

Prepared for

**Illinois Power Resources Generating, LLC**

Document type

**2019 Annual Groundwater Monitoring and Corrective Action Report**

Date

**January 31, 2020**

# **2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**

## **DUCK CREEK BOTTOM ASH BASIN, DUCK CREEK POWER STATION**

**2019 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT  
DUCK CREEK BOTTOM ASH BASIN, DUCK CREEK POWER  
STATION**

Project name **Duck Creek Power Station**  
Project no. **72753**  
Recipient **Illinois Power Resources Generating, LLC**  
Document type **Annual Groundwater Monitoring and Corrective Action Report**  
Version **FINAL**  
Date **January 31, 2020**  
Prepared by **Kristen L. Theesfeld**  
Checked by **Nicole M. Pagano**  
Approved by **Eric J. Tlachac**  
Description **Annual Report in Support of the CCR Rule Groundwater Monitoring Program**

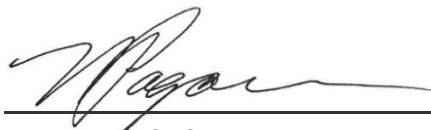
Ramboll  
234 W. Florida Street  
Fifth Floor  
Milwaukee, WI 53204  
USA

T 414-837-3607  
F 414-837-3608  
<https://ramboll.com>



---

**Kristen L. Theesfeld**  
Hydrogeologist



---

**Nicole M. Pagano**  
Senior Managing Engineer

## CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>3</b>
<b>1. Introduction</b>	<b>4</b>
<b>2. Monitoring and Corrective Action Program Status</b>	<b>5</b>
<b>3. Key Actions Completed in 2019</b>	<b>6</b>
<b>4. Problems Encountered and Actions to Resolve the Problems</b>	<b>8</b>
<b>5. Key Activities Planned for 2020</b>	<b>9</b>
<b>6. References</b>	<b>10</b>

## TABLES

Table A	2018–2019 Detection Monitoring Program Summary (in text)
Table 1	2019 Analytical Results – Groundwater Elevation and Appendix III Parameters
Table 2	Statistical Background Values

## FIGURES

Figure 1	Monitoring Well Location Map
----------	------------------------------

Duck Creek

## ACRONYMS AND ABBREVIATIONS

BAB	Bottom Ash Basin
CCR	Coal Combustion Residuals
SAP	Sampling and Analysis Plan
SSI	Statistically Significant Increase

Duck Creek

## EXECUTIVE SUMMARY

This report has been prepared to provide the information required by Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257.90(e) for the Duck Creek Bottom Ash Basin (BAB) located at Duck Creek Power Station near Canton, Illinois.

Groundwater is being monitored at Duck Creek BAB in accordance with the Detection Monitoring Program requirements specified in 40 C.F.R. § 257.94.

No changes were made to the monitoring system in 2019 (no wells were installed or decommissioned).

No Statistically Significant Increases (SSIs) of 40 C.F.R. Part 257 Appendix III parameter concentrations greater than background concentrations were determined in 2019 and Duck Creek BAB remains in the Detection Monitoring Program.

Duck Creek

## 1. INTRODUCTION

This report has been prepared by Ramboll on behalf of Illinois Power Resources Generating, LLC, to provide the information required by 40 C.F.R. § 257.90(e) for Duck Creek BAB located at Duck Creek Power Station near Canton, Illinois.

In accordance with 40 C.F.R. § 257.90(e), the owner or operator of a Coal Combustion Residuals (CCR) unit must prepare an Annual Groundwater Monitoring and Corrective Action Report for the preceding calendar year that documents the status of the Groundwater Monitoring and Corrective Action Program for the CCR unit, summarizes key actions completed, describes any problems encountered, discusses actions to resolve the problems, and projects key activities for the upcoming year. At a minimum, the Annual Report must contain the following information, to the extent available:

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.
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.
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.
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 relative to background levels).
5. Other information required to be included in the Annual Report as specified in §§ 257.90 through 257.98.

This report provides the required information for Duck Creek BAB for calendar year 2019.

## **2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS**

No changes have occurred to the monitoring program status in calendar year 2019, and Duck Creek BAB remains in the Detection Monitoring Program in accordance with 40 C.F.R. § 257.94.

Duck Creek

### 3. KEY ACTIONS COMPLETED IN 2019

The Detection Monitoring Program is summarized in Table A. The groundwater monitoring system, including the CCR unit and all background and downgradient monitoring wells, is presented in Figure 1. No changes were made to the monitoring system in 2019 (no wells were installed or decommissioned). In general, one groundwater sample was collected from each background and downgradient well during each monitoring event. All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (SAP) (NRT/OBG, 2017a). All monitoring data obtained under 40 C.F.R. §§ 257.90 through 257.98 (as applicable) in 2019 are presented in Table 1. Analytical data were evaluated in accordance with the Statistical Analysis Plan (NRT/OBG, 2017b) to determine any SSIs of Appendix III parameters relative to background concentrations.

Statistical background values are provided in Table 2.

Analytical results for the October 2018 sampling event were provided in the 2018 Annual Groundwater Monitoring and Corrective Action Report.

Duck Creek



**Table A – 2018–2019 Detection Monitoring Program Summary**

<b>Sampling Date</b>	<b>Analytical Data Receipt Date</b>	<b>Parameters Collected</b>	<b>SSI(s)</b>	<b>SSI(s) Determination Date</b>
October 13, 2018	January 16, 2019	Appendix III	none	April 15, 2019
February 7, 2019	April 15, 2019	Appendix III	none	July 15, 2019
July 10-17, 2019	October 15, 2019	Appendix III	TBD	TBD

**Notes:**

NA: Not Applicable  
 TBD: To Be Determined

Duck Creek

#### **4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS**

No problems were encountered with the Groundwater Monitoring Program during 2019. Groundwater samples were collected and analyzed in accordance with the SAP (NRT/OBG, 2017a), and all data were accepted.

Duck Creek

## 5. KEY ACTIVITIES PLANNED FOR 2020

The following key activities are planned for 2020:

- Continuation of the Detection Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2020.
- Complete evaluation of analytical data from the downgradient wells, using background data to determine whether an SSI of Appendix III parameters detected at concentrations greater than background concentrations has occurred.
- If an SSI is identified, potential alternate sources (i.e., a source other than the CCR unit caused the SSI or that that SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality) will be evaluated.
  - If an alternate source is demonstrated to be the cause of the SSI, a written demonstration will be completed within 90 days of SSI determination and included in the 2020 Annual Groundwater Monitoring and Corrective Action Report.
  - If an alternate source(s) is not identified to be the cause of the SSI, the applicable requirements of 40 C.F.R. §§ 257.94 through 257.98 as may apply in 2020 (e.g., Assessment Monitoring) will be met, including associated recordkeeping/notifications required by 40 C.F.R. §§ 257.105 through 257.108.

## 6. REFERENCES

Natural Resource Technology, an OBG Company (NRT/OBG), 2017a. Sampling and Analysis Plan, Duck Creek Bottom Ash Basin, Duck Creek Power Station, Canton, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company (NRT/OBG), 2017b. Statistical Analysis Plan, Duck Creek Power Station, Edwards Power Station, Illinois Power Resources Generating, LLC, October 17, 2017.

Duck Creek

## TABLES

Duck Creek

**TABLE 1.**  
**2019 ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
DUCK CREEK POWER STATION  
UNIT ID 205 - DUCK CREEK BOTTOM ASH BASIN  
CANTON, ILLINOIS  
DETECTION MONITORING PROGRAM

Well Identification Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date & Time Sampled	Depth to Groundwater (ft) <sup>1</sup>	Groundwater Elevation (ft NAVD88)	40 C.F.R. Part 257 Appendix III						
						Boron, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Fluoride, total (mg/L)	pH (field) (S.U.)	Sulfate, total (mg/L)	Total Dissolved Solids (mg/L)
						6020A <sup>2</sup>	6020A <sup>2</sup>	9251 <sup>2</sup>	9214 <sup>2</sup>	SM 4500 H+B <sup>2</sup>	9036 <sup>2</sup>	SM 2540C <sup>2</sup>
<b>Background / Upgradient Monitoring Wells</b>												
BA05	40.469347	-89.983075	2/7/2019 12:16	15.55	580.47	0.33	160	41	0.254	7.3	350	970
			7/17/2019 11:01	14.76	581.26	0.16	200	10	0.295	7.2	490	1200
BA06	40.469317	-89.980961	2/7/2019 13:10	19.71	576.22	1.5	280	480	<0.250	7.3	300	1900
			7/17/2019 12:10	19.60	576.33	5.2	380	700	0.314	7.2	500	2100
<b>Downgradient Monitoring Wells</b>												
BA01	40.468887	-89.982141	2/7/2019 8:31	12.00	575.09	0.036	120	9.9	<0.250	7.0	140	640
			7/10/2019 11:50	12.00	575.09	0.032	130	8.4	0.278	7.0	140	610
BA02	40.468419	-89.981325	2/7/2019 9:14	4.96	574.97	0.071	110	10	<0.250	7.3	21	540
			7/10/2019 12:42	5.06	574.87	0.061	110	10	0.282	7.3	16	520
BA03	40.468083	-89.982136	2/7/2019 10:09	4.44	573.90	0.026	110	6.1	<0.250	7.5	19	500
			7/10/2019 14:32	3.98	574.36	0.032	110	6.0	0.314	7.3	18	480
BA04	40.468374	-89.982991	2/7/2019 11:08	5.37	572.82	1.8	120	36	<0.250	7.1	140	680
			7/17/2019 10:02	5.00	573.19	0.09	120	36	0.326	7.1	120	700

[O: RAB 12/20/19, C: KLT 12/23/19]

**Notes:**  
40 C.F.R. = Title 40 of the Code of Federal Regulations  
ft = foot/feet  
mg/L = milligrams per liter  
NAVD88 = North American Vertical Datum of 1988  
S.U. = Standard Units  
< = concentration is less than the concentration shown, which corresponds to the reporting limit for the method; estimated concentrations below the reporting limit and associated qualifiers are not provided since not utilized in statistics to determine Statistically Significant Increases (SSIs) over background.  
<sup>1</sup>All depths to groundwater were measured on the first day of the sampling event.  
<sup>2</sup>4-digit numbers represent SW-846 analytical methods.

**TABLE 2.**  
**STATISTICAL BACKGROUND VALUES**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
DUCK CREEK POWER STATION  
UNIT ID 205 - DUCK CREEK BOTTOM ASH BASIN  
CANTON, ILLINOIS  
DETECTION MONITORING PROGRAM

Parameter	Statistical Background Value (UPL)
<b>40 C.F.R. Part 257 Appendix III</b>	
Boron (mg/L)	3.90
Calcium (mg/L)	409
Chloride (mg/L)	650
Fluoride (mg/L)	0.529
pH (S.U.)	6.9 / 7.7
Sulfate (mg/L)	596.3
Total Dissolved Solids (mg/L)	2164

[O: RAB 12/20/19, C: KLT 12/23/19]

**Notes:**

40 C.F.R. = Title 40 of the Code of Federal Regulations  
mg/L = milligrams per liter  
S.U. = Standard Units  
UPL = Upper Prediction Limit

Duck Creek

## FIGURES




Duck Creek



Y:\Mapping\Projects\222285\MXD\2019\_AnnualGWM\_CAR\Figure 1\_GWS\_WellLoc\_DuckCreek\_BAB.mxd  
PROJECT: 169000XXXXX | DATED: 1/13/2020 | DESIGNER: GALARNIC



Service Layer Credits: NAIP 2017

-  UPGRADIENT MONITORING WELL LOCATION
-  DOWNGRADIENT MONITORING WELL LOCATION
-  CCR MONITORED UNIT



### MONITORING WELL LOCATION MAP DUCK CREEK BOTTOM ASH BASIN UNIT ID:205

2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT  
VISTRA CCR RULE GROUNDWATER MONITORING  
DUCK CREEK POWER STATION  
CANTON, ILLINOIS

FIGURE 1

O'BRIEN & GERE ENGINEERS, INC.  
A RAMBOLL COMPANY

