



**CCR COMPLIANCE
GROUNDWATER MONITORING AND CORRECTIVE ACTION
ANNUAL REPORT
BOTTOM ASH PONDS AND ASH DISPOSAL SITE**

Prepared for:



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Cheswick Generating Station
Springdale, Pennsylvania

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1.0 Introduction

Title 40 Code of Federal Regulations (CFR) §257.90 mandates that existing Coal Combustion Residuals (CCR) landfills and surface impoundments, also known as CCR units, be subject to groundwater monitoring and corrective action requirements as further detailed in §257.91 through §257.98. These requirements are part of the overall CCR Rule (or Rule) which was published in the Federal Register on April 17, 2015 and which became effective on October 19, 2015. Specific obligations for Owners and Operators of existing CCR units regarding the preparation of “Annual Groundwater Monitoring and Corrective Action Reports (Annual Report)” are outlined in §257.90(e)(1-5). The first of these Annual Reports must be completed no later than January 31, 2018, and provide information to address the following aspects for the preceding calendar year:

- Document the status of the groundwater monitoring and corrective action program for the respective CCR units;
- Summarize key actions completed;
- Describe any problems encountered and actions taken to resolve the problems; and
- Offer a projection of key activities for the upcoming year.

At a minimum, the Annual Report must contain the following information to the extent applicable and available:

- A map, aerial image, or diagram showing the CCR unit and all background/upgradient and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program;
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;
- In addition to all the monitoring data obtained under §257.90 through §257.98, a summary including the number of groundwater samples that were collected for analysis for each background/upgradient and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;
- A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and
- Any other information required to be included as specified in §257.90 through §257.98.

The Cheswick Generating Station, operated by NRG Power Midwest LP, a subsidiary of GenOn Energy, Inc. (GenOn), is a coal-fired power plant located in Springdale, Pennsylvania. The Rule applies to this facility due to the management/disposal of CCR materials that are generated from the combustion of coal. CCR units associated with station operations include the Cheswick Ash Disposal Site and two bottom ash ponds, identified as the “Recycle Pond” and the “Emergency Pond.” Each of these CCR units has a dedicated groundwater monitoring system that was originally installed to comply with Commonwealth of Pennsylvania Residual Waste Regulations, and was subsequently evaluated and modified (as needed) for use under the CCR program. Additionally, in accordance with the provisions of §257.91(d) of the Rule, the groundwater monitoring system for the Bottom Ash Ponds has been designated to provide coverage in the context of a multiunit system encompassing both ponds collectively.

In summary, this second Annual Report has been prepared to comply with the requirements of §257.90(e), addressing each of the Cheswick Station’s CCR Units with respect to the groundwater monitoring and corrective actions undertaken during Calendar Year 2018. This Annual Report and all subsequent reports thereto will be placed in the Station’s operating record per §257.105(h)(1), noticed to the State Director per §257.106(h)(1), and posted to the publicly accessible internet site per §257.107(h)(1).

2.0 Bottom Ash Ponds

2.1 Groundwater Monitoring Network

The CCR groundwater monitoring system for the Bottom Ash Ponds is comprised of four wells, including Well MW-8 (upgradient), and Wells MW-9, MW-10, and MW-11 (downgradient). All four wells communicate with the alluvium, which is the uppermost aquifer. The locations of the wells are shown on the attached Figure 1, along with depiction of the generalized groundwater flow direction in the area of the ponds. Each of these wells was already existing, and no new wells were added nor were any existing wells abandoned/replaced during the 2018 reporting period.

2.2 2018 Data Collection

During January 2018, the results from the October 2017 Detection Monitoring Event were reviewed, and subsequent determination made that several downgradient wells showed Appendix III constituents at levels representing a statistically significant increase (SSI) above corresponding background concentrations (see Table 1). Accordingly, the Bottom Ash Ponds were transitioned into the CCR Assessment Monitoring Program, and an initial round of samples covering all Appendix IV constituents was collected in April 2018 (see Table 2) per §257.95(b). From these results, the detected Appendix IV constituents were carried forward and analyzed during continued Assessment Monitoring events conducted in July 2018 and October 2018. As shown in Table 2, none of the Appendix IV constituents from the July and October 2018 events were measured at concentrations representing a statistically significant level (SSL) above the corresponding site-specific groundwater protection standards. Detected concentrations of several Appendix IV constituents; however, do remain above calculated background, and thus providing the basis for continued Assessment Monitoring into 2019.

2.3 2018 Monitoring Program Transitions

In 2018, the Bottom Ash Ponds transitioned into the Assessment Monitoring Program based on review of the October 2017 Detection Monitoring results, and subsequent confirmation that several Appendix III constituents in downgradient wells were at levels representing SSIs above background. The transition to the Assessment Monitoring Program was implemented during April 2018, including placement of an appropriate notification into the facility's operating record per §257.105(h)(5).

2.4 2018 Corrective Actions

During 2018, there were no problems identified or corrective actions undertaken.

2.5 2019 Projected Activities

It is anticipated that Assessment Monitoring activities will continue for the Bottom Ash Ponds during 2019, with continued review of Appendix IV constituent concentrations and comparison against established groundwater protection standards.

3.0 Ash Disposal Site

3.1 Groundwater Monitoring Network

The CCR groundwater monitoring system for the Ash Disposal Site is comprised of four wells, including Well MW-24 (upgradient) and Wells MW-21, MW-22 and MW-25 (downgradient). All four wells are screened across the soil/bedrock interface, wherein the uppermost aquifer exists. The locations of the wells are shown on Figure 2, along with depiction of the generalized groundwater flow direction in the area of the disposal site. Each of these wells was already existing, and no new wells were added nor were any existing wells abandoned/replaced during the 2018 reporting period.

3.2 2018 Data Collection

During January 2018, the results from the October 2017 Detection Monitoring Event were reviewed, and subsequent determination made that several downgradient wells showed Appendix III constituents at levels representing a statistically significant increase (SSI) above corresponding background concentrations (see Table 3). Accordingly, the Ash Disposal Site was transitioned into the CCR Assessment Monitoring Program, and an initial round of samples covering all Appendix IV constituents was collected in April 2018 (see Table 4) per §257.95(b). From these results, the detected Appendix IV constituents were carried forward and analyzed during continued Assessment Monitoring events conducted in July 2018 and October 2018. As shown in Table 4, none of the Appendix IV constituents from the July and October 2018 events were measured at concentrations representing a statistically significant level (SSL) above the corresponding site-specific groundwater protection standards. Detected concentrations of several Appendix IV constituents; however, do remain above calculated background, and thus providing the basis for continued Assessment Monitoring into 2019.

3.3 2018 Monitoring Program Transitions

In 2018, the Ash Disposal Site transitioned into the Assessment Monitoring Program based on review of the October 2017 Detection Monitoring results, and subsequent confirmation that several Appendix III constituents in downgradient wells were at levels representing SSIs above background. The transition to the Assessment Monitoring Program was implemented during April 2018, including placement of an appropriate notification into the facility's operating record per §257.105(h)(5).

3.4 2018 Corrective Actions

During 2018, there were no problems identified or corrective actions undertaken.

3.5 2019 Projected Activities

It is anticipated that Assessment Monitoring activities will continue for the Ash Disposal Site during 2019, with continued review of Appendix IV constituent concentrations and comparison against established groundwater protection standards.

Tables

Table 1
Cheswick Generating Station
Bottom Ash Ponds--Groundwater Analytical Data
CCR Appendix III Constituents

Monitoring Well	Date Sampled	Groundwater Elevation (ft. MSL)	Total Boron (mg/L)	Total Calcium (mg/L)	Total Chloride (mg/L)	Total Fluoride (mg/L)	Total Dissolved Solids (mg/L)	Sulfate (mg/L)	pH (S.U.)
			Calculated Background						
			0.45	95.1	175	0.2	701	191	6.19-6.80
MW-8 (Upgradient)	28-Dec-15	769.52	0.25	83.7	138	0.2	536	118	6.49
	28-Jan-16	768.82	0.27	81.0	122	0.2	500	132	6.55
	5-May-16	768.54	0.32	87.8	129	0.2	596	157	6.54
	28-Jul-16	767.89	0.31	69.0	115	0.2	502	110	6.45
	19-Oct-16	768.40	0.27	85.5	149	0.2	604	112	6.42
	30-Jan-17	768.27	0.29	70.9	109	0.2	490	129	6.46
	13-Apr-17	769.07	0.34	78.2	87	0.2	464	145	6.67
	1-Aug-17	769.43	0.37	73.2	78	0.2	486	150	6.34
	5-Oct-17	768.01	0.37	73.4	94	0.1	464	130	6.45
	11-Jul-18	768.93	0.27	61.9	79	0.3	428	112	6.77
16-Oct-18	768.93	0.28	54.8	74	0.3	406	112	6.70	
MW-9 (Downgradient)	28-Dec-15	757.75	0.26	86.7	167	0.1	554	112	6.56
	28-Jan-16	757.12	0.28	91.7	173	0.1	566	104	6.56
	5-May-16	756.96	0.23	91.4	189	0.1	646	103	6.68
	28-Jul-16	757.22	0.28	94.1	194	0.1	668	115	6.57
	19-Oct-16	756.98	0.25	99.8	173	0.1	732	110	6.52
	30-Jan-17	758.17	0.25	84.5	155	< 0.1	596	113	6.45
	13-Apr-17	757.82	0.26	89.4	141	< 0.1	548	107	5.59
	1-Aug-17	758.55	0.25	89.0	159	< 0.1	564	114	6.11
	5-Oct-17	756.95	0.29	113	238	< 0.1	776	150	6.45
	11-Jul-18	757.60	0.25	85.0	159	< 0.1	546	114	6.60
16-Oct-18	757.70	0.26	74.9	144	0.1	540	117	6.36	
MW-10 (Downgradient)	28-Dec-15	760.57	0.30	119	280	0.2	822	127	6.83
	28-Jan-16	760.04	0.29	118	263	0.2	766	118	6.98
	5-May-16	759.95	0.28	114	267	0.1	790	110	6.97
	28-Jul-16	760.13	0.28	89.8	198	0.2	656	106	6.78
	19-Oct-16	759.99	0.30	127	246	0.2	862	107	6.67
	30-Jan-17	760.75	0.27	109	239	0.1	722	118	6.85
	13-Apr-17	760.63	0.28	110	228	< 0.1	738	113	6.62
	1-Aug-17	760.89	0.30	114	255	0.1	784	125	6.89
	5-Oct-17	759.82	0.32	109	270	< 0.1	798	136	6.78
	11-Jul-18	758.58	0.28	107	242	0.1	742	126	7.07
16-Oct-18	760.48	0.32	97.7	237	0.1	744	127	7.09	
MW-11 (Downgradient)	28-Dec-15	764.35	0.19	79.3	35	0.5	346	68	7.06
	28-Jan-16	763.77	0.20	144	307	0.3	860	93	6.94
	5-May-16	764.00	0.22	112	209	0.4	694	93	6.88
	28-Jul-16	763.88	0.31	144	340	0.2	1070	144	6.71
	19-Oct-16	763.84	0.27	132	229	0.3	848	107	6.94
	30-Jan-17	764.29	0.18	84.1	106	0.5	450	77	6.95
	13-Apr-17	764.27	0.20	86.9	99	0.4	448	77	7.03
	1-Aug-17	764.23	0.26	98.1	110	0.5	498	80	6.75
	5-Oct-17	763.81	0.28	153	323	< 0.1	1130	162	6.60
	11-Jul-18	764.13	0.23	97.8	117	0.5	544	93	7.06
16-Oct-18	764.11	0.23	82.7	71	0.6	452	79	6.80	
PZ-1 (Observation Well)	28-Dec-15	771.51	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	28-Jan-16	769.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5-May-16	767.48	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	28-Jul-16	762.50	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	19-Oct-16	764.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	30-Jan-17	771.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	13-Apr-17	770.94	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1-Aug-17	774.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5-Oct-17	772.50	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11-Jul-18	771.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16-Oct-18	769.83	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A = Not applicable. Well only used for the collection of groundwater levels.

Notes:

- Cells with "<" are represented as non-detects. Values shown correspond to the laboratory reporting limit.
- Background values based on statistical evaluation of initial eight rounds (Dec. 2015 thru Aug. 2017) of groundwater sampling data for Well MW-8.

Table 2
Cheswick Generating Station
Bottom Ash Ponds--Groundwater Analytical Data
CCR Appendix IV Constituents

Monitoring Well	Date Sampled	Total Antimony (mg/L)	Total Arsenic (mg/L)	Total Barium (mg/L)	Total Beryllium (mg/L)	Total Cadmium (mg/L)	Total Chromium (mg/L)	Total Cobalt (mg/L)	Total Fluoride (mg/L)	Total Lead (mg/L)	Total Lithium (mg/L)	Total Mercury (mg/L)	Total Molybdenum (mg/L)	Total Selenium (mg/L)	Total Thallium (mg/L)	Total Radium-226 and 228 (pCi/L)	
		Calculated Background															
		0.001	0.001	0.04	0.001	0.002	0.01	0.005	0.2	0.001	0.01	0.0002	0.02	0.018	0.0002	1.39	
		Groundwater Protection Standard															
		MCL	MCL	MCL	MCL	MCL	MCL	RSL	MCL	RSL	RSL	MCL	RSL	MCL	MCL	MCL	
0.006	0.01	2	0.004	0.005	0.1	0.006	4.0	0.015	0.04	0.002	0.10	0.05	0.002	5			
MW-8 (Upgradient)	28-Dec-15	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.007	< 0.0002	0.62	
	28-Jan-16	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	0.01	< 0.0002	< 0.02	0.013	< 0.0002	0.50	
	5-May-16	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.016	< 0.0002	0.80	
	28-Jul-16	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	0.01	< 0.0002	< 0.02	0.009	< 0.0002	0.43	
	19-Oct-16	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	0.01	< 0.0002	< 0.02	0.007	< 0.0002	0.77	
	30-Jan-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.013	< 0.0002	0.67	
	13-Apr-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.015	< 0.0002	0.40	
	1-Aug-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	0.01	< 0.0002	< 0.02	0.013	< 0.0002	0.98	
	3-Apr-18	< 0.001	0.002	0.02	< 0.001	< 0.002	< 0.01	< 0.005	0.3	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	1.47	
11-Jul-18	Not Analyzed	< 0.001	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.3	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.008	Not Analyzed	0.11		
16-Oct-18	Not Analyzed	< 0.001	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.3	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.007	Not Analyzed	0.58		
MW-9 (Downgradient)	28-Dec-15	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.80	
	28-Jan-16	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.15	
	5-May-16	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.75	
	28-Jul-16	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.18	
	19-Oct-16	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.43	
	30-Jan-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	-0.04	
	13-Apr-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	-0.19	
	1-Aug-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.31	
	3-Apr-18	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	1.33	
11-Jul-18	Not Analyzed	< 0.001	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	-0.30		
16-Oct-18	Not Analyzed	< 0.001	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	0.98		
MW-10 (Downgradient)	28-Dec-15	< 0.001	< 0.001	0.07	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	-0.04	
	28-Jan-16	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.36	
	5-May-16	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.53	
	28-Jul-16	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.13	
	19-Oct-16	< 0.001	< 0.001	0.10	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.64	
	30-Jan-17	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	-0.15	
	13-Apr-17	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.52	
	1-Aug-17	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	1.12	
	3-Apr-18	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.13	
11-Jul-18	Not Analyzed	< 0.001	0.04	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	0.86		
16-Oct-18	Not Analyzed	< 0.001	0.04	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	1.11		
MW-11 (Downgradient)	28-Dec-15	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.5	< 0.001	< 0.01	< 0.0002	< 0.02	0.004	< 0.0002	0.05	
	28-Jan-16	< 0.001	< 0.001	0.10	< 0.001	< 0.002	< 0.01	< 0.005	0.3	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.50	
	5-May-16	< 0.001	< 0.001	0.08	< 0.001	< 0.002	< 0.01	< 0.005	0.4	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.44	
	28-Jul-16	< 0.001	< 0.001	0.12	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	1.24	
	19-Oct-16	< 0.001	< 0.001	0.13	< 0.001	< 0.002	< 0.01	< 0.005	0.3	< 0.001	0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.82	
	30-Jan-17	< 0.001	< 0.001	0.07	< 0.001	< 0.002	< 0.01	< 0.005	0.5	< 0.001	< 0.01	< 0.0002	< 0.02	0.003	< 0.0002	0.23	
	13-Apr-17	< 0.001	< 0.001	0.08	< 0.001	< 0.002	< 0.01	< 0.005	0.4	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.94	
	1-Aug-17	< 0.001	< 0.001	0.10	< 0.001	< 0.002	< 0.01	< 0.005	0.5	< 0.001	< 0.01	< 0.0002	< 0.02	0.001	< 0.0002	0.89	
	3-Apr-18	< 0.001	< 0.001	0.07	< 0.001	< 0.002	< 0.01	< 0.005	0.9	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.40	
11-Jul-18	Not Analyzed	< 0.001	0.11	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.5	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.001	Not Analyzed	0.53		
16-Oct-18	Not Analyzed	< 0.001	0.10	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.6	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.001	Not Analyzed	1.01		

Notes:

- Cells with "<" are represented as non-detects. Values shown correspond to the laboratory reporting limit.
- Background values based on statistical evaluation of initial eight rounds (Dec. 2015 thru Aug. 2017) of groundwater sampling data for Well MW-8.
- As indicated, Groundwater Protection Standards are either published MCLs or risk-based Regional Screening Levels (RSLs). For constituents where calculated background exceeds either the MCL or RSL, the background value is used.

Table 3
Cheswick Generating Station
Ash Disposal Site--Groundwater Analytical Data
CCR Appendix III Constituents

Monitoring Well	Date Sampled	Groundwater Elevation (ft. MSL)	Total Boron (mg/L)	Total Calcium (mg/L)	Total Chloride (mg/L)	Total Fluoride (mg/L)	Total Dissolved Solids (mg/L)	Sulfate (mg/L)	pH (S.U.)
			Calculated Background						
			0.05	141	137	0.1	738	69	6.21-6.98
MW-24 (Upgradient)	14-Oct-16	1075.54	< 0.05	126	85	< 0.1	534	58	6.53
	8-Dec-16	1077.22	< 0.05	125	83	< 0.1	478	52	6.38
	9-Jan-17	1077.24	< 0.05	126	90	< 0.1	738	59	6.57
	15-Feb-17	1078.30	< 0.05	134	60	< 0.1	516	52	6.65
	6-Mar-17	1077.65	< 0.05	125	61	< 0.1	496	48	6.52
	24-Apr-17	1077.71	< 0.05	127	51	< 0.1	516	46	6.62
	26-Jun-17	1077.59	< 0.05	118	49	< 0.1	522	45	6.82
	27-Jul-17	1077.21	< 0.05	116	57	< 0.1	544	49	6.59
	6-Oct-17	1073.21	< 0.05	122	47	< 0.1	508	47	6.61
	10-Jul-18	1077.46	< 0.05	125	24	0.1	514	46	6.68
17-Oct-18	1077.33	< 0.05	119	31	< 0.1	522	37	6.92	
MW-21 (Downgradient)	28-Dec-15	869.60	< 0.05	56.3	3	0.2	294	56	6.78
	9-Mar-16	866.25	0.06	61.3	2	0.2	278	55	7.92
	7-Jun-16	865.23	0.07	57.8	2	0.2	272	56	7.10
	9-Sep-16	865.35	< 0.05	59.3	2	0.2	296	48	7.16
	8-Dec-16	865.55	0.09	61.2	3	0.1	288	51	7.13
	16-Feb-17	867.05	0.07	62.1	3	0.2	272	53	7.17
	20-Apr-17	864.95	< 0.05	60.5	3	0.2	330	56	7.44
	26-Jun-17	864.23	< 0.05	57.9	3	0.1	296	60	7.42
	26-Jul-17	864.01	< 0.05	60.5	3	0.2	282	55	7.30
	6-Oct-17	863.37	< 0.05	60.4	3	0.2	274	53	6.80
10-Jul-18	864.48	< 0.05	61.2	3	0.2	298	57	7.18	
17-Oct-18	865.19	< 0.05	65.7	3	0.2	300	57	7.67	
MW-22 (Downgradient)	28-Dec-15	869.37	< 0.05	111	5	0.1	664	199	6.72
	9-Mar-16	865.46	0.07	95.2	4	0.1	506	148	7.14
	7-Jun-16	865.24	0.08	87.1	4	< 0.1	516	144	6.73
	9-Sep-16	864.88	< 0.05	86.8	5	0.4	600	146	6.28
	8-Dec-16	865.18	0.09	103	6	0.1	638	172	6.83
	16-Feb-17	865.85	0.16	96.3	8	0.1	616	183	6.86
	19-Apr-17	864.30	0.08	95.8	7	< 0.1	628	191	6.91
	26-Jun-17	864.01	0.07	89.6	7	< 0.1	622	186	7.15
	26-Jul-17	863.82	0.07	85.0	6	0.1	578	175	6.94
	6-Oct-17	863.52	0.05	86.1	7	0.1	594	169	6.62
10-Jul-18	864.66	0.08	83.9	6	0.1	598	159	7.00	
17-Oct-18	865.32	0.10	88.6	7	0.2	646	182	7.10	
MW-25 (Downgradient)	14-Oct-16	864.82	1.03	155	67	< 0.1	878	324	6.95
	8-Dec-16	865.17	1.51	128	27	< 0.1	670	268	6.86
	9-Jan-17	864.15	1.90	118	29	0.2	676	241	6.97
	16-Feb-17	866.37	4.11	199	65	0.1	916	420	7.16
	6-Mar-17	865.44	4.91	214	83	< 0.1	1080	469	6.97
	19-Apr-17	864.04	2.88	173	60	< 0.1	954	374	7.18
	26-Jun-17	863.79	2.48	134	27	< 0.1	702	242	7.13
	26-Jul-17	863.61	3.97	148	34	< 0.1	706	261	6.69
	6-Oct-17	863.11	3.63	158	48	< 0.1	802	236	6.60
	10-Jul-18	864.02	2.15	139	34	< 0.1	642	204	6.78
17-Oct-18	864.59	< 0.05	122	31	0.1	508	38	7.22	

Notes:

- Cells with "<" are represented as non-detects. Values shown correspond to the laboratory reporting limit.
- Background values based on statistical evaluation of initial eight rounds (Oct. 2016 thru July 2017) of groundwater sampling data for Well MW-24.

Table 4
Cheswick Generating Station
Ash Disposal Site--Groundwater Analytical Data
CCR Appendix IV Constituents

Monitoring Well	Date Sampled	Total Antimony (mg/L)	Total Arsenic (mg/L)	Total Barium (mg/L)	Total Beryllium (mg/L)	Total Cadmium (mg/L)	Total Chromium (mg/L)	Total Cobalt (mg/L)	Total Fluoride (mg/L)	Total Lead (mg/L)	Total Lithium (mg/L)	Total Mercury (mg/L)	Total Molybdenum (mg/L)	Total Selenium (mg/L)	Total Thallium (mg/L)	Total Radium-226 and 228 (pCi/L)
		Calculated Background														
		0.001	0.001	0.14	0.001	0.002	0.01	0.005	0.1	0.001	0.01	0.0002	0.02	0.001	0.0002	12.9
		Groundwater Protection Standard														
		MCL	MCL	MCL	MCL	MCL	MCL	RSL	MCL	RSL	RSL	MCL	RSL	MCL	RSL	MCL
		0.006	0.01	2	0.004	0.005	0.1	0.006	4.0	0.015	0.04	0.002	0.10	0.05	0.002	12.9
MW-24 (Upgradient)	14-Oct-16	< 0.001	< 0.001	0.12	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.22
	8-Dec-16	< 0.001	< 0.001	0.12	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	-0.08
	9-Jan-17	< 0.001	< 0.001	0.12	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.03
	15-Feb-17	< 0.001	< 0.001	0.13	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.37
	6-Mar-17	< 0.001	< 0.001	0.12	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.28
	24-Apr-17	< 0.001	< 0.001	0.13	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	-0.31
	26-Jun-17	< 0.001	< 0.001	0.11	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.40
	27-Jul-17	< 0.001	< 0.001	0.11	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	1.71
	4-Apr-18	< 0.001	0.001	0.13	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.25
	10-Jul-18	Not Analyzed	0.001	0.13	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	0.53
17-Oct-18	Not Analyzed	< 0.001	0.06	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	0.86	
MW-21 (Downgradient)	28-Dec-15	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.21
	9-Mar-16	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.003	< 0.0002	-0.25
	7-Jun-16	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.56
	9-Sep-16	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.40
	8-Dec-16	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.003	< 0.0002	-0.04
	16-Feb-17	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.003	< 0.0002	0.35
	20-Apr-17	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.37
	26-Jun-17	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.91
	26-Jul-17	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.74
	4-Apr-18	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	< 0.01	< 0.0002	< 0.02	0.003	< 0.0002	0.46
10-Jul-18	Not Analyzed	< 0.001	0.05	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.2	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.003	Not Analyzed	-0.41	
17-Oct-18	Not Analyzed	< 0.001	0.06	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.2	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.002	Not Analyzed	1.77	
MW-22 (Downgradient)	28-Dec-15	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	0.01	< 0.0002	< 0.02	0.002	< 0.0002	1.46
	9-Mar-16	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.54
	7-Jun-16	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.002	< 0.0002	0.31
	9-Sep-16	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.4	< 0.001	< 0.01	< 0.0002	< 0.02	0.003	< 0.0002	0.88
	8-Dec-16	< 0.001	0.003	0.07	< 0.001	< 0.002	< 0.01	< 0.005	0.1	0.006	0.01	< 0.0002	< 0.02	0.004	< 0.0002	0.14
	16-Feb-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	0.01	< 0.0002	< 0.02	0.004	< 0.0002	0.60
	19-Apr-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.004	< 0.0002	0.31
	26-Jun-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.004	< 0.0002	0.73
	26-Jul-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.004	< 0.0002	0.79
	4-Apr-18	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	< 0.01	< 0.0002	< 0.02	0.003	< 0.0002	0.55
10-Jul-18	Not Analyzed	< 0.001	0.02	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.005	Not Analyzed	2.26	
17-Oct-18	Not Analyzed	< 0.001	0.04	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.2	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.004	Not Analyzed	2.21	

Table 4
Cheswick Generating Station
Ash Disposal Site--Groundwater Analytical Data
CCR Appendix IV Constituents

Monitoring Well	Date Sampled	Total Antimony (mg/L)	Total Arsenic (mg/L)	Total Barium (mg/L)	Total Beryllium (mg/L)	Total Cadmium (mg/L)	Total Chromium (mg/L)	Total Cobalt (mg/L)	Total Fluoride (mg/L)	Total Lead (mg/L)	Total Lithium (mg/L)	Total Mercury (mg/L)	Total Molybdenum (mg/L)	Total Selenium (mg/L)	Total Thallium (mg/L)	Total Radium-226 and 228 (pCi/L)	
		Calculated Background															
		0.001	0.001	0.14	0.001	0.002	0.01	0.005	0.1	0.001	0.01	0.0002	0.02	0.001	0.0002	12.9	
		Groundwater Protection Standard															
		MCL	MCL	MCL	MCL	MCL	MCL	RSL	MCL	RSL	RSL	MCL	RSL	MCL	MCL	MCL	BACKGROUND
		0.006	0.01	2	0.004	0.005	0.1	0.006	4.0	0.015	0.04	0.002	0.10	0.05	0.002	12.9	
MW-25 (Downgradient)	14-Oct-16	< 0.001	< 0.001	0.06	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	0.02	< 0.0002	< 0.02	0.002	< 0.0002	0.55	
	8-Dec-16	< 0.001	0.002	0.04	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	0.03	< 0.0002	< 0.02	< 0.001	< 0.0002	0.35	
	9-Jan-17	< 0.001	< 0.001	0.05	< 0.001	< 0.002	< 0.01	< 0.005	0.2	< 0.001	0.03	< 0.0002	< 0.02	< 0.001	< 0.0002	1.00	
	16-Feb-17	< 0.001	< 0.001	0.09	< 0.001	< 0.002	< 0.01	< 0.005	0.1	< 0.001	0.13	< 0.0002	0.27	0.006	< 0.0002	0.86	
	6-Mar-17	< 0.001	< 0.001	0.08	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	0.14	< 0.0002	0.29	0.007	< 0.0002	-0.19	
	19-Apr-17	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	0.04	< 0.0002	< 0.02	0.001	< 0.0002	0.76	
	26-Jun-17	< 0.001	< 0.001	0.04	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	0.03	< 0.0002	< 0.02	< 0.001	< 0.0002	0.71	
	26-Jul-17	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	< 0.1	< 0.001	0.04	< 0.0002	< 0.02	0.001	< 0.0002	0.33	
	4-Apr-18	< 0.001	< 0.001	0.03	< 0.001	< 0.002	< 0.01	< 0.005	0.3	< 0.001	< 0.01	< 0.0002	< 0.02	< 0.001	< 0.0002	0.54	
	10-Jul-18	Not Analyzed	< 0.001	0.04	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	1.31
17-Oct-18	Not Analyzed	0.001	0.13	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.001	Not Analyzed	0.96	




- Notes:**
- Cells with "<" are represented as non-detects. Values shown correspond to the laboratory reporting limit.
 - Background values based on statistical evaluation of initial eight rounds (Oct. 2016 thru July 2017) of groundwater sampling data for Well MW-24.
 - As indicated, Groundwater Protection Standards are either published MCLs or risk-based Regional Screening Levels (RSLs). For constituents where calculated background exceeds either the MCL or RSL, the background value is used.

Figures

OFFICE: Pittsburgh, PA
 DATE: 1/31/18
 DESIGNED BY: --
 DRAWN BY: E. Schlegel
 CHECKED BY: --
 APPROVED BY: --
 DRAWING NUMBER: 1009134004-B10

File: O:\PROJECT\1009134004_Cheswick\1009134004-B10.dwg
 Plot Date/Time: Nov 26, 2018 - 10:03am
 Xref: --
 Image: --
 Plotted By: Greg Jones



- LEGEND:**
- 
MW-10 (760.48) CCR GROUNDWATER MONITORING WELL WITH GROUNDWATER ELEVATION MEASURED ON OCTOBER 16, 2018
 - 
PZ-1 (769.83) OBSERVATION WELL (GROUNDWATER LEVELS ONLY) WITH GROUNDWATER ELEVATION MEASURED ON OCTOBER 16, 2018
 - 
GROUNDWATER FLOW DIRECTION



REFERENCE:
 GOOGLE AERIAL PHOTOGRAPH, DATED 6/14/2014.

	500 Penn Center Boulevard, Suite 1000 Pittsburgh, Pennsylvania 15235
--	--



FIGURE 1
 CCR COMPLIANCE GROUNDWATER MONITORING WELL LOCATION MAP
 BOTTOM ASH PONDS
 CHESWICK GENERATING STATION
 SPRINGDALE, ALLEGHENY COUNTY, PENNSYLVANIA

OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Pittsburgh, PA	1/31/18	---	E. Schlegel	---	---	1009134004-B11

File: O:\PROJECT\1009134004_Cheswick\1009134004-B11.dwg
 Plot Date/Time: Nov 28, 2018 - 10:05am
 Xref: Image
 Plotted By: Greg Jones



LEGEND:

MW-25 (864.59) CCR GROUNDWATER MONITORING WELL WITH GROUNDWATER ELEVATION MEASURED ON OCTOBER 17, 2018
 GROUNDWATER FLOW DIRECTION



REFERENCES:

1. GOOGLE AERIAL PHOTOGRAPH, DATED 6/14/2014.

	500 Penn Center Boulevard, Suite 1000 Pittsburgh, Pennsylvania 15235
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FIGURE 2
 CCR COMPLIANCE GROUNDWATER MONITORING WELL LOCATION MAP
 CHESWICK ASH DISPOSAL SITE
 CHESWICK GENERATING STATION
 SPRINGDALE, ALLEGHENY COUNTY, PENNSYLVANIA