

Prepared for  
**Electric Energy, Inc.**

Date  
**January 31, 2021**

Project No.  
**1940074920**

# **2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**

## **JOPPA LANDFILL, JOPPA POWER STATION**




Bright ideas. Sustainable change.

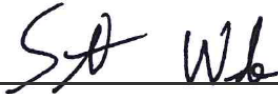
**2020 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT  
JOPPA LANDFILL, JOPPA POWER STATION**

Project name **Joppa Power Station**  
Project no. **1940074920**  
Recipient **Electric Energy, Inc.**  
Document type **Annual Groundwater Monitoring and Corrective Action Report**  
Version **FINAL**  
Date **January 31, 2021**  
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Description **Annual Report in Support of the CCR Rule Groundwater Monitoring Program**

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## ACRONYMS AND ABBREVIATIONS

40 C.F.R.	Title 40 of the Code of Federal Regulations
CCR	Coal Combustion Residuals
CMA	Corrective Measures Assessment
LF	Landfill
GWPS	Groundwater Protection Standard
SSI	Statistically Significant Increase
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 the Joppa Landfill (LF) located at Joppa Power Station near Joppa, Illinois.

Groundwater is being monitored at Joppa LF 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 2020 (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 and Joppa LF remains in the Detection Monitoring Program.

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## 1. INTRODUCTION

This report has been prepared by Ramboll on behalf of Electric Energy, Inc., to provide the information required by 40 C.F.R. § 257.90(e) for Joppa LF located at Joppa Power Station near Joppa, 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 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 Statistically Significant Level (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 Corrective Measures Assessment (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 Joppa LF for calendar year 2020.

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

No changes have occurred to the monitoring program status in calendar year 2020, and Joppa LF remains in the Detection Monitoring Program in accordance with 40 C.F.R. § 257.94.

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### 3. KEY ACTIONS COMPLETED IN 2020

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 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 event, 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.

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**Table A – 2019–2020 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>
September 9, 2019	October 15, 2019	Appendix III	None	January 13, 2020
March 30, 2020	April 15, 2020	Appendix III	None	July 14, 2020
September 23, 2020	October 16, 2020	Appendix III	TBD	TBD

**Notes:**

TBD: To Be Determined

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## **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.

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## 5. KEY ACTIVITIES PLANNED FOR 2021

The following key activities are planned for 2021:

- Continuation of the Detection 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 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 2021 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 2021 (*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, Joppa Landfill, Joppa Power Station, Joppa, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company (NRT/OBG), 2017b, Statistical Analysis Plan, Joppa Power Station, Electric Energy, Inc., October 17, 2017.

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## TABLES

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**TABLE 1.**  
**ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS**  
**2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 JOPPA POWER STATION  
 402 - LANDFILL  
 JOPPA, IL

Well ID	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Depth to Groundwater (ft)	Groundwater Elevation (ft NAVD88)	Boron, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Fluoride, total (mg/L)	pH (field) (STD)	Sulfate, total (mg/L)	Total Dissolved Solids (mg/L)
				6020A	6020A	6020A	6020A	9251	9214	SM4500 H+B	9036	SM 2540C
G101 Background	37.22859851	-88.87309148	9/9/2019	44.88	330.41	<0.025	9.22	<5	0.28	6.3	35	190
			3/30/2020	42.4	332.89	<0.025	8.88	<5	0.32	6.8	41	174
			9/23/2020			<0.025	9.42	4	0.28	6.5	37	184
			9/24/2020	45.03	330.26							
G102 Background	37.228679	-88.875032	9/9/2019	56.73	330.58	<0.025	7.42	<5	0.18	6.1	34	190
			3/30/2020	51.8	335.51	<0.025	6.24	<5	0.2	6.5	38	158
			9/23/2020			<0.025	7.24	5	0.16	6.2	34	154
			9/24/2020	57.35	329.96							
G105 Downgradient	37.22754083	-88.87586571	9/9/2019	55.6	325.13	<0.025	29.7	51	0.16	6.1	12	252
			3/30/2020	51.5	329.23	<0.025	23.4	32	0.16	6.3	13	192
			9/23/2020			<0.025	31.8	70	0.15	6.2	16	268
			9/24/2020	52.29	328.44							
G107 Downgradient	37.22589366	-88.87557663	9/9/2019	55.65	321.68	0.0373	101	89	0.23	6.5	112	668
			3/30/2020	47.43	329.9	<0.025	86.1	113	0.2	6.7	89	550
			9/23/2020			0.0353	83.4	92	0.23	6.7	101	544
			9/24/2020	56.66	320.67							
G109 Downgradient	37.22579213	-88.87461468	9/9/2019	51.75	324.24	0.0255	30.9	19	0.3	6.5	59	348
			3/30/2020	44.79	331.2	0.0272	28	7	0.25	6.8	41	240
			9/23/2020			<0.025	25	15	0.23	6.6	42	236
			9/24/2020	52.89	323.1							
G111 Downgradient	37.22573906	-88.87384136	9/9/2019	50.64	323	0.0258	26.1	11	0.32	5.9	33	288
			3/30/2020	43.55	330.09	0.03	23.5	<5	0.27	6.7	44	240
			9/23/2020			<0.025	22.4	9	0.27	6.6	31	238
			9/24/2020	50.69	322.95							

**TABLE 1.**  
**ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS**  
**2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**

JOPPA POWER STATION  
402 - LANDFILL  
JOPPA, IL

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.

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**TABLE 2.**  
**STATISTICAL BACKGROUND VALUES**  
**2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 JOPPA POWER STATION  
 402 - LANDFILL  
 JOPPA, ILLINOIS  
 DETECTION MONITORING PROGRAM

<b>G105</b>	
<b>Parameter</b>	<b>Statistical Background Value (UPL)</b>
<b>40 C.F.R. Part 257 Appendix III</b>	
Boron (mg/L)	DQR*
Calcium (mg/L)	45
Chloride (mg/L)	60.7
Fluoride (mg/L)	0.29
pH (S.U.)	5.8/6.7
Sulfate (mg/L)	16
Total Dissolved Solids (mg/L)	277

[O: RAB 12/15/2020, C: MIK 12/20/2020]

<b>G107</b>	
<b>Parameter</b>	<b>Statistical Background Value (UPL)</b>
<b>40 C.F.R. Part 257 Appendix III</b>	
Boron (mg/L)	0.04
Calcium (mg/L)	107
Chloride (mg/L)	145
Fluoride (mg/L)	0.256
pH (S.U.)	6.1/7.1
Sulfate (mg/L)	149
Total Dissolved Solids (mg/L)	790

[O: RAB 12/15/2020, C: MIK 12/20/2020]

<b>G109</b>	
<b>Parameter</b>	<b>Statistical Background Value (UPL)</b>
<b>40 C.F.R. Part 257 Appendix III</b>	
Boron (mg/L)	0.03
Calcium (mg/L)	55
Chloride (mg/L)	26.4
Fluoride (mg/L)	0.393
pH (S.U.)	6.1/7.1
Sulfate (mg/L)	95
Total Dissolved Solids (mg/L)	507

[O: RAB 12/15/2020, C: MIK 12/20/2020]

<b>G111</b>	
<b>Parameter</b>	<b>Statistical Background Value (UPL)</b>
<b>40 C.F.R. Part 257 Appendix III</b>	
Boron (mg/L)	0.04
Calcium (mg/L)	27
Chloride (mg/L)	21.4
Fluoride (mg/L)	0.37
pH (S.U.)	5.9/6.8
Sulfate (mg/L)	54.3
Total Dissolved Solids (mg/L)	365

[O: RAB 12/15/2020, C: MIK 12/20/2020]

**Notes:**

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

DQR = Double Quantification Rule

mg/L = milligrams per liter

S.U. = Standard Units

UPL = Upper Prediction Limit

\*All upgradient results are non-detect values. A detected downgradient value is considered to be an exceedance and will be automatically resampled.

## FIGURES

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

0 150 300 Feet

### MONITORING WELL LOCATION MAP JOPPA LANDFILL UNIT ID:402

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

FIGURE 1

RAMBOLL AMERICAS  
ENGINEERING SOLUTIONS, INC.

