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**Dynegy Zimmer, LLC**

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

Date

**January 31, 2020**

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

## **ZIMMER D BASIN, ZIMMER POWER STATION**



Bright ideas. Sustainable change.

**2019 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT  
ZIMMER D BASIN, ZIMMER POWER STATION**

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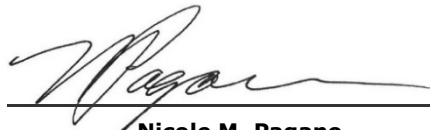
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## **ACRONYMS AND ABBREVIATIONS**

CCR	Coal Combustion Residuals
GWPS	Groundwater Protection Standard
SAP	Sampling and Analysis Plan
SSL	Statistically Significant Level

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## 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 Zimmer D Basin located at Zimmer Power Station near Moscow, Ohio.

Groundwater is being monitored at Zimmer D Basin in accordance with the Assessment Monitoring Program requirements specified in 40 C.F.R. § 257.95.

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

No Statistically Significant Levels (SSLs) of 40 C.F.R. Part 257 Appendix IV parameters were determined in 2019 and Zimmer D Basin remains in the Assessment Monitoring Program.

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## 1. INTRODUCTION

This report has been prepared by Ramboll on behalf of Dynegy Zimmer, LLC, to provide the information required by 40 C.F.R. § 257.90(e) for Zimmer D Basin located at Zimmer Power Station near Moscow, Ohio.

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 Zimmer D Basin 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 Zimmer D Basin remains in the Assessment Monitoring Program in accordance with 40 C.F.R. § 257.95.

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### 3. KEY ACTIONS COMPLETED IN 2019

The Assessment 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) (AECOM, 2017). All monitoring data obtained under 40 C.F.R. §§ 257.90 through 257.98 (as applicable) in 2019 are presented in Tables 1 and 2. Analytical data were evaluated in accordance with the Statistical Analysis Plan (NRT/OBG, 2017) to determine any SSLs of Appendix IV parameters over Groundwater Protection Standards (GWPSs).

Statistical background values are provided in Table 3 and GWPSs in Table 4.

Analytical results for the May and September 2018 sampling events were provided in the 2018 Annual Groundwater Monitoring and Corrective Action Report.

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**Table A – 2018-2019 Assessment Monitoring Program Summary**

Sampling Dates	Analytical Data Receipt Date	Parameters Collected	SSL(s)	SSL(s) Determination Date
May 8-9, 2018	July 9, 2018	Appendix III Appendix IV	NA	NA
September 19-27, 2018	October 9, 2018	Appendix III Appendix IV Detected <sup>1</sup>	None	January 7, 2019
March 14, 2019	May 2, 2019	Appendix III Appendix IV	None	July 31, 2019
September 11, 2019	October 16, 2019	Appendix III Appendix IV Detected <sup>1</sup>	NA	TBD

**Notes:**

NA: Not Applicable

TBD: To Be Determined

1. Groundwater sample analysis was limited to Appendix IV parameters detected in previous events in accordance with 40 C.F.R. § 257.95(d)(1).

## **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 (AECOM, 2017), and all data were accepted.

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## 5. KEY ACTIVITIES PLANNED FOR 2020

The following key activities are planned for 2020:

- Continuation of the Assessment 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 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 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 2020 Annual Groundwater Monitoring and Corrective Action Report.
  - If an alternate source(s) is not identified to be the cause of the SSL, the applicable requirements of 40 C.F.R. §§ 257.94 through 257.98 (e.g., assessment of corrective measures) as may apply in 2020 will be met, including associated recordkeeping/notifications required by 40 C.F.R. §§ 257.105 through 257.108.

## 6. REFERENCES

AECOM, 2017. Sampling and Analysis Plan, CCR Rule Groundwater Monitoring, Basin D, Unit 121, Zimmer Power Station, Moscow, Ohio, Job Number: 60442412, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company (NRT/OBG), 2017. Statistical Analysis Plan, Zimmer Power Station, Dynegy Zimmer, LLC, October 17, 2017.

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## TABLES

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**TABLE 1.**  
**2019 ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 ZIMMER POWER STATION  
 UNIT ID 121 - ZIMMER D BASIN  
 MOSCOW, OHIO  
 ASSESSMENT 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>												
MW-1	38.877454	-84.227187	3/14/2019 9:50	35.82	475.10	<0.080	152	78.7	<1.00	7.0	90.2	617
			9/11/2019 9:45	52.01	458.91	<0.080	167	63.1	<1.00	7.0	90.6	637
MW-8	38.870008	-84.225596	3/14/2019 8:05	37.76	473.84	<0.080	117	23.8	<1.00	6.9	62.5	462
			9/11/2019 8:55	52.51	459.09	<0.080	129	34.0	<1.00	6.8	59.5	508
MW-12	38.875725	-84.226430	3/14/2019 9:05	36.74	475.18	0.256	147	33.2	<1.00	6.9	106	596
			9/11/2019 12:45	52.38	459.54	0.204	148	26.6	<1.00	7.7	90.0	557
<b>Downgradient Monitoring Wells</b>												
MW-9	38.875531	-84.230096	3/14/2019 10:40	35.70	474.21	2.29	299	111	<1.00	7.0	995	1840
			9/11/2019 12:45	53.31	456.60	0.737	236	30.7	<1.00	8.3	495	1190
MW-13	38.875138	-84.230054	3/14/2019 11:45	25.55	473.85	0.0830	141	18.5	<1.00	7.1	260	717
			9/11/2019 9:11	42.98	456.42	<0.080	144	14.4	<1.00	7.6	146	616
MW-14	38.874783	-84.230029	3/14/2019 12:30	30.04	473.77	<0.080	186	29.5	<1.00	7.1	420	946
			9/11/2019 16:05	47.50	456.31	0.139	181	28.8	<1.00	7.4	287	836
MW-15	38.874477	-84.230087	3/14/2019 13:10	36.61	473.97	0.0807	198	38.6	<1.00	6.9	486	1090
			9/11/2019 16:40	53.93	456.65	0.120	241	36.2	<1.00	7.4	535	1170

[O: RAB 12/25/19, C: KLT 12/26/19]

**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.**  
**2019 ANALYTICAL RESULTS - APPENDIX IV PARAMETERS**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 ZIMMER POWER STATION  
 UNIT ID 121 - ZIMMER D BASIN  
 MOSCOW, OHIO  
 ASSESSMENT MONITORING PROGRAM

Well Identification Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date & Time Sampled	40 C.F.R. Part 257 Appendix IV														
				Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Cadmium, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	Radium 226/228, Combined (pCi/L)	Selenium, total (mg/L)	Thallium, total (mg/L)
				6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	7470A <sup>1</sup>	6020A <sup>1</sup>	903/904 <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>
<b>Background / Upgradient Monitoring Wells</b>																		
MW-1	38.877454	-84.227187	3/14/2019 9:50	<0.0020	<0.00100	0.0665	<0.00100	<0.00100	0.00230	<0.000500	<1.00	<0.00100	0.00665	<0.000200	<0.00500	0.171	<0.00500	<0.00100
			9/11/2019 9:45 <sup>2</sup>	NA	<0.00100	0.0770	<0.00100	NA	<0.00200	<0.000500	<1.00	<0.00100	0.0109	NA	<0.00500	0.110	<0.00500	NA
MW-8	38.870008	-84.225596	3/14/2019 8:05	<0.0020	<0.00100	0.0454	<0.00100	<0.00100	0.00201	<0.000500	<1.00	<0.00100	<0.00500	<0.000200	<0.00500	0.0807	<0.00500	<0.00100
			9/11/2019 8:55 <sup>2</sup>	NA	<0.00100	0.0552	<0.00100	NA	0.00206	<0.000500	<1.00	<0.00100	0.00754	NA	<0.00500	0.261	<0.00500	NA
MW-12	38.875725	-84.226430	3/14/2019 9:05	<0.0020	<0.00100	0.0631	<0.00100	<0.00100	0.00218	<0.000500	<1.00	<0.00100	0.00543	<0.000200	<0.00500	0.247	<0.00500	<0.00100
			9/11/2019 12:45 <sup>2</sup>	NA	<0.00100	0.0692	<0.00100	NA	0.00249	<0.000500	<1.00	<0.00100	0.0114	NA	<0.00500	0.118	<0.00500	NA
<b>Downgradient Monitoring Wells</b>																		
MW-9	38.875531	-84.230096	3/14/2019 10:40	<0.0020	0.00171	0.0333	<0.00100	<0.00100	<0.00200	0.00351	<1.00	<0.00100	0.00779	<0.000200	<0.00500	0.323	<0.00500	<0.00100
			9/11/2019 12:45 <sup>2</sup>	NA	0.00188	0.0261	<0.00100	NA	0.00237	0.00267	<1.00	<0.00100	0.0135	NA	<0.00500	0.372	<0.00500	NA
MW-13	38.875138	-84.230054	3/14/2019 11:45	<0.0020	0.0183	0.0540	<0.00100	<0.00100	<0.00200	0.00295	<1.00	<0.00100	<0.00500	<0.000200	<0.00500	0.284	<0.00500	<0.00100
			9/11/2019 9:11 <sup>2</sup>	NA	0.00525	0.0461	<0.00100	NA	0.00231	0.00368	<1.00	<0.00100	0.00811	NA	<0.00500	0.449	<0.00500	NA
MW-14	38.874783	-84.230029	3/14/2019 12:30	<0.0020	<0.00100	0.0507	<0.00100	<0.00100	0.00213	0.00229	<1.00	<0.00100	<0.00500	<0.000200	<0.00500	0.229	<0.00500	<0.00100
			9/11/2019 16:05 <sup>2</sup>	NA	0.00155	0.0554	<0.00100	NA	0.00254	0.00239	<1.00	<0.00100	0.00843	NA	<0.00500	1.94	<0.00500	NA
MW-15	38.874477	-84.230087	3/14/2019 13:10	<0.0020	<0.00100	0.0600	<0.00100	<0.00100	<0.00200	0.00318	<1.00	<0.00100	<0.00500	<0.000200	<0.00500	0.783	<0.00500	<0.00100
			9/11/2019 16:40 <sup>2</sup>	NA	<0.00100	0.0836	<0.00100	NA	0.00257	0.00381	<1.00	<0.00100	0.00845	NA	<0.00500	0.756	<0.00500	NA

[O: RAB 12/25/19, C: KLT 12/26/19]

**Notes:**

40 C.F.R. = Title 40 of the Code of Federal Regulations

mg/L = milligrams per liter

NA = Not Analyzed

pCi/L = picoCuries per liter

< = concentration is less than 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 Levels (SSLs) over Groundwater Protection Standards.

<sup>1</sup>4-digit numbers represent SW-846 analytical methods and 3-digit numbers represent Clean Water Act analytical methods.

<sup>2</sup>Only the parameters detected during the previous sampling events were analyzed during this sampling event, in accordance with 40 C.F.R. § 257.95(d)(1).

**TABLE 3.**  
**STATISTICAL BACKGROUND VALUES**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 ZIMMER POWER STATION  
 UNIT ID 121 - ZIMMER D BASIN  
 MOSCOW, OHIO  
 ASSESSMENT MONITORING PROGRAM

Parameter	Statistical Background Value (UPL)
<b>40 C.F.R. Part 257 Appendix III</b>	
Boron (mg/L)	0.38
Calcium (mg/L)	200
Chloride (mg/L)	72.87
Fluoride (mg/L)	0.2
pH (S.U.)	6.7 / 7.4
Sulfate (mg/L)	129.2
Total Dissolved Solids (mg/L)	695

[O: RAB 12/25/19, C: KLT 12/26/19]

**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

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**TABLE 4.**  
**GROUNDWATER PROTECTION STANDARDS**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 ZIMMER POWER STATION  
 UNIT ID 121 - ZIMMER D BASIN  
 MOSCOW, OHIO  
 ASSESSMENT MONITORING PROGRAM

Parameter	Groundwater Protection Standard <sup>1</sup>
<b>40 C.F.R. Part 257 Appendix IV</b>	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.010
Barium (mg/L)	2
Beryllium (mg/L)	0.004
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)	0.040
Mercury (mg/L)	0.002
Molybdenum (mg/L)	0.10
Radium 226+228 (pCi/L)	5
Selenium (mg/L)	0.05
Thallium (mg/L)	0.002

[O: RAB 12/25/19, C: KLT 12/26/19]

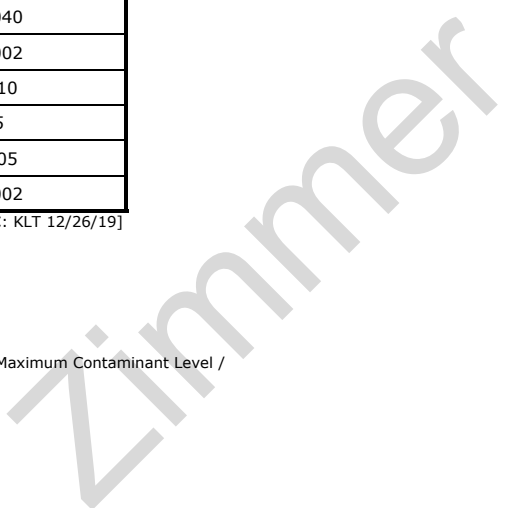
**Notes:**

40 C.F.R. = Title 40 of the Code of Federal Regulations

mg/L = milligrams per liter

pCi/L = picoCuries per liter

<sup>1</sup>Groundwater Protection Standard is the higher of the Maximum Contaminant Level / Health-Based Level or background.



## FIGURES

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



**MONITORING WELL LOCATION MAP  
ZIMMER D BASIN  
UNIT ID:121**

**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
VISTRA CCR RULE GROUNDWATER MONITORING  
ZIMMER POWER STATION  
MOSCOW, OHIO

**FIGURE 1**

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

