

# **Annual Groundwater Monitoring Report**

Appalachian Power Company  
John E. Amos Plant  
Bottom Ash Pond CCR Management Unit  
Winfield, West Virginia

**January 2023**

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An **AEP** Company

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BOUNDLESS ENERGY<sup>SM</sup>

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

**Appendix 2** – Statistical Analysis

**Appendix 3** – Not applicable

**Appendix 4** – Groundwater Monitoring Program Transition Notification

**Appendix 5** – Not applicable

**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 2022 in assessment monitoring and remained in assessment monitoring throughout all of 2022.
- 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 March, May, and October 2022.
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units.
- Analytical results of the March, May, and November rounds of sampling are listed in the tables in **Appendix 1**. Also shown are the groundwater flow rates and flow directions.
- Statistical analysis of the November 2021 sampling event was completed in March 2022 and is included in **Appendix 2**. There were no exceedances over established groundwater protection standards (GWPS's) so the unit remains in assessment monitoring. However, the following statistically significant increases (SSI's), or decreases in the case of pH, occurred for Appendix III indicator parameters:
  - MW-1: Calcium, chloride, sulfate, and total dissolved solids (TDS)
  - MW-4: pH
  - MW-1605: Calcium, chloride, sulfate, TDS
  - MW-1606: Chloride, sulfate, and TDS
- Statistical analysis of the May 2022 sampling event was completed in September 2022 and is included in **Appendix 2**. There were no exceedances over established GWPS's so the unit remains in assessment monitoring. However, the following SSI's occurred for Appendix III indicator parameters:
  - MW-1: Calcium, chloride, sulfate, and TDS
  - MW-4: Boron, calcium, chloride, fluoride, sulfate, and TDS

- MW-5: Calcium, chloride, sulfate, and TDS
- MW-1604: Calcium, chloride, sulfate, and TDS
- MW-1606: Calcium, sulfate, and TDS
- November 2022 sampling event data has been received, however, statistical analysis is not yet completed. The statistical analysis will be completed in early 2023. If no SSL's are identified, the unit will remain in assessment monitoring. If SSL's 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 2022 (**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**

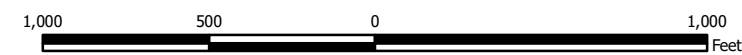
Figure 1 depicts the PE-certified groundwater monitoring network, the monitoring well locations, and their corresponding identification numbers. The monitoring well distribution adequately covers downgradient and upgradient areas as detailed in the *Groundwater Monitoring Network Evaluation Report* that 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



**Site Layout  
 Ash Pond System**

AEP Amos Generating Plant  
 Winfield, West Virginia

**Geosyntec**  
 consultants

Columbus, Ohio

2018/12/24

Figure

**1**

### **III. Monitoring Wells Installed or Decommissioned**

There were no monitoring wells installed or decommissioned in 2022.

### **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 2022. Static water elevation data from each monitoring event in 2022 are also shown in **Appendix 1**, along with the groundwater velocity calculations, groundwater flow direction and potentiometric maps developed after each sampling event.

### **V. Groundwater Quality Data Statistical Analysis**

Statistical analysis of the assessment monitoring samples from the November 2021 event was completed in March 2022 (**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-4: pH
- MW-1605: Calcium, chloride, sulfate, TDS
- MW-1606: Chloride, sulfate, and TDS

Statistical analysis of the May 2022 sampling event was completed in September 2022 and is included in **Appendix 2**. There were no exceedances over established GWPS's so the unit remains in assessment monitoring. However, the following SSI's occurred for Appendix III indicator parameters:

- MW-1: Calcium, chloride, sulfate, and TDS
- MW-4: Boron, calcium, chloride, fluoride, sulfate, and TDS
- MW-5: Calcium, chloride, sulfate, and TDS
- MW-1604: Calcium, chloride, sulfate, and TDS
- MW-1606: Calcium, sulfate, and TDS

Statistical analysis of the November 2022 assessment monitoring event is ongoing and will be completed in early 2023.

**VI. Alternative Source Demonstration**

No alternative source demonstrations were performed in 2022.

**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**.

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 2022 and Actions Taken**

No significant problems were encountered. The low flow sampling effort went smoothly and the schedule was met to support the 2022 annual groundwater report preparation.

**X. A Projection of Key Activities for the Upcoming Year**

Key activities for 2023 include:

- Complete statistical analysis on the sampling results from the November 2022 assessment monitoring event
- Respond to any new data received in light of what the CCR rule requires.
- Preparation of the 2023 annual groundwater report.



## APPENDIX 1

Figures and Tables follow showing data collected and the rate and direction of groundwater flow. The dates that the samples were collected is shown, as well as, whether the data were collected under background, detection, or assessment monitoring.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

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	µg/L	pCi/L	mg/L	µg/L	mg/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
3/15/2021	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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

Table 1 - Groundwater Data Summary: MW-4

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	µg/L	pCi/L	mg/L	µg/L	mg/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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

Table 1 - Groundwater Data Summary: MW-5

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	µg/L	pCi/L	mg/L	µg/L	mg/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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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



Table 1 - Groundwater Data Summary: MW-6

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	µg/L	pCi/L	mg/L	µg/L	mg/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
2/11/2020	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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

Table 1 - Groundwater Data Summary: MW-1601

## 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	µg/L	pCi/L	mg/L	µg/L	mg/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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

--: Not analyzed

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.

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

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

Table 1 - Groundwater Data Summary: MW-1602A

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	µg/L	pCi/L	mg/L	µg/L	mg/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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

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

**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	--	--
5/20/2022	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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

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	µg/L	pCi/L	mg/L	µg/L	mg/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
5/20/2022	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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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



Table 1 - Groundwater Data Summary: MW-1604

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	µg/L	pCi/L	mg/L	µg/L	mg/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	--	--	--	--	--	--

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

--: Not analyzed

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.

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

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

Table 1 - Groundwater Data Summary: MW-1605

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	µg/L	pCi/L	mg/L	µg/L	mg/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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

--: Not analyzed

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.

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

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

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

**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
3/17/2021	Assessment	--	--	--	0.03 J1	5.4	--	--
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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

Table 1 - Groundwater Data Summary: MW-1606

## 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	µg/L	pCi/L	mg/L	µg/L	mg/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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

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

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

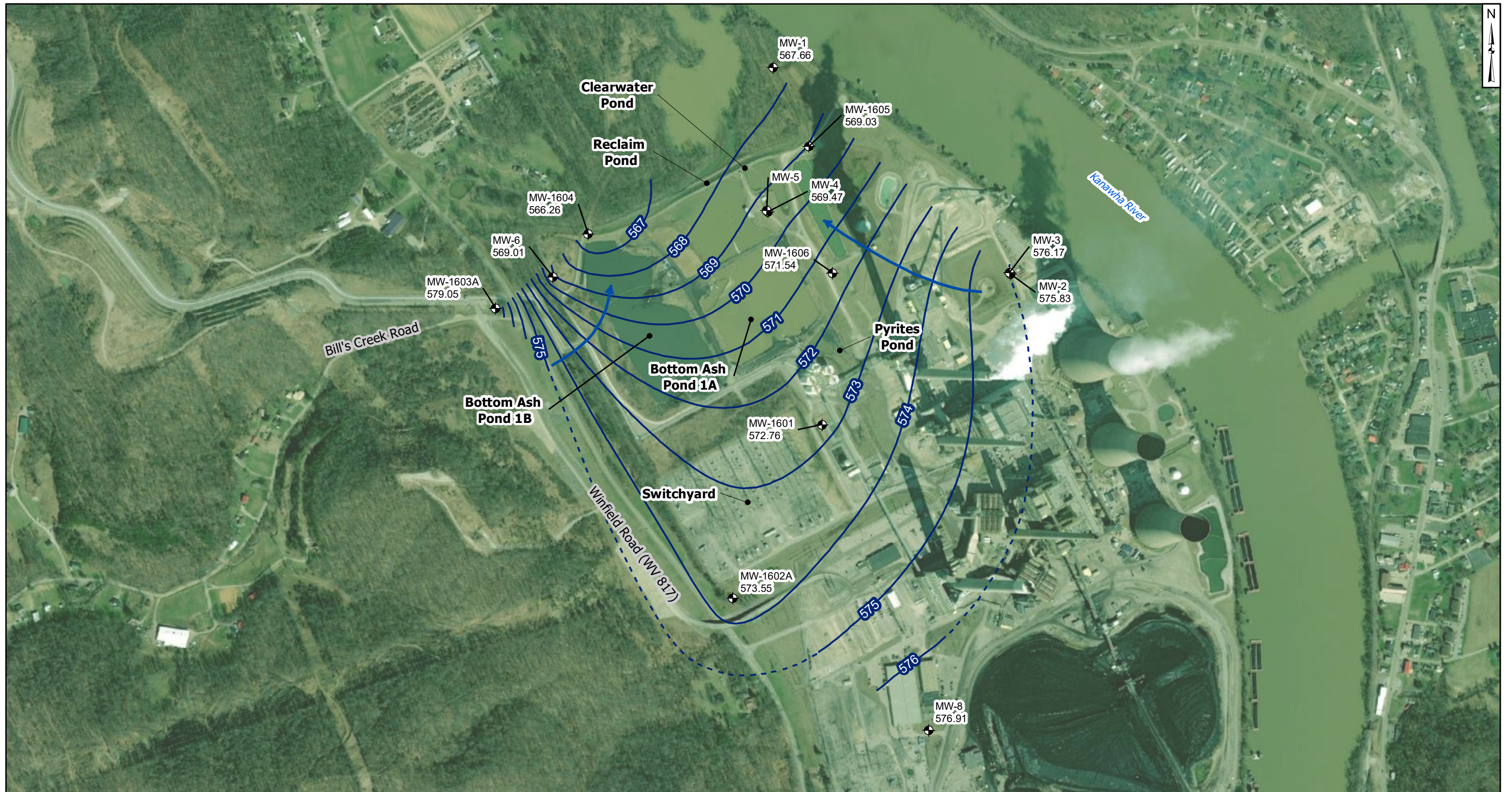
**Table 1: Residence Time Calculation Summary  
Amos Bottom Ash Pond**

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2022-02		2022-05		2022-10	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Bottom Ash Pond	MW-1 <sup>[2]</sup>	2.0	26.5	2.3	26.0	2.3	14.9	4.1
	MW-4 <sup>[2]</sup>	2.0	27.1	2.2	20.7	2.9	62.3	1.0
	MW-5 <sup>[2]</sup>	2.0	115.4	0.5	81.5	0.7	31.3	1.9
	MW-6 <sup>[1]</sup>	2.0	59.9	1.0	70.6	0.9	63.5	1.0
	MW-1601 <sup>[1]</sup>	2.0	21.0	2.9	18.4	3.3	15.2	4.0
	MW-1602A <sup>[1]</sup>	2.0	6.2	9.8	5.6	10.9	19.2	3.2
	MW-1603A <sup>[1]</sup>	2.0	192.8	0.3	196.5	0.3	184.6	0.3
	MW-1604 <sup>[2]</sup>	2.0	67.1	0.9	78.2	0.8	70.3	0.9
	MW-1605 <sup>[2]</sup>	2.0	35.4	1.7	28.8	2.1	36.8	1.7
MW-1606 <sup>[2]</sup>	2.0	29.5	2.1	28.2	2.2	24.8	2.5	

Notes:

[1] - Background Well

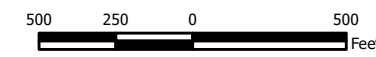
[2] - Downgradient Well



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

**Notes**

- Monitoring well coordinates and water level data (collected on February 28, 2022) provided by AEP.
- Groundwater elevation units are feet above mean sea level.
- MW-5 (570.33) was not used to generate groundwater contours due to inconsistent, or anomalous readings.
- Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis, 2016) provided by AEP.



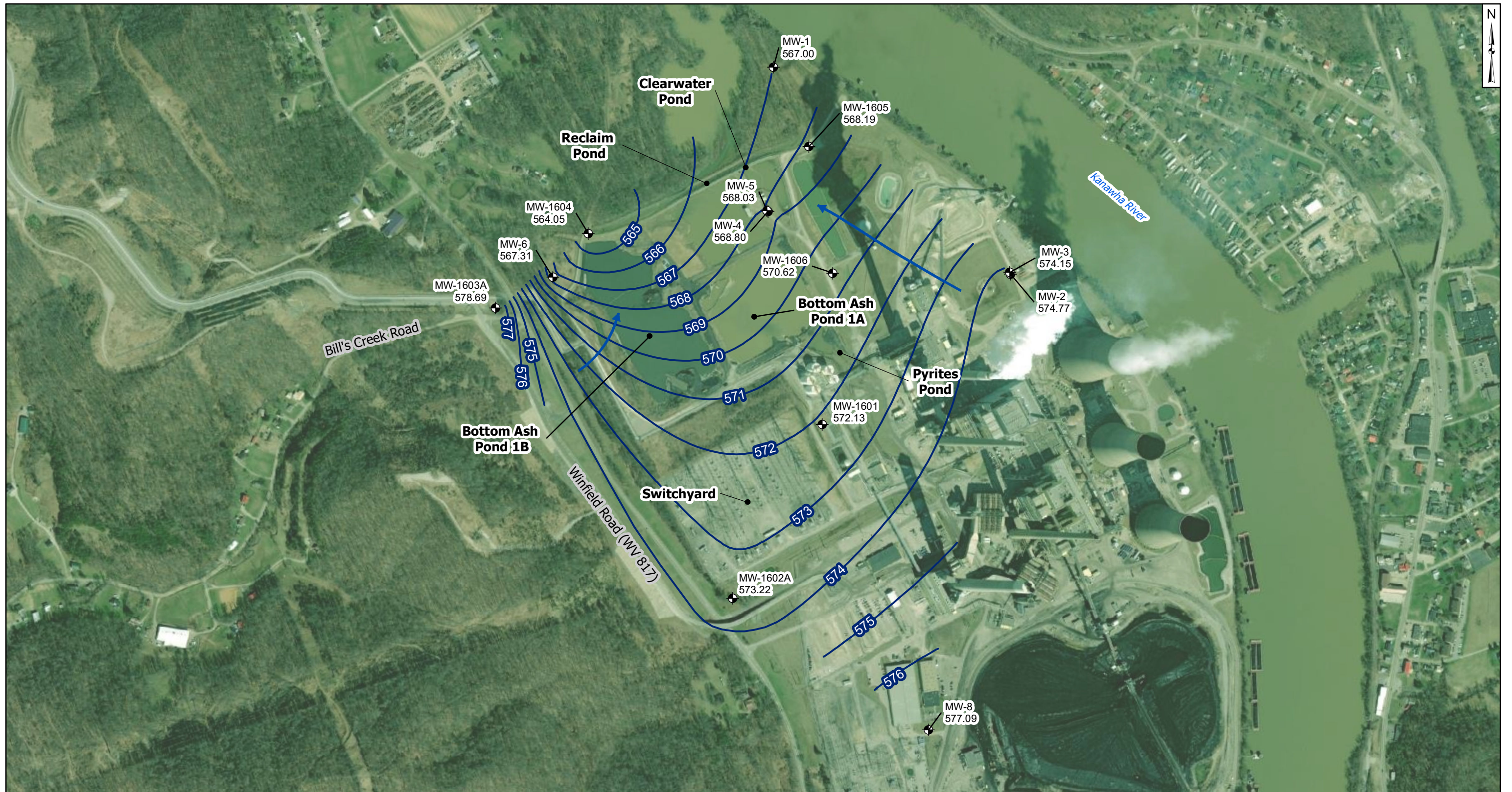
**Potentiometric Surface Map - Uppermost Aquifer  
February 2022**

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

**Geosyntec**  
consultants

Columbus, Ohio      2022/06/17

Figure  
**2**



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

**Notes**

- Monitoring well coordinates and water level data (collected on May 16, 2022) provided by AEP.
- Groundwater elevation units are feet above mean sea level.
- 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  
May 2022**

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

**Geosyntec**  
consultants

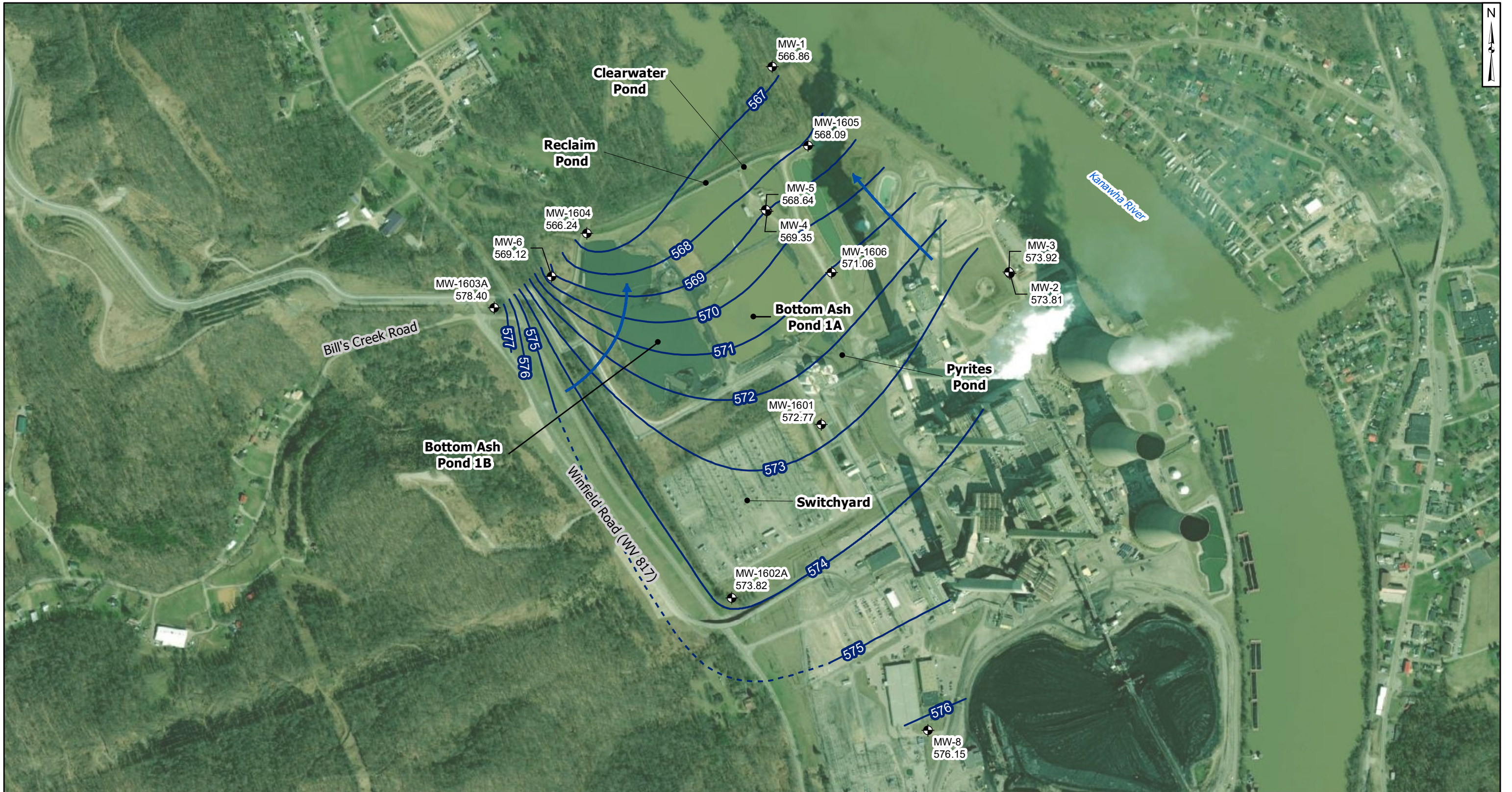
Figure

**3**

Columbus, Ohio

2022/07/29

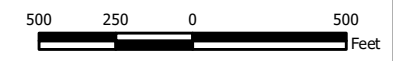




- Legend**
- Monitoring Well Location
  - Groundwater Elevation Contour
  - - - Groundwater Elevation Contour (Inferred)
  - ➔ Groundwater Flow Direction

**Notes**

- Monitoring well coordinates and water level data (collected on October 24, 2022) provided by AEP.
- Groundwater elevation units are feet above mean sea level.
- 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  
October 2022**

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

**Geosyntec**  
consultants

Figure  
**4**

Columbus, Ohio      2023/01/06

## **APPENDIX 2**

Statistical analysis reports completed in 2022 follow.

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

*Submitted to*



1 Riverside Plaza  
Columbus, Ohio 43215-2372

*Submitted by*



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March 10, 2022  
CHA8500

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

## LIST OF ATTACHMENTS

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

## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
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
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 2021, 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 November. During the March and May 2021 assessment monitoring events, no statistically significant levels (SSLs) were observed, and the unit remained in assessment monitoring (Geosyntec, 2021). One assessment monitoring event was conducted at the BAP in November 2021 in accordance with 40 CFR 257.95. The results of the November 2021 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 November 2021. Samples from November 2021 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.9.6.32 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 November 2021 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, 2020b). 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 chromium, combined radium, lead, and molybdenum. Non-parametric tolerance limits were calculated for antimony, arsenic, barium, beryllium, cadmium, cobalt, fluoride,

lithium, selenium, and thallium due to apparent non-normal distributions and for mercury due to a high non-detect frequency. 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 became available.

For the intrawell tests, insufficient data was available to compare against the existing background dataset, the prediction limits were not updated for the intrawell tests at this time. The intrawell prediction limits were previously calculated using historical data through May 2020 (Geosyntec, 2020).

Prediction limits for the interwell tests were recalculated using data collected during the 2021 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 practical quantitation limit (PQL) – i.e., “J-flagged” data – were considered detections and the estimated results were used in the statistical analyses. Non-parametric analyses were selected for datasets with at least 50% non-detect data or datasets that could not be normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk / Shapiro-Francia test for normality. The Kaplan-Meier non-detect adjustment was applied to datasets with between 15% and 50% non-detect data. For datasets with fewer than 15% non-detect data, non-detect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or non-parametric) and transformation (where applicable) for each background dataset are shown in Attachment B.



Interwell UPLs were updated for boron, calcium, chloride, sulfate, and TDS using historical data through November 2021. Intrawell UPLs were previously calculated for fluoride and pH and intrawell lower prediction limits (LPLs) were updated for pH using all the historical data through May 2020 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 November 2021 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 19.7 mg/L at MW-1 (40.9 mg/L) and MW-1605 (46.4 mg/L).
- Chloride concentrations exceeded the interwell UPL of 43.4 mg/L at MW-1 (76.1 mg/L), MW-1605 (85.3 mg/L), and MW-1606 (81.5 mg/L).
- The pH value at MW-4 (5.3 standard units [SU]) is below the intrawell LPL of 5.4.
- Sulfate concentrations exceeded the interwell UPL of 75.7 mg/L at MW-1 (166 mg/L), MW-1605 (226 mg/L), and MW-1606 (78.6 mg/L).
- TDS concentrations exceeded the interwell UPL of 261 mg/L at MW-1 (410 mg/L), MW-1605 (520 mg/L), and MW-1606 (290 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the November 2021 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 semi-annual 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 November 2021 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. Appendix III parameters were compared to established prediction limits, with exceedances identified for calcium, chloride, sulfate, and TDS and a pH value below the LPL.

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. 2020. Statistical Analysis Summary – Bottom Ash Pond, Amos Plant, Winfield, West Virginia. September 2, 2020.

Geosyntec. 2021. Statistical Analysis Summary – Bottom Ash Pond, Amos Plant, Winfield, West Virginia. August 27, 2021.

# TABLES

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

Parameter	Unit	MW-1	MW-1601	MW-1602	MW-1603	MW-1604	MW-1605	MW-1606	MW-4	MW-5	MW-6
		11/9/2021	11/9/2021	1/10/2021	11/5/2021	11/4/2021	11/9/2021	11/4/2021	11/3/2021	11/3/2021	11/2/2021
Antimony	µg/L	0.1 U	0.1 U	0.07 J	0.04 J	0.1 U	0.04 J	0.1 U	0.1 U	0.1 U	0.1 U
Arsenic	µg/L	0.14	7.64	17.5	85.2	4.38	4.96	2.68	1.42	3.07	35.4
Barium	µg/L	24.9	168	222	234	138	116	41.2	89.8	120	146
Beryllium	µg/L	0.102	0.042 J	0.044 J	0.017 J	0.054	0.117	0.064	0.050	0.036 J	0.013 J
Boron	mg/L	0.023 J	0.052	0.012 J	0.011 J	0.143	0.053	0.032 J	0.068	0.024 J	0.05 U
Cadmium	µg/L	0.881	0.028	0.021	0.02 U	0.02 U	0.012 J	0.221	0.040	0.004 J	0.02 U
Calcium	mg/L	40.9	19.4	19.0	15.1	17.7	46.4	17.7	14.9	12.1	10.8
Chloride	mg/L	76.1	42.9	43.4	6.54	25.7	85.3	81.5	18.6	9.88	9.11
Chromium	µg/L	0.15 J	0.73	1.65	0.67	1.02	0.58	0.38	0.42	0.45	0.45
Cobalt	µg/L	11.0	8.34	0.920	0.269	0.469	9.41	8.18	7.38	1.03	8.03
Combined Radium	pCi/L	0.45	1.33	0.86	1.13	1.18	0.78	0.67	0.76	0.55	1.33
Fluoride	mg/L	0.03 J	0.04 J	0.13	0.25	0.06	0.02 J	0.03 J	0.06	0.04 J	0.05 J
Lead	µg/L	0.13 J	0.43	2.21	0.36	0.38	0.60	0.20	0.23	0.2 U	0.05 J
Lithium	mg/L	0.00270	0.00201	0.00122	0.00037	0.00058	0.00205	0.00229	0.00164	0.00132	0.00097
Molybdenum	µg/L	0.3 J	0.2 J	0.8	1.0	0.2 J	0.2 J	0.5 U	0.1 J	0.2 J	0.4 J
Selenium	µg/L	0.10 J	0.1 J	0.14 J	0.5 U	0.13 J	0.16 J	0.5 U	0.5 U	0.5 U	0.1 J
Sulfate	mg/L	166	75.7	11.9	0.4 U	0.4 U	226	78.6	39.9	42.2	0.75
Thallium	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Dissolved Solids	mg/L	410	250	190	90	210	520	290	190	150	230
pH	SU	5.2	5.8	6.5	6.7	6.2	5.6	5.4	5.3	5.4	7.0

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

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

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

**Table 2: Appendix IV Groundwater Protection Standards***Geosyntec Consultants, Inc.***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		0.000106	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000300	0.00500
Chromium, Total (mg/L)	0.100		0.00190	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.0140	0.0140
Combined Radium, Total (pCi/L)	5.00		2.31	5.00
Fluoride, Total (mg/L)	4.00		0.310	4.00
Lead, Total (mg/L)	0.0150		0.00563	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0300	0.0400
Mercury, Total (mg/L)	0.00200		0.00000500	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00221	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**

Analyte	Unit	Description	MW-1	MW-1604	MW-1605	MW-1606	MW-4	MW-5
			11/9/2021	11/4/2021	11/9/2021	11/4/2021	11/3/2021	11/3/2021
Boron	mg/L	Interwell Background Value (UPL)	0.183					
		Analytical Result	0.023	0.143	0.053	0.032	0.068	0.024
Calcium	mg/L	Interwell Background Value (UPL)	19.7					
		Analytical Result	<b>40.9</b>	17.7	<b>46.4</b>	17.7	14.9	12.1
Chloride	mg/L	Interwell Background Value (UPL)	43.4					
		Analytical Result	<b>76.1</b>	25.7	<b>85.3</b>	<b>81.5</b>	18.6	9.88
Fluoride	mg/L	Intrawell Background Value (UPL)	0.0300	0.140	0.0900	0.0300	0.0760	0.0500
		Analytical Result	0.03	0.06	0.02	0.03	0.06	0.04
pH	SU	Intrawell Background Value (UPL)	7.3	7.2	6.5	6.7	7.0	6.4
		Intrawell Background Value (LPL)	4.9	5.9	5.1	5.2	5.4	5.2
		Analytical Result	5.2	6.2	5.6	5.4	<b>5.3</b>	5.4
Sulfate	mg/L	Interwell Background Value (UPL)	75.7					
		Analytical Result	<b>166</b>	0.06	<b>226</b>	<b>78.6</b>	39.9	42.2
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	261					
		Analytical Result	<b>410</b>	210	<b>520</b>	<b>290</b>	190	150

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

# ATTACHMENT A

Certification by Qualified Professional Engineer



**Certification by Qualified Professional Engineer**

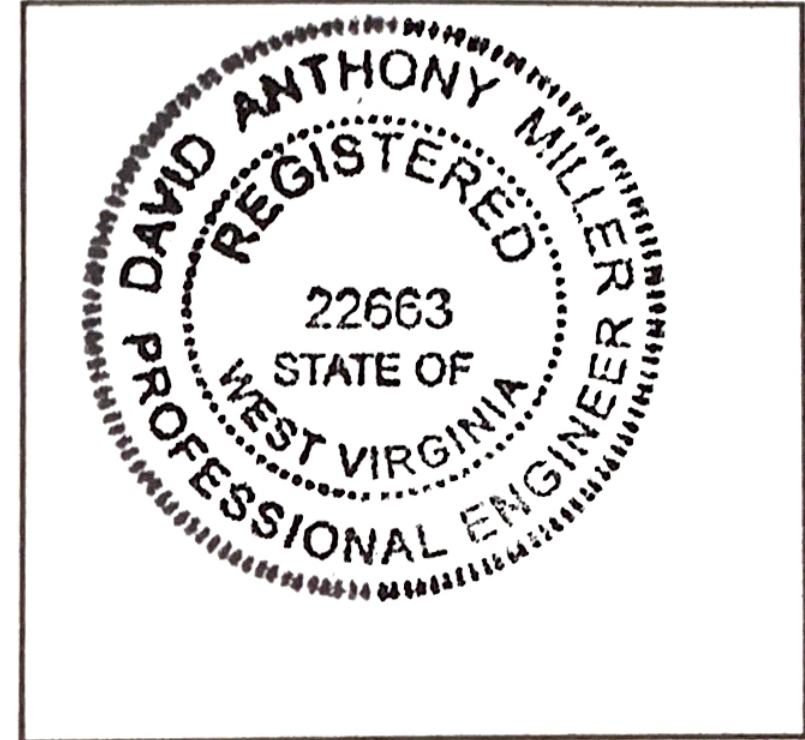
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Amos Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



22663

License Number

WEST VIRGINIA

Licensing State

03.10.22

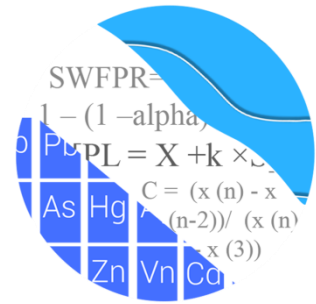
Date

**ATTACHMENT B**  
**Statistical Analysis Output**

# GROUNDWATER STATS CONSULTING

January 24, 2022

Geosyntec Consultants  
Attn: Ms. Allison Kreinberg  
941 Chatham Lane, #103  
Columbus, OH 43221



Re: Amos Bottom Ash Pond  
Background Update & Statistical Analysis – November 2021

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background update of Appendix III constituents and the statistical analysis of the Appendix IV constituents for the November 2021 sample event 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 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:

- **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

For all constituents, a substitution of the most recent reporting limit, as described below, is used for non-detect data. In the time series plots, a single reporting limit substitution is used across all wells for a given parameter since the wells are plotted as a group. For calculating 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 in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. 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 last updated during Spring 2021, and the results of those findings were submitted with the February 26, 2021 report. During this analysis, upgradient well data through November 2021 were re-screened for the purpose of updating the interwell prediction limits for boron, calcium, chloride, fluoride, and TDS. Intrawell prediction limits, will be updated during the Fall 2022 when sufficient compliance samples are available.

### Outlier Analysis

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 (Figure C). 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. A summary table of all flagged outliers follows this report (Figure C).

### 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 will be updated after the Fall 2022 sample event when a minimum of 4 compliance samples are available. A summary table of the limits follows this report (Figure D).

### 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 (Figure E). 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 this 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. A summary table and graphical results for the updated limits follow this letter (Figure G).

### **Evaluation of Appendix IV Parameters – November 2021**

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.

For the current analysis, Tukey's outlier test on pooled upgradient well data through October 2021 identified outliers for combined radium 226 + 228 and these values were flagged during previous background updates and will remain flagged. In addition, the next two highest values for combined in radium 226 + 228 in upgradient well BAP-MW-1602A were also flagged in order to construct statistical limits that are conservative (i.e., lower) from a regulatory perspective.

Additionally, downgradient well data through November 2021 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. The two highest values for molybdenum at downgradient BAP-MW-4 were flagged as outliers since these values were substantially higher than concentrations found within its respective well in addition to being higher than any concentrations observed upgradient of the facility. 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 2021 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 2021 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

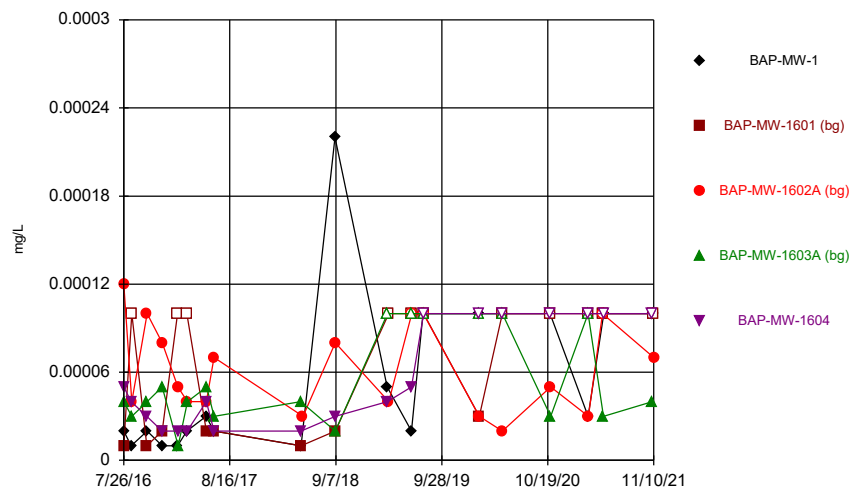
# 100% Non-Detects

Analysis Run 1/20/2022 10:12 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

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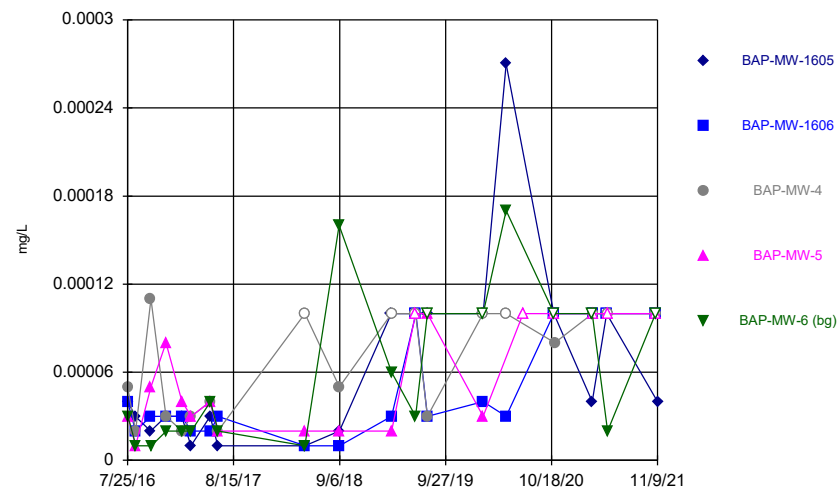
Mercury, total (mg/L)  
BAP-MW-1605, BAP-MW-4, BAP-MW-5

### Time Series



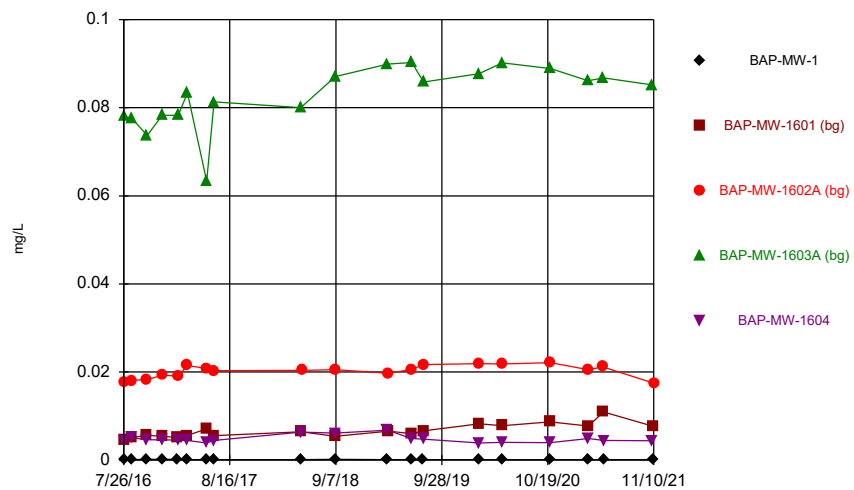
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



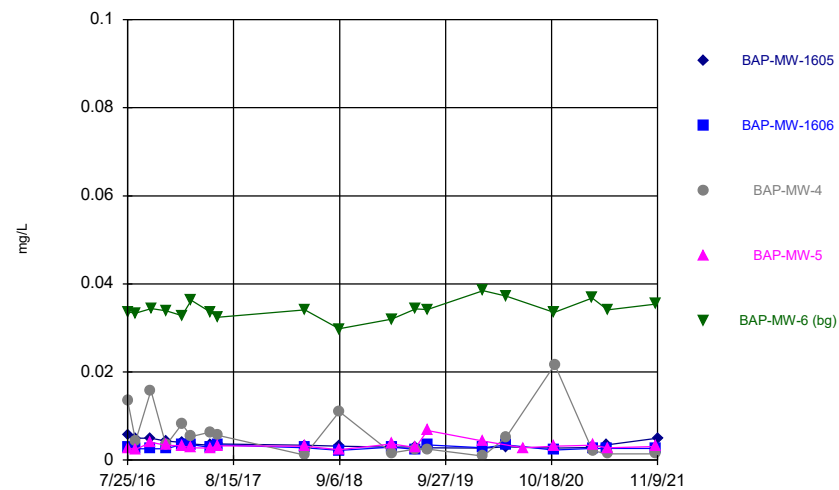
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### Time Series



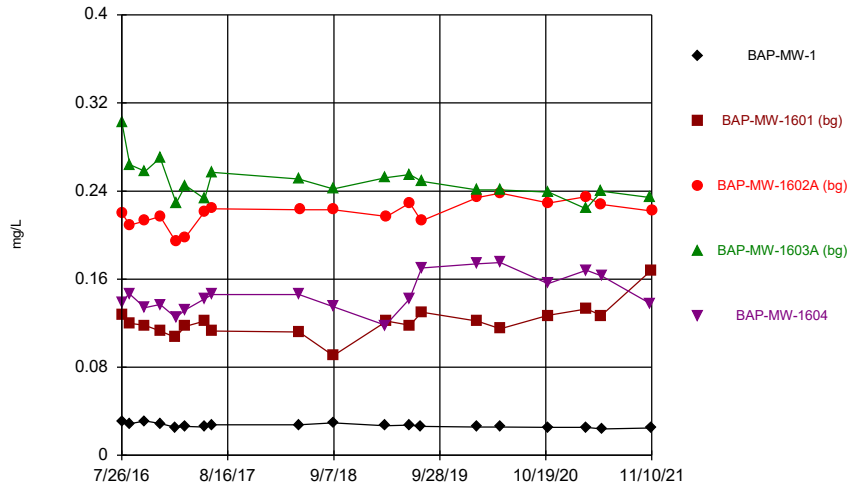
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### Time Series



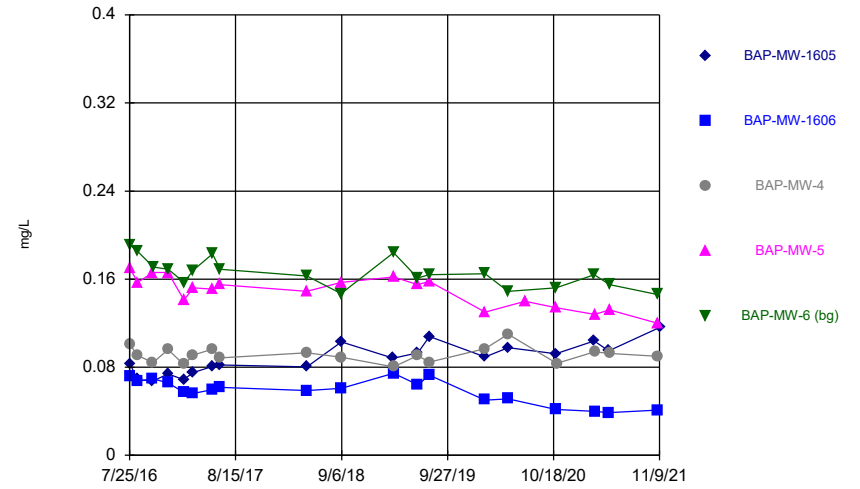
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Time Series



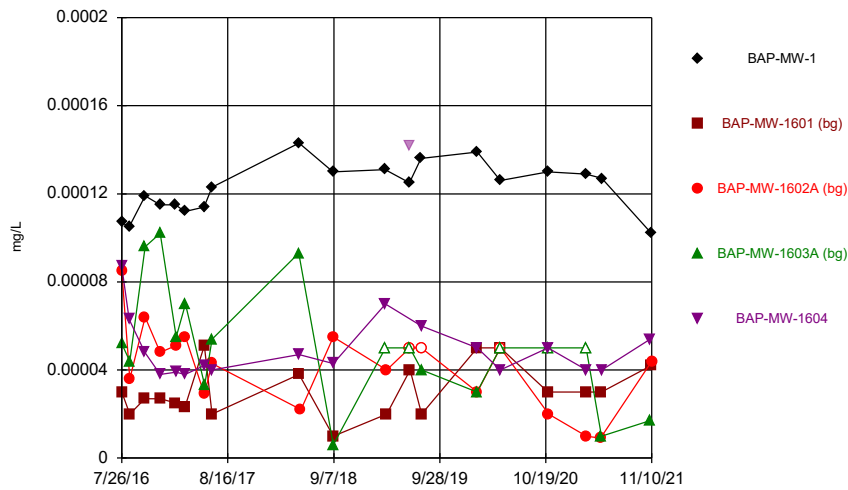
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Time Series



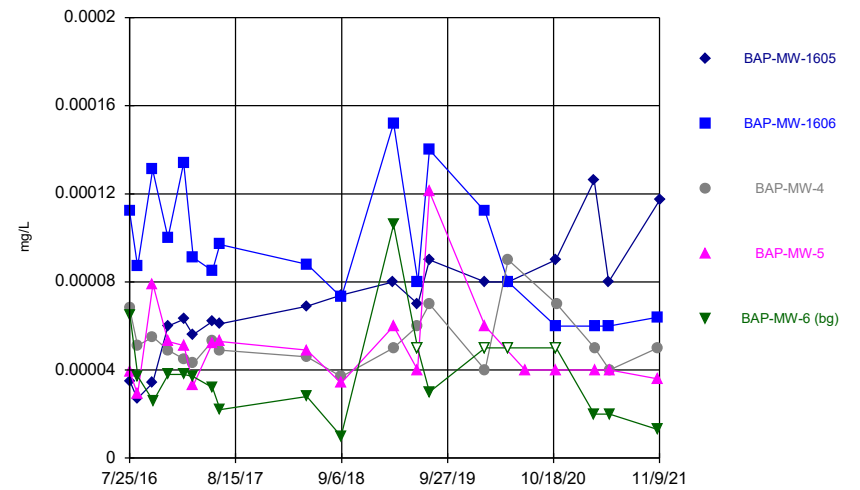
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Time Series



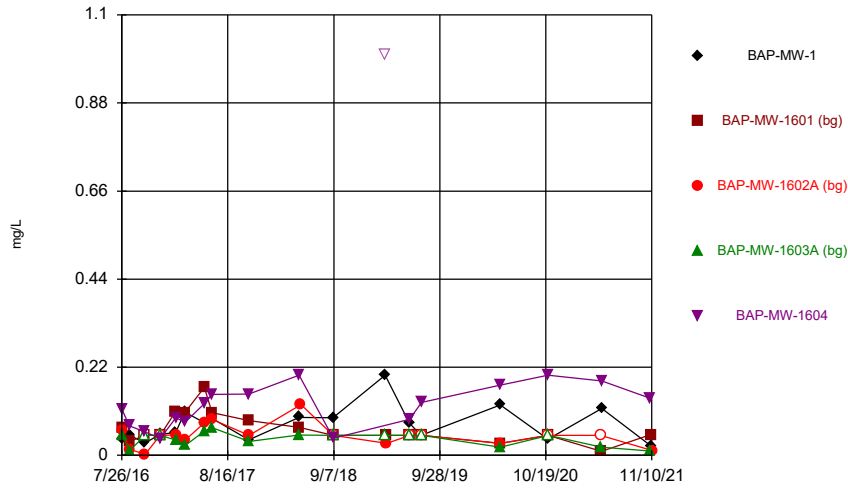
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Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



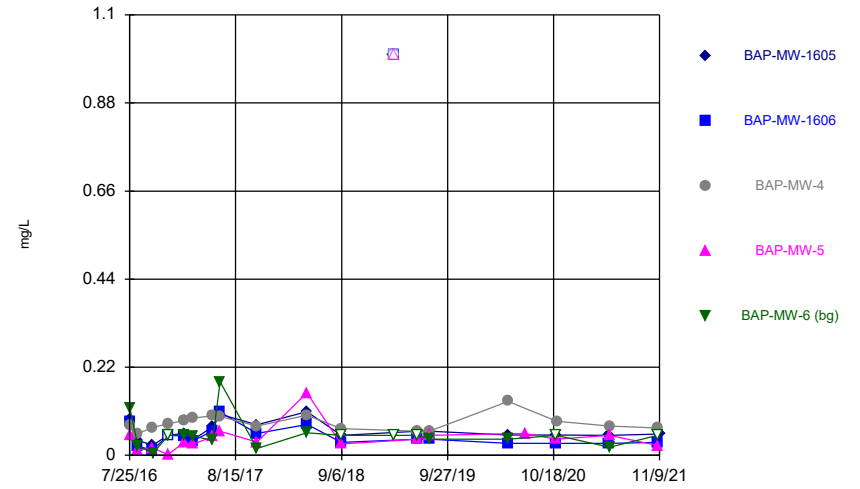
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### Time Series



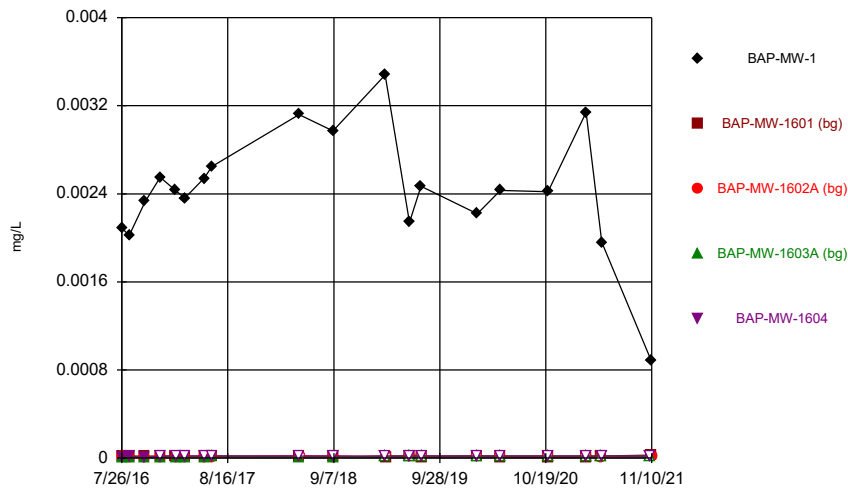
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



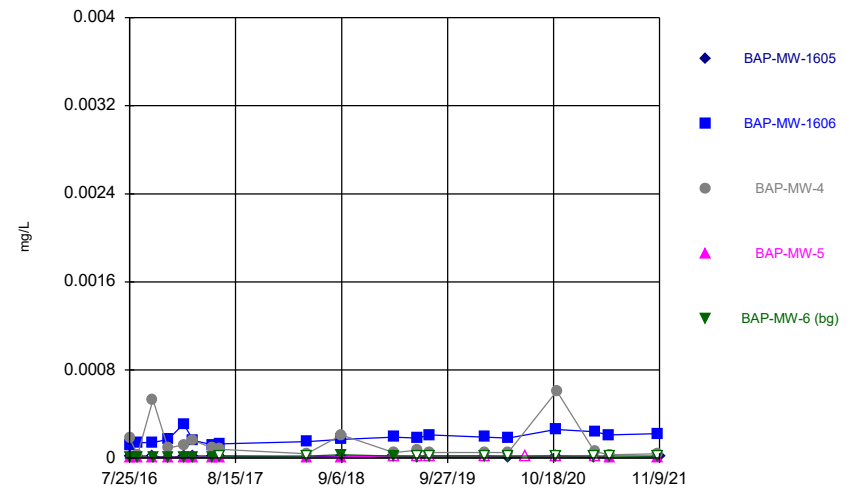
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### Time Series



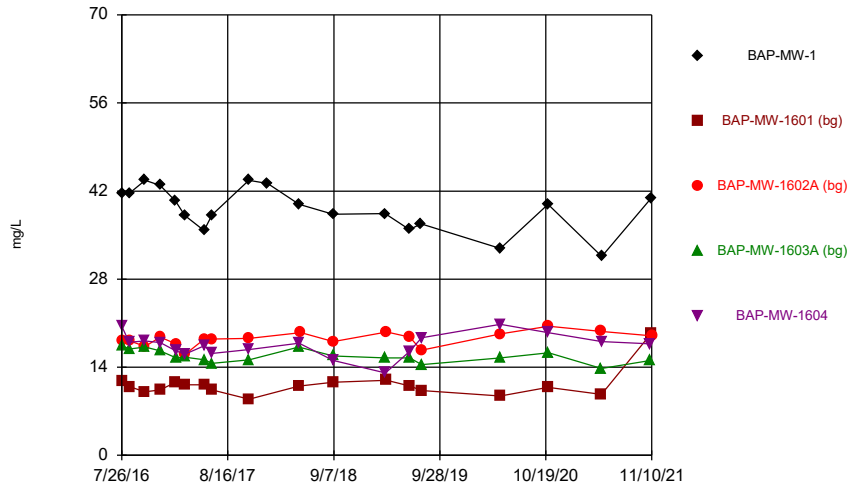
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



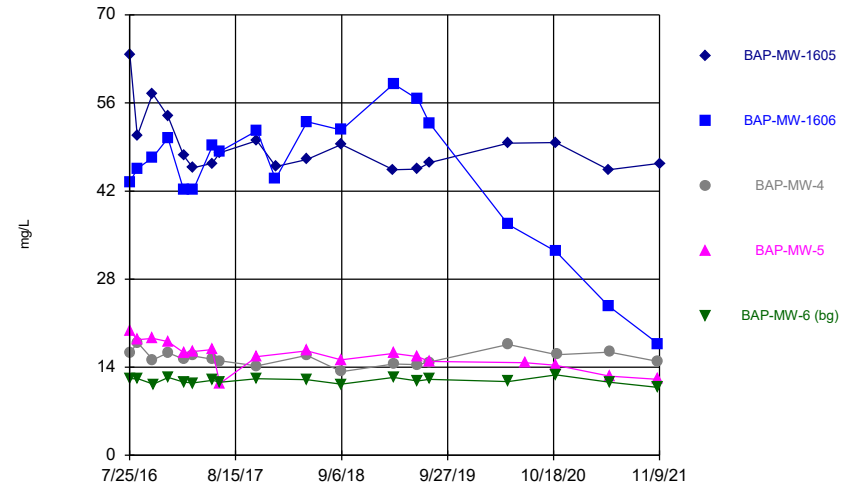
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Time Series



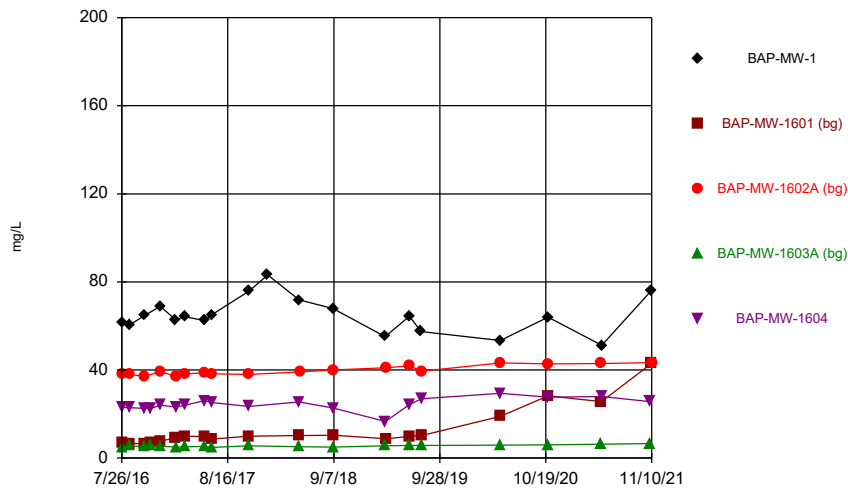
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Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



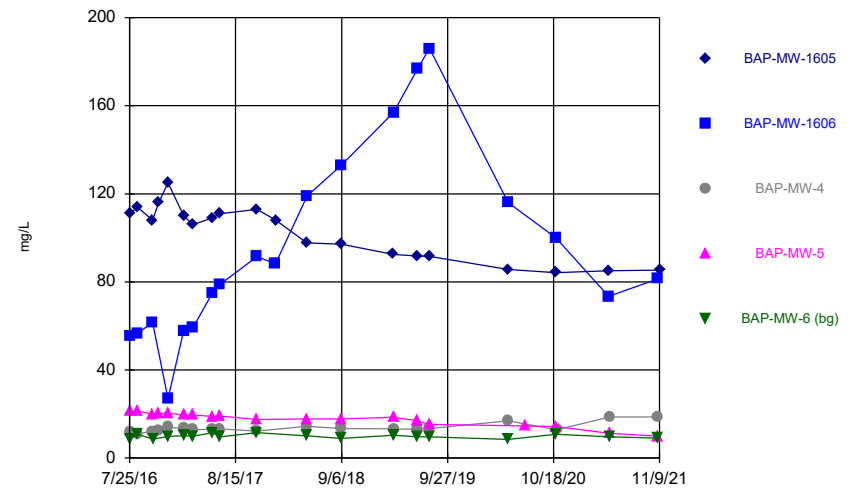
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Time Series



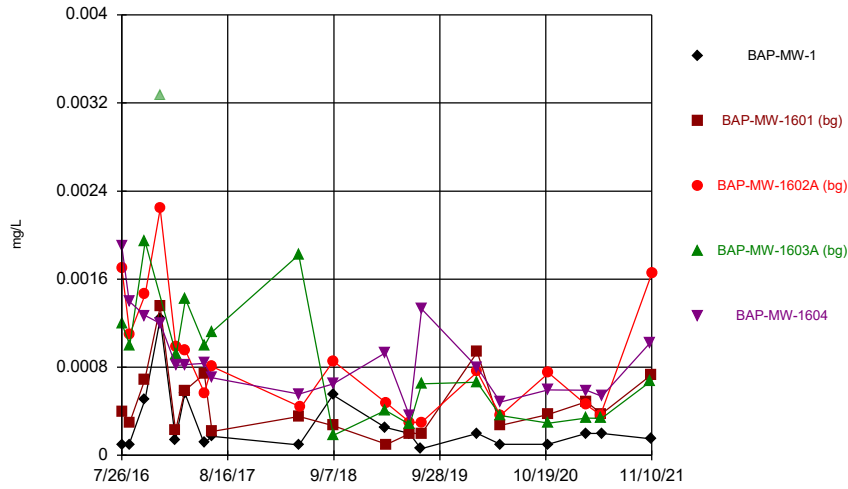
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Time Series



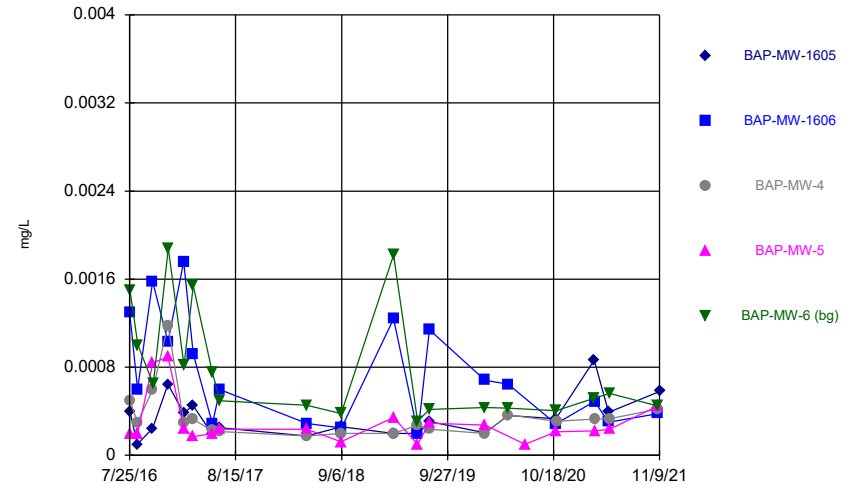
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Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



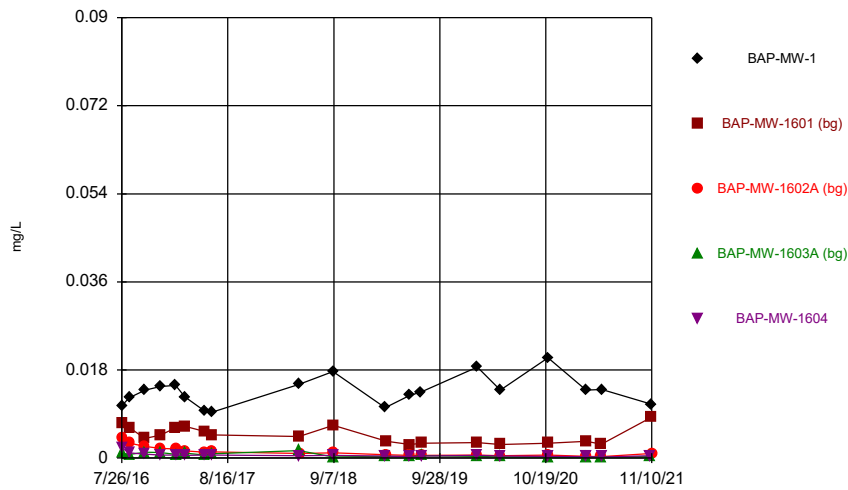
Constituent: Chromium, total Analysis Run 1/21/2022 12:54 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



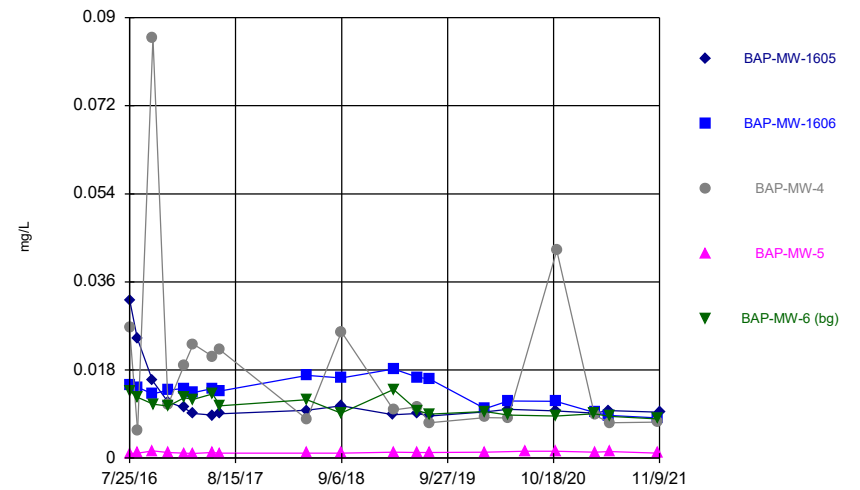
Constituent: Chromium, total Analysis Run 1/21/2022 12:54 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



Constituent: Cobalt, total Analysis Run 1/21/2022 12:54 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

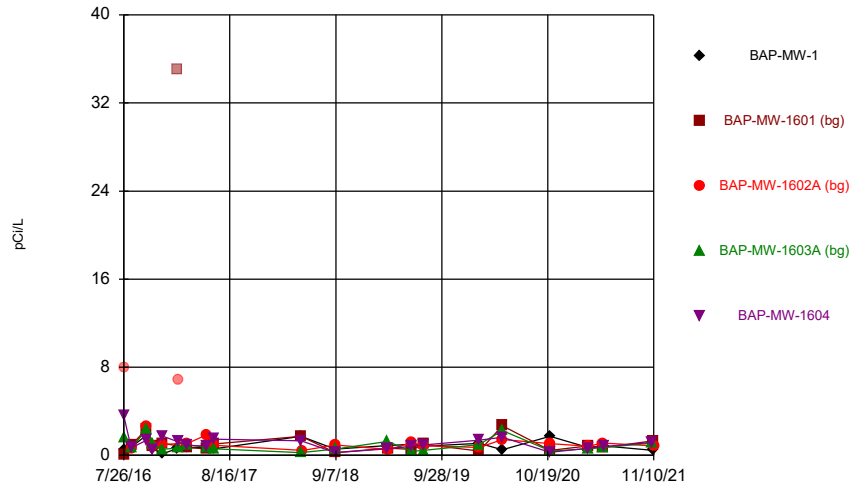
Time Series



Constituent: Cobalt, total Analysis Run 1/21/2022 12:54 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

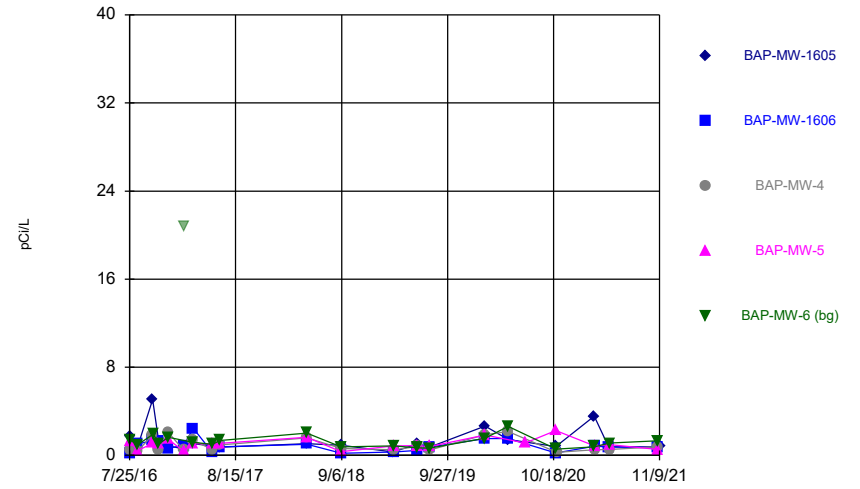


Time Series



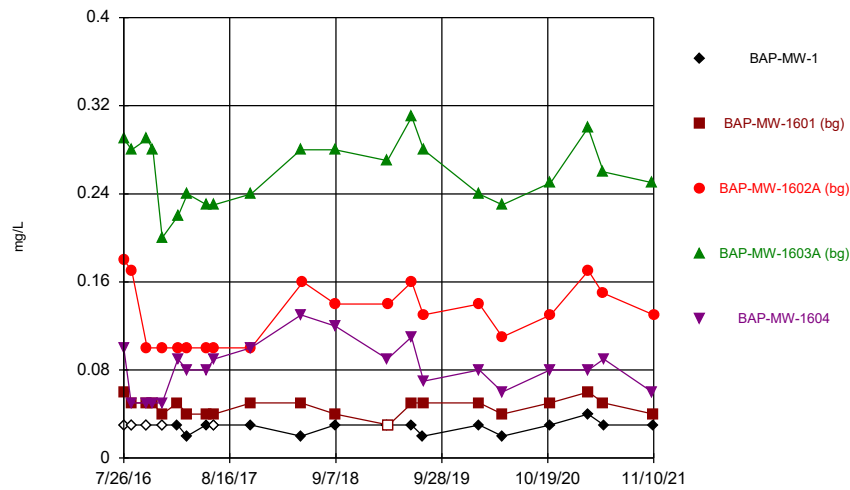
Constituent: Combined Radium 226 + 228 Analysis Run 1/21/2022 12:54 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



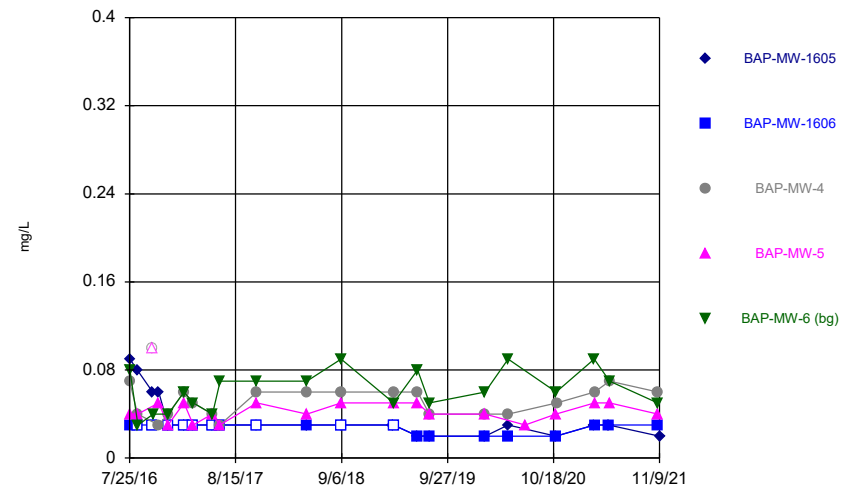
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Time Series



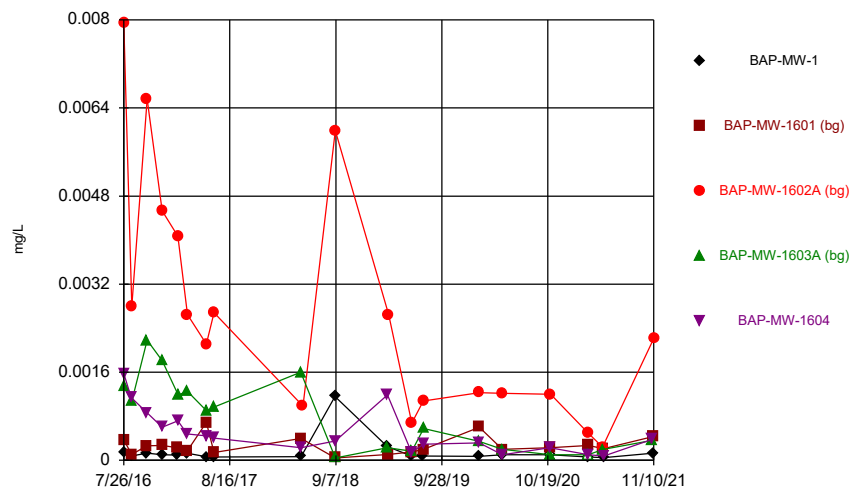
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Time Series



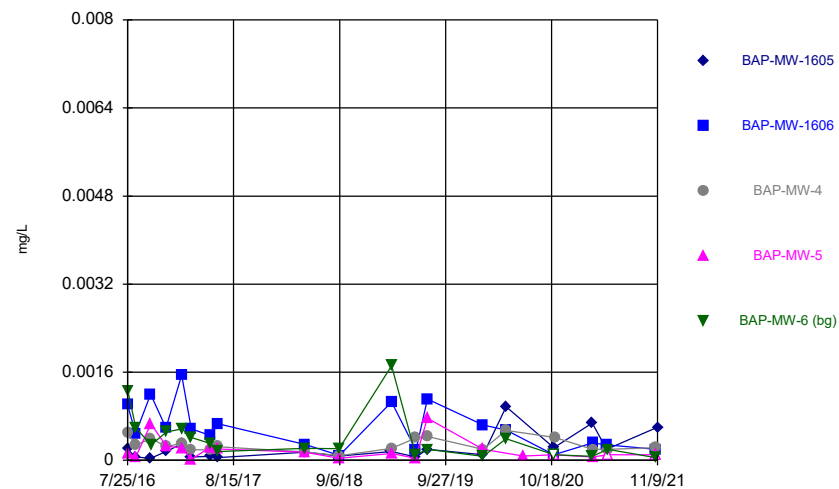
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



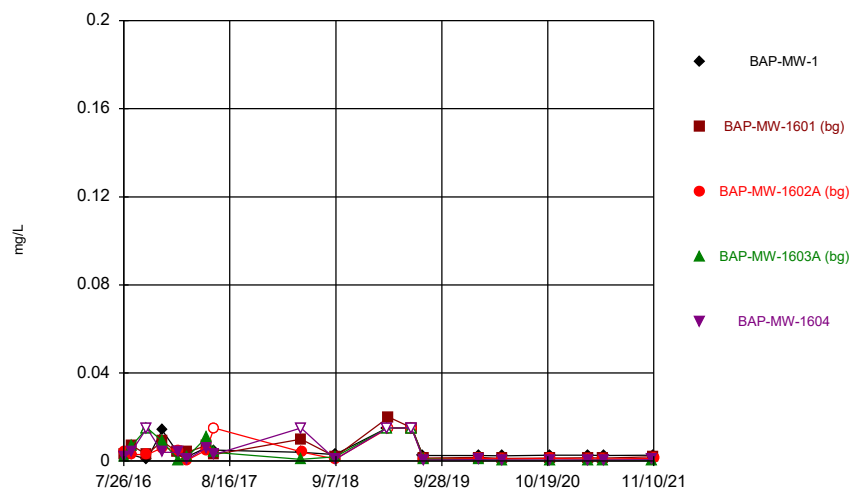
Constituent: Lead, total Analysis Run 1/21/2022 12:54 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



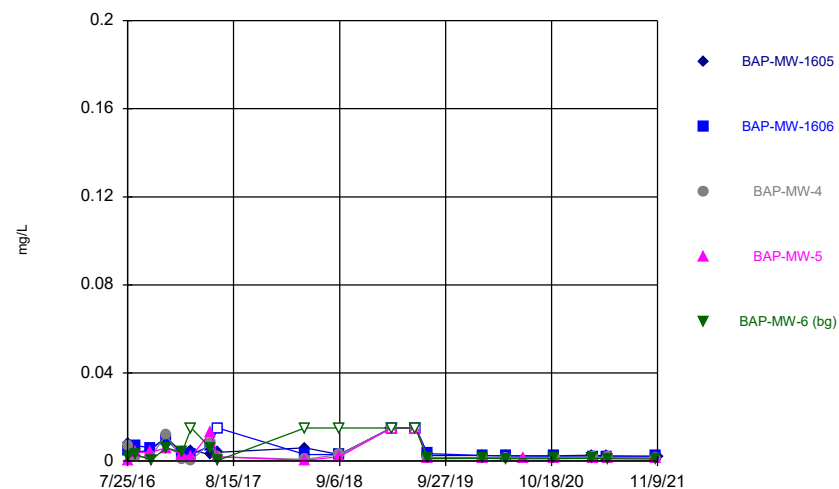
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### Time Series



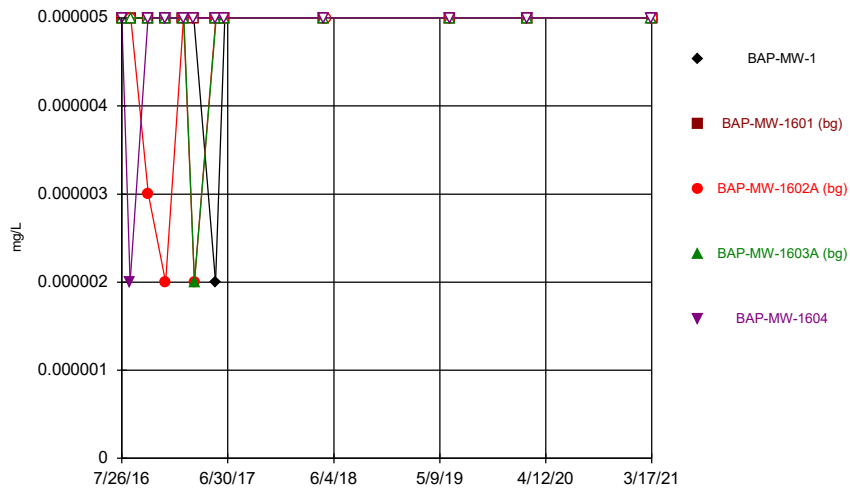
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



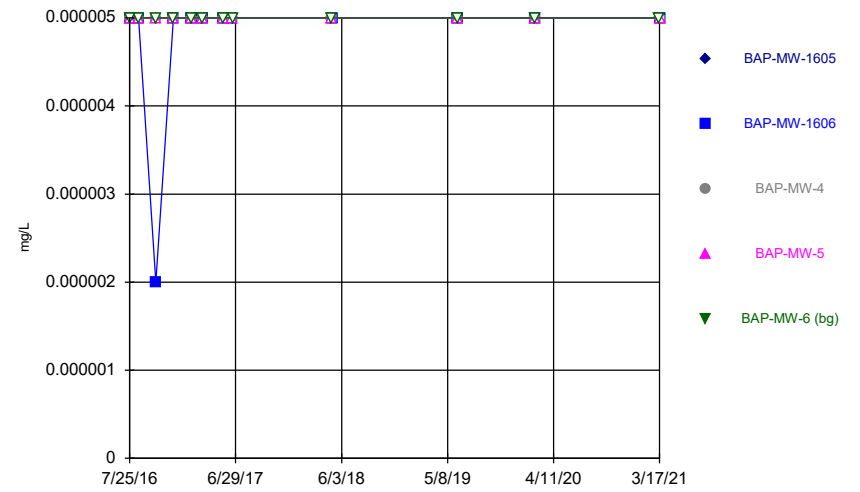
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



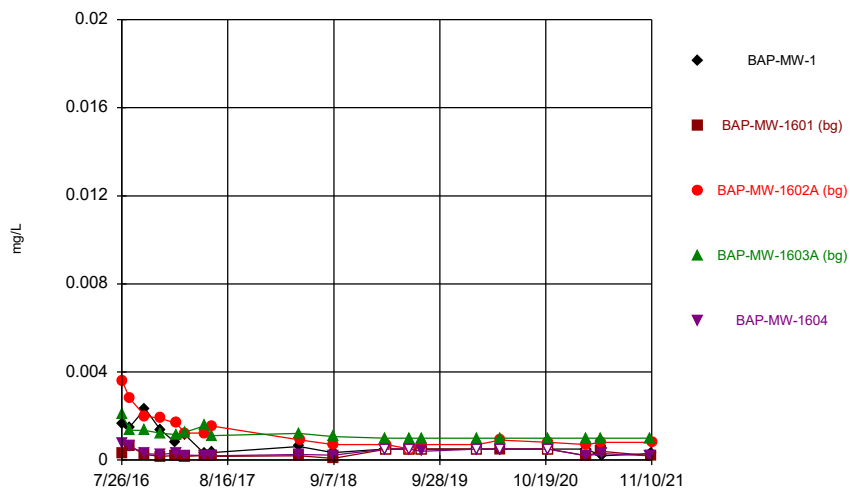
Constituent: Mercury, total Analysis Run 1/21/2022 12:54 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



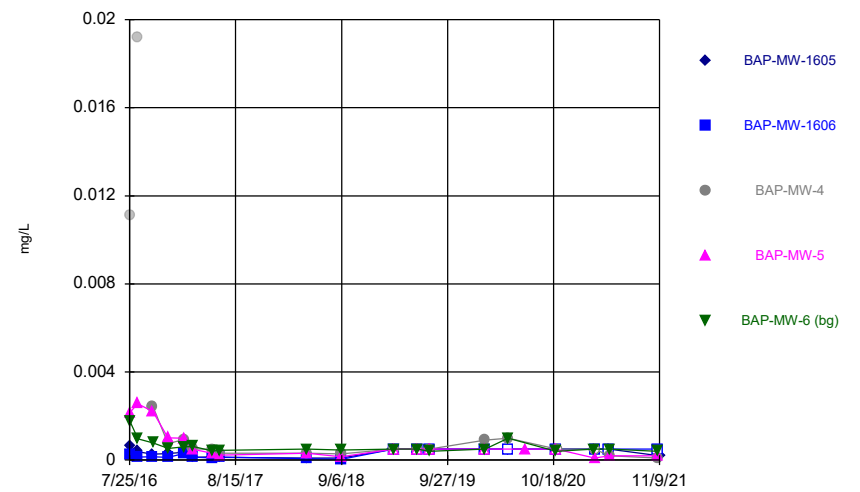
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### Time Series



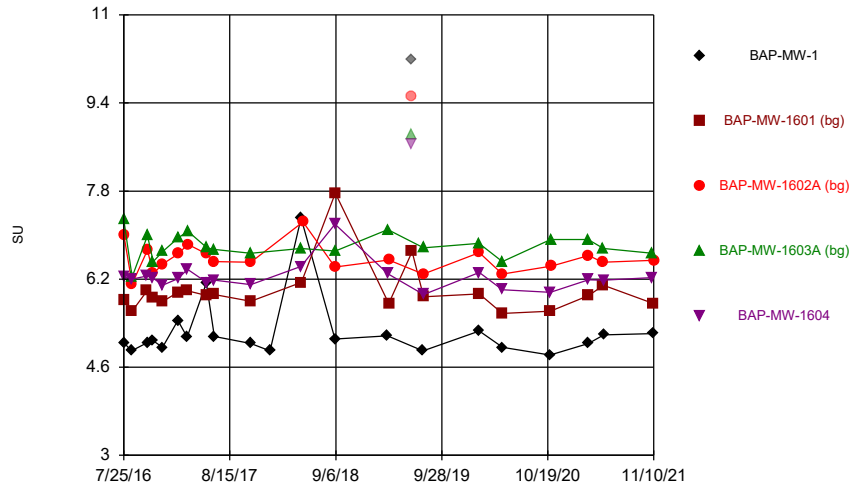
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



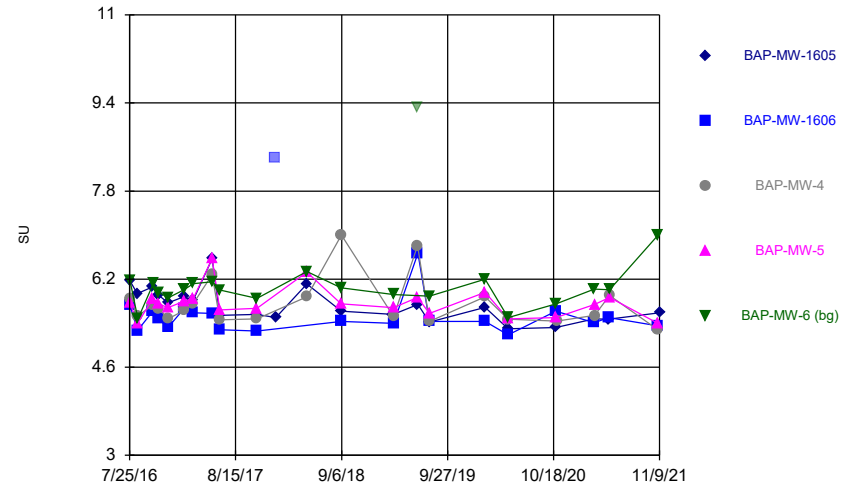
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Time Series



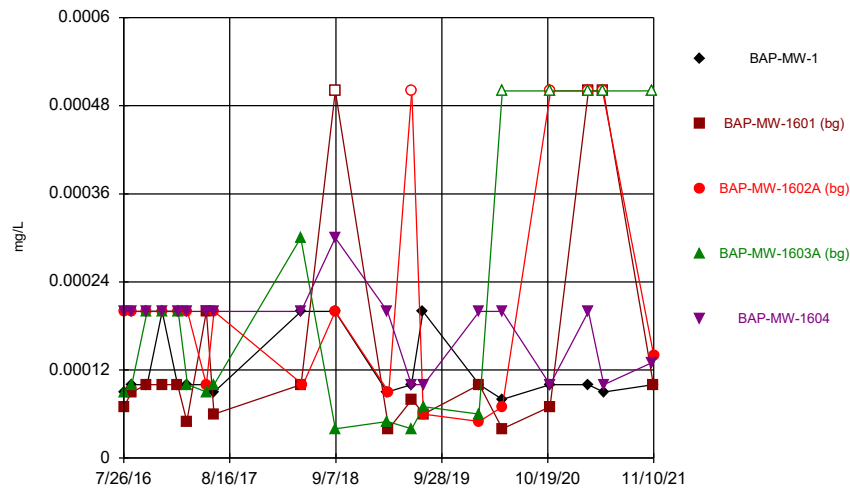
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Time Series



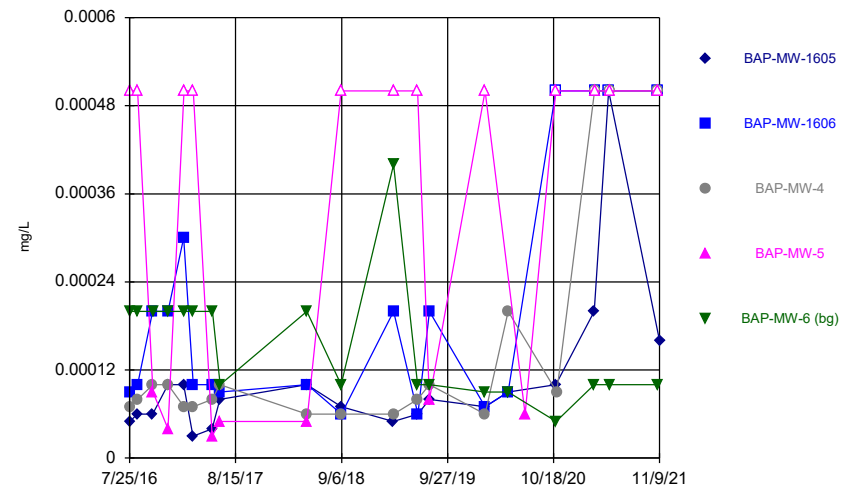
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Time Series



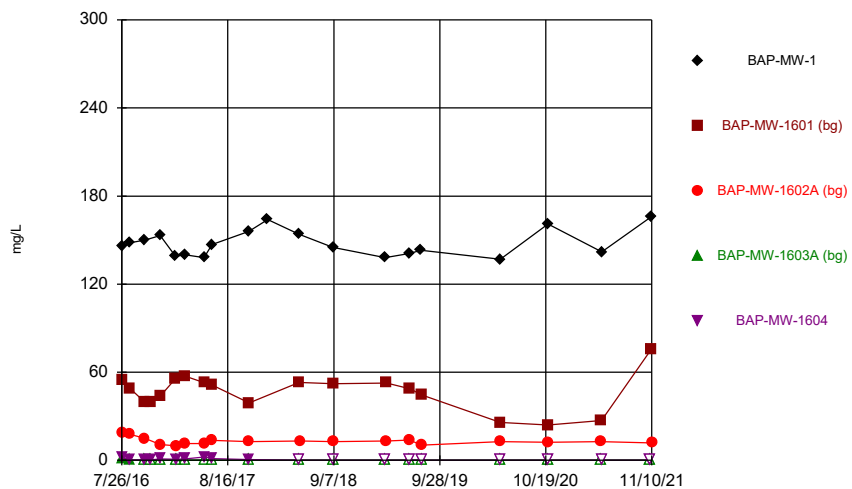
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Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



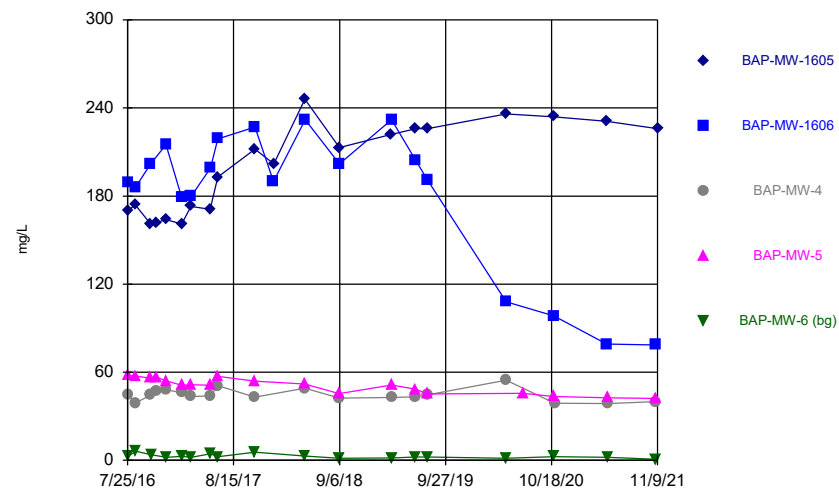
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



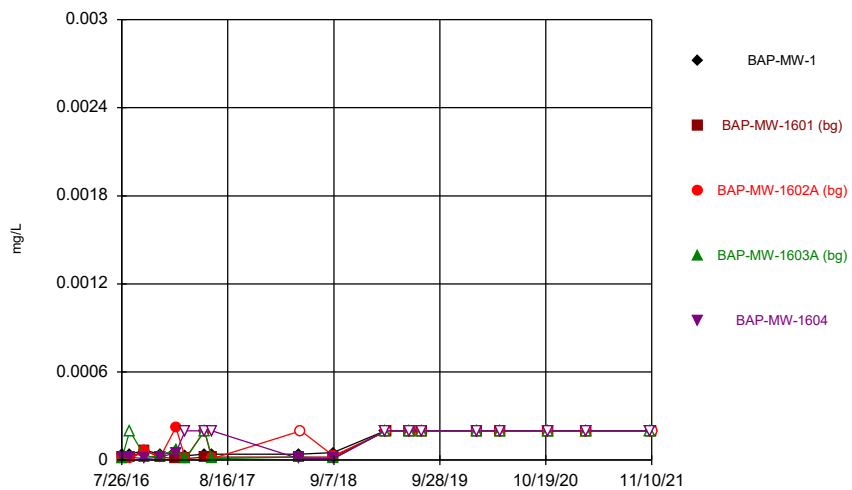
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Amos BAP Client: Geosyntec Data: Amos BAP

### Time Series



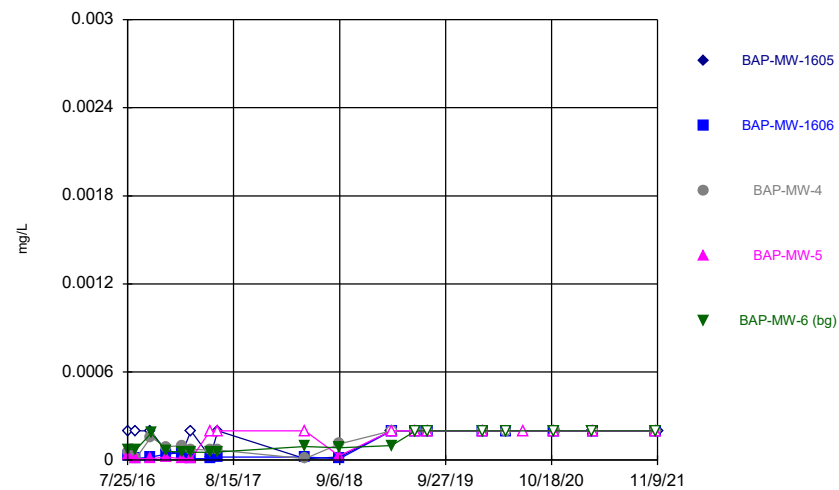
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### Time Series



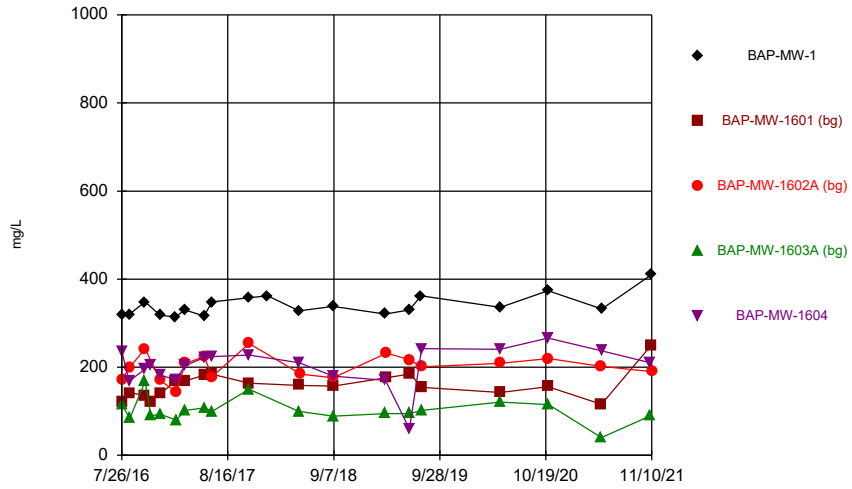
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### Time Series



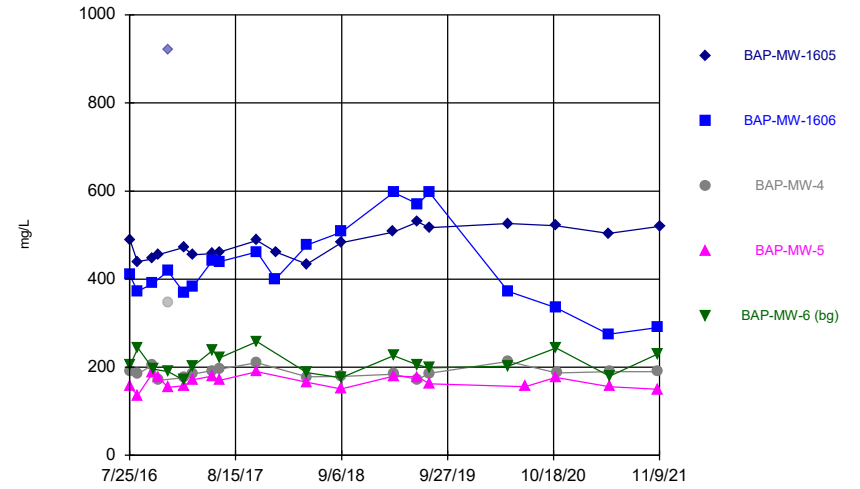
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### Time Series



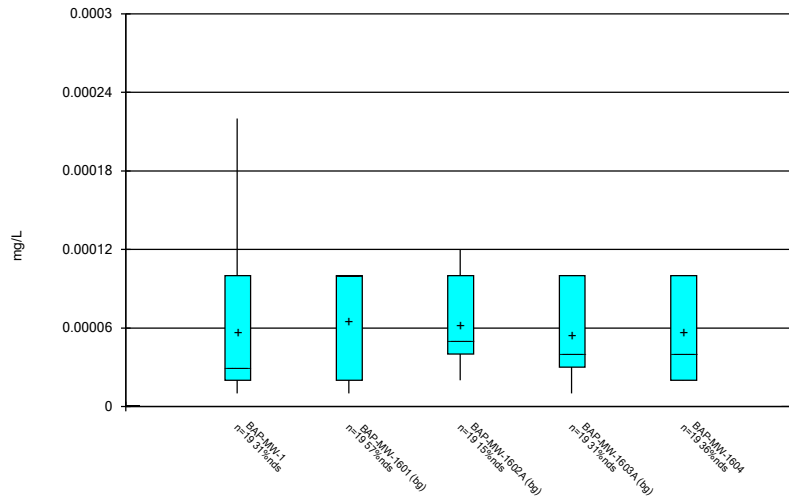
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### Time Series



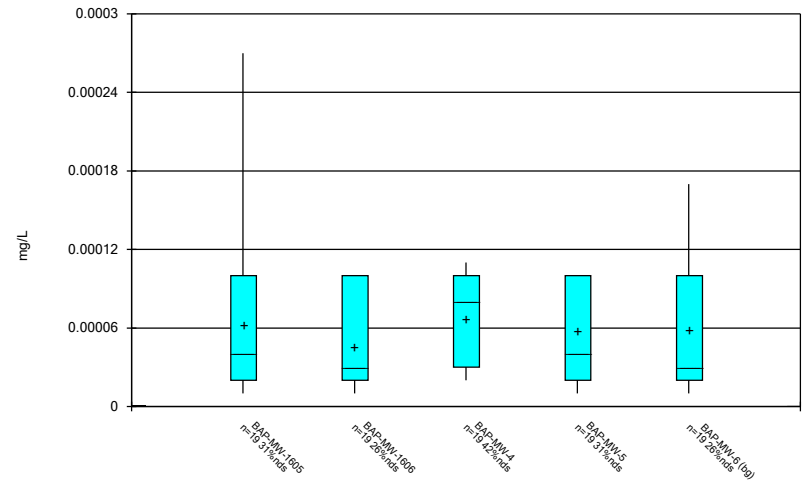
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



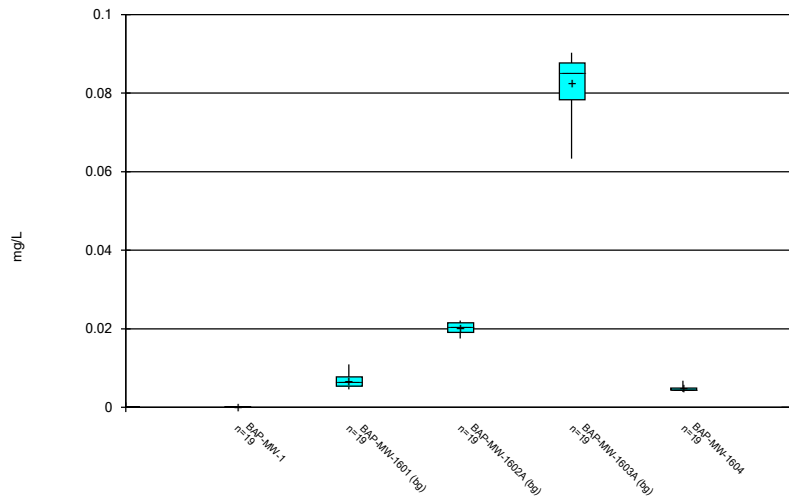
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



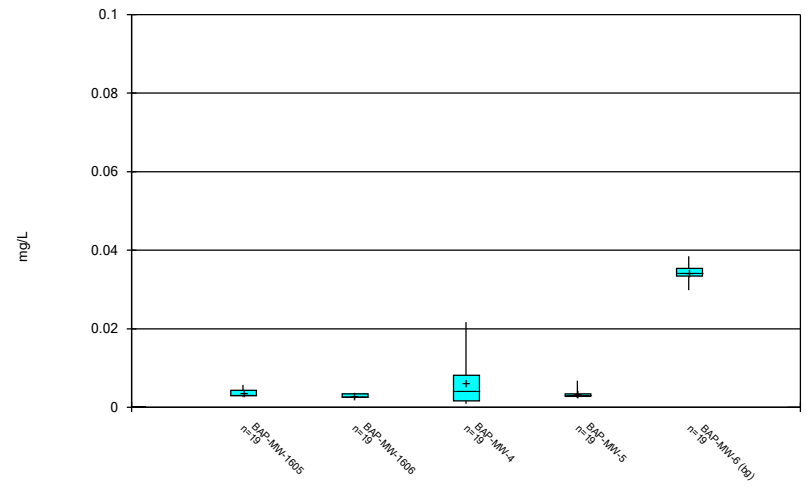
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



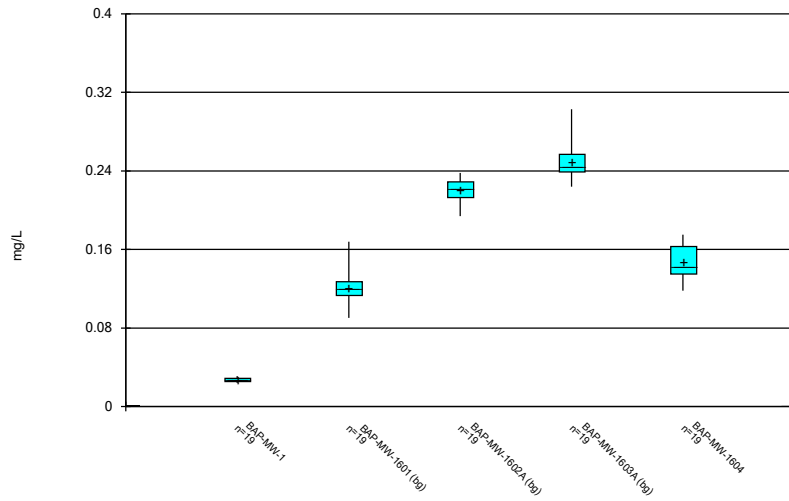
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### Box & Whiskers Plot



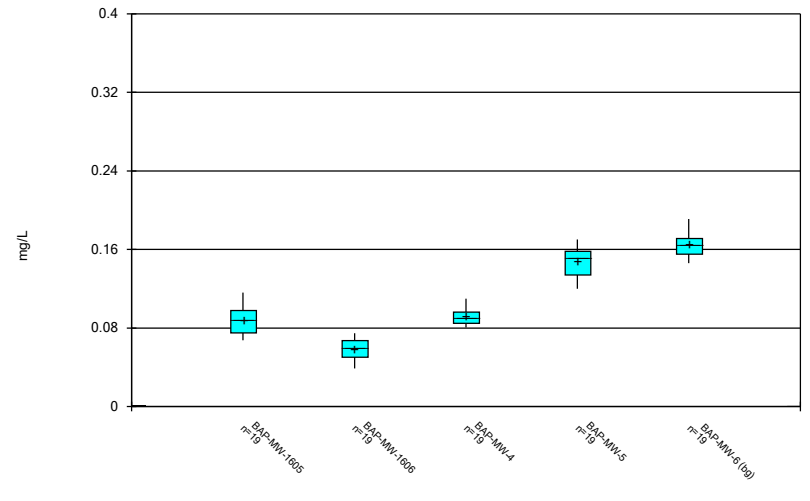
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



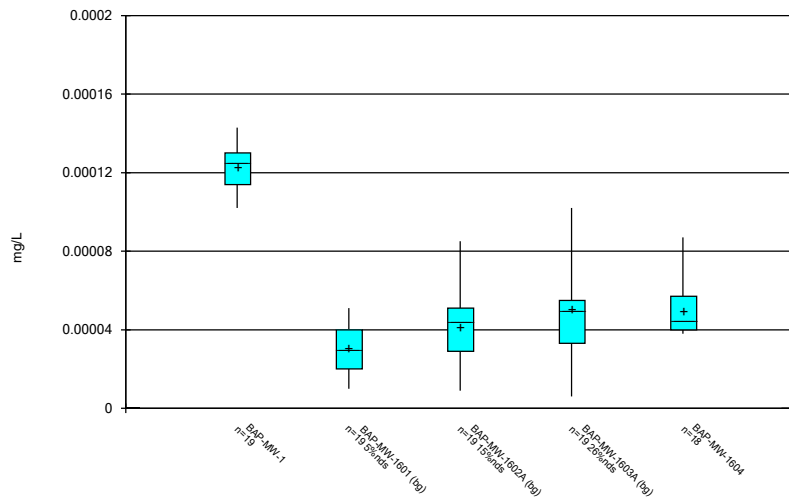
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Box & Whiskers Plot



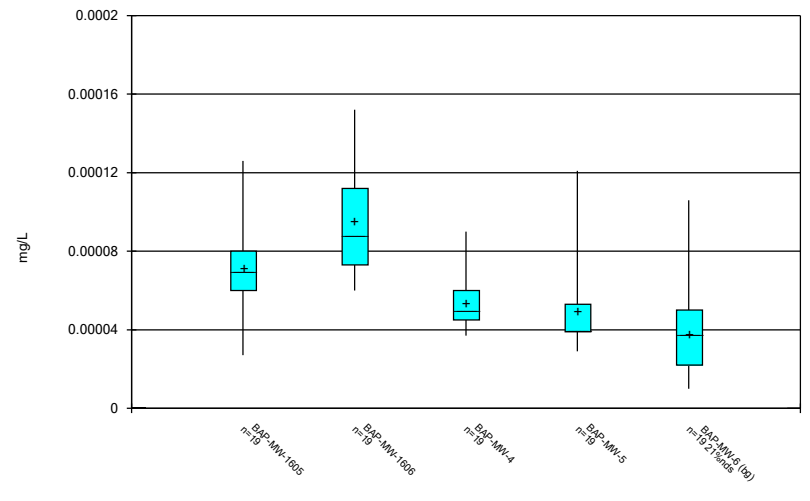
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



Constituent: Beryllium, total Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
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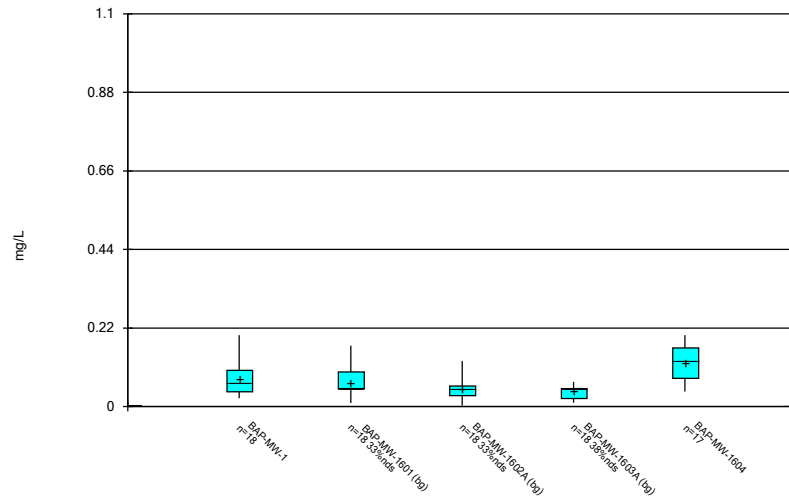
Box & Whiskers Plot



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Amos BAP Client: Geosyntec Data: Amos BAP

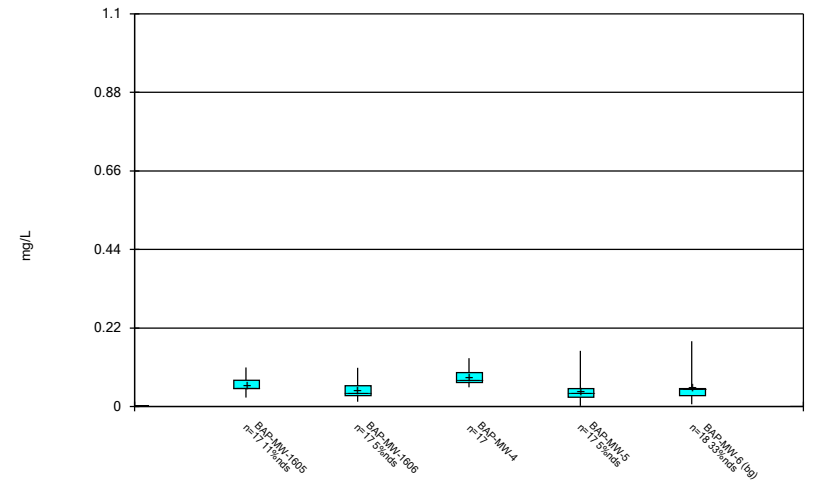


Box & Whiskers Plot



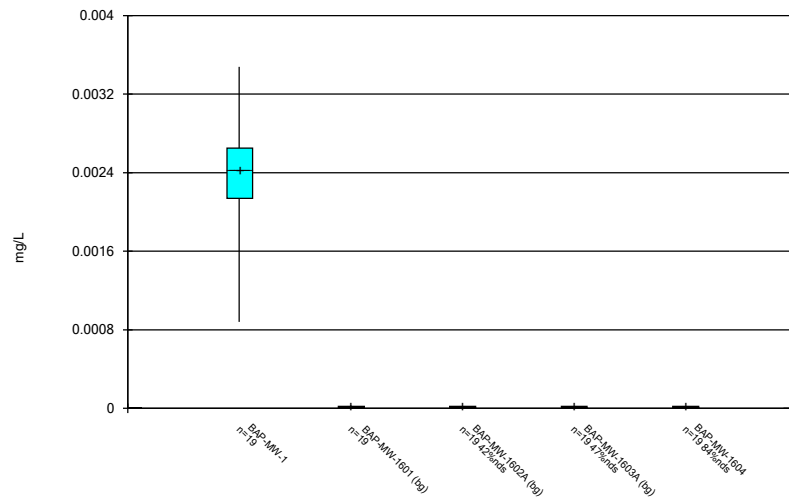
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Box & Whiskers Plot



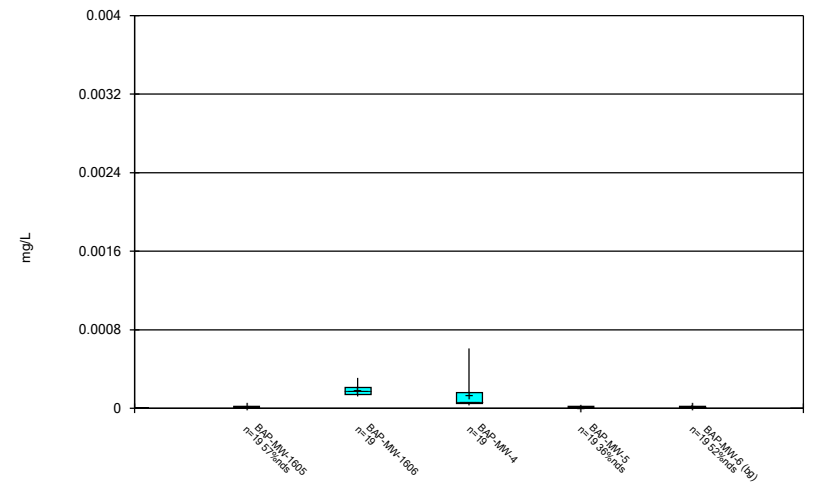
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



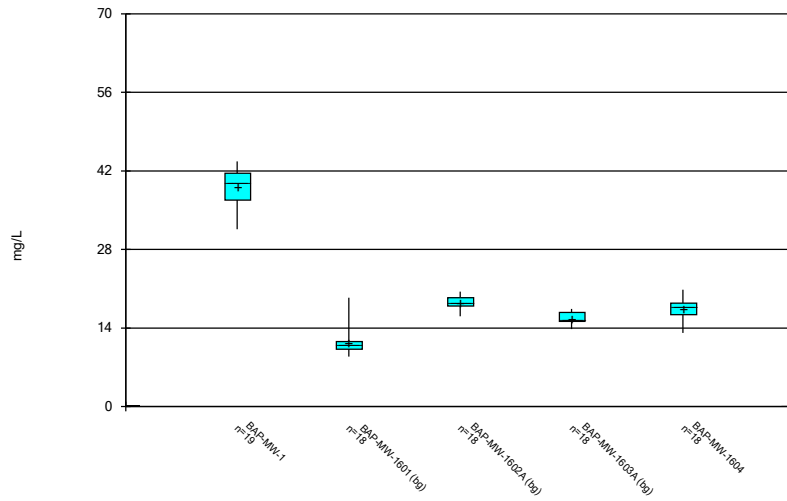
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



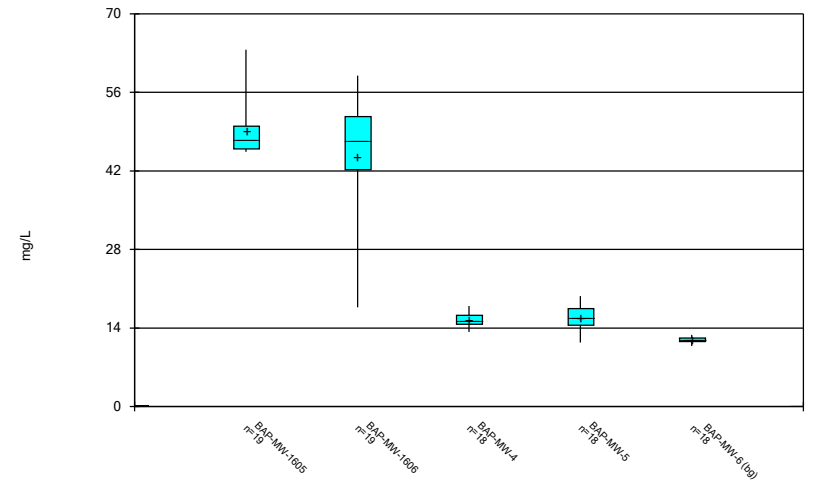
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



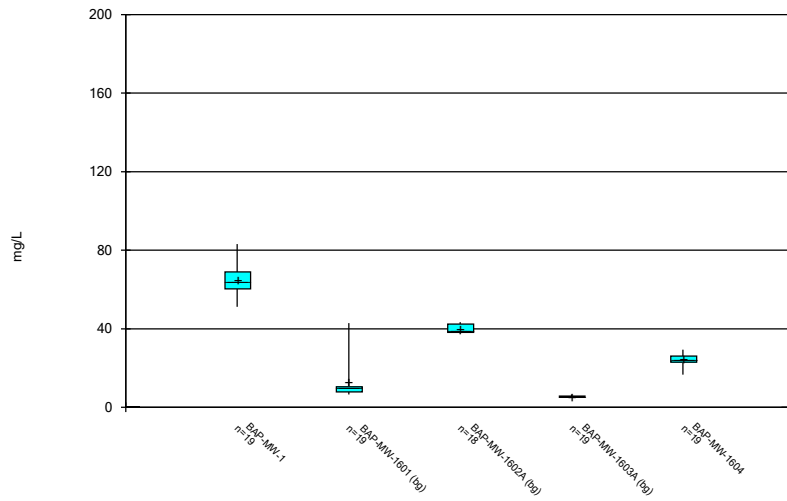
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 Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



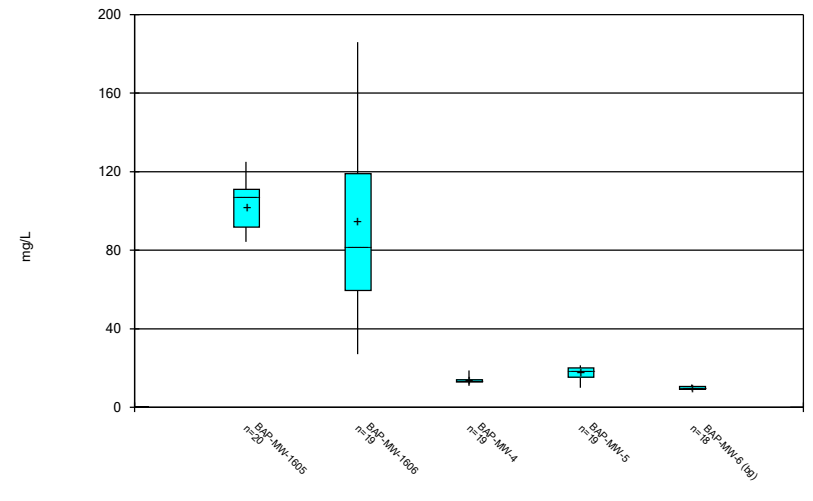
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### Box & Whiskers Plot



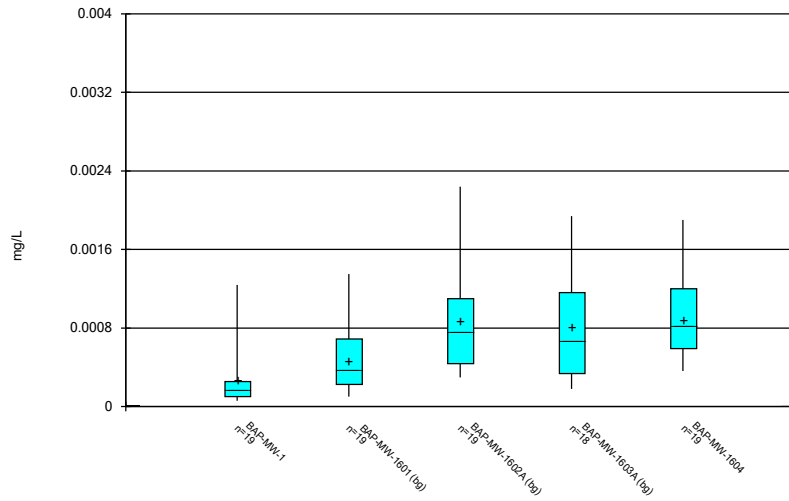
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 Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



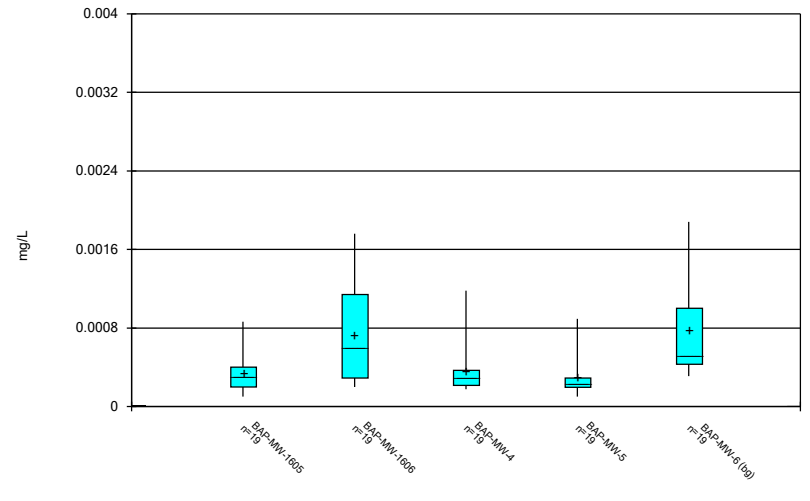
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 Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



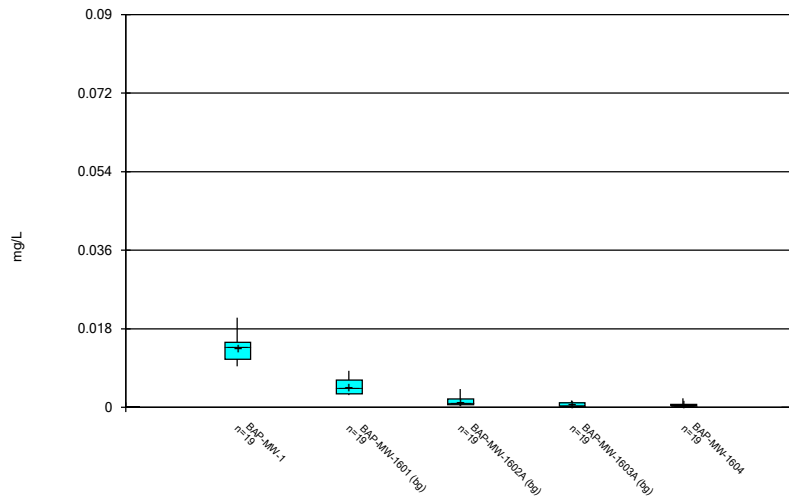
Constituent: Chromium, total Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



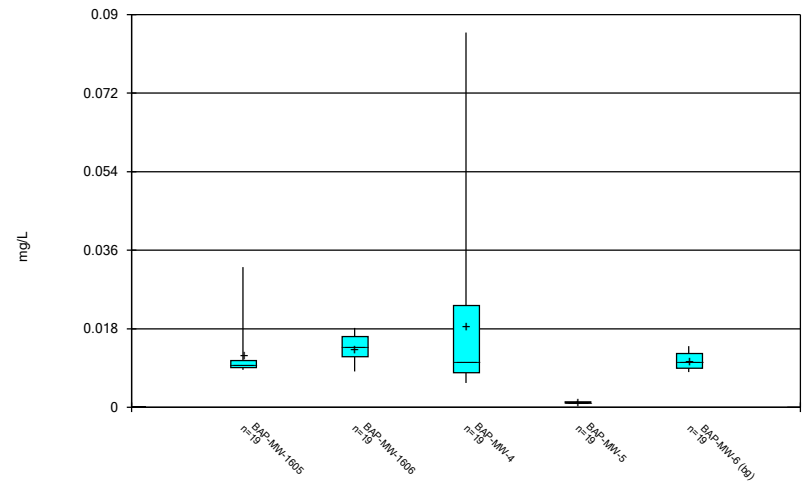
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 Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



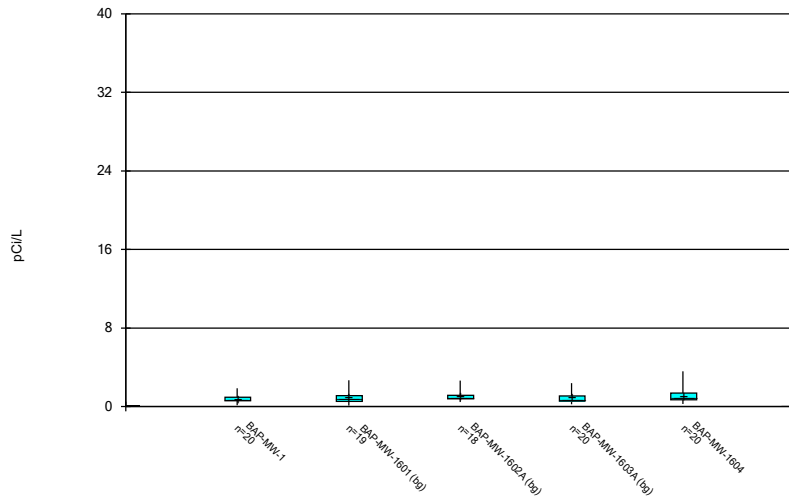
Constituent: Cobalt, total Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



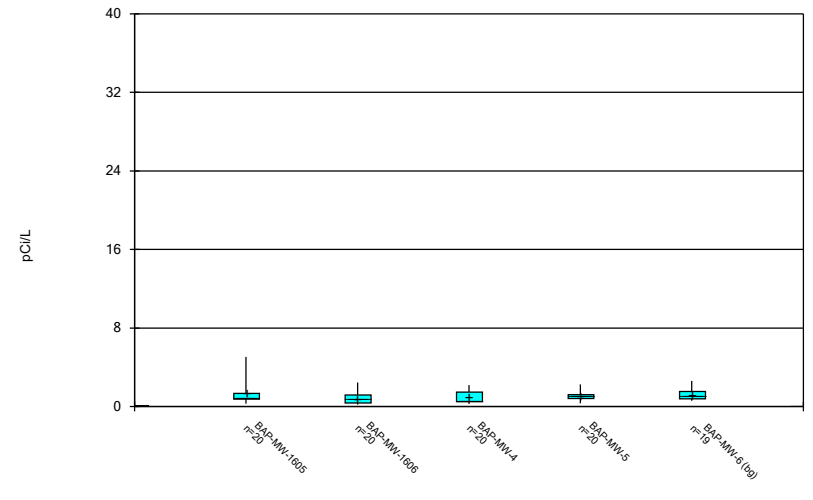
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Box & Whiskers Plot



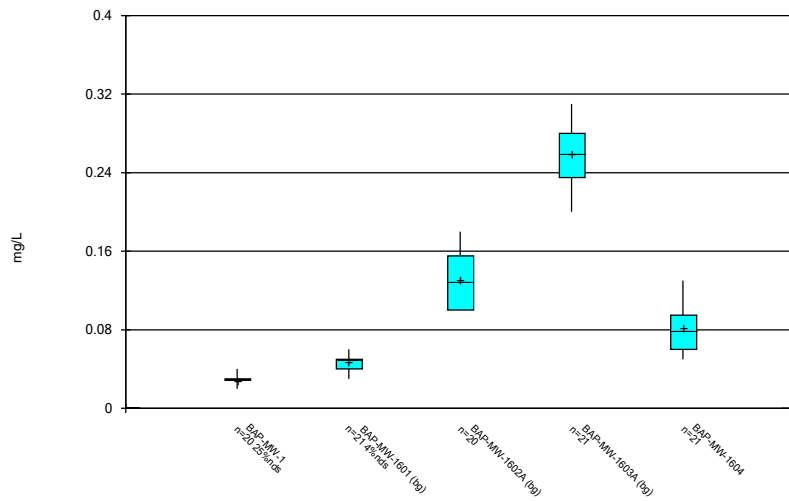
Constituent: Combined Radium 226 + 228 Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



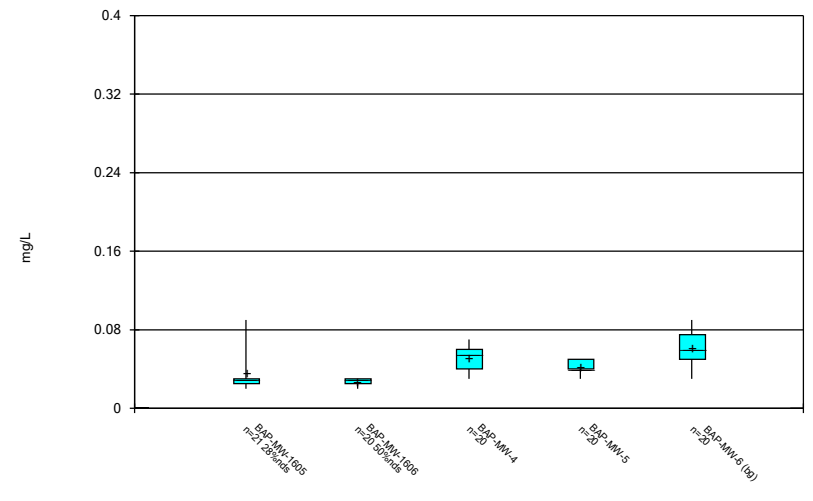
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



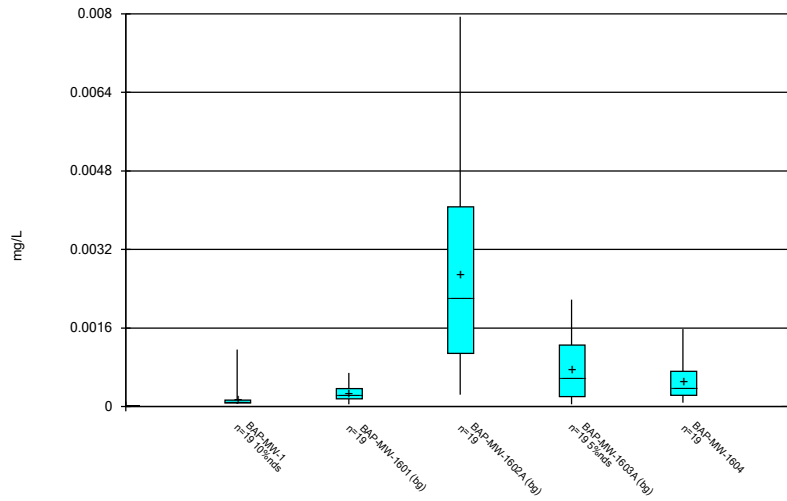
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



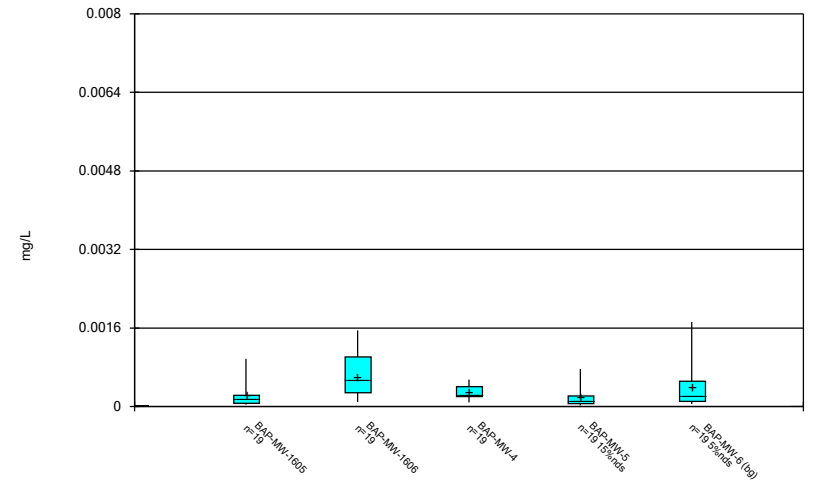
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Box & Whiskers Plot



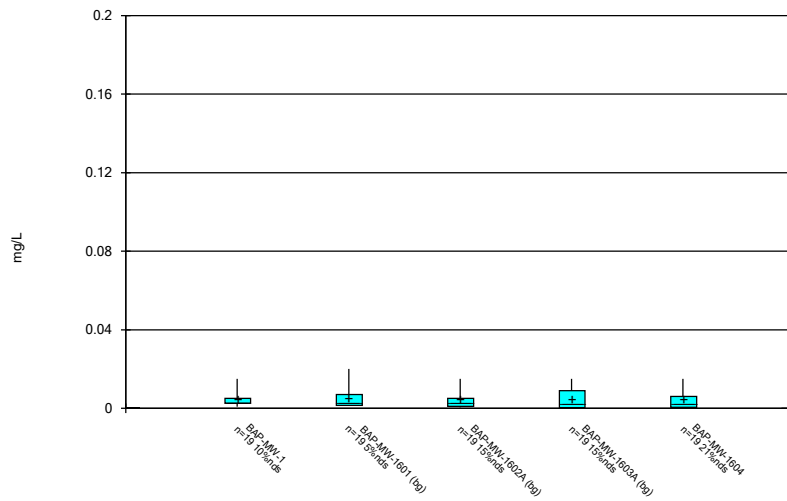
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



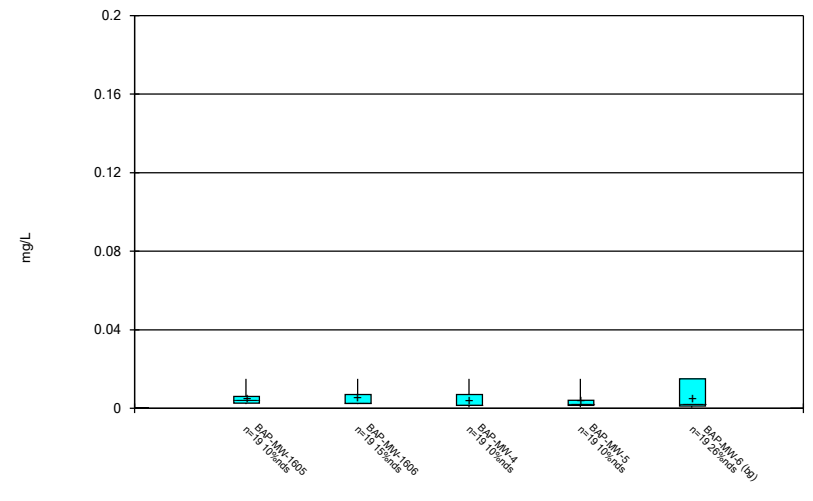
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



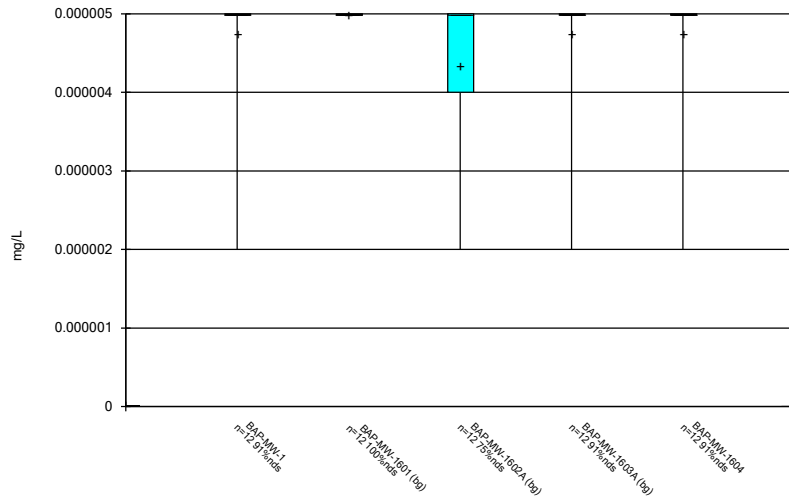
Constituent: Lithium, total Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



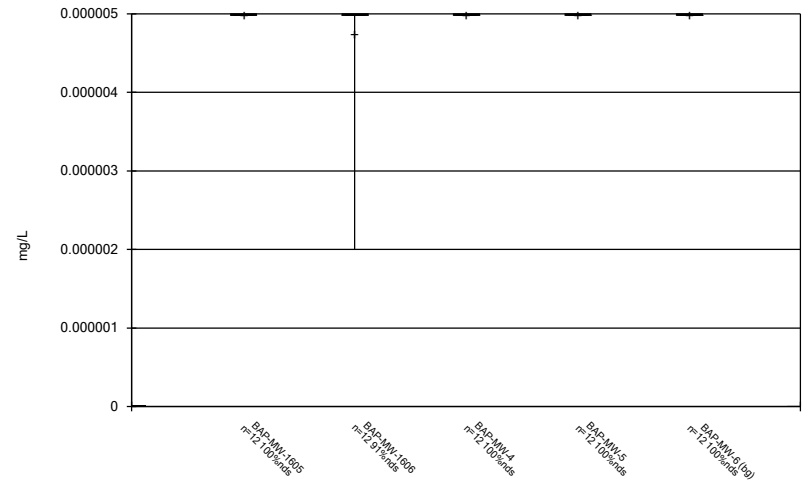
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



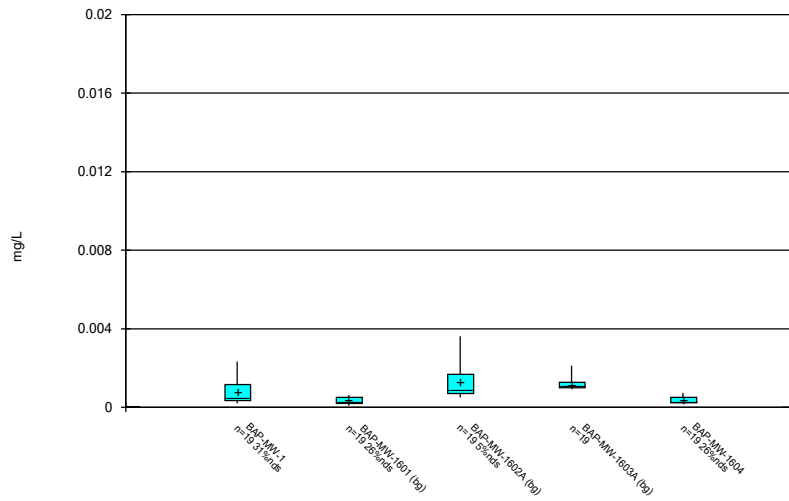
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



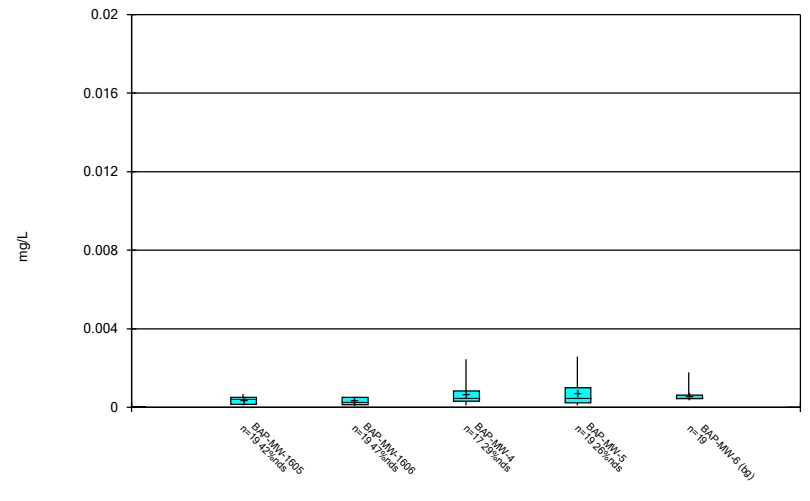
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



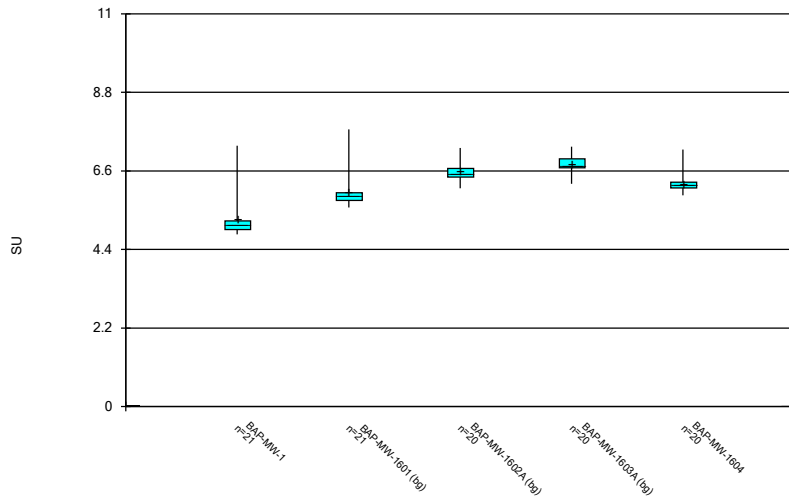
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



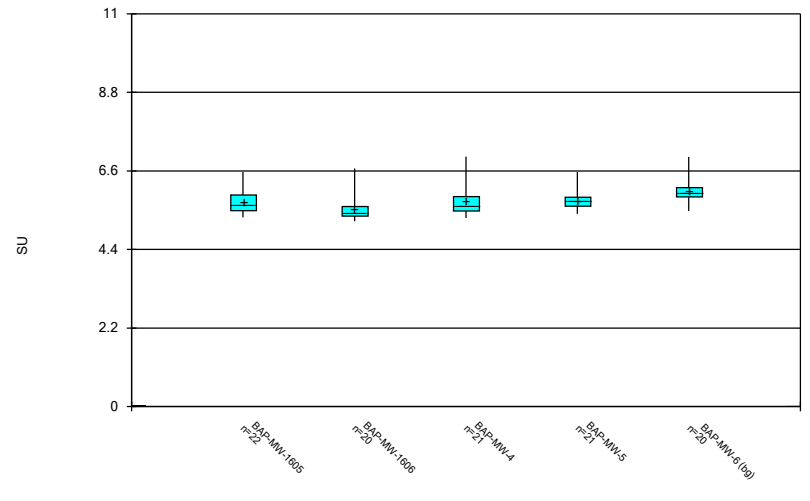
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



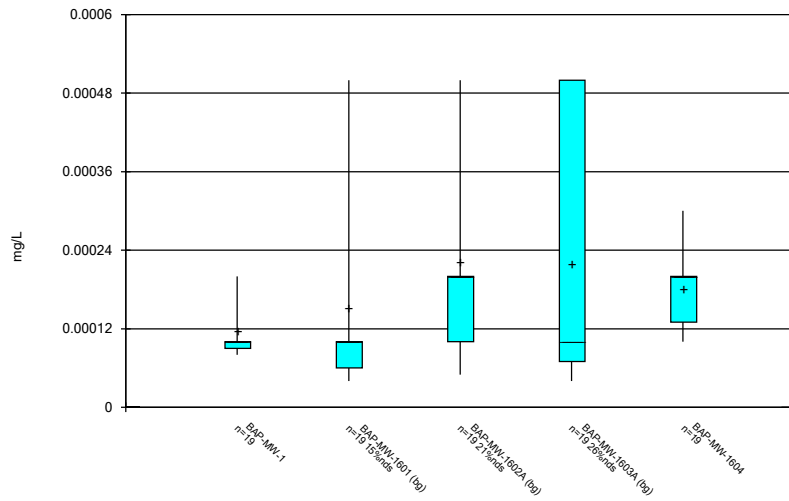
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



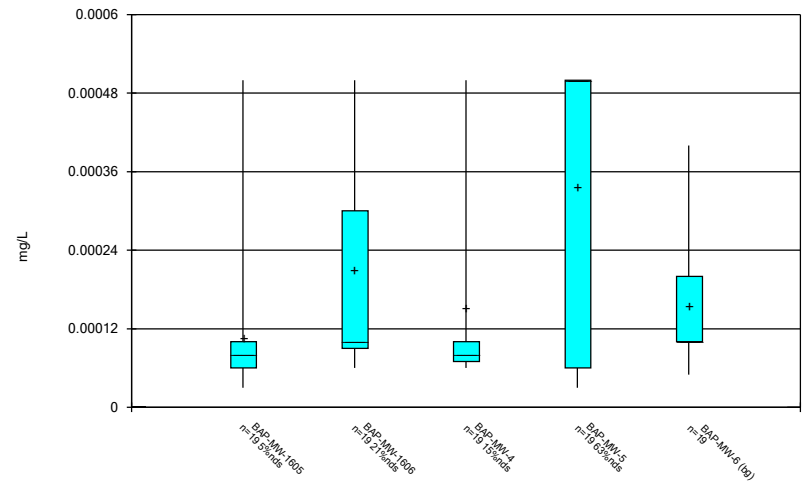
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



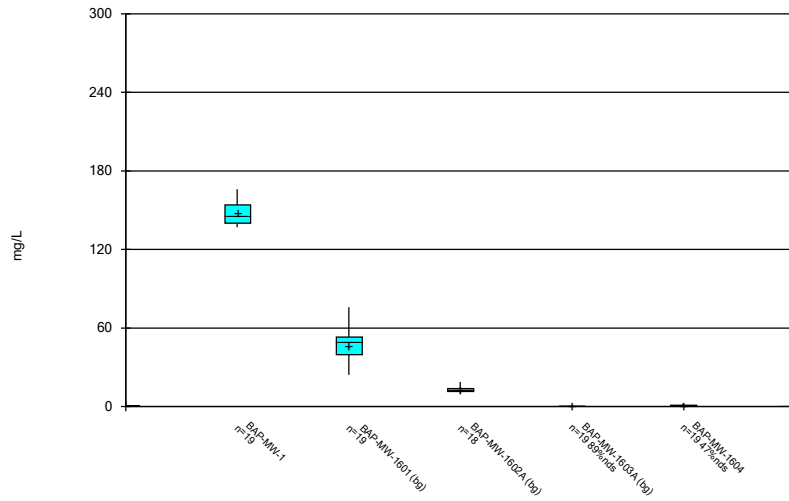
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



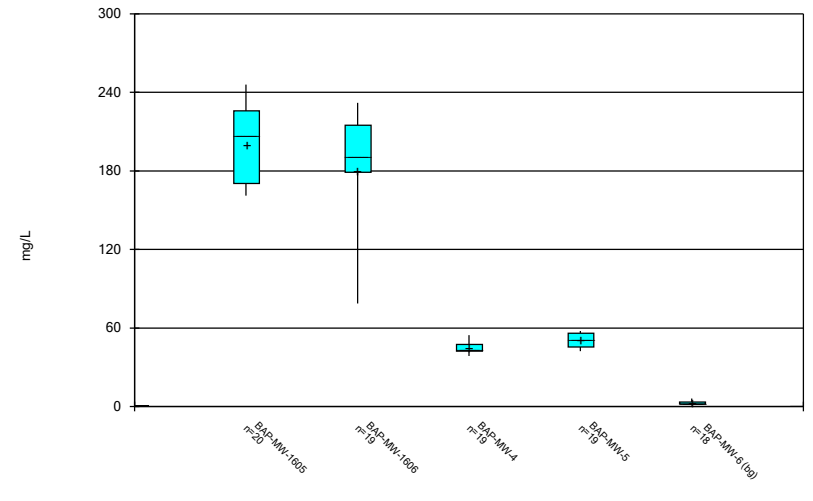
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



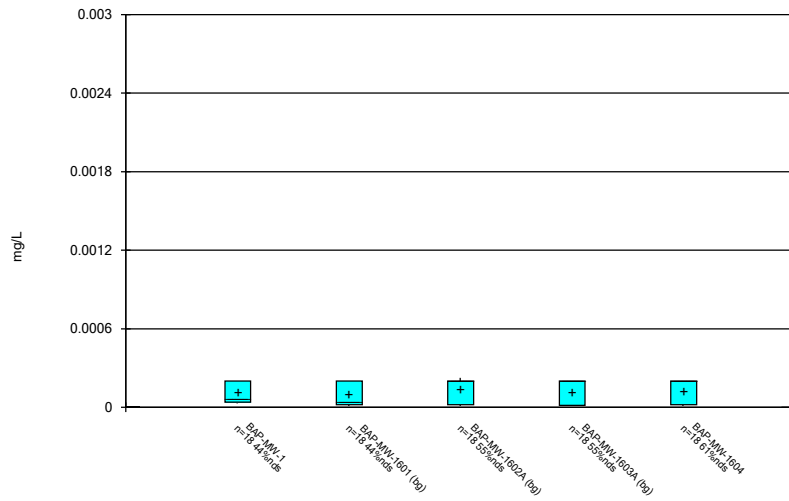
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



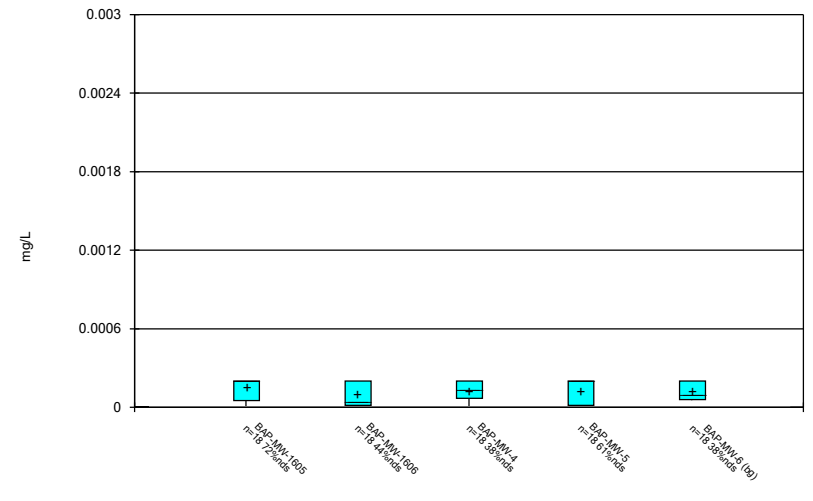
Constituent: Sulfate, total Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

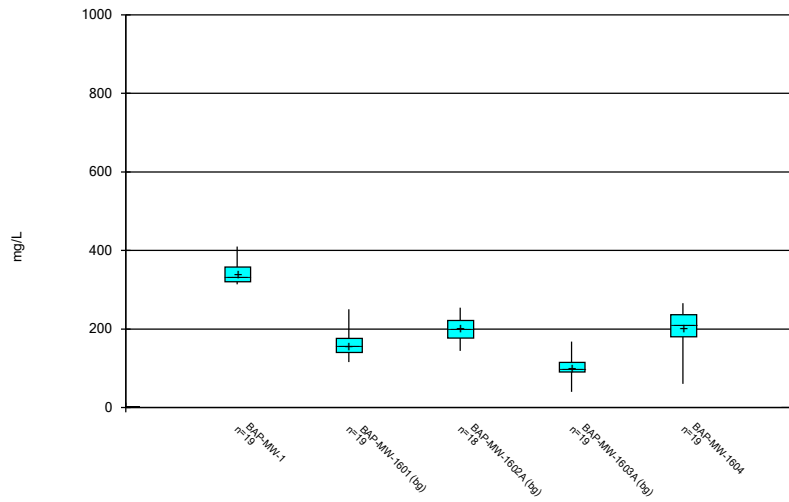
Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

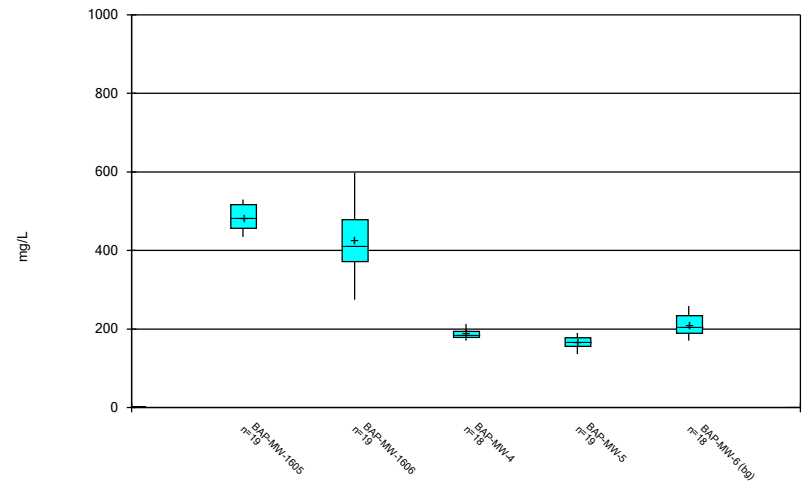


Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/21/2022 12:59 PM View: Appendix III and IV  
Amos BAP Client: Geosyntec Data: Amos BAP

# Outlier Summary

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/22/2022, 12:43 AM

Date	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)
7/25/2016										
7/26/2016								7.914 (o)		
8/23/2016										
10/18/2016										
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)	<0.1 (o)					
6/10/2019	0.000142 (o)									
6/11/2019										

Date	BAP-MW-4 Fluoride, total (mg/L)	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)
7/25/2016			0.0111 (o)							
7/26/2016										
8/23/2016			0.0192 (o)							
10/18/2016	<0.2 (o)	<0.2 (o)								
12/12/2016										920 (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)					

# Outlier Summary

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/22/2022, 12:43 AM

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BAP-MW-4 Total Dissolved Solids [TDS] (mg/L)

7/25/2016	
7/26/2016	
8/23/2016	
10/18/2016	
12/12/2016	348 (o)
12/13/2016	
2/7/2017	
2/8/2017	
1/8/2018	
3/14/2019	
3/15/2019	
6/10/2019	
6/11/2019	

# Outlier Analysis - Significant Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/20/2022, 9:05 PM

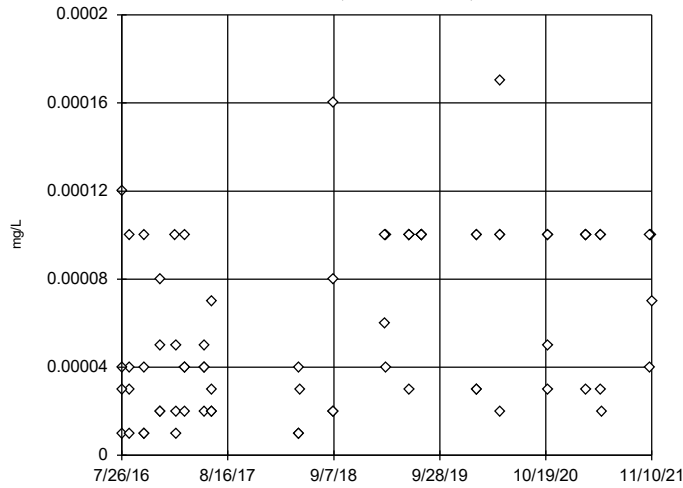
<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Boron, total (mg/L)	BAP-MW-1601,BAP-M...	Yes	0.17,0.003,0.127,0.006,0.183	n/a w/combined bg	NP (nrm)	NaN	72	0.05235	0.03279	unknown	ShapiroFrancia
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1601,BAP-M...	Yes	35.02,20.83	n/a w/combined bg	NP (nrm)	NaN	80	1.868	4.498	unknown	ShapiroFrancia

# Outlier Analysis - All Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/20/2022, 9:05 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.00006053	0.00003946	unknown	ShapiroFrancia
Arsenic, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.03594	0.02914	unknown	ShapiroFrancia
Barium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.1889	0.05161	unknown	ShapiroFrancia
Beryllium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.00004866	0.00003129	unknown	ShapiroFrancia
<b>Boron, total (mg/L)</b>	<b>BAP-MW-1601,BAP-M...</b>	<b>Yes</b>	<b>0.17,0.003,0.127,0.006,0.183</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)</b>	<b>NaN</b>	<b>72</b>	<b>0.05235</b>	<b>0.03279</b>	<b>unknown</b>	<b>ShapiroFrancia</b>
Cadmium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.00001579	0.000006025	unknown	ShapiroFrancia
Calcium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	72	14.32	3.273	unknown	ShapiroFrancia
Chloride, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	74	16.85	14.25	unknown	ShapiroFrancia
Chromium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	EPA 1989	0.05	76	0.0007629	0.0005772	ln(x)	ShapiroFrancia
Cobalt, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.004305	0.004219	unknown	ShapiroFrancia
<b>Combined Radium 226 + 228 (pCi/L)</b>	<b>BAP-MW-1601,BAP-M...</b>	<b>Yes</b>	<b>35.02,20.83</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)</b>	<b>NaN</b>	<b>80</b>	<b>1.868</b>	<b>4.498</b>	<b>unknown</b>	<b>ShapiroFrancia</b>
Lead, total (mg/L)	BAP-MW-1603A,BAP-...	No	n/a	n/a w/combined bg	EPA 1989	0.05	76	0.001032	0.001509	ln(x)	ShapiroFrancia
Lithium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.007268	0.01038	unknown	ShapiroFrancia
Mercury, total (mg/L)	BAP-MW-1601,BAP-M...	n/a	n/a	n/a w/combined bg	NP (nrm)	NaN	48	0.000004771	7.8e-7	unknown	ShapiroWilk
Molybdenum, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.0008892	0.0006	unknown	ShapiroFrancia
Selenium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	76	0.0001861	0.0001516	unknown	ShapiroFrancia
Sulfate, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	74	15.91	19.84	unknown	ShapiroFrancia
Thallium, total (mg/L)	BAP-MW-1601,BAP-M...	No	n/a	n/a w/combined bg	NP (nrm)	NaN	72	0.0001204	0.00008495	unknown	ShapiroFrancia
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-1603A,BAP-...	No	n/a	n/a w/combined bg	Rosner's	0.01	74	167	50.97	normal	ShapiroFrancia

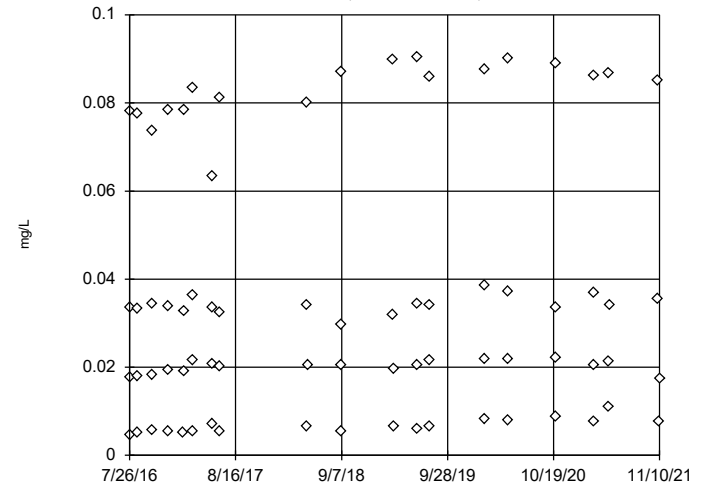
### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 76  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0007901, low cutoff = -0.00003347, based on IQR multiplier of 3.

Constituent: Antimony, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

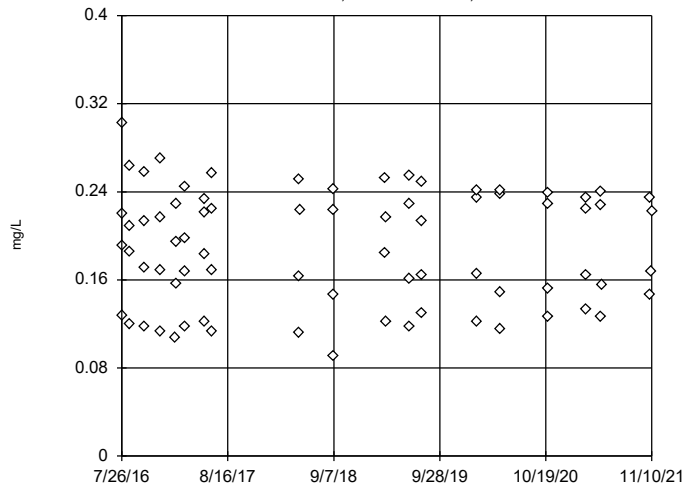
### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 76  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 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 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

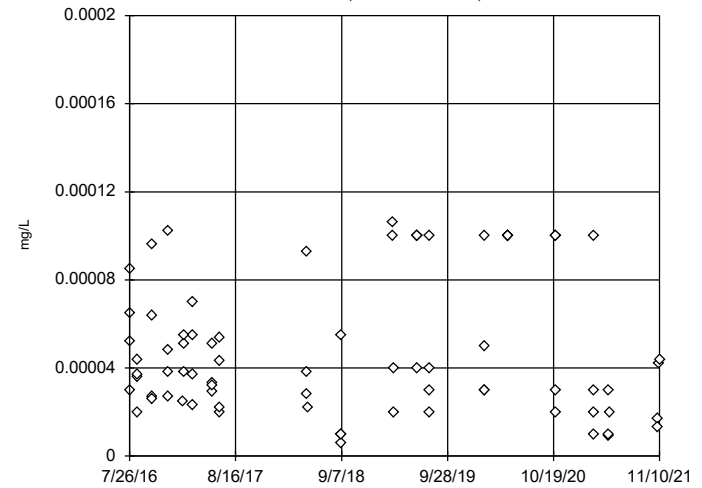
### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 76  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Ladder of Powers transformations did not improve normality: analysis run on raw data.  
 High cutoff = 0.4945, low cutoff = -0.1145, based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

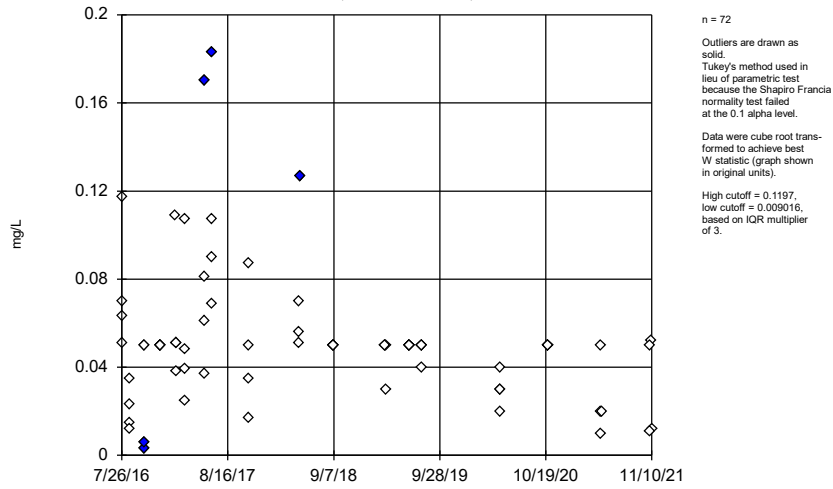
### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 76  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.001249, low cutoff = 0.00001377, based on IQR multiplier of 3.

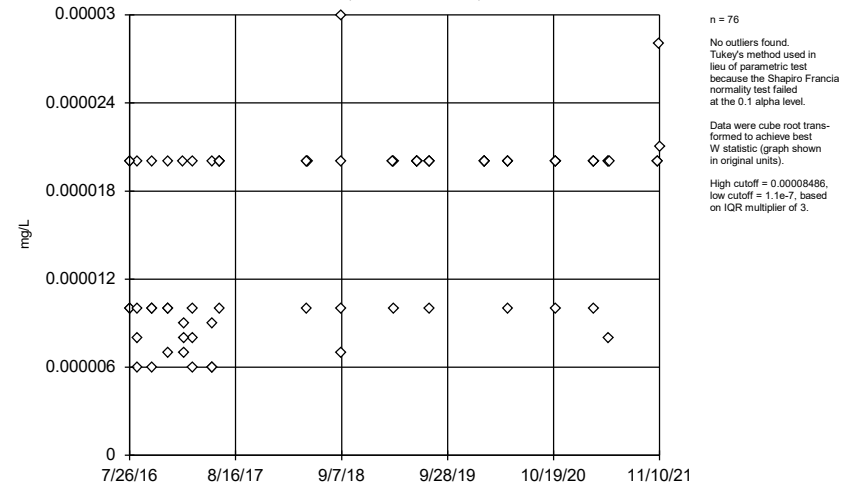
Constituent: Beryllium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



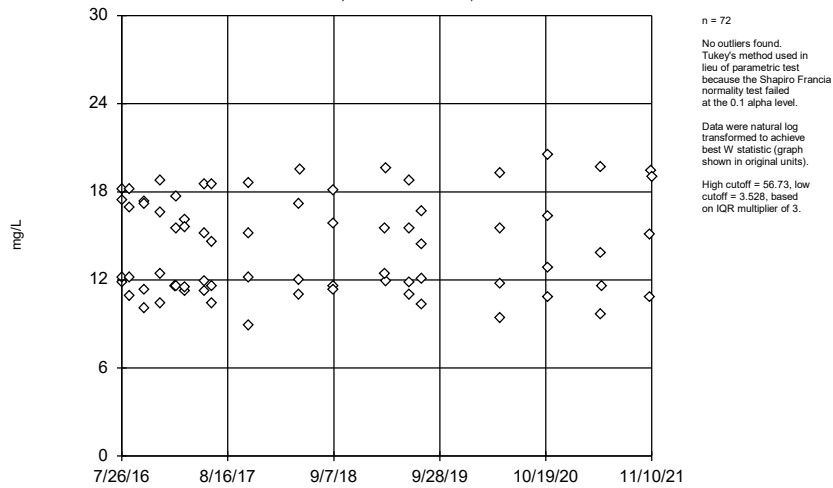
Constituent: Boron, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



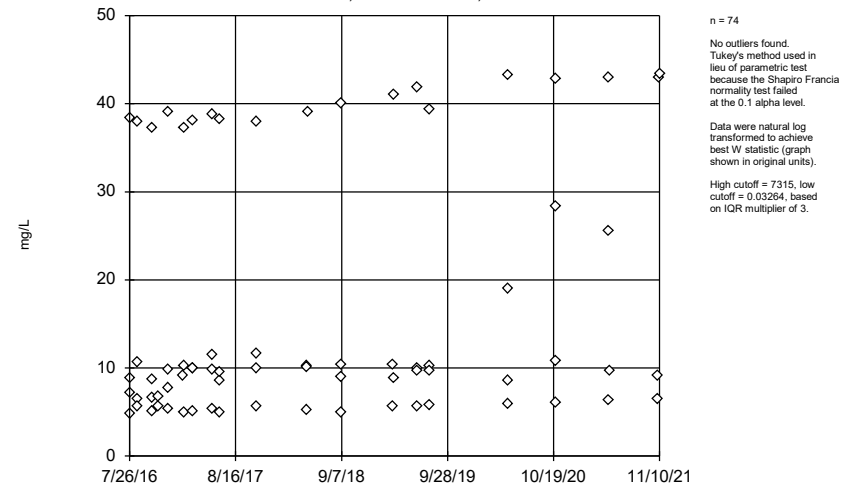
Constituent: Cadmium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



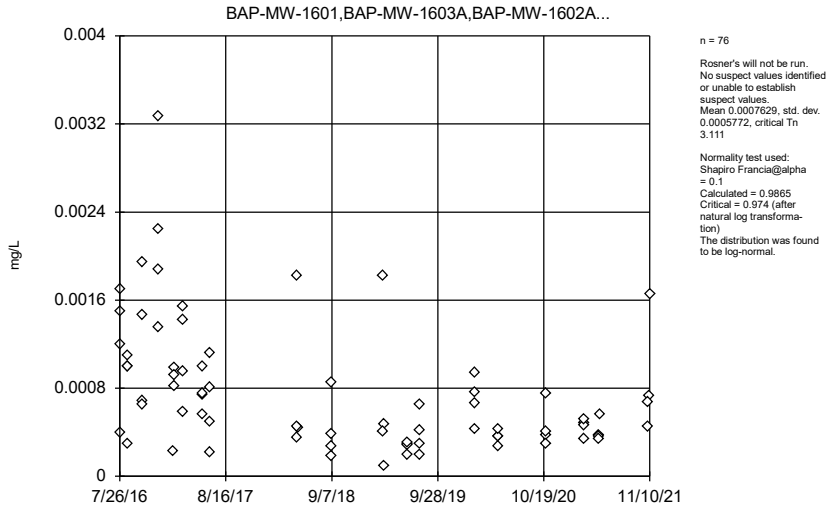
Constituent: Calcium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



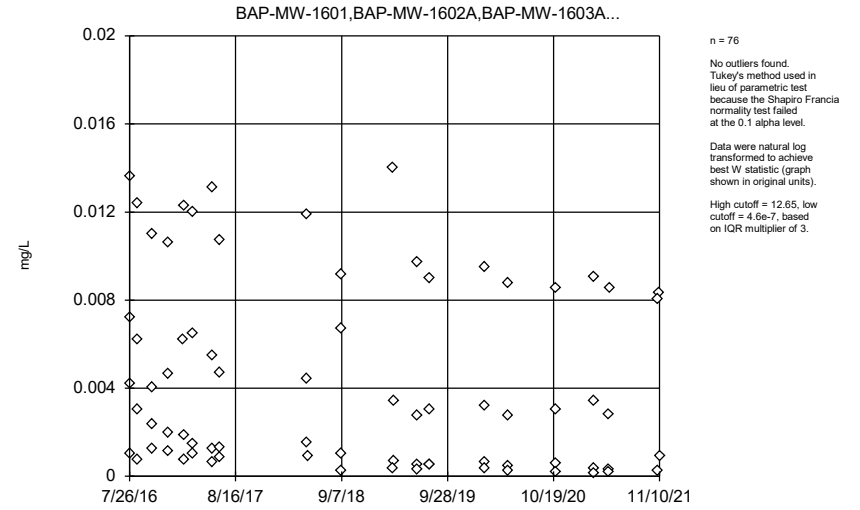
Constituent: Chloride, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### EPA Screening (suspected outliers for Rosner's Test)



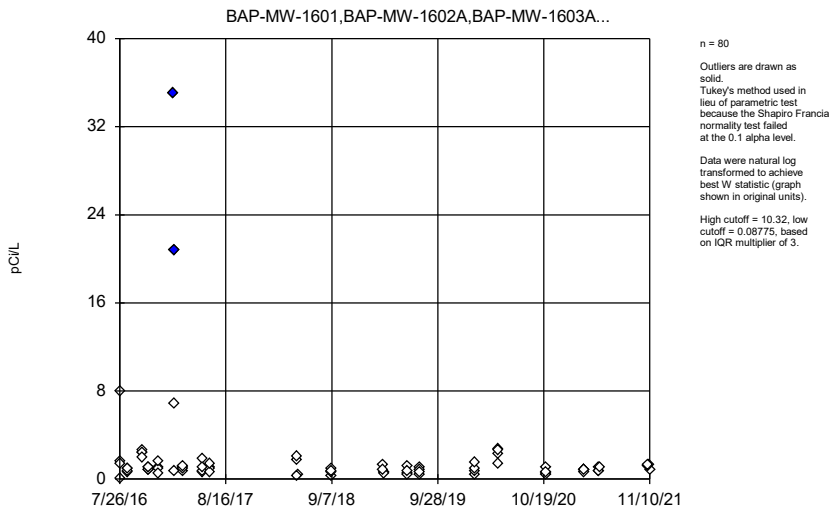
Constituent: Chromium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background



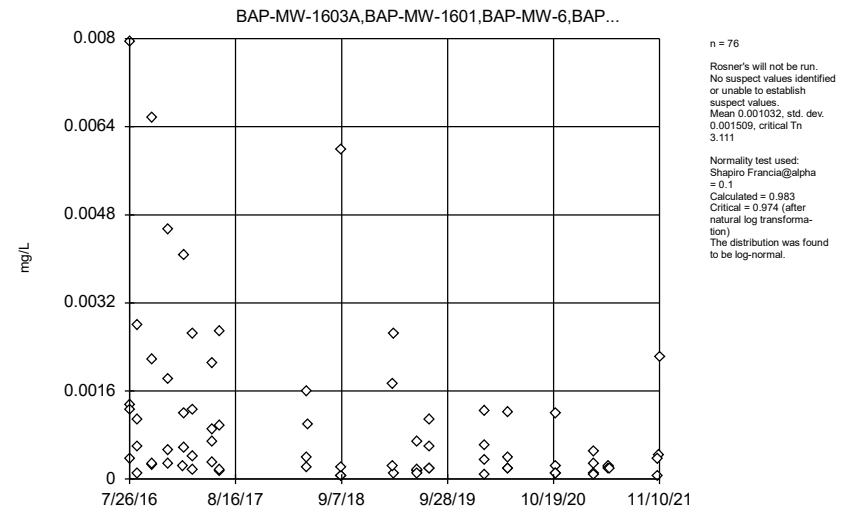
Constituent: Cobalt, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background



Constituent: Combined Radium 226 + 228 Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### EPA Screening (suspected outliers for Rosner's Test)

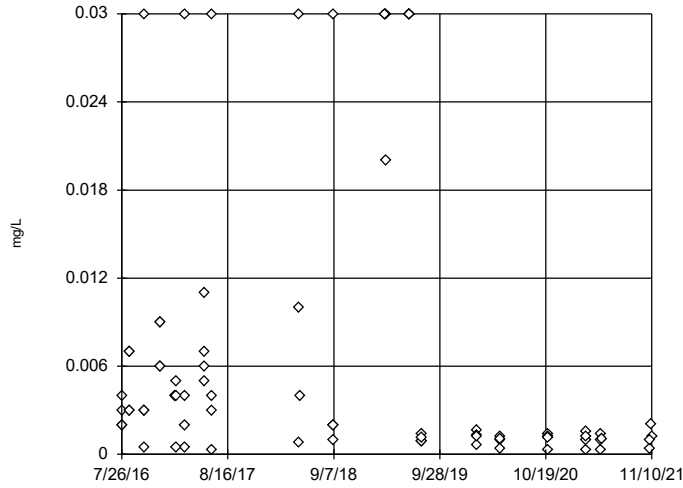


Constituent: Lead, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP



### Tukey's Outlier Screening, Pooled Background

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

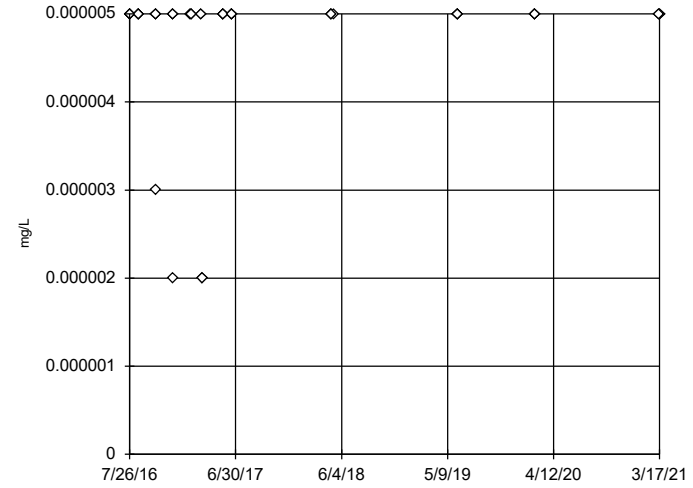


n = 76  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 2.077, low cutoff = 0.000003538, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background

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

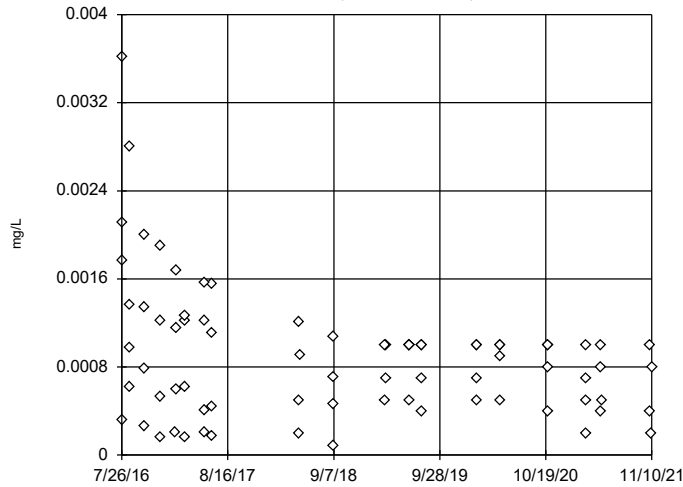


n = 48  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background

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

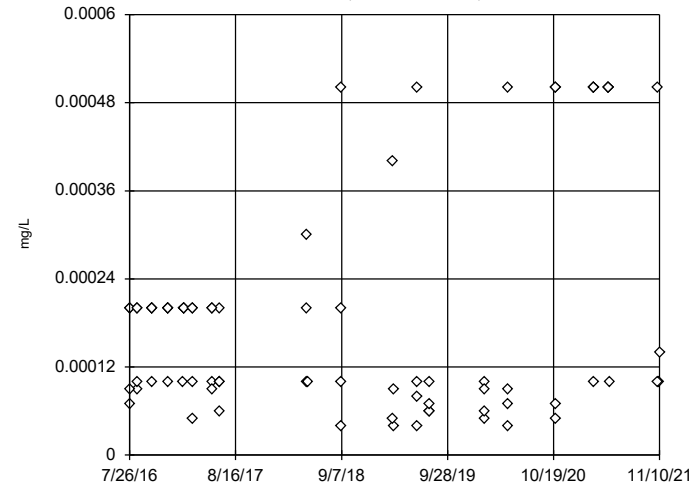


n = 76  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.004612, low cutoff = 0.000002779, based on IQR multiplier of 3.

Constituent: Molybdenum, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background

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

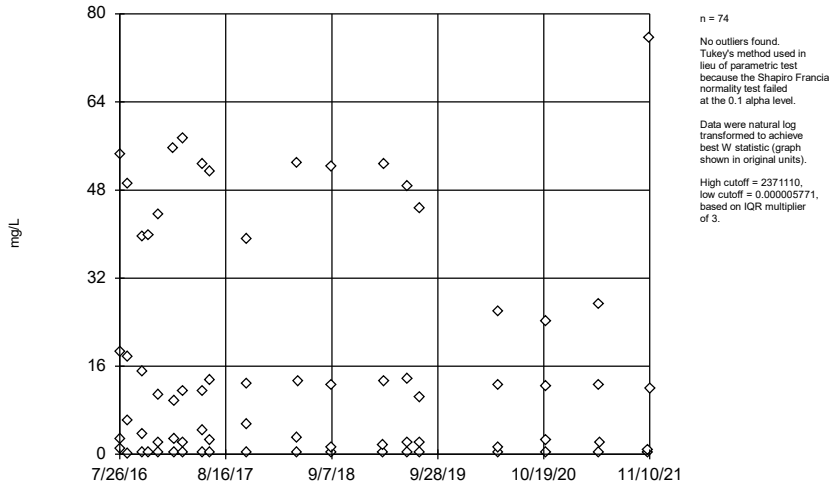


n = 76  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.002195, low cutoff = 0.000008201, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background

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

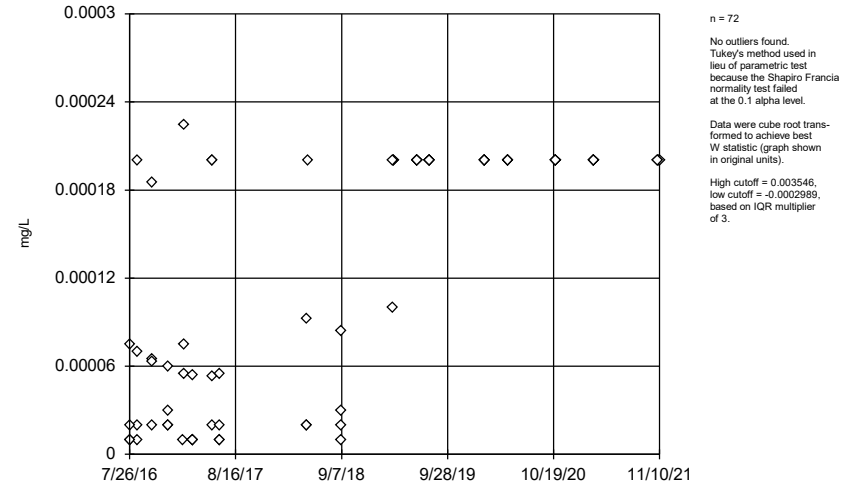


n = 74  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 2371110, low cutoff = 0.000005771, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Tukey's Outlier Screening, Pooled Background

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

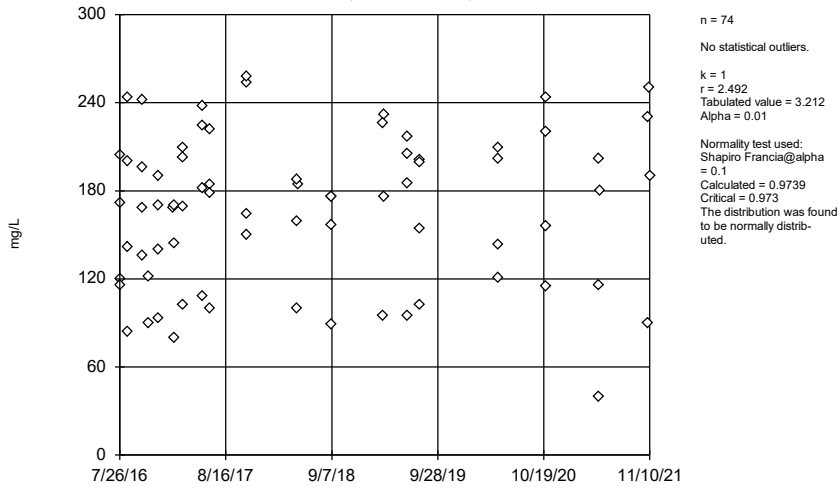


n = 72  
 No outliers found.  
 Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.1 alpha level.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.003546, low cutoff = -0.0002989, based on IQR multiplier of 3.

Constituent: Thallium, total Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Rosner's Outlier Test, Pooled Background

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



n = 74  
 No statistical outliers.  
 k = 1  
 r = 2.492  
 Tabulated value = 3.212  
 Alpha = 0.01  
 Normality test used: Shapiro Francia@alpha = 0.1  
 Calculated = 0.9739  
 Critical = 0.973  
 The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/20/2022 8:58 PM View: Tukey's Outlier Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

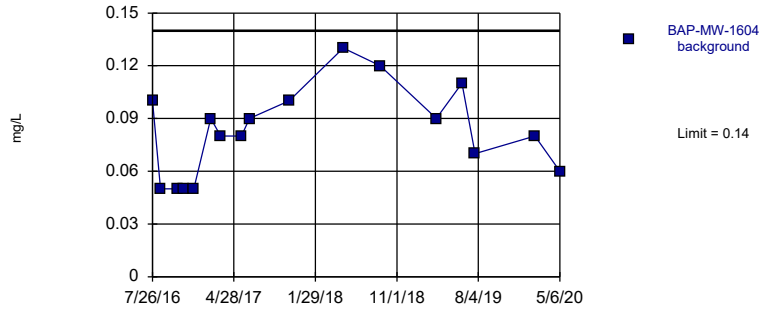
# Appendix III - Intrawell Prediction Limits - All Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/19/2022, 9:19 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	0.030	n/a	n/a	1 future	n/a	16	n/a	n/a	31.25	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-1601	0.060	n/a	n/a	1 future	n/a	17	n/a	n/a	5.882	n/a	n/a	0.005914	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-1602A	0.18	n/a	n/a	1 future	n/a	16	n/a	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-1603A	0.33	n/a	n/a	1 future	n/a	17	0.2582	0.03107	0	None	No	0.001254	Param Intra 1 of 2
Fluoride, total (mg/L)	BAP-MW-1604	0.14	n/a	n/a	1 future	n/a	17	0.08235	0.02513	0	None	No	0.001254	Param Intra 1 of 2
Fluoride, total (mg/L)	BAP-MW-1605	0.090	n/a	n/a	1 future	n/a	17	n/a	n/a	29.41	n/a	n/a	0.005914	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-1606	0.030	n/a	n/a	1 future	n/a	16	n/a	n/a	62.5	n/a	n/a	0.006456	NP Intra (NDs) 1 of 2
Fluoride, total (mg/L)	BAP-MW-4	0.076	n/a	n/a	1 future	n/a	16	0.04875	0.01258	0	None	No	0.001254	Param Intra 1 of 2
Fluoride, total (mg/L)	BAP-MW-5	0.050	n/a	n/a	1 future	n/a	15	n/a	n/a	0	n/a	n/a	0.007533	NP Intra (normality) 1 of 2
Fluoride, total (mg/L)	BAP-MW-6	0.1	n/a	n/a	1 future	n/a	16	0.06063	0.01879	0	None	No	0.001254	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1	7.3	4.9	n/a	1 future	n/a	17	n/a	n/a	0	n/a	n/a	0.01183	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-1601	7.8	5.6	n/a	1 future	n/a	17	n/a	n/a	0	n/a	n/a	0.01183	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-1602A	7.2	5.9	n/a	1 future	n/a	16	6.579	0.2879	0	None	No	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1603A	7.3	6.2	n/a	1 future	n/a	16	6.79	0.2537	0	None	No	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1604	7.2	5.9	n/a	1 future	n/a	16	n/a	n/a	0	n/a	n/a	0.01291	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-1605	6.5	5.1	n/a	1 future	n/a	18	5.786	0.311	0	None	No	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-1606	6.7	5.2	n/a	1 future	n/a	16	n/a	n/a	0	n/a	n/a	0.01291	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-4	7.0	5.4	n/a	1 future	n/a	17	n/a	n/a	0	n/a	n/a	0.01183	NP Intra (normality) 1 of 2
pH, field (SU)	BAP-MW-5	6.4	5.2	n/a	1 future	n/a	17	5.802	0.2847	0	None	No	0.0006268	Param Intra 1 of 2
pH, field (SU)	BAP-MW-6	6.5	5.5	n/a	1 future	n/a	16	5.976	0.233	0	None	No	0.0006268	Param Intra 1 of 2



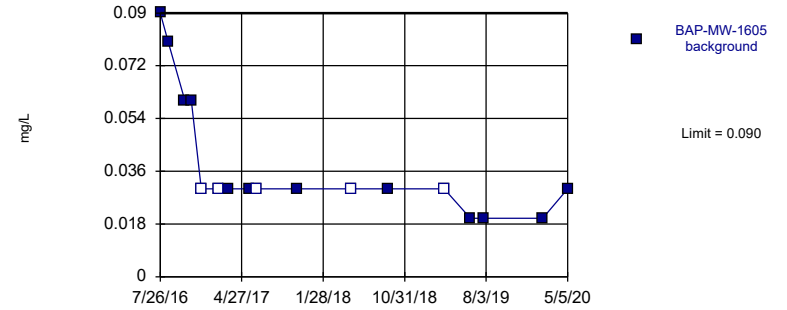
Prediction Limit  
Intrawell Parametric, BAP-MW-1604



Background Data Summary: Mean=0.08235, Std. Dev.=0.02513, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9355, critical = 0.851. Kappa = 2.181 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP

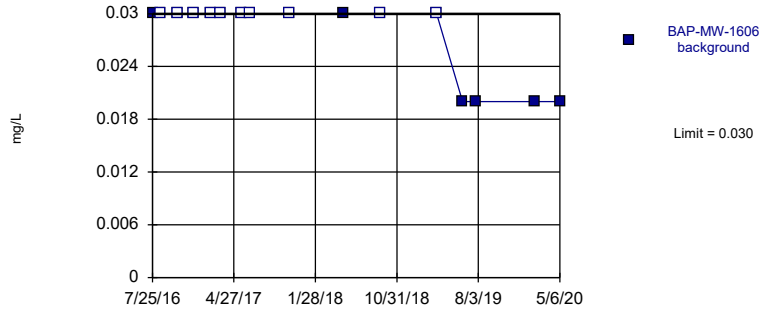
Prediction Limit  
Intrawell Non-parametric, BAP-MW-1605



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 17 background values. 29.41% NDs. Well-constituent pair annual alpha = 0.01179. Individual comparison alpha = 0.005914 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP

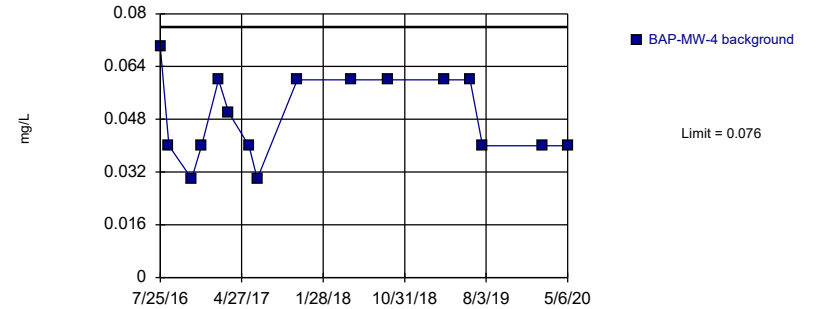
Prediction Limit  
Intrawell Non-parametric, BAP-MW-1606



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 62.5% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

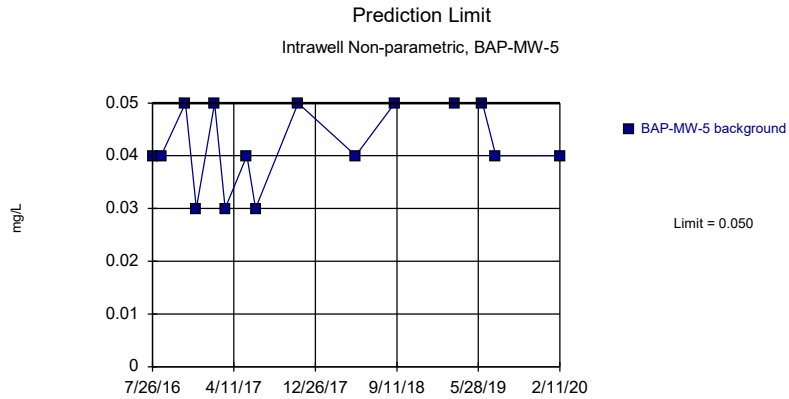
Constituent: Fluoride, total Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP

Prediction Limit  
Intrawell Parametric, BAP-MW-4



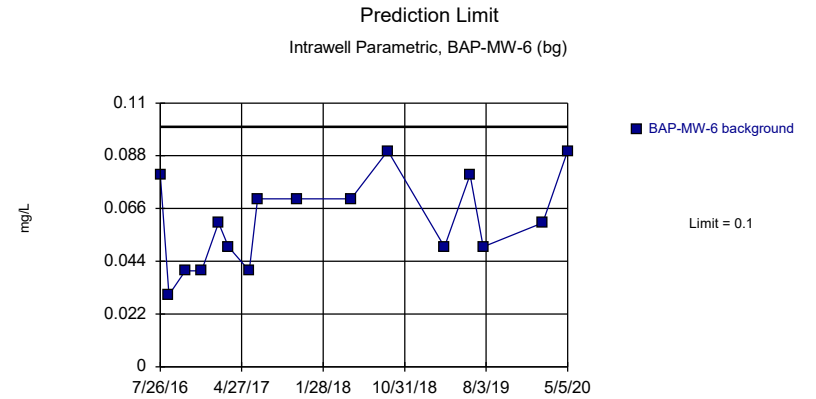
Background Data Summary: Mean=0.04875, Std. Dev.=0.01258, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.864, critical = 0.844. Kappa = 2.205 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP



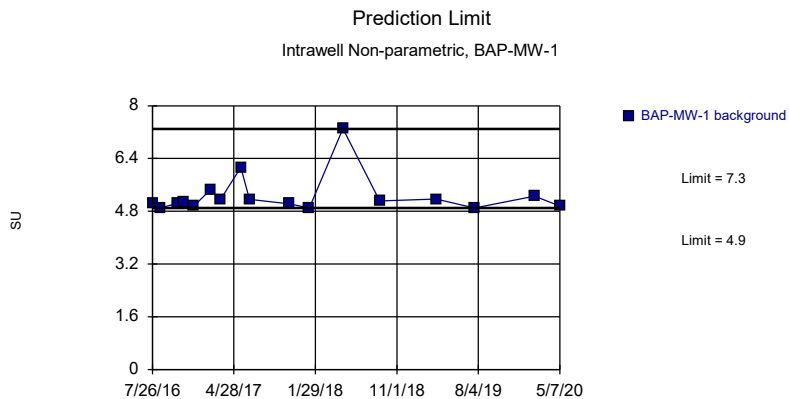
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 15 background values. Well-constituent pair annual alpha = 0.01501. Individual comparison alpha = 0.007533 (1 of 2). Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP



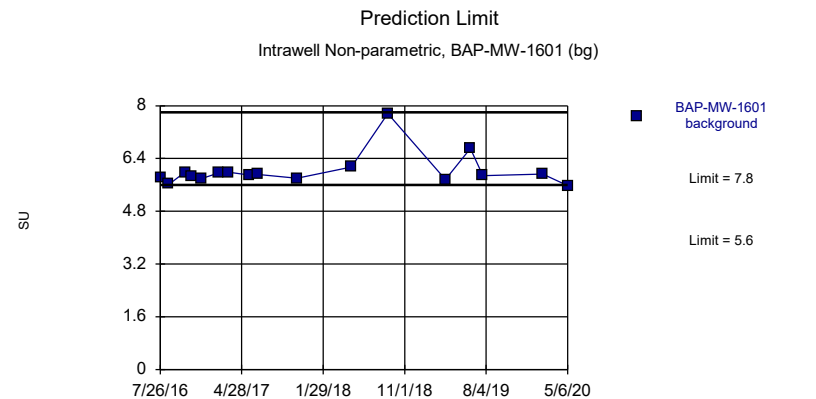
Background Data Summary: Mean=0.06063, Std. Dev.=0.01879, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9447, critical = 0.844. Kappa = 2.205 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: Fluoride, total Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP



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 17 background values. Well-constituent pair annual alpha = 0.02359. Individual comparison alpha = 0.01183 (1 of 2). Assumes 1 future value.

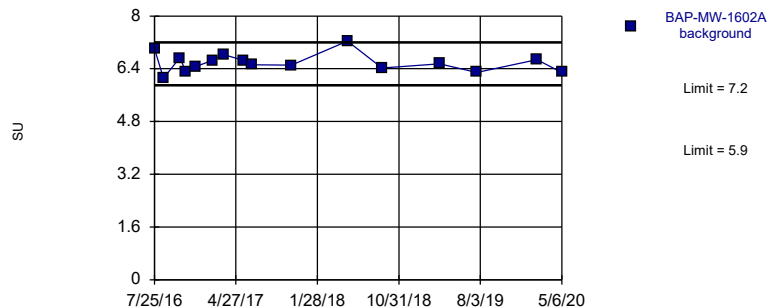
Constituent: pH, field Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP



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 17 background values. Well-constituent pair annual alpha = 0.02359. Individual comparison alpha = 0.01183 (1 of 2). Assumes 1 future value.

Constituent: pH, field Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP

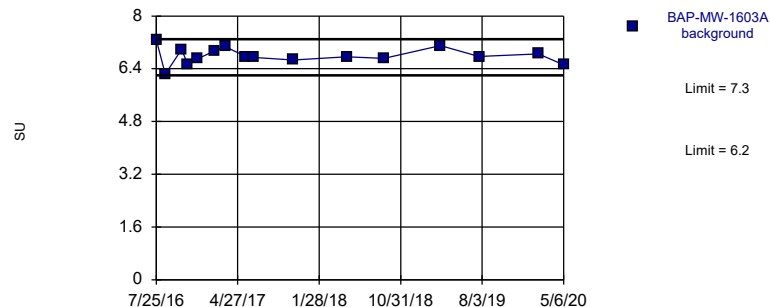
### Prediction Limit Intrawell Parametric, BAP-MW-1602A (bg)



Background Data Summary: Mean=6.579, Std. Dev.=0.2879, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9628, critical = 0.844. Kappa = 2.205 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP

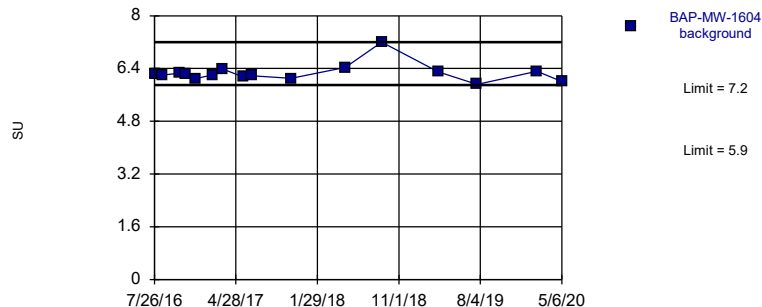
### Prediction Limit Intrawell Parametric, BAP-MW-1603A (bg)



Background Data Summary: Mean=6.79, Std. Dev.=0.2537, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.974, critical = 0.844. Kappa = 2.205 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP

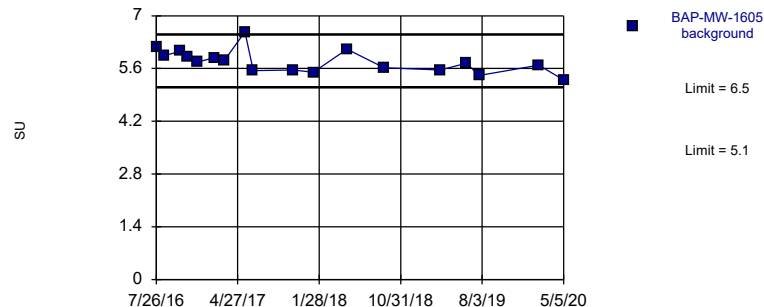
### Prediction Limit Intrawell Non-parametric, BAP-MW-1604



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 16 background values. Well-constituent pair annual alpha = 0.02574. Individual comparison alpha = 0.01291 (1 of 2). Assumes 1 future value.

Constituent: pH, field Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP

### Prediction Limit Intrawell Parametric, BAP-MW-1605



Background Data Summary: Mean=5.786, Std. Dev.=0.311, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9594, critical = 0.858. Kappa = 2.157 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.001254. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/19/2022 8:10 PM View: Appendix III Intrawell  
Amos BAP Client: Geosyntec Data: Amos BAP





# Appendix III Trend Test Summary - Significant Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/19/2022, 9:29 PM

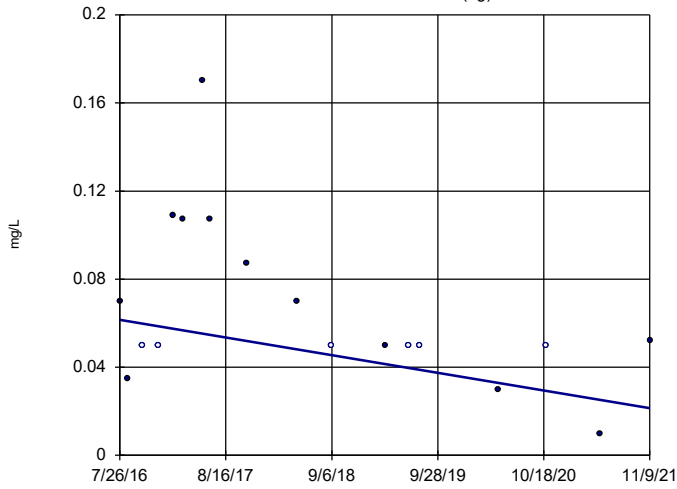
<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Calcium, total (mg/L)	BAP-MW-1603A (bg)	-0.4117	-69	-68	Yes	18	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	BAP-MW-1601 (bg)	3.129	136	74	Yes	19	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	BAP-MW-1602A (bg)	1.161	108	68	Yes	18	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	BAP-MW-1603A (bg)	0.2281	99	74	Yes	19	0	n/a	n/a	0.01	NP

# Appendix III Trend Test Summary - All Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/19/2022, 9:29 PM

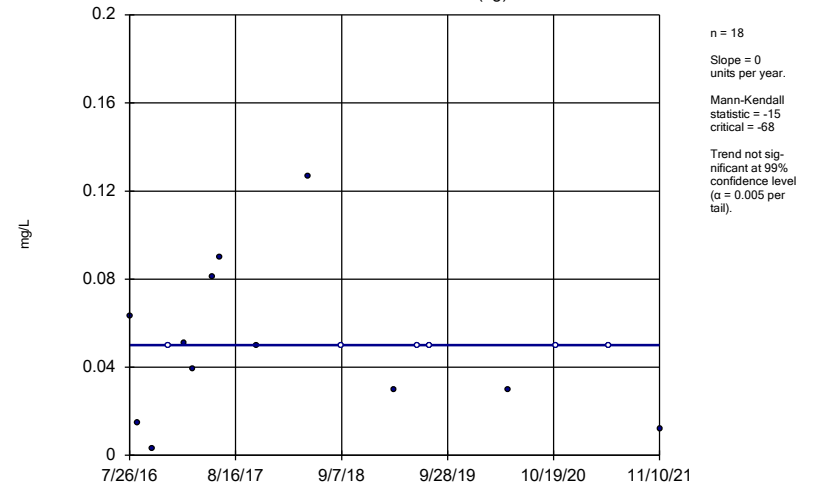
Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	BAP-MW-1601 (bg)	-0.007557	-44	-68	No	18	33.33	n/a	n/a	0.01	NP
Boron, total (mg/L)	BAP-MW-1602A (bg)	0	-15	-68	No	18	33.33	n/a	n/a	0.01	NP
Boron, total (mg/L)	BAP-MW-1603A (bg)	-0.0004002	-34	-68	No	18	38.89	n/a	n/a	0.01	NP
Boron, total (mg/L)	BAP-MW-6 (bg)	0	-9	-68	No	18	33.33	n/a	n/a	0.01	NP
Calcium, total (mg/L)	BAP-MW-1601 (bg)	-0.08892	-13	-68	No	18	0	n/a	n/a	0.01	NP
Calcium, total (mg/L)	BAP-MW-1602A (bg)	0.3136	66	68	No	18	0	n/a	n/a	0.01	NP
<b>Calcium, total (mg/L)</b>	<b>BAP-MW-1603A (bg)</b>	<b>-0.4117</b>	<b>-69</b>	<b>-68</b>	<b>Yes</b>	<b>18</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Calcium, total (mg/L)	BAP-MW-6 (bg)	-0.0488	-13	-68	No	18	0	n/a	n/a	0.01	NP
<b>Chloride, total (mg/L)</b>	<b>BAP-MW-1601 (bg)</b>	<b>3.129</b>	<b>136</b>	<b>74</b>	<b>Yes</b>	<b>19</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Chloride, total (mg/L)</b>	<b>BAP-MW-1602A (bg)</b>	<b>1.161</b>	<b>108</b>	<b>68</b>	<b>Yes</b>	<b>18</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Chloride, total (mg/L)</b>	<b>BAP-MW-1603A (bg)</b>	<b>0.2281</b>	<b>99</b>	<b>74</b>	<b>Yes</b>	<b>19</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Chloride, total (mg/L)	BAP-MW-6 (bg)	-0.04417	-8	-68	No	18	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-1601 (bg)	-2.104	-31	-74	No	19	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-1602A (bg)	-0.2778	-32	-68	No	18	0	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-1603A (bg)	0	-1	-74	No	19	89.47	n/a	n/a	0.01	NP
Sulfate, total (mg/L)	BAP-MW-6 (bg)	-0.3887	-63	-68	No	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-1601 (bg)	7.379	39	74	No	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-1602A (bg)	3.471	22	68	No	18	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-1603A (bg)	-0.5489	-7	-74	No	19	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	BAP-MW-6 (bg)	0.8924	4	68	No	18	0	n/a	n/a	0.01	NP

### Sen's Slope Estimator BAP-MW-1601 (bg)



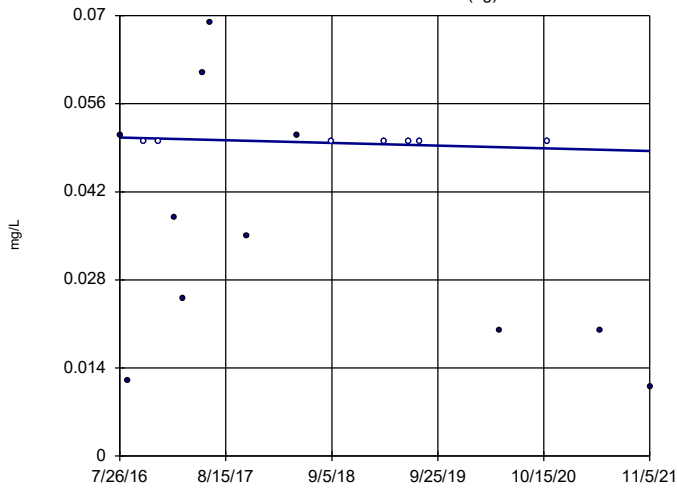
Constituent: Boron, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator BAP-MW-1602A (bg)



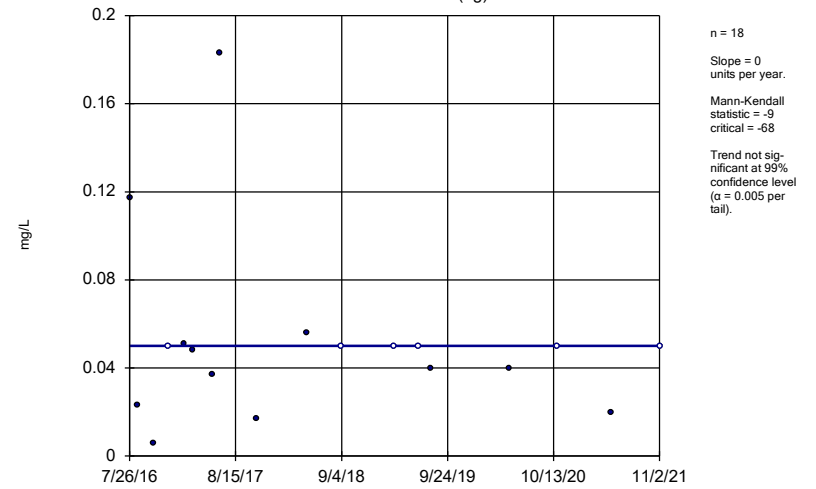
Constituent: Boron, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator BAP-MW-1603A (bg)



Constituent: Boron, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

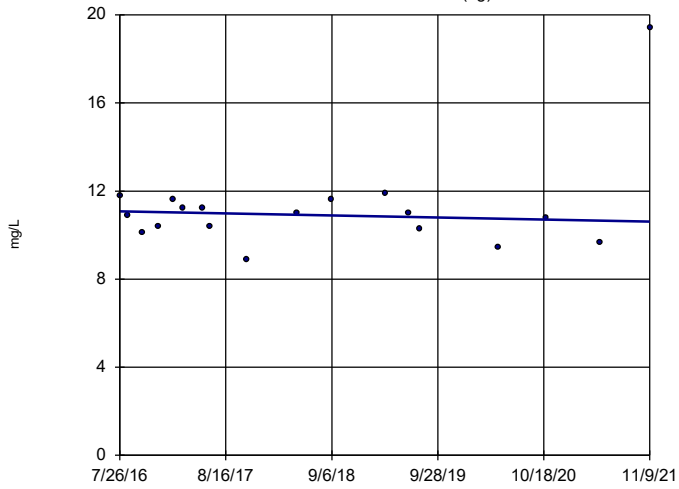
### Sen's Slope Estimator BAP-MW-6 (bg)



Constituent: Boron, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

BAP-MW-1601 (bg)

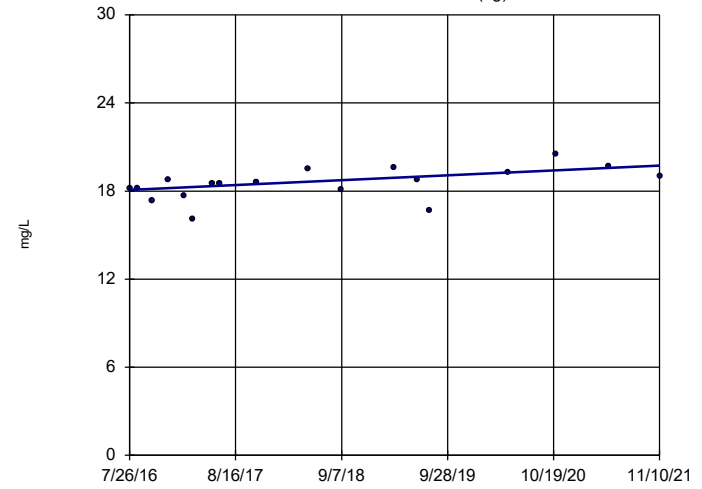


n = 18  
 Slope = -0.08892  
 units per year.  
 Mann-Kendall  
 statistic = -13  
 critical = -68  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Calcium, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

BAP-MW-1602A (bg)

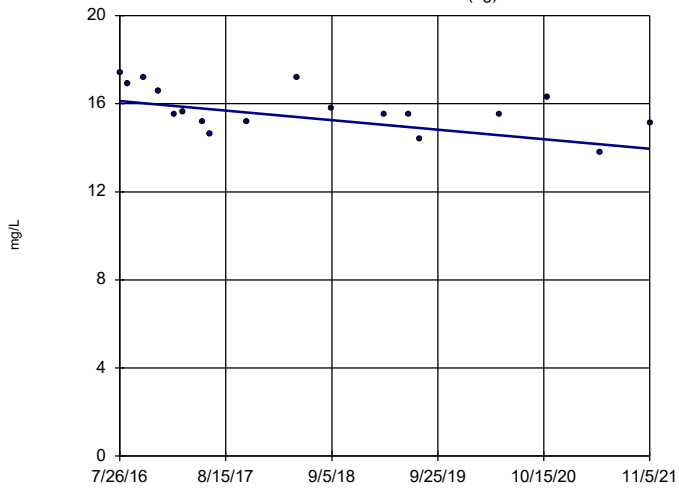


n = 18  
 Slope = 0.3136  
 units per year.  
 Mann-Kendall  
 statistic = 66  
 critical = 68  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Calcium, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

BAP-MW-1603A (bg)

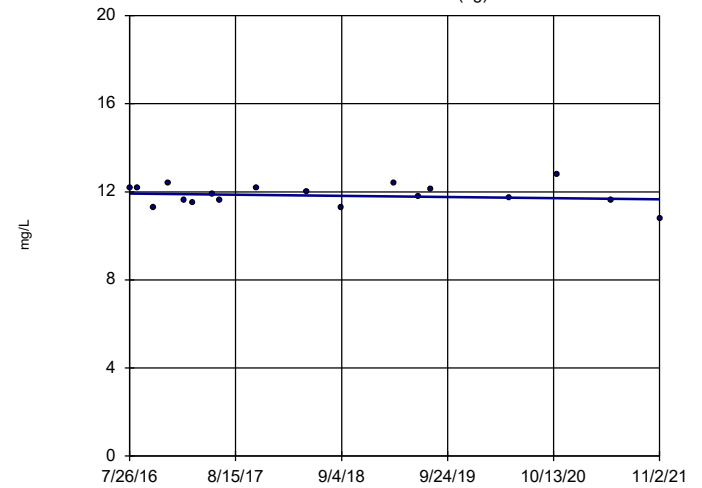


n = 18  
 Slope = -0.4117  
 units per year.  
 Mann-Kendall  
 statistic = -69  
 critical = -68  
 Decreasing trend  
 significant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Calcium, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

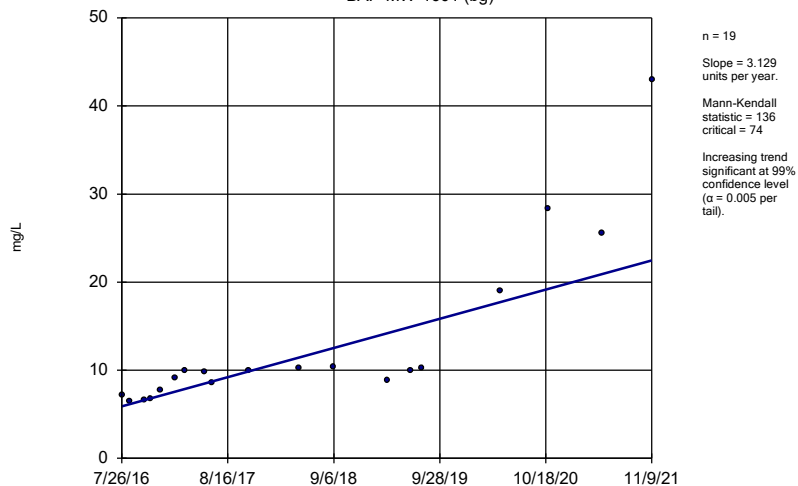
BAP-MW-6 (bg)



n = 18  
 Slope = -0.0488  
 units per year.  
 Mann-Kendall  
 statistic = -13  
 critical = -68  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

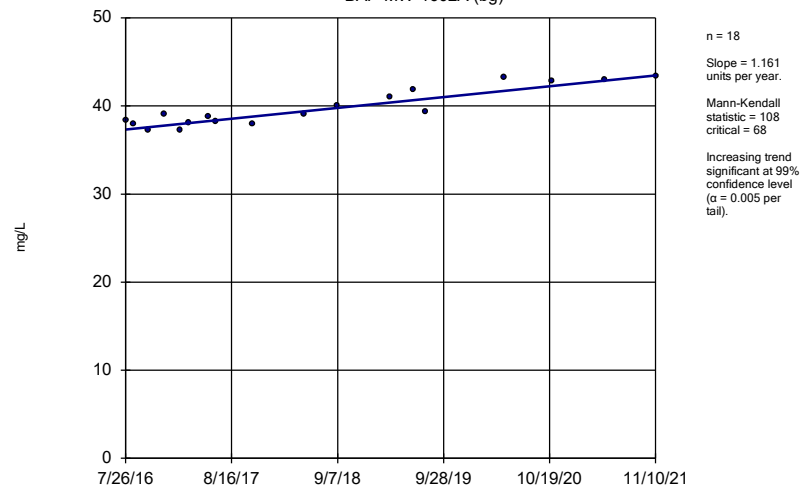
Constituent: Calcium, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
 Amos BAP Client: Geosyntec Data: Amos BAP

Sen's Slope Estimator  
BAP-MW-1601 (bg)



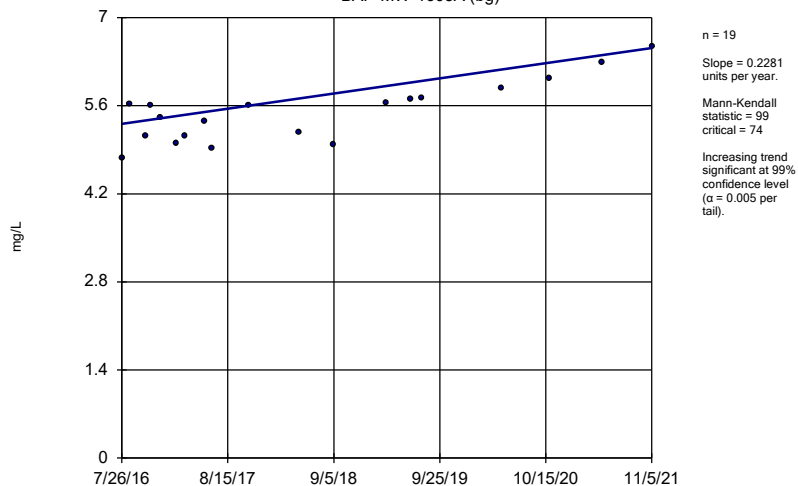
Constituent: Chloride, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

Sen's Slope Estimator  
BAP-MW-1602A (bg)



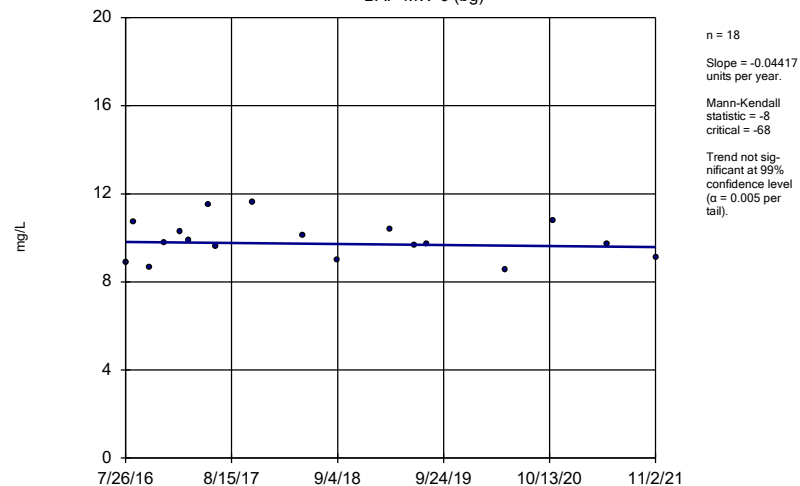
Constituent: Chloride, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

Sen's Slope Estimator  
BAP-MW-1603A (bg)



Constituent: Chloride, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

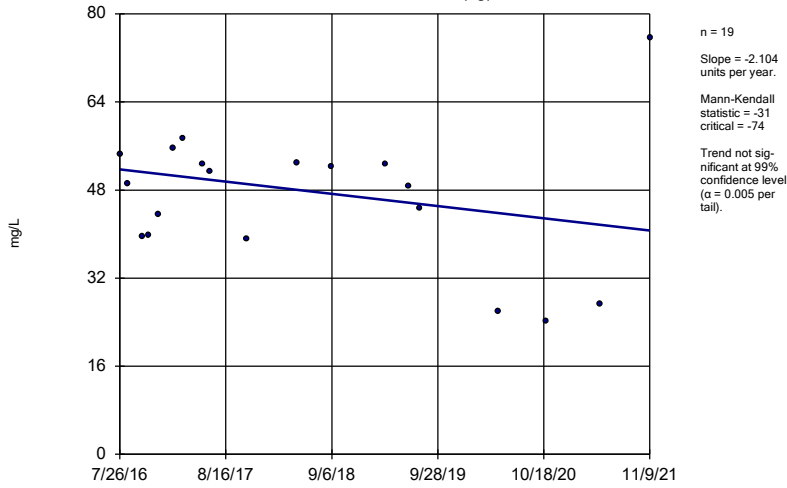
Sen's Slope Estimator  
BAP-MW-6 (bg)



Constituent: Chloride, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

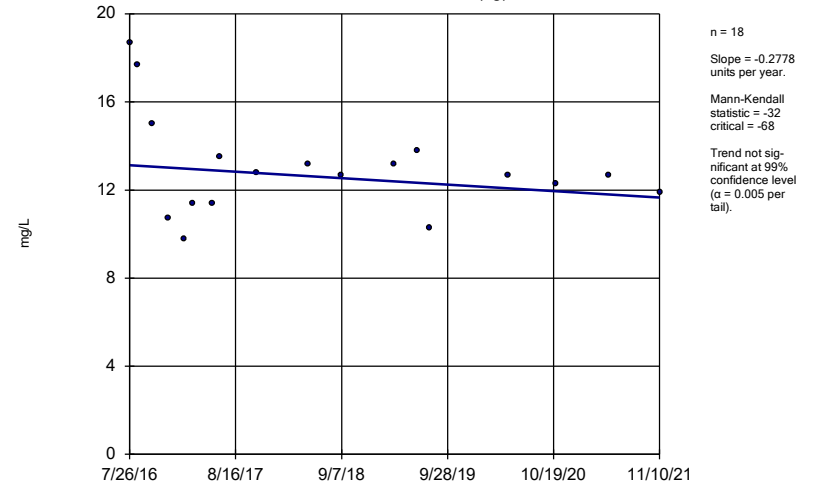
BAP-MW-1601 (bg)



Constituent: Sulfate, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

BAP-MW-1602A (bg)

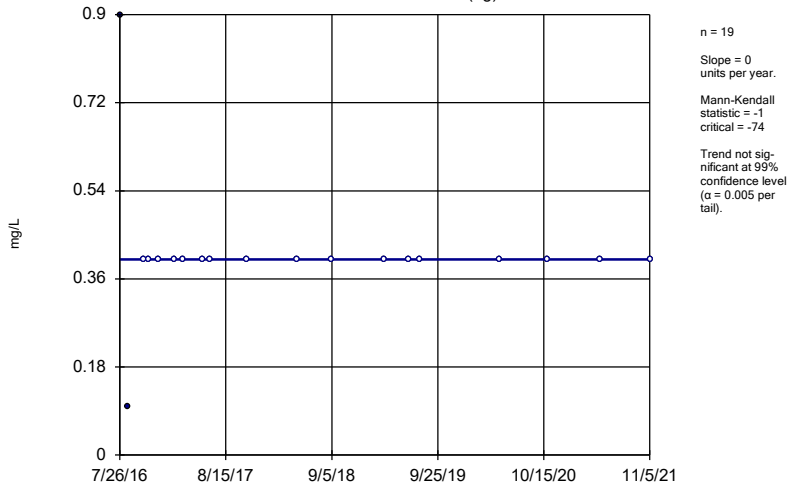


Constituent: Sulfate, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

Hollow symbols indicate censored values.

### Sen's Slope Estimator

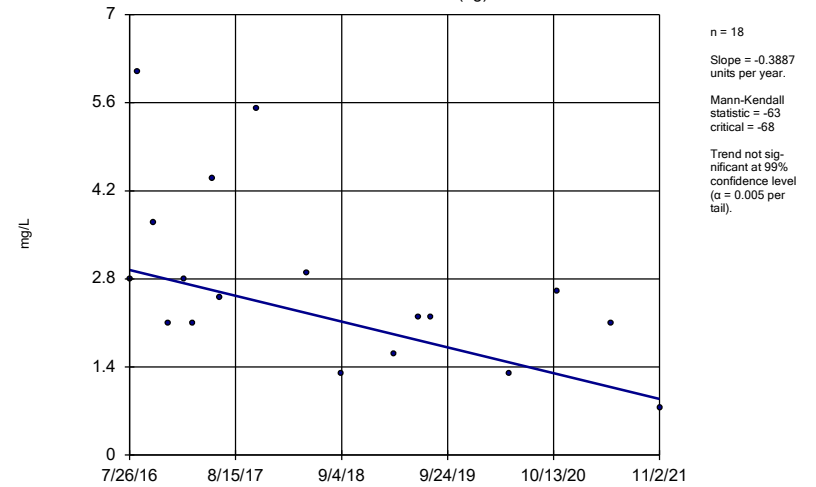
BAP-MW-1603A (bg)



Constituent: Sulfate, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

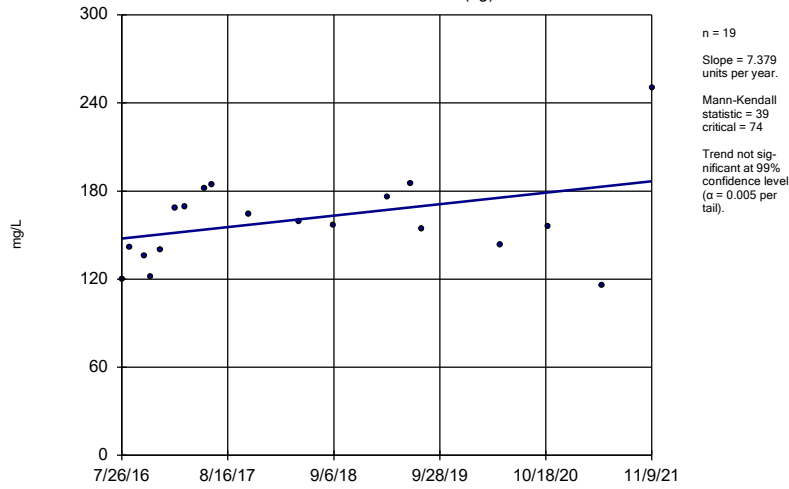
BAP-MW-6 (bg)



Constituent: Sulfate, total Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

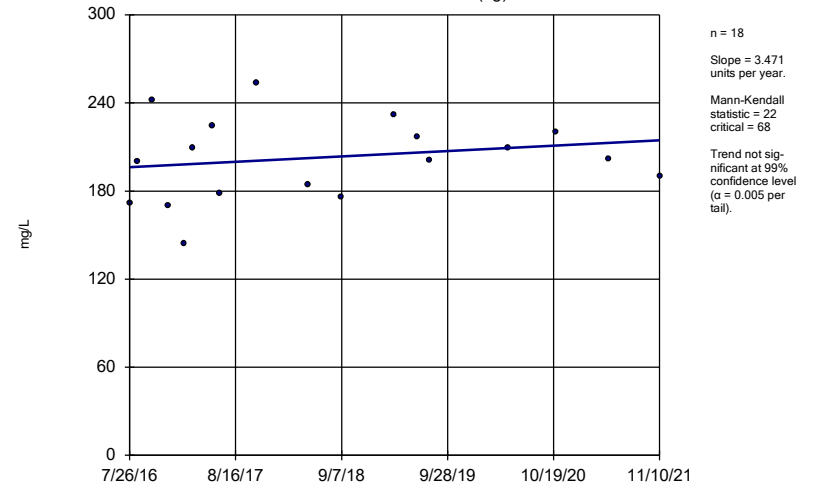
BAP-MW-1601 (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

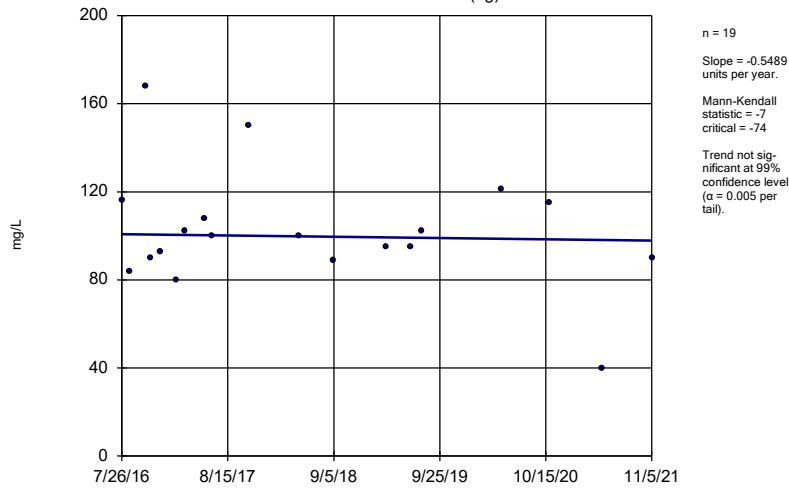
BAP-MW-1602A (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

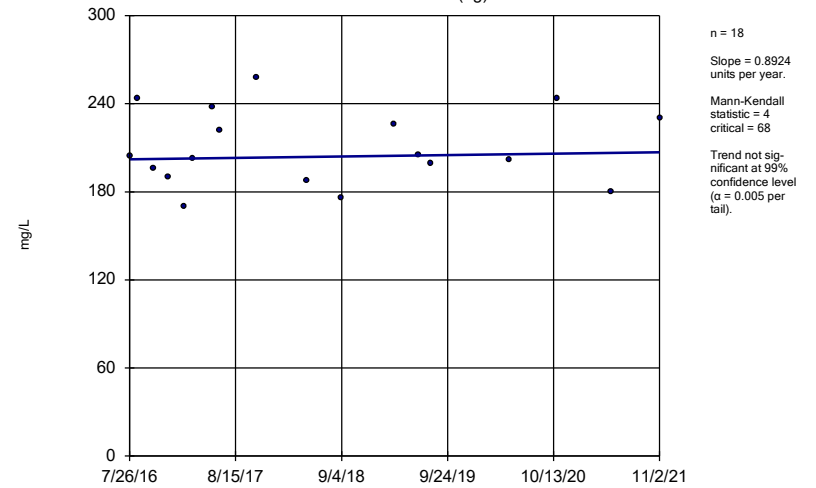
BAP-MW-1603A (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

### Sen's Slope Estimator

BAP-MW-6 (bg)



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/19/2022 9:28 PM View: Trend Test  
Amos BAP Client: Geosyntec Data: Amos BAP

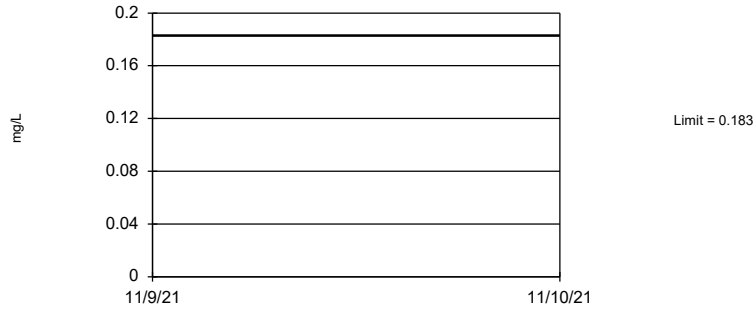
# Appendix III - Interwell Prediction Limits - All Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/20/2022, 9:44 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	68	n/a	n/a	30.88	n/a	n/a	0.0004142	NP Inter (normality) 1 of 2
Calcium, total (mg/L)	n/a	19.7	n/a	n/a	6 future	n/a	68	n/a	n/a	0	n/a	n/a	0.0004142	NP Inter (normality) 1 of 2
Chloride, total (mg/L)	n/a	43.4	n/a	n/a	6 future	n/a	70	n/a	n/a	0	n/a	n/a	0.0003873	NP Inter (normality) 1 of 2
Sulfate, total (mg/L)	n/a	75.7	n/a	n/a	6 future	n/a	70	n/a	n/a	22.86	n/a	n/a	0.0003873	NP Inter (normality) 1 of 2
Total Dissolved Solids [TDS] (mg/L)	n/a	261	n/a	n/a	6 future	n/a	70	166.1	50.79	0	None	No	0.001254	Param Inter 1 of 2



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 68 background values. 30.88% NDs. Annual per-constituent alpha = 0.004959. Individual comparison alpha = 0.0004142 (1 of 2). Assumes 6 future values.

Constituent: Boron, total Analysis Run 1/20/2022 9:44 PM View: Appendix III Interwell  
Amos BAP Client: Geosyntec Data: Amos BAP

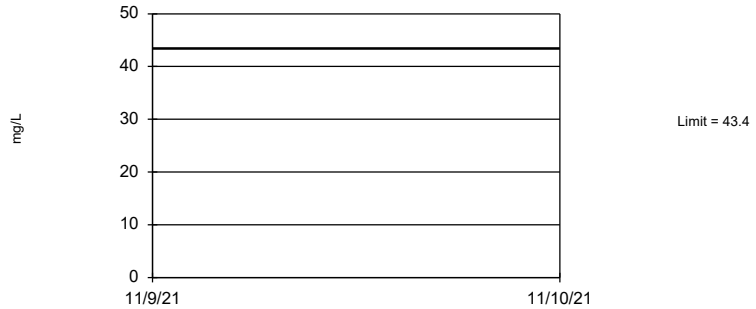
Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 68 background values. Annual per-constituent alpha = 0.004959. Individual comparison alpha = 0.0004142 (1 of 2). Assumes 6 future values.

Constituent: Calcium, total Analysis Run 1/20/2022 9:44 PM View: Appendix III Interwell  
Amos BAP Client: Geosyntec Data: Amos BAP

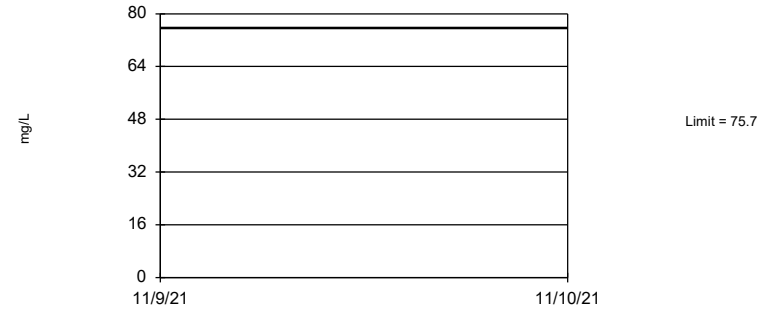
Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 70 background values. Annual per-constituent alpha = 0.004638. Individual comparison alpha = 0.0003873 (1 of 2). Assumes 6 future values.

Constituent: Chloride, total Analysis Run 1/20/2022 9:44 PM View: Appendix III Interwell  
Amos BAP Client: Geosyntec Data: Amos BAP

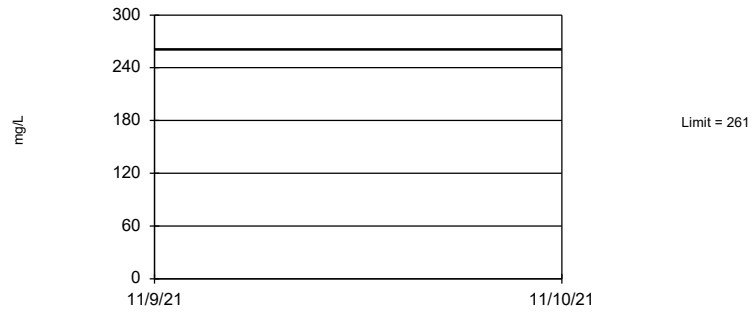
Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 70 background values. 22.86% NDs. Annual per-constituent alpha = 0.004638. Individual comparison alpha = 0.0003873 (1 of 2). Assumes 6 future values.

Constituent: Sulfate, total Analysis Run 1/20/2022 9:44 PM View: Appendix III Interwell  
Amos BAP Client: Geosyntec Data: Amos BAP

Prediction Limit  
Interwell Parametric



Background Data Summary: Mean=166.1, Std. Dev.=50.79, n=70. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9766, critical = 0.952. Kappa = 1.868 (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 1/20/2022 9:44 PM View: Appendix III Interwell  
Amos BAP Client: Geosyntec Data: Amos BAP

# Upper Tolerance Limits - Appendix IV

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/20/2022, 9:41 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony, total (mg/L)	0.00017	n/a	n/a	n/a	n/a	76	32.89	n/a	0.02028	NP Inter(normality)
Arsenic, total (mg/L)	0.0903	n/a	n/a	n/a	n/a	76	0	n/a	0.02028	NP Inter(normality)
Barium, total (mg/L)	0.303	n/a	n/a	n/a	n/a	76	0	n/a	0.02028	NP Inter(normality)
Beryllium, total (mg/L)	0.000106	n/a	n/a	n/a	n/a	76	17.11	n/a	0.02028	NP Inter(normality)
Cadmium, total (mg/L)	0.00003	n/a	n/a	n/a	n/a	76	35.53	n/a	0.02028	NP Inter(normality)
Chromium, total (mg/L)	0.001903	n/a	n/a	n/a	n/a	75	0	x^(1/3)	0.05	Inter
Cobalt, total (mg/L)	0.014	n/a	n/a	n/a	n/a	76	0	n/a	0.02028	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.312	n/a	n/a	n/a	n/a	76	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.31	n/a	n/a	n/a	n/a	82	1.22	n/a	0.01491	NP Inter(normality)
Lead, total (mg/L)	0.005629	n/a	n/a	n/a	n/a	76	2.632	ln(x)	0.05	Inter
Lithium, total (mg/L)	0.03	n/a	n/a	n/a	n/a	76	15.79	n/a	0.02028	NP Inter(normality)
Mercury, total (mg/L)	0.000005	n/a	n/a	n/a	n/a	48	91.67	n/a	0.08526	NP Inter(NDs)
Molybdenum, total (mg/L)	0.00221	n/a	n/a	n/a	n/a	76	7.895	sqrt(x)	0.05	Inter
Selenium, total (mg/L)	0.0005	n/a	n/a	n/a	n/a	76	15.79	n/a	0.02028	NP Inter(normality)
Thallium, total (mg/L)	0.000224	n/a	n/a	n/a	n/a	72	48.61	n/a	0.02489	NP Inter(normality)

<b>AMOS BAP GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR Rule-Specified</b>	<b>Background</b>	<b>GWPS</b>
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		0.00011	0.004
Cadmium, Total (mg/L)	0.005		0.00003	0.005
Chromium, Total (mg/L)	0.1		0.0019	0.1
Cobalt, Total (mg/L)		0.006	0.014	0.014
Combined Radium, Total (pCi/L)	5		2.31	5
Fluoride, Total (mg/L)	4		0.31	4
Lead, Total (mg/L)	0.015		0.0056	0.015
Lithium, Total (mg/L)		0.04	0.03	0.04
Mercury, Total (mg/L)	0.002		0.000005	0.002
Molybdenum, Total (mg/L)		0.1	0.0022	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*



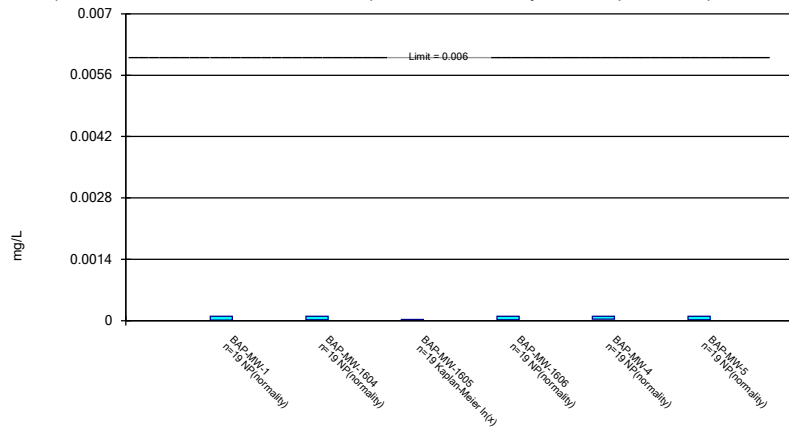
# Appendix IV - Confidence Intervals - All Results (No Significant) Page 2

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/20/2022, 10:16 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	12	8.7e-7	91.67	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	BAP-MW-1	0.0009857	0.0004017	0.1	No	19	0.0005736	31.58	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-1604	0.0005	0.00021	0.1	No	19	0.0001655	26.32	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-1605	0.0005	0.00015	0.1	No	19	0.0001794	42.11	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-1606	0.0005	0.00012	0.1	No	19	0.0001906	47.37	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-4	0.0008178	0.0002851	0.1	No	17	0.0005304	29.41	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-5	0.0007277	0.0002133	0.1	No	19	0.0007451	26.32	ln(x)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1	0.0002	0.00009	0.05	No	19	0.00004392	0	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1604	0.0003	0.00013	0.05	No	19	0.00005148	0	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1605	0.0001197	0.00005759	0.05	No	19	0.0001038	5.263	ln(x)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1606	0.0003	0.00009	0.05	No	19	0.0001668	21.05	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-4	0.0002	0.00007	0.05	No	19	0.0001581	15.79	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-5	0.0005	0.00006	0.05	No	19	0.0002198	63.16	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1	0.0002	0.00004	0.002	No	18	0.00008001	44.44	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-1604	0.0002	0.00002	0.002	No	18	0.00009068	61.11	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1605	0.0002	0.00004	0.002	No	18	0.00007881	72.22	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1606	0.0002	0.00001	0.002	No	18	0.00009158	44.44	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-4	0.0002	0.000068	0.002	No	18	0.00007204	38.89	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-5	0.0002	0.00002	0.002	No	18	0.0000913	61.11	No	0.01	NP (NDs)

### Parametric and Non-Parametric (NP) Confidence Interval

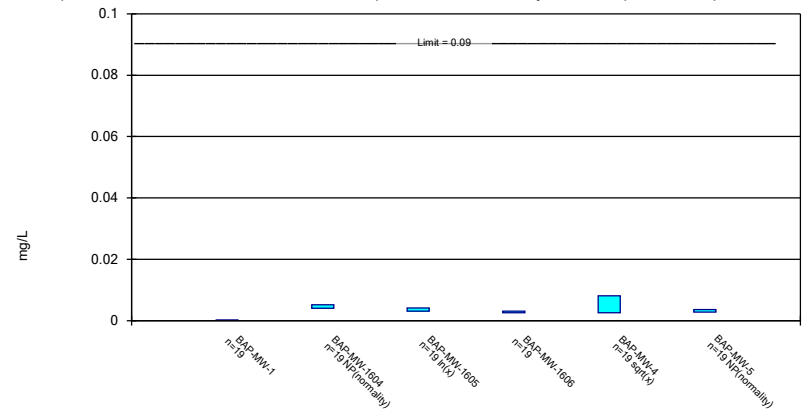
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

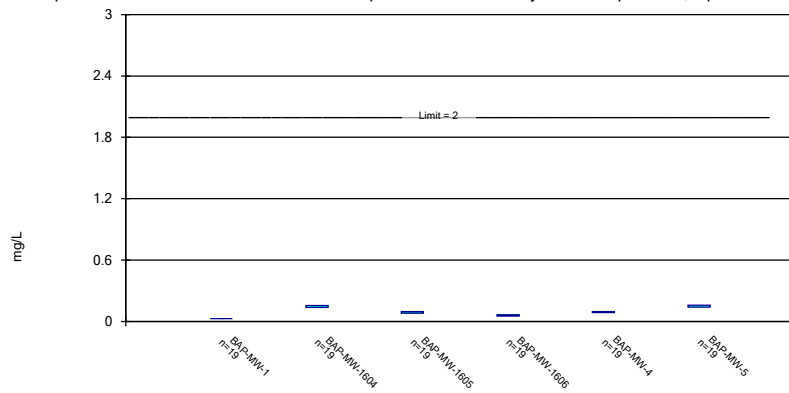
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

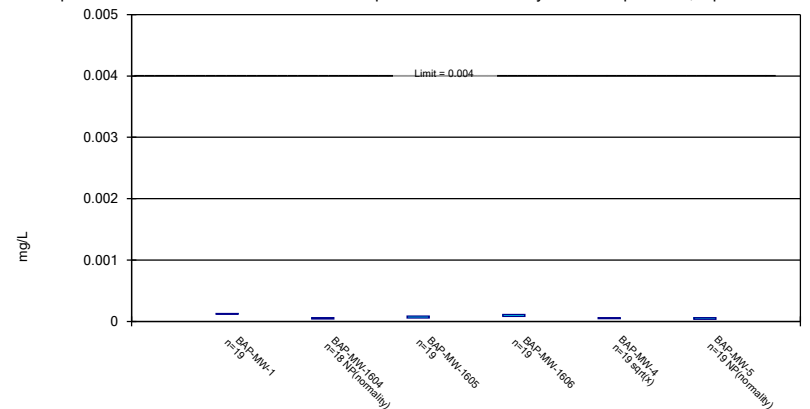
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

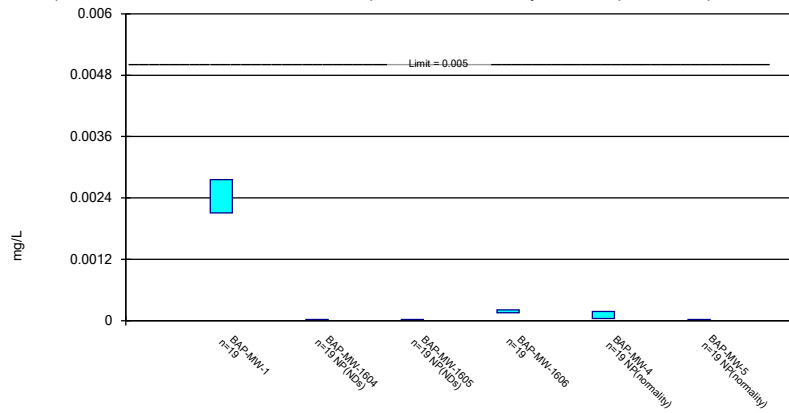
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

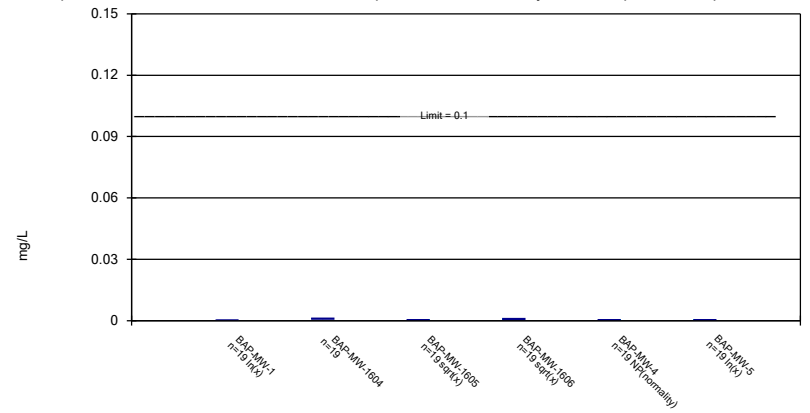
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

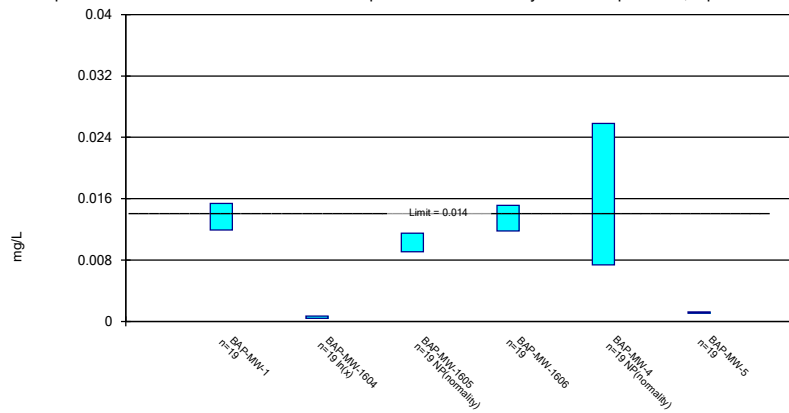
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

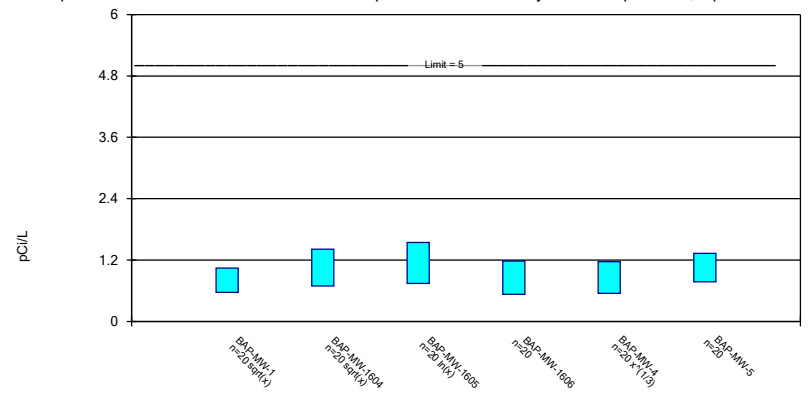
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 1/20/2022 10:13 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.

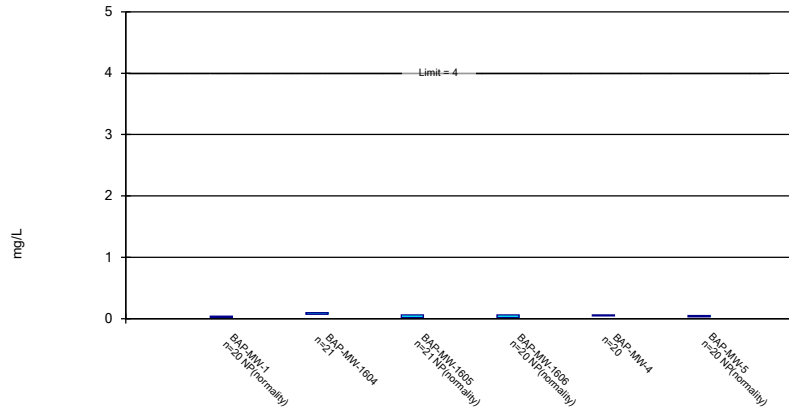


Constituent: Combined Radium 226 + 228 Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP



### Parametric and Non-Parametric (NP) Confidence Interval

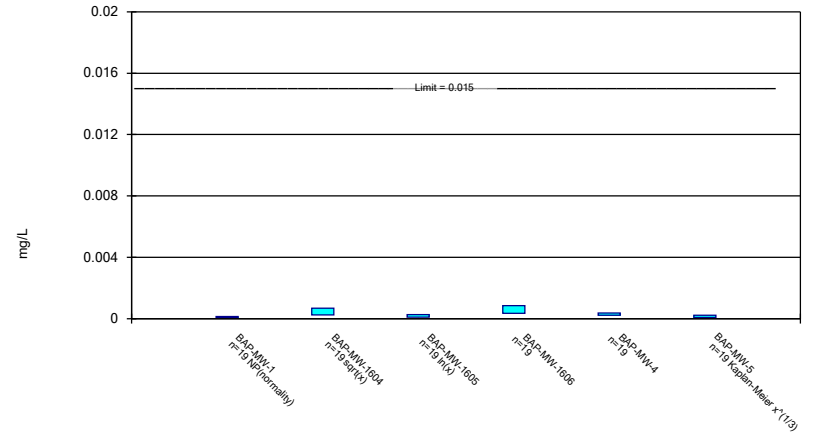
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

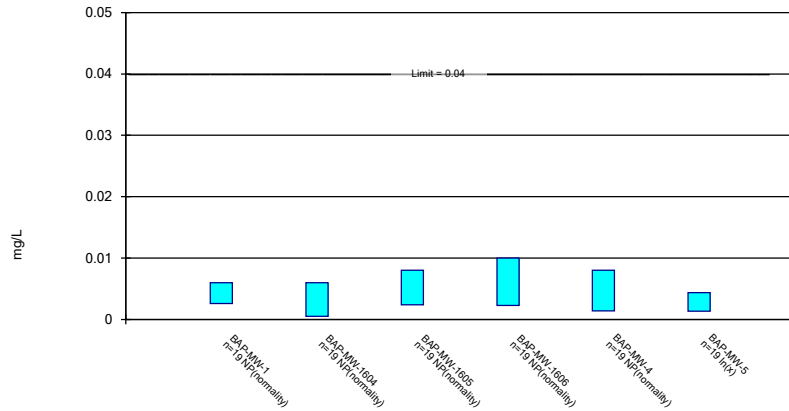
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

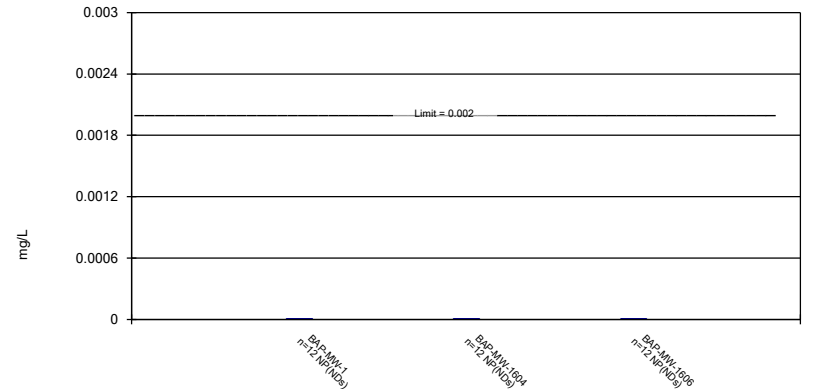
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

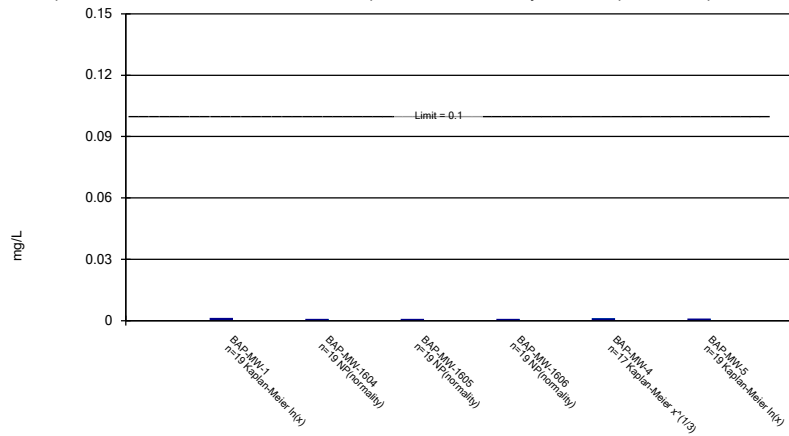
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

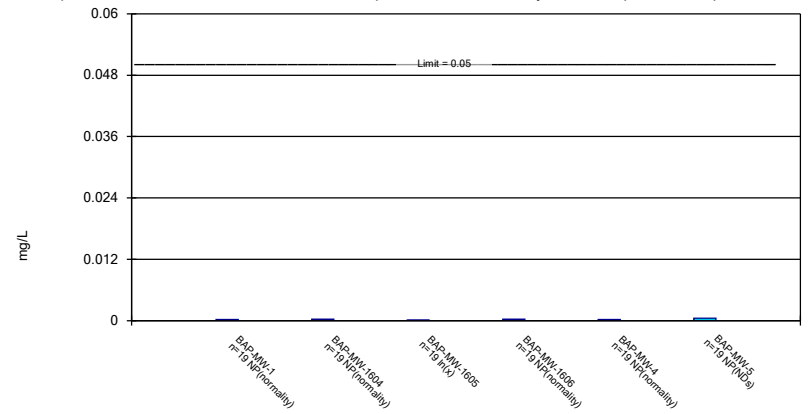
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

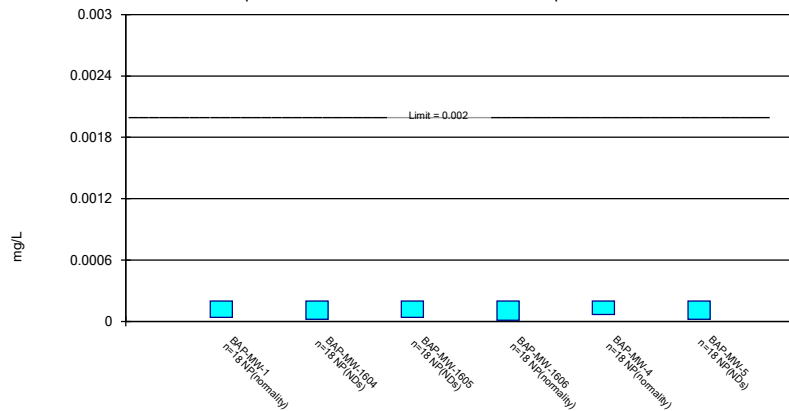
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 1/20/2022 10:13 PM View: Confidence Intervals  
Amos BAP Client: Geosyntec Data: Amos BAP

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

*Submitted to*



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*Submitted by*



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September 13, 2022

CHA8500B

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## LIST OF ATTACHMENTS

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

## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
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
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
UTL	Upper Tolerance Limit
USEPA	United States Environmental Protection Agency

## SECTION 1

### EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257.90-257.98, "CCR rule"), groundwater monitoring has been conducted at the Bottom Ash Pond (BAP), an existing CCR unit at the Amos Power Plant located in Winfield, West Virginia. Recent groundwater monitoring results were compared to the site-specific groundwater protection standards (GWPS) 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 following the detection monitoring events, so the BAP has been in assessment monitoring since 2018. During the most recent assessment monitoring event, completed in November 2021, no statistically significant levels (SSLs) were identified during this event and the unit remained in assessment monitoring (Geosyntec, 2022).

During 2022, an annual sampling event for the Appendix IV parameters required by 257.95(b) was completed in March, and a semi-annual sampling event for the Appendix III and Appendix IV parameters required by 257.95(d)(1) was completed in May. The results of these annual and semi-annual assessment monitoring events are documented in this report.

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

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. 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, two sets of samples were collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(b) (March 2022) and 257.95(d)(1) (May 2022). Samples from the March 2022 event were analyzed for Appendix IV parameters only, whereas samples from the May 2022 sample event were analyzed for all Appendix III and detected Appendix IV parameters based on the results of the March event. A summary of data collected during these assessment monitoring events may be found in Table 1.

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

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

The data obtained in March and May 2022 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, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B. The calculated confidence limits were compared to the GWPSs provided in Table 2. The GWPSs were established during a

previous statistical analysis as either the greater value of the background concentration or the maximum contaminant level (MCL) and risk-based level specified in 40 CFR 257.95(h)(2) (Geosyntec, 2022).

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

- Boron concentrations exceeded the interwell UPL of 0.183 mg/L at MW-4 (0.218 mg/L).
- Calcium concentrations exceeded the interwell UPL of 19.7 mg/L at MW-1 (36.4 mg/L), MW-4 (23.1 mg/L), MW-5 (50.1 mg/L), MW-1604 (47.0 mg/L), and MW-1606 (25.4 mg/L).
- Chloride concentrations exceeded the interwell UPL of 43.4 mg/L at MW-1 (54.2 mg/L), MW-4 (56.6 mg/L), MW-5 (92.3 mg/L), and MW-1604 (134 mg/L).
- Fluoride concentrations exceeded the intrawell UPL of 0.140 mg/L at MW-4 (0.21 mg/L).
- Sulfate concentrations exceeded the interwell UPL of 75.7 mg/L at MW-1 (145 mg/L), MW-4 (456 mg/L), MW-5 (225 mg/L), MW-1604 (109 mg/L), and at MW-1606 (115 mg/L).
- TDS concentrations exceeded the interwell UPL of 261 mg/L at MW-1 (340 mg/L), MW-4 (1,090 mg/L), MW-5 (520 mg/L), MW-1604 (380 mg/L), and MW-1606 (270 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the May 2022 sample was above the UPL or below the lower prediction limit (LPL). Based on this evaluation, concentrations of Appendix III constituents appear to be above background concentrations and the unit will remain in assessment monitoring.



### **2.3 Conclusions**

An annual and a semi-annual assessment monitoring event were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers in the March 2022 and May 2022 data. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. No SSLs were identified. Appendix III parameters were compared to prediction limits, with exceedances identified for boron, calcium, chloride, fluoride, 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 – Amos Plant. October 2020.

Geosyntec. 2022. Statistical Analysis Summary – Bottom Ash Pond, Amos Plant, Winfield, West Virginia. March 10, 2022.

# TABLES

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

Parameter	Unit	MW-1		MW-4		MW-5		MW-6		MW-1601	
		3/2/2022	5/18/2022	3/1/2022	5/19/2022	3/1/2022	5/19/2022	3/2/2022	5/23/2022	3/2/2022	5/24/2022
Antimony	µg/L	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.05 J1	0.1 U1	0.1 U1
Arsenic	µg/L	0.08 J1	0.12	1.65	1.12	3.41	3.58	33.7	37.2	5.78	6.57
Barium	µg/L	24.0	25.1	87.6	93.4	171	272 M1, P3	170	169	131	113
Beryllium	µg/L	0.120	0.131	0.040 J1	0.040 J1	0.040 J1	0.066	0.016 J1	0.022 J1	0.016 J1	0.031 J1
Boron	mg/L	-	0.082	-	0.040 J1	-	0.047 J1	-	0.01 J1	-	0.009 J1
Cadmium	µg/L	2.32	2.79	0.110	0.040	0.006 J1	0.02 U1	0.02 U1	0.005 J1	0.021	0.021
Calcium	mg/L	-	36.4	-	13.9	-	25.4	-	11.9	-	15.1
Chloride	mg/L	-	54.2	-	21.4	-	21.8	-	10.9	-	28.1
Chromium	µg/L	0.53	0.52	0.67	0.32	0.37	0.25	0.83	1.03	0.45	0.46
Cobalt	µg/L	19.9	15.0	7.53	8.84	0.833	0.862	10.6	11.7	7.03	6.60
Combined Radium	pCi/L	1.98	2	1.74	1	1.28	1.85	1.93	2.88	1.69	0.79
Fluoride	mg/L	0.02 J1	0.02 J1	0.04 J1	0.06	0.03 J1	0.03 J1	0.05 J1	0.05 J1	0.03 J1	0.02 J1
Lead	µg/L	0.08 J1	0.14 J1	0.21	0.05 J1	0.06 J1	0.06 M1, P3, J1	0.2 U1	0.24	0.06 J1	0.28
Lithium	mg/L	0.00259	0.00275	0.00147	0.00198	0.00142	0.00201	0.00108	0.00118	0.00189	0.00195
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	3.5	0.4 J1	0.6	0.5 U1	0.5 U1
Selenium	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1
Sulfate	mg/L		145		14.7		115		3.31		60.2
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.06 J1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	-	340 L1	-	170 L1	-	270 L1	-	190 L1	-	170 L1
pH	SU	5.39	5.67	6.19	5.93	5.51	5.85	6.97	6.5	5.54	6.12

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

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

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

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

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

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

-: Not analyzed

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

Parameter	Unit	MW-1602A		MW-1603A		MW-1604		MW-1605		MW-1606	
		3/2/2022	5/23/2022	3/1/2022	5/20/2022	3/2/2022	5/24/2022	3/2/2022	5/18/2022	2/28/2022	5/23/2022
Antimony	µg/L	0.07 J1	0.1 U1	0.03 J1	0.03 J1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.03 J1	0.06 J1
Arsenic	µg/L	20.3	19.6	87.2	83.2	3.56	3.66	2.98	3.07	3.03	8.83
Barium	µg/L	242	241	241	239	131	172	99.9	104	58.7	75.1
Beryllium	µg/L	0.027 J1	0.010 J1	0.011 J1	0.05 U1	0.042 J1	0.036 J1	0.099	0.113	0.110	0.145
Boron	mg/L	-	0.01 J1	-	0.017 J1	-	0.218	-	0.055	-	0.031 J1
Cadmium	µg/L	0.006 J1	0.02 U1	0.02 U1	0.009 J1	0.02 U1	0.02 U1	0.006 J1	0.006 J1	0.390	0.359
Calcium	mg/L	-	19.5	-	14.7	-	23.1	-	50.1	-	47.0 M1, P3
Chloride	mg/L	-	39.5	-	8.26	-	56.6	-	92.3	-	134
Chromium	µg/L	1.19	0.41	0.71	0.43	0.87	0.60	0.70	0.75	0.57	0.79
Cobalt	µg/L	0.516	0.244	0.228	0.175	0.507	0.422	9.63	9.82	11.8	14.6
Combined Radium	pCi/L	1.33	1.59	1.13	1.38	1.36	1.29	0.87	0.61	1.5	1.46
Fluoride	mg/L	0.14	0.14	0.23	0.23	0.06	0.21	0.06 U1	0.06 U1	0.06 U1	0.06 U1
Lead	µg/L	1.17	0.42	0.19 J1	0.06 J1	0.23	0.15 J1	0.41	0.53	0.58	1.23
Lithium	mg/L	0.00107	0.00090	0.00027	0.00026	0.00044	0.00040	0.00222	0.00257	0.00217	0.00260
Mercury	µg/L	0.005 U1	-	0.005 U1	-	0.005 U1	-	0.005 U1	-	0.005 U1	-
Molybdenum	µg/L	0.8	0.8	1	1.3	0.2 J1	0.4 J1	0.5 U1	0.5 U1	0.5 U1	0.1 J1
Selenium	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.10 J1	0.13 J1	0.12 J1	0.09 J1	0.5 U1	0.5 U1
Sulfate	mg/L		13.6		0.4 U1		456		225		109
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	-	190 L1	-	110 L1	-	1,090 L1	-	520 L1	-	380 L1
pH	SU	6.51	6.5	6.62	6.62	6.35	5.91	5.44	5.93	6.81	6.02

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

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

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

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

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

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

-: Not analyzed

**Table 2: Appendix IV Groundwater Protection Standards***Geosyntec Consultants, Inc.***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		0.000106	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000300	0.00500
Chromium, Total (mg/L)	0.100		0.00190	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.0140	0.0140
Combined Radium, Total (pCi/L)	5.00		2.31	5.00
Fluoride, Total (mg/L)	4.00		0.310	4.00
Lead, Total (mg/L)	0.0150		0.00563	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0300	0.0400
Mercury, Total (mg/L)	0.00200		0.00000500	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00221	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**

Analyte	Unit	Description	MW-1	MW-4	MW-5	MW-1604	MW-1605	MW-1606
			5/18/2022	5/19/2022	5/19/2022	5/24/2022	5/18/2022	5/23/2022
Boron	mg/L	Interwell Background Value (UPL)	0.183					
		Analytical Result	0.082	<b>0.218</b>	0.055	0.031	0.040	0.047
Calcium	mg/L	Interwell Background Value (UPL)	19.7					
		Analytical Result	<b>36.4</b>	<b>23.1</b>	<b>50.1</b>	<b>47.0</b>	13.9	<b>25.4</b>
Chloride	mg/L	Interwell Background Value (UPL)	43.4					
		Analytical Result	<b>54.2</b>	<b>56.6</b>	<b>92.3</b>	<b>134</b>	21.4	21.8
Fluoride	mg/L	Intrawell Background Value (UPL)	0.0300	0.140	0.0900	0.0300	0.0760	0.0500
		Analytical Result	0.02	<b>0.21</b>	0.02	0.02	0.06	0.03
pH	SU	Intrawell Background Value (UPL)	7.3	7.2	6.5	6.7	7.0	6.4
		Intrawell Background Value (LPL)	4.9	5.9	5.1	5.2	5.4	5.2
		Analytical Result	5.7	5.9	5.9	6.0	5.9	5.9
Sulfate	mg/L	Interwell Background Value (UPL)	75.7					
		Analytical Result	<b>145</b>	<b>456</b>	<b>225</b>	<b>109</b>	14.7	<b>115</b>
Total Dissolved Solids	mg/L	Interwell Background Value (UPL)	261					
		Analytical Result	<b>340</b>	<b>1,090</b>	<b>520</b>	<b>380</b>	170	<b>270</b>

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Background values are shaded gray.**

**Bold values exceed the background value.**

--: Not measured

## ATTACHMENT A

Certification by Qualified Professional Engineer



**Certification by Qualified Professional Engineer**

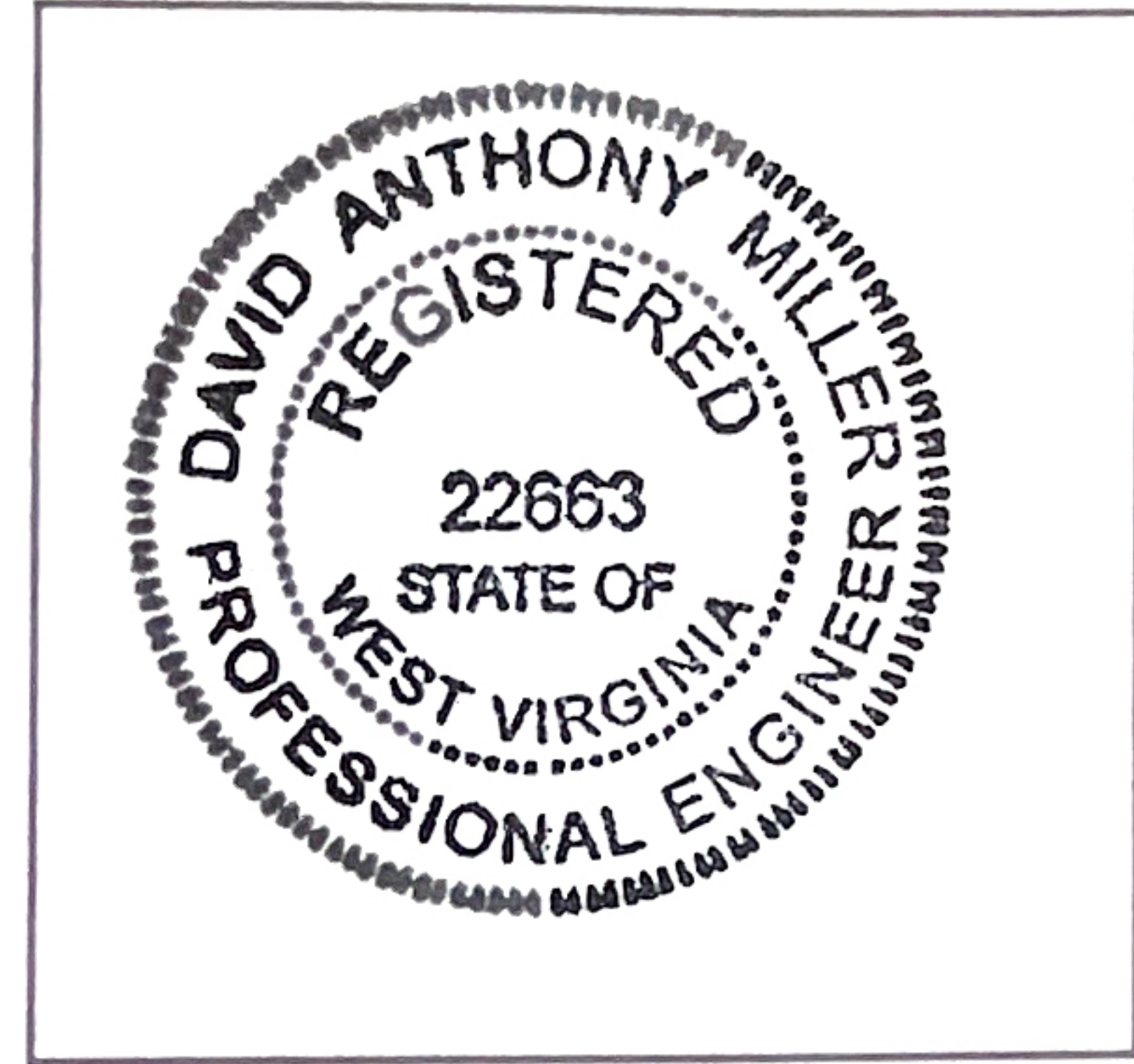
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Amos Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



22663

License Number

WEST VIRGINIA

Licensing State

09.15.22

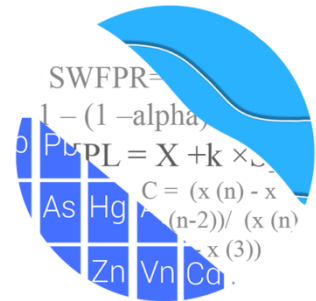
Date

**ATTACHMENT B**  
**Statistical Analysis Output**

# GROUNDWATER STATS CONSULTING

July 29, 2022

Geosyntec Consultants  
Attn: Ms. Allison Kreinberg  
941 Chatham Lane, #103  
Columbus, OH 43221



Re: Amos Bottom Ash Pond  
Assessment Monitoring Summary – May 2022

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 2022 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

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 prediction limits as appropriate.

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. 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 2021**

### 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 2021. 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 for each Appendix IV parameter through November 2021 (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 2022.

## Evaluation of Appendix IV Parameters – May 2022

Confidence intervals were then constructed with data through May 2022 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). 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,



Tristan Clark  
Groundwater Analyst



Andrew Collins  
Project Manager

# 100% Non-Detects

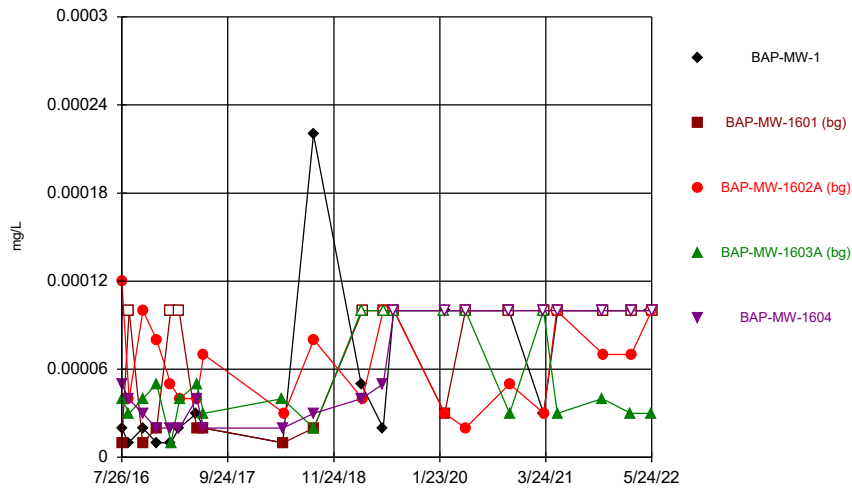
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Mercury, total (mg/L)  
BAP-MW-1605, BAP-MW-4, BAP-MW-5

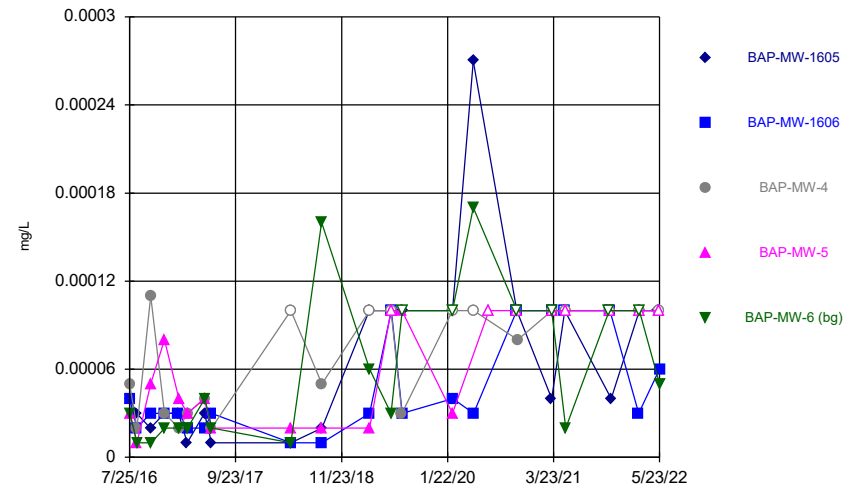


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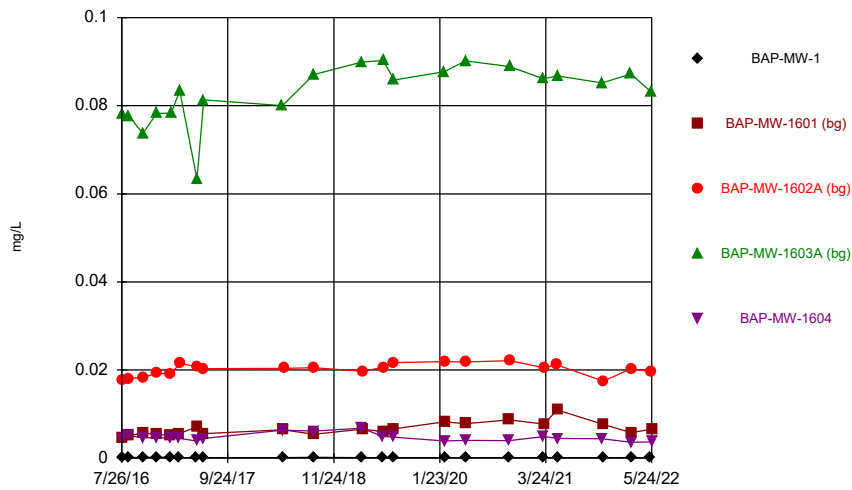
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### Time Series



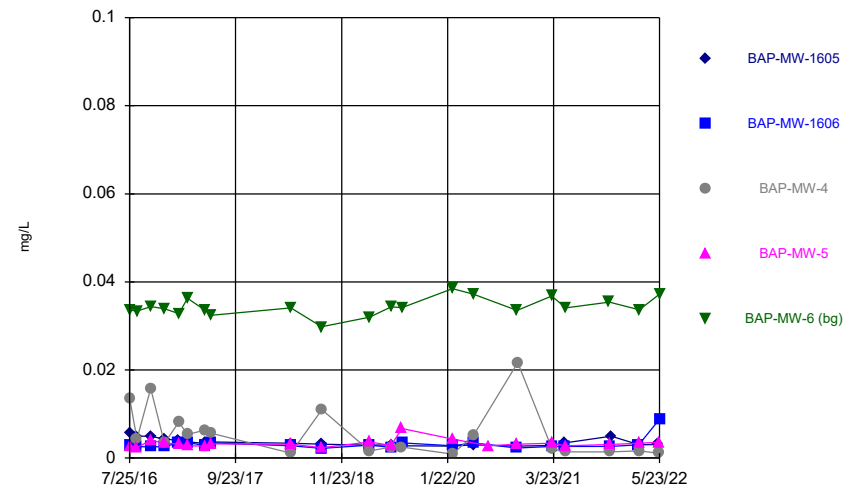
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### Time Series



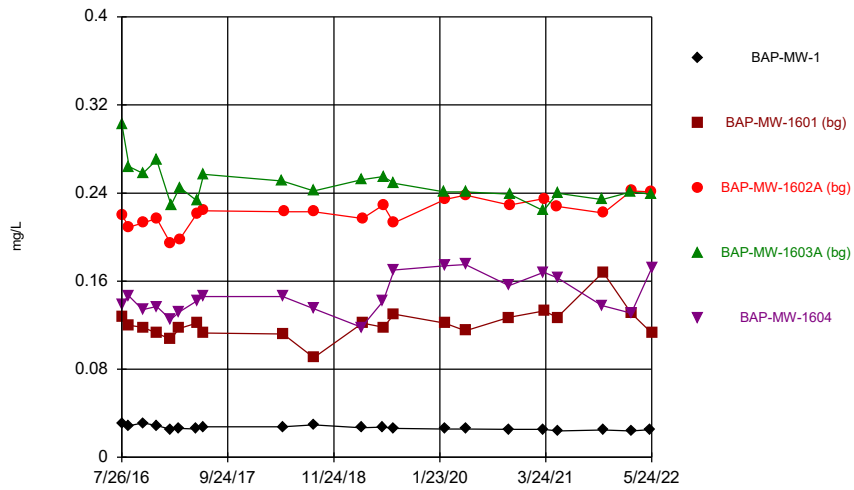
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### Time Series



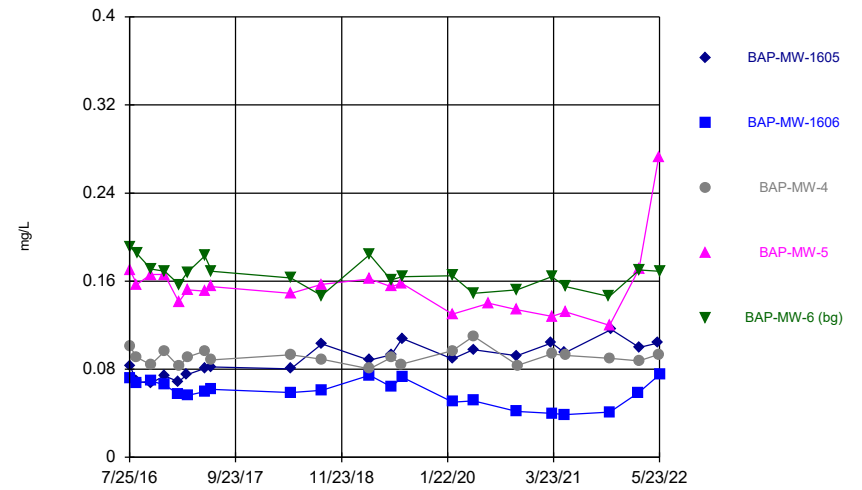
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### Time Series



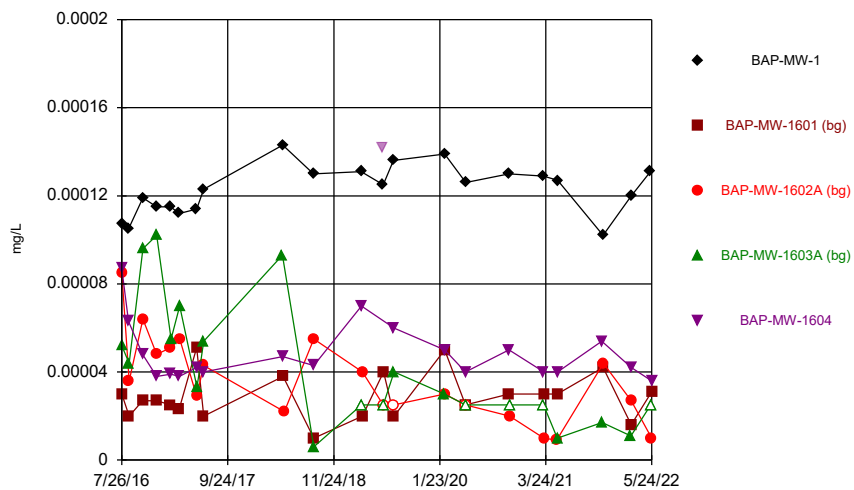
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### Time Series



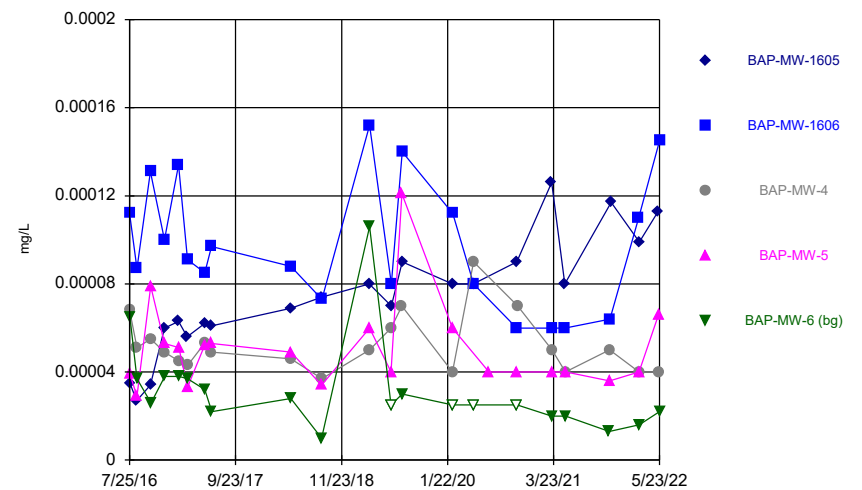
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### Time Series



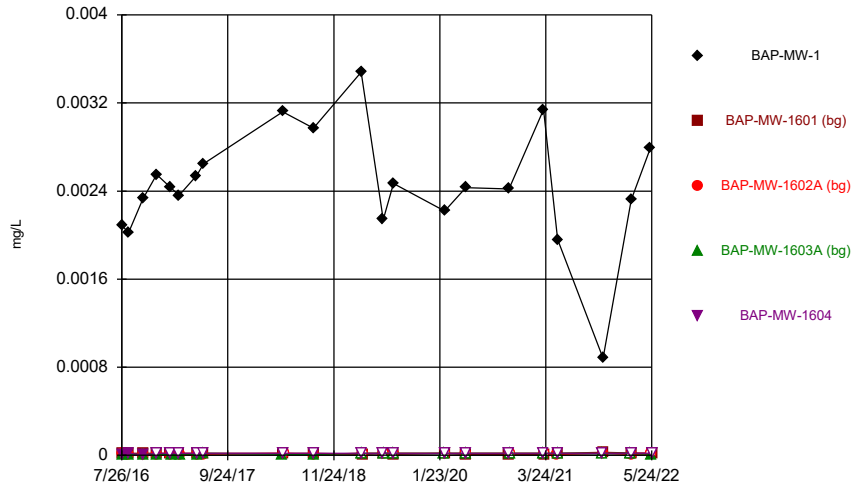
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### Time Series



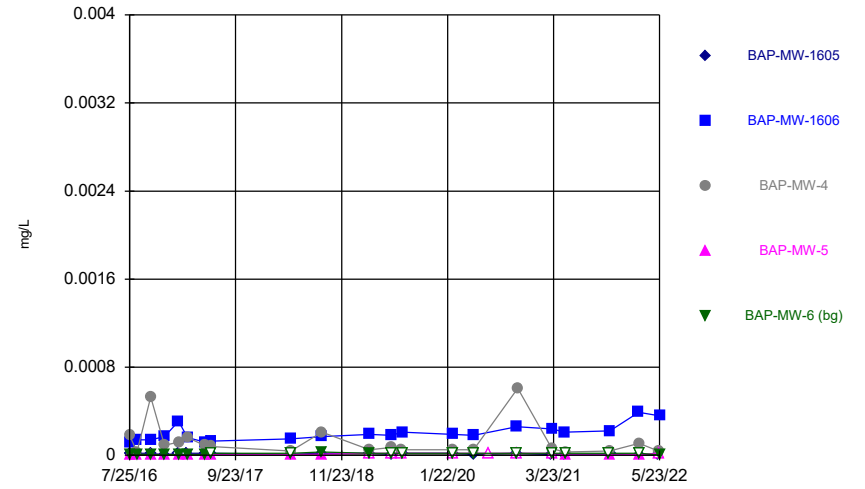
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### Time Series



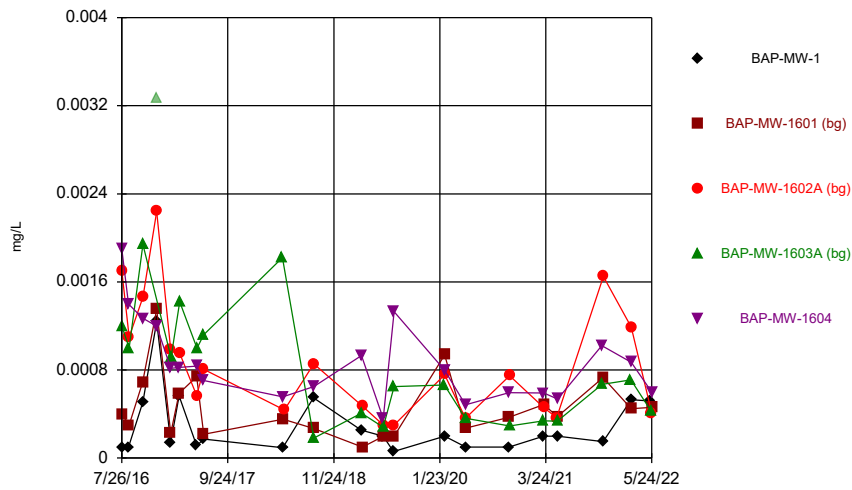
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### Time Series



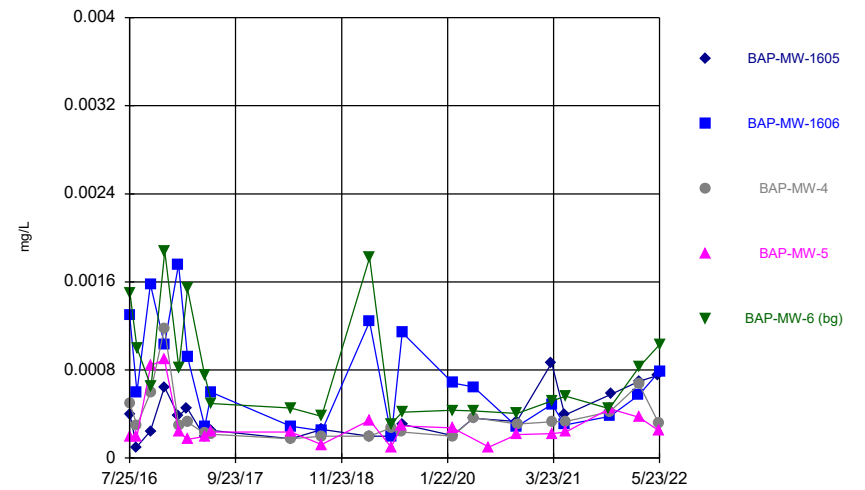
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### Time Series



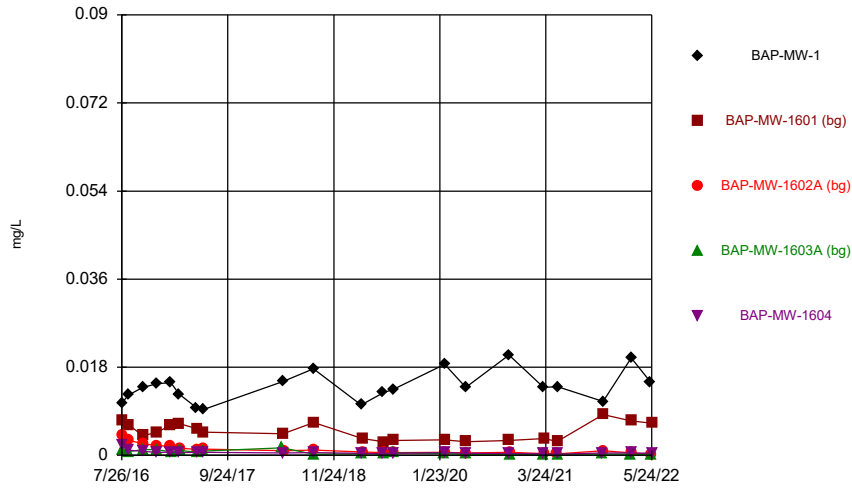
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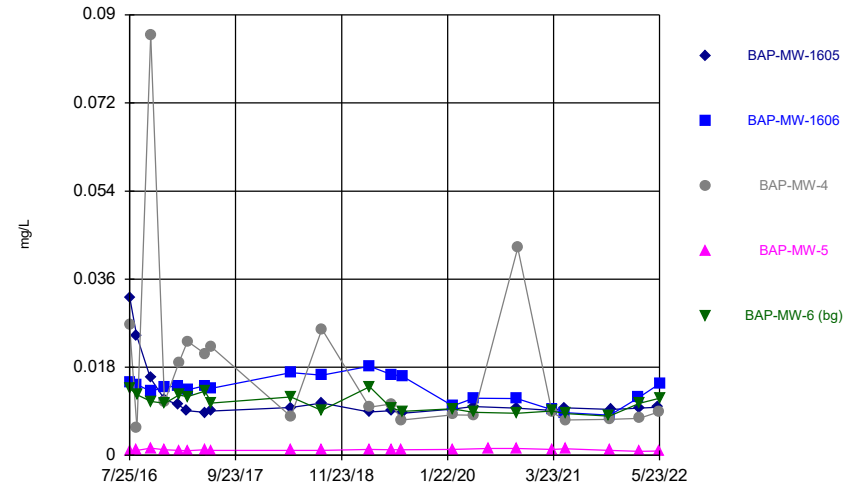
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Time Series



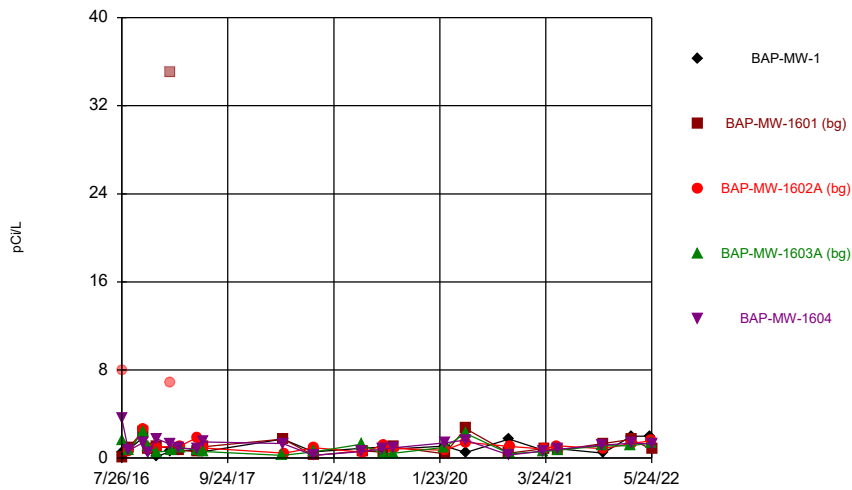
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Time Series



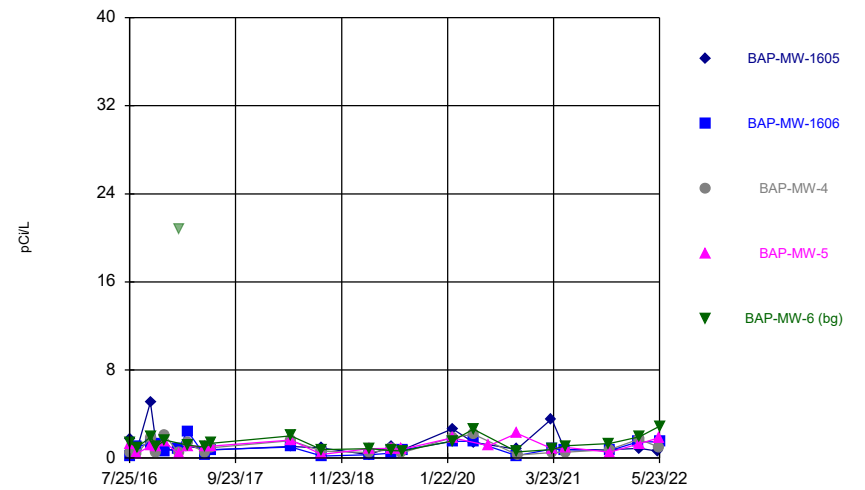
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Time Series



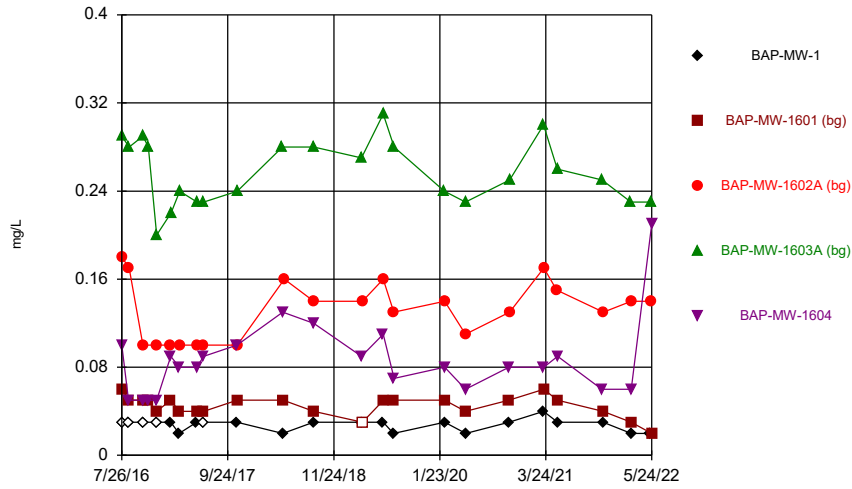
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Time Series



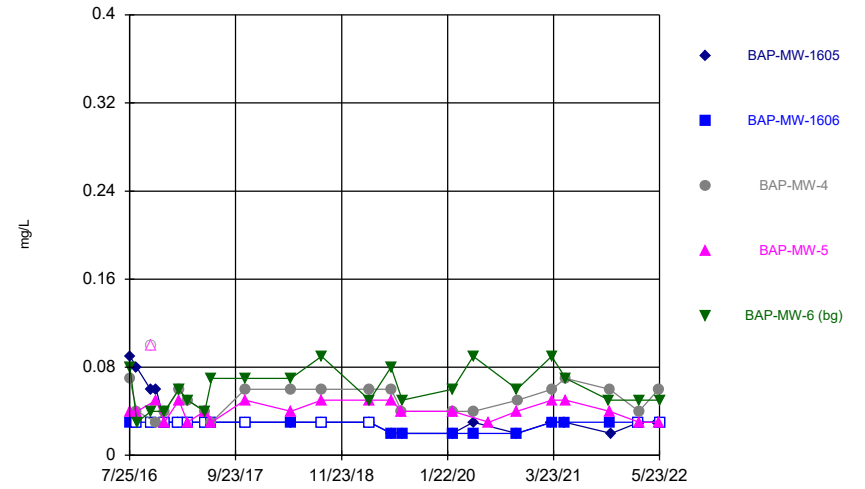
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Time Series



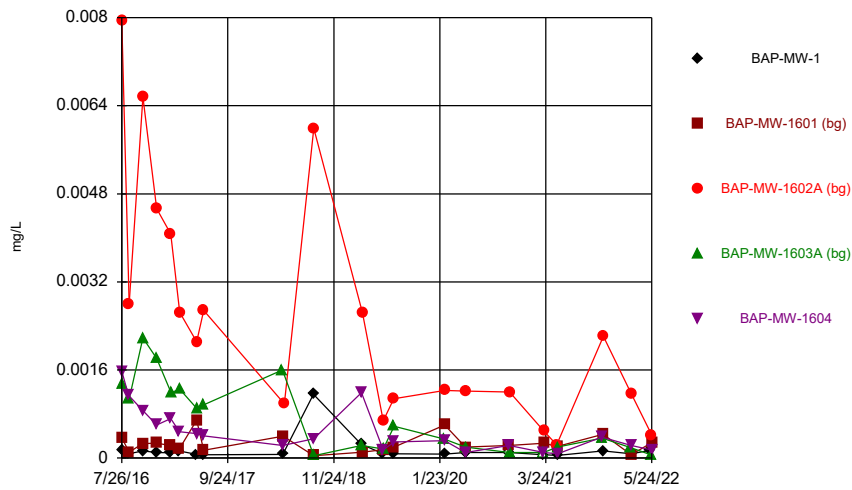
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Time Series



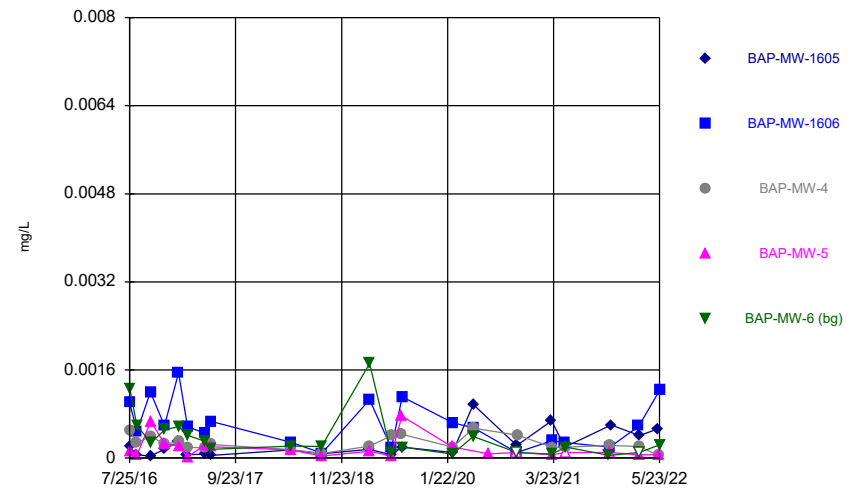
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Time Series



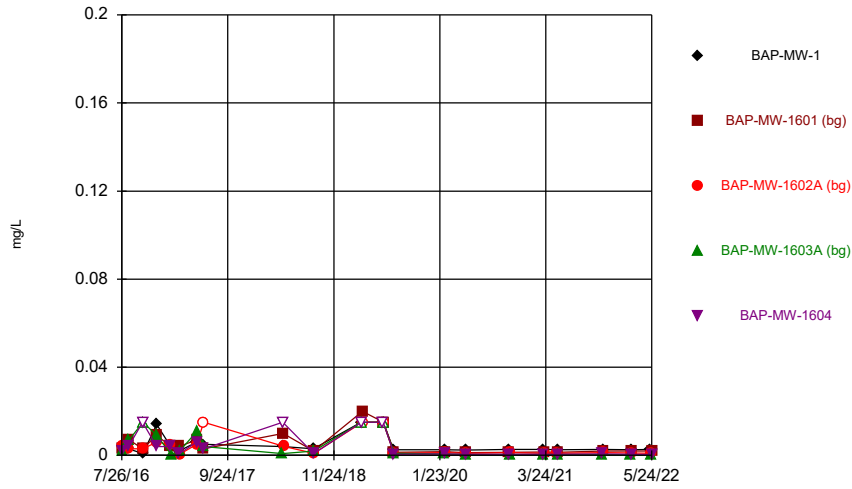
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Time Series



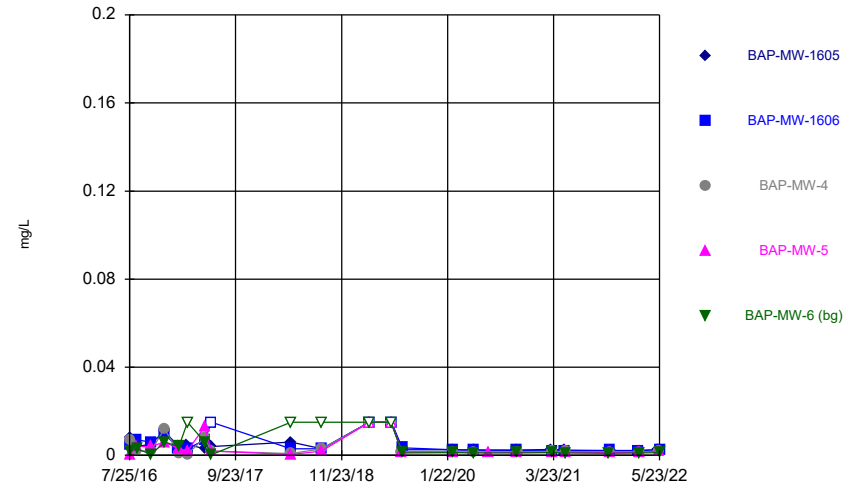
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Time Series



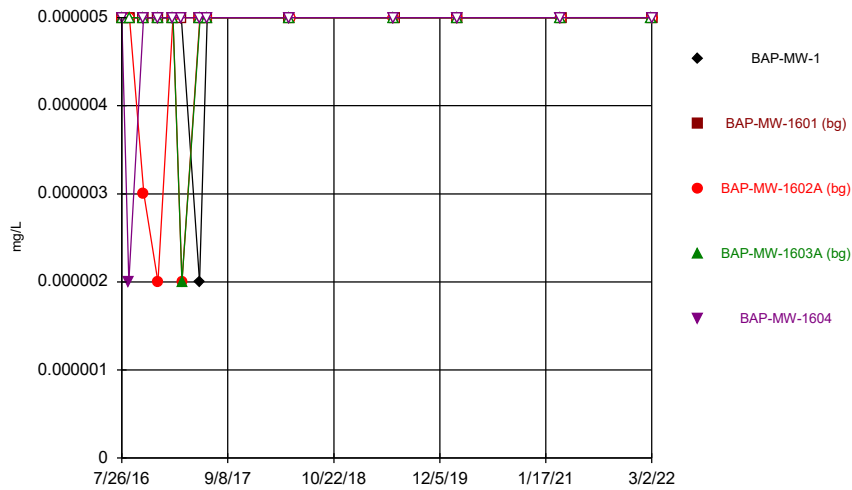
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Time Series



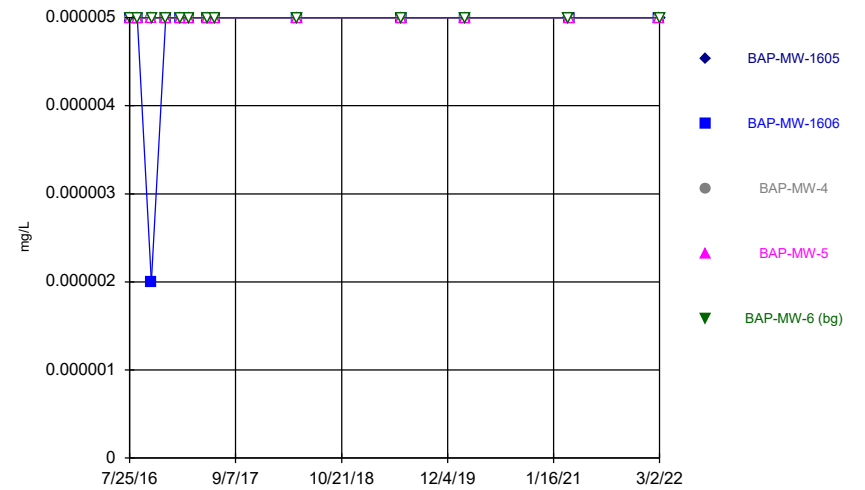
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Time Series



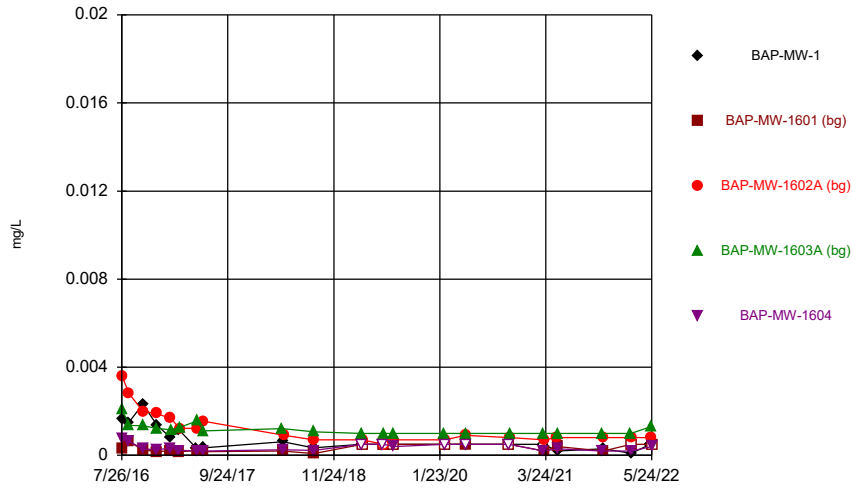
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Time Series



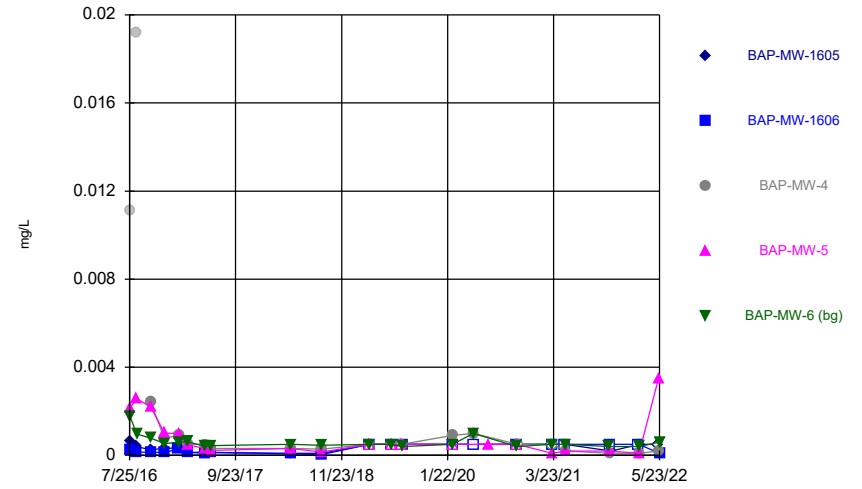
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### Time Series



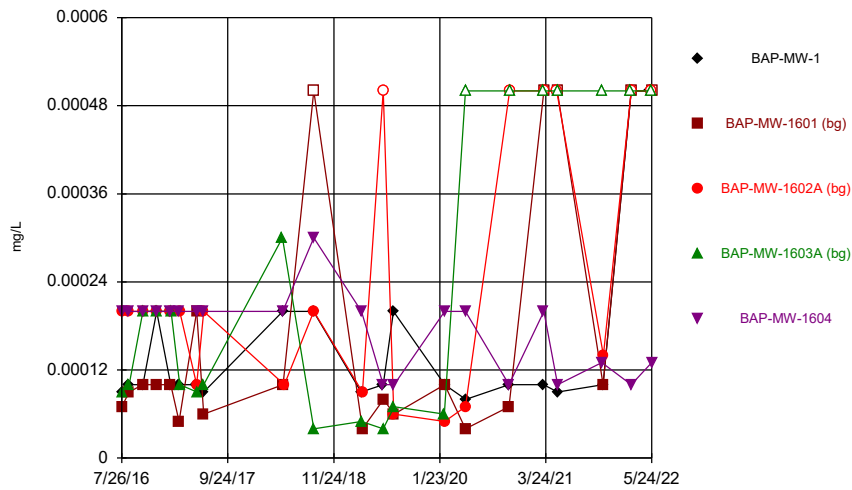
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### Time Series



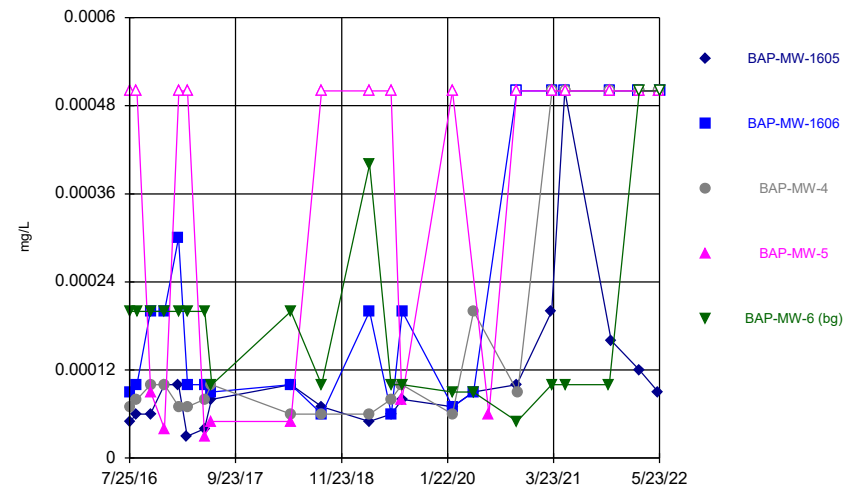
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### Time Series



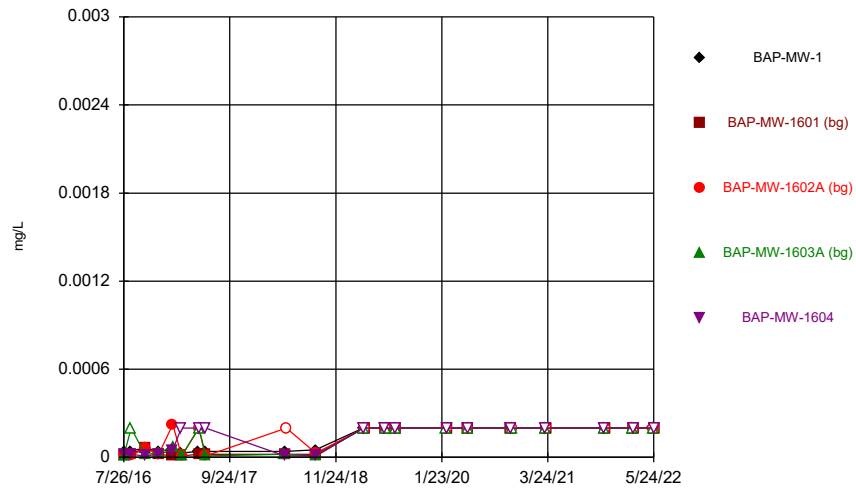
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### Time Series



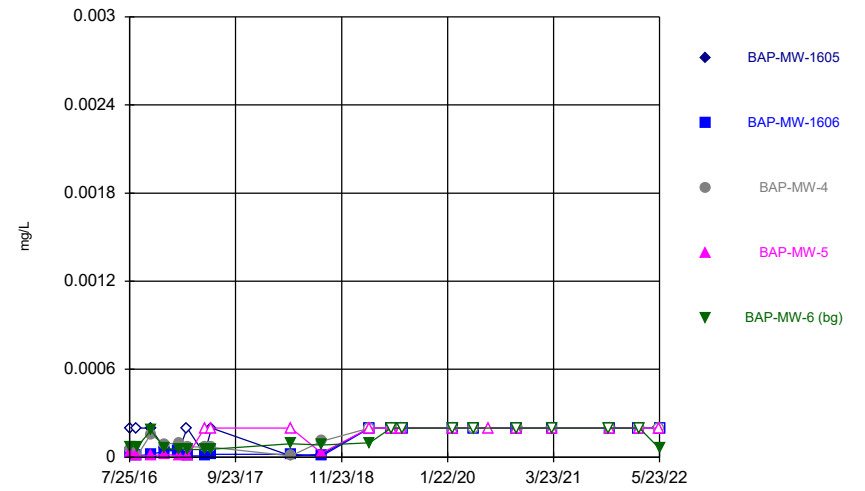
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### Time Series



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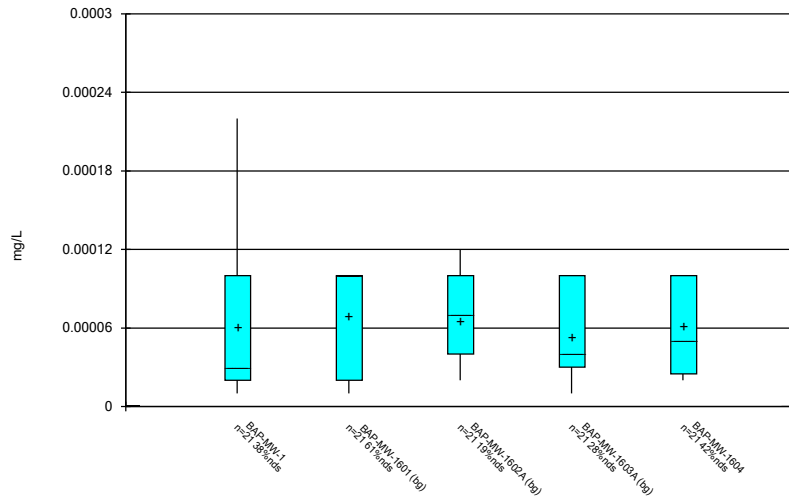
### Time Series



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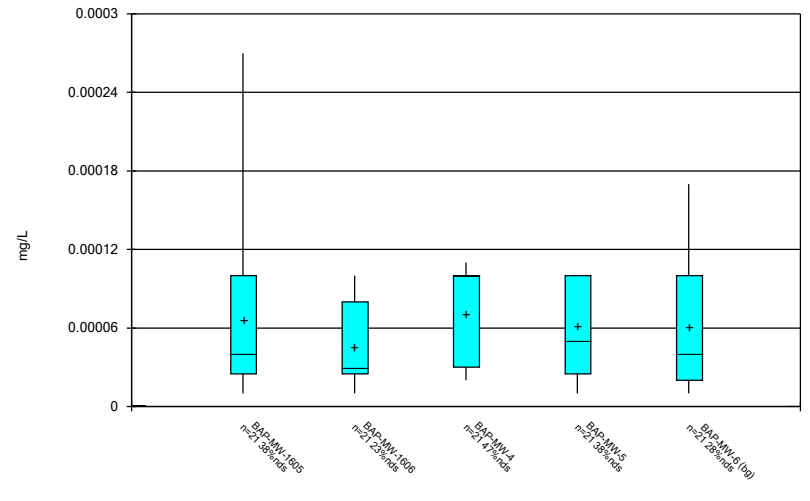


Box & Whiskers Plot



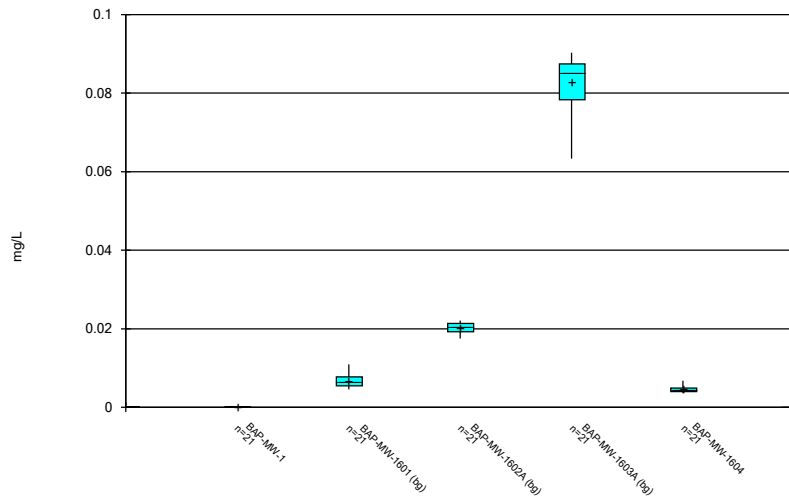
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Box & Whiskers Plot



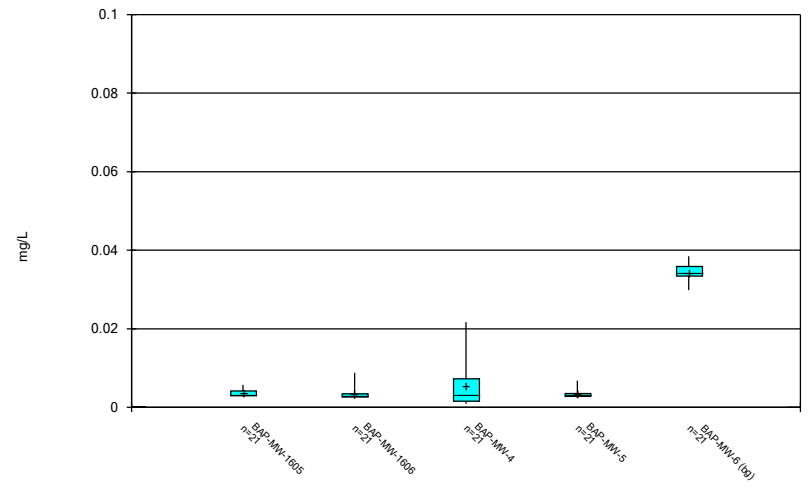
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Box & Whiskers Plot



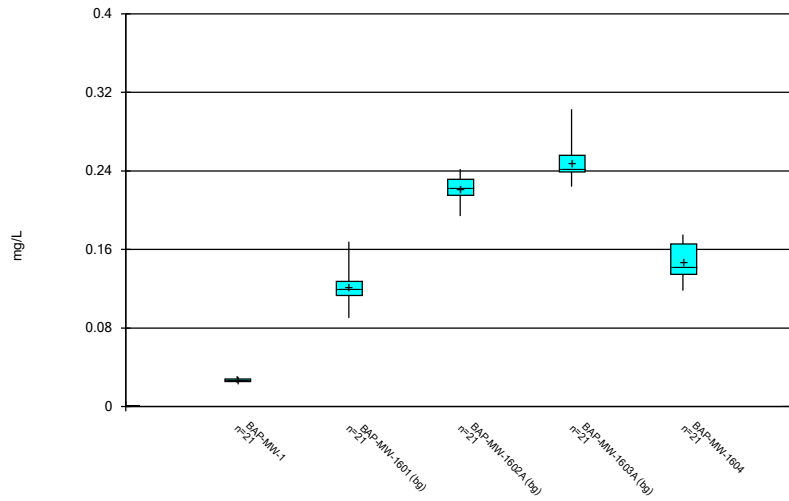
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



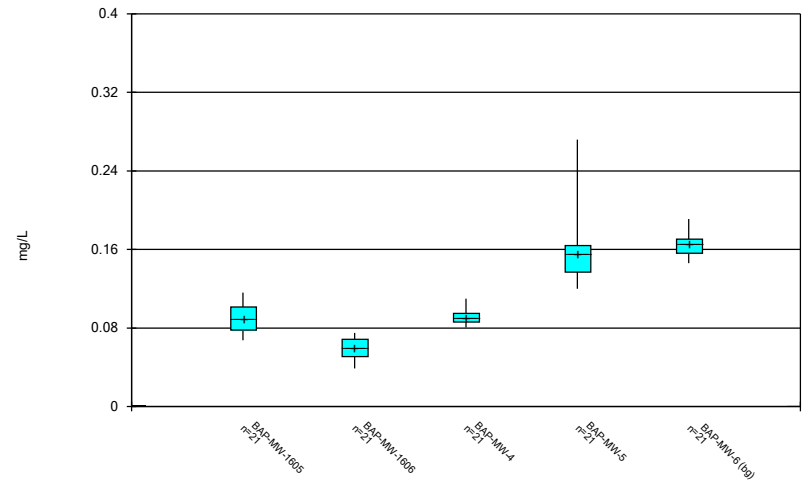
Constituent: Arsenic, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



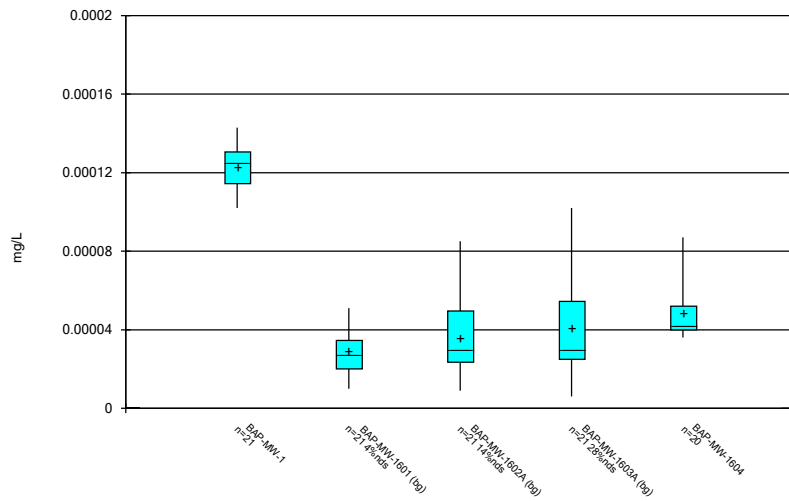
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 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



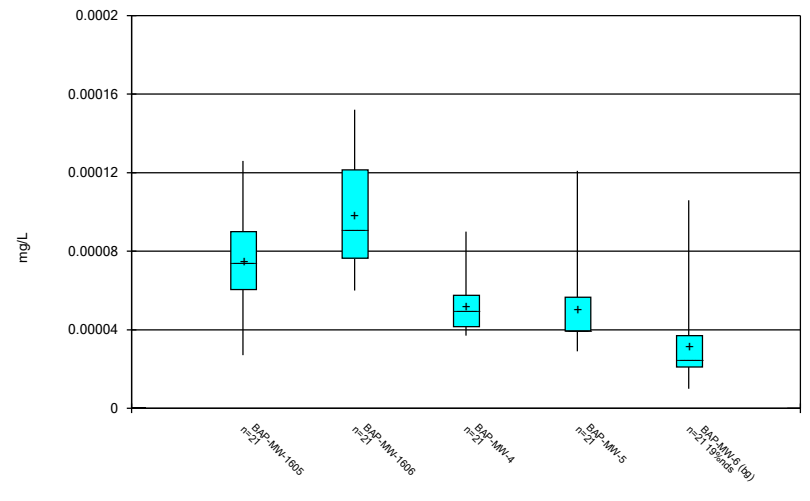
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 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



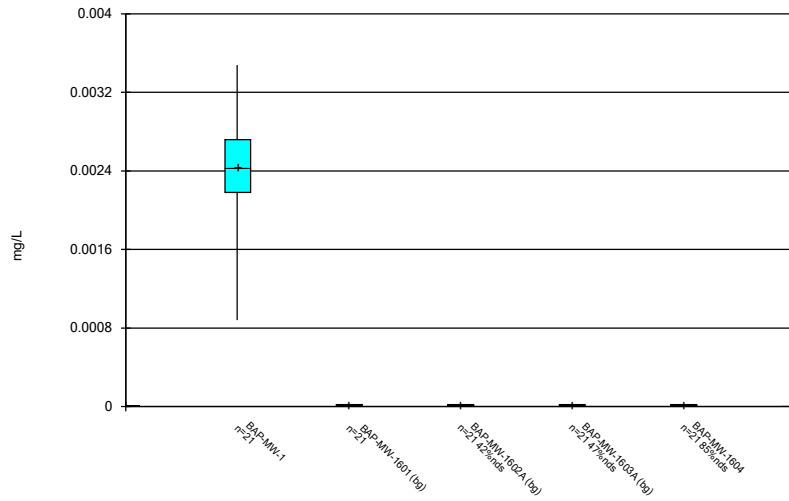
Constituent: Beryllium, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



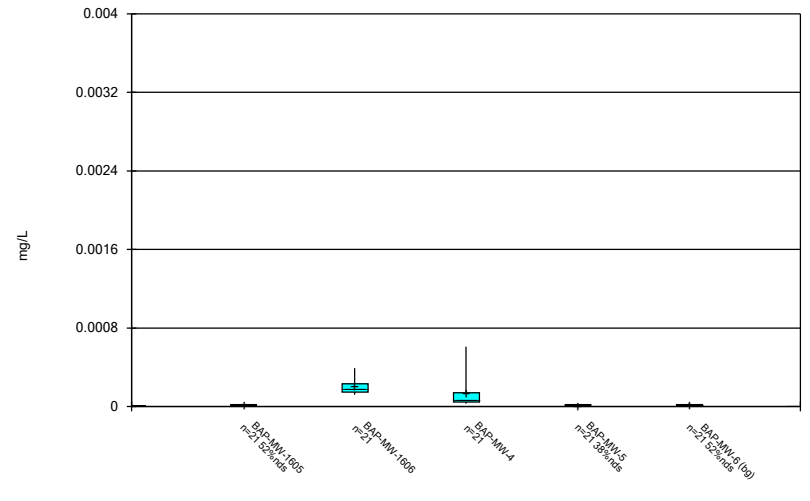
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 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



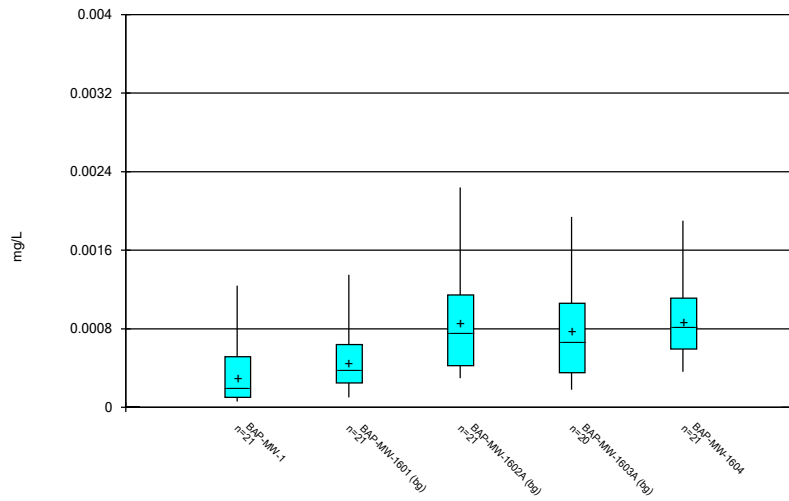
Constituent: Cadmium, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



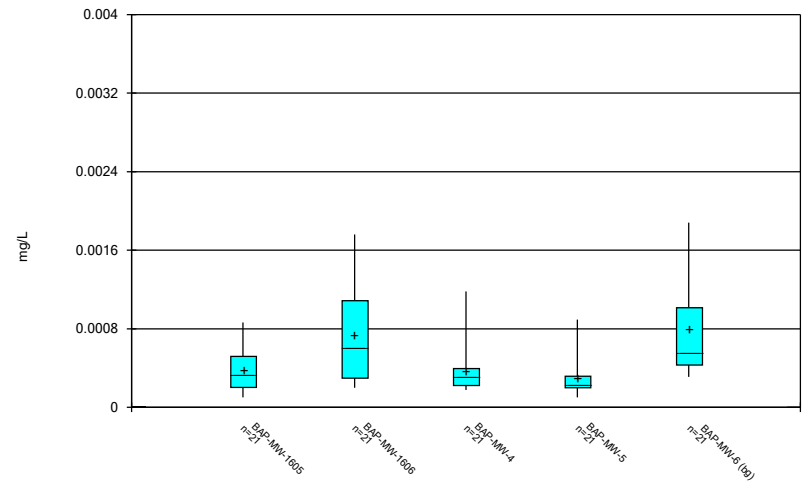
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



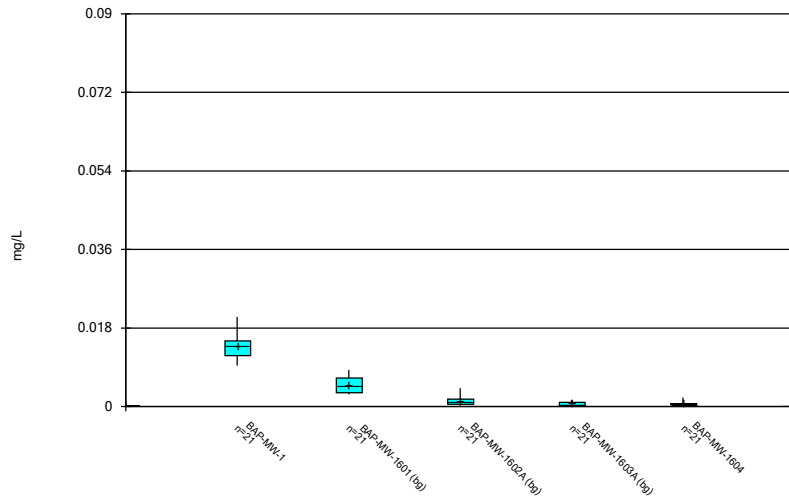
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



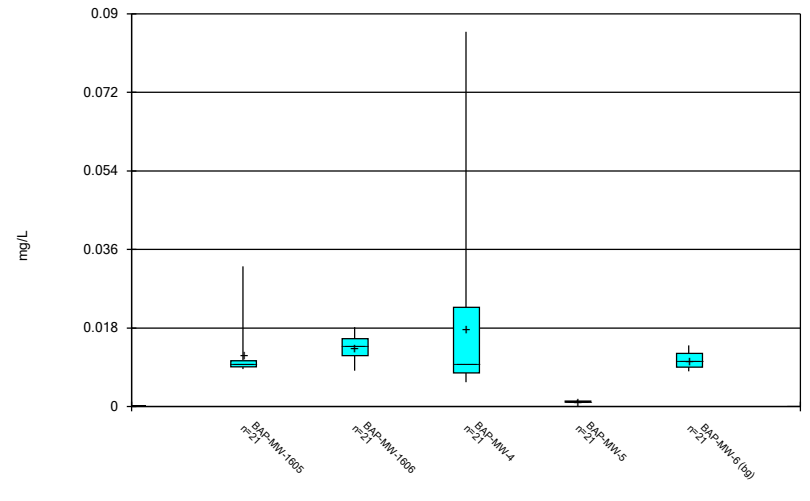
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



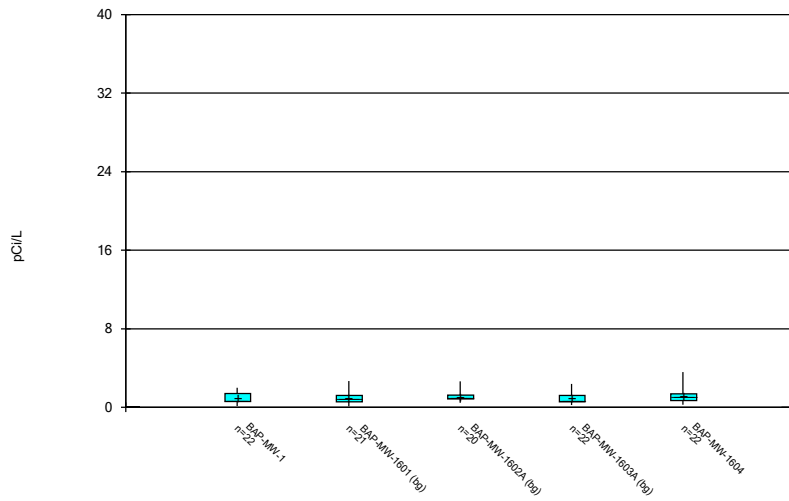
Constituent: Cobalt, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



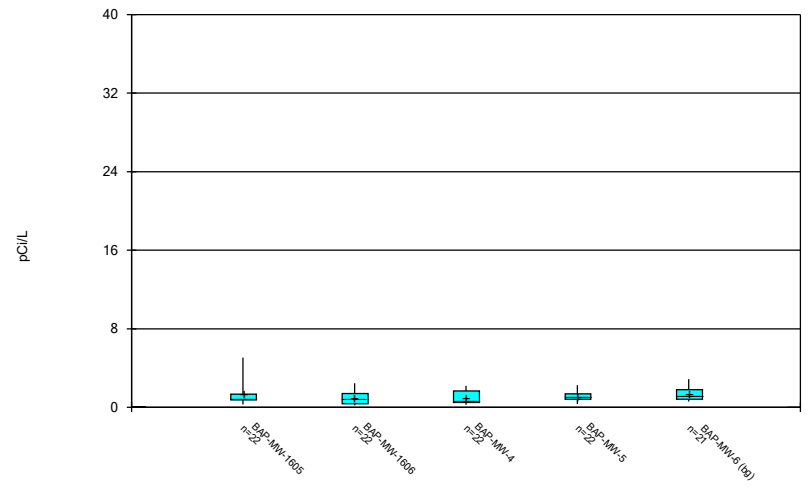
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



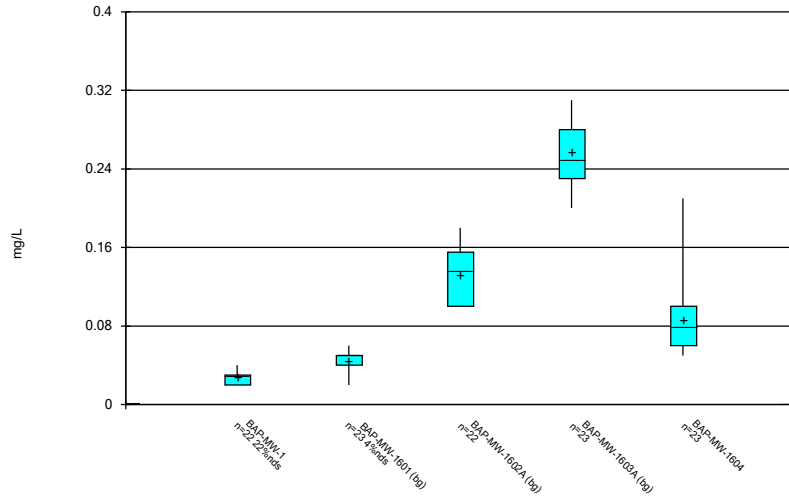
Constituent: Combined Radium 226 + 228 Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



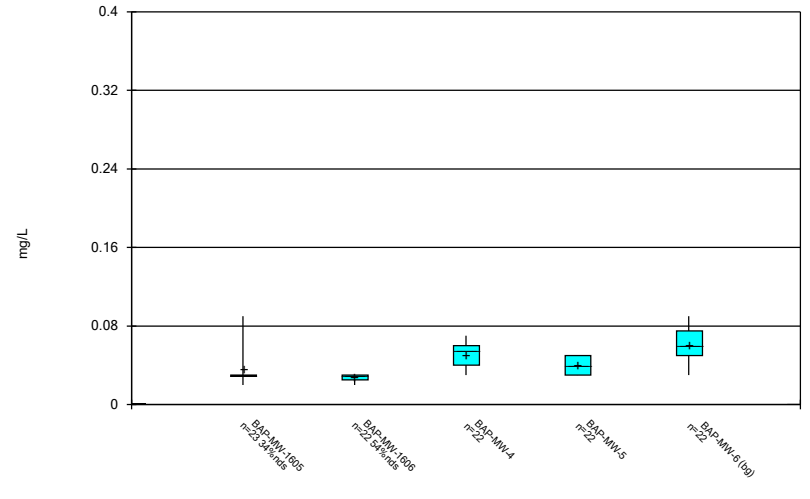
Constituent: Combined Radium 226 + 228 Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



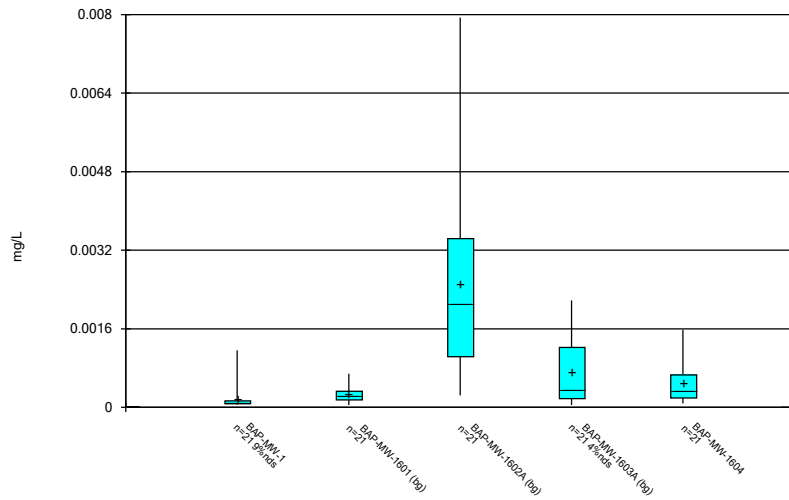
Constituent: Fluoride, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



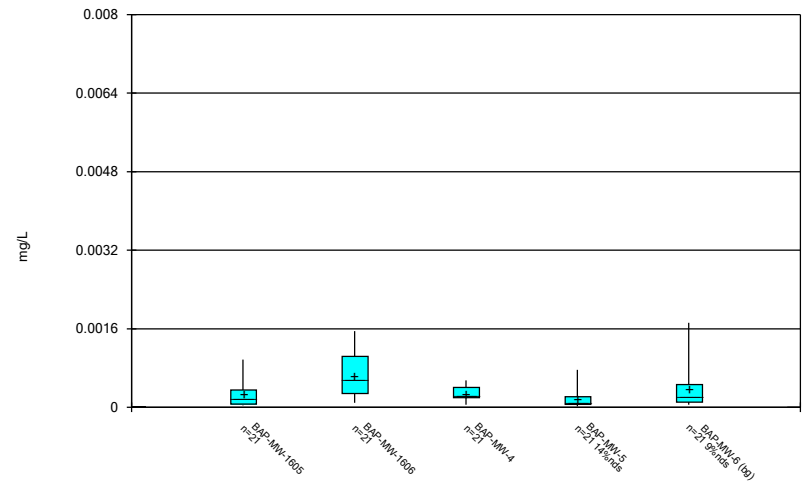
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Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



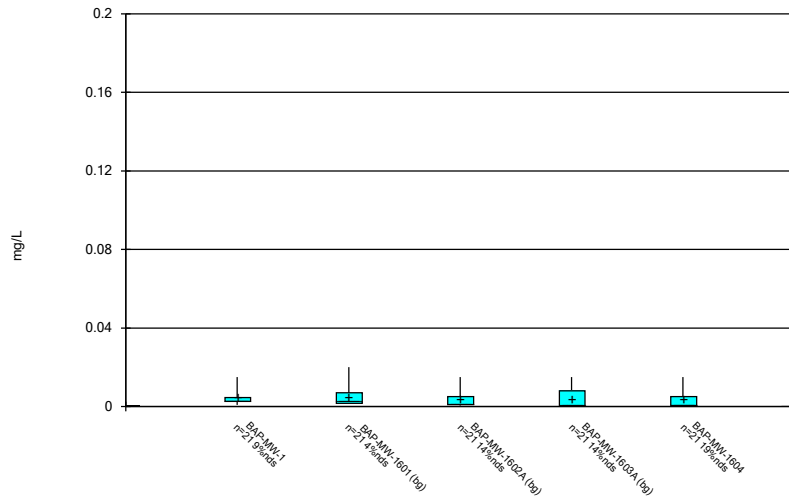
Constituent: Lead, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

### Box & Whiskers Plot



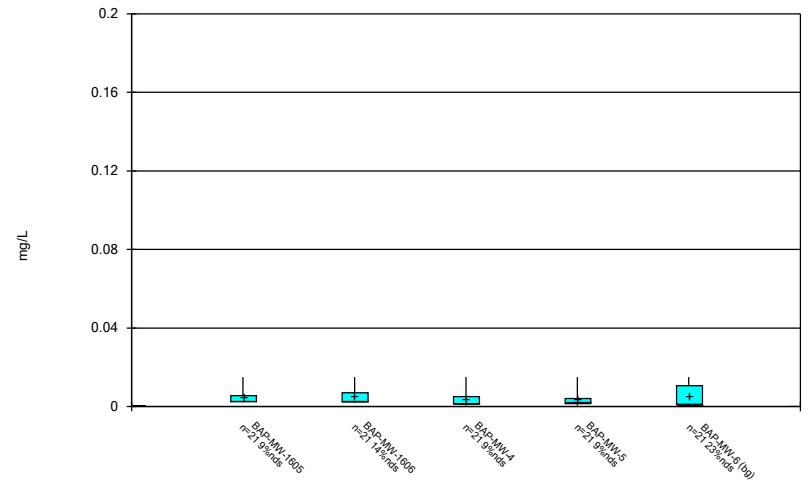
Constituent: Lead, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



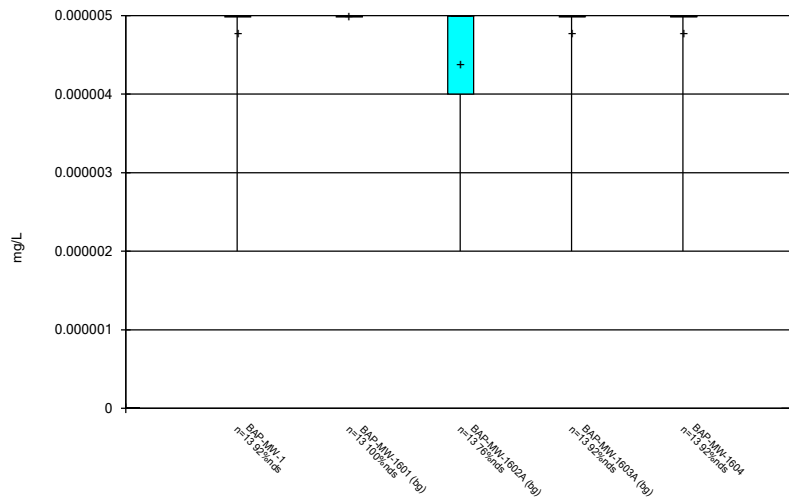
Constituent: Lithium, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



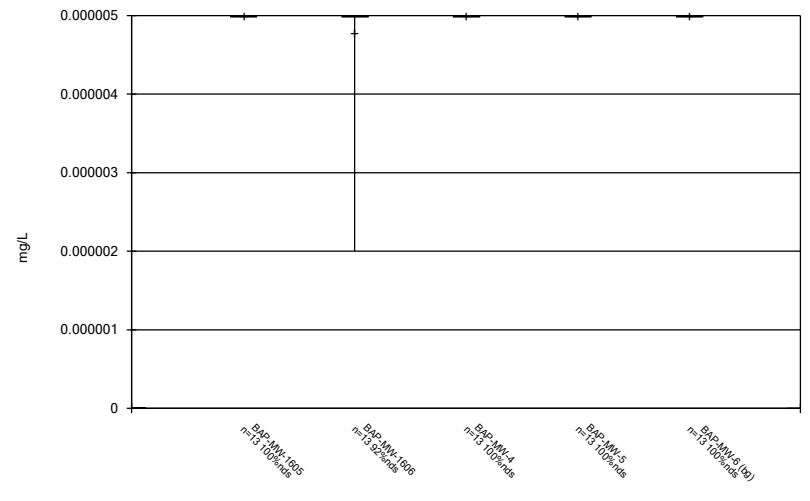
Constituent: Lithium, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



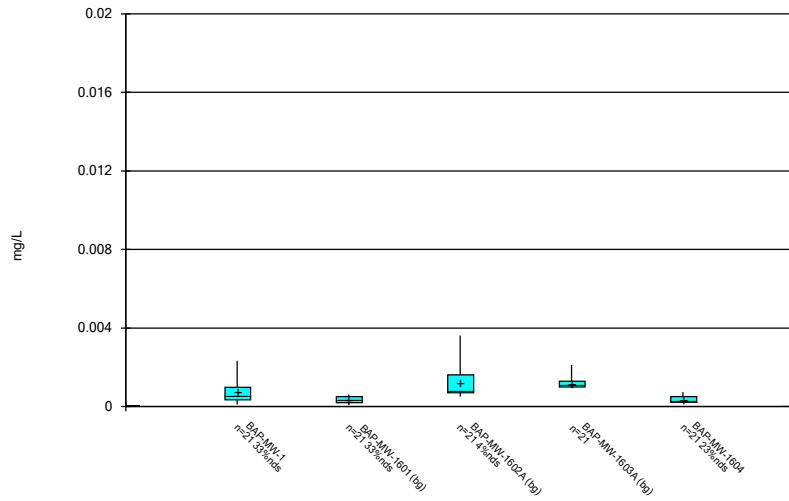
Constituent: Mercury, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



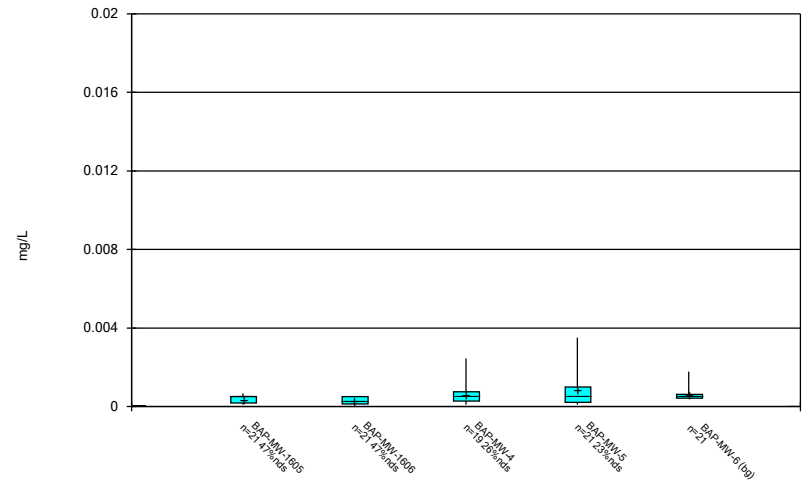
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Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



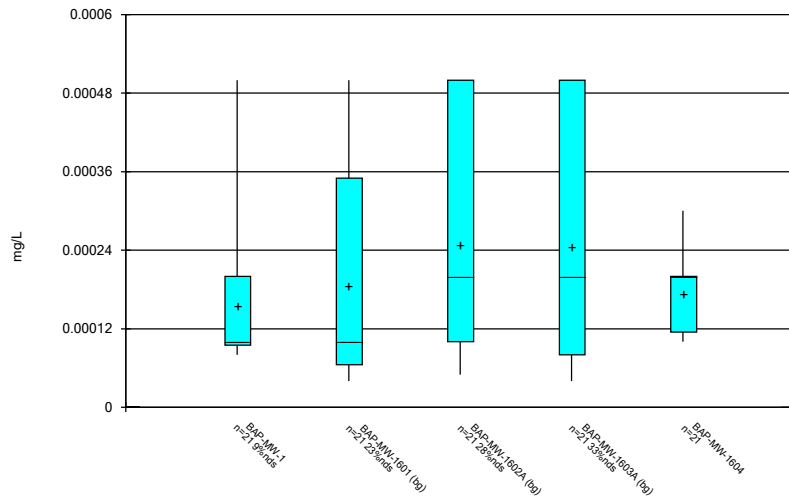
Constituent: Molybdenum, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



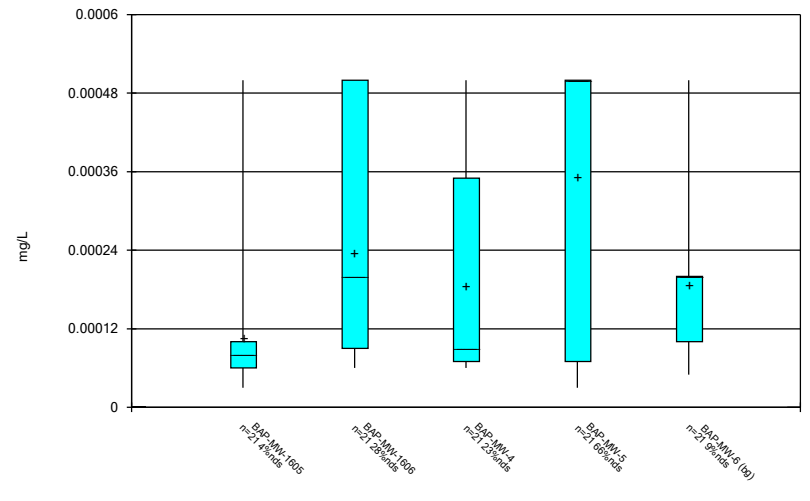
Constituent: Molybdenum, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



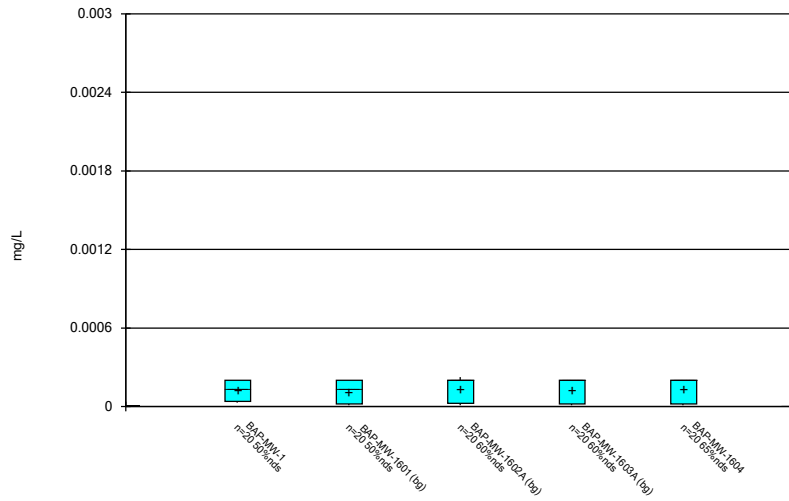
Constituent: Selenium, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



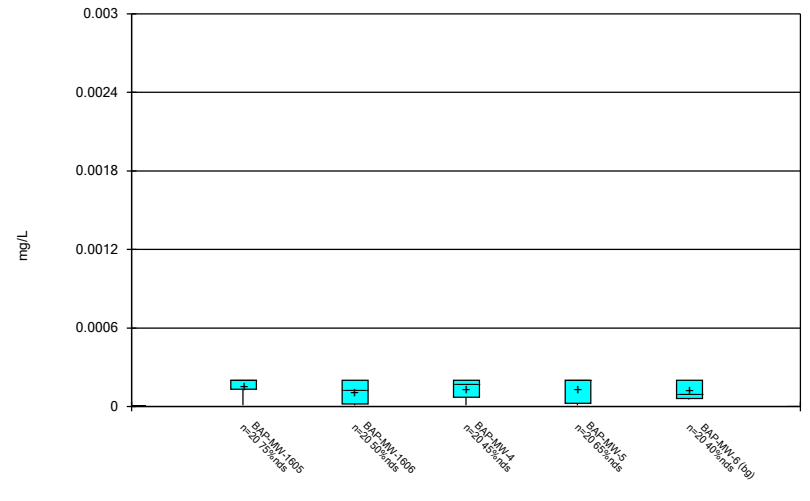
Constituent: Selenium, total Analysis Run 7/28/2022 4:30 PM View: Appendix IV  
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



Constituent: Thallium, total    Analysis Run 7/28/2022 4:30 PM    View: Appendix IV  
Amos BAP    Client: Geosyntec    Data: Amos BAP

Box & Whiskers Plot



Constituent: Thallium, total    Analysis Run 7/28/2022 4:30 PM    View: Appendix IV  
Amos BAP    Client: Geosyntec    Data: Amos BAP



# Outlier Summary

Amos BAP Client: Geosyntec Data: Amos BAP Printed 7/28/2022, 4:31 PM

Date	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)							

# Upper Tolerance Limits - Appendix IV

Amos BAP Client: Geosyntec Data: Amos BAP Printed 1/20/2022, 9:41 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony, total (mg/L)	0.00017	n/a	n/a	n/a	n/a	76	32.89	n/a	0.02028	NP Inter(normality)
Arsenic, total (mg/L)	0.0903	n/a	n/a	n/a	n/a	76	0	n/a	0.02028	NP Inter(normality)
Barium, total (mg/L)	0.303	n/a	n/a	n/a	n/a	76	0	n/a	0.02028	NP Inter(normality)
Beryllium, total (mg/L)	0.000106	n/a	n/a	n/a	n/a	76	17.11	n/a	0.02028	NP Inter(normality)
Cadmium, total (mg/L)	0.00003	n/a	n/a	n/a	n/a	76	35.53	n/a	0.02028	NP Inter(normality)
Chromium, total (mg/L)	0.001903	n/a	n/a	n/a	n/a	75	0	x^(1/3)	0.05	Inter
Cobalt, total (mg/L)	0.014	n/a	n/a	n/a	n/a	76	0	n/a	0.02028	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.312	n/a	n/a	n/a	n/a	76	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.31	n/a	n/a	n/a	n/a	82	1.22	n/a	0.01491	NP Inter(normality)
Lead, total (mg/L)	0.005629	n/a	n/a	n/a	n/a	76	2.632	ln(x)	0.05	Inter
Lithium, total (mg/L)	0.03	n/a	n/a	n/a	n/a	76	15.79	n/a	0.02028	NP Inter(normality)
Mercury, total (mg/L)	0.000005	n/a	n/a	n/a	n/a	48	91.67	n/a	0.08526	NP Inter(NDs)
Molybdenum, total (mg/L)	0.00221	n/a	n/a	n/a	n/a	76	7.895	sqrt(x)	0.05	Inter
Selenium, total (mg/L)	0.0005	n/a	n/a	n/a	n/a	76	15.79	n/a	0.02028	NP Inter(normality)
Thallium, total (mg/L)	0.000224	n/a	n/a	n/a	n/a	72	48.61	n/a	0.02489	NP Inter(normality)

<b>AMOS BAP GWPS</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR Rule-Specified</b>	<b>Background</b>	<b>GWPS</b>
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		0.00011	0.004
Cadmium, Total (mg/L)	0.005		0.00003	0.005
Chromium, Total (mg/L)	0.1		0.0019	0.1
Cobalt, Total (mg/L)		0.006	0.014	0.014
Combined Radium, Total (pCi/L)	5		2.31	5
Fluoride, Total (mg/L)	4		0.31	4
Lead, Total (mg/L)	0.015		0.0056	0.015
Lithium, Total (mg/L)		0.04	0.03	0.04
Mercury, Total (mg/L)	0.002		0.000005	0.002
Molybdenum, Total (mg/L)		0.1	0.0022	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*

# Confidence Intervals - All Results (No Significant)

Amos BAP Client: Geosyntec Data: Amos BAP Printed 7/28/2022, 4:33 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	BAP-MW-1	0.0001	0.00002	0.006	No	21	38.1	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-1604	0.0001	0.00003	0.006	No	21	42.86	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-1605	0.00003175	0.000009425	0.006	No	21	38.1	x^(1/3)	0.01	Param.
Antimony, total (mg/L)	BAP-MW-1606	0.00002018	0.00001069	0.006	No	21	23.81	ln(x)	0.01	Param.
Antimony, total (mg/L)	BAP-MW-4	0.0001	0.00003	0.006	No	21	47.62	No	0.01	NP (normality)
Antimony, total (mg/L)	BAP-MW-5	0.0001	0.00002	0.006	No	21	38.1	No	0.01	NP (normality)
Arsenic, total (mg/L)	BAP-MW-1	0.0001377	0.00009944	0.09	No	21	0	No	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1604	0.00508	0.004187	0.09	No	21	0	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1605	0.004039	0.003114	0.09	No	21	0	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-1606	0.00343	0.00258	0.09	No	21	0	No	0.01	NP (normality)
Arsenic, total (mg/L)	BAP-MW-4	0.007322	0.002364	0.09	No	21	0	sqrt(x)	0.01	Param.
Arsenic, total (mg/L)	BAP-MW-5	0.00358	0.00277	0.09	No	21	0	No	0.01	NP (normality)
Barium, total (mg/L)	BAP-MW-1	0.02786	0.02568	2	No	21	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1604	0.1566	0.1377	2	No	21	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1605	0.09682	0.08137	2	No	21	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-1606	0.06531	0.05261	2	No	21	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-4	0.09496	0.08748	2	No	21	0	No	0.01	Param.
Barium, total (mg/L)	BAP-MW-5	0.166	0.134	2	No	21	0	No	0.01	NP (normality)
Beryllium, total (mg/L)	BAP-MW-1	0.000129	0.0001167	0.004	No	21	0	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-1604	0.00005369	0.00004114	0.004	No	20	0	ln(x)	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-1605	0.000089	0.00006015	0.004	No	21	0	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-1606	0.0001142	0.00008205	0.004	No	21	0	No	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-4	0.00005849	0.00004494	0.004	No	21	0	sqrt(x)	0.01	Param.
Beryllium, total (mg/L)	BAP-MW-5	0.00005684	0.00003952	0.004	No	21	0	ln(x)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-1	0.002736	0.002151	0.005	No	21	0	No	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-1604	0.00002	0.000007	0.005	No	21	85.71	No	0.01	NP (NDs)
Cadmium, total (mg/L)	BAP-MW-1605	0.00002	0.000007	0.005	No	21	52.38	No	0.01	NP (NDs)
Cadmium, total (mg/L)	BAP-MW-1606	0.000236	0.00016	0.005	No	21	0	sqrt(x)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-4	0.000134	0.00005259	0.005	No	21	0	ln(x)	0.01	Param.
Cadmium, total (mg/L)	BAP-MW-5	0.00002	0.000006	0.005	No	21	38.1	No	0.01	NP (normality)
Chromium, total (mg/L)	BAP-MW-1	0.0003591	0.0001388	0.1	No	21	0	x^(1/3)	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1604	0.001076	0.0006643	0.1	No	21	0	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1605	0.0004978	0.0002639	0.1	No	21	0	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-1606	0.000983	0.0004773	0.1	No	21	0	No	0.01	Param.
Chromium, total (mg/L)	BAP-MW-4	0.0004183	0.0002497	0.1	No	21	0	ln(x)	0.01	Param.
Chromium, total (mg/L)	BAP-MW-5	0.0003389	0.0001827	0.1	No	21	0	ln(x)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1	0.01573	0.01228	0.014	No	21	0	No	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1604	0.0006763	0.0004086	0.014	No	21	0	ln(x)	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-1605	0.0107	0.00909	0.014	No	21	0	No	0.01	NP (normality)
Cobalt, total (mg/L)	BAP-MW-1606	0.01496	0.01191	0.014	No	21	0	No	0.01	Param.
Cobalt, total (mg/L)	BAP-MW-4	0.0233	0.00753	0.014	No	21	0	No	0.01	NP (normality)
Cobalt, total (mg/L)	BAP-MW-5	0.001213	0.001019	0.014	No	21	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1	1.169	0.6195	5	No	22	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1604	1.4	0.7439	5	No	22	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1605	1.446	0.7395	5	No	22	0	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-1606	1.22	0.6031	5	No	22	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-4	1.225	0.6076	5	No	22	0	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	BAP-MW-5	1.364	0.8335	5	No	22	0	No	0.01	Param.
Fluoride, total (mg/L)	BAP-MW-1	0.04	0.02	4	No	22	22.73	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-1604	0.1004	0.06773	4	No	23	0	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	BAP-MW-1605	0.06	0.03	4	No	23	34.78	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-1606	0.06	0.03	4	No	22	54.55	No	0.01	NP (NDs)
Fluoride, total (mg/L)	BAP-MW-4	0.06	0.04	4	No	22	0	No	0.01	NP (normality)
Fluoride, total (mg/L)	BAP-MW-5	0.05	0.03	4	No	22	0	No	0.01	NP (normality)
Lead, total (mg/L)	BAP-MW-1	0.000133	0.000068	0.015	No	21	9.524	No	0.01	NP (normality)
Lead, total (mg/L)	BAP-MW-1604	0.000622	0.0002388	0.015	No	21	0	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-1605	0.0003318	0.0001097	0.015	No	21	0	sqrt(x)	0.01	Param.
Lead, total (mg/L)	BAP-MW-1606	0.0008553	0.0003965	0.015	No	21	0	No	0.01	Param.
Lead, total (mg/L)	BAP-MW-4	0.000344	0.0001991	0.015	No	21	0	No	0.01	Param.
Lead, total (mg/L)	BAP-MW-5	0.0002143	0.00007373	0.015	No	21	14.29	x^(1/3)	0.01	Param.
Lithium, total (mg/L)	BAP-MW-1	0.005	0.00258	0.04	No	21	9.524	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1604	0.006	0.000475	0.04	No	21	19.05	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1605	0.006	0.00236	0.04	No	21	9.524	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-1606	0.007	0.00229	0.04	No	21	14.29	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-4	0.007	0.00147	0.04	No	21	9.524	No	0.01	NP (normality)
Lithium, total (mg/L)	BAP-MW-5	0.003965	0.001355	0.04	No	21	9.524	ln(x)	0.01	Param.
Mercury, total (mg/L)	BAP-MW-1	0.000005	0.000002	0.002	No	13	92.31	No	0.01	NP (NDs)
Mercury, total (mg/L)	BAP-MW-1604	0.000005	0.000002	0.002	No	13	92.31	No	0.01	NP (NDs)

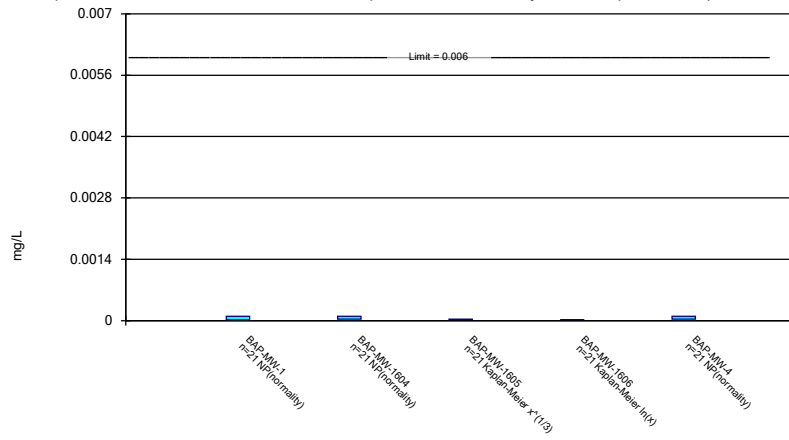
# Confidence Intervals - All Results (No Significant)

Amos BAP Client: Geosyntec Data: Amos BAP Printed 7/28/2022, 4:33 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Mercury, total (mg/L)	BAP-MW-1606	0.000005	0.000002	0.002	No	13	92.31	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	BAP-MW-1	0.0008266	0.0002908	0.1	No	21	33.33	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-1604	0.0003382	0.0002069	0.1	No	21	23.81	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-1605	0.0005	0.00015	0.1	No	21	47.62	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-1606	0.0005	0.00012	0.1	No	21	47.62	No	0.01	NP (normality)
Molybdenum, total (mg/L)	BAP-MW-4	0.0006145	0.0001868	0.1	No	19	26.32	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	BAP-MW-5	0.0008849	0.0002132	0.1	No	21	23.81	x^(1/3)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1	0.0002	0.00009	0.05	No	21	9.524	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1604	0.0002	0.00013	0.05	No	21	0	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-1605	0.000118	0.00006098	0.05	No	21	4.762	ln(x)	0.01	Param.
Selenium, total (mg/L)	BAP-MW-1606	0.0005	0.00009	0.05	No	21	28.57	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-4	0.0002	0.00007	0.05	No	21	23.81	No	0.01	NP (normality)
Selenium, total (mg/L)	BAP-MW-5	0.0005	0.00006	0.05	No	21	66.67	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1	0.0002	0.00004	0.002	No	20	50	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-1604	0.0002	0.00002	0.002	No	20	65	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1605	0.0002	0.000062	0.002	No	20	75	No	0.01	NP (NDs)
Thallium, total (mg/L)	BAP-MW-1606	0.0002	0.00002	0.002	No	20	50	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-4	0.0002	0.000069	0.002	No	20	45	No	0.01	NP (normality)
Thallium, total (mg/L)	BAP-MW-5	0.0002	0.00002	0.002	No	20	65	No	0.01	NP (NDs)

### Parametric and Non-Parametric (NP) Confidence Interval

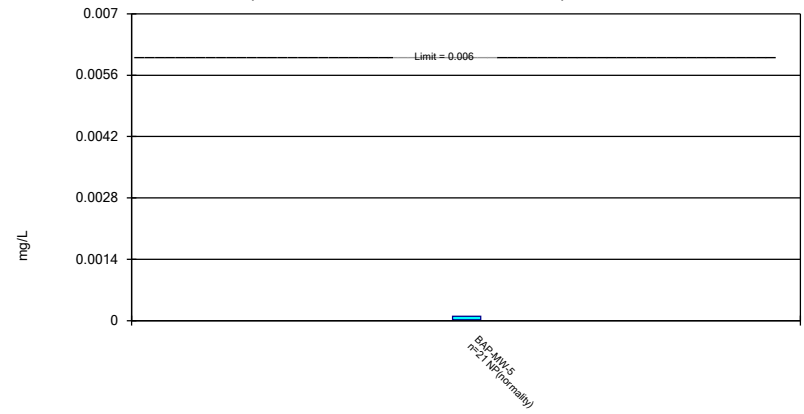
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

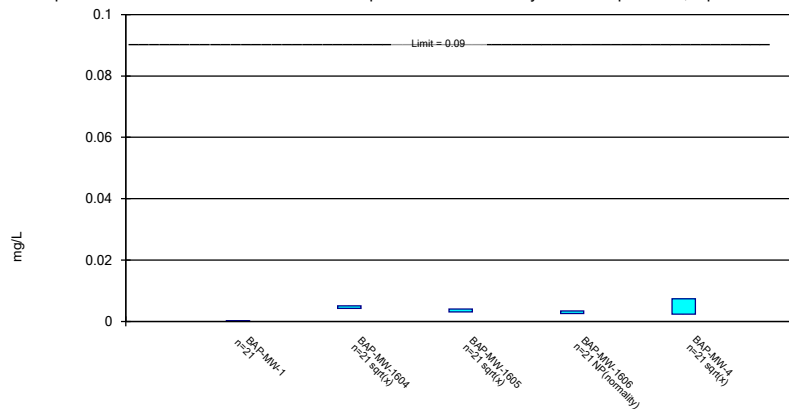
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

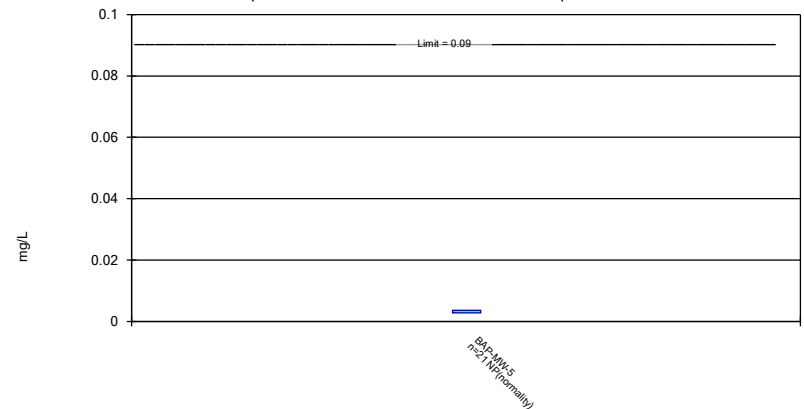
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

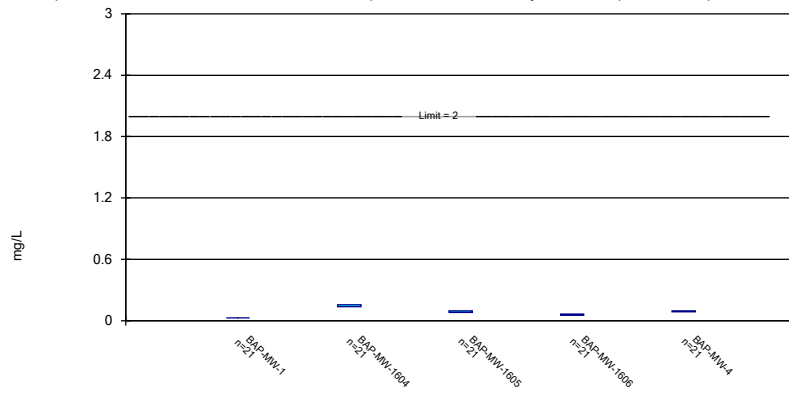
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

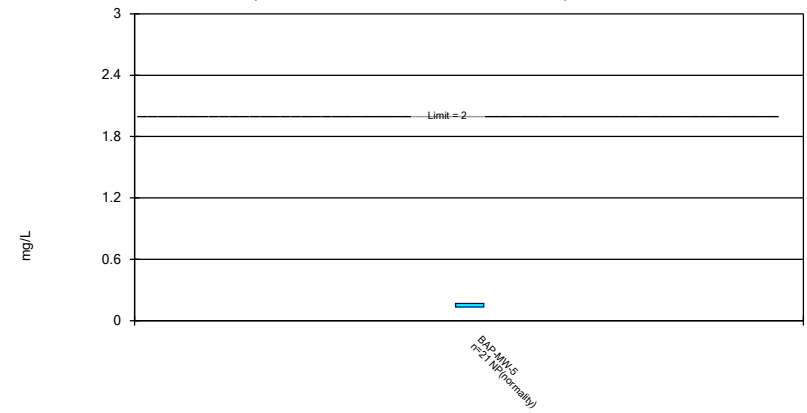
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

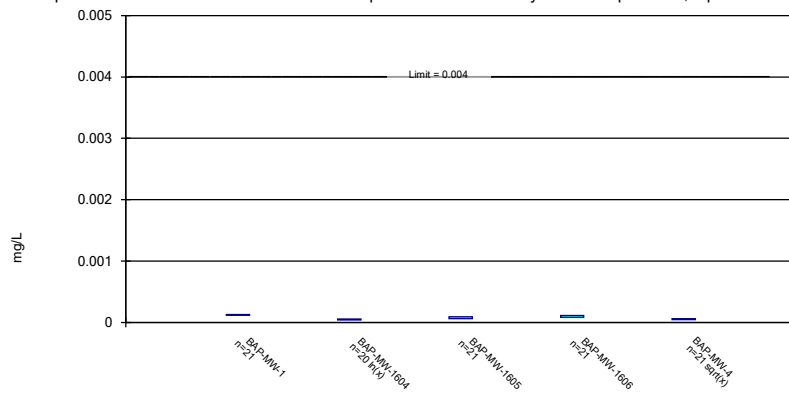
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Barium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

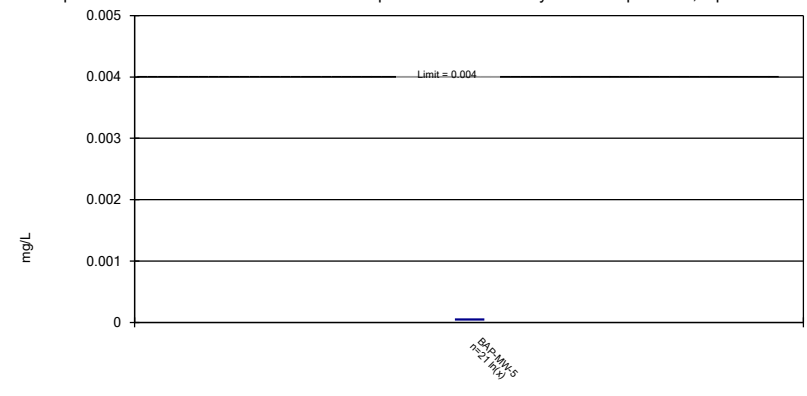
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

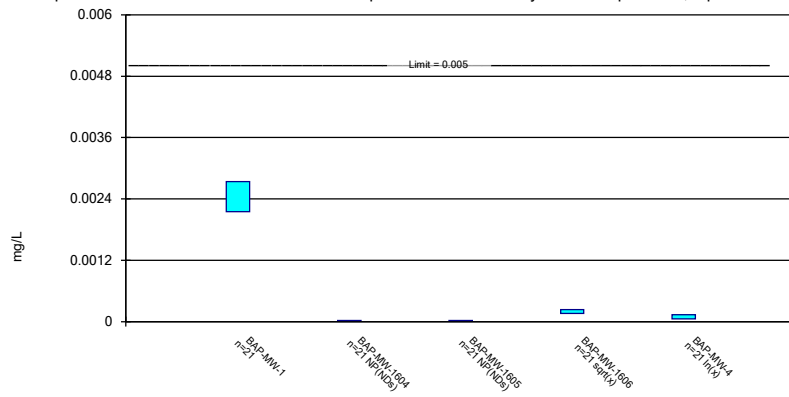
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

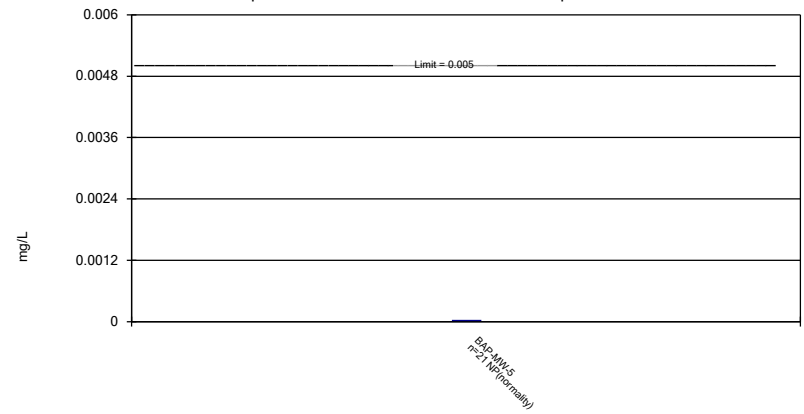
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

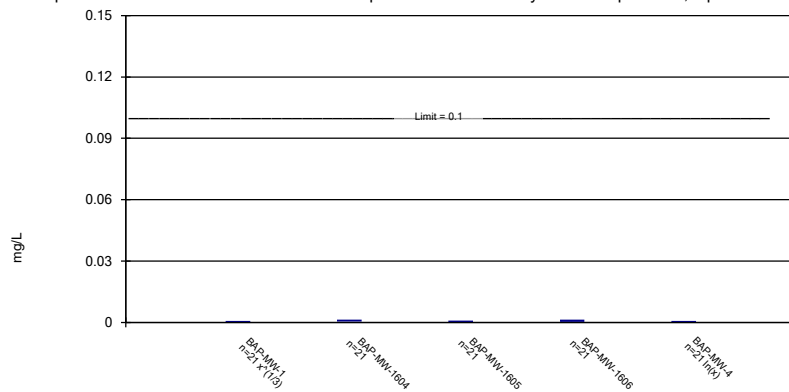
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

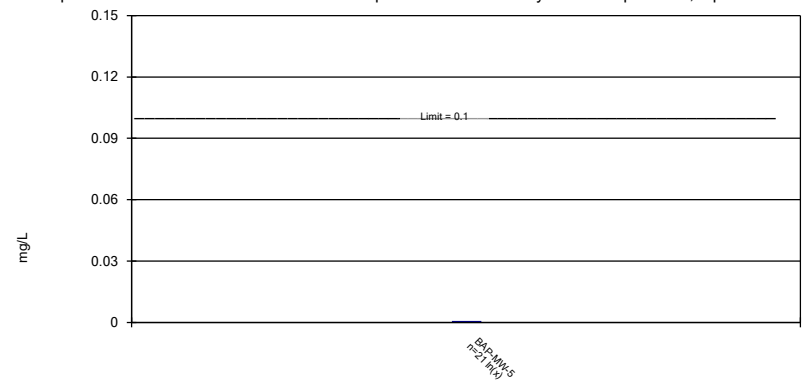
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
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.

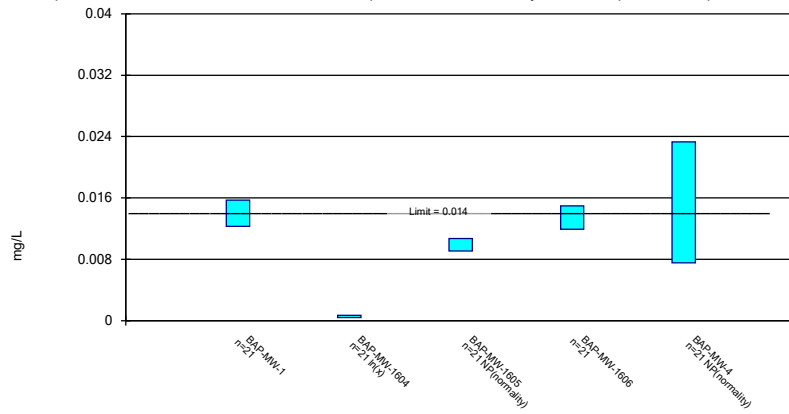


Constituent: Chromium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP



### Parametric and Non-Parametric (NP) Confidence Interval

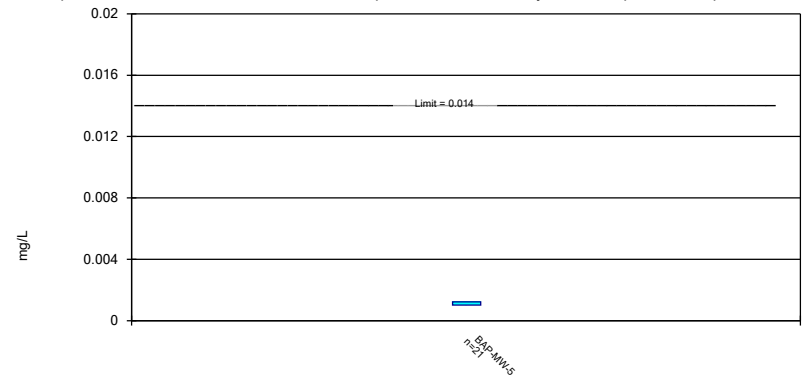
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

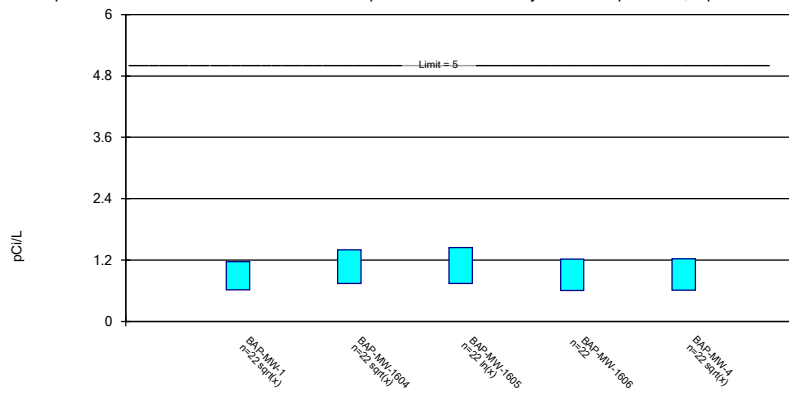
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

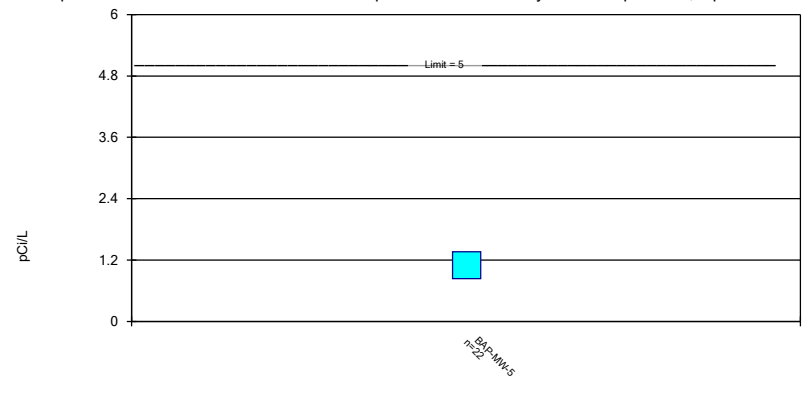
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

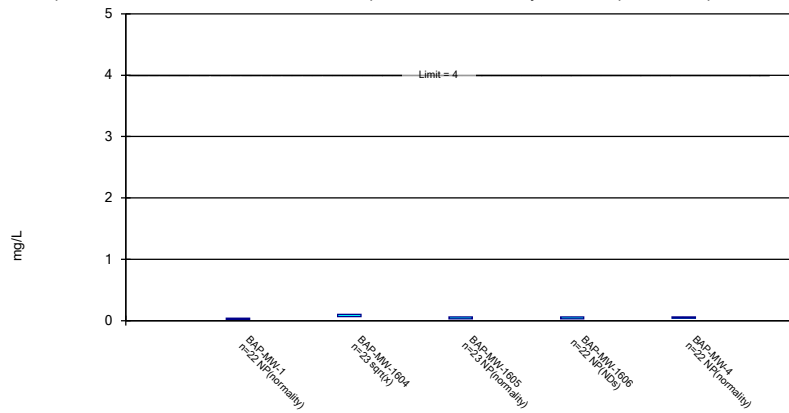
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

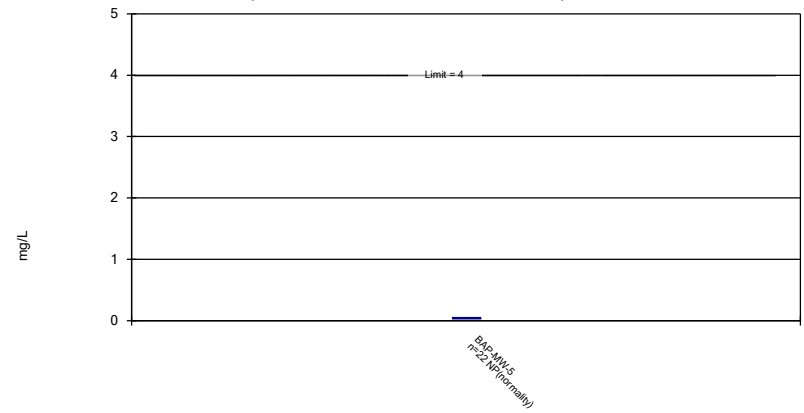
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

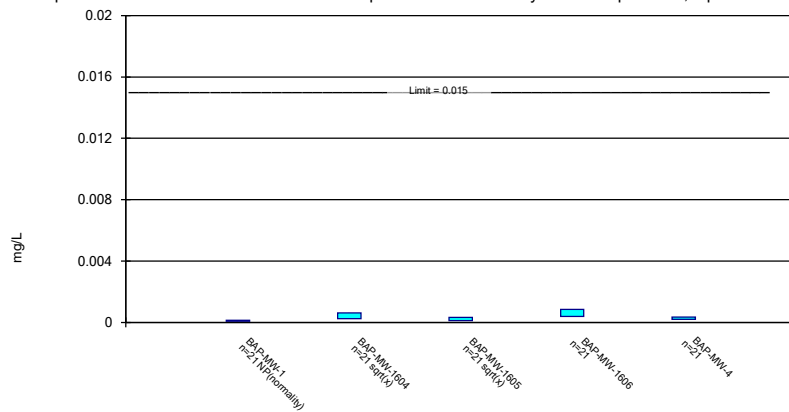
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

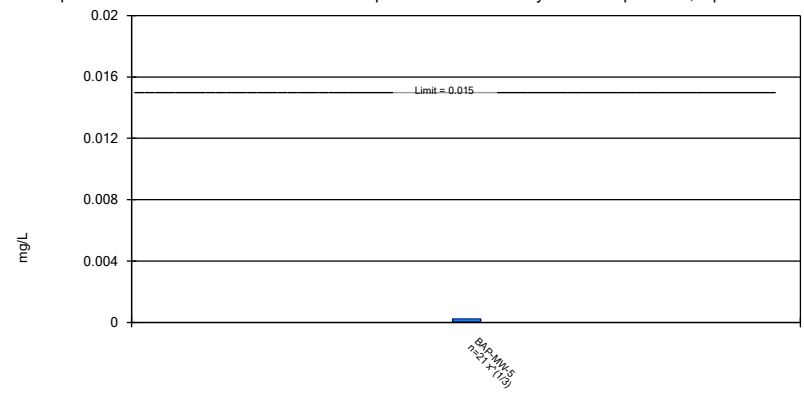
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

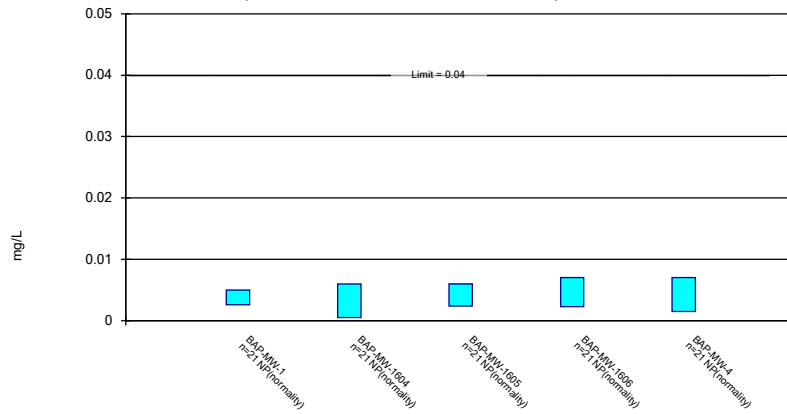
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

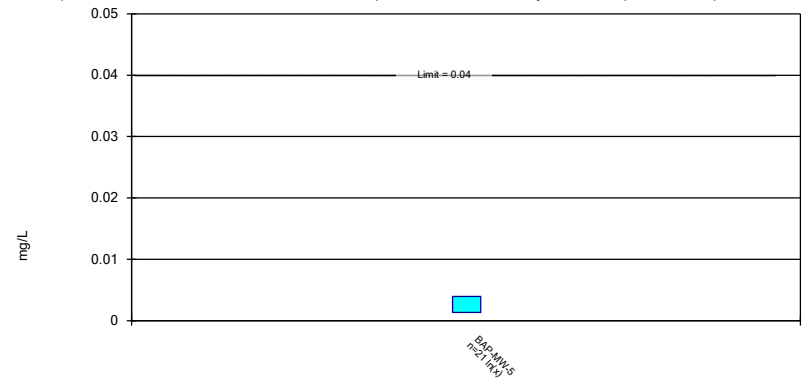
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lithium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

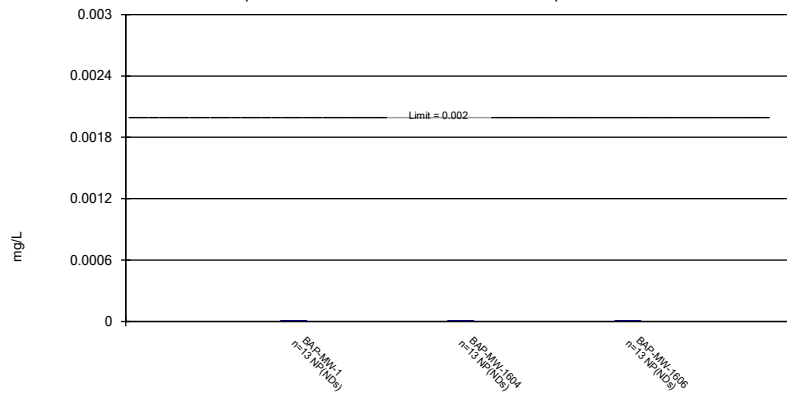
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

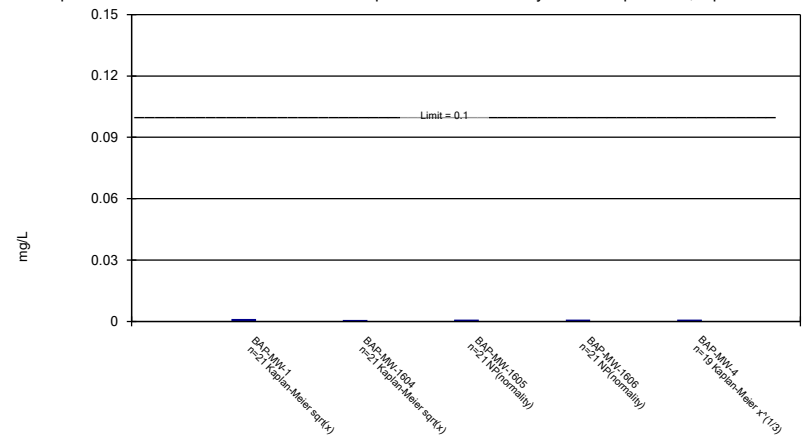
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

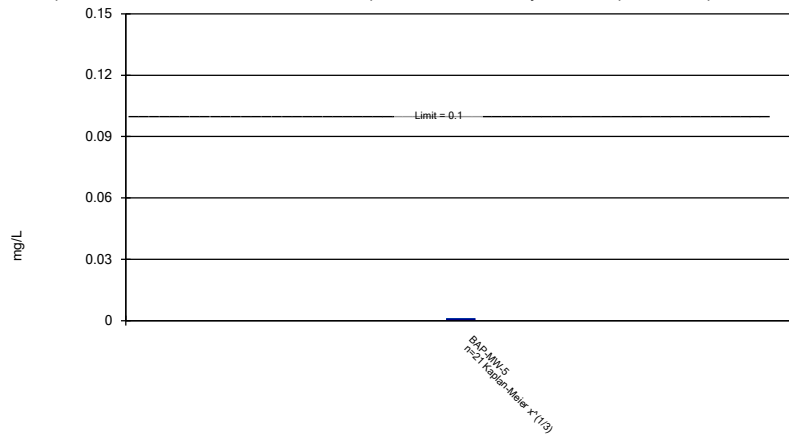
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric Confidence Interval

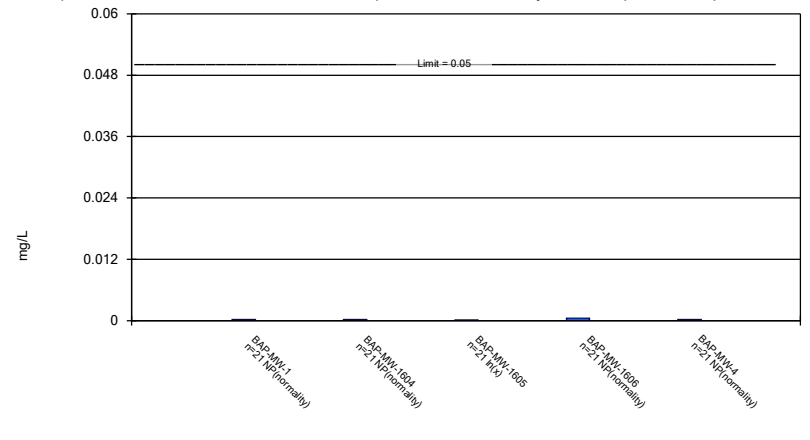
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Parametric and Non-Parametric (NP) Confidence Interval

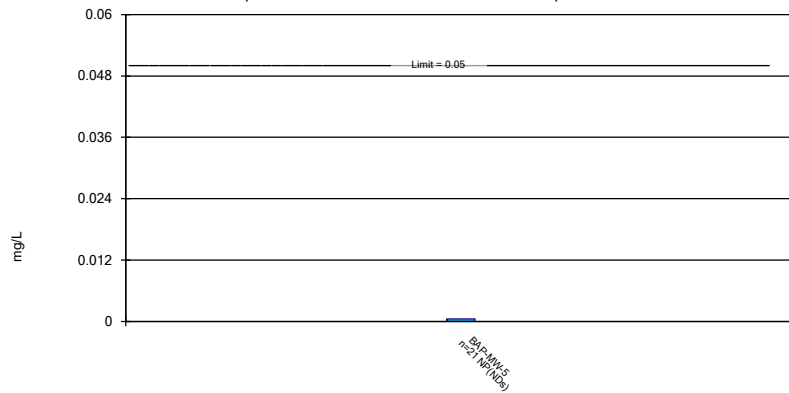
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

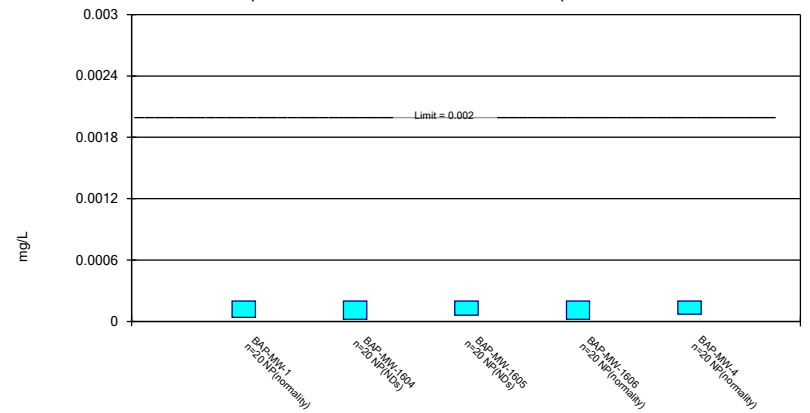
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

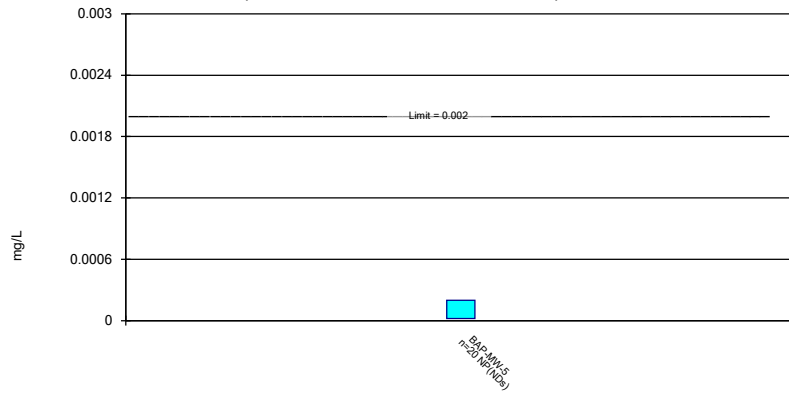
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
Amos BAP Client: Geosyntec Data: Amos BAP

### Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 7/28/2022 4:32 PM View: Confidence Interval  
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.