

# Annual Groundwater Monitoring Report

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

**January 2025**

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An **AEP** Company

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BOUNDLESS ENERGY<sup>SM</sup>

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**Abbreviations:**

- ASD – Alternate Source Demonstration
- CCR – Coal Combustion Residual
- GWPS – Groundwater Protection Standard
- SSI – Statistically Significant Increase
- SSL – Statistically Significant Level
- AMFAP – Amos Fly 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 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 initial Annual Groundwater Monitoring and Corrective Action Report for inactive surface impoundments be posted to the operating record no later than August 1, 2019 and then annually, thereafter. This Annual Groundwater Monitoring and Corrective Action Report covers all activities required by the CCR Rule for all of 2024.

In general, the following activities were completed:

- The Amos Fly Ash Pond (AMFAP) CCR unit began 2024 in detection monitoring and remained in detection monitoring throughout all of 2024.
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units.
- The October 2023 detection monitoring sampling event resulted in potential statistically significant increase (SSI) for calcium at MW-2, but verification sampling in January 2024 did not confirm the SSI. Statistical analysis of the October monitoring event was completed in March 2024.
- The May 2024 detection monitoring sampling event resulted in potential statistically significant increase (SSI) for fluoride at MW-9, but verification sampling in July 2024 did not confirm the SSI. Statistical analysis of the May 2024 detection monitoring event was completed in October 2024.
- A detection monitoring sampling event occurred in November 2024. The statistical analysis for this event is not yet complete. Potential SSIs were identified for fluoride at MW-9, and for TDS at MW-1806A. A resampling event for these parameters will occur in early 2025. If the SSI is confirmed, an ASD will be performed. If the ASD is unsuccessful, the AMFAP will transition into the assessment monitoring program under the CCR Rule.
- Statistics reports completed in 2024 are included in **Appendix 2**.

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

- A map, aerial photograph or a drawing showing the CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers.
- 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**).

- Results of the required statistical analysis of groundwater monitoring results (**Appendix 2**).
- Discussion of any alternative source demonstrations completed, if applicable (Appendix 3). This is not applicable to this report.
- A summary of any transition between monitoring programs or an alternate monitoring frequency, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring, in addition to identifying the constituents detected at a statistically significant increase over background concentrations, if applicable (Appendix 4). This is not applicable to this report.
- 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 to this report.
- Other information required to be included in the annual report such as an alternate monitoring frequency or assessment of corrective measures, if applicable.

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

## **II. Groundwater Monitoring Well Locations and Identification Numbers**

Figure 1 depicts the PE-certified groundwater monitoring network, the monitoring well locations and their corresponding identification numbers. The groundwater monitoring network has been determined to adequately monitor upgradient, downgradient, and background areas adjacent to the Fly Ash Pond, as detailed in the *Groundwater Monitoring Well Network Evaluation* that was placed on the AEP CCR public internet site on May 1, 2019. The groundwater quality monitoring network includes the following:

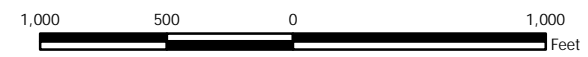
- Five upgradient or sidegradient monitoring wells: MW-1807A, MW-1807B, MW-1808A, MW-1809A, and MW-1810A.
- Ten downgradient monitoring wells: MW-1, MW-2, MW-5, MW-6, MW-7, MW-8, MW-9, MW-1801A, MW-1804A, and MW-1806A.

MW-1807B is screened in the Clarksburg shale to provide background groundwater quality in a deeper secondary groundwater-bearing zone that is hydraulically connected to the uppermost aquifer. Since this monitoring well is not located within the uppermost aquifer but in a deeper groundwater bearing zone, it is shown only on the site figure and not included in the groundwater flow direction maps.



- Legend
- Upgradient Sampling Location
  - Downgradient Sampling Location
  - Fly Ash Pond

Notes  
 - Monitoring well coordinates and site features provided by AEP.



Site Layout  
 Fly Ash Pond

AEP Amos Generating Plant  
 Winfield, West Virginia

**Geosyntec**  
 consultants

Figure

1

Columbus, Ohio

2019/07/30

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

No monitoring wells were installed or decommissioned in 2024. The network design, as summarized in the *Groundwater Monitoring Well Network Evaluation Report (2019)* and as posted at the CCR website for Amos' Fly Ash Pond, did not change. That network design report, viewable on the AEP CCR website, discussed the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, downgradient monitoring well locations and the upgradient monitoring well locations.

### **IV. Groundwater Quality Data and Static Water Elevation Data. With Flow Rate and Direction Calculations and Discussion**

**Appendix 1** contains the groundwater quality data collected since initiating CCR background sampling through results received in 2024. **Appendix 1** also contains the groundwater velocity and residence time determinations for each completed sampling event, to date. Static water elevation data from each monitoring event are used to develop potentiometric maps and determine the groundwater flow direction for each respective sampling event.

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

Statistical analysis of the October 2023 detection monitoring samples was completed in March 2024. There were no SSI's observed during this event. A potential SSI for calcium at MW-2 was not confirmed with verification sampling in January 2024. The statistical analysis can be found in **Appendix 2**.

Statistical analysis of the May 2024 detection monitoring samples was completed in October 2024. There were no SSI's observed during this event. A potential SSI for Fluoride at MW-9 was not confirmed with verification sampling in July 2024. The statistical analysis can be found in **Appendix 2**.

A detection monitoring sampling event occurred in November 2024. The statistical analysis for this event is not yet complete. Potential SSIs were identified for fluoride at MW-9 and for TDS at MW-1806A. A resampling event for these parameters will occur in early 2025. If the SSI is confirmed, an ASD will be performed. If the ASD is unsuccessful, the AMFAP will transition into the assessment monitoring program under the CCR Rule.

### **VI. Alternative Source Demonstration**

No alternative source demonstrations were completed in 2024 since no SSIs were identified.

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

As of this annual groundwater report date there has been no transition between detection monitoring and assessment monitoring and the CCR Unit remains in detection monitoring. Detection monitoring will continue throughout 2025 pending the results of the aforementioned statistical analysis regarding the November 2024 detection monitoring event. If the statistical analysis confirms any SSIs, an ASD will be performed if applicable. The sampling frequency of twice per year will be maintained for the Appendix III parameters upon a successful alternative source demonstration. If necessary, a transition to the assessment monitoring program will occur.

Regarding defining an alternate monitoring frequency, the groundwater velocity and monitoring well production is high enough at this facility that no modification of the twice-per-year detection monitoring frequency is needed.

**VIII. Other Information Required**

As required by the CCR detection monitoring rules in 40 CFR 257.94, sampling all CCR wells for the Appendix III parameters was completed in 2024. All required information has been included in this annual groundwater monitoring report.

**IX. Description of Any Problems Encountered in 2024 and Actions Taken**

No significant problems were encountered. The low flow sampling effort went smoothly and the schedule was met to support the 2024 annual groundwater report preparation.

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

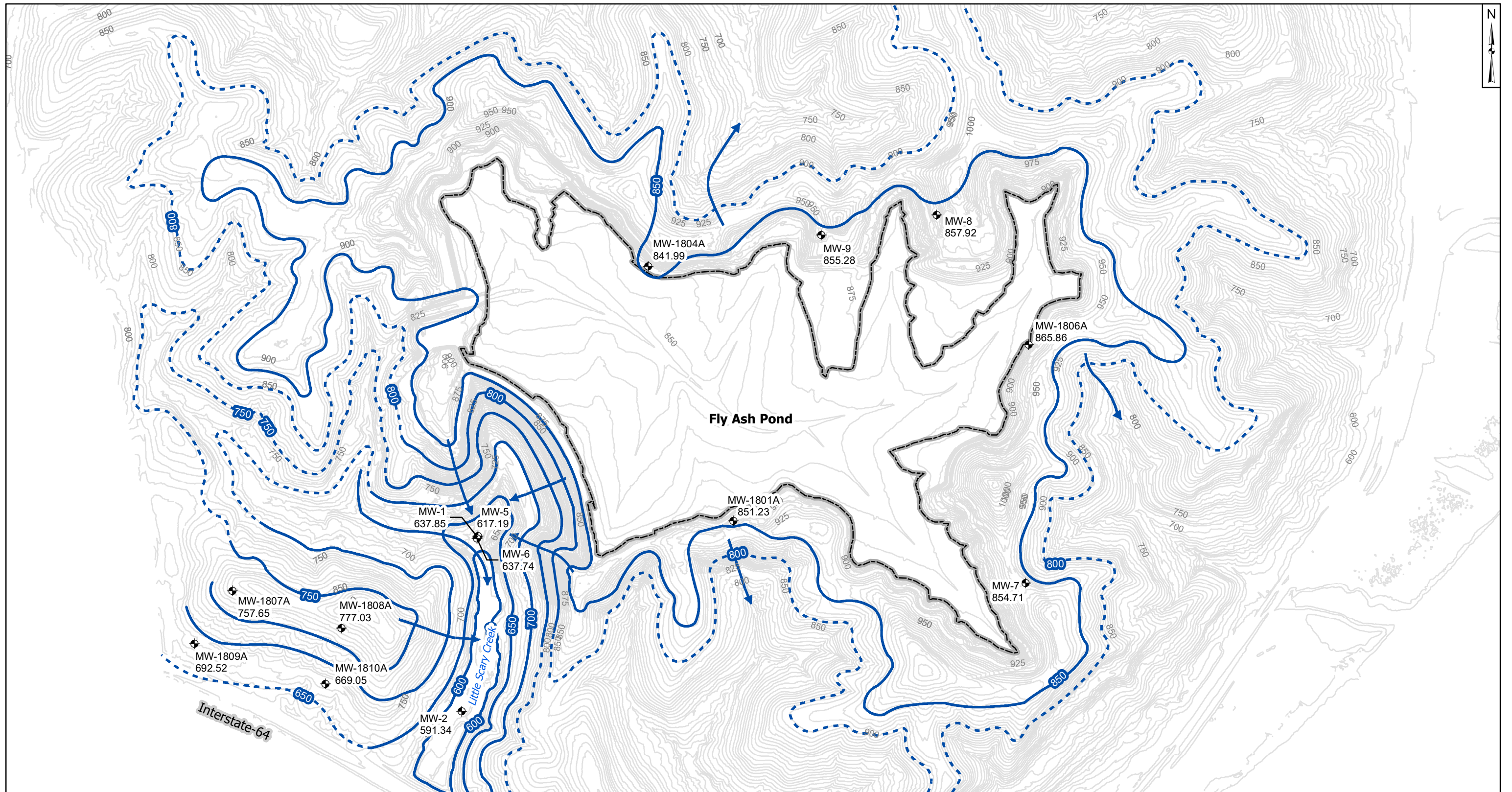
Key activities for the upcoming year include:

- Complete the statistical evaluation of the November 2024 second semi-annual detection monitoring results and subsequent verification sampling, looking for any confirmed statistically significant increases.
- Perform an ASD, if necessary, for the November 2024 detection monitoring event if any SSIs are confirmed. If the ASD if necessary and is unsuccessful, the CCR unit will transition into assessment monitoring. If it is successful or no SSIs are confirmed, the CCR unit will continue detection monitoring on a semi-annual basis.
- Respond to any new data received in light of what the CCR rule requires.
- Preparation of the 2025 annual groundwater report.



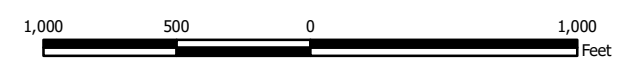
## APPENDIX 1


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

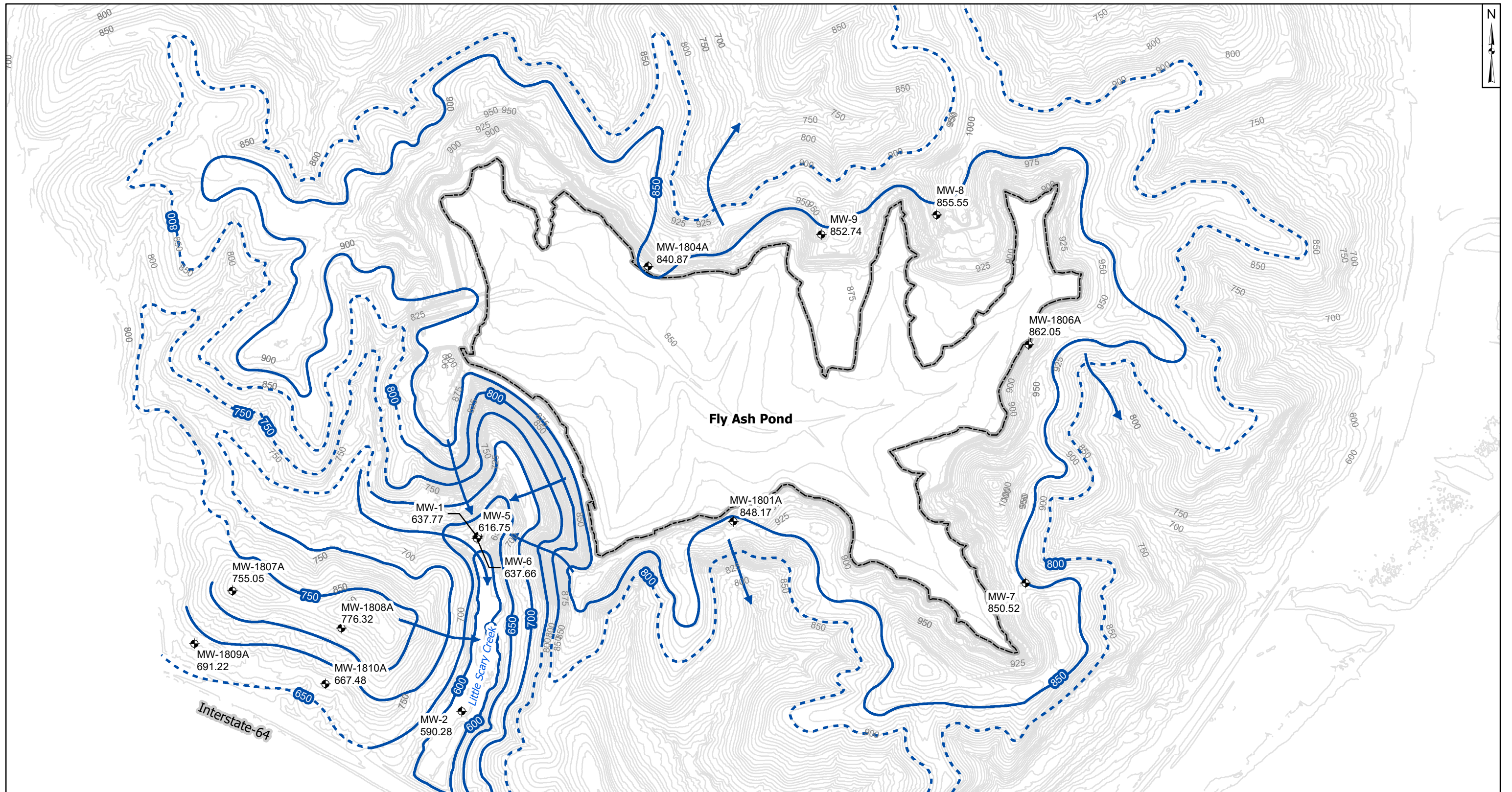


- Legend**
- ◆ Groundwater Monitoring Well
  - ➔ Groundwater Flow Direction
  - Groundwater Elevation Contour
  - - - Groundwater Elevation Contour (Inferred)
  - ▭ Fly Ash Pond

- Notes**
1. Monitoring well coordinates and water level data (collected on May 6, 2024) provided by AEP.
  2. Topography basemap from AEP Drawing No. 13-30705-0 (topographic contour interval: 10 feet).
  3. Site features based on information available in the Fly Ash Pond CCR Groundwater Monitoring Well Network Evaluation - Amos Plant report (Arcadis 2019) provided by AEP.
  4. Groundwater elevation units are in feet above mean sea level (amsl).



<b>Potentiometric Surface Map - Uppermost Aquifer May 2024</b>		<b>Figure X</b>
AEP Amos Generating Plant - Fly Ash Pond Winfield, West Virginia		
		
Columbus, Ohio	2024/06/06	



- Legend**
- Groundwater Monitoring Well
  - Groundwater Flow Direction
  - Groundwater Elevation Contour
  - Groundwater Elevation Contour (Inferred)
  - Fly Ash Pond

- Notes**
1. Monitoring well coordinates and water level data (collected on October 14 and 15, 2024) provided by AEP.
  2. Topography basemap from AEP Drawing No. 13-30705-0 (topographic contour interval: 10 feet).
  3. Site features based on information available in the Fly Ash Pond CCR Groundwater Monitoring Well Network Evaluation - Amos Plant report (Arcadis 2019) provided by AEP.
  4. Groundwater elevation units are in feet above mean sea level (ft amsl).



**Potentiometric Surface Map - Uppermost Aquifer  
October 2024**

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



Figure

**X**

Columbus, Ohio

2025/01/07

**Table 2: Residence Time Calculation Summary  
Amos Fly Ash Pond**

*Geosyntec Consultants, Inc.*

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2024-01 <sup>[3]</sup>		2024-05		2024-07 <sup>[3]</sup>		2024-10	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Fly Ash Pond	MW-1801A <sup>[1]</sup>	2.0	3.3	18.5	6.0	10.2	3.1	19.7	5.9	10.3
	MW-1804A <sup>[1]</sup>	2.0	15.9	3.8	24.6	2.5	15.6	3.9	15.3	4.0
	MW-1806A <sup>[1]</sup>	2.0	9.5	6.4	12.4	4.9	10.8	5.6	9.6	6.3
	MW-1807A <sup>[2]</sup>	2.0	5.6	10.9	8.5	7.2	7.6	8.0	5.8	10.6
	MW-1808A <sup>[2]</sup>	2.0	35.2	1.7	36.5	1.7	39.4	1.5	39.1	1.6
	MW-1809A <sup>[2]</sup>	2.0	33.1	1.8	34.3	1.8	34.1	1.8	32.8	1.9
	MW-1810A <sup>[2]</sup>	2.0	22.2	2.7	21.4	2.8	18.4	3.3	19.0	3.2
	MW-1 <sup>[1]</sup>	2.0	55.7	1.1	67.5	0.9	59.9	1.0	57.9	1.1
	MW-2 <sup>[1]</sup>	2.0	15.1	4.0	14.0	4.4	20.0	3.0	13.8	4.4
	MW-5 <sup>[1]</sup>	2.0	22.0	2.8	24.1	2.5	24.4	2.5	23.9	2.5
	MW-6 <sup>[1]</sup>	2.0	64.0	1.0	52.9	1.1	71.2	0.9	68.8	0.9
	MW-7 <sup>[1]</sup>	2.0	1.9	32.2	14.2	4.3	7.8	7.8	15.0	4.1
	MW-8 <sup>[1]</sup>	2.0	7.4	8.2	13.7	4.4	4.1	14.8	10.2	6.0
MW-9 <sup>[1]</sup>	2.0	8.0	7.6	14.3	4.3	7.4	8.2	7.2	8.5	

Notes:

[1] - Downgradient Well

[2] - Upgradient/Sidegradient Well

[3] - Two-of-two verification sampling

**Table 1. Groundwater Data Summary: MW-1***Geosyntec Consultants, Inc.***Amos - FAP****Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/24/2018	Background	0.182	2.83	11.7	0.42	8.2	30.6	473
8/28/2018	Background	0.135	2.80	11.3	0.45	8.5	31.6	435
10/3/2018	Background	0.138	2.95	11.1	0.40	8.3	30.8	457
10/22/2018	Background	0.180	2.36	11.4	0.42	8.3	30.7	434
11/13/2018	Background	0.209	3.03	11.5	0.45	8.0	32.2	444
12/19/2018	Background	0.117	2.71	10.7	0.43	8.1	30.9	428
1/23/2019	Background	0.115	2.29	14.6	0.41	8.2	55.9	453
2/19/2019	Background	0.126	2.36	10.9	0.44	8.5	31.3	457
3/12/2019	Detection	0.110	2.60	11.0	0.43	8.2	31.6	458
11/8/2019	Detection	0.114	2.38	11.2	0.42	8.2	33.7	461
5/13/2020	Detection	0.122	2.74	11.2	0.42	8.2	33.6	457
11/2/2020	Detection	0.097	2.70	10.5	0.48	8.4	33.6	434
5/5/2021	Detection	0.111	2.65	11.0	0.51	8.3	32.9	448
7/21/2021	Detection	--	--	--	0.49	8.1	--	--
11/10/2021	Detection	0.109	2.31	11.0	0.48	8.2	31.5	440
5/23/2022	Detection	0.108	2.19	10.7	0.48	8.2	33.5	430 L1
10/26/2022	Detection	0.106	2.53	10.5	0.46	8.3	34.2	430
6/1/2023	Detection	0.107	2.25	10.4	0.47	8.1	32.9	430
10/18/2023	Detection	0.101	2.59	10.1	0.46	8.2	32.3	410
5/10/2024	Detection	0.103	2.67	10.3	0.46	8.3	32.4	420
10/15/2024	Detection	0.110	2.25	9.89	0.46	8.5	31.0	430

**Table 1. Groundwater Data Summary: MW-1**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/24/2018	Background	0.02 J1	7.65	52.9	< 0.004 U1	0.008 J1	0.075	0.031	1.086	0.42	0.041	0.012	< 0.002 U1	1.94	< 0.03 U1	0.03 J1
8/28/2018	Background	0.02 J1	7.90	49.5	< 0.004 U1	< 0.005 U1	0.092	0.039	0.261	0.45	0.047	0.009	< 0.002 U1	1.48	< 0.03 U1	0.01 J1
10/3/2018	Background	< 0.02 U1	7.98	51.5	< 0.02 U1	< 0.01 U1	0.1 J1	0.03 J1	1.782	0.40	0.02 J1	< 0.009 U1	< 0.002 U1	1 J1	< 0.03 U1	< 0.1 U1
10/22/2018	Background	< 0.02 U1	6.84	44.7	< 0.02 U1	< 0.01 U1	0.1 J1	0.05 J1	0.608	0.42	0.07 J1	< 0.009 U1	< 0.002 U1	1 J1	< 0.03 U1	< 0.1 U1
11/13/2018	Background	< 0.02 U1	8.04	51.9	< 0.02 U1	< 0.01 U1	0.583	0.03 J1	0.4563	0.45	0.06 J1	< 0.009 U1	< 0.002 U1	1 J1	< 0.03 U1	< 0.1 U1
12/19/2018	Background	0.03 J1	7.65	48.6	< 0.02 U1	< 0.01 U1	0.08 J1	0.03 J1	0.3156	0.43	0.02 J1	0.02 J1	< 0.002 U1	1 J1	< 0.03 U1	< 0.1 U1
1/23/2019	Background	0.06 J1	7.64	43.7	< 0.02 U1	< 0.01 U1	0.09 J1	0.03 J1	0.688	0.41	0.03 J1	< 0.009 U1	< 0.002 U1	1 J1	< 0.03 U1	< 0.1 U1
2/19/2019	Background	0.05 J1	7.83	44.7	< 0.02 U1	< 0.01 U1	0.1 J1	0.03 J1	0.00538	0.44	0.111	0.01 J1	< 0.002 U1	1 J1	0.05 J1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-2**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/27/2018	Background	0.259	4.24	471	3.08	8.4	2.4	1,260
8/29/2018	Background	0.249	3.98	443	2.99	8.6	17.4	1,310
10/4/2018	Background	0.256	4.31	435	2.99	8.5	14.8	1,280
10/23/2018	Background	0.262	3.95	438	3.08	8.5	7.4	1,250
11/15/2018	Background	0.328	4.07	469	3.30	8.5	13.5	1,250
12/19/2018	Background	0.225	3.81	430	3.03	8.5	6.4	1,250
1/23/2019	Background	0.318	3.67	441	3.00	8.2	6.4	1,310
2/20/2019	Background	0.237	3.95	447	3.06	8.7	2.3	1,310
3/13/2019	Detection	0.230	3.98	441	3.02	8.7	1.8	1,300
11/12/2019	Detection	0.265	4.77	426	2.73	8.5	20.1	1,340
2/11/2020	Detection	--	4.31	--	--	8.3	--	--
5/12/2020	Detection	0.214	4.35	443	2.91	8.6	6 J1	1,340
11/2/2020	Detection	0.194	4.13	435	3.24	8.6	6.6	1,310
5/5/2021	Detection	0.230	4.07	480	3.24	8.4	13.1	1,310
11/11/2021	Detection	0.212	4.54	451	3.26	8.4	9.9	1,310
5/24/2022	Detection	0.214	4.44	445	3.01	8.4	13.8	1,290 L1
10/26/2022	Detection	0.220	5.18	450	3.06	8.5	14.9	1,320
2/7/2023	Detection	--	4.65	--	--	8.4	--	--
6/2/2023	Detection	0.20 J1	4.73	454	3.16	7.5	4.5	1,310
7/18/2023	Detection	--	--	--	--	8.4	--	--
10/19/2023	Detection	0.22 M1, J1	5.16 M1	455	3.08	8.4	4.6	1,300
1/24/2024	Detection	--	4.61	--	--	8.5	--	--
5/13/2024	Detection	0.21 J1	4.7	453	3.05	8.6	6.9	1,300
10/15/2024	Detection	0.223	4.85	453	3.08	8.6	3.3	1,320

**Table 1. Groundwater Data Summary: MW-2**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/27/2018	Background	0.06	1.68	202	0.008 J1	0.02 J1	0.312	0.102	1.354	3.08	0.406	0.019	< 0.002 U1	27.2	0.04 J1	0.02 J1
8/29/2018	Background	0.02 J1	1.62	178	< 0.004 U1	< 0.005 U1	0.129	0.034	1.70	2.99	0.033	0.023	< 0.002 U1	34.5	< 0.03 U1	0.02 J1
10/4/2018	Background	< 0.02 U1	1.76	192	< 0.02 U1	< 0.01 U1	0.2 J1	0.05 J1	1.288	2.99	0.1 J1	< 0.009 U1	< 0.002 U1	30.8	< 0.03 U1	< 0.1 U1
10/23/2018	Background	< 0.02 U1	1.24	181	< 0.02 U1	< 0.01 U1	0.2 J1	0.055	0.594	3.08	0.214	0.03 J1	< 0.002 U1	26.1	< 0.03 U1	< 0.1 U1
11/15/2018	Background	< 0.02 U1	1.66	185	< 0.02 U1	< 0.01 U1	0.2 J1	0.04 J1	0.953	3.30	0.110	0.02 J1	< 0.002 U1	29.2	< 0.03 U1	< 0.1 U1
12/19/2018	Background	0.03 J1	1.33	182	< 0.02 U1	0.03 J1	0.967	0.04 J1	1.058	3.03	0.290	0.02 J1	< 0.002 U1	25.5	< 0.03 U1	< 0.1 U1
1/23/2019	Background	< 0.02 U1	1.55	178	< 0.02 U1	< 0.01 U1	0.382	0.050	0.725	3.00	0.166	0.01 J1	< 0.002 U1	29.2	0.04 J1	< 0.1 U1
2/20/2019	Background	< 0.1 U1	1.35	169	< 0.1 U1	< 0.05 U1	< 0.2 U1	< 0.1 U1	0.2747	3.06	< 0.1 U1	0.02 J1	< 0.002 U1	21.9	< 0.2 U1	< 0.5 U1



**Table 1. Groundwater Data Summary: MW-5**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/24/2018	Background	0.252	6.75	793	3.32	8.1	0.2	1,890
8/29/2018	Background	0.240	6.71	780	3.33	8.2	0.2	1,880
10/3/2018	Background	0.276	7.03	776	3.33	8.1	0.1 J1	1,860
10/24/2018	Background	0.249	7.09	811	3.44	8.1	< 0.06 U1	1,840
11/13/2018	Background	0.264	6.79	832	3.63	8.0	0.1 J1	1,880
12/19/2018	Background	0.221	6.48	783	3.43	7.9	< 0.06 U1	1,890
1/23/2019	Background	0.323	5.98	782	3.36	8.1	< 0.06 U1	1,910
2/19/2019	Background	0.239	6.79	793	3.38	8.2	< 0.06 U1	1,920
3/13/2019	Detection	0.229	6.85	804	3.44	8.0	0.08 J1	1,930
11/8/2019	Detection	0.182	21.0	663	3.04	8.0	32.0	1,840
2/11/2020	Detection	--	11.3	713	--	7.8	18.6	--
5/11/2020	Detection	0.211	9.85	746	2.97	7.9	11.0	1,820
7/7/2020	Detection	--	8.77	--	--	8.1	22.8	--
10/27/2020	Detection	0.207	9.50	729	3.24	8.2	25.1	1,770
1/7/2021	Detection	--	9.31	--	--	8.1	14.6	--
5/5/2021	Detection	0.203	7.23	773	3.31	8.1	13.7	1,750
7/21/2021	Detection	--	--	--	--	8.0	45.9	--
11/11/2021	Detection	0.207	11.0	707	3.21	7.9	17.8	1,720
5/23/2022	Detection	0.199	8.57	715	3.12	8.0	12.2	1,690 L1
10/26/2022	Detection	0.201	10.2	781	3.28	8.2	1.3	1,770
5/31/2023	Detection	0.173	7.07	703	3.18	7.9	19.2	1,660
10/19/2023	Detection	0.151	14.9	612	2.84	8.1	37.9	1,620
5/10/2024	Detection	0.189	9.01	720	3.16	8.1	3.1	1,740
10/15/2024	Detection	0.207	8.87	697	3.13	8.3	2.7	1,750

Table 1. Groundwater Data Summary: MW-5

Amos - FAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/24/2018	Background	0.06	4.89	356	0.004 J1	0.006 J1	0.152	0.046	1.370	3.32	0.222	0.032	< 0.002 U1	36.5	< 0.03 U1	0.05 J1
8/29/2018	Background	0.18	5.08	359	< 0.004 U1	0.01 J1	0.278	0.085	1.805	3.33	0.284	0.030	< 0.002 U1	38.4	< 0.03 U1	0.02 J1
10/3/2018	Background	< 0.02 U1	4.86	373	< 0.02 U1	< 0.01 U1	0.626	0.053	1.630	3.33	0.03 J1	< 0.009 U1	< 0.002 U1	35.7	< 0.03 U1	< 0.1 U1
10/24/2018	Background	0.02 J1	4.34	363	< 0.02 U1	< 0.01 U1	0.219	0.516	0.731	3.44	0.06 J1	0.03 J1	< 0.002 U1	35.1	0.04 J1	< 0.1 U1
11/13/2018	Background	< 0.02 U1	4.37	353	< 0.02 U1	< 0.01 U1	0.1 J1	0.04 J1	1.824	3.63	0.03 J1	0.02 J1	< 0.002 U1	34.7	< 0.03 U1	< 0.1 U1
12/19/2018	Background	< 0.02 U1	4.39	364	< 0.02 U1	< 0.01 U1	0.07 J1	0.04 J1	1.514	3.43	< 0.02 U1	0.03 J1	< 0.002 U1	34.8	< 0.03 U1	< 0.1 U1
1/23/2019	Background	< 0.04 U1	4.35	351	< 0.04 U1	< 0.02 U1	0.532	< 0.04 U1	1.052	3.36	< 0.04 U1	0.02 J1	< 0.002 U1	35.0	< 0.06 U1	< 0.2 U1
2/19/2019	Background	< 0.06 U1	5.25	349	< 0.06 U1	< 0.03 U1	0.2 J1	< 0.06 U1	1.454	3.38	< 0.06 U1	0.034	< 0.002 U1	33.6	< 0.09 U1	< 0.3 U1

**Table 1. Groundwater Data Summary: MW-6**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/24/2018	Background	0.120	61.0	19.3	0.22	6.9	44.4	392
8/28/2018	Background	0.096	59.7	19.4	0.24	6.9	44.6	398
10/3/2018	Background	0.125	60.7	18.9	0.21	6.8	43.4	402
10/24/2018	Background	0.1 J1	61.5	18.4	0.23	6.9	42.0	400
11/13/2018	Background	0.111	64.9	19.8	0.24	6.7	44.6	390
12/19/2018	Background	0.07 J1	55.8	17.7	0.23	6.7	41.7	376
1/23/2019	Background	0.08 J1	54.1	17.8	0.22	6.6	41.3	411
2/19/2019	Background	0.09 J1	55.8	17.3	0.24	7.0	40.4	406
3/12/2019	Detection	0.08 J1	57.9	17.4	0.23	6.9	39.8	390
11/8/2019	Detection	0.079	56.6	17.2	0.24	6.9	41.7	368
5/11/2020	Detection	0.088	55.8	15.9	0.25	7.0	32.6	416
10/27/2020	Detection	0.089	53.4	16.5	0.28	7.1	38.6	384
1/7/2021	Detection	--	--	--	0.30	7.1	--	--
5/6/2021	Detection	0.074	49.7	15.4	0.32	6.9	35.8	400
7/21/2021	Detection	--	--	--	0.27	6.8	--	--
11/11/2021	Detection	0.078	52.5 M1, P3	16.0	0.28	6.8	36.6	370
5/24/2022	Detection	0.070	51.8	14.8	0.26	6.9	38.4	360 L1
10/27/2022	Detection	0.073	53.7 M1, P3	15.7	0.26	7.0	39.9	360
5/31/2023	Detection	0.070	46.8	13.7	0.28	6.8	36.6	350
10/19/2023	Detection	0.073	47.3	13.0	0.27	6.9	35.3	350
5/10/2024	Detection	0.072	53.2	12.3	0.27	7.0	34.9	340
10/15/2024	Detection	0.084	52.5	12.3	0.29	7.1	34.5	370

**Table 1. Groundwater Data Summary: MW-6**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/24/2018	Background	0.01 J1	1.81	536	0.009 J1	0.01 J1	0.094	0.242	2.73	0.22	0.02 J1	0.012	< 0.002 U1	0.58	< 0.03 U1	0.03 J1
8/28/2018	Background	0.02 J1	1.82	527	0.008 J1	0.02	0.663	0.323	2.439	0.24	0.167	0.009	< 0.002 U1	0.60	< 0.03 U1	0.02 J1
10/3/2018	Background	< 0.02 U1	1.91	523	< 0.02 U1	0.01 J1	0.09 J1	0.260	4.59	0.21	< 0.02 U1	< 0.009 U1	< 0.002 U1	0.5 J1	< 0.03 U1	< 0.1 U1
10/24/2018	Background	< 0.02 U1	1.72	494	0.03 J1	< 0.01 U1	0.07 J1	0.258	2.202	0.23	0.03 J1	0.01 J1	< 0.002 U1	0.6 J1	< 0.03 U1	< 0.1 U1
11/13/2018	Background	< 0.02 U1	2.12	524	< 0.02 U1	< 0.01 U1	0.08 J1	0.233	2.325	0.24	0.03 J1	< 0.009 U1	< 0.002 U1	0.7 J1	< 0.03 U1	< 0.1 U1
12/19/2018	Background	< 0.02 U1	1.88	510	< 0.02 U1	0.01 J1	0.06 J1	0.234	2.53	0.23	0.02 J1	0.01 J1	< 0.002 U1	0.7 J1	< 0.03 U1	< 0.1 U1
1/23/2019	Background	0.04 J1	1.89	486	< 0.02 U1	< 0.01 U1	0.04 J1	0.220	1.82	0.22	< 0.02 U1	< 0.009 U1	< 0.002 U1	0.6 J1	< 0.03 U1	< 0.1 U1
2/19/2019	Background	< 0.02 U1	1.53	482	< 0.02 U1	< 0.01 U1	0.277	0.219	2.136	0.24	< 0.02 U1	0.02 J1	< 0.002 U1	0.6 J1	0.04 J1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-7**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/26/2018	Background	0.087	1.33	5.41	0.27	8.5	32.0	368
8/29/2018	Background	0.112	1.29	5.32	0.27	8.8	31.5	387
10/3/2018	Background	0.156	1.44	5.23	0.26	8.8	31.8	376
10/24/2018	Background	0.09 J1	1.40	5.37	0.27	8.8	31.7	344
11/13/2018	Background	0.192	1.49	5.65	0.29	8.4	33.2	379
12/17/2018	Background	0.1 J1	1.24	5.29	0.27	8.6	32.0	387
1/23/2019	Background	0.127	1.41	5.18	0.25	8.4	32.0	389
2/18/2019	Background	0.06 J1	1.37	5.39	0.26	9.0	32.1	401
3/12/2019	Detection	0.06 J1	1.47	5.49	0.27	8.9	32.5	385
11/11/2019	Detection	0.066	2.18	5.36	0.25	8.7	32.3	390
2/11/2020	Detection	--	1.39	--	--	8.5	--	--
5/11/2020	Detection	0.067	1.59	5.30	0.27	8.4	23.6	395
10/28/2020	Detection	0.065	1.81	5.34	0.31	8.9	31.2	387
1/6/2021	Detection	--	1.53	--	0.31	9.0	--	--
5/12/2021	Detection	0.055	1.46	5.45	0.30	8.8	31.1	401
11/10/2021	Detection	0.058	1.57	5.50	0.27	8.6	29.9	390
5/20/2022	Detection	0.060	1.62	5.42	0.29	8.7	32.0	400 L1
10/25/2022	Detection	0.065	1.84	5.44	0.28	8.7	32.5	400
6/1/2023	Detection	0.05 J1	1.61	5.40	0.24	8.4	30.9	380
10/19/2023	Detection	0.05 J1	1.68	5.34	0.24	8.5	30.1	390
5/14/2024	Detection	0.056	1.63	5.54	0.24	8.8	30.3	390
10/16/2024	Detection	0.060	1.71	5.48	0.25	8.7	30.0	410

**Table 1. Groundwater Data Summary: MW-7**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/26/2018	Background	0.04 J1	5.31	34.0	< 0.004 U1	0.01 J1	0.082	0.038	1.958	0.27	0.211	0.009	< 0.002 U1	1.12	< 0.03 U1	0.01 J1
8/29/2018	Background	0.05 J1	5.51	32.3	< 0.004 U1	0.01 J1	0.190	0.023	0.745	0.27	0.121	0.010	< 0.002 U1	1.06	< 0.03 U1	0.02 J1
10/3/2018	Background	0.07 J1	5.65	33.9	< 0.02 U1	< 0.01 U1	0.07 J1	< 0.02 U1	2.391	0.26	0.111	< 0.009 U1	< 0.002 U1	1 J1	0.03 J1	< 0.1 U1
10/24/2018	Background	0.18	5.13	37.0	< 0.02 U1	0.02 J1	0.296	0.134	0.1126	0.27	0.476	< 0.009 U1	< 0.002 U1	1 J1	0.05 J1	< 0.1 U1
11/13/2018	Background	0.12	5.24	32.7	< 0.02 U1	< 0.01 U1	0.1 J1	0.03 J1	0.9538	0.29	0.146	< 0.009 U1	< 0.002 U1	1 J1	< 0.03 U1	< 0.1 U1
12/17/2018	Background	0.06 J1	5.21	33.5	< 0.02 U1	< 0.01 U1	0.1 J1	< 0.02 U1	1.236	0.27	0.1 J1	< 0.009 U1	< 0.002 U1	1 J1	0.04 J1	< 0.1 U1
1/23/2019	Background	0.44	5.86	36.8	< 0.02 U1	0.02 J1	0.221	0.068	0.558	0.25	0.420	< 0.009 U1	< 0.002 U1	1 J1	0.05 J1	< 0.1 U1
2/18/2019	Background	0.27	5.33	34.3	0.03 J1	0.02 J1	0.1 J1	0.057	0.543	0.26	0.230	0.01 J1	< 0.002 U1	1 J1	< 0.03 U1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-8**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/26/2018	Background	0.233	2.15	--	--	--	--	--
8/2/2018	Background	--	--	105	2.70	8.2	21.6	690
8/30/2018	Background	0.225	1.99	109	2.66	8.9	24.2	727
10/3/2018	Background	0.259	2.74	108	2.58	7.9	31.6	729
10/23/2018	Background	0.278	2.32	108	2.74	8.5	26.3	717
11/13/2018	Background	0.254	2.46	116	2.93	8.2	27.2	711
12/18/2018	Background	0.224	2.28	110	2.78	8.5	26.4	696
1/23/2019	Background	0.213	2.39	111	2.62	8.1	30.1	739
2/20/2019	Background	0.195	2.49	111	2.87	9.2	26.4	740
3/12/2019	Detection	0.192	2.32	110	2.87	8.5	27.4	716
11/8/2019	Detection	0.197	1.98	109	2.97	8.3	22.5	717
5/12/2020	Detection	0.191	1.83	108	2.73	7.3	19.9	720
10/26/2020	Detection	0.215	8.47	508	3.07	8.4	37.4	1,400
1/7/2021	Detection	--	2.46	107	--	8.2	18.3	729
5/7/2021	Detection	0.180	2.19	109	2.99	8.5	20.2	711
11/10/2021	Detection	0.191	2.28	107	2.97	8.6	15.8	700
5/20/2022	Detection	0.179	2.11	106	2.91	8.5	21.7	710 L1
10/26/2022	Detection	0.192	2.34	108	3.03	8.5	21.7	700
6/1/2023	Detection	0.17 J1	2.12	107	2.95	8.3	22.3	710
10/19/2023	Detection	0.171	2.25	108	2.88	8.4	21.0	690
5/14/2024	Detection	0.18 J1	2.3	110	2.94	8.3	20.9	700
10/17/2024	Detection	0.192	2.39	111	3.08	8.5	21.2	720

**Table 1. Groundwater Data Summary: MW-8**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/26/2018	Background	0.04 J1	3.02	63.7	0.005 J1	< 0.005 U1	0.114	0.210	1.5625	--	0.237	0.013	< 0.002 U1	11.7	0.05 J1	0.02 J1
8/2/2018	Background	--	--	--	--	--	--	--	--	2.70	--	--	--	--	--	--
8/30/2018	Background	0.85	5.71	58.2	0.049	0.05	1.89	1.69	0.655	2.66	2.78	0.012	0.004 J1	20.6	0.2	0.076
10/3/2018	Background	0.20	5.18	86.2	< 0.02 U1	0.02 J1	0.2 J1	0.270	3.981	2.58	0.427	< 0.009 U1	< 0.002 U1	8.76	0.08 J1	< 0.1 U1
10/23/2018	Background	0.15	4.26	70.9	< 0.02 U1	< 0.01 U1	0.229	0.284	0.294	2.74	0.491	0.02 J1	< 0.002 U1	10.2	0.08 J1	< 0.1 U1
11/13/2018	Background	0.14	3.49	71.5	< 0.02 U1	< 0.01 U1	0.2 J1	0.253	0.691	2.93	0.352	< 0.009 U1	< 0.002 U1	7.64	0.08 J1	< 0.1 U1
12/18/2018	Background	0.26	2.91	73.3	< 0.02 U1	< 0.01 U1	0.264	0.231	0.956	2.78	0.357	0.02 J1	< 0.002 U1	6.93	0.1 J1	< 0.1 U1
1/23/2019	Background	0.27	3.49	76.8	< 0.02 U1	< 0.01 U1	0.463	0.513	0.3857	2.62	0.990	< 0.009 U1	< 0.002 U1	11.0	0.09 J1	< 0.1 U1
2/20/2019	Background	0.4 J1	2.41	71.9	< 0.1 U1	< 0.05 U1	0.4 J1	0.538	0.736	2.87	0.770	0.009 J1	< 0.002 U1	8 J1	0.4 J1	< 0.5 U1



**Table 1. Groundwater Data Summary: MW-9**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/26/2018	Background	0.157	1.03	--	--	--	--	--
8/2/2018	Background	--	--	7.22	0.87	8.3	12.9	421
8/30/2018	Background	0.128	1.04	7.21	0.86	8.0	12.2	468
10/2/2018	Background	0.145	1.44	7.60	0.83	7.1	12.6	513
10/23/2018	Background	0.141	1.07	7.26	0.87	9.3	12.8	460
11/13/2018	Background	0.166	1.24	7.29	0.91	9.1	11.9	449
12/19/2018	Background	--	--	--	--	9.2	--	--
12/20/2018	Background	0.114	1.03	7.11	0.84	--	15.7	435
1/22/2019	Background	--	--	--	--	9.7	--	--
1/23/2019	Background	0.134	1.01	7.45	0.77	--	20.1	484
2/19/2019	Background	--	--	--	--	9.2	--	--
2/20/2019	Background	0.128	1.26	7.70	0.84	--	28.5	505
3/12/2019	Detection	0.122	1.18	7.50	0.91	9.0	24.0	463
11/8/2019	Detection	0.133	1.02	7.72	0.83	8.8	19.1	440
5/13/2020	Detection	0.122	0.959	7.27	0.82	9.0	12.0	459
10/29/2020	Detection	0.128	1.44	6.93	0.90	7.1	11.1	459
5/5/2021	Detection	--	--	--	--	9.0	--	--
5/6/2021	Detection	0.109	1.01	7.08	0.92	--	14.4	448
11/11/2021	Detection	0.122	1.11	7.26	0.91	8.8	14.5	450
5/20/2022	Detection	0.118	1.03	7.45	0.90	9.0	15.4	460 L1
10/25/2022	Detection	0.135	1.07	7.15	0.87	9.1	14.3	450
6/2/2023	Detection	0.12 J1	1.07	7.26	0.88	8.9	14.3	460
10/19/2023	Detection	0.12 J1	1.03	6.89	0.89	9.0	11.8	430
5/14/2024	Detection	0.12 J1	1.1	7.67	0.99	8.8	17.4	480
7/16/2024	Detection	--	--	--	0.91	9.3	--	--
10/17/2024	Detection	0.131	1.06	7.45	0.99	8.3	14.1	460

**Table 1. Groundwater Data Summary: MW-9**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/26/2018	Background	0.21	5.23	46.8	0.004 J1	0.01 J1	0.218	1.00	0.912	--	1.12	0.010	< 0.002 U1	7.31	0.06 J1	0.060
8/2/2018	Background	--	--	--	--	--	--	--	--	0.87	--	--	--	--	--	--
8/30/2018	Background	0.91	5.87	46.8	0.02 J1	0.35	1.17	2.15	1.162	0.86	5.23	0.010	0.012	6.28	0.2	0.209
10/2/2018	Background	0.59	7.04	66.0	0.192	0.07	4.52	3.70	0.543	0.83	8.66	0.009 J1	0.016	6.07	0.9	0.4 J1
10/23/2018	Background	1.28	4.58	45.4	0.08 J1	0.02 J1	1.90	1.39	0.658	0.87	2.68	0.01 J1	0.008	5.93	0.4	0.3 J1
11/13/2018	Background	0.35	5.83	51.1	0.115	0.02 J1	2.54	1.92	0.635	0.91	3.44	< 0.009 U1	0.004 J1	6.06	0.6	0.2 J1
12/20/2018	Background	0.33	4.47	35.8	< 0.02 U1	0.10	0.725	0.393	0.847	0.84	1.03	< 0.009 U1	0.010	6.51	0.4	0.1 J1
1/23/2019	Background	1.08	5.84	44.6	0.09 J1	0.03 J1	2.46	1.43	1.464	0.77	2.45	< 0.009 U1	0.009	6.49	0.5	0.2 J1
2/20/2019	Background	0.4 J1	5.45	41.5	< 0.1 U1	< 0.05 U1	0.7 J1	0.349	0.2514	0.84	0.955	0.01 J1	0.006	6 J1	0.3 J1	< 0.5 U1

**Table 1. Groundwater Data Summary: MW-1801A**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/24/2018	Background	0.274	62.5	9.64	0.1 J1	7.6	49.4	372
8/29/2018	Background	0.288	64.0	10.8	0.11	7.4	54.8	420
10/2/2018	Background	0.137	61.0	7.48	0.1 J1	7.4	46.7	356
10/24/2018	Background	0.105	63.1	8.14	0.1 J1	7.5	41.8	357
11/14/2018	Background	0.236	65.4	9.86	0.1 J1	7.3	49.3	386
12/19/2018	Background	0.289	62.8	9.08	0.12	7.3	45.5	361
1/24/2019	Background	0.168	53.4	9.18	0.14	6.3	46.3	365
2/20/2019	Background	0.09 J1	53.3	8.96	0.13	8.0	40.0	343
3/12/2019	Detection	0.09 J1	51.2	9.40	0.16	7.5	41.7	306
11/11/2019	Detection	0.229	61.6	9.76	0.12	7.4	45.3	385
5/13/2020	Detection	0.105	52.6	9.93	0.13	7.6	34.6	353
11/4/2020	Detection	0.244	62.4	8.84	0.12	7.3	41.5	385
5/6/2021	Detection	0.090	56.4	6.75	0.12	7.1	30.5	304
11/8/2021	Detection	0.162	58.1	8.81	0.15	7.3	36.8	360
5/23/2022	Detection	0.068	61.8	7.84	0.10	7.2	33.7	310 L1
10/27/2022	Detection	0.137	59.0	8.15	0.10	7.4	38.3	350
6/1/2023	Detection	0.068	62.3	7.65	0.08	7.0	32.7	330
10/19/2023	Detection	0.147 M1	56.8 M1	7.49	0.10	7.2	34.9	330
5/14/2024	Detection	0.064	59.9	6.84	0.09	7.0	29.4	310
10/16/2024	Detection	0.153	54.7 M1	7.25	0.10	7.4	33.5	350 S7

**Table 1. Groundwater Data Summary: MW-1801A**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/24/2018	Background	0.13	0.36	54.4	< 0.004 U1	0.01 J1	0.113	0.194	0.602	0.1 J1	0.042	0.009	< 0.002 U1	4.97	0.09 J1	0.04 J1
8/29/2018	Background	0.05 J1	0.57	56.5	< 0.004 U1	< 0.005 U1	0.143	0.260	1.222	0.11	0.024	0.007	< 0.002 U1	3.07	0.05 J1	0.04 J1
10/2/2018	Background	0.14	0.82	47.1	< 0.02 U1	< 0.01 U1	0.09 J1	0.422	0.254	0.1 J1	0.04 J1	0.02 J1	< 0.002 U1	4.79	0.1 J1	< 0.1 U1
10/24/2018	Background	0.06 J1	0.72	51.3	< 0.02 U1	< 0.01 U1	0.08 J1	0.380	0.654	0.1 J1	0.02 J1	0.009 J1	< 0.002 U1	2.08	0.2 J1	< 0.1 U1
11/14/2018	Background	0.08 J1	1.01	51.3	< 0.02 U1	0.03 J1	0.08 J1	0.414	0.6902	0.1 J1	0.05 J1	< 0.009 U1	< 0.002 U1	2.34	0.1 J1	< 0.1 U1
12/19/2018	Background	0.04 J1	1.11	56.0	< 0.02 U1	0.02 J1	0.1 J1	0.349	0.836	0.12	0.03 J1	0.01 J1	< 0.002 U1	2.77	0.09 J1	< 0.1 U1
1/24/2019	Background	0.06 J1	1.57	55.3	< 0.02 U1	< 0.01 U1	0.07 J1	0.326	0.595	0.14	< 0.02 U1	< 0.009 U1	< 0.002 U1	2.22	0.1 J1	< 0.1 U1
2/20/2019	Background	0.09 J1	1.52	56.6	< 0.02 U1	< 0.01 U1	0.1 J1	0.290	0.588	0.13	< 0.02 U1	< 0.009 U1	< 0.002 U1	3.57	0.2 J1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1804A**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/27/2018	Background	0.672	28.1	--	--	--	--	--
8/1/2018	Background	--	--	3.87	0.70	7.4	35.2	423
8/28/2018	Background	0.779	15.9	5.27	0.84	8.3	44.7	452
10/2/2018	Background	0.629	38.8	3.63	0.61	7.9	35.7	458
10/23/2018	Background	0.675	12.9	4.79	0.78	7.6	36.9	452
11/13/2018	Background	0.846	8.90	5.32	0.91	7.8	46.0	498
12/19/2018	Background	0.772	10.1	4.51	0.78	7.9	40.1	433
1/24/2019	Background	0.673	12.1	3.14	0.71	7.4	32.3	414
2/20/2019	Background	0.611	7.43	3.29	0.89	8.0	33.8	461
3/12/2019	Detection	0.568	10.2	3.55	0.85	7.9	34.0	411
11/11/2019	Detection	0.730	6.77	11.2	0.64	8.0	85.4	582
2/12/2020	Detection	--	--	9.59	--	7.8	69.0	--
5/14/2020	Detection	0.739	4.51	6.20	0.85	8.1	51.4	484
11/2/2020	Detection	0.549	4.70	7.12	0.86	8.0	57.0	517
1/6/2021	Detection	--	--	9.72	--	8.2	69.3	--
5/6/2021	Detection	0.565	3.98	10.6	0.97	8.1	57.3	533
7/20/2021	Detection	--	--	6.22	--	7.8	47.3	--
11/8/2021	Detection	0.628	5.35	9.80	0.84	8.0	61.1	550
5/20/2022	Detection	0.869	4.60	6.20	0.84	7.9	48.6	480 L1
10/27/2022	Detection	0.759	6.04	7.39	0.79	8.3	49.2	520
6/1/2023	Detection	0.72	5.18	10.4	0.82	7.9	58.1	550
10/19/2023	Detection	0.82	7.08	12.5	0.76	7.7	68.8	590
5/10/2024	Detection	0.90	6.4	9.14	0.75	7.8	56.4	540
10/16/2024	Detection	0.909	6.41	11.1	0.75	7.8	65.3	590

**Table 1. Groundwater Data Summary: MW-1804A**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/27/2018	Background	0.54	2.48	245	0.008 J1	< 0.005 U1	0.185	0.458	1.814	--	0.445	0.018	< 0.002 U1	136	1.8	0.069
8/1/2018	Background	--	--	--	--	--	--	--	--	0.70	--	--	--	--	--	--
8/28/2018	Background	0.15	3.59	204	< 0.004 U1	< 0.005 U1	0.304	0.314	1.559	0.84	0.031	0.015	< 0.002 U1	136	0.2	0.05 J1
10/2/2018	Background	0.53	2.35	390	< 0.02 U1	< 0.01 U1	0.1 J1	0.693	1.664	0.61	0.05 J1	0.032	< 0.002 U1	111	3.1	< 0.1 U1
10/23/2018	Background	0.18	3.36	131	< 0.02 U1	< 0.01 U1	0.1 J1	0.137	0.444	0.78	0.114	0.01 J1	< 0.002 U1	116	0.7	< 0.1 U1
11/13/2018	Background	0.09 J1	4.16	135	< 0.02 U1	< 0.01 U1	0.2 J1	0.160	0.523	0.91	0.133	0.02 J1	< 0.002 U1	129	0.2	< 0.1 U1
12/19/2018	Background	0.13	4.00	169	< 0.02 U1	< 0.01 U1	0.1 J1	0.176	1.089	0.78	0.111	0.01 J1	< 0.002 U1	130	0.5	< 0.1 U1
1/24/2019	Background	0.30	3.32	183	< 0.02 U1	< 0.01 U1	0.2 J1	0.137	1.424	0.71	0.140	< 0.009 U1	< 0.002 U1	110	1.7	< 0.1 U1
2/20/2019	Background	0.19	4.48	116	< 0.02 U1	< 0.01 U1	0.2 J1	0.096	0.894	0.89	0.219	< 0.009 U1	< 0.002 U1	115	0.6	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1806A**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/27/2018	Background	0.164	12.9	--	--	--	--	--
8/1/2018	Background	--	--	17.7	0.56	7.6	48.4	426
8/29/2018	Background	0.162	12.0	16.2	0.55	8.0	45.6	445
10/2/2018	Background	0.150	5.81	7.21	0.80	8.5	36.2	435
10/23/2018	Background	0.158	7.43	8.62	0.77	8.4	40.8	423
11/13/2018	Background	0.213	7.51	8.15	0.85	8.1	40.1	442
12/19/2018	Background	0.162	5.14	5.29	0.85	8.5	30.9	409
1/24/2019	Background	0.168	12.2	11.7	0.59	8.1	48.1	445
2/18/2019	Background	0.133	5.67	6.24	0.81	8.6	33.0	460
3/12/2019	Detection	0.130	4.98	5.51	0.83	8.8	32.9	430
11/12/2019	Detection	0.156	13.5	11.1	0.48	7.9	42.8	423
5/15/2020	Detection	0.127	2.32	8.45	0.86	8.8	35.2	456
10/29/2020	Detection	0.153	7.38	10.2	0.85	8.7	49.7	480
5/6/2021	Detection	0.123	2.01	8.82	0.95	9.0	33.8	449
11/10/2021	Detection	0.127	2.31	10.5	0.91	8.9	34.5	450
5/23/2022	Detection	0.136	2.66	10.7	0.87	8.9	37.4	450 L1
10/27/2022	Detection	0.138	3.48	11.5	0.87	8.9	38.4	440
6/1/2023	Detection	0.12 J1	3.04	13.1	0.87	8.8	40.5	450
10/19/2023	Detection	0.120	3.02	14.2	0.84	8.7	41.2	450
5/14/2024	Detection	0.13 J1	3.5	14.3	0.83	8.7	42.7	460
10/16/2024	Detection	0.16 J1	4.2	15.2	0.84	8.7	44.6	500 S7

Table 1. Groundwater Data Summary: MW-1806A

Amos - FAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/27/2018	Background	1.16	2.65	163	0.01 J1	0.01 J1	0.416	0.240	0.998	--	0.368	0.012	< 0.002 U1	17.0	0.1	0.03 J1
8/1/2018	Background	--	--	--	--	--	--	--	--	0.56	--	--	--	--	--	--
8/29/2018	Background	0.89	3.29	148	< 0.004 U1	0.008 J1	1.54	0.161	1.533	0.55	0.154	0.010	< 0.002 U1	14.2	0.09 J1	0.02 J1
10/2/2018	Background	0.28	5.30	65.4	< 0.02 U1	< 0.01 U1	0.1 J1	0.080	0.900	0.80	0.158	0.02 J1	< 0.002 U1	7.73	0.07 J1	< 0.1 U1
10/23/2018	Background	0.19	5.16	88.3	< 0.02 U1	< 0.01 U1	0.252	0.152	0.469	0.77	0.195	0.02 J1	< 0.002 U1	6.66	0.07 J1	< 0.1 U1
11/13/2018	Background	0.11	5.91	98.7	< 0.02 U1	< 0.01 U1	0.1 J1	0.163	0.3442	0.85	0.137	< 0.009 U1	< 0.002 U1	7.44	0.05 J1	< 0.1 U1
12/19/2018	Background	0.17	5.65	65.6	< 0.02 U1	< 0.01 U1	0.1 J1	0.071	0.8606	0.85	0.122	< 0.009 U1	< 0.002 U1	6.02	0.06 J1	< 0.1 U1
1/24/2019	Background	0.15	3.97	168	< 0.02 U1	< 0.01 U1	0.08 J1	0.159	1.164	0.59	0.06 J1	0.02 J1	< 0.002 U1	5.62	0.04 J1	< 0.1 U1
2/18/2019	Background	0.1 J1	4.21	78.8	< 0.02 U1	< 0.01 U1	0.2 J1	0.050	0.419	0.81	0.110	0.01 J1	< 0.002 U1	4.74	0.03 J1	< 0.1 U1



**Table 1. Groundwater Data Summary: MW-1807A**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/26/2018	Background	0.170	146	9.57	0.21	7.5	334	929
8/28/2018	Background	0.137	136	11.8	0.21	6.9	356	953
10/4/2018	Background	0.129	166	12.5	0.16	6.7	367	985
10/24/2018	Background	0.199	144	10.3	0.20	6.9	308	838
11/14/2018	Background	0.175	155	10.5	0.21	6.8	326	904
12/20/2018	Background	0.208	151	9.68	0.19	7.2	315	931
1/25/2019	Background	0.183	156	11.3	0.15	8.2	361	876
2/21/2019	Background	0.08 J1	150	12.0	0.14	7.2	396	1,050
3/14/2019	Detection	0.09 J1	160	11.1	0.15	6.7	363	1,020
11/11/2019	Detection	0.074	173	11.9	0.13	6.9	392	1,070
5/12/2020	Detection	0.088	159	10.8	0.12	6.7	358	1,040
10/28/2020	Detection	0.069	170	12.4	0.13	7.0	392	1,020
5/6/2021	Detection	0.082	153	10.2	0.17	6.8	328	936
11/11/2021	Detection	0.106	166	9.90	0.15	6.9	336	960
5/26/2022	Detection	0.089	164 M1, P3	10.9	0.15	6.8	363	1,020 L1
10/31/2022	Detection	--	--	--	--	6.9	--	--
11/1/2022	Detection	0.2 J1	164	10.3	0.15	--	333	1,000
6/1/2023	Detection	< 0.1 U1	159	11.5	0.12	6.6	391	1,050
10/25/2023	Detection	0.13 M1, J1	154 M1	9.69	0.16	6.9	291	880
5/15/2024	Detection	0.07 J1	159	11.8	0.14	6.7	383	1,040
10/17/2024	Detection	0.076	126	11.9	0.14	6.8	374	980

**Table 1. Groundwater Data Summary: MW-1807A**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/26/2018	Background	0.13	0.99	32.6	0.006 J1	0.02	0.098	0.629	1.366	0.21	0.046	0.020	< 0.002 U1	1.65	0.3	0.03 J1
8/28/2018	Background	0.87	1.13	32.6	0.005 J1	0.06	0.253	0.565	1.507	0.21	0.300	0.018	0.002 J1	9.07	0.6	0.054
10/4/2018	Background	0.14	1.10	30.1	< 0.02 U1	0.05 J1	0.205	0.918	1.127	0.16	0.142	< 0.009 U1	< 0.002 U1	11.1	0.2 J1	< 0.1 U1
10/24/2018	Background	0.18	0.84	27.8	< 0.02 U1	0.03 J1	0.2 J1	0.579	0.38891	0.20	0.105	0.02 J1	< 0.002 U1	2 J1	0.2 J1	< 0.1 U1
11/14/2018	Background	0.17	0.96	28.8	< 0.02 U1	0.03 J1	0.09 J1	0.614	0.985	0.21	0.09 J1	0.01 J1	< 0.002 U1	2 J1	0.2	< 0.1 U1
12/20/2018	Background	0.17	0.94	29.5	< 0.02 U1	0.03 J1	0.403	0.616	1.016	0.19	0.251	0.02 J1	< 0.002 U1	1 J1	0.3	< 0.1 U1
1/25/2019	Background	0.12	0.92	27.4	< 0.02 U1	0.03 J1	0.1 J1	0.733	1.269	0.15	0.126	0.030	< 0.002 U1	1 J1	0.1 J1	< 0.1 U1
2/21/2019	Background	0.08 J1	0.82	24.1	< 0.02 U1	0.03 J1	0.1 J1	0.811	0.735	0.14	0.118	0.01 J1	< 0.002 U1	0.6 J1	0.1 J1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1807B***Geosyntec Consultants, Inc.***Amos - FAP****Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/26/2018	Background	0.195	8.76	8.46	0.75	8.3	218	732
8/28/2018	Background	0.178	8.39	10.8	1.13	8.1	219	706
10/5/2018	Background	0.201	9.21	9.94	1.01	7.9	219	752
10/24/2018	Background	0.176	8.92	7.93	0.81	8.3	220	735
11/14/2018	Background	0.211	8.87	8.52	0.91	7.7	230	732
12/20/2018	Background	0.164	11.6	9.88	1.16	8.2	230	738
1/25/2019	Background	0.277	9.33	7.68	0.79	6.9	227	742
2/21/2019	Background	0.168	11.0	9.53	1.06	8.4	238	791
3/14/2019	Detection	0.163	12.7	10.8	1.19	7.9	249	793
11/11/2019	Detection	0.189	12.7	13.3	1.40	8.0	247	807
5/13/2020	Detection	0.170	8.70	10.5	1.13	7.7	224	783
11/2/2020	Detection	0.079	168	10.9	0.18	6.7	343	1,020
5/11/2021	Detection	0.182	8.93	12.3	1.46	7.8	193	787
11/11/2021	Detection	0.189	9.21	14.7	1.78	8.0	179	780
5/25/2022	Detection	0.208	9.77	14.9	1.73	7.8	176	780 L1
10/27/2022	Detection	0.194	10.0	13.3	1.42	7.7	192	770
6/1/2023	Detection	0.19 J1	7.46	13.2	1.77	7.9	162	760
10/24/2023	Detection	0.2 J1	9.3	12.1	1.78	7.9	153	790 S7
5/14/2024	Detection	0.2 J1	7.5	11.2	1.86	7.8	147	710
10/15/2024	Detection	0.2 J1	8.1	10.4	1.77	8.0	146	750

Table 1. Groundwater Data Summary: MW-1807B

Amos - FAP

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/26/2018	Background	0.27	1.93	49.6	0.049	0.01 J1	1.40	0.525	0.719	0.75	0.756	0.021	< 0.002 U1	4.22	0.3	0.03 J1
8/28/2018	Background	0.23	1.94	56.3	< 0.004 U1	< 0.005 U1	0.134	0.046	1.310	1.13	0.035	0.010	< 0.002 U1	23.9	0.08 J1	0.01 J1
10/5/2018	Background	0.15	1.70	59.6	0.03 J1	< 0.01 U1	0.263	0.179	2.079	1.01	0.310	< 0.009 U1	< 0.002 U1	12.5	0.2 J1	< 0.1 U1
10/24/2018	Background	0.25	1.26	42.3	< 0.02 U1	< 0.01 U1	0.381	0.139	0.305	0.81	0.203	0.02 J1	< 0.002 U1	5.59	0.07 J1	< 0.1 U1
11/14/2018	Background	0.16	1.28	41.4	< 0.02 U1	< 0.01 U1	0.247	0.073	0.348	0.91	0.08 J1	0.02 J1	< 0.002 U1	5.62	0.05 J1	< 0.1 U1
12/20/2018	Background	0.43	1.75	73.7	< 0.02 U1	< 0.01 U1	0.335	0.114	0.2672	1.16	0.145	0.02 J1	< 0.002 U1	13.5	0.1 J1	< 0.1 U1
1/25/2019	Background	0.09 J1	1.23	43.0	< 0.02 U1	< 0.01 U1	0.08 J1	0.05 J1	1.003	0.79	0.04 J1	0.02 J1	< 0.002 U1	4.21	0.06 J1	< 0.1 U1
2/21/2019	Background	0.35	1.48	66.9	< 0.02 U1	< 0.01 U1	0.1 J1	0.051	0.291	1.06	0.04 J1	< 0.009 U1	< 0.002 U1	9.27	0.08 J1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1808A**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/25/2018	Background	0.182	40.4	19.6	0.52	7.7	184	734
8/28/2018	Background	0.142	38.5	19.4	0.57	7.6	227	740
10/4/2018	Background	0.135	38.6	16.7	0.41	7.4	216	790
10/24/2018	Background	0.103	41.5	17.1	0.55	7.7	126	614
11/13/2018	Background	0.152	40.2	18.4	0.51	7.4	210	770
12/20/2018	Background	0.172	40.3	21.6	0.47	7.6	242	834
1/25/2019	Background	0.173	47.4	18.3	0.40	6.1	231	840
2/21/2019	Background	0.122	39.4	17.4	0.40	7.2	213	821
3/14/2019	Detection	0.112	62.9	20.9	0.33	7.7	290	912
11/11/2019	Detection	0.131	29.3	17.1	0.45	7.6	235	887
5/13/2020	Detection	0.124	69.6	23.3	0.29	7.0	321	1,010
11/3/2020	Detection	0.119	54.3	25.6	0.44	7.2	300	1,050
5/7/2021	Detection	0.152	28.7	25.0	0.53	7.2	276	1,070
11/11/2021	Detection	0.126	50.1	19.4	0.48	7.1	221	840
5/25/2022	Detection	0.143	76.7	31.9	0.33	7.1	352	1,100 L1
10/28/2022	Detection	0.158	71.8	30.7	0.31	7.0	380	1,140
6/1/2023	Detection	0.14 J1	34.2	27.6	0.38	7.2	274	980
10/19/2023	Detection	0.11 J1	47.2	17.5	0.34	7.3	165	700
5/14/2024	Detection	0.076	45.2	18.9	0.28	7.5	152	600
10/15/2024	Detection	0.103	46.9	15.4	0.38	7.5	166	770

**Table 1. Groundwater Data Summary: MW-1808A**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/25/2018	Background	0.29	2.47	86.2	0.299	0.007 J1	0.831	0.544	1.892	0.52	2.28	0.024	0.006	6.46	0.5	0.04 J1
8/28/2018	Background	0.14	5.34	105	0.251	0.01 J1	1.25	0.821	4.96	0.57	2.06	0.025	0.005 J1	11.7	0.4	0.083
10/4/2018	Background	0.14	2.84	78.1	0.05 J1	< 0.01 U1	0.500	0.231	2.082	0.41	0.392	< 0.009 U1	< 0.002 U1	4.56	0.07 J1	< 0.1 U1
10/24/2018	Background	0.03 J1	1.86	86.2	0.05 J1	< 0.01 U1	0.443	0.117	1.040	0.55	0.397	0.02 J1	< 0.002 U1	3.06	0.07 J1	< 0.1 U1
11/13/2018	Background	0.04 J1	3.83	74.1	0.03 J1	< 0.01 U1	0.381	0.160	0.470	0.51	0.245	0.02 J1	0.002 J1	2.75	0.05 J1	< 0.1 U1
12/20/2018	Background	0.05 J1	4.37	71.0	0.04 J1	< 0.01 U1	0.293	0.119	1.048	0.47	0.227	0.03 J1	0.003 J1	2 J1	0.08 J1	< 0.1 U1
1/25/2019	Background	0.06 J1	2.27	80.3	0.102	< 0.01 U1	0.415	0.149	2.76	0.40	0.717	0.035	< 0.002 U1	1 J1	0.2 J1	< 0.1 U1
2/21/2019	Background	0.02 J1	1.99	78.9	0.05 J1	< 0.01 U1	0.213	0.076	0.535	0.40	0.316	0.01 J1	< 0.002 U1	1 J1	0.09 J1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1809A***Geosyntec Consultants, Inc.***Amos - FAP****Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/26/2018	Background	0.085	173	26.1	0.16	7.2	386	1,020
8/28/2018	Background	0.091	179	28.8	0.17	7.1	386	1,020
10/3/2018	Background	0.09 J1	191	26.8	0.14	7.1	388	1,070
10/23/2018	Background	0.114	181	26.6	0.14	7.1	390	1,050
11/14/2018	Background	0.09 J1	188	28.4	0.16	7.2	403	1,050
12/19/2018	Background	0.06 J1	182	27.7	0.15	7.0	384	1,040
1/25/2019	Background	0.08 J1	188	28.1	0.14	5.1	390	1,080
2/20/2019	Background	0.08 J1	184	30.2	0.14	7.2	403	1,080
3/12/2019	Detection	0.05 J1	189	31.0	0.14	7.2	396	1,090
11/8/2019	Detection	0.096	195	37.6	0.15	7.0	393	1,110
5/13/2020	Detection	0.081	179	34.9	0.11	7.3	400	1,100
11/5/2020	Detection	0.055	196	33.8	0.13	6.9	391	1,100
5/6/2021	Detection	0.062	182	34.8	0.14	7.1	384	1,090
11/11/2021	Detection	0.063	195	36.6	0.11	7.0	391	1,090
5/24/2022	Detection	0.071	202	36.6	0.12	7.0	375	1,080 L1
10/28/2022	Detection	0.058	203	39.3	0.12	6.9	409	1,090
5/31/2023	Detection	0.071	180	37.5	0.11	7.0	384	1,060
10/19/2023	Detection	0.052	176	35.1	0.11	7.0	391	1,060
5/9/2024	Detection	0.056	194	34.7	0.11	7.1	373	1,050
10/15/2024	Detection	0.07 J1	176	34.3	0.11	7.1	372	1,060

**Table 1. Groundwater Data Summary: MW-1809A**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/26/2018	Background	0.05	2.30	60.2	0.004 J1	< 0.005 U1	0.119	0.555	1.561	0.16	0.035	0.020	< 0.002 U1	7.18	0.04 J1	0.01 J1
8/28/2018	Background	0.03 J1	2.83	67.3	0.004 J1	< 0.005 U1	0.200	0.754	1.193	0.17	0.01 J1	0.024	< 0.002 U1	3.01	0.06 J1	0.02 J1
10/3/2018	Background	0.03 J1	2.87	61.4	< 0.02 U1	< 0.01 U1	0.1 J1	0.533	4.22	0.14	< 0.02 U1	< 0.009 U1	< 0.002 U1	2.27	0.05 J1	< 0.1 U1
10/23/2018	Background	< 0.02 U1	2.59	53.0	< 0.02 U1	< 0.01 U1	0.09 J1	0.424	1.501	0.14	< 0.02 U1	0.043	< 0.002 U1	2 J1	0.03 J1	< 0.1 U1
11/14/2018	Background	< 0.02 U1	3.10	58.0	< 0.02 U1	< 0.01 U1	0.08 J1	0.447	1.717	0.16	< 0.02 U1	0.01 J1	< 0.002 U1	2 J1	< 0.03 U1	< 0.1 U1
12/19/2018	Background	< 0.02 U1	3.51	63.4	< 0.02 U1	< 0.01 U1	0.212	0.504	1.417	0.15	< 0.02 U1	0.032	< 0.002 U1	2.88	< 0.03 U1	< 0.1 U1
1/25/2019	Background	< 0.02 U1	3.39	57.2	< 0.02 U1	< 0.01 U1	0.06 J1	0.375	2.99	0.14	< 0.02 U1	0.046	< 0.002 U1	2 J1	< 0.03 U1	< 0.1 U1
2/20/2019	Background	< 0.1 U1	4.57	64.5	< 0.1 U1	< 0.05 U1	< 0.2 U1	0.559	1.56	0.14	< 0.1 U1	0.038	< 0.002 U1	2 J1	< 0.2 U1	< 0.5 U1



**Table 1. Groundwater Data Summary: MW-1810A**

*Geosyntec Consultants, Inc.*

**Amos - FAP**

**Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
7/26/2018	Background	0.220	23.0	--	--	--	--	--
8/2/2018	Background	--	--	23.4	0.93	7.4	170	565
8/27/2018	Background	0.271	25.9	21.6	0.93	7.5	129	525
10/3/2018	Background	0.245	28.0	19.0	0.89	7.3	114	542
10/24/2018	Background	0.211	23.7	18.6	0.86	7.7	93.1	473
11/13/2018	Background	0.238	30.2	19.5	1.04	7.3	160	544
12/20/2018	Background	0.210	30.1	17.0	0.98	7.1	160	548
1/23/2019	Background	0.319	24.8	16.3	0.90	7.5	112	494
2/20/2019	Background	0.245	32.3	15.4	1.01	7.4	170	580
3/12/2019	Detection	0.228	30.5	15.4	1.00	7.3	153	548
11/8/2019	Detection	0.249	44.5	15.2	0.94	7.1	256	692
5/12/2020	Detection	0.226	67.5	17.2	0.78	7.4	379	993
11/3/2020	Detection	0.194	53.7	15.8	0.91	7.0	341	802
5/6/2021	Detection	0.207	64.0	17.3	0.87	7.2	373	935
11/11/2021	Detection	0.230	59.3	15.4	0.83	7.2	283	770
5/24/2022	Detection	0.230	87.1	17.6	0.80	7.1	386	940 L1
10/28/2022	Detection	0.210	52.4 M1	15.7	0.88	7.3	270	730
5/31/2023	Detection	0.213	60.6	15.5	0.91	7.1	295	790
10/19/2023	Detection	0.212	43.5	14.0	0.81	7.3	200	640
5/9/2024	Detection	0.214	55.9	14.2	0.90	7.3	261	720
10/15/2024	Detection	0.24 J1	52.3	14.3	0.84	7.4	253	720

**Table 1. Groundwater Data Summary: MW-1810A**

**Amos - FAP**

**Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
7/26/2018	Background	0.13	0.88	124	0.009 J1	< 0.005 U1	0.442	0.150	0.382	--	0.149	0.018	< 0.002 U1	9.26	0.06 J1	0.051
8/2/2018	Background	--	--	--	--	--	--	--	--	0.93	--	--	--	--	--	--
8/27/2018	Background	0.10	0.51	83.4	< 0.004 U1	< 0.005 U1	0.229	0.048	0.842	0.93	0.057	0.015	< 0.002 U1	8.52	0.04 J1	0.02 J1
10/3/2018	Background	0.11	0.49	83.0	< 0.02 U1	< 0.01 U1	0.2 J1	0.03 J1	1.218	0.89	0.09 J1	< 0.009 U1	< 0.002 U1	7.06	0.05 J1	< 0.1 U1
10/24/2018	Background	0.07 J1	0.54	88.5	< 0.02 U1	< 0.01 U1	0.1 J1	0.02 J1	0.992	0.86	0.03 J1	0.02 J1	< 0.002 U1	6.28	0.04 J1	< 0.1 U1
11/13/2018	Background	0.09 J1	0.40	83.5	< 0.02 U1	< 0.01 U1	0.1 J1	0.02 J1	0.24	1.04	0.04 J1	< 0.009 U1	< 0.002 U1	6.03	0.03 J1	< 0.1 U1
12/20/2018	Background	0.08 J1	0.43	87.9	< 0.02 U1	< 0.01 U1	0.1 J1	0.03 J1	0.5648	0.98	0.05 J1	0.02 J1	< 0.002 U1	5.24	0.03 J1	< 0.1 U1
1/23/2019	Background	0.07 J1	0.45	84.2	< 0.02 U1	< 0.01 U1	0.08 J1	0.02 J1	0.768	0.90	0.03 J1	0.01 J1	< 0.002 U1	5.94	0.03 J1	< 0.1 U1
2/20/2019	Background	< 0.1 U1	0.4 J1	87.8	< 0.1 U1	< 0.05 U1	0.3 J1	< 0.1 U1	0.65	1.01	0.1 J1	0.02 J1	< 0.002 U1	4 J1	< 0.2 U1	< 0.5 U1

**Table 1. Groundwater Data Summary  
Amos - Fly Ash Pond**

*Geosyntec Consultants, Inc.*

Notes:

1. Combined radium values were calculated from the sum of the reported radium-226 and radium-228 results.

Radium data quality flags were not included. Reported negative radium-226 or radium-228 results were replaced with zero.

--: Not analyzed

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

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

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

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

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

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

mg/L: milligrams per liter

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

pCi/L: picocuries per liter

S7: Sample did not achieve constant weight.

SU: standard unit

µg/L: micrograms per liter

## APPENDIX 2

The statistical analysis reports completed in 2024 follow.

## Memorandum

Date: March 22, 2024

To: David Miller (AEP)

Copies to: Marie Gildow (AEP)

From: Allison Kreinberg (Geosyntec)

Subject: Evaluation of Detection Monitoring Data at  
Amos Plant's Fly Ash Pond (FAP)

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In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257 Subpart D, "CCR rule"), the second semiannual detection monitoring event of 2023 at the Fly Ash Pond (FAP), an existing inactive CCR unit at the Amos Power Plant located in Winfield, West Virginia, was completed on October 18-19, 2023. Based on these results, verification sampling was completed on January 24, 2024.

Background values for the FAP were originally calculated in March 2020 and have been periodically updated as sufficient data becomes available. After a minimum of four additional detection monitoring events, the results of those events were compared to the existing background, and the background dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the most recent calculation of the revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated February 29, 2024.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is concluded only if both samples in a series of two exceed the UPL (or are below the LPL for pH). In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1. No SSIs were observed at the Amos FAP CCR unit, and as a result the Amos FAP will remain in detection monitoring.

The statistical analysis was conducted within 90 days of completion of sampling and analysis in accordance with 40 CFR 257.93(h)(2). A certification of these statistics by a qualified professional engineer is provided in Attachment A.

**Table 1. Detection Monitoring Data Evaluation  
Detection Monitoring Memorandum  
Amos Plant – Fly Ash Pond**

Analyte	Unit	Description	MW-1	MW-2		MW-5	MW-6	MW-7	MW-8	MW-9	MW-1801A	MW-1804A	MW-1806A
			10/18/2023	10/19/2023	1/24/2024	10/19/2023	10/19/2023	10/19/2023	10/19/2023	10/19/2023	10/19/2023	10/19/2023	10/19/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.144	0.330		0.316	0.131	0.142	0.284	0.166	0.392	0.918	0.205
		Analytical Result	0.101	0.22	--	0.151	0.073	0.05	0.171	0.12	0.147	0.82	0.120
Calcium	mg/L	Intrawell Background Value (UPL)	3.18	5.14		21.0	66.9	2.05	2.79	1.44	69.1	16.8	18.1
		Analytical Result	2.59	<b>5.16</b>	4.61	14.9	47.3	1.68	2.25	1.03	56.8	7.08	3.02
Chloride	mg/L	Intrawell Background Value (UPL)	14.6	482		866	19.0	5.64	115	7.84	11.3	14.3	18.1
		Analytical Result	10.1	455	--	612	13.0	5.34	108	6.89	7.49	12.5	14.2
Fluoride	mg/L	Intrawell Background Value (UPL)	0.521	3.40		3.67	0.320	0.320	3.20	0.963	0.166	1.03	0.989
		Analytical Result	0.46	3.08	--	2.84	0.27	0.24	2.88	0.89	0.1	0.76	0.84
pH	SU	Intrawell Background Value (UPL)	8.5	8.7		8.3	7.2	9.1	9.3	9.8	8.0	8.5	9.5
		Intrawell Background Value (LPL)	7.9	7.5		7.8	6.6	8.2	7.4	6.3	6.5	7.3	7.5
		Analytical Result	8.2	8.4	--	8.1	6.9	8.5	8.4	9.0	7.2	7.7	8.7
Sulfate	mg/L	Intrawell Background Value (UPL)	35.2	22.8		49.0	48.2	33.2	36.6	28.5	57.5	91.5	53.3
		Analytical Result	32.3	4.6	--	37.9	35.3	30.1	21.0	11.8	34.9	68.8	41.2
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	478	1,340		1,950	433	414	749	515	428	606	481
		Analytical Result	410	1,300	--	1,620	350	390	690	430	330	590	450

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

## ATTACHMENT A

Certification by a Qualified Professional Engineer



**CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER**

I certify that the selected statistical method, described above and in the February 29, 2024 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Amos FAP CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

David Anthony Miller

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Printed Name of Licensed Professional Engineer



*David Anthony Miller*

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Signature

22663

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License Number

West Virginia

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Licensing State

03.23.2024

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Date

## Memorandum

Date: October 16, 2024

To: David Miller (AEP)

Copies to: Marie Gildow (AEP)

From: Allison Kreinberg (Geosyntec)

Subject: Evaluation of Detection Monitoring Data at  
Amos Plant's Fly Ash Pond (FAP)

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In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257 Subpart D, "CCR rule"), the first semiannual detection monitoring event of 2024 at the Fly Ash Pond (FAP), an existing inactive CCR unit at the Amos Power Plant located in Winfield, West Virginia, was completed on May 10-14, 2024. Based on these results, verification sampling was completed on July 16, 2024.

Background values for the FAP were originally calculated in March 2020 and have been periodically updated as sufficient data becomes available. After a minimum of four additional detection monitoring events, the results of those events were compared to the existing background, and the background dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the most recent calculation of the revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated February 29, 2024.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is concluded only if both samples in a series of two exceed the UPL (or are below the LPL for pH). In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1. No SSIs were observed at the Amos FAP CCR unit, and as a result the Amos FAP will remain in detection monitoring.

The statistical analysis was conducted within 90 days of completion of sampling and analysis in accordance with 40 CFR 257.93(h)(2). A certification of these statistics by a qualified professional engineer is provided in Attachment A.

**Table 1. Detection Monitoring Data Evaluation  
Detection Monitoring Memorandum  
Amos Plant – Fly Ash Pond**

Analyte	Unit	Description	MW-1	MW-2	MW-5	MW-6	MW-7	MW-8	MW-9		MW-1801A	MW-1804A	MW-1806A
			5/10/2024	5/13/2024	5/10/2024	5/10/2024	5/14/2024	5/14/2024	5/14/2024	7/16/2024	5/14/2024	5/10/2024	5/14/2024
Boron	mg/L	Intrawell Background Value (UPL)	0.144	0.330	0.316	0.131	0.142	0.284	0.166		0.392	0.918	0.205
		Analytical Result	0.103	0.21	0.189	0.072	0.056	0.18	0.12	--	0.064	0.9	0.13
Calcium	mg/L	Intrawell Background Value (UPL)	3.18	5.14	21.0	66.9	2.05	2.79	1.44		69.1	16.8	18.1
		Analytical Result	2.67	4.7	9.01	53.2	1.63	2.3	1.1	--	59.9	6.4	3.5
Chloride	mg/L	Intrawell Background Value (UPL)	14.6	482	866	19.0	5.64	115	7.84		11.3	14.3	18.1
		Analytical Result	10.3	453	720	12.3	5.54	110	7.67	--	6.84	9.14	14.3
Fluoride	mg/L	Intrawell Background Value (UPL)	0.521	3.40	3.67	0.320	0.320	3.20	0.963		0.166	1.03	0.989
		Analytical Result	0.46	3.05	3.16	0.27	0.24	2.94	<b>0.99</b>	0.91	0.09	0.75	0.83
pH	SU	Intrawell Background Value (UPL)	8.5	8.7	8.3	7.2	9.1	9.3	9.8		8.0	8.5	9.5
		Intrawell Background Value (LPL)	7.9	7.5	7.8	6.6	8.2	7.4	6.3		6.5	7.3	7.5
		Analytical Result	8.3	8.6	8.1	7.0	8.8	8.3	8.8	--	7.0	7.8	8.7
Sulfate	mg/L	Intrawell Background Value (UPL)	35.2	22.8	49.0	48.2	33.2	36.6	28.5		57.5	91.5	53.3
		Analytical Result	32.4	6.9	3.1	34.9	30.3	20.9	17.4	--	29.4	56.4	42.7
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	478	1,340	1,950	433	414	749	515		428	606	481
		Analytical Result	420	1,300	1,740	340	390	700	480	--	310	540	460

Notes:

1. **Bold values exceed the background value.**

2. Background values are shaded gray.

--: not sampled

LPL: lower prediction limit

mg/L: milligrams per liter

SU: standard units

UPL: upper prediction limit

## ATTACHMENT A

Certification by a Qualified Professional Engineer

**CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER**

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David Anthony Miller

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Printed Name of Licensed Professional Engineer



*David Anthony Miller*

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Signature

22663

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License Number

West Virginia

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Licensing State

10.18.2024

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Date

**APPENDIX 3**

Not Applicable.

**APPENDIX 4**

Not applicable.



**APPENDIX 5**

Not applicable.