

ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT SEDIMENTATION POND A.B. BROWN GENERATING STATION POSEY COUNTY, INDIANA

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File No. 129420 January 2022

## **Table of Contents**

			Pa	ige
	of Table of Figur			ii ii
1.	Annu	al Gro	undwater Monitoring Report Summary	1
	1.1		OF FEDERAL REGULATIONS TITLE 40 (40 CFR) § 257.90(E)(6) SUMMARY  40 CFR § 257.90(e)(6)(i) — Status of Monitoring Program at Start of Reporting Period	1
		1.1.2	40 CFR § 257.90(e)(6)(ii) – Status of Monitoring Program at End of Reporting Period	1
		1.1.3	40 CFR § 257.90(e)(6)(iii) – Statistically Significant Increases	1
		1.1.4	40 CFR § 257.90(e)(6)(iv) – Statistically Significant Levels	2
		1.1.5	40 CFR § 257.90(e)(6)(v) – Selection of Remedy	3
		1.1.6	40 CFR § 257.90(e)(6)(vi) – Remedial Activities	3
	1.2		§ 257.90(A)	3
	1.3		§ 257.90(E) – SUMMARY	3
			Status of the Groundwater Monitoring Program	4
			Key Actions Completed	4
			Problems Encountered	4
			Actions to Resolve Problems	5
			Project Key Activities for Upcoming Year	5
	1.4		§ 257.90(E) – INFORMATION	5
			40 CFR § 257.90(e)(1)	5
			40 CFR § 257.90(e)(2)	5
			40 CFR § 257.90(e)(3)	5
			40 CFR § 257.90(e)(4)	6
		1.4.5	40 CFR § 257.90(e)(5)	6

i

## Tables Figures



## **List of Tables**

Table No.

Title

Groundwater Monitoring Well Location and Construction Details

Summary of Groundwater Quality Data

# **List of Figures**

Figure No. Title

1 Groundwater Monitoring Well Locations – Sedimentation Pond



## 1. Annual Groundwater Monitoring Report Summary

#### 1.1 CODE OF FEDERAL REGULATIONS TITLE 40 (40 CFR) § 257.90(e)(6) SUMMARY

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

## 1.1.1 40 CFR § 257.90(e)(6)(i) – Status of Monitoring Program at Start of Reporting Period

At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the start of the current annual reporting period (1 January 2021), the Sedimentation Pond at A.B. Brown Generating Station (ABB) was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

## 1.1.2 40 CFR § 257.90(e)(6)(ii) – Status of Monitoring Program at End of Reporting Period

At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the end of the current annual reporting period (31 December 2021), the Sedimentation Pond was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

#### 1.1.3 40 CFR § 257.90(e)(6)(iii) — Statistically Significant Increases

If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to § 257.94(e):

## 1.1.3.1 40 CFR § 257.90(e)(6)(iii)(A)

Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and

The Sedimentation Pond was operating under an assessment monitoring program throughout 2021; therefore, no statistical evaluations were conducted on Appendix III constituents in 2021.



#### 1.1.3.2 40 CFR § 257.90(e)(6)(iii)(B)

Provide the date when the assessment monitoring program was initiated for the CCR unit.

An assessment monitoring program was established on 15 August 2018 for the Sedimentation Pond to meet the requirements of 40 CFR § 257.95. The Sedimentation Pond has remained in assessment monitoring since that time.

## 1.1.4 40 CFR § 257.90(e)(6)(iv) — Statistically Significant Levels

If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to § 257.95(g) include all of the following:

### 1.1.4.1 40 CFR § 257.90(e)(6)(iv)(A) – Statistically Significant Level Constituents

Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;

Statistical analyses were completed in 2021 following the November 2020 and May 2021 semiannual assessment monitoring events as described in § 257.93(h)(2). Statistically significant levels (SSLs) were not identified in any of the monitoring wells in 2021.

## 1.1.4.2 40 CFR § 257.90(e)(6)(iv)(B) – Initiation of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was initiated for the CCR unit;

An assessment of corrective measures has not been initiated for this unit since no SSLs have been identified through year end 2021. The Sedimentation Pond remained in assessment monitoring throughout 2021.

#### 1.1.4.3 40 CFR § 257.90(e)(iv)(C) – Assessment of Corrective Measures Public Meeting

Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

An assessment of corrective measures is not required and therefore has not been initiated for the Sedimentation Pond through year end 2021; therefore, a public meeting was not held.



#### 1.1.4.4 40 CFR § 257.90(e)(6)(iv)(D) – Completion of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was completed for the CCR unit.

An assessment of corrective measures has not been completed for this unit since no SSLs have been identified through year end 2021. The Sedimentation Pond remained in assessment monitoring during 2021.

#### 1.1.5 40 CFR § 257.90(e)(6)(v) – Selection of Remedy

Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

Since an assessment of corrective measures has not been required, the selection of remedy under § 257.97 is not required.

#### 1.1.6 40 CFR § 257.90(e)(6)(vi) – Remedial Activities

Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

Remedial activities were not required in 2021; therefore, no demonstration or certification is applicable.

#### 1.2 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 Sedimentation Pond at ABB is subject to the groundwater monitoring and corrective action requirements described under 40 CFR § 257.90 through § 257.98 (Rule). The remainder of this document addresses the requirement for the Owner/Operator to prepare an Annual Groundwater Monitoring and Corrective Action Report per § 257.90(e).

#### 1.3 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 Groundwater Monitoring and Corrective Action Report documents the activities completed in 2021 for the Sedimentation Pond as required by the Rule. Semi-annual 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.

#### 1.3.1 Status of the Groundwater Monitoring Program

Annual and semi-annual groundwater sampling continued in May 2021 and November 2021 as outlined in § 257.95(b) and 257.95(d)(1). Statistical analyses were completed within 90-days following completion of the sampling and analysis events as described in § 257.93(h)(2). The results of these statistical analyses continued to demonstrate that SSLs of Appendix IV constituents were not present in groundwater downgradient of the Sedimentation Pond. Although SSLs were not present, some concentrations are above background, therefore in accordance with 257.95(f), the Sedimentation Pond will continue with semiannual assessment monitoring.

#### 1.3.2 Key Actions Completed

The following key actions were completed in 2021:

- Per the requirements of 257.93(c) of the Rule, static water level measurements were collected during each sampling event to evaluate groundwater flow direction and rate.
- Completed statistical analyses of assessment monitoring results to evaluate potential SSLs.
- Prepared 2020 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 in 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 in the facility's operating record [§ 257.107(d) and 257.107(h)(1)];
- Collected and analyzed two rounds of groundwater samples in accordance with § 257.95(b) and § 257.95(d)(1).

### 1.3.3 Problems Encountered

Problems such as damaged wells, issues with sample collection or lack of sampling or problems with laboratory analyses were not encountered at the Sedimentation Pond in 2021.



#### 1.3.4 Actions to Resolve Problems

Actions to resolve problems were not required.

#### 1.3.5 Project Key Activities for Upcoming Year

Key activities to be completed in 2022 include the following:

Continue semiannual assessment monitoring as required by § 257.95; and
 Complete statistical analyses of the semiannual groundwater sampling results as required by § 257.93(h)(2).

#### 1.4 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:

#### 1.4.1 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 Sedimentation Pond and associated upgradient, and downgradient wells is presented as Figure 1.

#### 1.4.2 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;

Additional monitoring wells were not installed nor were any monitoring wells decommissioned during 2021. However, location and construction details of the existing monitoring well network for the Sedimentation Pond is provided for reference as Table I.

#### 1.4.3 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 Sedimentation Pond is presented in Table II of this report.

#### 1.4.4 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

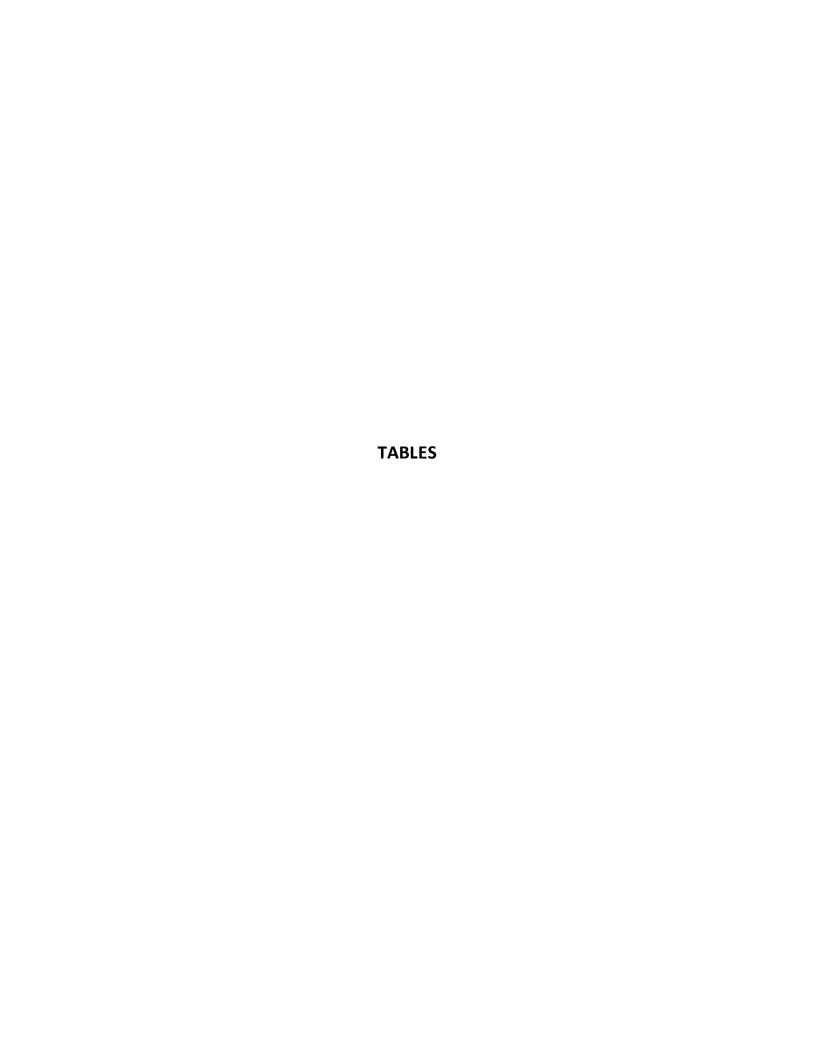
The statistical analyses completed in 2021 determined that SSLs of Appendix IV constituents were not present downgradient of the Sedimentation Pond, though some concentrations are above background. As a result, this CCR Unit remains in assessment monitoring and semiannual sampling will continue in 2022.

### 1.4.5 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 and recording of groundwater monitoring results in the operating record were discussed in prior annual reports.





A.B. BROWN GENERATING STATION - SEDIMENTATION POND MOUNT VERNON, INDIANA

Well	CCR Unit	Date Installed	Easting	Northing	Top of Pad Elevation (ft msl)	Top of Riser Elevation (ft msl)	Surface Grout (ft bgs)	Bentonite (ft bgs)	Sand Pack (ft bgs)	Scre (f	en Z t bgs		Screen Length (ft)	Well Radius (in)	Status
CCR-SP-1	Sediment Pond	March 2016	2770030.26	970981.89	403.90	403.51	0.0 - 6.0	6.0 - 8.0	8.0 - 20.0	10.00	-	20.00	10	2	Active
CCR-SP-2	Sediment Pond	March 2016	2769939.51	970887.25	403.60	403.23	0.0 - 6.0	6.0 - 8.0	8.0 - 20.0	10.00	-	20.00	10	2	Active
CCR-SP-3	Sediment Pond	March 2016	2770027.64	970735.02	403.90	403.57	0.0 - 6.0	6.0 - 8.0	8.0 - 20.0	10.00	-	20.00	10	2	Active
CCR-BK-1R	Background	March 2016	2770919.08	974083.40	480.10	483.39	0.0 - 50.0	50.0 - 52.0	52.0 - 64.0	54.00	-	64.00	10	2	Active
CCR-BK-2	Background	March 2016	2769728.14	972854.33	427.50	430.60	0.0 - 11.5	11.5 - 13.5	13.5 - 25.5	15.50	-	25.50	10	2	Active

#### Notes:

bgs = below ground surface

ft = feet

in = inches

msl = mean sea level

Datum of Elevations in NAVD 88

TABLE II SUMMARY OF GROUNDWATER QUALITY DATA

Page 1 of 2

A.B. BROWN GENERATION STATION SEDIMENTATION POND MOUNT VERNON, INDIANA

Location Group	Action Level	Background							
Location Name	Maximum	CCR-BK-1R	CCR-BK-1R	CCR-BK-2	CCR-BK-2				
Sample Name	Contaminant	CCR-BK-1R-20210519	CCR-BK-1R-20211118	CCR-BK-2-20210519	CCR-BK-2-20211118				
Sample Date	Level/ Regional	05/19/2021	11/18/2021	05/19/2021	11/18/2021				
Lab Sample ID	Screening Levels	180-122065-13	180-130315-12	180-122065-14	180-130315-11				
Detection Monitoring - EPA Appendix III Constituents (mg/L)									
Boron, Total	NA	0.054 J	0.08 UJ	0.056 J	0.08 UJ				
Calcium, Total	NA	53	47 J+	58	34 J+				
Chloride	NA	6.6	7.2	12	18				
Fluoride	4	0.33 J+	0.36	0.16 J+	0.19 J+				
pH (lab) (pH units)	NA	6.5 J	7.5 J	6.8 J	7.3 J				
Sulfate	NA	30	35	41	22				
Total Dissolved Solids (TDS)	NA	320	300	330	250				
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)									
Antimony, Total	0.006	0.002 U	0.002 U	0.002 U	0.002 U				
Arsenic, Total	0.01	0.001 U	0.001 U	0.001 U	0.0027				
Barium, Total	2	0.035	0.038	0.04	0.049				
Beryllium, Total	0.004	0.001 U	0.001 U	0.001 U	0.001 U				
Cadmium, Total	0.005	0.001 U	0.001 U	0.001 U	0.001 U				
Chromium, Total	0.1	0.002 U	0.0015 J	0.002 U	0.0047				
Cobalt, Total	0.006	0.0005 U	0.00022 J	0.0005 U	0.0015				
Fluoride	4	0.33 J+	0.36	0.16 J+	0.19 J+				
Lead, Total	0.015	0.001 U	0.00026 J	0.001 U	0.0024				
Lithium, Total	0.04	0.005 U	0.005 U	0.005 U	0.0043 J				
Mercury, Total	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U				
Molybdenum, Total	0.1	0.00084 J	0.00098 J	0.00092 J	0.00077 J				
Selenium, Total	0.05	0.005 U	0.005 U	0.005 U	0.005 U				
Thallium, Total	0.002	0.001 U	0.001 U	0.001 U	0.00019 J				
Radiological (pCi/L)									
Radium-226	NA	0.252 ± 0.108	0.410 ± 0.202	0.0449 ± 0.0731	0.359 ± 0.293				
Radium-228	NA	0.388 ± 0.296	2.05 ± 0.517	0.268 ± 0.287	2.39 ± 0.889				
Radium-226 & 228	5	0.640 ± 0.315	2.46 ± 0.555	0.313 ± 0.296	2.74 ± 0.936				
Field Parameters									
Temperature (Deg C)	NA	16.16	13.12	14.63	14.33				
Dissolved Oxygen, Field (mg/L)	NA	6.65	6.33	0.37	0.81				
Conductivity, Field (mS/cm)	NA	0.50816	0.51769	0.51031	0.63651				
ORP, Field (mv)	NA	42.6	61.9	27.6	53.2				
Turbidity, Field (NTU)	NA	0.19	2.07	1.77	7.23				
pH, Field (pH units)	NA	7.04	6.94	6.98	6.78				
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#### ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.

mg/L: milligram per liter. pCi/L: picoCurie per liter.

USEPA: United States Environmental Protection Agency.

Results in **bold** are detected.

- USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals

from Electric Utilities. July 26. 40 CFR Part 257.

https://www.epa.gov/coalash/coal-ash-rule

**SUMMARY OF GROUNDWATER QUALITY DATA**A.B. BROWN GENERATION STATION

SEDIMENTATION POND

MOUNT VERNON, INDIANA

Location Group	p Action Level Downgradient									
Location Name	Maximum	CCR-SP-1	CCR-SP-1	CCR-SP-1	CCR-SP-2	CCR-SP-2	CCR-SP-2	CCR-SP-3	CCR-SP-3	
Sample Name	Contaminant	CCR-SP-1-20210521	BLIND DUPLICATE 3-20210521	CCR-SP-1-20211118	CCR-SP-2-20210521	CCR-SP-2-20211118	DUP-2-20211118	CCR-SP-3-20210521	CCR-SP-3-20211118	
Sample Date	Level/ Regional	05/21/2021	05/21/2021	11/18/2021	05/21/2021	11/18/2021	11/18/2021	05/21/2021	11/18/2021	
Lab Sample ID	Screening Levels	180-122147-6	180-122147-14	180-130263-7	180-122147-7	180-130263-8	180-130263-13	180-122147-8	180-130263-9	
Detection Monitoring - EPA Appendix III Constituents (mg/L)										
Boron, Total	NA	0.36 J-	0.38 J-	0.59 J+	0.098 J-	0.24 J	0.15 J	0.08 UJ	0.11 UJ	
Calcium, Total	NA	190	200	210	170	180 J+	170 J+	90	78 J+	
Chloride	NA	95	95	95	44	68	73	14	5.4	
Fluoride	4	0.16 J+	0.17 J+	0.22 J+	0.2 J+	0.26 J+	0.26 J+	0.33 J+	0.31 J+	
pH (lab) (pH units)	NA	6.2 J	6.5 J	6.7 J	7.2 J	7 J	7 J	7.4 J	7.2 J	
Sulfate	NA	700	680	710	300	350	360	25	3.5	
Total Dissolved Solids (TDS)	NA	1600 J	1600 J	1800	870 J	1000	1000	440 J	420	
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)										
Antimony, Total	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Arsenic, Total	0.01	0.0037	0.0038	0.0033	0.011	0.013	0.013	0.0097	0.0071	
Barium, Total	2	0.051	0.055	0.044	0.046	0.066	0.064	0.074	0.068	
Beryllium, Total	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Cadmium, Total	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chromium, Total	0.1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cobalt, Total	0.006	0.0062	0.0066	0.0068	0.00037 J	0.00049 J	0.00042 J	0.00065	0.00047 J	
Fluoride	4	0.16 J+	0.17 J+	0.22 J+	0.2 J+	0.26 J+	0.26 J+	0.33 J+	0.31 J+	
Lead, Total	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00023 J	
Lithium, Total	0.04	0.0036 J	0.0039 J	0.0053	0.005 U	0.0054	0.005	0.005 U	0.005 U	
Mercury, Total	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	
Molybdenum, Total	0.1	0.001 J	0.005 U	0.0011 J	0.0012 J	0.0015 J	0.0012 J	0.0034 J	0.0036 J	
Selenium, Total	0.05	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
Thallium, Total	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.00043 J	0.001 U	0.001 U	0.00022 J	
Radiological (pCi/L)										
Radium-226	NA	0.129 ± 0.169	0.179 ± 0.132	0.164 ± 0.107	0.153 ± 0.127	0.199 ± 0.122	0.224 ± 0.124	0.216 ± 0.176	0.0872 ± 0.121	
Radium-228	NA	0.0547 ± 0.268	0.206 ± 0.3	0.810 ± 0.288	0.352 ± 0.29	0.570 ± 0.321	0.640 ± 0.306	0.364 ± 0.386	0.987 ± 0.386	
Radium-226 & 228	5	0.183 ± 0.317	0.385 ± 0.328	0.974 ± 0.307	0.505 ± 0.317	0.769 ± 0.343	0.865 ± 0.33	0.580 ± 0.424	1.07 ± 0.405	
Field Parameters										
Temperature (Deg C)	NA	13.58	13.58	16.48	15.5	15.52	15.52	14.36	16.74	
Dissolved Oxygen, Field (mg/L)	NA	0.04	0.04	0.05	0.21	0.07	0.07	0.18	0.3	
Conductivity, Field (mS/cm)	NA	2.0369	2.0369	2.1818	1.176	1.4299	1.4299	0.72377	0.66465	
ORP, Field (mv)	NA	-49.6	-49.6	-53.2	-124	-102.9	-102.9	-56	-51.8	
Turbidity, Field (NTU)	NA	0	0	0	2.99	0	0	11.44	0	
pH, Field (pH units)	NA	6.81	6.81	6.42	7.13	6.71	6.71	6.87	6.79	

## ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.

mg/L: milligram per liter.

pCi/L: picoCurie per liter.

USEPA: United States Environmental Protection Agency.

Results in **bold** are detected.

- USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals

from Electric Utilities. July 26. 40 CFR Part 257.

https://www.epa.gov/coalash/coal-ash-rule

