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31 January 2019
File No. 130116
AES Ohio Generation, LLC
745 US Route 52
Manchester, Ohio 45144

Attention: Mr. Troy Williams

Subject: 2018 Annual Groundwater Monitoring and Corrective Action Report for
the Ash Pond
Killen Electric Generating Station
Manchester, Ohio

Dear Mr. Williams:

Haley & Aldrich, Inc. is pleased to submit this 2018 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) for the Ash Pond at the Killen Electric Generating Station (KEGS). This Annual Report was developed to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule effective 19 October 2015 (Rule), specifically Code of Federal Regulations Title 40, subsection § 257.90(e). The annual report documents the status of the groundwater monitoring and corrective action program for the Ash Pond, key actions completed in 2018, problems encountered (if any), actions to resolve the problems (if any), and key activities planned for 2019 consistent with applicable sections of § 257.90 through § 257.98.

The specific requirements listed in Sections § 257.90(e)(1) through § 257.90(e)(5) of the Rule are provided in the Annual Report in bold/italic type, followed by a short narrative describing how the Rule has been met.

Sincerely yours,
HALEY & ALDRICH, INC.

A handwritten signature in black ink, appearing to read "Steve Putrich".

Steve Putrich, P.E.
Project Principal

A handwritten signature in blue ink, appearing to read "Mark Miesfeldt".

Mark Miesfeldt
Lead Hydrogeologist

2018 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT
ASH POND
KILLEN ELECTRIC GENERATING STATION
MANCHESTER, OH

by Haley & Aldrich, Inc.
Cleveland, Ohio

AES Ohio Generation, LLC
Manchester, OH

File No. 130116
January 2019



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1. 40 CFR § 257.90 Applicability

1.1 40 CFR § 257.90(a)

Except as provided for in § 257.100 for inactive CCR surface impoundments, all CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under § 257.90 through § 257.98.

The Ash Pond at KEGS is subject to the groundwater monitoring and corrective action requirements described under Code of Federal Regulations Title 40 (40 CFR) § 257.90 through § 257.98. This document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e).

1.2 40 CFR § 257.90(e) - SUMMARY

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1).

This Annual Report documents the activities completed in 2018 for the Ash Pond as required by the Rule. Groundwater sampling and analysis was conducted per the requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.95 is provided in this report.

1.2.1 Status of the Groundwater Monitoring Program

As provided in the notification on January 15, 2018 statistically significant increases (SSI) of Appendix III constituents were identified downgradient of the Ash Pond. An evaluation of alternate sources was conducted; however, a successful alternative source demonstration (ASD) was not achieved at that time. As a result, an assessment monitoring program was initiated as required by § 257.94(e)(2). The notification was placed in the operating record as required by § 257.105(h)(5).

1.2.2 Key Actions Completed

The following key actions were completed in 2018:

- Pursuant to § 257.93(h) conducted a statistical analysis of detection monitoring results to evaluate potential SSIs.
- Prepared 2017 Annual Report including:
 - Pursuant to § 257.105(h)(1), the Annual Report was placed in the facility's operating record.

- Pursuant to § 257.106(h)(1), the notification was sent to the relevant State Director and/or Tribal authority within 30 days of the Annual Report being placed on the facility's operating record [§ 257.106(d)].
- Pursuant to § 257.107(h)(1), the Annual Report was posted to the CCR Website within 30 days of the Annual Report being placed on the facility's operating record [§ 257.107(d)].
- In accordance with § 257.94(e)(2) evaluated possible alternate sources for Appendix III SSLs.
- Prepared notification stating that an assessment monitoring program had been established in accordance with §257.94(e)(3) and posted notification to website as required by §257.107(h)(4).
- Collected and analyzed two rounds of assessment monitoring results in accordance with § 257.95(b) and § 257.95(d)(1) and recorded the concentrations in the facility operating record as required by § 257.95(d)(1).
- Established groundwater protection standards for all Appendix IV constituents detected as required by § 257.95(d)(2). Groundwater protection standards are presented in **Table 1**.

1.2.3 Problems Encountered

No problems such as damaged wells, issues with sample collection or lack of sampling, and problems with analytical analysis were encountered at the KEGS Ash Pond in 2018.

1.2.4 Actions to Resolve Problems

No actions to resolve problems were required.

1.2.5 Project Key Activities for Upcoming Year

Key activities to be completed in 2019 include the following:

- Statistical analysis of assessment monitoring analytical data to determine if statistically significant levels (SSLs) of the detected Appendix IV constituents are present as required by § 257.95(g)
- Based on the findings of the statistical analysis, conduct applicable groundwater monitoring and subsequent statistical analysis as required by § 257.94 or § 257.95.

1.3 40 CFR § 257.90(e) - INFORMATION

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

1.3.1 40 CFR § 257.90(e)(1)

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

As required by § 257.90(e)(1), a map showing the locations of the CCR unit and associated upgradient and downgradient monitoring wells for the Ash Pond is included in this report (see **Figure 1**).

1.3.2 40 CFR § 257.90(e)(2)

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;

No monitoring wells were installed or decommissioned during 2018.

1.3.3 40 CFR § 257.90(e)(3)

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 and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

In accordance with § 257.95(b) and § 257.95(d)(1), two independent samples from each background and downgradient monitoring well were collected and analyzed. A summary table including the sample names, dates of sample collection, reason for sample collection (detection or assessment), and monitoring data obtained for the groundwater monitoring program for the Ash Pond is presented in **Table 1** of this report.

1.3.4 40 CFR § 257.90(e)(4)

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

As required by § 257.93(h) the statistical analyses of the Appendix III constituents were completed by January 15, 2018. These statistical analyses determined that statistically significant increases of boron, calcium, pH, sulfate, and total dissolved solids were present downgradient of the Ash Pond. Pursuant to § 257.94(e)(2), an Alternative Source Demonstration was initiated to evaluate whether a source other than the CCR unit was causing the SSIs; however, a successful demonstration was not completed at that time. Pursuant to § 257.94(e)(2), § 257.94(e)(3), and 257.95(b), the facility established an Assessment Monitoring Program in accordance with the requirements of § 257.95 on July 16, 2018.

1.3.5 40 CFR § 257.90(e)(5)

Other information required to be included in the annual report as specified in § 257.90 through § 257.98.

Other information including development of groundwater protection standards, recording groundwater monitoring results in the operating record, and an evaluation of alternate sources is discussed in preceding sections.

TABLES

TABLE 1
SUMMARY OF ANALYTICAL RESULTS
ASH POND - KILLEN ELECTRIC GENERATING STATION
AES GENERATION, LLC - MANCHESTER, OHIO

Chemical Group					EPA Appendix III Constituents							EPA Appendix IV Constituents													
Chemical Name					Boron, Total	Calcium, Total	Chloride	Fluoride	pH (lab)	Sulfate	Total Dissolved Solids (TDS)	Antimony, Total	Arsenic, Total	Barium, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Cobalt, Total	Fluoride	Lead, Total	Lithium, Total	Mercury, Total	Molybdenum, Total	Selenium, Total	Thallium, Total
GWPS (US EPA MCL/RSL (THQ=1.0))					-	-	-	4	-	-	0.006	0.01	2	0.004	0.005	0.1	0.006	4	0.015	0.04	0.002	0.1	0.05	0.002	
Units					mg/L	mg/L	mg/L	mg/L	su	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Well Location	Sample Date	Sample Reason	Sample Name																						
Upgradient	MW-1	05/29/2018	Assessment	MW1-052918-1725	0.42	61	4.1	0.27	-	28	370	< 0.002	< 0.005	0.099	< 0.001	< 0.001	< 0.002	< 0.001	0.27	< 0.001	0.041	< 0.0002	< 0.005	< 0.005	< 0.001
	MW-1	09/05/2018	Assessment	MW-1-090518-1420	0.46	62	4.1	0.28	7.4 J	29	360	-	-	0.096	-	-	-	< 0.001	0.28	< 0.001	0.043	-	< 0.005	-	-
	MW-2	05/29/2018	Assessment	MW2-052918-1535	1.9	69	11	0.45	-	26	370	< 0.002	< 0.005	0.11	< 0.001	< 0.001	< 0.002	< 0.001	0.45	< 0.001	0.04	< 0.0002	< 0.005	< 0.005	< 0.001
	MW-2	09/04/2018	Assessment	MW-2-090418-1635	1.6	74	22	0.42	7.4 J	33	390	-	-	0.096	-	-	-	< 0.001	0.42	< 0.001	0.041	-	< 0.005	-	-
Downgradient	MW-5	05/25/2018	Assessment	MW5-052518-1545	-	-	-	0.058	-	-	-	< 0.002	< 0.005	0.065	< 0.001	< 0.001	< 0.002	< 0.001	0.058	< 0.001	< 0.008	< 0.0002	< 0.005	< 0.005	< 0.001
	MW-5	09/05/2018	Assessment	MW-5-090518-1005	2.6	130	130	0.061	6.3 J	250	680	-	-	0.055	-	-	-	< 0.001	0.061	0.0012	< 0.008	-	< 0.005	-	-
	MW-6	05/25/2018	Assessment	MW6-052518-1725	-	-	-	0.24	-	-	-	< 0.002	< 0.005	0.059	< 0.001	< 0.001	< 0.002	< 0.001	0.24	< 0.001	0.13	< 0.0002	< 0.005	< 0.005	< 0.001
	MW-6	09/05/2018	Assessment	MW-6-090518-1240	6.9	200	220	0.22	6.4 J	510	1100	-	-	0.058	-	-	-	0.0037	0.22	0.0021	0.11	-	< 0.005	-	-
	MW-10	05/29/2018	Assessment	MW10-052918-1235	2.3	150	180	0.27	-	230	810	< 0.002	< 0.005	0.1	< 0.001	< 0.001	< 0.002	0.0025	0.27	0.0013	0.011	< 0.0002	< 0.005	< 0.005	< 0.001
	MW-10	09/04/2018	Assessment	MW-10-090418-1140	2.4	160	160	0.26	7.3 J	260	790	-	-	0.11	-	-	-	0.006	0.26	0.0064	0.015	-	0.0066	-	-
	MW-11	05/29/2018	Assessment	MW11-052918-1400	-	-	-	0.34	-	-	-	< 0.002	< 0.005	0.064	< 0.001	< 0.001	< 0.002	0.0012	0.34	< 0.001	0.2	< 0.0002	0.1	< 0.005	< 0.001
	MW-11	09/05/2018	Assessment	MW-11-090518-1040	7.1	150	130	0.36	7.6 J	340	840	-	-	0.067	-	-	-	0.0012	0.36	< 0.001	0.22	-	0.1	-	-
	MW-12	05/29/2018	Assessment	MW12-052918-1740	9.2	180	100	0.36	-	520	950	< 0.002	< 0.005	0.1	< 0.001	< 0.001	< 0.002	< 0.001	0.36	< 0.001	0.81	< 0.0002	1.7	< 0.005	< 0.001
	MW-12	09/04/2018	Assessment	MW-12-090418-1445	9.3	170	120	0.36	7.8 J	460	930	-	-	0.1	-	-	-	0.0024	0.36	0.0024	0.82	-	1.5	-	-
	MW-13	05/29/2018	Assessment	MW13-052918-1937	-	-	-	0.11	-	-	-	< 0.002	< 0.005	0.1	< 0.001	< 0.001	< 0.002	< 0.001	0.11	< 0.001	0.13	< 0.0002	0.0077	< 0.005	< 0.001
MW-13	09/05/2018	Assessment	MW-13-090518-1310	8.5	240	220	0.12	7.3 J	510	1200	-	-	0.096	-	-	-	< 0.001	0.12	< 0.001	0.13	-	0.009	-	-	

NOTES:

Bold indicates concentration detected above laboratory reporting limit

mg/L: milligram per liter

MCL: Maximum Contaminant Level

pCi/L: picoCurie per liter

RSL: Regional Screening Level

THQ: Target Hazard Quotient

US EPA: United States Environmental Protection Agency

" - " Denotes constituent not required to be sampled during this event

J: Value is estimated

TABLE 1
SUMMARY OF ANALYTICAL RESULTS
ASH POND - KILLEN ELECTRIC GENERATING STATION
AES GENERATION, LLC - MANCHESTER, OHIO

	Chemical Group				Radiological			Field Parameters						
	Well Location	Sample Date	Sample Reason	Sample Name	Chemical Name GWPS (US EPA MCL/RSL (THQ=1.0)) Units	Radium-226 - pCi/L	Radium-228 - pCi/L	Radium-226 & 228 5 pCi/L	Conductivity, Field - mS/cm	Dissolved Oxygen, Field - mg/L	ORP, Field - mv	pH, Field - pH su	Temperature - Deg C	Turbidity, Field - NTU
Upgradient	MW-1	05/29/2018	Assessment	MW1-052918-1725		0.248 ± 0.104	0.295 U ± 0.249	0.543 J ± 0.27	0.744	0.25	-78.5	7.14	20.36	8.6
	MW-1	09/05/2018	Assessment	MW-1-090518-1420		0.344 R ± 0.103	0.597 R ± 0.256	0.941 R ± 0.276	0.748	0.09	-89.1	6.57	22.5	9.6
	MW-2	05/29/2018	Assessment	MW2-052918-1535		0.204 ± 0.0969	0.323 U ± 0.255	0.528 J ± 0.273	0.825	0.95	248.2	7.2	25.8	6.5
	MW-2	09/04/2018	Assessment	MW-2-090418-1635		0.49 J ± 0.118	0.66 R ± 0.26	1.15 J+ ± 0.286	0.775	0.78	67.3	6.54	20.1	7.5
Downgradient	MW-5	05/25/2018	Assessment	MW5-052518-1545		0.0475 U ± 0.0738	0.202 U ± 0.277	0.249 U ± 0.287	1.42	0.3	322.5	6.49	14.19	7.5
	MW-5	09/05/2018	Assessment	MW-5-090518-1005		0.209 R ± 0.082	0.144 U ± 0.229	0.353 UJ ± 0.243	1.184	0.67	181.8	5.58	18.4	9.7
	MW-6	05/25/2018	Assessment	MW6-052518-1725		0.108 U ± 0.0846	0.198 U ± 0.208	0.306 U ± 0.225	2.205	0.15	316	6.64	11.18	5.1
	MW-6	09/05/2018	Assessment	MW-6-090518-1240		0.693 J ± 0.166	0.512 R ± 0.31	1.21 J+ ± 0.352	1.75	1.57	178	5.7	25	41
	MW-10	05/29/2018	Assessment	MW10-052918-1235		0.482 ± 0.152	0.218 U ± 0.227	0.7 J ± 0.273	1.378	0.27	128.2	7.29	18	9.5
	MW-10	09/04/2018	Assessment	MW-10-090418-1140		0.54 J ± 0.148	0.5 R ± 0.302	1.04 J+ ± 0.336	1.41	1.26	15.1	6.55	17.5	128
	MW-11	05/29/2018	Assessment	MW11-052918-1400		0.202 ± 0.0992	0.0159 U ± 0.243	0.218 UJ ± 0.262	1.058	1.13	232.4	7.83	16.22	8.8
	MW-11	09/05/2018	Assessment	MW-11-090518-1040		0.453 J ± 0.114	0.135 U ± 0.217	0.588 J ± 0.245	1.492	0.2	158.7	7.41	18.71	60.1
	MW-12	05/29/2018	Assessment	MW12-052918-1740		0.336 ± 0.117	0.381 U ± 0.298	0.717 J ± 0.32	1.562	0.32	417.6	7.24	19.8	2.2
	MW-12	09/04/2018	Assessment	MW-12-090418-1445		0.591 J ± 0.157	0.298 U ± 0.277	0.889 J ± 0.318	1.398	1.1	36.5	7.29	21.5	40
	MW-13	05/29/2018	Assessment	MW13-052918-1937		0.262 ± 0.109	-0.0889 U ± 0.23	0.262 UJ ± 0.255	2.14	4.75	329.9	6.56	14.4	0
MW-13	09/05/2018	Assessment	MW-13-090518-1310		0.364 R ± 0.105	0.128 U ± 0.167	0.493 J+ ± 0.197	2.188	3.09	169.1	7.51	18.59	22.1	

NOTES:

Bold indicates concentration detected above laboratory reporting limit

mg/L: milligram per liter

MCL: Maximum Contaminant Level

pCi/L: picoCurie per liter

RSL: Regional Screening Level

THQ: Target Hazard Quotient

US EPA: United States Environmental Protection Agency

" - " Denotes constituent not required to be sampled during this event

J: Value is estimated

FIGURES

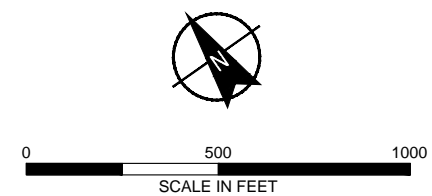


LEGEND

- PROPERTY BOUNDARY
- - - - - APPROXIMATE WASTE BOUNDARY
- ◆ UPGRADIENT MONITORING WELLS
- ◆ DOWNGRADIENT MONITORING WELLS
- ◆ OTHER MONITORING WELLS

NOTES:

1. BASEMAP TAKEN FROM MACTEC DRAWING PROVIDED BY DP&L. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.



HALEY ALDRICH
 AES GENERATION, LLC
 KILLEN ELECTRIC GENERATING STATION
 14869 U. S. 52
 MANCHESTER, OHIO

ASH POND MONITORING WELL LOCATION MAP

SCALE: AS SHOWN
 JANUARY 2019

FIGURE 1