Prepared for

Dynegy Midwest Generation, LLC

Date

January 31, 2021

Project No.

1940074919

2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

HENNEPIN EAST ASH POND, HENNEPIN POWER STATION

RAMBOLL Bright ideas. Sustainable change.

2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
HENNEPIN EAST ASH POND, HENNEPIN POWER STATION

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Project no.	**1940074919**
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Description	**Annual Report in Support of the CCR Rule Groundwater Monitoring Program**

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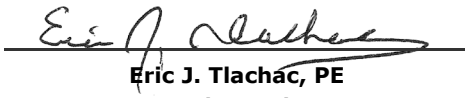

Eric J. Tlachac, PE
Managing Engineer

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ACRONYMS AND ABBREVIATIONS

40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
CCR	Coal Combustion Residuals
CMA	Corrective Measures Assessment
EAP	East Ash Pond
GWPS	Groundwater Protection Standard
SSI	Statistically Significant Increase
SSL	Statistically Significant Level

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 Hennepin East Ash Pond (EAP) located at Hennepin Power Station near Hennepin, Illinois.

Groundwater is being monitored at Hennepin EAP in accordance with the Assessment Monitoring Program requirements specified in 40 C.F.R. § 257.95. Assessment Monitoring was initiated at Hennepin EAP on April 9, 2018.

No changes were made to the monitoring system in 2020 (no wells were installed or decommissioned).

No Statistically Significant Levels (SSLs) of 40 C.F.R. Part 257 Appendix IV parameters were determined. Consequently, a Corrective Measures Assessment (CMA) is not required and Hennepin EAP remains in the Assessment Monitoring Program.

1. INTRODUCTION

This report has been prepared by Ramboll Americas Engineering Solutions Inc. (Ramboll) on behalf of Dynegy Midwest Generation, LLC, to provide the information required by 40 C.F.R.§ 257.90(e) for Hennepin EAP located at Hennepin Power Station near Hennepin, 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 [SSI] relative to background levels).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.
6. 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:
   i. 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.
   ii. 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.
   iii. If it was determined that there was a SSI over background for one or more constituents listed in Appendix III of §257 pursuant to §257.94(e):
      A. Identify those constituents listed in Appendix III of §257 and the names of the monitoring wells associated with the SSI(s).

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

iv. If it was determined that there was a SSL above the Groundwater Protection Standard (GWPS) for one or more constituents listed in Appendix IV of §257 pursuant to §257.95(g) include all of the following:

A. Identify those constituents listed in Appendix IV of §257 and the names of the monitoring wells associated with the SSL(s).

B. Provide the date when the CMA was initiated for the CCR unit.

C. Provide the date when the public meeting was held for CMA for the CCR unit.

D. Provide the date when the CMA was completed for the CCR unit.

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

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

This report provides the required information for Hennepin EAP for calendar year 2020.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

No changes have occurred to the Monitoring Program status in calendar year 2020, and Hennepin EAP remains in the Assessment Monitoring Program in accordance with 40 C.F.R. § 257.95.

3. KEY ACTIONS COMPLETED IN 2020

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 2020. 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 (NRT/OBG, 2017a). All monitoring data obtained under 40 C.F.R. §§ 257.90 through 257.98 (as applicable) in 2020, and analytical results for the September 2019 sampling events, are presented in Tables 1 and 2. Analytical data were evaluated in accordance with the Statistical Analysis Plan (NRT/OBG, 2017b) to determine any SSLs of Appendix IV parameters over GWPSs.

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

Table A – 2019-2020 Assessment Monitoring Program Summary

Sampling Dates	Analytical Data Receipt Date	Parameters Collected	SSL(s)	SSL(s) Determination Date
September 17, 2019	October 22, 2019	Appendix III Appendix IV Detected [1]	none	January 20, 2020
March 11, 2020	April 15, 2020	Appendix III Appendix IV	none	July 14, 2020
September 2-3, 2020	October 16, 2020	Appendix III Appendix IV Detected [1]	TBD	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 2020. Groundwater samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017a), and all data were accepted.

5. KEY ACTIVITIES PLANNED FOR 2021

The following key activities are planned for 2021:

- Continuation of the Assessment Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2021.
- 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 2021 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 2021 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, Hennepin East Ash Pond, Hennepin Power Station, Hennepin, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company (NRT/OBG), 2017b. Statistical Analysis Plan, Baldwin Energy Complex, Havana Power Station, Hennepin Power Station, Wood River Power Station, Dynegy Midwest Generation, LLC, October 17, 2017.

TABLES

TABLE 1.
ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
HENNEPIN POWER STATION
803 - EAST ASH POND
HENNEPIN, IL

Well ID	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Depth to Groundwater (ft) 6020A	Groundwater Elevation (ft NAVD88) 6020A	Boron, total (mg/L) 6020A	Calcium, total (mg/L) 6020A	Chloride, total (mg/L) 9251	Fluoride, total (mg/L) 9214	pH (field) (STD) SM4500 H+B	Sulfate, total (mg/L) 9036	Total Dissolved Solids (mg/L) SM 2540C
07 Background	41.297986	-89.305712	9/18/2019	64.6	453.67	0.0797	147	33	0.11	6.3	55	666
			3/11/2020	66.15	452.12							
			3/12/2020			0.0788	148	60	0.11	6.7	53	638
			9/2/2020	64.9	453.37							
			9/3/2020			0.0811	146	38	0.1	6.8	67	606
08 Background	41.300698	-89.3044	9/18/2019	50.82	450.56	0.151	242	220	<0.1	6.6	195	1360
			3/11/2020	52.36	449.02							
			3/12/2020			0.106	203	209	0.11	6.7	197	1210
			9/2/2020	51.69	449.69							
			9/3/2020			0.119	202	168	<0.1	6.7	154	1010
08D Background	41.300799	-89.304522	9/18/2019	50.9	450.44	0.117	187	226	0.12	6.7	121	1230
			3/11/2020	52.79	448.55							
			3/12/2020			0.115	182	217	0.12	6.7	142	1110
			9/2/2020	51.62	449.72							
			9/3/2020			0.0942	226	222	0.11	6.7	213	1200
12 Downgradient	41.303663	-89.304304	9/17/2019	48.36	450.08	0.345	83.4	66	0.28	7.1	58	510
			3/11/2020	49.9	448.54	0.493	89.6	62	0.33	7.2	64	496
			9/2/2020	49.02	449.42	0.402	76.2	57	0.3	7.4	61	432
13 Downgradient	41.303658	-89.304315	9/17/2019	48.38	450.09	1.14	75.7	77	0.26	7.4	92	552
			3/11/2020	49.9	448.57	1.34	79.9	72	0.3	7.5	98	552
			9/2/2020	49	449.47	1	71.4	64	0.24	7.5	81	456
46 Downgradient	41.303953	-89.303472	9/17/2019	48.58	450.17	0.298	76.1	64	0.28	7.3	57	468
			3/11/2020	50.14	448.61	0.407	74.6	67	0.32	7.4	63	468
			9/2/2020	49.22	449.53							
			9/3/2020			0.289	77.7	58	0.27	7.0	58	436
47 Downgradient	41.303292	-89.305994	9/17/2019	54.25	450.07	0.156	99	71	0.31	7.0	54	520
			3/11/2020	55.75	448.57	0.19	90.5	63	0.37	7.2	53	462
			9/2/2020	53.5	450.82	0.158	94.1	69	0.29	7.1	51	478

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.
4-digit numbers below parameter represent SW-846 analytical methods and alpha-numeric values that begin with SM represent Standard Methods for the Examination of Water and Wastewater.

TABLE 2.
ANALYTICAL RESULTS - APPENDIX IV PARAMETERS
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
HENNEPIN POWER STATION
803 - EAST ASH POND
HENNEPIN, IL

Well ID	Date	Antimony, total 6020A	Arsenic, total 6020A	Barium, total 6020A	Beryllium, total 6020A	Cadmium, total 6020A	Chromium, total 6020A	Cobalt, total 6020A	Fluoride, total 6020A	Lead, total 6020A	Lithium, total 6020A	Mercury, total 7470A	Molybdenum, total 6020A	Radium-226 + Radium 228, 6020A	Selenium, total 6020A	Thallium, total 6020A
07 Background	9/18/2019		<0.001	0.114		<0.001		<0.001	0.11	<0.001	0.0088		<0.0015	0.85	<0.001	
	3/12/2020	<0.001	<0.001	0.114	<0.001	<0.001	<0.0015	<0.001	0.11	<0.001	0.0081	<0.0002	<0.0015	1.36	<0.001	<0.002
	9/3/2020	<0.001	<0.001	0.117	<0.001	<0.001	<0.0015	<0.001	0.1	<0.001	0.0086	<0.0002	<0.0015	0.49	<0.001	<0.002
08 Background	9/18/2019		<0.001	0.0943		<0.001		0.0099	<0.1	<0.001	0.0123		<0.0015	1.39	<0.001	
	3/12/2020	<0.001	<0.001	0.0707	<0.001	<0.001	<0.0015	0.0131	0.11	<0.001	0.0098	<0.0002	0.0016	1.13	<0.001	<0.002
	9/3/2020	<0.001	<0.001	0.0918	<0.001	<0.001	<0.0015	0.0047	<0.1	<0.001	0.0116	<0.0002	<0.0015	0.88	<0.001	<0.002
08D Background	9/18/2019		<0.001	0.143		<0.001		0.0057	0.12	<0.001	0.0142		0.0016	0.42	<0.001	
	3/12/2020	<0.001	<0.001	0.127	<0.001	<0.001	<0.0015	0.0023	0.12	<0.001	0.0132	<0.0002	<0.0015	1.35	<0.001	<0.002
	9/3/2020	<0.001	<0.001	0.131	<0.001	<0.001	<0.0015	0.0042	0.11	<0.001	0.013	<0.0002	<0.0015	0.55	<0.001	<0.002
12 Downgradient	9/17/2019		<0.001	0.064		<0.001		<0.001	0.28	<0.001	0.0148		0.0285	0.58	<0.001	
	3/11/2020	<0.001	<0.001	0.0774	<0.001	<0.001	<0.0015	<0.001	0.33	<0.001	0.0141	<0.0002	0.0232	0.66	0.0013	<0.002
	9/2/2020			0.0609					0.3		0.0126		0.0322	0.63	<0.001	
13 Downgradient	9/17/2019		<0.001	0.0428		<0.001		<0.001	0.26	<0.001	0.0207		0.0187	0	0.0022	
	3/11/2020	<0.001	<0.001	0.0469	<0.001	<0.001	<0.0015	<0.001	0.3	<0.001	0.025	<0.0002	0.0177	0.43	0.0033	<0.002
	9/2/2020			0.0422					0.24		0.0207		0.0198	0.94	0.0019	
46 Downgradient	9/17/2019		<0.001	0.0621		<0.001		<0.001	0.28	<0.001	0.0113		0.0272	1.01	0.001	
	3/11/2020	<0.001	<0.001	0.0644	<0.001	<0.001	<0.0015	<0.001	0.32	<0.001	0.0117	<0.0002	0.0271	2.51	0.001	<0.002
	9/3/2020			0.0653					0.27		0.0117		0.0254	0.72	<0.001	
47 Downgradient	9/17/2019		<0.001	0.0871		<0.001		<0.001	0.31	<0.001	0.0095		0.0287	0.33	<0.001	
	3/11/2020	<0.001	<0.001	0.0821	<0.001	<0.001	<0.0015	<0.001	0.37	<0.001	0.0089	<0.0002	0.0308	1.11	<0.001	<0.002
	9/2/2020			0.0932					0.29		0.0083		0.0245	0.39		

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.
4-digit numbers below parameter represent SW-846 analytical methods and 3-digit numbers represent Clean Water Act analytical methods

TABLE 3.
STATISTICAL BACKGROUND VALUES
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
HENNEPIN POWER STATION
803 - EAST ASH POND
HENNEPIN, ILLINOIS
ASSESSMENT MONITORING PROGRAM

Parameter	Statistical Background Value (UPL)
40 C.F.R. Part 257 Appendix III	
Boron (mg/L)	0.15
Calcium (mg/L)	274
Chloride (mg/L)	384
Fluoride (mg/L)	0.12
pH (S.U.)	6.6 / 7.5
Sulfate (mg/L)	196
Total Dissolved Solids (mg/L)	1493

[O: RAB 12/23/19, C: KLT 12/24/19]

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

TABLE 4.
GROUNDWATER PROTECTION STANDARDS
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
HENNEPIN POWER STATION
803 - EAST ASH POND
HENNEPIN, ILLINOIS
ASSESSMENT MONITORING PROGRAM

Parameter	Groundwater Protection Standard[1]
40 C.F.R. Part 257 Appendix IV	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.01
Barium (mg/L)	2
Beryllium (mg/L)	0.004
Cadmium (mg/L)	0.005
Chromium (mg/L)	0.10
Cobalt (mg/L)	0.039
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 12/23/19, C: KLT 12/24/19]

Notes:
40 C.F.R. = Title 40 of the Code of Federal Regulations
mg/L = milligrams per liter
pCi/L = picoCuries per liter
[1]Groundwater Protection Standard is the higher of the Maximum Contaminant Level / Health-Based Level or background.

FIGURES

Y:\Mapping\Projects\222285\MXD\2020_AnnualGWM_CAR\Figure 1_GWS_WellLoc_HenEAP.mxd

PROJECT: 169000XXXX | DATED: 1/25/2021 | DESIGNER: galammc

- BACKGROUND WELL LOCATION
- DOWNGRADIENT WELL LOCATION
- CCR MONITORED UNIT

0 175 350 Feet

MONITORING WELL LOCATION MAP
HENNEPIN EAST ASH POND
UNIT ID:803

2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
VISTRA CCR RULE GROUNDWATER MONITORING
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL