2018 Annual Groundwater Monitoring and Corrective Action Report

Edwards Ash Pond – CCR Unit ID 301
Edwards Power Station
7800 South Cilco Lane
Bartonville, Illinois 61607

Illinois Power Resources Generating, LLC

January 31, 2019

OBG
Part of Ramboll

JANUARY 31, 2019 | PROJECT #70088

2018 Annual Groundwater Monitoring and Corrective Action Report

Edwards Ash Pond – CCR Unit ID 301
Edwards Power Station
Bartonville, Illinois

Prepared for:
Illinois Power Resources Generating, LLC

RACHEL A. BANOFF
Environmental Engineer

NATHANIEL R. KELLER, PG
Senior Hydrogeologist

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
mg/L	milligrams per liter
NRT/OBG	Natural Resource Technology, an OBG Company
OBG	O'Brien & Gere Engineers, part of Ramboll
pCi/L	picoCuries per liter
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
S.U.	Standard Units
TDS	Total Dissolved Solids

SECTION 1: INTRODUCTION

This report has been prepared on behalf of Illinois Power Resources Generating, LLC by O'Brien & Gere Engineers, part of Ramboll (OBG), to provide the information required by the Code of Federal Regulations (CFR) found in 40 CFR 257.90(e) for the Edwards Ash Pond located at Edwards Power Station near Bartonville, Illinois.

In accordance with 40 CFR § 257.90(e), the owner or operator of an existing 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 over background levels).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98[1].

This report provides the required information for the Edwards Ash Pond for calendar year 2018.

[1] For calendar year 2018, corrective action and other information required to be included in the annual report as specified in §§ 257.96 through 257.98 is not applicable.

SECTION 2: MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

Detection Monitoring Program sampling event dates and parameters collected are provided in the detection monitoring program summary table below. One sample was collected from each background and downgradient well in the monitoring system during each sampling event. Analytical data was evaluated after each event in accordance with the Statistical Analysis Plan, Edwards Power Station, Illinois Power Resources Generating, LLC (NRT, 2017a) to identify any statistically significant increases (SSIs) of Appendix III parameters over background concentrations. The sampling event and whether SSIs were identified are provided in the detection monitoring program summary table below.

Detection Monitoring Program Summary

Sampling Dates	Parameters Collected	SSIs	Assessment Monitoring Program Established
November 1 and 2, 2017	Appendix III	Yes	April 9, 2018

Alternate source evaluations were inconclusive for one or more of the SSIs. Consequently, and in accordance with 40 CFR § 257.94(e)(2), an Assessment Monitoring Program was established for Edwards Ash Pond on April 9, 2018 and the required notifications completed.

The first Assessment Monitoring sampling event was completed on May 5, 7, and 29. One sample was collected from each background and downgradient well in the monitoring system and analyzed for Appendix III and Appendix IV parameters. In accordance with 40 CFR § 257.95(d)(1), all wells were resampled on July 27, August 24, and August 27 for all Appendix III parameters and Appendix IV parameters detected during the first Assessment Monitoring sampling event. During both the Assessment monitoring and the resample event, the presence of train cars and unloading activities resulted in samples being collected over a period of several weeks.

One sample was collected from each background and downgradient well in the monitoring system. Analytical data from the resampling event was evaluated in accordance with the statistical analysis plan (NRT/OBG, 2017a) to determine any SSIs of Appendix III parameters over background concentrations or statistically significant levels (SSLs) of Appendix IV parameters over Groundwater Protection Standards (GWPSs). The assessment monitoring program summary table below provides a summary of the Assessment Monitoring Program and results of SSL determinations.

Assessment Monitoring Program Summary

Sampling Dates	Parameters Collected	SSLs
May 5, 7, and 29, 2018	Appendix III Appendix IV	Not Applicable
July 27, 2018 **August 24 and 27, 2018**	Appendix III Appendix IV Detected	To Be Determined

Statistical background values are provided in Table 1 and GWPSs in Table 2. Analytical results from the events summarized in the detection and assessment monitoring summary tables above are included in Tables 3 and 4.

The Edwards Ash Pond remains in the Assessment Monitoring Program in accordance with 40 CFR § 257.95.

SECTION 3: KEY ACTIONS COMPLETED IN 2018

Two groundwater monitoring events were completed in 2018 under the Assessment Monitoring Program. These events occurred in May and July/August, and are detailed in Section 2. One groundwater sample was collected from each background and downgradient well in the monitoring system during each event. All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017b). All monitoring data obtained under 40 CFR §§ 257.90 through 257.98 (as applicable) in 2018 are presented in Tables 3 and 4. The groundwater monitoring system, including the CCR unit and all background and downgradient monitoring wells, is presented in Figure 1.

SECTION 4: PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the groundwater monitoring program during 2018. Groundwater samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017b), and all data was accepted.

SECTION 5: KEY ACTIVITIES PLANNED FOR 2019

The following key activities are planned for 2019:

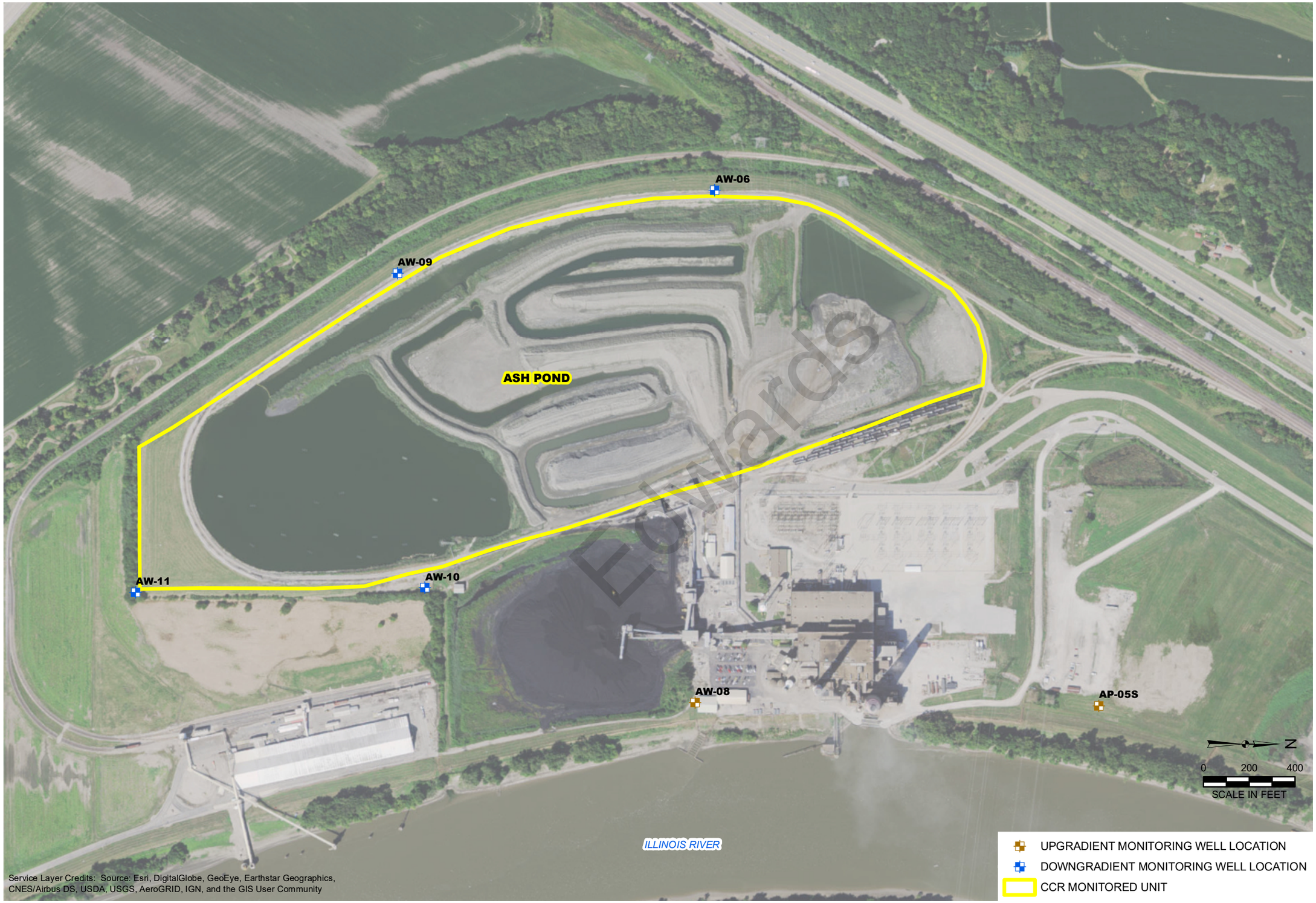
- Continuation of the Assessment Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2019.
- Complete evaluation of analytical data from the downgradient wells, using GWPSs to determine whether an SSL of Appendix IV parameters has occurred.
- If an SSL is identified, potential alternate sources (i.e., a source other than the CCR unit caused the SSL or that SSL 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 SSL, a written demonstration will be completed within 90 days of SSL determination and included in the annual groundwater monitoring and corrective action report for 2019.
  - If an alternate source(s) is not identified to be the cause of the SSL, the applicable requirements of 40 CFR §§ 257.94 through 257.98 (e.g., assessment of corrective measures) as may apply in 2019 will be met, including associated recordkeeping/notifications required by 40 CFR §§ 257.105 through 257.108.

REFERENCES

Natural Resource Technology, an OBG Company, 2017a, Statistical Analysis Plan, Duck Creek Power Station, Edwards Power Station, Illinois Power Resources Generating, LLC, October 17, 2017.

Natural Resource Technology, an OBG Company, 2017b, Sampling and Analysis Plan, Edwards Ash Pond, Edwards Power Station, Bartonville, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Figures



GROUNDWATER SAMPLING WELL LOCATION MAP
EDWARDS ASH POND
UNIT ID: 301

2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
VISTRA CCR RULE GROUNDWATER MONITORING
EDWARDS POWER STATION
BARTONVILLE, ILLINOIS

DRAWN BY/DATE:
SDS 12/17/18
REVIEWED BY/DATE:
AJB 1/24/19
APPROVED BY/DATE:
NRK 1/28/19

PROJECT NO: 70088

FIGURE NO: 1

OBG
Part of Ramboll

Tables

Table 1. Statistical Background Values

2018 Annual Groundwater Monitoring and Corrective Action Report
Edwards Power Station
Unit ID 301 - Edwards Ash Pond

Parameter	Statistical Background Value
Appendix III	
Boron (mg/L)	0.04151
Calcium (mg/L)	173.51
Chloride (mg/L)	44
Fluoride (mg/L)	0.376
pH (S.U.)	6.6 / 7.4
Sulfate (mg/L)	77.7
TDS (mg/L)	940

[O: KLS 8/31/18, C: RAB 8/31/18]

Notes:

mg/L = milligrams per liter
S.U. = Standard Units
TDS = Total Dissolved Solids

Table 2. Groundwater Protection Standards

2018 Annual Groundwater Monitoring and Corrective Action Report
Edwards Power Station
Unit ID 301 - Edwards Ash Pond

Parameter	Groundwater Protection Standard
Appendix IV	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.0187
Barium (mg/L)	2
Beryllium (mg/L)	0.014
Cadmium (mg/L)	0.005
Chromium (mg/L)	0.10
Cobalt (mg/L)	0.006
Fluoride (mg/L)	4
Lead (mg/L)	0.015
Lithium (mg/L)	0.054
Mercury (mg/L)	0.002
Molybdenum (mg/L)	0.10
Selenium (mg/L)	0.05
Thallium (mg/L)	0.002
Radium 226+228 (pCi/L)	5

[O: KLS 8/31/18, C: RAB 8/31/18]

Notes:

mg/L = milligrams per liter
pCi/L = picoCuries per liter

Table 3. Apendix III Analytical Results

2018 Annual Groundwater Monitoring and Corrective Action Report
Edwards Power Station
Unit ID 301 - Edwards Ash Pond

Sample Location	Date Sampled	B, total (mg/L)	Ca, total (mg/L)	Cl, total (mg/L)	F, total (mg/L)	pH (field) (S.U.)	SO4, total (mg/L)	TDS (mg/L)
Background / Upgradient Monitoring Wells								
AP-05S	11/2/2017	0.37	100	39	<0.25	7.2	10	820
	5/7/2018	0.29	94	42	<0.25	7.2	8.1	860
	7/27/2018	0.33	110	41	<0.25	7.1	6.2	940
	8/27/2018	NA	NA	NA	NA	7.0	NA	NA
AW-08	11/1/2017	0.14	150	16	0.334	7.1	11	680
	5/5/2018	0.096	130	18	0.338	7.1	7.5	640
	7/27/2018	0.13	130	17	0.313	7.2	6.0	600
	8/27/2018	NA	NA	NA	NA	7.1	NA	NA
Downgradient Monitoring Wells								
AW-06	11/2/2017	0.18	100	32	0.405	7.1	32	500
	5/5/2018	0.17	120	37	0.286	7.2	29	430
	8/24/2018	0.14	110	35	0.366	7.9	31	540
AW-09	11/2/2017	0.90	110	32	0.279	7.0	29	690
	5/5/2018	0.29	130	26	0.294	7.0	<1	670
	8/24/2018	0.72	120	36	0.334	7.0	26	720
AW-10	11/2/2017	0.54	100	85	<0.25	7.2	2.8	1000
	5/7/2018	0.42	110	85	<0.25	7.3	<1	1000
	7/27/2018	0.48	170	88	<0.25	7.2	<1	1100
	8/27/2018	NA	NA	NA	NA	7.1	NA	NA
AW-11	11/2/2017	0.23	140	33	<0.25	7.2	3.2	920
	5/7/2018	0.21	140	30	<0.25	7.2	<1	880
	8/27/2018	0.30	290	31	0.27	7.2	1.1	980

[O: RAB 12/27/18, C: JQW 12/27/18]

Notes:
mg/L = milligrams per liter
S.U. = Standard Units
TDS = Total Dissolved Solids
NA = Not Analyzed
< = concentration is less than the reporting limit

Table 4. Apendix IV Analytical Results

2018 Annual Groundwater Monitoring and Corrective Action Report
Edwards Power Station
Unit ID 301 - Edwards Ash Pond

Sample Location	Date Sampled	Sb, total (mg/L)	As, total (mg/L)	Ba, total (mg/L)	Be, total (mg/L)	Cd, total (mg/L)	Cr, total (mg/L)	Co, total (mg/L)	F, total (mg/L)	Pb, total (mg/L)	Li, total (mg/L)	Hg, total (mg/L)	Mo, total (mg/L)	Ra226/228 Combined (pCi/L)	Se, total (mg/L)	Tl, total (mg/L)
Background / Upgradient Monitoring Wells																
AP-05S	5/7/2018	<0.003	0.0028	0.46	<0.001	<0.001	<0.004	<0.002	<0.25	<0.001	0.032	<0.0002	0.0038	NA	<0.001	<0.001
	5/29/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.68	NA	NA
	7/27/2018[a]	NA	0.0047	0.70	<0.001	NA	<0.004	<0.002	<0.25	<0.001	0.025	NA	0.0029	3.19	<0.001	NA
AW-08	5/5/2018	<0.003	0.027	0.24	<0.001	<0.001	<0.004	<0.002	0.338	<0.001	0.014	<0.0002	0.0044	NA	<0.001	<0.001
	5/29/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.422	NA	NA
	7/27/2018[a]	NA	0.02	0.19	<0.001	NA	<0.004	<0.002	0.313	<0.001	<0.01	NA	0.0043	0.807	<0.001	NA
Downgradient Monitoring Wells																
AW-06	5/5/2018	<0.003	0.037	0.45	0.0014	<0.001	0.034	0.018	0.286	0.019	0.048	<0.0002	0.0080	NA	0.0028	<0.001
	5/29/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.09	NA	NA
	8/24/2018[a]	NA	0.0048	0.18	<0.001	NA	<0.004	<0.002	0.366	0.0018	<0.01	NA	0.0057	1.98	<0.001	NA
AW-09	5/5/2018	<0.003	0.036	0.37	<0.001	<0.001	0.015	0.01	0.294	0.0076	0.029	<0.0002	0.037	NA	0.0015	<0.001
	5/29/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.633	NA	NA
	8/24/2018[a]	NA	<0.001	0.18	<0.001	NA	<0.004	0.0034	0.334	<0.001	0.011	NA	0.015	0.466	<0.001	NA
AW-10	5/7/2018	<0.003	0.0089	0.88	<0.001	<0.001	<0.004	0.0031	<0.25	0.001	0.042	<0.0002	0.0020	NA	<0.001	<0.001
	5/29/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.40	NA	NA
	7/27/2018[a]	NA	0.018	1.4	0.0022	NA	0.063	0.036	<0.25	0.035	0.11	NA	0.003	8.03	0.0035	NA
AW-11	5/7/2018	<0.003	0.011	0.73	<0.001	<0.001	<0.004	0.0029	<0.25	<0.001	0.021	<0.0002	0.0064	NA	<0.001	<0.001
	5/29/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.75	NA	NA
	8/24/2018[a]	NA	0.029	3.0	0.0046	NA	0.15	0.07	0.270	0.080	0.16	NA	0.0099	7.60	0.0083	NA

[O: RAB 12/27/18, C: JQW 12/27/18, U: AJB 1/28/19]

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

NA = Not Analyzed

< = concentration is less than the reporting limit

[a]Only the parameters detected during the previous sampling event were analyzed during this sampling event, in accordance with 40CFR § 257.95(d)(1).

OBG
Part of Ramboll