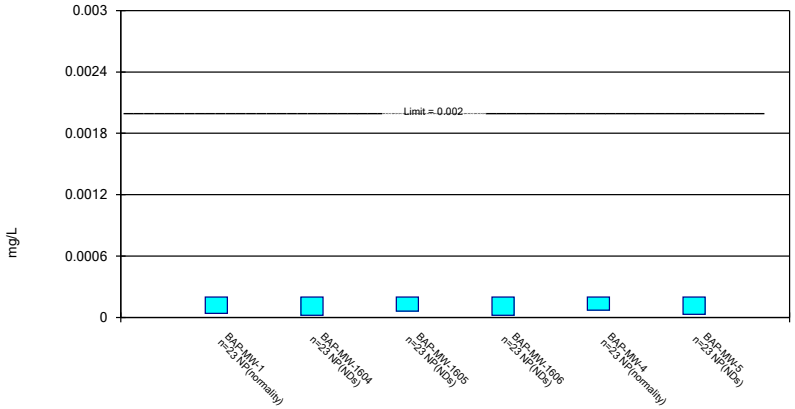


Constituent: Selenium, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

Sanitas™ v.9.6.37 Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 7/21/2023 8:30 AM View: Confidence Intervals
Amos BAP Client: Geosyntec Data: Amos BAP

APPENDIX 3

Not applicable.

APPENDIX 4

The notification of the establishment of an assessment monitoring program follows.

John Amos Plant

Notice of Assessment Monitoring Program Establishment

Bottom Ash Pond

On January 15, 2018, it was determined that Amos Plant's Bottom Ash Pond had statistically significant increases over background for Calcium, Chloride. Sulfate, and Total Dissolved Solids (TDS). An alternative source demonstration was not successful within the 90 day period as allowed for in 257.94(e)(2) prompting the initiation of an assessment monitoring program, which was established on April 13, 2018. Therefore this notice is being placed in the operating record in accordance with the requirement of 257.94(e)(3).

APPENDIX 5

Not applicable.