Annual Groundwater Monitoring Report

Appalachian Power Company

Mountaineer Plant

Landfill CCR Unit

Letart, WV

January 31, 2026

Prepared by:
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APPALACHIAN POWER℠

An AEP Company

BOUNDLESS ENERGY℠

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Abbreviations:
ASD – Alternate Source Demonstration
AEP – American Electric Power
CCR – Coal Combustion Residual
GWPS – Groundwater protection standards
U.S. EPA – United States Environmental Protection Agency
MTLF – Mountaineer Landfill
PE – Professional Engineer
SSI – Statistically Significant Increase

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 the landfill CCR unit at Appalachian Power Company's, a wholly owned subsidiary of American Electric Power Company (AEP), Mountaineer Power Plant. The U.S. EPA's CCR rules require that the Annual Groundwater Monitoring and Corrective Action Report be posted to the operating record for the preceding year no later than January 31st.

In general, the following activities were completed during this reporting period:

- At the start of the current annual reporting period, the Mountaineer Landfill (MTLF) was operating under the detection monitoring program in §257.94.
- At the end of the current annual reporting period, the MTLF was operating under the detection monitoring program in §257.94.
- Data and statistical analysis not available for the previous reporting period indicates that during the October 2024 semi-annual sampling event there were no confirmed statistical increases.
- Statistical analysis for data collected during the May 2025 semi-annual sampling event and the July 2025 resampling event identified the following SSIs over the background:
    - Chloride at; MW-1611.
- The data collected for the October 2025 semi-annual sampling event and the December 2025 resampling event are still undergoing statistical analysis and will be completed in 2026.
- An alternate source demonstration (ASD) was successfully completed and certified for the SSI identified for chloride at MW-1611.

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

- A map, aerial photograph or a drawing showing the MTLF, all groundwater monitoring wells and monitoring well identification numbers (**Figure 1**).
- All 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 comparison of monitoring data to determine if there have been SSIs over background concentrations (**Appendix 2**).

- A discussion of whether any alternate source demonstrations were performed, and the conclusions (**Appendix 3**).
- A summary of any transition between monitoring program, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring (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 (Appendix 5).

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. The groundwater quality monitoring network includes the following:

- Two upgradient wells: MW-1612 and MW-30; and
- Five downgradient wells: MW-1611, MW-26, MW-27, MW-38, and MW-39.

III. Monitoring Wells Installed or Decommissioned

There were no monitoring wells installed or decommissioned during this annual reporting period. The network design, as summarized in the *Groundwater Monitoring Network Design Report* (2016) and as posted at the CCR web site for Mountaineer Plant, did not change. That design report, viewable on the AEP CCR web site, discusses the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, downgradient monitoring well locations and the upgradient monitoring well locations.

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

Appendix 1 contains tables showing the groundwater quality data collected since background through data received during this annual reporting period. Static water elevation data, and groundwater flow direction from each monitoring event are shown in the Figures located in **Appendix 1**, the groundwater velocity calculations are presented in a table.

V. Groundwater Quality Data Statistical Analysis

The statistical analysis reports for this reporting period are included in **Appendix 2**.

- Data and statistical analysis not available for the previous reporting period indicates that during the October 2024 semi-annual sampling event there were no confirmed statistical increases.

- Statistical analysis for data collected during the May 2025 semi-annual sampling event and the July 2025 resampling event identified the following SSIs over the background:

    - Chloride at; MW-1611.

- The data collected for the October 2025 semi-annual sampling event and the December 2025 resampling event are still undergoing statistical analysis and will be completed in 2026.

The background groundwater standards were last updated in January 2025 and the background update calculations report was included in last year's (January 31, 2025) annual groundwater monitoring report.

VI. Alternative Source Demonstrations

A successful ASD was completed and certified for the chloride exceedance at MW-1611 from the first semiannual monitoring event of 2025 (May 2025) and is included in **Appendix 3**.

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

No transition between monitoring requirements occurred at Mountaineer Landfill, and the groundwater velocity and monitoring well production continued to be high enough at this facility that no modification of the twice-per-year detection monitoring effort was needed.

VIII. Other Information Required

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

IX. Description of Any Problems Encountered and Actions Taken

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

X. A Projection of Key Activities for the Upcoming Year

- Complete the statistical analysis of the data collected during the second semi-annual monitoring event that took place in during the 2H2025.
- Complete detection monitoring on a twice per year schedule.
- Evaluation of the detection monitoring results from a statistical analysis viewpoint, looking for any statistically significant increases, or decreases when pH is considered.
- Responding to any new data received considering what the CCR rule requires.
- Preparation of the next annual groundwater report.

Groundwater Monitoring Network Figure

Monitoring Well Network

- Downgradient Sampling Location
- Background Sampling Location
- Landfill

Notes

- Monitoring well coordinates provided by AEP.
- Site features based on information available in Little Broad Run Landfill-CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016) provided by AEP.

750 375 0 750 Feet

Site Layout
CCR Landfill

AEP Mountaineer Generating Plant
Letart, West Virginia

Geosyntec consultants

Columbus, Ohio | 2018/01/26

Figure **1**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Mountaineer\AEP-Mountaineer_LF_Site_Layout.mxd. ARevezzo. 1/26/2018. CHA8423/07/08.

APPENDIX 1

Tables and figures follow that show the groundwater monitoring data collected and rate and direction of groundwater flow. The dates that the samples were collected are also shown.

Table 1. Groundwater Data Summary: MW-26
Mountaineer - LF
Appendix III Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.097	61.5	5.57	0.12	7.5	9.6	322
11/01/2016	Background	0.117	50.5	5.17	0.13	7.4	10.6	270
12/21/2016	Background	0.074	48.6	5.21	0.13	7.6	10.2	316
2/22/2017	Background	0.145	56.2	5.35	0.13	7.4	6.5	325
3/28/2017	Background	0.222	52.9	6.25	0.13	7.4	7.3	334
4/17/2017	Background	0.169	57.1	5.73	0.13	7.3	6.7	320
5/17/2017	Background	0.161	58.6	5.87	0.13	8.1	6.5	343
6/13/2017	Background	0.121	53.7	5.00	0.12	7.4	5.3	324
10/31/2017	Detection	0.165	54.7	5.48	0.13	7.5	5.8	346
1/22/2018	Detection	--	55.7	--	--	7.3	--	--
9/20/2018	Detection	0.214	49.4	6.04	0.16	8.0	6.3	344
11/26/2018	Detection	0.182	53.6	5.97	0.14	7.4	7.2	364
4/09/2019	Detection	0.128	62.8	6.71	0.13	7.3	7.6	370
6/18/2019	Detection	--	--	7.22	--	7.2	--	387
9/09/2019	Detection	0.099	60.2	5.80	0.14	7.4	5.7	353
7/08/2020	Detection	--	--	--	--	7.4	--	366
10/08/2020	Detection	0.103	51.2	5.74	0.16	6.9	6.4	344
1/04/2021	Detection	--	--	--	--	7.5	--	--
5/13/2021	Detection	0.110	60.2	6.56	0.15	7.2	8.5	378
11/03/2021	Detection	0.091	57.5	5.50	0.14	7.1	5.20	340
3/04/2022	Detection	--	--	--	--	7.5	--	--
5/23/2022	Detection	0.099	64.8	5.97	0.13	7.5	7.90	370 L1
7/25/2022	Detection	--	61.8	--	--	7.7	--	--
11/10/2022	Detection	0.103	58.5	5.69	0.13	7.2	6.58	370
5/23/2023	Detection	0.090	57.1 M1	6.05	0.12	7.2	8.1	370
10/26/2023	Detection	0.087	57.0	5.04	0.12	7.1	6.3	350
5/20/2024	Detection	0.097	63.0 M1	5.80	0.12	7.1	6.9	370
10/02/2024	Detection	0.113	57.6	5.73	0.13	7.3	6.3	380
5/27/2025	Detection	0.113	66.1	6.40	0.15	7.4	9.5	360
10/22/2025	Detection	0.102	63.5	5.91	0.13	7.3	8.20	360

Table 1. Groundwater Data Summary: MW-26
Mountaineer - LF
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.13	3.57	917	< 0.005 U1	0.01 J1	0.4	0.214	3.25	0.12	0.165	0.010	< 0.002 U1	1.88	0.1	0.03 J1
11/01/2016	Background	0.11	4.06	871	< 0.005 U1	0.005 J1	0.3	0.220	3.57	0.13	0.043	0.006	< 0.002 U1	3.07	0.1	0.02 J1
12/21/2016	Background	0.12	4.51	872	0.01 J1	0.006 J1	1.27	0.329	3.15	0.13	0.167	0.004	< 0.002 U1	3.52	0.2	0.062
2/22/2017	Background	0.09	4.11	717	0.01 J1	0.01 J1	0.731	0.345	3.60	0.13	0.244	0.012	< 0.002 U1	2.53	0.1	0.04 J1
3/28/2017	Background	0.50	3.95	886	0.028	0.01 J1	1.43	0.532	2.88	0.13	0.517	0.014	< 0.002 U1	1.18	0.2	0.03 J1
4/17/2017	Background	0.09	3.60	802	0.007 J1	0.007 J1	0.328	0.299	1.967	0.13	0.164	0.009	< 0.002 U1	1.08	0.1 J1	0.01 J1
5/17/2017	Background	0.06	4.01	869	< 0.004 U1	0.007 J1	0.238	0.251	3.22	0.13	0.090	0.007	< 0.002 U1	3.99	0.1	0.01 J1
6/13/2017	Background	0.10	3.45	905	0.008 J1	0.008 J1	0.405	0.325	3.28	0.12	0.252	0.018	< 0.002 U1	1.23	0.1	0.01 J1

Table 1. Groundwater Data Summary: MW-27
Mountaineer - LF
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.276	18.9	1.82	2.23	9.2	4.9	618
11/01/2016	Background	0.288	1.57	1.86	2.38	9.1	7.2	558
12/21/2016	Background	0.219	1.39	1.69	2.44	9.2	7.3	528
2/22/2017	Background	0.282	1.42	1.48	2.27	9.1	4.3	531
3/28/2017	Background	0.387	1.26	1.59	2.32	9.3	4.7	508
4/17/2017	Background	0.312	1.65	1.56	2.30	9.0	5.0	536
5/17/2017	Background	0.290	1.48	1.59	2.38	11.1	4.8	539
6/13/2017	Background	0.293	1.77	1.64	2.33	9.4	4.5	526
10/31/2017	Detection	0.275	1.33	1.63	2.38	9.2	4.2	544
9/20/2018	Detection	0.357	1.14	1.69	2.41	9.1	4.4	550
11/26/2018	Detection	0.292	1.20	1.52	2.37	9.0	3.6	522
4/09/2019	Detection	0.303	1.19	1.54	2.32	9.0	2.9	542
9/10/2019	Detection	0.285	1.13	1.67	2.71	9.1	3.0	530
7/08/2020	Detection	--	1.20	1.63	--	9.1	--	--
10/08/2020	Detection	0.273	1.20	1.67	2.38	8.7	3.4	541
1/04/2021	Detection	--	--	--	--	9.0	--	--
5/13/2021	Detection	0.288	1.07	1.71	2.54	8.9	3.1	541
11/03/2021	Detection	0.280	1.10	1.60	2.54	8.4	1.53	560
3/04/2022	Detection	--	--	--	--	9.3	--	--
5/23/2022	Detection	0.288	1.70	1.57	2.58	9.3	2.78	550 L1
11/10/2022	Detection	0.296	1.24	1.57	2.54	8.9	2.18	550
5/23/2023	Detection	0.272	1.18	1.48	2.58	8.8	3.0	550
10/26/2023	Detection	0.274	1.34	1.48	2.48	8.5	3.1	570
1/17/2024	Detection	--	--	--	--	9.0	--	--
5/20/2024	Detection	0.281	1.36	1.48	2.48	8.7	2.8	510
10/02/2024	Detection	0.61	1.6	1.42	2.40	9.0	2.3	530
12/09/2024	Detection	0.291	--	--	--	--	--	--
12/10/2024	Detection	--	--	--	--	8.7	--	--
5/27/2025	Detection	0.287	1.97	2.44	2.66	9.1	6.4	560
7/16/2025	Detection	--	1.62	1.75	--	9.0	--	--
10/22/2025	Detection	0.276	1.49	1.36	2.63	9.1	4.04	560

Table 1. Groundwater Data Summary: MW-27
Mountaineer - LF
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.39	8.05	326	0.654	0.11	11.6	4.95	2.565	2.23	17.3	0.016	0.004 J1	24.2	2.2	0.1 J1
11/01/2016	Background	0.26	5.42	151	0.158	0.02	5.0	0.817	2.003	2.38	4.00	0.007	< 0.002 U1	35.6	0.4	0.03 J1
12/21/2016	Background	0.23	4.26	113	0.093	0.01 J1	2.94	0.502	1.489	2.44	8.87	0.001	< 0.002 U1	34.6	0.3	0.04 J1
2/22/2017	Background	0.06	3.76	94.8	0.054	0.009 J1	1.95	0.320	1.419	2.27	1.28	0.012	0.002 J1	32.1	0.1	0.03 J1
3/28/2017	Background	0.08	4.45	105	0.062	0.008 J1	1.69	0.319	0.888	2.32	1.06	0.016	< 0.002 U1	31.5	0.2	0.02 J1
4/17/2017	Background	0.15	4.54	108	0.085	0.01 J1	2.36	0.511	0.486	2.30	1.45	0.005	0.002 J1	32.0	0.2	0.02 J1
5/17/2017	Background	0.11	4.54	94.6	0.052	0.005 J1	1.33	0.335	0.20279	2.38	0.971	0.015	< 0.002 U1	31.6	0.2	0.01 J1
6/13/2017	Background	0.18	4.55	102	0.082	0.01 J1	2.25	0.600	0.797	2.33	1.39	0.015	< 0.002 U1	30.6	0.2	0.02 J1

Table 1. Groundwater Data Summary: MW-30
Mountaineer - LF
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
10/26/2016	Background	0.239	16.6	250	3.42	8.7	31.5	--
11/02/2016	Background	0.240	10.9	257	3.41	8.6	19.6	1350
12/28/2016	Background	0.250	9.91	250	3.43	8.0	19.1	1280
2/22/2017	Background	0.257	2.76	246	3.18	8.6	11.5	1220
3/29/2017	Background	0.344	2.54	242	3.31	8.7	0.1 J1	1270
4/19/2017	Background	0.296	2.91	247	3.28	8.5	11.2	1210
5/17/2017	Background	0.269	2.97	247	1.34	10.1	4.4	1290
6/13/2017	Background	0.283	4.06	255	3.28	8.9	10.8	1170
10/31/2017	Detection	0.315	3.27	257	3.30	8.5	11.4	1210
9/20/2018	Detection	0.315	4.69	253	3.36	8.6	13.0	1230
11/26/2018	Detection	--	--	--	--	8.4	--	--
11/27/2018	Detection	0.344	3.16	247	3.40	--	11.7	1240
4/09/2019	Detection	0.290	2.88	245	3.32	8.4	10.6	1260
9/10/2019	Detection	0.259	3.39	249	3.76	8.3	9.6	1260
5/18/2020	Detection	0.271	2.95	264	3.54	8.1	10.8	1240
10/07/2020	Detection	0.249	2.93	247	2.73	8.0	10.9	1260
5/14/2021	Detection	0.259	2.63	259	3.38	8.3	9.9	1250
10/28/2021	Detection	0.261	2.80	253	3.47	8.2	8.09	1250
5/20/2022	Detection	0.289	2.94	259	3.57	8.6	10.7	1260 L1
11/09/2022	Detection	0.279	3.37	257	3.34	8.3	8.7	1100
5/25/2023	Detection	0.241	3.24	271	3.57	7.8	10.6	1250
10/30/2023	Detection	0.260	4.88	288	3.46	8.0	10.9	1320 S7
5/20/2024	Detection	0.238	3.53	254	3.46	8.1	9.6	1250
7/18/2024	Detection	0.238	3.69	269	3.46	8.5	9.2	1290
10/01/2024	Detection	0.280	4.61	254	3.40	8.6	9.1	1280
10/15/2024	Detection	--	--	--	--	8.1	--	--
5/21/2025	Detection	0.237	2.91	269	3.67	8.4	12.2	1260
10/22/2025	Detection	0.269	3.85	248	3.64	8.5	11.0	1270

Table 1. Groundwater Data Summary: MW-30
Mountaineer - LF
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/26/2016	Background	0.36	7.38	567	0.692	0.10	13.1	33.8	2.588	3.42	33.2	0.034	0.054	68.7	3.8	0.724
11/02/2016	Background	0.26	7.54	576	0.630	0.09	11.7	33.3	1.404	3.41	30.9	0.026	0.016	73.7	2.7	0.654
12/28/2016	Background	0.91	6.87	360	0.502	0.08	18.1	15.9	2.725	3.43	13.8	0.024	0.026	107	2.6	0.350
2/22/2017	Background	0.52	4.65	223	0.082	0.008 J1	3.24	2.40	2.418	3.18	1.68	0.022	0.004 J1	125	0.5	0.258
3/29/2017	Background	0.66	5.45	243	0.149	0.007 J1	6.13	4.24	1.204	3.31	3.62	0.027	0.003 J1	120	0.7	0.381
4/19/2017	Background	1.55	5.80	246	0.140	0.01 J1	5.76	3.91	3.83	3.28	3.49	0.019	0.061	123	0.7	0.365
5/17/2017	Background	0.75	6.90	241	0.120	< 0.005 U1	3.99	3.63	2.395	1.34	3.41	0.027	0.004 J1	128	0.9	0.287
6/13/2017	Background	2.74	6.86	251	0.197	0.02 J1	6.83	5.35	3.45	3.28	4.80	0.027	0.005 J1	118	0.8	0.366

Table 1. Groundwater Data Summary: MW-38
Mountaineer - LF
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/27/2016	Background	0.024	55.7	7.12	0.32	7.1	28.1	410
11/02/2016	Background	0.040	46.3	7.27	0.32	7.0	36.6	358
12/21/2016	Background	0.019	48.2	7.43	0.35	7.4	35.8	404
2/22/2017	Background	0.028	47.2	7.21	0.29	7.0	31.7	409
3/28/2017	Background	0.070	50.0	7.08	0.32	7.0	30.1	390
4/18/2017	Background	0.038	52.5	7.22	0.33	7.0	30.6	422
5/16/2017	Background	0.027	54.5	7.41	0.33	7.6	32.5	421
6/13/2017	Background	0.093	51.4	7.01	0.28	7.0	31.0	406
10/31/2017	Detection	0.045	56.1	7.59	0.38	7.0	28.7	460
1/22/2018	Detection	--	53.8	--	--	6.7	--	419
9/20/2018	Detection	0.068	51.2	7.31	0.36	7.4	31.5	441
11/26/2018	Detection	0.08 J1	48.2	7.06	0.34	7.0	35.2	415
4/09/2019	Detection	0.04 J1	52.0	7.46	0.32	6.9	27.8	427
6/18/2019	Detection	--	--	--	--	7.6	--	--
9/10/2019	Detection	0.03 J1	49.9	7.45	0.35	7.7	28.2	417
10/22/2019	Detection	--	--	--	--	6.9	--	--
5/15/2020	Detection	0.02 J1	48.3	7.59	0.38	6.7	31.4	421
10/08/2020	Detection	0.03 J1	53.4	7.68	0.47	6.8	25.5	452
5/13/2021	Detection	0.03 J1	50.9	7.51	0.43	7.1	23.2	432
10/29/2021	Detection	0.028 J1	44.6	7.26	0.37	6.9	28.7	430
5/20/2022	Detection	0.029 J1	58.8	7.51	0.39	7.2	26.7	440 L1
7/25/2022	Detection	--	53.3	--	--	7.3	--	--
11/09/2022	Detection	0.027 J1	45.4	6.85	0.33	6.9	33.4	380
5/22/2023	Detection	0.023 J1	42.2	7.30	0.36	6.9	27.5	430
10/31/2023	Detection	0.031 J1	49.5	7.25	0.38	6.9	29.5	420
5/16/2024	Detection	0.024 J1	49.3	7.34	0.39	6.8	29.7	380
10/02/2024	Detection	0.031 J1	48.4	6.88	0.31	6.9	33.5	430
5/28/2025	Detection	0.029 J1	51.1	7.47	0.40	7.0	32.1	420
10/23/2025	Detection	0.032 J1	52.2 M1	7.08	0.39	7.0	31.8	420

Table 1. Groundwater Data Summary: MW-38
Mountaineer - LF
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/27/2016	Background	0.09	9.82	221	0.023	0.03	1.0	2.72	2.229	0.32	0.442	0.002	< 0.002 U1	2.76	0.2	0.103
11/02/2016	Background	0.07	8.15	179	< 0.005 U1	0.02 J1	0.4	0.855	1.744	0.32	0.113	0.0009 J1	< 0.002 U1	2.10	0.04 J1	0.04 J1
12/21/2016	Background	0.05	6.62	162	< 0.005 U1	0.02	1.67	0.655	2.06	0.35	0.082	< 0.0002 U1	< 0.002 U1	2.50	0.06 J1	0.082
2/22/2017	Background	0.03 J1	5.74	141	< 0.005 U1	0.02	0.526	0.949	1.000	0.29	0.039	0.004	< 0.002 U1	3.37	0.03 J1	0.04 J1
3/28/2017	Background	0.05 J1	11.5	184	< 0.005 U1	0.03	0.197	0.916	0.548	0.32	0.073	0.006	< 0.002 U1	2.47	0.06 J1	0.05 J1
4/18/2017	Background	0.04 J1	6.34	179	< 0.004 U1	0.03	0.111	2.87	0.494	0.33	0.02 J1	0.003	< 0.002 U1	2.30	< 0.03 U1	0.068
5/16/2017	Background	0.06	5.09	186	< 0.004 U1	0.03	0.093	3.66	0.536	0.33	0.01 J1	0.004	< 0.002 U1	3.76	< 0.03 U1	0.062
6/13/2017	Background	0.06	8.09	187	< 0.004 U1	0.03	0.130	2.53	1.268	0.28	0.056	0.013	< 0.002 U1	2.67	0.04 J1	0.056

Table 1. Groundwater Data Summary: MW-39
Mountaineer - LF
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/26/2016	Background	0.143	12.4	3.00	0.77	8.4	< 0.04 U1	350
11/02/2016	Background	0.134	7.88	3.05	0.83	8.4	< 0.04 U1	344
12/21/2016	Background	0.122	10.5	3.07	0.86	8.8	< 0.04 U1	450
2/22/2017	Background	0.134	7.65	2.98	0.80	8.4	< 0.04 U1	374
3/28/2017	Background	0.202	5.95	2.95	0.78	8.4	0.1 J1	310
4/18/2017	Background	0.156	6.48	2.91	0.78	8.3	< 0.04 U1	344
5/16/2017	Background	0.139	6.74	2.98	0.79	9.5	1.5	367
6/14/2017	Background	0.179	6.15	2.92	0.78	8.5	0.1	340
10/31/2017	Detection	0.171	7.25	3.05	0.78	8.3	0.2	385
9/20/2018	Detection	0.182	6.43	2.99	0.80	8.5	0.1 J1	369
11/26/2018	Detection	0.167	6.33	2.93	0.80	8.3	0.07 J1	380
4/09/2019	Detection	0.158	6.65	2.94	0.77	8.3	< 0.06 U1	376
9/09/2019	Detection	0.144	6.78	3.07	0.84	8.1	< 0.06 U1	369
5/15/2020	Detection	0.148	6.15	3.11	0.84	7.9	0.2 J1	374
7/08/2020	Detection	--	--	--	--	8.4	--	--
10/08/2020	Detection	0.133	6.11	2.98	0.89	7.9	< 0.06 U1	404
1/04/2021	Detection	--	--	--	--	8.4	--	--
5/13/2021	Detection	0.148	5.65	3.08	0.85	8.2	0.1 J1	375
10/29/2021	Detection	0.150	6.10	3.01	0.85	8.1	< 0.06 U1	380
5/23/2022	Detection	0.140	6.46	3.02	0.86	8.6	0.18 J1	370 L1
11/09/2022	Detection	0.144	7.60	2.92	0.78	8.2	< 0.06 U1	370
5/25/2023	Detection	0.134	7.07	3.03	0.86	8.0	0.2 J1	360
10/31/2023	Detection	0.142	8.58	2.99	0.83	8.0	0.2 J1	390
5/17/2024	Detection	0.137	7.26	3.04	0.87	7.9	0.3 J1	360
7/17/2024	Detection	--	--	--	--	8.1	< 0.1 U1	--
10/02/2024	Detection	0.135	7.72	2.99	0.80	8.1	< 0.1 U1	370
5/28/2025	Detection	0.139	7.47	3.17	0.91	8.2	0.3 J1	350
10/23/2025	Detection	0.137	7.69	2.97	0.89	8.3	0.19 J1	370

Table 1. Groundwater Data Summary: MW-39
Mountaineer - LF
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/26/2016	Background	0.06	4.80	264	0.095	0.01 J1	2.2	1.43	1.142	0.77	2.21	0.016	< 0.002 U1	8.51	0.3	0.04 J1
11/02/2016	Background	0.04 J1	3.89	276	0.068	< 0.004 U1	3.2	0.615	1.941	0.83	0.532	0.011	< 0.002 U1	9.54	0.09 J1	0.03 J1
12/21/2016	Background	0.08	3.95	296	0.202	0.006 J1	6.32	2.34	1.311	0.86	1.79	0.008	< 0.002 U1	8.03	0.6	0.070
2/22/2017	Background	0.03 J1	3.91	243	0.041	0.01 J1	1.41	0.539	1.162	0.80	0.467	0.012	0.002 J1	9.23	0.1	0.03 J1
3/28/2017	Background	0.02 J1	3.58	241	0.01 J1	< 0.004 U1	0.560	0.206	0.793	0.78	0.176	0.015	< 0.002 U1	8.50	0.06 J1	0.02 J1
4/18/2017	Background	0.01 J1	3.70	244	0.007 J1	< 0.005 U1	0.243	0.188	0.1602	0.78	0.113	0.009	< 0.002 U1	8.65	0.04 J1	< 0.01 U1
5/16/2017	Background	0.01 J1	3.88	244	0.004 J1	0.02	0.221	0.174	0.611	0.79	0.073	0.017	< 0.002 U1	9.39	0.04 J1	< 0.01 U1
6/14/2017	Background	0.02 J1	3.76	247	0.008 J1	< 0.005 U1	0.203	0.209	0.470	0.78	0.092	0.028	< 0.002 U1	9.06	0.06 J1	< 0.01 U1

Table 1. Groundwater Data Summary: MW-1611
Mountaineer - LF
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
9/26/2016	Background	0.136	25.0	8.72	0.56	7.8	17.3	382
11/02/2016	Background	0.140	22.8	9.36	0.61	7.8	22.7	388
12/20/2016	Background	0.124	22.2	9.39	0.64	7.7	21.8	380
2/22/2017	Background	0.175	22.5	9.10	0.57	7.7	18.0	381
3/28/2017	Background	0.210	22.3	8.04	0.50	7.8	15.7	326
4/18/2017	Background	0.155	22.8	8.59	0.56	7.7	17.7	388
5/16/2017	Background	0.190	23.1	9.14	0.60	8.3	18.7	392
6/12/2017	Background	0.158	22.4	9.29	0.57	7.2	19.4	384
10/31/2017	Detection	0.152	24.0	9.80	0.61	7.8	18.9	402
1/22/2018	Detection	--	22.6	--	--	7.5	--	376
9/20/2018	Detection	0.258	23.2	9.48	0.61	7.8	19.0	416
11/26/2018	Detection	0.147	21.9	9.57	0.62	7.7	18.5	387
4/09/2019	Detection	0.139	26.2	7.96	0.46	7.6	20.7	431
6/18/2019	Detection	--	22.8	9.58	--	7.9	--	--
7/10/2019	Detection	--	--	--	--	7.6	--	402
9/09/2019	Detection	0.136	26.1	10.1	0.62	7.7	17.3	402
5/15/2020	Detection	0.135	24.0	9.35	0.61	7.3	20.8	404
10/08/2020	Detection	0.124	24.8	9.44	0.64	7.3	22.2	451
1/04/2021	Detection	--	--	--	--	7.7	--	407
5/13/2021	Detection	0.132	23.5	10.1	0.64	7.7	19.2	405
10/26/2021	Detection	0.125	24.6	9.91	0.63	7.5	20.8	400
5/20/2022	Detection	0.133	25.1	10.7	0.63	7.7	21.1	410 L1
7/25/2022	Detection	--	--	9.48	--	8.1	--	--
11/09/2022	Detection	0.134	26.1	9.89	0.58	7.6	20.8	420
5/25/2023	Detection	0.119	25.3	9.91	0.57	7.6	22.4	390
10/26/2023	Detection	0.119	23.5	10.7	0.60	7.5	20.3	400
1/17/2024	Detection	--	--	10.1	--	7.6	--	--
5/21/2024	Detection	0.124	25.2	10.6	0.59	7.3	20.1	430
10/03/2024	Detection	0.129	25.8	11.0	0.56	7.5	20.4	400
12/09/2024	Detection	--	--	--	--	7.6	--	--
12/10/2024	Detection	--	--	10.4	--	--	--	--
5/28/2025	Detection	0.126	26.3	11.1	0.67	7.7	22.6	410
7/16/2025	Detection	--	--	11.3	--	7.8	--	--
10/21/2025	Detection	0.110	23.2 M1	11.3	0.67	7.7	20.1	400
12/16/2025	Detection	--	--	10.9	--	7.6	--	--

Table 1. Groundwater Data Summary: MW-1611
Mountaineer - LF
Appendix IV Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
9/26/2016	Background	0.03 J1	1.01	165	0.046	0.02	1.4	0.370	1.258	0.56	0.482	0.004	< 0.002 U1	6.97	0.07 J1	0.088
11/02/2016	Background	0.03 J1	0.97	156	0.030	0.01 J1	0.9	0.245	2.888	0.61	0.310	0.004	< 0.002 U1	5.83	0.06 J1	0.03 J1
12/20/2016	Background	< 0.01 U1	0.74	140	< 0.005 U1	< 0.004 U1	2.10	0.092	0.772	0.64	0.023	0.002	< 0.002 U1	5.46	< 0.03 U1	< 0.01 U1
2/22/2017	Background	< 0.01 U1	0.75	135	0.007 J1	0.006 J1	0.209	0.096	0.5828	0.57	0.055	0.007	0.002 J1	5.36	0.04 J1	0.208
3/28/2017	Background	0.01 J1	0.60	166	0.01 J1	0.005 J1	0.426	0.108	0.645	0.50	0.195	0.011	< 0.002 U1	7.26	0.07 J1	0.02 J1
4/18/2017	Background	0.01 J1	0.69	155	0.01 J1	0.006 J1	0.337	0.104	0.487	0.56	0.133	0.003	< 0.002 U1	6.01	< 0.03 U1	< 0.01 U1
5/16/2017	Background	0.03 J1	0.75	145	0.008 J1	< 0.005 U1	0.661	0.101	2.534	0.60	0.119	0.006	< 0.002 U1	5.49	0.04 J1	0.02 J1
6/12/2017	Background	0.03 J1	0.76	148	0.007 J1	< 0.005 U1	0.138	0.092	0.508	0.57	0.058	0.018	< 0.002 U1	5.39	0.03 J1	< 0.01 U1

Table 1. Groundwater Data Summary: MW-1612
Mountaineer - LF
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
10/26/2016	Background	0.637	9.47	38.1	3.02	8.3	272	--
11/02/2016	Background	0.629	8.48	33.4	3.23	8.3	238	850
12/21/2016	Background	0.501	8.96	36.1	3.33	8.1	271	966
2/22/2017	Background	0.473	7.90	35.6	2.95	8.4	288	1090
3/29/2017	Background	0.673	7.10	23.7	3.50	8.7	190	1240
4/19/2017	Background	0.589	8.61	22.4	3.26	8.4	226	1040
5/16/2017	Background	0.565	12.5	27.8	2.88	8.8	346	1150
6/13/2017	Background	0.532	8.09	27.4	2.98	8.2	334	1130
10/31/2017	Detection	0.457	7.22	20.2	3.53	8.2	147	914
9/20/2018	Detection	0.543	4.50	14.6	3.78	8.4	63.9	835
11/26/2018	Detection	0.413	4.25	11.5	3.91	8.0	49.2	764
4/09/2019	Detection	0.449	3.21	10.2	4.02	8.3	54.8	725
9/10/2019	Detection	0.438	4.77	11.1	4.34	8.3	31.3	786
5/18/2020	Detection	0.388	4.18	6.75	4.39	8.2	40.5	637
10/07/2020	Detection	0.351	3.43	6.36	3.92	8.3	40.0	662
5/14/2021	Detection	0.351	4.78	6.72	4.15	8.4	36.4	688
10/26/2021	Detection	0.367	3.4	6.24	4.31	8.4	38.0	630
5/19/2022	Detection	0.394	4.40	9.29	4.17	8.6	91.5	740 L1
11/09/2022	Detection	0.407	4.94	8.81	4.09	8.4	107	780
5/22/2023	Detection	0.336	4.00	6.98	4.40	8.3	77.8	670
11/01/2023	Detection	0.365	5.95	7.72	4.14	8.3	104	730
5/22/2024	Detection	0.346	4.36	6.91	4.29	8.1	94.3	700
9/30/2024	Detection	0.45	5.3	8.79	3.94	--	167	890
10/01/2024	Detection	--	--	--	--	8.4	--	--
5/22/2025	Detection	--	--	--	--	8.5	--	--
5/23/2025	Detection	0.358	5.11	9.15	3.95	--	183	840
10/24/2025	Detection	0.44	9.5	9.45	3.90	8.5	219	910

Table 1. Groundwater Data Summary: MW-1612
Mountaineer - LF
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
10/26/2016	Background	0.31	12.4	66.2	0.033	0.007 J1	1.63	0.367	2.765	3.02	0.391	0.018	< 0.002 U1	62.1	0.2	0.03 J1
11/02/2016	Background	0.35	16.8	80.4	0.009 J1	< 0.004 U1	0.6	0.197	0.973	3.23	0.168	0.014	0.002 J1	67.6	0.08 J1	0.087
12/21/2016	Background	0.13	14.9	62.1	0.007 J1	< 0.004 U1	0.913	0.111	0.947	3.33	0.121	0.011	0.002 J1	52.2	0.1	< 0.01 U1
2/22/2017	Background	0.31	14.4	72.4	0.058	< 0.004 U1	2.13	0.700	1.084	2.95	0.640	0.018	0.003 J1	38.5	0.1	0.04 J1
3/29/2017	Background	0.77	12.4	141	0.290	0.01 J1	3.19	2.60	0.860	3.50	1.37	0.020	0.014	45.9	0.5	0.03 J1
4/19/2017	Background	0.82	10.7	233	0.551	< 0.05 U1	15.5	3.94	0.425	3.26	4.10	0.019	0.004 J1	58.0	1.2	0.2 J1
5/16/2017	Background	0.15	10.4	77.1	0.02 J1	< 0.005 U1	0.445	0.231	2.744	2.88	0.210	0.022	< 0.002 U1	43.1	0.1	0.02 J1
6/13/2017	Background	0.15	10.7	59.6	0.006 J1	< 0.005 U1	0.227	0.101	0.824	2.98	0.023	0.028	< 0.002 U1	34.3	0.06 J1	< 0.01 U1

Notes:
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
pCi/L: picocuries per liter
S7: Sample did not achieve constant weight.
SU: standard unit
µg/L: micrograms per liter

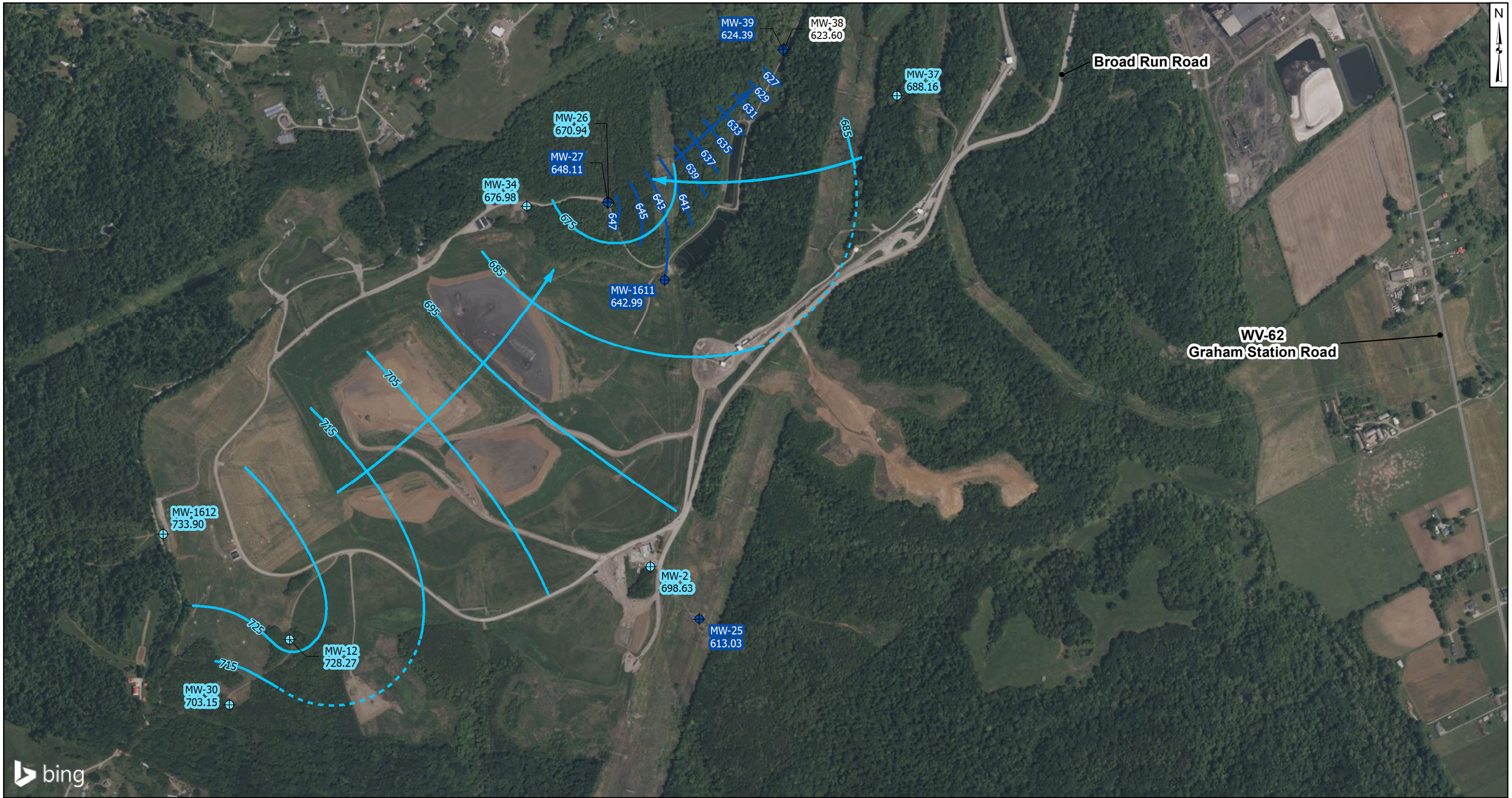
Table 1: Residence Time Calculation Summary
Mountaineer Landfill

Geosyntec Consultants, Inc.

			2025-05		2025-07[3]		2025-10		2025-12[3]	
CCR Management Unit	Monitoring Well	Well Diameter (inches)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Landfill	MW-26 [2]	2.0	1.5	40.4	1.6	37.7	1.6	39.1	1.6	37.3
	MW-27 [2]	2.0	19.5	3.1	18.5	3.3	16.8	3.6	18.5	3.3
	MW-30 [1]	2.0	4.8	12.8	4.7	12.9	5.2	11.6	5.0	12.1
	MW-38 [2]	2.0	NC	NC	NC	NC	NC	NC	NC	NC
	MW-39 [2]	2.0	17.2	3.5	17.3	3.5	17.9	3.4	17.1	3.6
	MW-1611 [2]	2.0	13.1	4.7	10.6	5.7	10.2	5.9	11.6	5.2
	MW-1612 [1]	2.0	10.6	5.8	11.1	5.5	11.7	5.2	10.9	5.6

Notes:
[1] - Upgradient Well
[2] - Downgradient Well
[3] - Two-of-two verification sampling

NC - Not calculated
Groundwater residence time for MW-38 could not be calculated, as it is the only monitoring well for its lithologic unit (valley alluvium) within the monitoring network.



Legend

Monitoring Wells

- Alluvium
- Hydrologic Unit 3
- Hydrologic Unit 4

Groundwater Elevation Contours

- Hydrologic Unit 3
- Hydrologic Unit 3 (Inferred)
- Approximate Groundwater Flow Direction (Unit 3)
- Hydrologic Unit 4
- Approximate Groundwater Flow Direction (Unit 4)

Notes

1. Monitoring well coordinates and water level data (collected on May 20, 2025) provided by AEP.
2. Site features based on information available in Little Broad Run Landfill-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
3. Water level measurements from MW-25 (screened in shale below Unit 4) and MW-38 (screened in alluvium) were not used in ground water contouring.
4. Groundwater elevation units are feet above mean sea level (ft amsl).
5. Aerial imagery provided by Bing (updated January 2024).

1,000 500 0 1,000 Feet

Potentiometric Surface Map - Uppermost Aquifer
May 2025

AEP Mountaineer Generating Plant - CCR Landfill
New Haven, West Virginia

Geosyntec consultants

Columbus, Ohio | 2025/06/20

Figure 2

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Mountaineer\2025\AEP-Mountaineer_LF_GW_2025-05May.mxd. Okiemute.Commander. 6/20/2025. CHA8423/07/08.

Legend

Monitoring Wells

- Alluvium
- Hydrologic Unit 3
- Hydrologic Unit 4

Groundwater Elevation Contours

- Hydrologic Unit 3
- Hydrologic Unit 3 (Inferred)
- Approximate Groundwater Flow Direction (Unit 3)
- Hydrologic Unit 4
- Approximate Groundwater Flow Direction (Unit 4)

Notes

1. Monitoring well coordinates and water level data (collected on July 14, 2025) provided by AEP.
2. Site features based on information available in Little Broad Run Landfill-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
3. Water level measurements for MW-2 was anaomalous during the July 2025 event and therefore not used for contouring.
4. Water level measurements from MW-25 (screened in shale below Unit 4) and MW-38 (screened in alluvium) were not used in ground water contouring.
5. Groundwater elevation units are feet above mean sea level (ft amsl).

1,000 500 0 1,000 Feet

Potentiometric Surface Map - Uppermost Aquifer July 2025

AEP Mountaineer Generating Plant - CCR Landfill
New Haven, West Virginia

Geosyntec consultants

Columbus, Ohio | 2026/01/29

Figure 3

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Mountaineer\2025\AEP-Mountaineer_LF_GW_2025-07July_ver.mxd. okiemute.commander. 1/29/2026. CHA8423/07/08.

Legend

Monitoring Wells

- Alluvium
- Hydrologic Unit 3
- Hydrologic Unit 4

Groundwater Elevation Contours

- Hydrologic Unit 3
- Hydrologic Unit 3 (Inferred)
- Approximate Groundwater Flow Direction (Unit 3)
- Hydrologic Unit 4
- Approximate Groundwater Flow Direction (Unit 4)

Notes

1. Monitoring well coordinates and water level data (collected on October 20, 2025) provided by AEP.
2. Site features based on information available in Little Broad Run Landfill-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
3. Water level measurement for MW-2 was anomalous during the October 2025 event and therefore not used for contouring.
4. Water level measurements from MW-25 (screened in shale below Unit 4) and MW-38 (screened in alluvium) were not used in ground water contouring.
5. Groundwater elevation units are feet above mean sea level (ft amsl).
6. Aerial imagery provided by Google Earth (dated March 2025).

1,000 500 0 1,000 Feet

Potentiometric Surface Map - Uppermost Aquifer October 2025

AEP Mountaineer Generating Plant - CCR Landfill
New Haven, West Virginia

Geosyntec consultants

Columbus, Ohio | 2026/01/15

Figure 4

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Mountaineer\2025\AEP-Mountaineer_LF_GW_2025-10Oct.mxd. okiemute.commander. 1/15/2026. CHA8423/07/08.

Legend

Monitoring Wells

- Alluvium
- Hydrologic Unit 3
- Hydrologic Unit 4

Groundwater Elevation Contours

- Hydrologic Unit 3
- Hydrologic Unit 3 (Inferred)
- Approximate Groundwater Flow Direction (Unit 3)
- Hydrologic Unit 4
- Approximate Groundwater Flow Direction (Unit 4)

Notes

1. Monitoring well coordinates and water level data (collected on December 16, 2025) provided by AEP.
2. Site features based on information available in Little Broad Run Landfill-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
3. Water level measurement for MW-2 was anomalous during the December 2025 event and therefore not used for contouring.
4. Water level measurements from MW-25 (screened in shale below Unit 4) and MW-38 (screened in alluvium) were not used in ground water contouring.
5. Groundwater elevation units are feet above mean sea level (ft amsl).
6. Aerial imagery provided by Google Earth (dated March 2025).

1,000 500 0 1,000 Feet

Potentiometric Surface Map - Uppermost Aquifer December 2025

AEP Mountaineer Generating Plant - CCR Landfill
New Haven, West Virginia

Geosyntec consultants

Columbus, Ohio | 2026/01/29

Figure 5

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Mountaineer\2025\AEP-Mountaineer_LF_GW_2025-12Dec_ver.mxd. okiemute.commander. 1/29/2026. CHA8423/07/08.

APPENDIX 2

Groundwater Quality Data Statistical Analyses

Geosyntec consultants

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Worthington, Ohio 43085
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Memorandum

Date:	March 3, 2025
To:	David Miller (AEP)
Copies to:	Jill Parker-Witt (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Mountaineer Plant's Landfill

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 Subpart D, "CCR rule"), the second semiannual detection monitoring event of 2024 at the Landfill, an existing CCR unit at the Mountaineer Power Plant located in Letart, West Virginia, was completed on September 30-October 3, 2024. Based on these results, verification resampling was completed on December 9-10, 2024.

Background values for the Landfill were originally established in January 2018. After a minimum of four additional detection monitoring events, the results of those events were compared to the existing background dataset. 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 calculation of these revised background values are described in Geosyntec's January 2025 *Statistical Analysis Summary – Background Update Calculations* report.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate 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 only concluded if both samples in a series of two exceeds the UPL or, in the case of pH, are below the LPL. In practice, if the initial result did not exceed the UPL and, in the case of pH, is above the LPL, 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 Mountaineer Landfill CCR unit, and as a result the Mountaineer Landfill 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 Comparison
Detection Summary Memorandum
Mountaineer Power Plant - Landfill

Analyte	Unit	Description	MW-26	MW-27		MW-38	MW-39	MW-1611	
			10/2/2024	10/2/2024	12/10/2024	10/2/2024	10/2/2024	10/3/2024	12/9/2024
Boron	mg/L	Intrawell Background Value (UPL)	0.215	0.387		0.0852	0.190	0.150	
		Analytical Result	0.113	**0.610**	0.291	0.0310	0.135	0.129	--
Calcium	mg/L	Intrawell Background Value (UPL)	65.9	1.75		58.4	12.4	26.6	
		Analytical Result	57.6	1.60	--	48.4	7.72	25.8	--
Chloride	mg/L	Intrawell Background Value (UPL)	6.91	1.82		7.74	3.12	10.9	
		Analytical Result	5.73	1.42	--	6.88	2.99	**11.0**	10.4
Fluoride	mg/L	Interwell Background Value (UPL)	4.39						
		Analytical Result	0.13	2.4	--	0.31	0.80	0.56	--
pH	SU	Intrawell Background Value (UPL)	7.8	9.5		7.5	8.7	8.0	
		Intrawell Background Value (LPL)	6.9	8.5		6.5	7.8	7.2	
		Analytical Result	7.3	9.0	--	6.9	8.1	7.5	--
Sulfate	mg/L	Intrawell Background Value (UPL)	10.3	6.91		36.9	0.600	23.5	
		Analytical Result	6.30	2.30	--	33.5	<0.100	20.4	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	400	590		463	424	445	
		Analytical Result	380	530	--	430	370	400	--

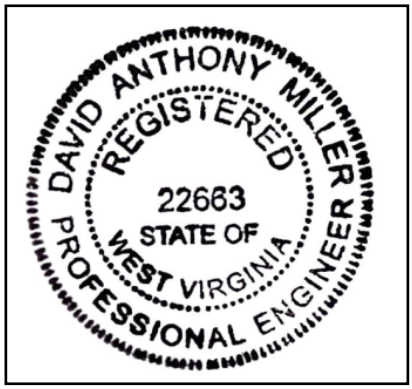
Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
3. Nondetects are shown as less than (<) the detection limit.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

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 January 14, 2025 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Mountaineer Landfill 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

Signature

22663	**West Virginia**	**03.10.2025**
License Number	Licensing State	Date

Geosyntec consultants

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Memorandum

Date:	October 8, 2025
To:	David Miller (AEP)
Copies to:	Dan Eurich (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Mountaineer Plant's Landfill

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 Subpart D, "CCR rule"), the first semiannual detection monitoring event of 2025 at the Landfill, an existing CCR unit at the Mountaineer Power Plant located in Letart, West Virginia, was completed on May 27-28, 2025. Based on these results, verification resampling was completed on July 2-16, 2025.

Background values for the Landfill were originally established in January 2018. After a minimum of four additional detection monitoring events, the results of those events were compared to the existing background dataset. 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 calculation of these revised background values are described in Geosyntec's January 2025 *Statistical Analysis Summary – Background Update Calculations* report.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate 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 only concluded if both samples in a series of two exceeds the UPL or, in the case of pH, are below the LPL. In practice, if the initial result did not exceed the UPL and, in the case of pH, is above the LPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1 and noted exceedances are described in the list below.

- Chloride concentrations exceeded the intrawell UPL of 10.9 mg/L in both the initial (11.1 mg/L) and second (11.3 mg/L) samples collected at MW-1611. An SSI over background is concluded for chloride at MW-1611.

In response to the exceedances noted above, the Mountaineer Landfill CCR unit will either transition to assessment monitoring or an alternative source demonstration (ASD) for chloride will be conducted in accordance with 40 CFR 257.94(e)(2). If the ASD is successful, the Mountaineer Landfill 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 Comparison
Detection Summary Memorandum
Mountaineer Power Plant - Landfill

Analyte	Unit	Description	MW-26		MW-27		MW-38	MW-39		MW-1611	
			5/27/2025	7/7/2025	5/27/2025	7/16/2025	5/28/2025	5/28/2025	7/2/2025	5/28/2025	7/16/2025
Boron	mg/L	Intrawell Background Value (UPL)	0.215		0.387		0.0852	0.190		0.150	
		Analytical Result	0.113	--	0.287	--	0.029	0.139	--	0.126	--
Calcium	mg/L	Intrawell Background Value (UPL)	65.9		1.75		58.4	12.4		26.6	
		Analytical Result	**66.1**	62.0	**1.97**	1.62	51.1	7.47	--	26.30	--
Chloride	mg/L	Intrawell Background Value (UPL)	6.91		1.82		7.74	3.12		10.9	
		Analytical Result	6.40	--	**2.44**	1.75	7.47	**3.17**	3.06	**11.1**	**11.3**
Fluoride	mg/L	Interwell Background Value (UPL)	4.39								
		Analytical Result	0.15	--	2.66	--	0.40	0.91	--	0.67	--
pH	SU	Intrawell Background Value (UPL)	7.8		9.5		7.5	8.7		8.0	
		Intrawell Background Value (LPL)	6.9		8.5		6.5	7.8		7.2	
		Analytical Result	7.4	--	9.1	--	7.0	8.2	--	7.7	--
Sulfate	mg/L	Intrawell Background Value (UPL)	10.3		6.91		36.9	0.600		23.5	
		Analytical Result	9.5	--	6.4	--	32.1	0.3	--	22.6	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	400		590		463	424		445	
		Analytical Result	360	--	560	--	420	350	--	410	--

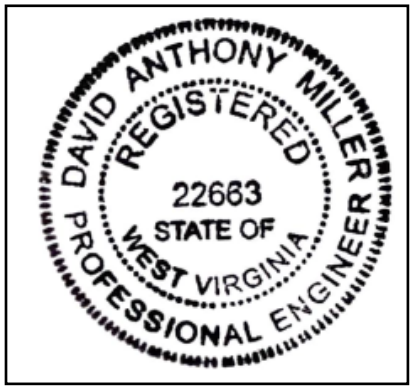
Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

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 January 14, 2025 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Mountaineer Landfill 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

Signature

22663	**West Virginia**	**10.17.2025**
License Number	Licensing State	Date

APPENDIX 3

Alternate Source Demonstrations

Geosyntec consultants

engineers | scientists | innovators

ALTERNATIVE SOURCE DEMONSTRATION REPORT – FIRST SEMIANNUAL DETECTION EVENT 2025

FEDERAL CCR RULE

Mountaineer Power Plant

Landfill

Letart, West Virginia

Prepared for

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

Prepared by

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

Project CHA1147F

January 2026

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ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
CCR	coal combustion residuals
CFR	Code of Federal Regulations
LBR	Little Broad Run
LCS	leachate collection system
LPL	lower prediction limit
LUD	leachate underdrain
mg/L	milligrams per liter
NPDES	National Pollutant Discharge Elimination System
SSI	statistically significant increase
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WVDEP	West Virginia Department of Environmental Protection

1. INTRODUCTION AND SUMMARY

This alternative source demonstration (ASD) report has been prepared to address a statistically significant increase (SSI) for chloride at the Mountaineer Power Plant Landfill (Landfill) following the first semiannual detection monitoring event of 2025.

Background values for the Landfill were originally established in January 2018. After a minimum of four additional detection monitoring events, the results of those events were compared to the existing background dataset. 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 calculation of these revised background values are described in Geosyntec's January 2025 *Statistical Analysis Summary – Background Update Calculations* report.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure in accordance with the Unified Guidance (United States Environmental Protection Agency [USEPA] 2009) and the statistical analysis plan developed for the site (Geosyntec 2021). With this procedure, an SSI is only concluded if both samples in a series of two exceeds the UPL or, in the case of pH, are below the LPL. In practice, if the initial result did not exceed the UPL and, in the case of pH, is above the LPL, a second sample was not collected or analyzed.

The first semiannual detection monitoring event of 2025 was performed in May 2025 (initial sampling event) and July 2025 (verification sampling event), and the results were compared to the calculated prediction limits. During this detection monitoring event, an SSI was identified for chloride at MW-1611 based on intrawell comparisons. A summary of the detection monitoring analytical results for all constituents listed in the Code of Federal Regulations (CFR) Title 40, Part 257, Appendix III, and the calculated prediction limits to which they were compared is provided in **Table 1**.

1.1 CCR Rule Requirements

In accordance with the USEPA regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments, 40 CFR 257.94(e)(2) states the following:

> The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer . . . verifying the accuracy of the information in the report.

Pursuant to 40 CFR 257.94(e)(2), Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report to identify whether the SSI identified for chloride at MW-1611 is from a source other than the Landfill.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which identified SSIs could be attributed. Alternative sources are classified into the following five types:

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Alternative Sources

A demonstration was conducted to assess whether the increases in chloride at monitoring well MW-1611 were based on a specific ASD type, or whether they should be attributed to a release from the Landfill.

2. SITE SUMMARY

A brief description of the site construction, geology, and hydrology are provided below.

2.1 Site Location and Construction

The Mountaineer Plant Landfill (formerly Little Broad Run [LBR] Landfill), located near Letart, West Virginia, is a lined facility designed for the disposal of CCR, including bottom ash, fly ash and flue gas desulfurization material (**Attachment A**). The Landfill has been in operation since spring of 1980 (EPRI 1999). The Landfill spans approximately 209 acres and is permitted for nine disposal areas, with Areas 1–7 filled to grade and Areas 8 and 9 permitted but not yet constructed (GEI 2024).

During Landfill construction, a liner was installed at the base of each area. Liners at Landfill Areas 1 through 3 include at least 2 feet of natural clay, covered by a single underdrain system to collect leachate and groundwater seepage. The liner at Area 4 uses a minimum 2-foot engineered clay liner, also covered by a single underdrain system, plus a groundwater interceptor drain beneath the clay liner to capture spring flow from perched groundwater (EPRI 1999). The liner construction for Areas 5 through 7 follows the Solid Waste/NPDES Permit No. WV007038 Permit Renewal Application (AEP 2003) and generally includes: a groundwater interceptor drainage system, minimum 12 inches of compacted or in-place clayey subbase, minimum 24 inches of compacted clay liner, leachate collection system (LCS), and a protective cover zone (Arcadis 2016).

2.2 Site Geology Summary

The Landfill is located in the Appalachian Plateau physiographic province and is underlain by Quaternary alluvial deposits consisting of silt, sand and gravel (Arcadis 2016). The soils in the valleys consist of a combination of residuum derived from weathered sandstone/shale and colluvium. Adjacent to the LBR, alluvial deposits are present, consisting of silty to sandy clay. Further up the ridges, soils are composed mainly of residuum. The unconsolidated materials are thickest in the valley floors and based on historical soil samples and well installation logs, the soil thickness ranges from 1.8 to 28 ft (Arcadis 2016).

Primary bedrock units that underlie the landfill are sedimentary rocks of the Permian Dunkard Formation and the Pennsylvanian Monongahela Formation. The Dunkard Formation which immediately underlies the Landfill consists of predominantly clay-shale with alternating beds of siltstone, sandstone and occasionally thin limestone beds (AEP 2003). The base of the Dunkard Formation is marked by a thick, massive conglomeritic sandstone that separates it from the Monongahela Formation which underlies it (EPRI 1999). The Monongahela Formation is similar in lithology to the Dunkard Formation. The Pittsburg No. 8A coal serves as the basal unit for the Monongahela Formation and is a regional marker bed (EPRI 1999, Arcadis 2016).

2.3 Site Hydrogeology Summary

The hydrogeologic setting is discussed in detail in Solid Waste/NPDES Permit No. WV0077038 Permit Renewal Application (AEP 2003). Groundwater occurrence in the bedrock generally coincides with the stress relief fracture system and is not necessarily related to lithology. Fracture orientation ranges from vertical (predominantly along valley slopes) to horizontal (along bedding planes). Groundwater flow occurs primarily in this fracture network, and the lateral flow generally

follows topography towards the LBR valley center. The alluvial deposits and residuum that overlie bedrock are in hydraulic connection to the fracture network. The principal direction of groundwater flow in the valley is towards the LBR valley mouth to the northeast (Arcadis 2016) (**Figure 1**).

Groundwater occurrence at the Site is usually in the fractured sandstone units, which have been identified as Hydrologic Units 1 through 4 in order from shallowest to deepest beneath the Landfill. Hydrologic Units 1 and 2 are limited in lateral extent in this area and are not sources of groundwater for wells or developed springs and thus not considered as part of the uppermost aquifer. The uppermost aquifer at the Site is defined as the laterally extensive Hydrologic Unit 3, and in the absence of Hydrologic Unit 3 the uppermost aquifer is defined as the deeper Hydrologic Unit 4 (Arcadis 2016).

The site lithology as well as the Hydrologic Units are illustrated on two lines of cross section that were initially prepared by AEP with modifications through the Landfill made by Arcadis to incorporate data obtained in 2016 (**Attachment B**). The cross sections also show the different area liners across the Landfill. One cross section trends from southwest to northeast through the Landfill (A to A') and the other cross section trends from the northwest to the southeast through the Landfill (B to B').

MW-1611 is screened in Hydrologic Unit 4 which belongs to the Pennsylvanian Monongahela Formation (EPRI 1999; Arcadis 2016). A boring log for compliance monitoring well MW-1611 is included as **Attachment B**.

3. ALTERNATIVE SOURCE DEMONSTRATION

An initial review of site geochemistry, site historical data, and laboratory quality assurance and quality control data did not demonstrate an alternative source in Type I (sampling) or Type II (laboratory) causes. A review of the statistical methods used did not identify any Type III (statistical) causes. A preliminary review of site geochemistry did not identify any Type V (anthropogenic) causes. Therefore, natural variation, which is a Type IV cause, was examined as a potential cause of the chloride SSI at MW-1611.

3.1 Landfill Leachate Underdrain Data Analysis

The concentrations of key constituents that are often indicative of CCR impacts (e.g., boron and sulfate) were examined in Landfill leachate underdrain (LUD) samples and compared to monitoring well network groundwater to evaluate whether Landfill leachate influenced downgradient groundwater. Boron and sulfate are typically considered geochemically conservative parameters due to their minimal attenuation by chemical processes in groundwater flow. They therefore function as indicators for potential CCR unit releases due to their high relative concentration in CCR. The following was observed:

- Historically, boron concentrations in Landfill LUD samples, which reflect leachate and groundwater captured within the underdrain, have ranged from 14.5 milligrams per liter (mg/L) to 104 mg/L. Leachate Underdrain #7 (LUD #7) which is located near the Area 7 Liner close to well of interest MW-1611, had a boron concentration of 14.5 mg/L in May 2025. This concentration is more than two orders of magnitude higher than the boron concentration at MW-1611 (0.126 mg/L) in May 2025. Concentrations of boron at downgradient well MW-1611 have been historically stable and consistently below the intrawell UPL of 0.150 mg/L (**Figure 2**).

- Sulfate concentrations in Landfill LUD samples were almost two orders of magnitude higher than in groundwater monitoring wells. The maximum sulfate concentration at MW-1611 is 22.7 mg/L with an average concentration of 19.85 mg/L from 2016 to date, while the average sulfate concentration at LUD #7 from 2022 to date is 1,748 mg/L. Concentrations of sulfate at downgradient well MW-1611 have been historically stable (**Figure 3**).

If Landfill leachate, which contains concentrations of boron and sulfate at least an order of magnitude higher than the well of interest, were impacting groundwater quality at MW-1611, an increase in boron and sulfate concentrations at downgradient well MW-1611 would be expected. The current boron and sulfate concentrations at the downgradient monitoring wells do not display increasing trends (**Figure 2** and **Figure 3,** respectively) and are below the background intrawell UPLs, which suggests that changes in chloride in groundwater at MW-1611 are not due to a release from the Landfill.

Piper diagrams, which represent the relative concentrations of major cations and anions in aqueous samples, were created to visualize the aqueous geochemistry for both Landfill LUD and downgradient well MW-1611 samples (**Figure 4**). The MW-1611 data shown in the Piper diagram reflects the detection monitoring period, with groundwater monitoring data collected from 2017 to 2025. LUD samples collected in September 2025 are shown.

The groundwater geochemistry at downgradient well MW-1611 has remained nearly unchanged throughout the monitoring period, as illustrated by the tight clustering of sample results for MW-1611 on the Piper diagram. The groundwater composition is distinct from that of the LUDs, particularly for the relative anion percentages; leachate underdrain samples consist predominantly of sulfate, while groundwater anion compositions are dominated by carbonate alkalinity. Considering the distinct geochemical composition of the LUD samples, variation in relative percentages of major anions would be expected if downgradient monitoring wells were impacted by Landfill leachate. No such variation is observed in downgradient monitoring well groundwater samples (**Figure 4**). These results illustrate stable geochemical composition of site groundwater over time and a lack of influence from leachate on the groundwater composition.

3.2 Examination of Natural Variability

Chloride is known to be a common constituent in groundwater from the Pennsylvanian-aged aquifers in West Virginia (Mathes et. al. 1998; Chambers, et al. 2012), which includes the Upper Pennsylvanian Monongahela Formation in which MW-1611 is screened.

A 1998 groundwater quality study conducted for the West Virginia Division of Environmental Protection (Mathes et al. 1998) analyzed water quality parameters from groundwater wells throughout West Virginia across multiple geologic time periods. As part of this study, statical analysis was completed on a dataset consisting of 376 groundwater samples collected from wells screened within Upper Pennsylvanian aquifers (inclusive of the Monongahela Formation in which MW-1611 is screened) that were analyzed for dissolved chloride. Dissolved chloride concentrations within Upper Pennsylvanian aquifer units contained a mean value of 109 mg/L and a median value of 13 mg/L (**Figure 5**). The mean dissolved chloride value of 109 mg/L exceeds the maximum chloride concentrations observed at MW-1611 (11.3 mg/L) to date. The median value of 13 mg/L is generally comparable to the observed concentrations from MW-1611.

An additional study monitored long-term groundwater quality at 300 wells in West Virginia from 1999 to 2008 (Chambers et al. 2008). Samples grouped by geologic age of the aquifer unit indicated that the highest chloride concentrations (i.e., greater than 250 mg/L) were measured at four Pennsylvanian-aged wells. A comparison of the median chloride concentration of Pennsylvanian-aged aquifers in West Virginia from the Chambers et al. United States Geologic Survey (USGS) report (19 mg/L) to the maximum chloride concentrations reported for MW-1611 to date (11.3 mg/L) indicates that chloride concentrations at MW-1611 are similar to or lower than chloride concentrations in Pennsylvanian aquifers at the regional scale (**Figure 5**). The observations of these studies suggest that chloride concentrations at MW-1611 are reflective of typical conditions within Pennsylvanian aquifer units in the region and are generally consistent with regional expectations for naturally occurring aqueous chloride.

The presence of major ions in Pennsylvanian aquifer units in West Virginia is a result of depositional history. The Pennsylvanian Monongahela Formation in which MW1611 is screened represent a cyclic depositional sequence which featured transgressive and regressive geologic periods that caused the deposition of interbedded sequences of limestone, shale, and coal (Martin 1998). In such depositional environments, fine grained siltstones and shales are deposited and cyclically exposed to marine waters which are often concentrated in major ions like chloride. Transgression-regression cycling creates sequences in which saline marine waters saturate open pore spaces in freshly deposited sediment. This process results in trapping of marine water at the

time of deposition. While a component of the marine water within the pore spaces is typically diluted and replaced by meteoric recharge, a component is typically retained by membrane filtration as an effect of the clay mineralogy of the shale components of these sequences (Drever 1988). In addition to the retention of some component of higher ionic strength marine formation water, deposited sediment in cyclic marine environments may also become impregnated with soluble evaporitic minerals like halite (crystalline sodium chloride, NaCl) (Hem 1985). These evaporites will preferentially precipitate in the larger pore spaces available in coarser grained lithologies and are known to be highly soluble and subject to dissolution during pore fluid evolution. Dissolution of evaporites from coarser-grained lithologies results in further increases to concentrations of aqueous major ions (e.g., chloride) in pore fluid. The concentrations of chloride observed in Landfill compliance well groundwater are generally consistent with expected regional trends that reflect this depositional environment.

These observations suggest that chloride concentrations at the downgradient location MW-1611 is attributable to natural variations within groundwater from native geologic material, as documented by various academic studies.

3.3 Summary of Findings

A demonstration was conducted to assess whether the SSI for chloride at MW-1611 was based on a Type IV cause (natural variation) and not by a release from the Mountaineer Plant Landfill. The following is concluded:

- The SSIs could not be attributed to a Type I (sampling error), Type II (laboratory), Type III (statistical), or Type V (anthropogenic) cause.
- Groundwater chemistry at MW-1611, which is the downgradient well with a chloride SSI, is generally stable and does not show evidence of influence from Landfill leachate.
- The concentrations of boron and sulfate, which can serve as primary indicators of CCR impacts to groundwater, do not show increasing trends at MW-1611) and are, in fact, below the background intrawell UPLs. If impacts from Landfill leachate to downgradient locations were occurring, increasing boron and sulfate groundwater concentrations would be expected.
- Pennsylvanian-aged aquifer data from both WVDEP and USGS reports indicate that MW-1611 contain chloride concentrations that are lower than or comparable to typical values for wells screened within this geologic material across the state.

3.4 Sampling Requirements

The conclusions of this ASD support the determination that the identified SSI is from natural variation and not due to a release from the Landfill. Therefore, the unit will remain in the detection monitoring program. Groundwater at the unit will be sampled for Appendix III parameters on a semiannual basis.

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 40 CFR 257.94(e)(2) and supports the conclusion that the SSI for chloride at MW-1611 is attributed to variation of natural groundwater quality (Type IV). Therefore, no further action is warranted, and the Mountaineer Plant Landfill will remain in the detection monitoring program. Certification of this ASD by a qualified professional engineer is provided in **Attachment D**.

5. REFERENCES

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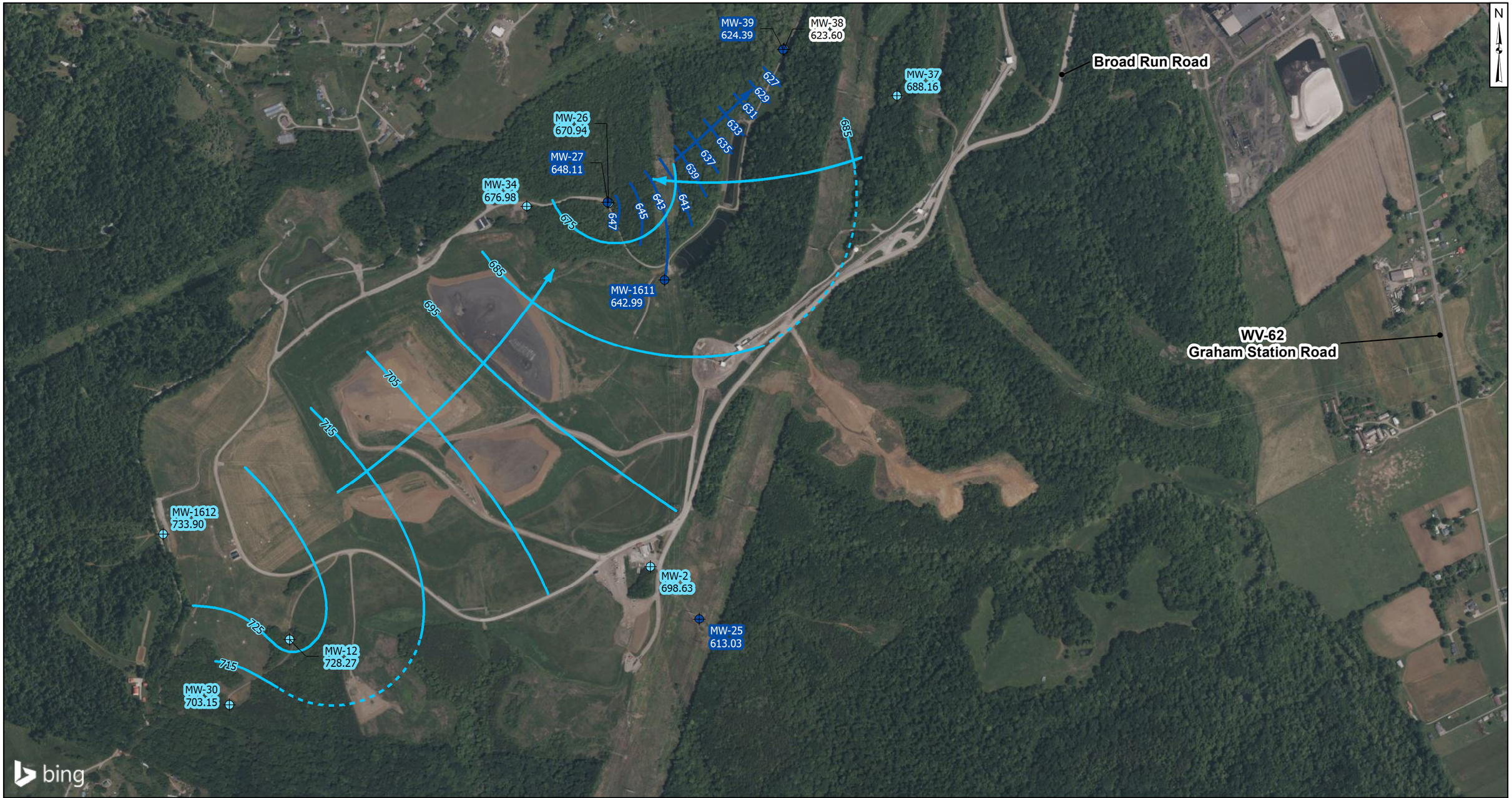
TABLES

Table 1. Detection Monitoring Data Comparison
Detection Summary Memorandum
Mountaineer Power Plant - Landfill

Analyte	Unit	Description	MW-26		MW-27		MW-38	MW-39		MW-1611	
			5/27/2025	7/7/2025	5/27/2025	7/16/2025	5/28/2025	5/28/2025	7/2/2025	5/28/2025	7/16/2025
Boron	mg/L	Intrawell Background Value (UPL)	0.215		0.387		0.0852	0.190		0.150	
		Analytical Result	0.113	--	0.287	--	0.029	0.139	--	0.126	--
Calcium	mg/L	Intrawell Background Value (UPL)	65.9		1.75		58.4	12.4		26.6	
		Analytical Result	**66.1**	62.0	**1.97**	1.62	51.1	7.47	--	26.30	--
Chloride	mg/L	Intrawell Background Value (UPL)	6.91		1.82		7.74	3.12		10.9	
		Analytical Result	6.40	--	**2.44**	1.75	7.47	**3.17**	3.06	**11.1**	**11.3**
Fluoride	mg/L	Interwell Background Value (UPL)	4.39								
		Analytical Result	0.15	--	2.66	--	0.40	0.91	--	0.67	--
pH	SU	Intrawell Background Value (UPL)	7.8		9.5		7.5	8.7		8.0	
		Intrawell Background Value (LPL)	6.9		8.5		6.5	7.8		7.2	
		Analytical Result	7.4	--	9.1	--	7.0	8.2	--	7.7	--
Sulfate	mg/L	Intrawell Background Value (UPL)	10.3		6.91		36.9	0.600		23.5	
		Analytical Result	9.5	--	6.4	--	32.1	0.3	--	22.6	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	400		590		463	424		445	
		Analytical Result	360	--	560	--	420	350	--	410	--

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

FIGURES



Legend

Monitoring Wells

- Alluvium
- Hydrologic Unit 3
- Hydrologic Unit 4

Groundwater Elevation Contours

- Hydrologic Unit 3
- Hydrologic Unit 3 (Inferred)
- Approximate Groundwater Flow Direction (Unit 3)
- Hydrologic Unit 4
- Approximate Groundwater Flow Direction (Unit 4)

Notes

1. Monitoring well coordinates and water level data (collected on May 20, 2025) provided by AEP.
2. Site features based on information available in Little Broad Run Landfill-CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2016) provided by AEP.
3. Water level measurements from MW-25 (screened in shale below Unit 4) and MW-38 (screened in alluvium) were not used in ground water contouring.
4. Groundwater elevation units are feet above mean sea level (ft amsl).
5. Aerial imagery provided by Bing (updated January 2024).

1,000 500 0 1,000 Feet

Potentiometric Surface Map - Uppermost Aquifer
May 2025

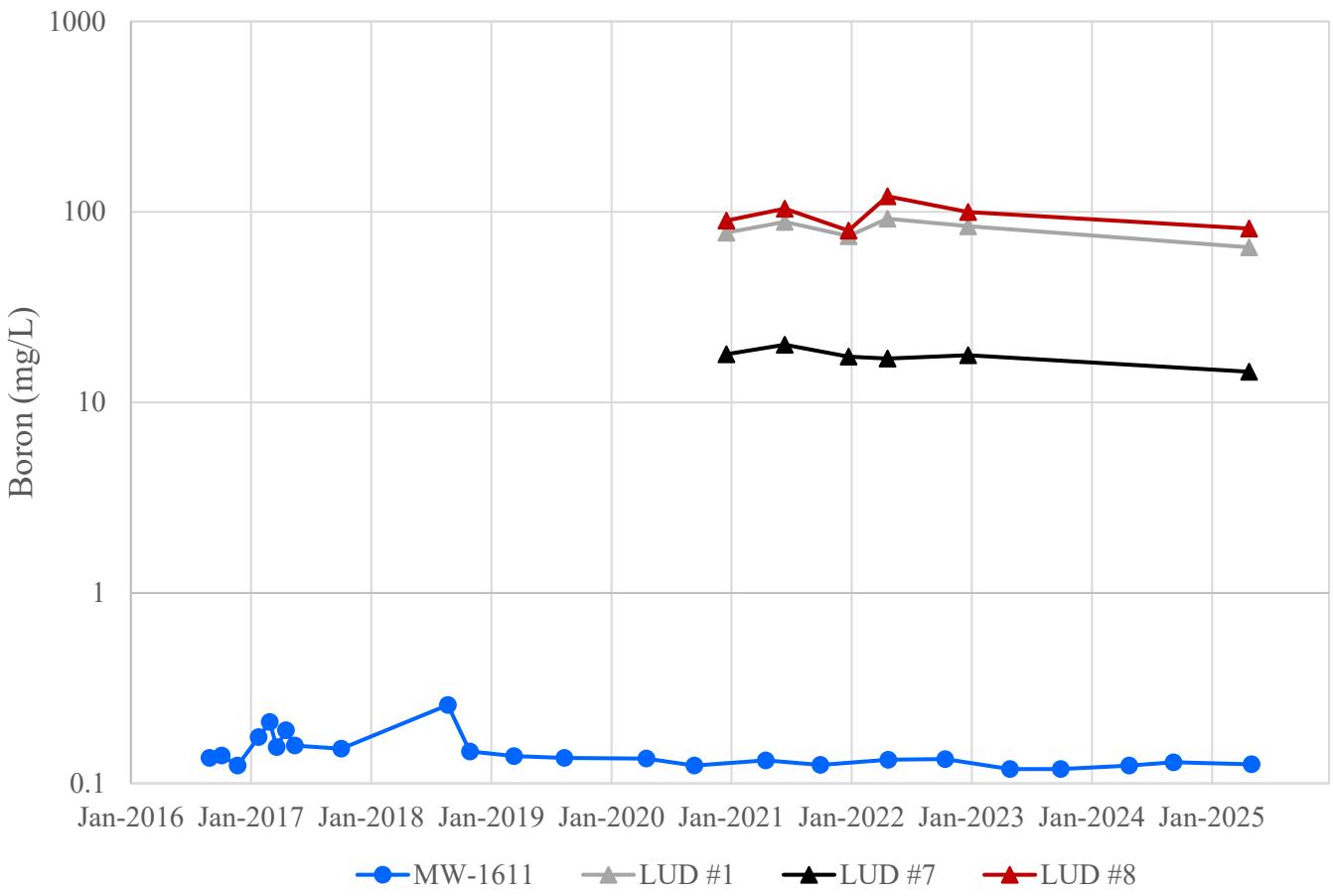
AEP Mountaineer Generating Plant - CCR Landfill
New Haven, West Virginia

Geosyntec consultants

Columbus, Ohio | 2025/06/20

Figure **1**

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Mountaineer\2025\AEP-Mountaineer_LF_GW_2025-05May.mxd. Okiemute.Commander. 6/20/2025. CHA8423/07/08.



Notes:
MW-1611 data were collected under the federal coal combustion residual (CCR) rule requirements and represents total boron in groundwater.

LUD: leachate underdrain
mg/L: milligrams per liter

Boron Time Series Graph

Mountaineer Landfill

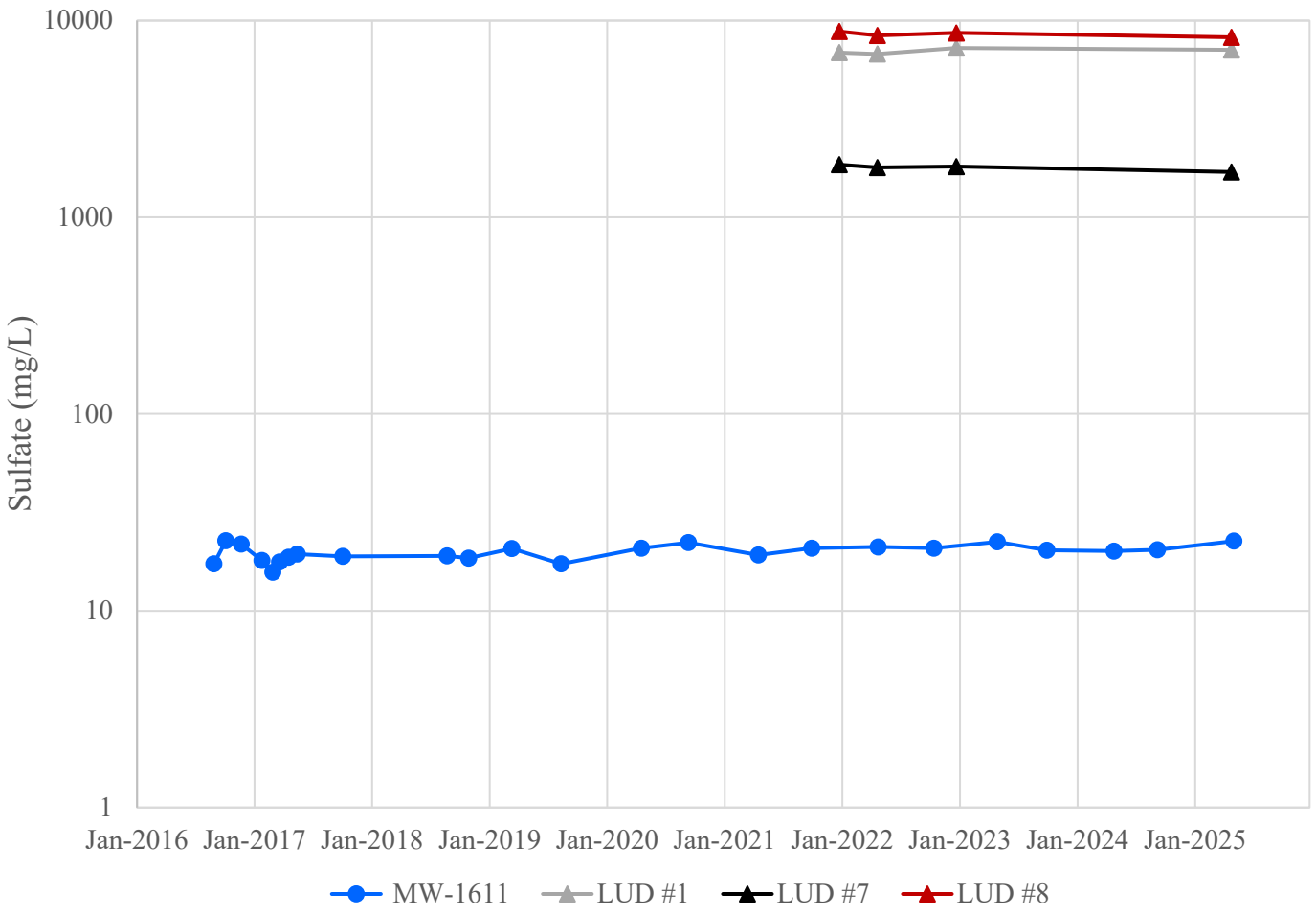
Geosyntec consultants

AMERICAN ELECTRIC POWER

Figure **2**

Columbus, Ohio

January 2026



Notes:
MW-1611 data were collected under the federal coal combustion residual (CCR) rule requirements and represent total sulfate in groundwater.

LUD: leachate underdrain
mg/L: milligrams per liter

Sulfate Time Series Graph

Mountaineer Landfill

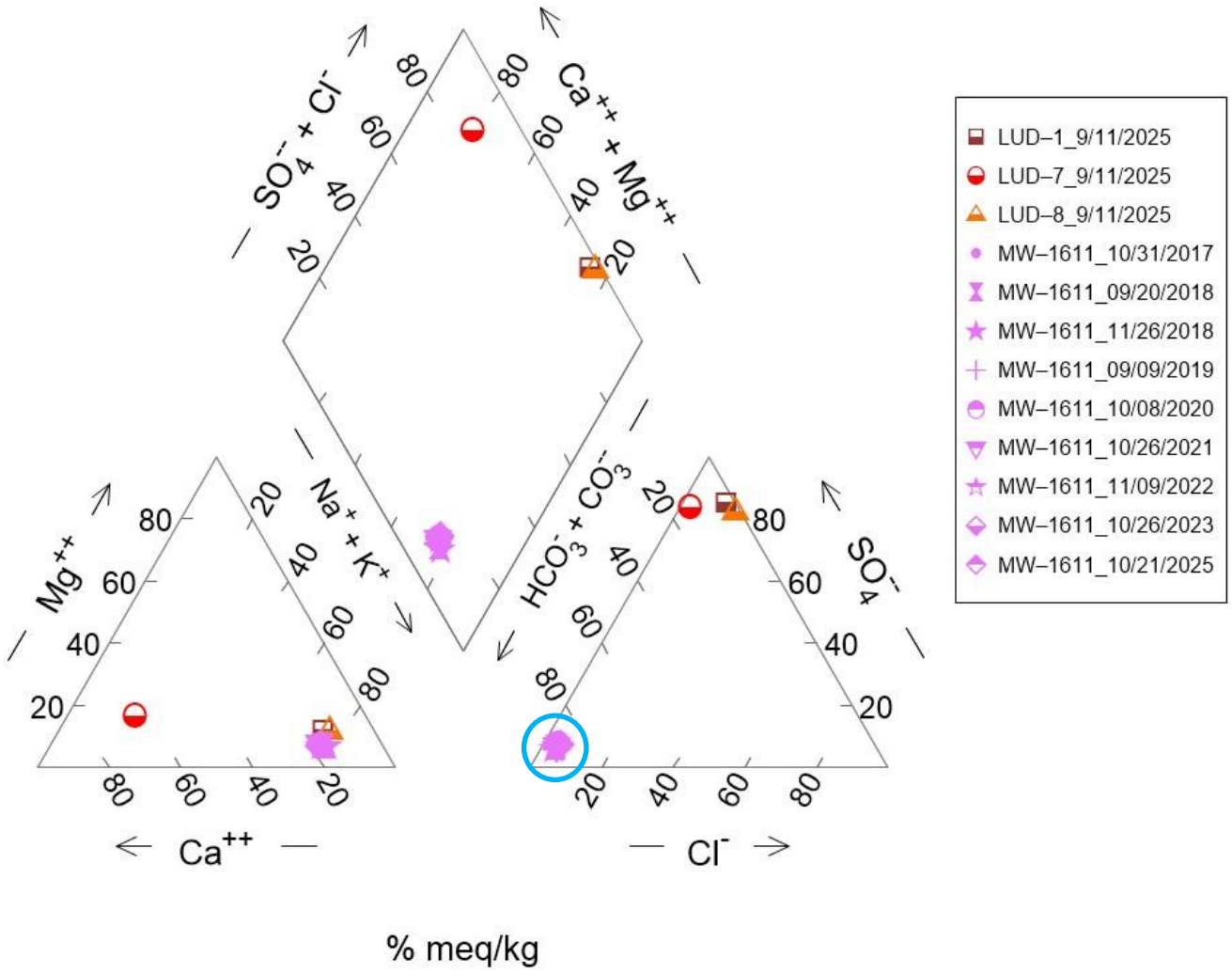
Geosyntec consultants

AMERICAN ELECTRIC POWER

Figure **3**

Columbus, Ohio

January 2026



Notes:
1. Landfill leachate underdrain samples were collected on September 11, 2025.
2. All groundwater samples for MW-1611 location are circled in blue on the anion distribution triangle.

% meq/kg: percent milliequivalents per kilogram

Piper Diagram: Leachate Underdrain Comparison

Mountaineer Landfill

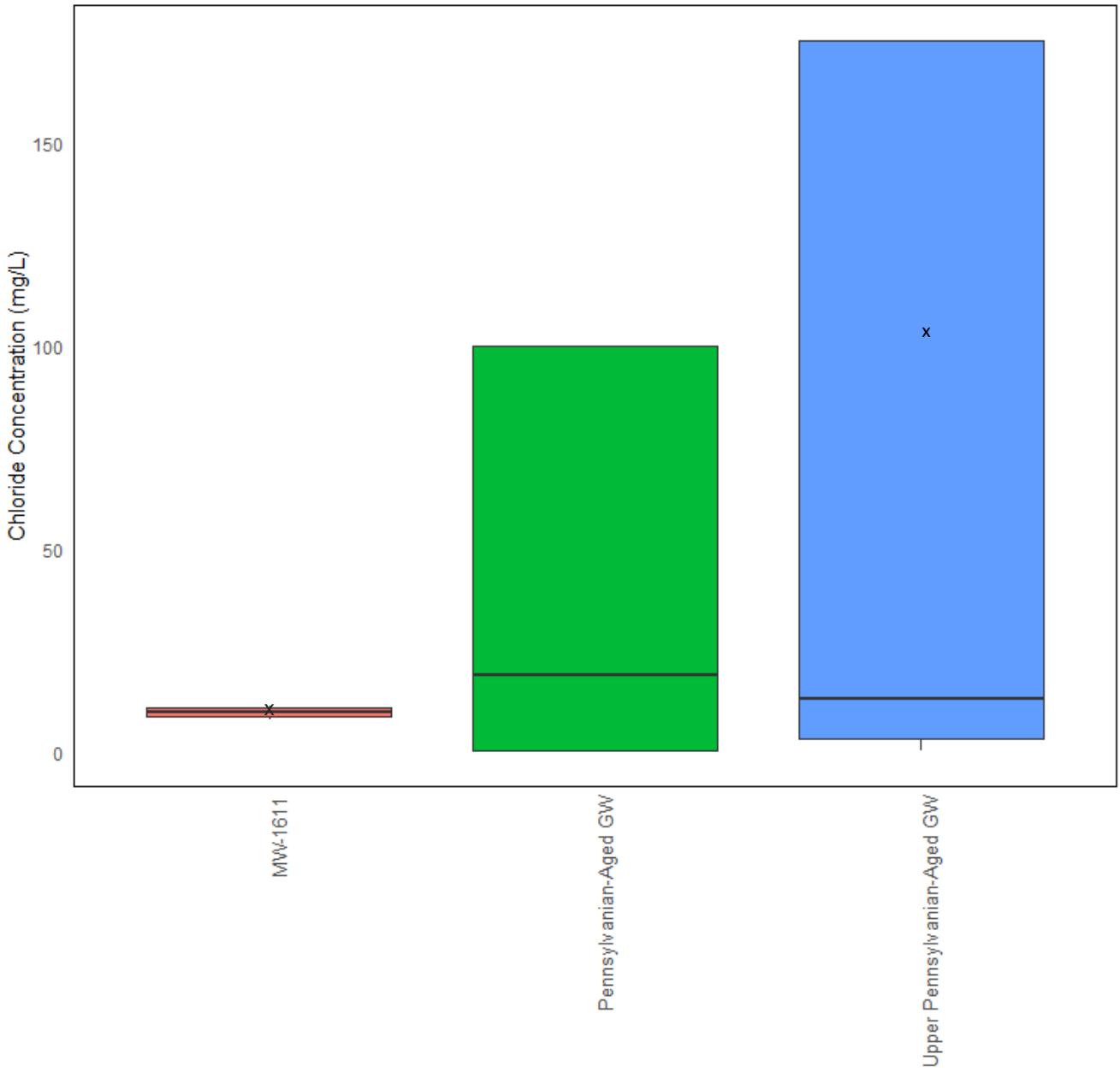
Geosyntec consultants

AMERICAN ELECTRIC POWER

Columbus, Ohio

January 2026

Figure **4**



Notes:
The box and whisker plot shows data collected from MW-1611 from all previous sampling events. 'Pennsylvanian-Aged GW', shown in green, represents pooled data from Pennsylvanian-aged aquifer samples from Chambers et al., 2008. 'Upper Pennsylvanian-Aged GW', shown in blue, represents pooled data from Upper Pennsylvanian-aged aquifer samples from Mathes et al., 1998.

The box and whisker plots show the 10th percentile of the dataset as the lower end of each box, and the 90th percentile of the data as the higher end of each box to eliminate outlier samples from the datasets. Medians of each dataset are shown with a black line in each box. Means are shown with 'x's.

Data for MW-1611 was collected under the federal CCR rule and represents total chloride in groundwater.

mg/L: milligrams per liter

Chloride Concentration Box-and-Whisker Plot

Mountaineer Landfill

Geosyntec consultants

AMERICAN ELECTRIC POWER

Columbus, Ohio

January 2026

Figure **5**

ATTACHMENT A
Site Location Map

New Haven

Graham Station Road / WV-62

Bottom Ash Ponds

Broad Run Road

Little Broad Run Landfill

Little Broad Run

Ohio River

Racine

N

0 3,500 7,000

SCALE IN FEET

Legend

- Coal Combustion Residual (CCR) Unit
- Streamflow Direction
- Rivers and Streams

NOTES:
1. 2014 AERIAL IMAGERY OBTAINED FROM USDA IMAGE SERVICE.
2. CCR BOUNDARY INCLUSIVE OF LANDFILL AREAS 1 THROUGH 7.
3. WEST VIRGINIA 1983 STATE PLANAR COORDINATES

AEP MOUNTAINEER GENERATING PLANT - LBR LANDFILL
BROAD RUN ROAD
NEW HAVEN, WEST VIRGINIA

PLANT AND CCR UNIT LOCATION MAP

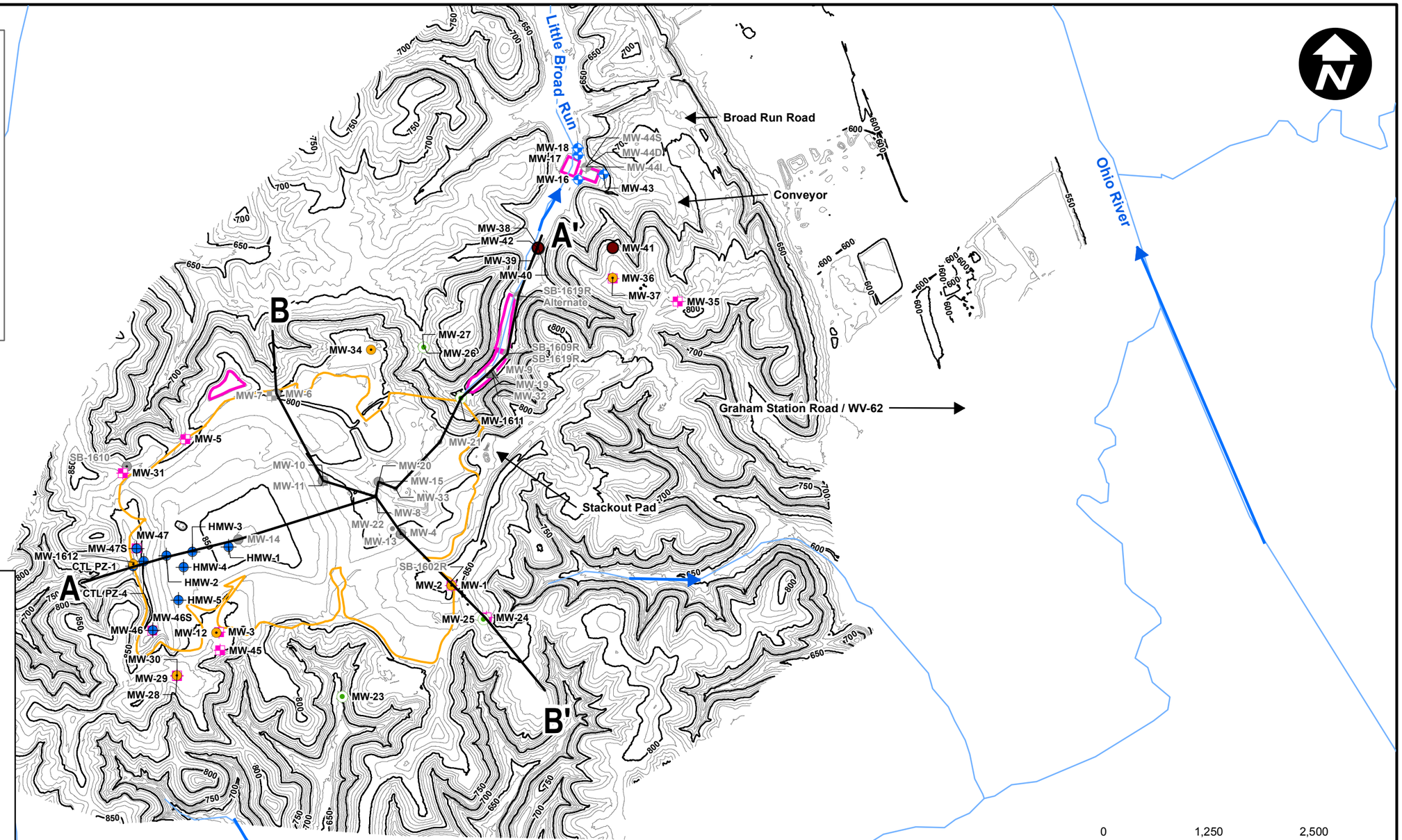
ARCADIS

FIGURE
2

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GISPROJECTS_ENV\AEP\Mountaineer\MXD\Landfill Report\Updated September 2016\F2_ Mtr Landfill Well Network - Plant and CCR Unit Location Map.mxd 9/16/2016 10:12:21 AM

ATTACHMENT B
Cross Sections (Arcadis 2016)

ALLUVIUM
MW-16, MW-17, MW-18, MW-19, MW-38, MW-43, MW-44S, MW-44I, MW-44D
HYDROLOGIC UNIT 1
MW-1, MW-3, MW-4, MW-5, MW-7, MW-10, MW-24, MW-28, MW-29, MW-31, MW-35, MW-36, MW-45, MW-46, MW-47
HYDROLOGIC UNIT 3
MW-2, MW-6, MW-11, MW-12, MW-13, MW-14, MW-20, MW-26, MW-30, MW-34, MW-37, MW-1612
HYDROLOGIC UNIT 4
MW-8, MW-9, MW-15, MW-21, MW-22, MW-23, MW-25, MW-27, MW-33, MW-39, MW-1611
PITTSBURG SANDSTONE
MW-40
REDSTONE COAL
MW-41, MW-42
PITTSBURG COAL
MW-32
PIEZOMETERS
CTL PZ-1, CTL PZ-4, MW-46S, MW-47S, HMW-1, HMW-2, HMW-3, HMW-4, HMW-5



Legend

- CCR Unit Boundary

Monitoring Well Network (gray if abandoned)

- Alluvium
- Hydrologic Unit 1
- Hydrologic Unit 3
- Hydrologic Unit 4
- Piezometer
- Pittsburg Coal
- Pittsburg Sandstone
- Redstone Coal
- Cross Section Location
- Streamflow Direction
- Rivers and Streams
- Topographic Contour (Contour Interval - 10 feet)
- Pond Boundary

0 1,250 2,500
SCALE IN FEET

NOTES:
1. TOPOGRAPHY FROM AEP DRAWING MTLF_3_20_12_2729SF.DGN
2. WELL COORDINATE SOURCE: GROUNDWATER QUALITY AT THE PHILIP SPORN AND MOUNTAINEER POWER PLANTS, MASON COUNTY, WEST VIRGINIA. EPRI. JUNE 1999 (WEST VIRGINIA 1983 STATE PLANAR COORDINATES)
3. MONITORING WELL COORDINATES FOR MW-1611 AND MW-1612 WERE SURVEYED BY AEP IN SEPTEMBER 2016 (WEST VIRGINIA 1927 STATE PLANAR COORDINATES)
4. CCR BOUNDARY INCLUSIVE OF LANDFILL AREAS 1 THROUGH 7

AEP MOUNTAINEER GENERATING PLANT - LBR LANDFILL
BROAD RUN ROAD
NEW HAVEN, WEST VIRGINIA

CROSS SECTION LOCATION MAP

ARCADIS

FIGURE 4

A
SOUTHWEST

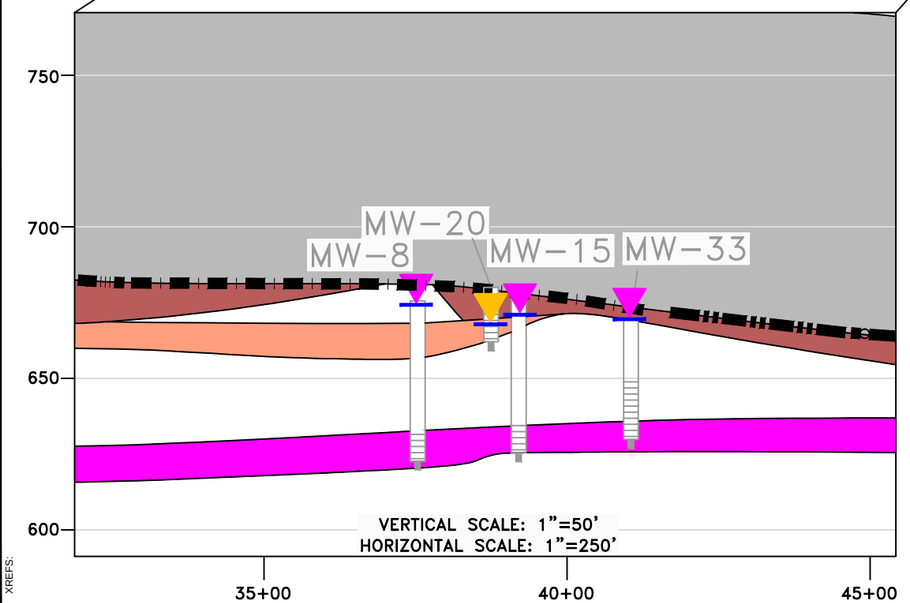
A'
NORTHEAST

ELEVATION (FEET ABOVE MEAN SEA LEVEL)

900
800
700
600
500
400

HMW-2
HMW-3
HMW-1
CURRENT GROUND SURFACE (LANDFILL)
CTL-PZ-4
MW-1612
CTL-PZ-1
MW-14
MW-20
MW-8
MW-15
MW-33
MW-21
MW-1611
POND
MW-32
MW-9
MW-19
SB-1609R
SB-1619R
POND
SB-1619R
ALTERNATE
MW-39
MW-38
PITTSBURG SANDSTONE
PITTSBURG No. 8 COAL

0+00 5+00 10+00 15+00 20+00 25+00 30+00 35+00 40+00 45+00 50+00 55+00 60+00 65+00 70+00



LEGEND

MW-8 — WELL IDENTIFICATION (GRAY IF ABANDONED)
WELL (GRAY IF ABANDONED)
WELL SCREEN
BORING
BOTTOM AND FLY ASH
ALLUVIUM AND SOILS
SHALE AND SILTSTONE
HYDROLOGIC UNIT 1 (SANDSTONE)
HYDROLOGIC UNIT 2 (SANDSTONE)
HYDROLOGIC UNIT 3 (SANDSTONE)
HYDROLOGIC UNIT 4 (SANDSTONE)
AREA 3 LINER
AREA 4 LINER
AREA 5 LINER
AREA 6 LINER
AREA 7 LINER

UPPERMOST AQUIFER

HYDROLOGIC UNIT 3 WATER LEVEL – MAXIMUM OBSERVED, AUG 1993–OCT 2002
HYDROLOGIC UNIT 4 WATER LEVEL – MAXIMUM OBSERVED, AUG 1993–OCT 2002

VERTICAL SCALE: 1"=100'
HORIZONTAL SCALE: 1"=500'

NOTES:

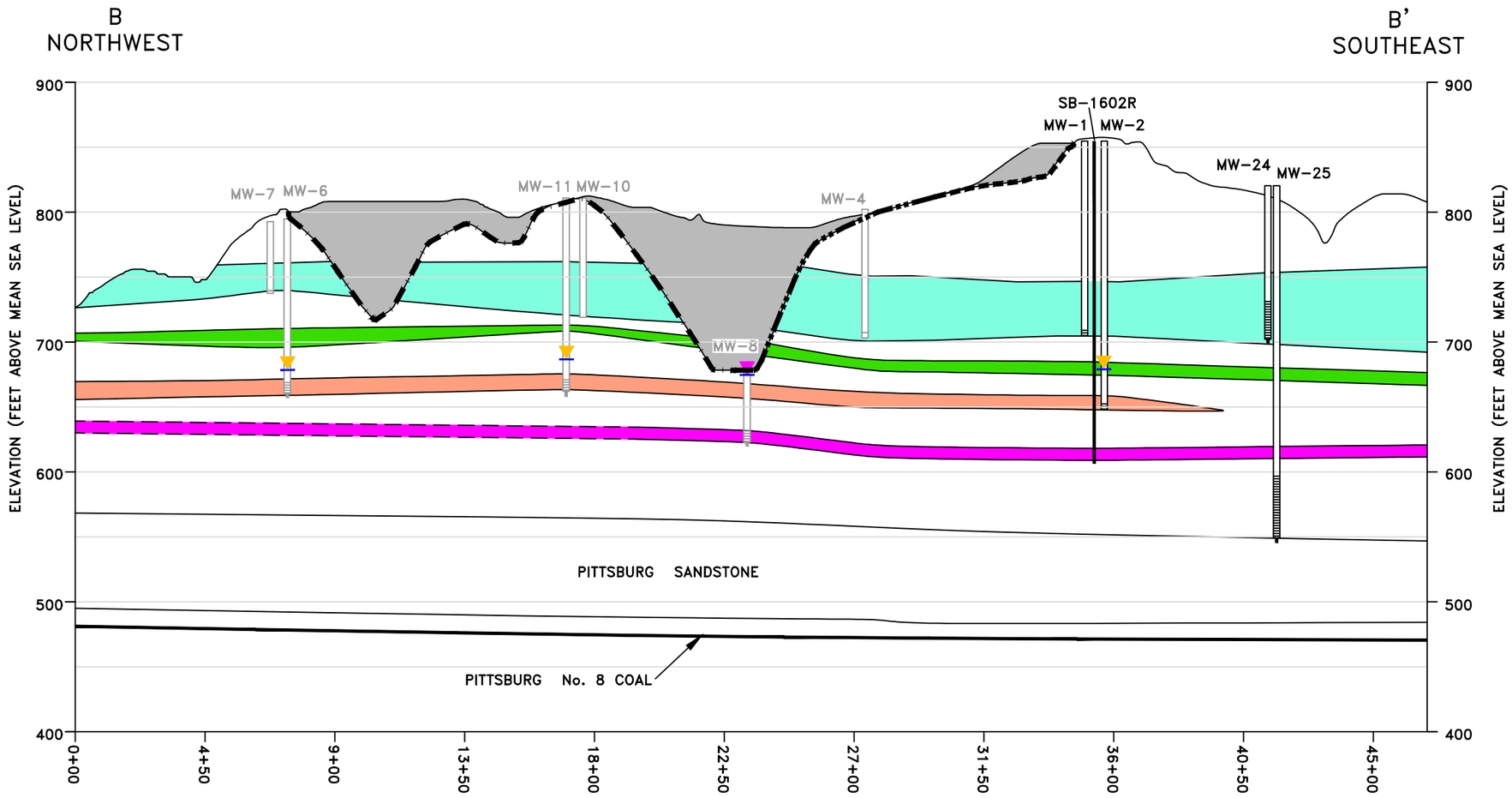
1. AREA 3 LINER: MINIMUM 2–FT THICK NATURAL CLAY LINER OVERLAIN BY A SINGLE UNDERDRAIN SYSTEM TO COLLECT LEACHATE AND GROUNDWATER SEEPAGE.
3. AREA 4 LINER: MINIMUM 2–FT THICK ENGINEERED CLAY LINER OVERLAIN BY A SINGLE UNDERDRAIN SYSTEM, AS WELL AS A GROUNDWATER INTERCEPTOR DRAIN SYSTEM BENEATH THE CLAY LINER TO CAPTURE SPRING FLOW FROM PERCHED GROUNDWATER.
4. AREA 5 LINER: GROUNDWATER INTERCEPTOR DRAINAGE SYSTEM, MINIMUM 1–FT COMPACTED OR IN–PLACE CLAYEY SUBBASE, MINIMUM 2–FT OF COMPACTED CLAY LINER, LEACHATE COLLECTION SYSTEM (LCS), AND 18–INCH PROTECTIVE COVER ZONE.
5. AREA 6 LINER: GROUNDWATER INTERCEPTOR DRAINAGE SYSTEM, 1–FT MINIMUM COMPACTED OR IN–PLACE CLAYEY SUBBASE, MINIMUM 2–FT OF COMPACTED CLAY LINER, LEACHATE COLLECTION SYSTEM (LCS), AND 18–INCH PROTECTIVE COVER ZONE.
6. AREA 7 LINER: GROUNDWATER INTERCEPTOR DRAINAGE SYSTEM, MINIMUM 1–FT COMPACTED OR IN–PLACE CLAYEY SUBBASE, MINIMUM 2–FT OF COMPACTED CLAY LINER, LEACHATE COLLECTION SYSTEM (LCS), AND 18–INCH PROTECTIVE COVER ZONE.

AEP MOUNTAINEER GENERATING PLANT - LBR LANDFILL
BROAD RUN ROAD
NEW HAVEN, WEST VIRGINIA

CROSS SECTION A-A'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5A



NOTES:

1. AREA 1 LINER: MINIMUM 2-FT THICK NATURAL CLAY LINER OVERLAIN BY A SINGLE UNDERDRAIN SYSTEM TO COLLECT LEACHATE AND GROUNDWATER SEEPAGE.
2. AREA 4 LINER: MINIMUM 2-FT THICK ENGINEERED CLAY LINER OVERLAIN BY A SINGLE UNDERDRAIN SYSTEM, AS WELL AS A GROUNDWATER INTERCEPTOR DRAIN SYSTEM BENEATH THE CLAY LINER TO CAPTURE SPRING FLOW FROM PERCHED GROUNDWATER.
3. AREA 6 LINER: GROUNDWATER INTERCEPTOR DRAINAGE SYSTEM, MINIMUM 1-FT COMPACTED OR IN-PLACE CLAYEY SUBBASE, MINIMUM 2-FT OF COMPACTED CLAY LINER, LEACHATE COLLECTION SYSTEM (LCS), AND 18-INCH PROTECTIVE COVER ZONE.

LEGEND

- BOTTOM AND FLY ASH
- SHALE AND SILTSTONE
- HYDROLOGIC UNIT 1 (SANDSTONE)
- HYDROLOGIC UNIT 2 (SANDSTONE)
- HYDROLOGIC UNIT 3 (SANDSTONE)
- HYDROLOGIC UNIT 4 (SANDSTONE)
- AREA 1 LINER
- AREA 4 LINER
- AREA 6 LINER

MW-8 — WELL IDENTIFICATION (GRAY IF ABANDONED)
- WELL (GRAY IF ABANDONED)
- WELL SCREEN
- BORING

UPPERMOST AQUIFER
- HYDROLOGIC UNIT 3 WATER LEVEL – MAXIMUM OBSERVED, AUG 1993–OCT 2002
- HYDROLOGIC UNIT 4 WATER LEVEL – MAXIMUM OBSERVED, AUG 1993–OCT 2002

VERTICAL SCALE: 1"=100'

HORIZONTAL SCALE: 1"=450'

AEP MOUNTAINEER GENERATING PLANT - LBR LANDFILL
BROAD RUN ROAD
NEW HAVEN, WEST VIRGINIA

CROSS SECTION B-B'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5B

ATTACHMENT C
MW-1611 Boring Log and Well Construction Diagram

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER **OH015976.0009**

COMPANY **American Electric Power**

PROJECT **Mountaineer Plant**

COORDINATES **N 711,948.8 E 1,731,867.6**

GROUND ELEVATION **654.0** SYSTEM

Water Level, ft	▽	▼	▼
TIME			
DATE			

BORING NO. **MW-1611** DATE **09/22/16** SHEET **1** OF **3**

BORING START **06/02/16** BORING FINISH **06/02/16**

PIEZOMETER TYPE **NA** WELL TYPE

HGT. RISER ABOVE GROUND **2.89** DIA

DEPTH TO TOP OF WELL SCREEN BOTTOM

WELL DEVELOPMENT BACKFILL

FIELD PARTY **NA** RIG **Hollow Stem Auger**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
0	NR	0.0	10.0		0					Straight drilled to 10 feet, boring was pre-drilled for utility clearance; no samples were taken.		
1	SS	10.0	12.0	2-3-3-3	0.3		10			FILL, brown, very soft, slightly silty fill.		
2	SS	12.0	14.0	0-0-2-3	24				CL	Clay; some silt; moist; soft; medium plasticity; medium tough; (5Y 4/1).		

TYPE OF CASING USED

	NQ-2 ROCK CORE	
NA	6" x 3.25 HSA	
NA	9" x 6.25 HSA	
NA	HW CASING ADVANCER	4"
NA	NW CASING	3"
NA	SW CASING	6"
NA	AIR HAMMER	8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC

WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **J. Wanner**

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER **OH015976.0009**

COMPANY **American Electric Power** BORING NO. **MW-1611** DATE **09/22/16** SHEET **2** OF **3**

PROJECT **Mountaineer Plant** BORING START **06/02/16** BORING FINISH **06/02/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
3	SS	14.0	16.0	0-0-1-2	24		15					
4	SS	16.0	18.0	0-0-0-0	24				CL	Clay with silt; little to some sand, fine to medium; soft; low plasticity; low toughness; moist; color 5GY 6/1 (greenish gray); bottom 0.5 feet includes 10% gravel.		
5	SS	18.0	20.0	3-4-3-5	19							
6	SS	20.0	22.0	21-22-24-31	12		20			Note: From 20 to 22 feet moist; color grades to (5/56-1).		
7	SS	22.0	24.0		0.3					Weathered shale; dry; fine pastes; weak plates; very faint iron staining. Straight drilled using a tricone bit, weathered bedrock.		
8	SS	24.0	26.0		24							
9	RC	26.0	30.5		60	60	25			Sandstone; field strength strong; color 10YR 6/3 to 10YR 5/2; texture medium grained; structure thinly bedded; decomposition slight; disintegration slight; fracture density intensely slight to very intense.		

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER **OH015976.0009**

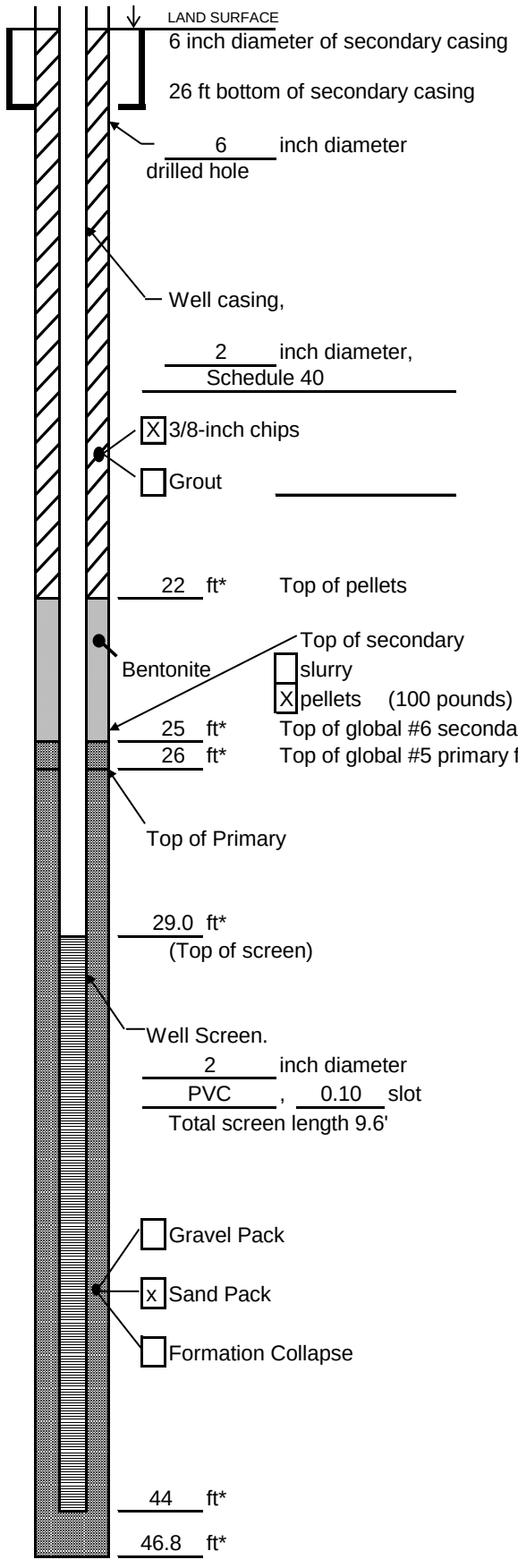
COMPANY **American Electric Power** BORING NO. **MW-1611** DATE **09/22/16** SHEET **3** OF **3**

PROJECT **Mountaineer Plant** BORING START **06/02/16** BORING FINISH **06/02/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
10	RC	30.5	35.5		62.4	58						
										Sandstone; field strength strong; color N 3/ (very dark gray) to N 6/ (gray); texture medium grained; structure thinly bedded, cross-bedded; decomposition fresh; disintegration competent; fracture density none unfractured.		
							35			Shale; field strength very weak to moderate; color N5/ (gray) to 10Y 5/1 (greenish gray); texture medium grained; structure thinly bedded; decomposition slightly; disintegration slightly; fracture density moderate to intense.		
11	RC	35.5	40.7		55.2	79			CL			
										Claystone/Mudstone; field strength; moderate to strong; color 7.5R 3/3; texture fine grained; structure thinly bedded; decomposition slightly; disintegration slightly; fracture density moderate to intensely.		
										Muddy shale; field strength strong; color 10BG 4/1 (dark greenish gray) to 5BG 4/1 (dark greenish gray); texture fine grained; structure thinly bedded; decomposition slightly; disintegration slightly; fracture density moderately to intensely.		
							40					
12	RC	40.7	46.0		57.6	39			CL	Claystone/Mudstone; field strength strong; color N 2.5/ (black) to 5GY 4/1 (dark greenish gray); texture fine grained; structure massive; decomposition moderately; disintegration slightly to moderately; fracture density intensely.		
									CL			
										Claystone/Mudstone; field strength strong; color 5GY 4/1 (dark greenish gray); texture fine grained; structure massive; decomposition slightly; disintegration slightly; fracture density moderately.		
							45					
										End of boring at 46 feet.		

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project AEP - Mountaineer Well MW-1611

Town/City New Haven

County Mason County State WV

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

654.01 feet ☐ Surveyed

☐ Estimated

Installation Date(s) 6/23/2016

Drilling Method Hollow Stem Auger

Drilling Contractor DLZ Ohio, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Waterra and Submersible Pump (7/7 thru 7/8/16)

Fluid Loss During Drilling N/A gallons

Water Removed During Development 70.7 gallons

Static Depth to Water 14.10 feet below M.P.

Pumping Depth to Water 42 feet below M.P.

Pumping Duration NM hours

Yield N/A gpm Date 7/7 thru 7/8/16

Specific Capacity N/A gpm/ft

Well Purpose Monitoring well

Remarks

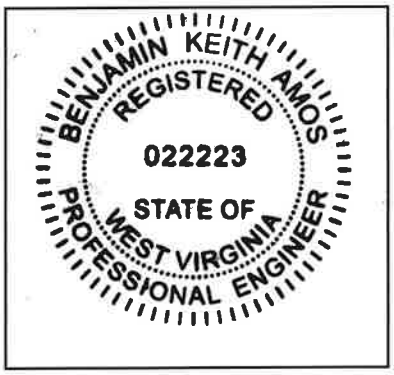
Prepared by Judd Wanner

ATTACHMENT D

Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that the above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Mountaineer Plant Landfill CCR management area and that the requirements of 40 CFR 257.94(e)(2) have been met.



Ben Amos
Printed Name of Licensed Professional Engineer

Signature

022223	West Virginia	1/14/2026
License Number	Licensing State	Date

APPENDIX 4

Notices for Monitoring Program Transitions and/or Other Applicable Notices – NA

APPENDIX 5

No monitoring wells were installed or decommissioned during this reporting period.