Prepared for
Illinois Power Generating Company

Date
January 31, 2022

Project No.
1940100711-012

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

PRIMARY ASH POND

NEWTON POWER PLANT

NEWTON, ILLINOIS

CCR UNIT 501

RAMBOLL Bright ideas. Sustainable change.

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
NEWTON POWER PLANT PRIMARY ASH POND

Project name	**Newton Power Plant**
Project no.	**1940100711-012**
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Description	**Annual Report in Support of the CCR Rule Groundwater Monitoring Program**

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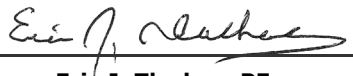

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ACRONYMS AND ABBREVIATIONS

§	Section
40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
CCR	coal combustion residuals
CMA	Corrective Measures Assessment
GWPS	groundwater protection standard
NA	not applicable
NPP	Newton Power Plant
NRT/OBG	Natural Resource Technology, an OBG Company
PAP	Primary Ash Pond
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SAP	Sampling and Analysis Plan
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TBD	to be determined
TDS	total dissolved solids

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.) Section (§) 257.90(e) for the Primary Ash Pond (PAP) located at Newton Power Plant (NPP) near Newton, Illinois.

Groundwater is being monitored at PAP 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 2021 (no wells were installed or decommissioned).

The following Statistically Significant Increases (SSIs) of 40 C.F.R. § 257 Appendix III parameter concentrations greater than background concentrations were determined:

- Calcium at wells APW07, APW08, APW09, and APW10
- Chloride at wells APW07 and APW09
- Sulfate at wells APW08, APW09, and APW10
- Total Dissolved Solids (TDS) at wells APW09 and APW10

Alternate Source Demonstrations (ASDs) were completed for the SSIs referenced above and the PAP remains in the Detection Monitoring Program.

1. INTRODUCTION

This report has been prepared by Ramboll Americas Engineering Solutions, Inc. (Ramboll) on behalf of Illinois Power Generating Company, to provide the information required by 40 C.F.R. § 257.90(e) for the PAP located at the NPP near Newton, 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 [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 the PAP for calendar year 2021.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

No changes have occurred to the monitoring program status in calendar year 2021 and the PAP remains in the Detection Monitoring Program in accordance with 40 C.F.R. § 257.94.

3. KEY ACTIONS COMPLETED IN 2021

The Detection Monitoring Program is summarized in **Table A** on the following page. The groundwater monitoring system, including the CCR unit and all background and compliance monitoring wells, is presented in **Figure 1**. No changes were made to the monitoring system in 2021. In general, one groundwater sample was collected from each background and compliance well during each monitoring event.[1] All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (SAP; Natural Resource Technology, an OBG Company [NRT/OBG], 2017a). All monitoring data obtained under 40 C.F.R. § 257.90 through 257.98 (as applicable) in 2021, and analytical results for the July 2020 sampling event, are presented in **Tables 1** and **2**. 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 3**. The background values reported in **Table 3** are slightly different from those reported previously because different software was utilized to calculate these values in 2021.

Potential alternate sources were evaluated as outlined in the 40 C.F.R. § 257.94(e)(2). ASDs were completed and certified by a qualified professional engineer. The dates the ASDs were completed are provided in **Table A**. The ASDs are included in **Appendix A**.

[1] Sampling was limited to APW08 during the October 2020 sampling event, and APW10 during the June 2021 sampling event, to confirm SSIs of select Appendix III parameters initially detected at concentrations greater than statistical background values in the preceding sampling event, as allowed by the Statistical Analysis Plan.

Table A. 2020-2021 Detection Monitoring Program Summary

Sampling Date	Analytical Data Receipt Date	Parameters Collected	SSI(s)	SSI(s) Determination Date	ASD Completion Date
July 28, 2020	October 15, 2020	Appendix III	Calcium (APW07, APW08, APW09, APW10) Chloride (APW07, APW09) Sulfate (APW08, APW10)	January 13, 2021	April 13, 2021
October 28, 2020 [1]	November 3, 2020	Chloride at well APW08 pH at well APW08 [2]	NA	NA	NA
February 9 - 11, 2021	April 14, 2021	Appendix III	Calcium (APW07, APW08, and APW09, APW10) Chloride (APW07, APW09) Sulfate (APW08, APW10)	July 13, 2021	October 11, 2021
June 30, 2021 [3]	July 7, 2021	pH at well APW10 TDS at well APW10 [2]	NA	NA	NA
November 9 - 10, 2021	December 8, 2021	Appendix III	TBD	TBD	TBD

Notes:

NA: not applicable

TBD: to be determined

[1] Sampling was limited to APW08 during the October 2020 sampling event to confirm SSIs of select Appendix III parameters initially detected at concentrations greater than statistical background values in the preceding sampling event, as allowed by the Statistical Analysis Plan.

[2] Groundwater sample analysis was limited to select Appendix III parameters initially detected at concentrations greater than statistical background values in the preceding sampling event to confirm SSIs, as allowed by the Statistical Analysis Plan.

[3] Sampling was limited to APW10 during the June 2021 sampling event to confirm SSIs of select Appendix III parameters initially detected at concentrations greater than statistical background values in the preceding sampling event, as allowed by the Statistical Analysis Plan.

4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the Groundwater Monitoring Program during 2021. Groundwater samples were collected and analyzed in accordance with the SAP (NRT/OBG, 2017a), and all data were accepted.

5. KEY ACTIVITIES PLANNED FOR 2022

The following key activities are planned for 2022:

- All or part of the monitoring well network that was proposed for compliance with Title 35 of the Illinois Administrative Code § 845 is under evaluation for incorporation into the current monitoring system.
- Continuation of the Detection Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2022.
- Complete evaluation of analytical data from the compliance 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 the 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 2022 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 2022 (*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, Newton Primary Ash Pond, Newton Power Station, Newton, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company (NRT/OBG), 2017b, Statistical Analysis Plan, Coffeen Power Station, Newton Power Station, Illinois Power Generating Company, October 17, 2017.

TABLES

TABLE 1
GROUNDWATER ELEVATIONS
2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
NEWTON POWER PLANT
501 - PRIMARY ASH POND
NEWTON, IL

Well ID	Well Type	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Depth to Groundwater (ft BMP)	Groundwater Elevation (ft NAVD88)
APW05	Background	38.93396	-88.28098	07/27/2020	14.30	529.77
				10/22/2020	14.53	529.54
				02/04/2021	13.96	530.11
				02/15/2021	14.24	529.83
				03/09/2021	14.46	529.61
				03/29/2021	14.39	529.68
				04/27/2021	14.34	529.73
				05/24/2021	13.25	530.82
				05/25/2021	14.56	529.51
				06/15/2021	14.65	529.42
				06/24/2021	14.69	529.38
				07/14/2021	14.74	529.33
				08/02/2021	14.79	529.28
				11/18/2021	14.84	529.23
APW06	Background	38.93375	-88.28628	07/27/2020	19.29	526.78
				10/22/2020	19.70	526.37
				02/04/2021	19.25	526.82
				02/15/2021	19.59	526.48
				03/09/2021	19.61	526.46
				03/29/2021	19.58	526.49
				04/27/2021	19.39	526.68
				05/24/2021	19.55	526.52
				05/25/2021	19.53	526.54
				06/15/2021	19.62	526.45
				06/24/2021	19.65	526.42
				07/14/2021	19.76	526.31
				08/02/2021	19.76	526.31
				11/18/2021	20.02	526.05
APW07	Compliance	38.92823	-88.29208	07/27/2020	46.40	491.97
				10/22/2020	46.87	491.50
				02/04/2021	45.65	492.72
				02/15/2021	46.21	492.16
				03/09/2021	46.44	491.93
				03/29/2021	46.20	492.17
				04/27/2021	46.18	492.19
				05/24/2021	46.49	491.88
				06/15/2021	46.52	491.85
				06/24/2021	46.62	491.75
				07/14/2021	46.60	491.77
				08/02/2021	46.10	492.27
				11/18/2021	46.90	491.47
APW08	Compliance	38.92315	-88.29229	07/27/2020	37.15	491.82
				10/22/2020	37.69	491.28
				02/04/2021	36.51	492.46
				02/15/2021	37.07	491.90
				03/09/2021	37.25	491.72

TABLE 1
GROUNDWATER ELEVATIONS
2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
NEWTON POWER PLANT
501 - PRIMARY ASH POND
NEWTON, IL

Well ID	Well Type	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Depth to Groundwater (ft BMP)	Groundwater Elevation (ft NAVD88)
APW08	Compliance	38.92315	-88.29229	03/29/2021	37.04	491.93
				04/27/2021	36.99	491.98
				05/24/2021	37.29	491.68
				06/15/2021	37.33	491.64
				06/24/2021	37.41	491.56
				07/14/2021	37.36	491.61
				08/02/2021	37.38	491.59
				11/18/2021	37.63	491.34
APW09	Compliance	38.92232	-88.28159	07/27/2020	26.21	505.31
				10/22/2020	27.69	503.83
				02/04/2021	25.83	505.69
				02/15/2021	26.59	504.93
				03/09/2021	26.42	505.10
				03/29/2021	26.29	505.23
				04/27/2021	26.78	504.74
				05/24/2021	26.80	504.72
				06/15/2021	26.89	504.63
				06/24/2021	27.04	504.48
				07/14/2021	26.28	505.24
				08/02/2021	26.75	504.77
				11/18/2021	27.13	504.39
APW10	Compliance	38.92744	-88.27313	07/27/2020	17.49	506.76
				10/22/2020	18.81	505.44
				02/04/2021	17.13	507.12
				02/15/2021	17.60	506.65
				03/09/2021	17.41	506.84
				03/29/2021	17.31	506.94
				04/27/2021	17.72	506.53
				05/24/2021	17.90	506.35
				06/15/2021	17.99	506.26
				06/24/2021	18.13	506.12
				07/14/2021	17.66	506.59
				08/02/2021	17.88	506.37
				11/18/2021	18.43	505.82

Notes:
ATC = above top of casing (well under pressure)
BMP = below measuring point
ft = foot/feet
NAVD88 = North American Vertical Datum of 1988

TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
NEWTON POWER PLANT
501 - PRIMARY ASH POND
NEWTON, IL

Well ID	Well Type	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Boron, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Fluoride, total (mg/L)	pH (field) (SU)	Sulfate, total (mg/L)	Total Dissolved Solids (mg/L)
APW05	Background	38.93396	-88.28098	07/28/2020	0.1	53	52	0.544	7.7	1.8	530
				02/09/2021	0.13	54	50	0.543	7.6	1.3	560
				11/10/2021	0.11	54	62	0.568	7.5	<1	510
APW06	Background	38.93375	-88.28628	07/28/2020	0.091	55	24	0.564	7.8	3.2	510
				02/09/2021	0.087	55	24	0.585	7.6	1.8	450
				11/10/2021	0.1	120	24	0.609	7.5	4.4	500
APW07	Compliance	38.92823	-88.29208	07/28/2020	0.086	94	77	0.412	7.3	6.7	530
				02/10/2021	0.11	110	69	0.372	7.0	6.3	540
				11/09/2021	0.089	97	66	0.46	7.4	11	600
APW08	Compliance	38.92315	-88.29229	07/28/2020	0.087	110	62	0.441	7.3	47	620
				10/28/2020	--	--	55	--	7.4	--	--
				02/10/2021	0.11	110	57	<0.25	7.2	42	550
				11/09/2021	0.085	100	52	0.505	7.4	42	620
APW09	Compliance	38.92232	-88.28159	07/28/2020	0.1	84	140	0.537	7.4	3.2	810
				02/11/2021	0.11	85	140	0.536	7.4	<10	840
				11/09/2021	0.12	730	110	0.402	6.7	1500	3200
APW10	Compliance	38.92744	-88.27313	07/28/2020	0.076	140	53	0.356	7.1	410	1000
				02/11/2021	0.082	150	45	0.362	7.4	410	1100
				06/30/2021	--	--	--	--	7.5	--	1000
				11/09/2021	0.08	150	43	0.377	7.4	410	1100

Notes:
mg/L = milligrams per liter
SU = 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 they are not utilized in statistics to determine Statistically Significant Increases (SSIs) over background
-- = not analyzed

TABLE 3
STATISTICAL BACKGROUND VALUES
2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
NEWTON POWER PLANT
501 - PRIMARY ASH POND
NEWTON, IL

Parameter	**Statistical Background Value (LPL/UPL)**
40 C.F.R. Part 257 Appendix III	
Boron (mg/L)	0.140
Calcium (mg/L)	66.5
Chloride (mg/L)	58.0
Fluoride (mg/L)	0.705
pH (field) (SU)	6.6/8.0
Sulfate (mg/L)	15.0
Total Dissolved Solids (mg/L)	1000

Notes:
40 C.F.R. = Title 40 of the Code of Federal Regulations
LPL = Lower Prediction Limit (applicable for pH only)
mg/L = milligrams per liter
SU = Standard Units
UPL = Upper Prediction Limit

FIGURES

BACKGROUND WELL
COMPLIANCE WELL
SOURCE SAMPLE LOCATION
PART 257 REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE

0 400 800
Feet

MONITORING WELL LOCATION MAP

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
PRIMARY ASH POND
NEWTON POWER PLANT
NEWTON, ILLINOIS

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\Mapping\Projects\22\22985\MXD\2021_AnnualGWM_CAR\Newton\PAP_501\Figure 1 NEW PAP MW Location Map.mxd

PROJECT: 169000XXXX | DATED: 12/30/2021 | DESIGNER: galammc

APPENDICES

APPENDIX A
ALTERNATE SOURCE DEMONSTRATIONS

Intended for
Illinois Power Generating Company

Date
April 13, 2021

Project No.
1940100711-012

40 C.F.R. § 257.94(e)(2): ALTERNATE SOURCE DEMONSTRATION

NEWTON PRIMARY ASH POND

RAMBOLL Bright ideas. Sustainable change.

CERTIFICATIONS

I, Nicole M. Pagano, a professional geologist in good standing in the State of Illinois, certify that the information in this report is accurate as of the date of my signature below. The content of this report is not to be used for other than its intended purpose and meaning, or for extrapolations beyond the interpretations contained herein.

Nicole M. Pagano
Professional Geologist
196-000750
Illinois
Ramboll Americas Engineering Solutions, Inc.
Date: April 13, 2021

I, Anne Frances Ackerman, a qualified professional engineer in good standing in the State of Illinois, certify that the information in this report is accurate as of the date of my signature below. The content of this report is not to be used for other than its intended purpose and meaning, or for extrapolations beyond the interpretations contained herein.

Anne Frances Ackerman
Qualified Professional Engineer
062-060586
Illinois
Ramboll Americas Engineering Solutions, Inc.
Date: April 13, 2021

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CONTENTS

TABLES (IN TEXT)

FIGURES (IN TEXT)

FIGURES (ATTACHED)

ACRONYMS AND ABBREVIATIONS

40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
bgs	below ground surface
CCR	Coal Combustion Residuals
cm/s	centimeters per second
CV	coefficient of variation
D7	Detection Monitoring Round 7
f/k/a	formerly known as
ft	foot/feet
IQR	interquartile range
LF2	Phase II Landfill
LOE	lines of evidence
M-K	Mann-Kendall
mg/L	milligrams per liter
NAVD88	North American Vertical Datum of 1988
NPDES	National Pollutant Discharge Elimination System
NRT/OBG	Natural Resource Technology, an OBG Company
PAP	Primary Ash Pond
Site	Newton Power Station
SSI	Statistically Significant Increase
UPL	Upper Prediction Limit

1. INTRODUCTION

Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257.94(e)(2) allows the owner or operator of a Coal Combustion Residuals (CCR) unit 90 days from the date of determination of a Statistically Significant Increase (SSI) over background for groundwater constituents listed in Appendix III of 40 C.F.R. Part 257 to complete a written demonstration that a source other than the CCR unit being monitored caused the SSI(s), or that the SSI(s) resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality (Alternate Source Demonstration [ASD]).

This ASD has been prepared on behalf of Illinois Power Generating Company, by Ramboll Americas Engineering Solutions, Inc, to provide pertinent information pursuant to 40 C.F.R. § 257.94(e)(2) for the Newton Primary Ash Pond (PAP) located near Newton, Illinois.

The most recent Detection Monitoring sampling event (Detection Monitoring Round 7 [D7]) was completed on July 28, 2020, and analytical data were received on October 15, 2020. Analytical data from D7 were evaluated in accordance with the Statistical Analysis Plan (Natural Resource Technology, an OBG Company [NRT/OBG] 2017a) to determine any SSIs of Appendix III parameters over background concentrations. That evaluation identified SSIs at downgradient monitoring wells as follows:

- Calcium at wells APW7, APW8, APW9, and APW10
- Chloride at APW7, APW8, and APW9
- Sulfate at wells APW8 and APW10

In accordance with the Statistical Analysis Plan, APW8 was resampled on October 28, 2020 and analyzed only for chloride to confirm the SSIs. Following evaluation of analytical data from the resample event, the following SSIs remained:

- Calcium at wells APW7, APW8, APW9, and APW10
- Chloride at APW7 and APW9
- Sulfate at wells APW8 and APW10

Pursuant to 40 C.F.R. § 257.94(e)(2), the following lines of evidence (LOEs) demonstrate that sources other than the Newton PAP were the cause of the calcium, chloride, and sulfate SSIs listed above. This ASD was completed by April 13, 2021, within 90 days of determination of the SSIs (January 13, 2021), as required by 40 C.F.R. § 257.94(e)(2).

2. BACKGROUND

2.1 Site Location and Description

The Newton Power Station (Site) is located in Jasper County in the southeastern part of central Illinois, approximately 7 miles southwest of the town of Newton. The plant is located on the north side of Newton Lake. The area is bounded by Newton Lake and agricultural land to the west, south, and east, and agricultural land to the north. Beyond the lake is additional agricultural land.

2.2 Description of Primary Ash Pond CCR Unit

The Newton Power Station's sole CCR surface impoundment, the PAP, was constructed in 1977 and has a design capacity of approximately 9,715 acre-feet. The PAP has a surface area of 400 acres and a height of approximately 71 feet (ft) above grade. The PAP currently receives bottom ash, fly ash, and low-volume wastewater from the plant's two coal-fired boilers, and is operated per National Pollutant Discharge Elimination System (NPDES) Permit IL0049191, Outfall 001. The PAP was not excavated during construction, except for native materials used to build the containment berms.

2.3 Geology and Hydrogeology

The information used to describe the hydrogeology is based on the local geology obtained from published sources, hydrogeologic investigation data, and boring data collected during monitoring well installation (NRT/OBG 2017b).

Quaternary deposits in the Newton area consist mainly of diamictons and outwash deposits that were deposited during Illinoian and Pre-Illinoian glaciations (Lineback 1979; Willman et al. 1975). The unconsolidated deposits occurring at Newton Power Station include the following units (beginning at the ground surface):

- Upper Confining Unit – Low permeability clays and silts, including the Peoria Silt (Loess Unit) in upland areas and the Cahokia Formation in the flood plain and channel areas to the south and east, underlain by the Sangamon Soil, and the predominantly clay diamictons of the Hagarstown (Till) and Vandalia (Till) Members of the Glasford Formation. The Hagarstown Member till has low hydraulic conductivities, ranging from 2.4×10^{-6} to 6.1×10^{-5} centimeters per second (cm/s) (NRT/OBG 2017b).
- Uppermost Aquifer – Thin to moderately thick (3 to 17 ft), moderate to high permeability sand, silty sand, and sandy silt/clay units of the Mulberry Grove Member of the Glasford Formation.
- Lower Confining Unit – Thick, very low permeability silty clay diamictons of the Smithboro (Till) Member of the Glasford Formation and the silty clay diamictons of the Banner Formation.

The bedrock beneath the unconsolidated deposits consists of Pennsylvanian-age Mattoon Formation (Willman et al. 1967) that is mostly shale near the bedrock surface but is characterized at depth by a complex sequence of shales, thin limestones, coals, underclays, and several sandstones (Willman et al. 1975). The erosional surface of the Pennsylvanian-age Mattoon Formation bedrock ranges widely in depth in the vicinity of the Site, but is typically encountered at 90 to 120 ft below ground surface (bgs).

Groundwater elevations (referenced to North American Vertical Datum of 1988 [NAVD88]) across the PAP ranged from approximately 492 to 530 ft during D7 (Figure 1). Depth to groundwater measurements used to generate the groundwater elevation contours shown on Figure 1 were collected on July 27, 2020. Groundwater flow in the Uppermost Aquifer beneath the eastern portion of PAP is generally to the south toward Newton Lake. The flow direction diverges to the southwest beneath the western portion of the PAP, toward Phase II Landfill (LF2), where groundwater flow in the area is converging along the major axis of LF2 Cells 1 and 2.

2.4 Groundwater and PAP Monitoring

The Uppermost Aquifer monitoring system for the PAP is shown on Figure 1. Monitoring wells APW5 and APW6 are used to monitor background water quality for the PAP. These wells are located north of the PAP. The downgradient monitoring wells are APW7, APW8, APW9, and APW10. Surface water samples from the PAP were collected from locations AP1 in the southwest corner of the PAP and AP2 in the southeast corner of the PAP.

3. ALTERNATE SOURCE DEMONSTRATION: LINES OF EVIDENCE

As allowed by 40 C.F.R. § 257.94(e)(2), this ASD demonstrates that sources other than the PAP (the CCR unit) caused the SSIs. LOEs supporting this ASD include the following:

1. The PAP is separated from the Uppermost Aquifer by a thick, low-permeability glacial till (Upper Confining Unit).
2. Concentrations of calcium and chloride in the PAP are lower than those observed in the groundwater.
3. Boron has concentrations in downgradient wells that are near or below concentrations observed in background monitoring wells.

These LOEs are described and supported in greater detail below.

3.1 LOE #1: The PAP Is Separated from the Uppermost Aquifer by a Thick, Low-Permeability Glacial Till (Upper Confining Unit)

Based on groundwater elevations and information on the boring logs for monitoring wells installed around the perimeter of the PAP, the top elevation of Uppermost Aquifer ranges from 461.8 ft NAVD88 in APW-8 to 482.8 ft NAVD88 in APW-10 and is overlain by the Upper Confining Unit, a low-permeability glacial till (Figure 2). The bottom elevation of the PAP is situated within the Upper Confining Unit at 508 ft NAVD88, approximately 25 ft above the highest point of the Uppermost Aquifer (Figure 2). Thus, the low-permeability Upper Confining Unit separates the PAP from the Uppermost Aquifer. The lack of hydraulic connection between the PAP and the Uppermost Aquifer demonstrates that there is no complete pathway for transport of CCR constituents to groundwater beneath the PAP, thus the PAP is not the source of CCR constituents in the Uppermost Aquifer.

3.2 LOE #2: Concentrations of Calcium and Chloride in the PAP Are Lower Than Those Observed in the Groundwater

Box plots graphically represent the range of a given dataset using lines to construct a box where the lower line, midline, and upper line of the box represent the values of the first quartile, median, and third quartile values, respectively. The minimum and maximum values of the dataset (excluding outliers) are illustrated by whisker lines extending beyond the first and third quartiles (*i.e.*, below and above) of the box plot. The interquartile range (IQR) is the distance between the first and third quartiles. Outliers (values that are at least 1.5 times the IQR away from the edges of the box) are represented by single points plotted outside of the range of the whiskers.

A box plot of calcium concentrations in downgradient monitoring wells and surface water samples is provided in Figure A. Calcium concentrations are lower in all PAP surface water samples (collected in November 2017, November 2019, February 2020, and August 2020) than in all downgradient groundwater samples collected between 2015 and 2020. The maximum concentration of calcium detected in PAP surface water (36 milligrams per liter [mg/L]) is lower than the minimum concentration of calcium in any downgradient well (38 mg/L at APW10).

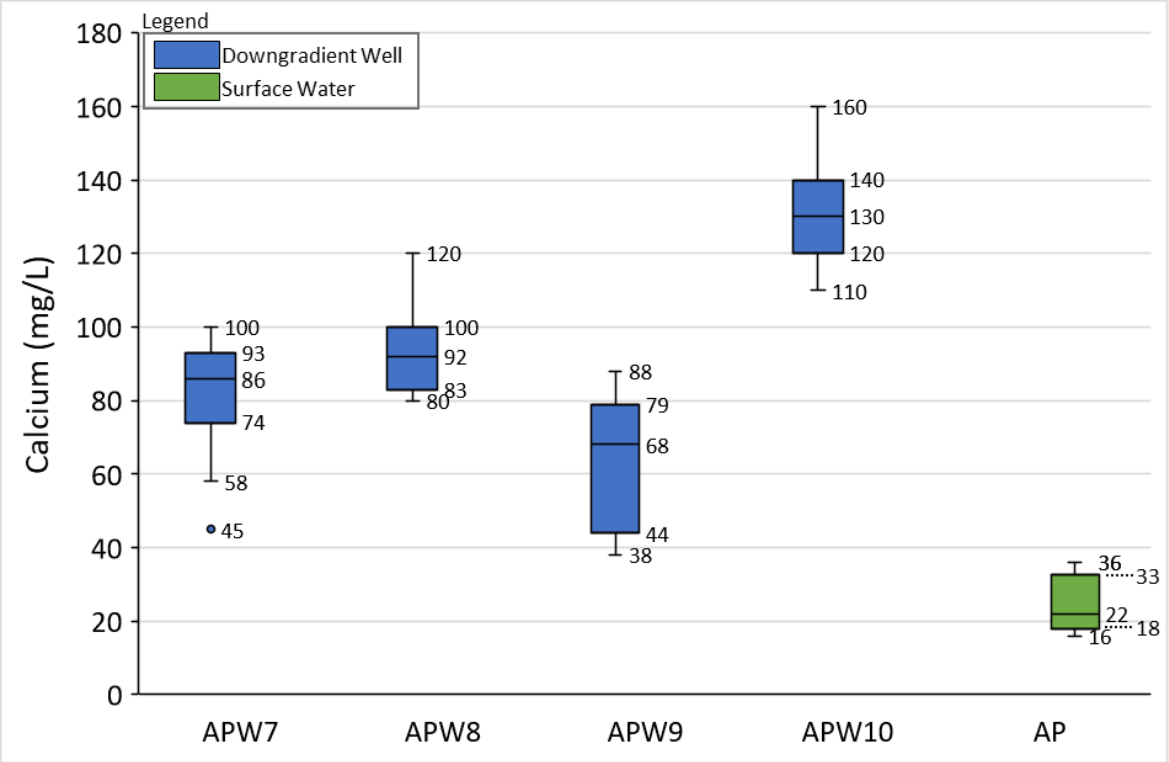


Figure A. Calcium Box Plot. The maximum, minimum, median, outlier, and IQR values are noted. AP includes data from both AP1 and AP2.

Similarly, chloride concentrations are lower in all PAP surface water samples (collected in November 2017, November 2019, February 2020, and August 2020) than in all downgradient groundwater samples collected between 2015 and 2020. A box plot of chloride concentrations is provided in Figure B. The maximum concentration of chloride detected in PAP surface water (18 mg/L) is lower than the minimum concentration of calcium in any downgradient well (43 mg/L at APW7).

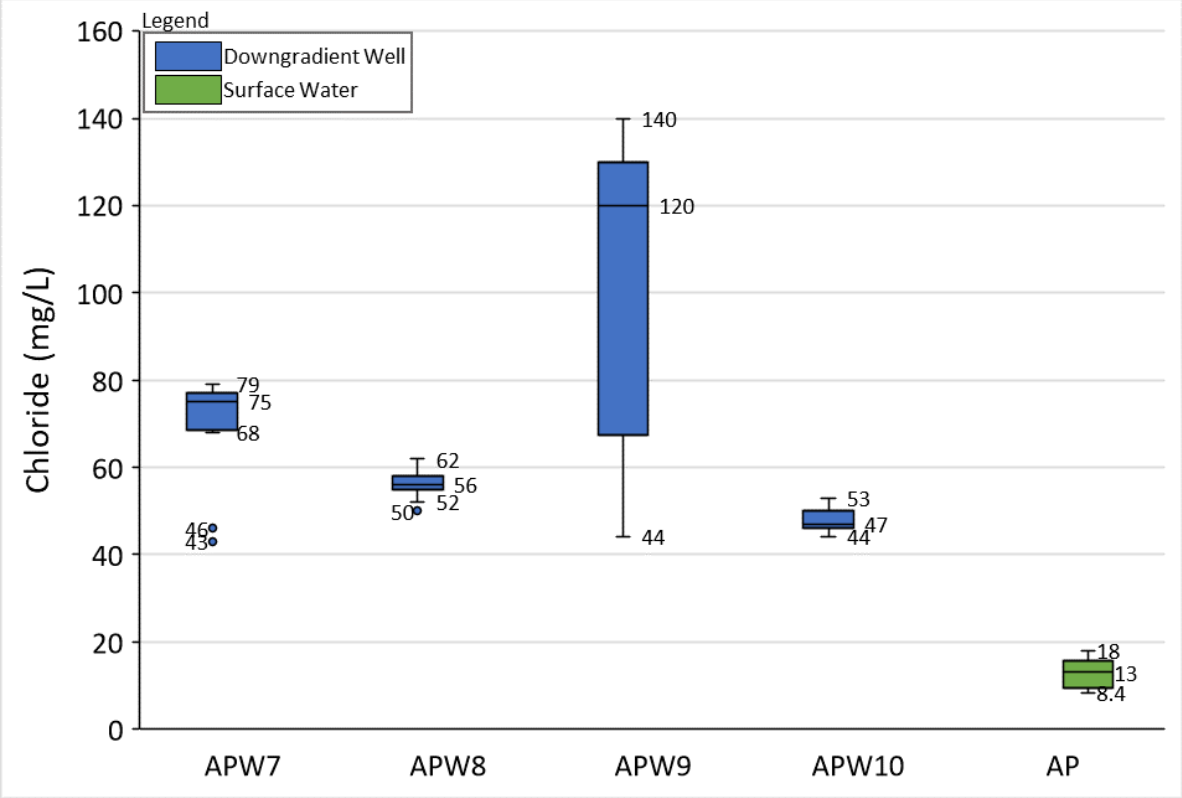


Figure B. Chloride Box Plot. The maximum, minimum, median, and outlier values are noted. AP includes data from both AP1 and AP2.

The concentrations of calcium and chloride in the PAP surface water are lower than those observed in the groundwater, indicating that the PAP is not the source of calcium and chloride to groundwater in the vicinity of the PAP. If the PAP were the source of calcium and chloride detected in groundwater, concentrations in PAP water would be higher than concentrations detected in groundwater.

3.3 LOE #3: Boron Has Concentrations in Downgradient Wells That Are Near or Below Concentrations Observed in Background Monitoring Wells

Boron is an indicator of CCR impacts to groundwater due to its leachability from CCR and mobility in groundwater. If the groundwater downgradient of the PAP had been impacted by discharge of CCR from the PAP, boron would be expected to be elevated above background concentrations. Concentrations of boron in all downgradient monitoring wells are near or below the boron concentrations in background monitoring wells. In addition, all downgradient monitoring well boron concentrations were below the Upper Prediction Limit (UPL) for boron (0.141 mg/L) (Figure C).

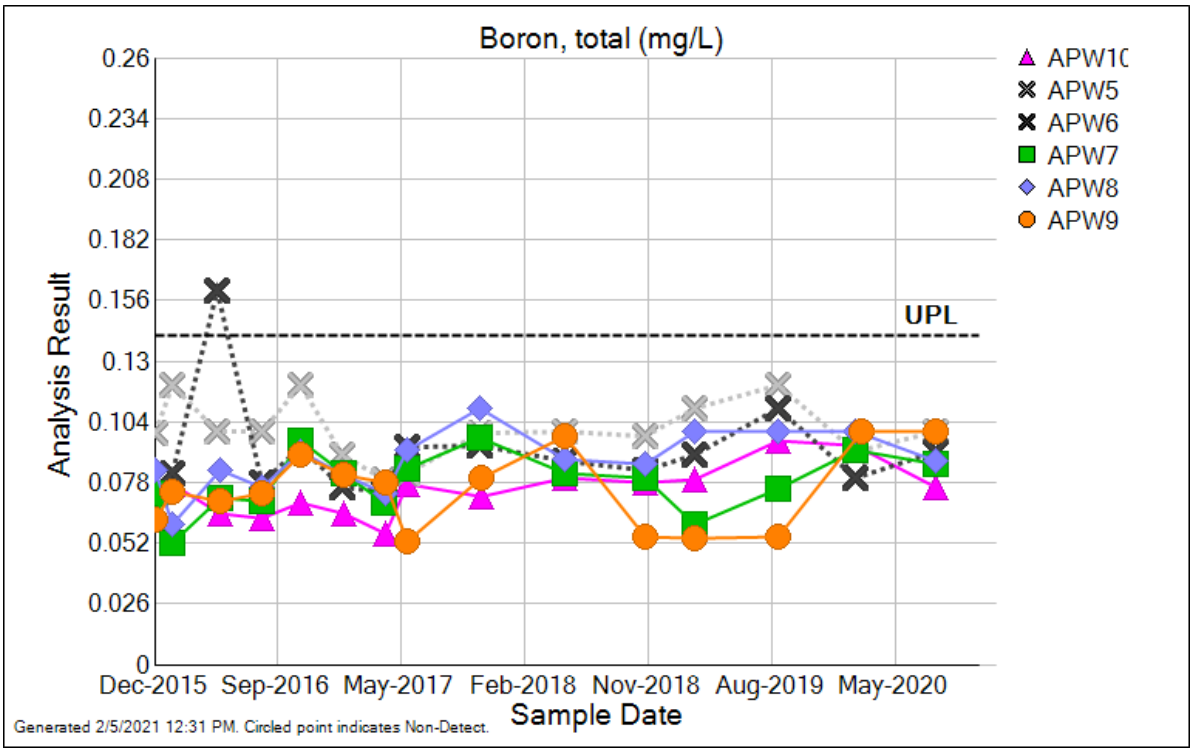


Figure C. Boron Time Series. The time series shows boron concentrations in downgradient wells are near or below concentrations in background wells (represented by gray and black "X"s).

Mann-Kendall (M-K) trend analysis tests were performed to determine the boron concentration trend in each well if there was a trend. If the M-K test identified a trend, the coefficient of variation (CV) was used to determine if the trend was of high or low magnitude. The CV is a measure of data spread calculated by dividing the standard deviation by the mean. CV values less than 1 indicate that the data are grouped closely around the mean and that is there is little variation in the data. Thus, a M-K analysis result of a trend with a CV less than 1 indicates that the data vary only slightly, and that the magnitude of the slope is low. No trends in boron concentrations were identified in background wells APW5 and APW6 and downgradient wells APW7 and APW9; upward trends were identified at APW8 and APW10. However, the CV values for upward trends in APW8 and APW10 are well below 1, indicating that there is little variation in the data and that the trends are low magnitude. Table A provides summary statistics, including the CV and trend per well.

Table A – Summary Statistics and Trend Analysis of Boron in Groundwater.

Monitoring Well	Boron (mg/L)					
	Minimum	Maximum	Median	Standard Deviation	Trend	CV
APW5	0.079	0.12	0.10	0.013	None	0.13
APW6	0.073	0.16	0.087	0.0214	None	0.24
APW7	0.052	0.097	0.080	0.0127	None	0.16
APW8	0.060	0.11	0.087	0.0125	Upward	0.14
APW9	0.053	0.10	0.074	0.0169	None	0.23
APW10	0.056	0.096	0.076	0.011	Upward	0.15

The low boron concentrations relative to background and generally stable boron concentrations in downgradient monitoring wells indicate that the PAP is not the source of the SSIs detected in groundwater.

4. CONCLUSIONS

Based on these three LOEs, it has been demonstrated that the SSIs at APW7, APW8, APW9, and APW10 are not due to the PAP but are from a source other than the CCR unit being monitored.

1. The PAP is separated from the Uppermost Aquifer by a thick, low-permeability glacial till.
2. Concentrations of calcium and chloride in the PAP are lower than those observed in the groundwater.
3. Boron has concentrations in downgradient wells that are below concentrations observed in background monitoring wells.

This information serves as the written ASD prepared in accordance with 40 CFR § 257.94(e)(2) that the SSIs observed during the D7 sampling event were not due to the PAP. Therefore, an assessment monitoring program is not required, and the PAP will remain in detection monitoring.

5. REFERENCES

Lineback, J., 1979, Quaternary Deposits of Illinois: Illinois State Geological Survey map, scale 1:500,000.

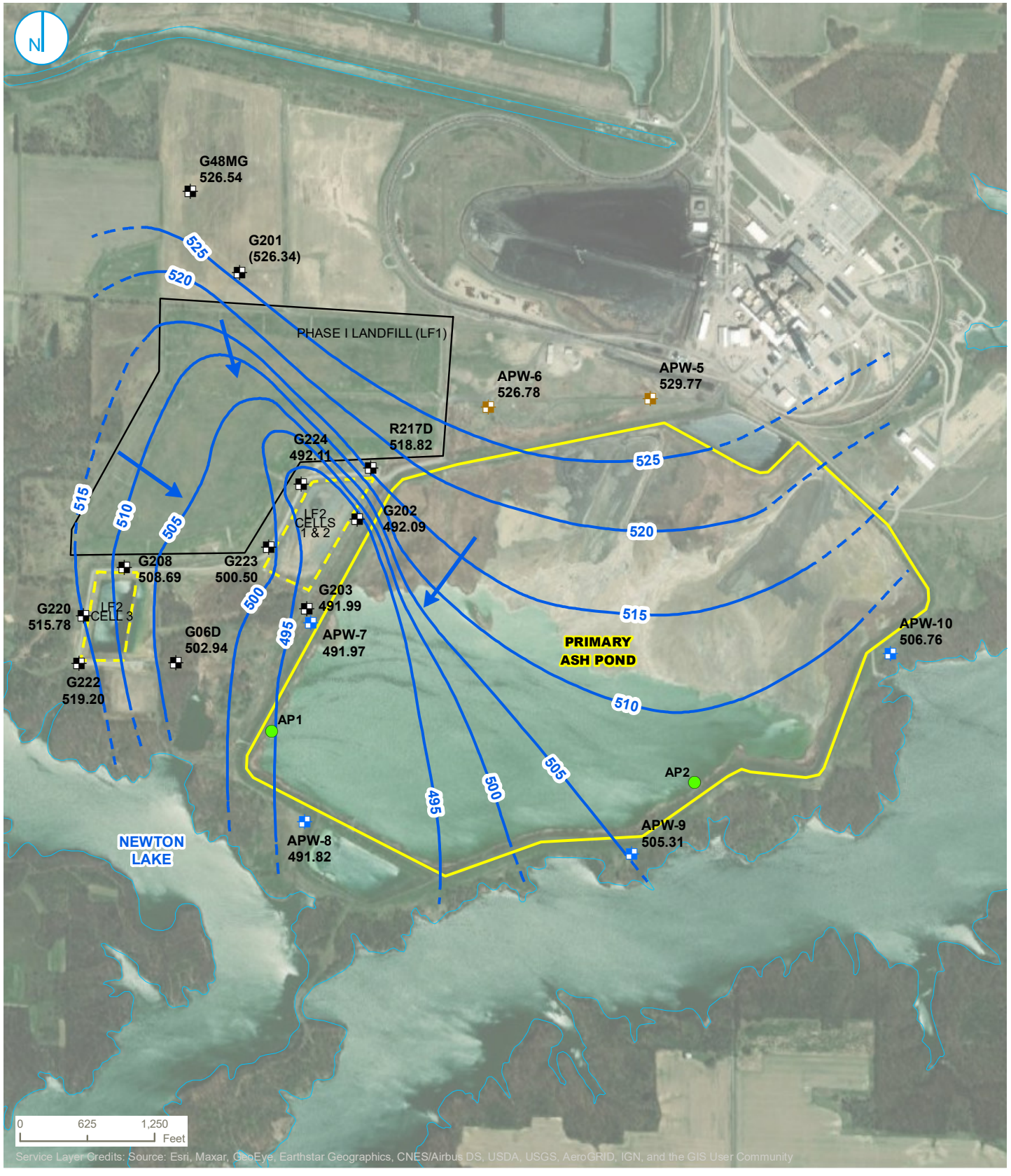
Natural Resource Technology, an OBG Company (NRT/OBG), 2017a, Statistical Analysis Plan, Coffeen Power Station, Newton Power Station, Illinois Power Generating Company, October 17, 2017.

Natural Resource Technology, an OBG Company (NRT/OBG), 2017b, Hydrogeologic Monitoring Plan, Newton Primary Ash Pond – CCR Unit ID 501, Newton Landfill 2 – CCR Unit ID 502, Newton Power Station, Canton, Illinois, Illinois Power Generating Company, October 17, 2017.

Willman, H.B., J.C. Frye, J.A. Simon, K.E. Clegg, D.H. Swann, E. Atherton, C. Collinson, J.A. Lineback, T.C. Buschbach, and H.B. Willman, 1967, Geologic Map of Illinois: Illinois State Geological Survey map, scale 1:500,000.

Willman, H.B., E. Atherton, T.C. Buschbach, C. Collinson, J.C. Frye, M.E. Hopkins, J.A. Lineback, and J.A. Simon, 1975, Handbook of Illinois Stratigraphy: Illinois State Geological Survey, Bulletin 95, 261 p.

FIGURES



Y:\Mapping\Projects\222285\MXD\Alt_Source_Dem\Newton\Figure 1_SampLoc and GWC PAP_D7.mxd

PROJECT: 169000XXX | DATED: 2/18/2021 | DESIGNER: STOLZSD

- PRIMARY ASH POND DOWNGRADIENT MONITORING WELL
- PRIMARY ASH POND UPGRADIENT MONITORING WELL
- LF2 CCR RULE MONITORING WELL
- SOURCE WATER LOCATION
- GROUNDWATER ELEVATION CONTOUR (5-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- SURFACE WATER FEATURE
- PRIMARY ASH POND CCR UNIT BOUNDARY
- LF2 CCR UNIT BOUNDARY
- LF1 UNIT BOUNDARY

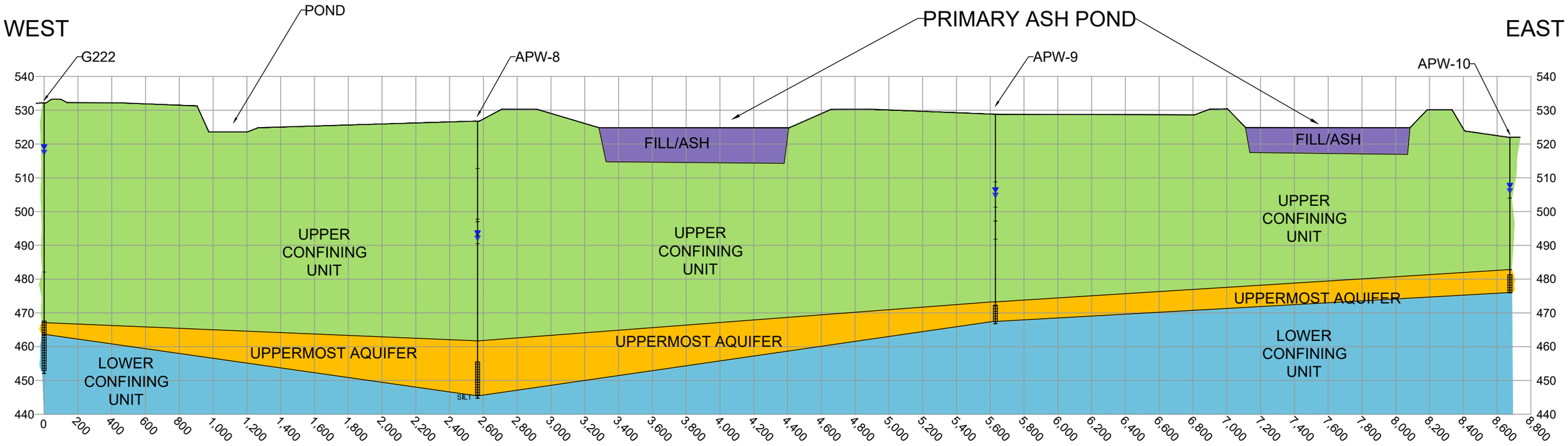
SAMPLING LOCATION AND GROUNDWATER ELEVATION CONTOUR MAP JULY 27, 2020

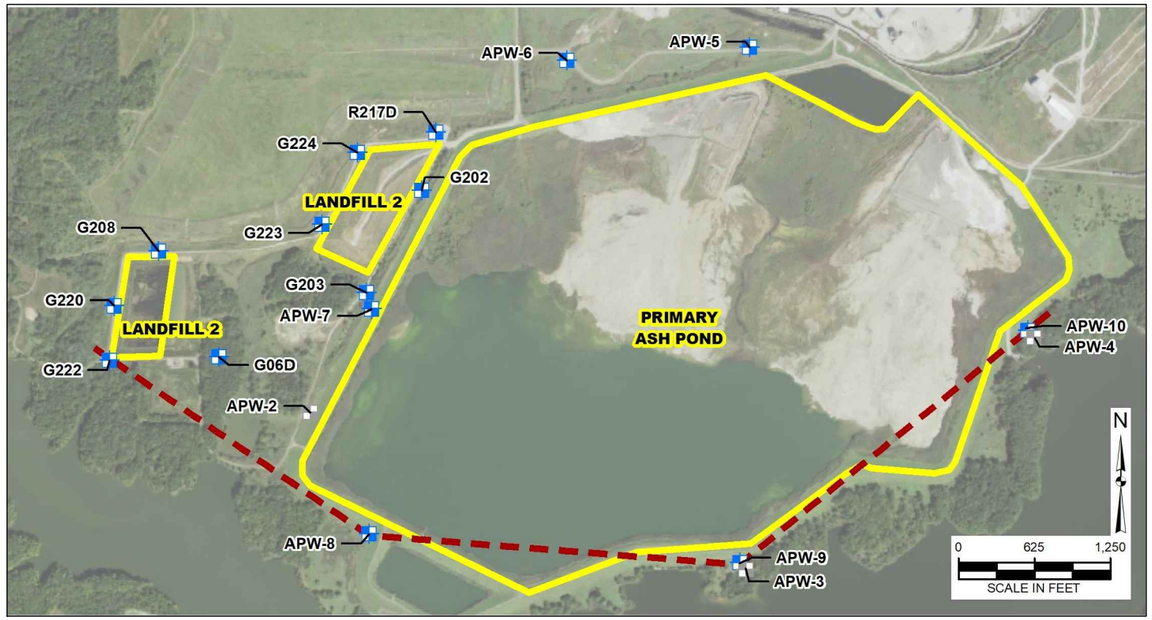
NEWTON PRIMARY ASH POND (UNIT ID: 501)
ALTERNATE SOURCE DEMONSTRATION
VISTRA ENERGY
NEWTON POWER STATION
NEWTON, ILLINOIS

FIGURE 1

RAMBOLL US CORPORATION
A RAMBOLL COMPANY

RAMBOLL





LEGEND

- FILL / ASH
- UPPER CONFINING UNIT
- UPPERMOST AQUIFER
- LOWER CONFINING UNIT
- WELL SCREEN
- GROUNDWATER ELEVATION

VERTICAL SCALE IN FEET: 30
HORIZONTAL SCALE IN FEET: 600
VERTICAL EXAGGERATION =20

GEOLOGIC CROSS SECTION

NEWTON PRIMARY ASH POND (UNIT ID: 501)
40 C.F.R § 257.94(e)(2): ALTERNATE SOURCE DEMONSTRATION
NEWTON POWER STATION
NEWTON, ILLINOIS

FIGURE 2

RAMBOLL US CORPORATION
A RAMBOLL COMPANY

RAMBOLL

Intended for
Illinois Power Generating Company

Date
October 11, 2021

Project No.
1940100711-012

40 C.F.R. § 257.94(e)(2): ALTERNATE SOURCE DEMONSTRATION

PRIMARY ASH POND

NEWTON POWER PLANT

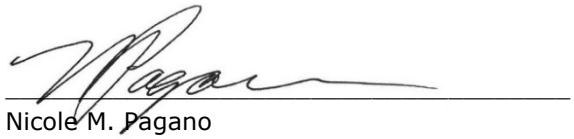
NEWTON, ILLINOIS

CCR UNIT 501

RAMBOLL Bright ideas. Sustainable change.

CERTIFICATIONS

I, Nicole M. Pagano, a professional geologist in good standing in the State of Illinois, certify that the information in this report is accurate as of the date of my signature below. The content of this report is not to be used other than for its intended purpose and meaning, or for extrapolations beyond the interpretations contained herein.



Nicole M. Pagano
Professional Geologist
196-000750
Illinois
Ramboll Americas Engineering Solutions, Inc.
Date: October 11, 2021

I, Anne Frances Ackerman, a qualified professional engineer in good standing in the State of Illinois, certify that the information in this report is accurate as of the date of my signature below. The content of this report is not to be used other than for its intended purpose and meaning, or for extrapolations beyond the interpretations contained herein.

Anne Frances Ackerman
Qualified Professional Engineer
062-060586
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Ramboll Americas Engineering Solutions, Inc.
Date: October 11, 2021

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CONTENTS

FIGURES (IN TEXT)

FIGURES (ATTACHED)

APPENDICES

ACRONYMS AND ABBREVIATIONS

40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
bgs	below ground surface
CCR	Coal Combustion Residuals
CCR Rule	40 C.F.R. § 257 Subpart D
cm/s	centimeters per second
D8	Detection Monitoring Round 8
LCU	lower confining unit
LF2	Phase II Landfill
LOE	lines of evidence
NAVD88	North American Vertical Datum of 1988
NPDES	National Pollutant Discharge Elimination System
NPP	Newton Power Plant
NRT/OBG	Natural Resource Technology, an OBG Company
NGVD29	National Geodetic Vertical Datum of 1929
PAP	Primary Ash Pond
Rapps	Rapps Engineering and Applied Science
SSI	Statistically Significant Increase
TDS	total dissolved solids
UA	uppermost aquifer
UCU	upper confining unit
UPL	Upper Prediction Limit

1. INTRODUCTION

Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257.94(e)(2) allows the owner or operator of a Coal Combustion Residuals (CCR) unit 90 days from the date of determination of a Statistically Significant Increase (SSI) over background for groundwater constituents listed in Appendix III of 40 C.F.R. § 257 to complete a written demonstration that a source other than the CCR unit being monitored caused the SSI(s), or that the SSI(s) resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality (Alternate Source Demonstration [ASD]).

This ASD has been prepared on behalf of Illinois Power Generating Company, by Ramboll Americas Engineering Solutions, Inc, to provide pertinent information pursuant to 40 C.F.R. § 257.94(e)(2) for the Newton Power Plant (NPP) Primary Ash Pond (PAP) located near Newton, Illinois.

The most recent Detection Monitoring sampling event (Detection Monitoring Round 8 [D8]) was completed on February 11, 2021, and analytical data were received on April 14, 2021. In accordance with 40 C.F.R. § 257.93(h)(2), statistical analysis of the data to identify SSIs of 40 C.F.R. § 257 Subpart D (CCR Rule) Appendix III parameters over background concentrations was completed by July 13, 2021, within 90 days of receipt of the analytical data. The statistical determination identified the following SSIs at compliance monitoring wells:

- Calcium at wells APW7, APW8, APW9, and APW10
- Chloride at APW7, and APW9
- Sulfate at wells APW8 and APW10
- Total dissolved solids (TDS) at APW10

In accordance with the Statistical Analysis Plan (Natural Resource Technology, an OBG Company [NRT/OBG] 2017a), APW10 was resampled on June 30, 2021 and analyzed only for TDS to confirm the SSI. Following evaluation of analytical data from the resample event, the following SSIs remained:

- Calcium at wells APW7, APW8, APW9, and APW10
- Chloride at APW7 and APW9
- Sulfate at wells APW8 and APW10

Pursuant to 40 C.F.R. § 257.94(e)(2), the following lines of evidence (LOE) demonstrate that sources other than the PAP were the cause of the calcium, chloride, and sulfate SSIs listed above. This ASD was completed by October 11, 2021, within 90 days of determination of the SSIs (July 13, 2021), as required by 40 C.F.R. § 257.94(e)(2).

2. BACKGROUND

2.1 Site Location and Description

The NPP is located in Jasper County in the southeastern part of central Illinois, approximately 7 miles southwest of the town of Newton. The plant is located on the north side of Newton Lake. The area is bounded by Newton Lake and agricultural land to the west, south, and east, and agricultural land to the north. Beyond the lake is additional agricultural land.

2.2 Description of Primary Ash Pond CCR Unit

The NPP's sole CCR surface impoundment, the PAP, was constructed in 1977 and has a design capacity of approximately 9,715 acre-feet. The PAP has a surface area of 400 acres and a height of approximately 71 feet above grade. The PAP currently receives bottom ash, fly ash, and low-volume wastewater from the plant's two coal-fired boilers, and is operated per National Pollutant Discharge Elimination System (NPDES) Permit IL0049191, Outfall 001. The PAP was not excavated during construction, except for native materials used to build the containment berms.

2.3 Geology and Hydrogeology

The information used to describe the hydrogeology is based on the local geology obtained from published sources, hydrogeologic investigation data, and boring data collected during site investigations conducted from 1997 to 2021.

Quaternary deposits in the Newton area consist mainly of diamictons and outwash deposits that were deposited during Illinoian and Pre-Illinoian glaciations (Lineback, 1979; Willman et al., 1975). The unconsolidated deposits include the following units (beginning at the ground surface):

- **Upper Drift:** The upper drift is composed of the low permeability silts and clays of the Peoria Silt and Sangamon Soil and the sandier soils of the Hagarstown Member. The hydraulic conductivity of this unit, calculated from field hydraulic test data from monitoring wells screened between 8 and 36 feet below ground surface (bgs), was observed to range from 2.4×10^{-6} to 6.1×10^{-5} centimeters per second (cm/s) with a geometric mean of 1.3×10^{-5} cm/s (Rapps Engineering and Applied Science [Rapps], 1997).
- **Upper Confining Unit (UCU):** The UCU consists of a thick package of the low permeability clay and silt of the Vandalia Till Member. This unit is a laterally continuous layer between the base of the upper drift and the top of the uppermost aquifer (UA). The hydraulic conductivity of this unit was observed to range from 6.3×10^{-9} to 2.1×10^{-8} cm/s with a geometric mean of 1.1×10^{-8} cm/s (Rapps, 1997).
- **Uppermost Aquifer (UA):** The UA is composed of the Mulberry Grove Member, which has been classified as poorly graded sand, silty sand, clayey sand, and gravel. Results of field hydraulic tests in monitoring wells screened in the UA ranged from 1.54×10^{-4} to 3.4×10^{-3} cm/s with a geometric mean hydraulic conductivity of 1.2×10^{-3} cm/s (NRT/OBG, 2017b).
- **Lower Confining Unit (LCU):** The LCU is comprised of low permeability silt and clay of the Smithboro Till Member and the Banner Formation. The hydraulic conductivity of this unit was observed to be 1.4×10^{-7} cm/s (Rapps, 1997).

The bedrock beneath the unconsolidated deposits consists of Pennsylvanian-age Mattoon Formation (Willman et al., 1967) that is mostly shale near the bedrock surface but is

characterized at depth by a complex sequence of shales, thin limestones, coals, underclays, and several sandstones (Willman et al., 1975). The erosional surface of the Pennsylvanian-age Mattoon Formation bedrock ranges widely in depth in the vicinity of the NPP, but is typically encountered at 90 to 120 feet bgs.

Groundwater elevations (referenced to North American Vertical Datum of 1988 [NAVD88]) across the PAP ranged from approximately 492 to 530 feet during D8 (Figure 1). Depth to groundwater measurements used to generate the groundwater elevation contours shown on Figure 1 were collected on February 4, 2021. Groundwater flow in the UA beneath the eastern portion of the PAP is generally to the south toward Newton Lake. The flow direction diverges to the southwest beneath the western portion of the PAP, toward Phase II Landfill (LF2), where groundwater flow in the area is converging along the major axis of LF2 Cells 1 and 2.

2.4 Groundwater and PAP Monitoring

The UA monitoring system for the PAP is shown on Figure 1. Monitoring wells APW5 and APW6, located north of the PAP, are used to monitor background water quality. The compliance wells are APW7, APW8, APW9, and APW10. Porewater samples from the PAP were collected from locations XPW01 and XPW02 on the northern side of the PAP, and from XPW03 and XPW04 on the northeastern side of the PAP.

3. ALTERNATE SOURCE DEMONSTRATION: LINES OF EVIDENCE

As allowed by 40 C.F.R. § 257.94(e)(2), this ASD demonstrates that sources other than the PAP (the CCR unit) caused the SSIs. LOEs supporting this ASD include the following:

1. The PAP is separated from the UA by a thick layer of low-permeability glacial till (UCU).
2. The ionic composition of groundwater is different than the ionic composition of porewater.
3. Downgradient concentrations of boron do not exceed background limits.

These LOEs are described and supported in greater detail below.

3.1 LOE #1: The PAP Is Separated from the UA by a Thick Layer of Low-Permeability Glacial Till (UCU)

Based on groundwater elevations and information on the boring logs for monitoring wells installed around the perimeter of the PAP, the top elevation of the UA ranges from 461.8 feet NAVD88 in APW-8 to 482.8 feet NAVD88 in APW-10 (Figure 2). It is overlain by the UCU, a low-permeability (6.3×10^{-9} to 2.1×10^{-8} cm/s) glacial till. The bottom elevation of the PAP is situated within the UCU, generally consistent with ground surface topography at the time the PAP was constructed (Figure 3). PAP construction drawing S-69 (Appendix A) indicates the former surface drainage feature within the footprint of the PAP was filled to elevation 508 feet National Geodetic Vertical Datum of 1929 (NGVD29) during construction of the PAP. The lowest bottom elevation of the PAP is located at its southern boundary at the low point of this former drainage feature. PAP bottom elevations in this area were observed in soil borings to be at approximately 486 feet NAVD88. The top of the UA in the closest monitoring well to the location of these soil borings (APW9) was observed to be 473.1 feet NAVD88, and is estimated to be 472 to 473 feet NAVD88 in the location of the soil borings. Thus, the UA is separated from the bottom of the PAP by approximately 14 feet of the low-permeability glacial till that comprises the UCU. Based upon these observations, there is no complete pathway for transport of CCR constituents to groundwater beneath the PAP, thus the PAP is not the source of CCR constituents in the UA.

3.2 LOE #2: The Ionic Composition of Groundwater is Different Than the Ionic Composition of Porewater

Piper diagrams graphically represent ionic composition of aqueous solutions. A Piper diagram displays the position of water samples with respect to their major cation and anion content on the two lower triangular portions of the diagram, providing the information which, when combined on the central, diamond-shaped portion of the diagram, identify composition categories or groupings (hydrochemical facies). Figure A, below, is a Piper diagram that displays the ionic composition of samples collected from the background and compliance wells associated with the PAP (D8 sampling event), and porewater sampling locations XPW01, XPW02, XPW03, and XPW04 associated with the PAP (sampled February 17, 2021).

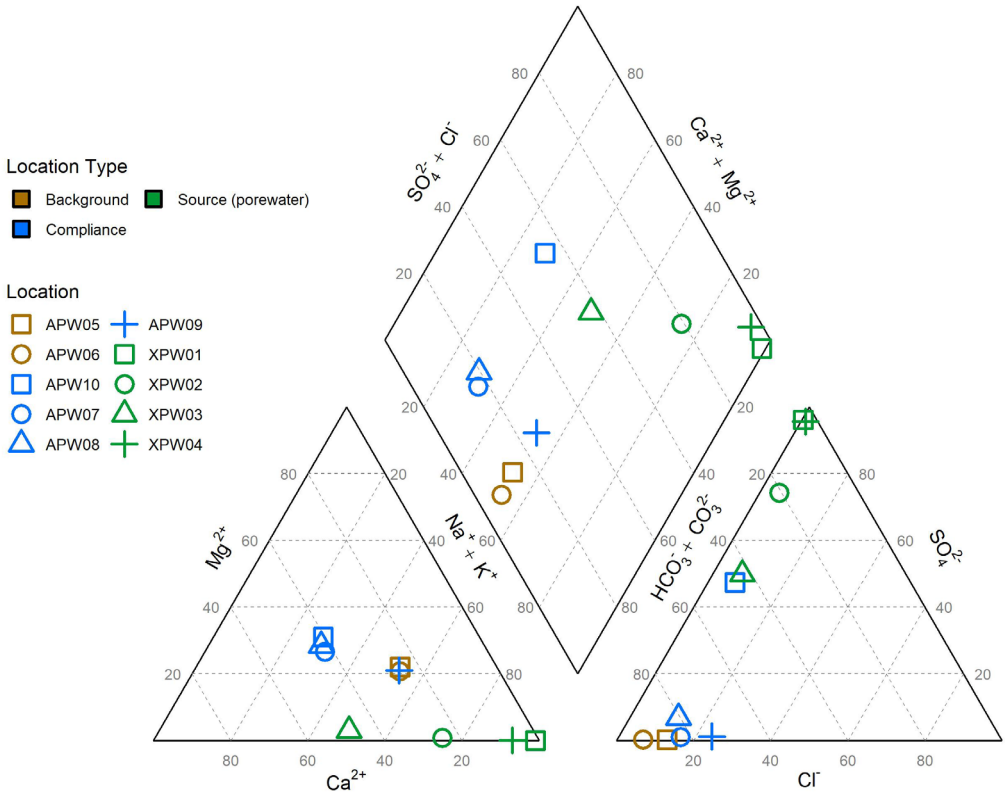

Figure A. Piper Diagram. Shows Ionic Composition of Samples of Groundwater during the D8 Sampling Event and Porewater Associated with the PAP (Collected February 17, 2021).

It is evident from the piper diagram (Figure A) that porewater from the PAP (green symbols) is primarily in the sodium-chloride hydrochemical facies, while the PAP groundwater samples (blue symbols) and background samples (brown symbols) are predominantly in the calcium-bicarbonate and calcium-sulfate hydrochemical facies. Therefore, compliance groundwater samples associated with the PAP have a different ionic composition than porewater, indicating that PAP porewater is not the source of CCR constituents detected in any PAP groundwater monitoring wells.

3.3 LOE #3: Downgradient Concentrations of Boron Do Not Exceed Background Limits

Boron is an indicator of CCR impacts to groundwater due to its leachability from CCR and mobility in groundwater. If the groundwater in PAP compliance wells had been impacted by CCR from the unit, boron concentrations would be expected to be elevated above the background Upper Prediction Limit (UPL). The UPL is an upper bound on background concentrations calculated for the purpose of comparing compliance measurements to background. Compliance monitoring wells with SSIs had concentrations of boron below the UPL (0.14 milligrams per liter).

4. CONCLUSIONS

Based on these three LOEs, it has been demonstrated that the SSIs at APW7, APW8, APW9, and APW10 are not due to the PAP but are from a source other than the CCR unit being monitored.

1. The PAP is separated from the UA by a thick, low-permeability glacial till (UCU).
2. The ionic composition of groundwater is different than the ionic composition of porewater.
3. Downgradient concentrations of boron do not exceed background limits.

This information serves as the written ASD prepared in accordance with 40 CFR § 257.94(e)(2) that the SSIs observed during the D8 sampling event were not due to the PAP. Therefore, an assessment monitoring program is not required, and the PAP will remain in detection monitoring.

5. REFERENCES

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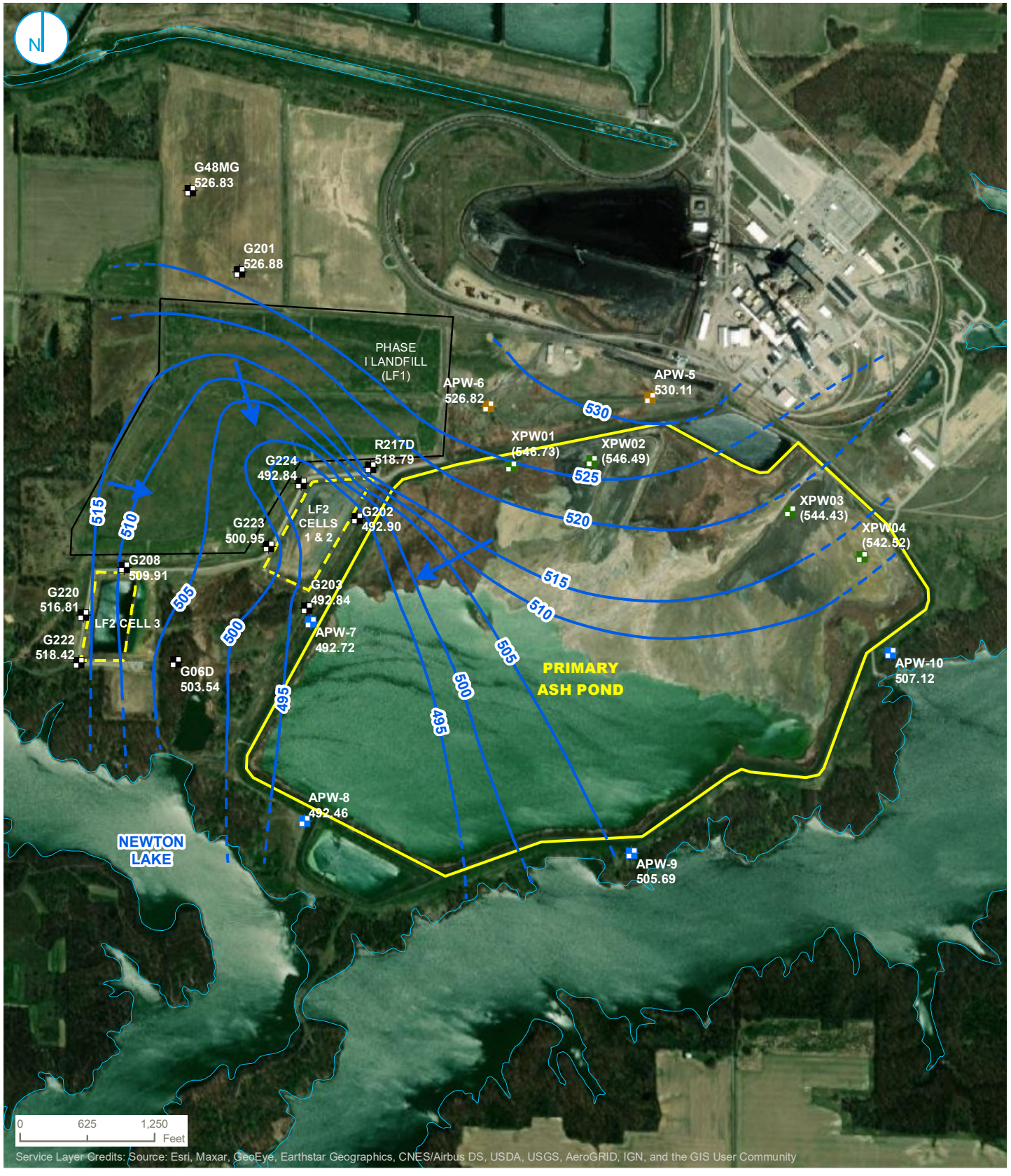
FIGURES



Y:\Mapping\Projects\22\22885\MXD\Alt_Source_Dem\Newton\Figure 1_SampLoc and GWC PAP_D8.mxd

PROJECT: 169000XXXX | DATED: 10/11/2021 | DESIGNER: STOLZSD

- PRIMARY ASH POND DOWNGRADIENT MONITORING WELL
- PRIMARY ASH POND UPGRADIENT MONITORING WELL
- LF2 CCR RULE MONITORING WELL
- SOURCE SAMPLE LOCATION
- GROUNDWATER ELEVATION CONTOUR (5-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- SURFACE WATER FEATURE
- PRIMARY ASH POND CCR UNIT BOUNDARY
- LF2 CCR UNIT BOUNDARY
- LF1 UNIT BOUNDARY

SAMPLING LOCATION AND GROUNDWATER ELEVATION CONTOUR MAP FEBRUARY 4, 2021

NEWTON PRIMARY ASH POND (UNIT ID: 501)
ALTERNATE SOURCE DEMONSTRATION
NEWTON POWER PLANT
NEWTON, ILLINOIS

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

MONITORING WELL

UPPERMOST AQUIFER ELEVATION (2-FOOT INTERVAL)

PART 845 REGULATED UNIT FACILITY BOUNDARY

OTHER UNIT

PROPERTY BOUNDARY

NOTES:
* = NOT USED FOR CONTOURING
ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

TOP OF AQUIFER CONTOURS GENERATED IN 2018 (HALEY & ALDRICH, INC., 2018) FOR 40 C.F.R. § 257; CONTOURS HAVE NOT BEEN MODIFIED USING BORING DATA COLLECTED IN 2021, ALTHOUGH THE SEPARATION DISTANCE BETWEEN THE TOP OF UPPERMOST AQUIFER AND BOTTOM OF ASH IS CONSISTENT.

0 400 800
Feet

TOP OF UPPERMOST AQUIFER

NEWTON PRIMARY ASH POND (UNIT ID: 501) ALTERNATE SOURCE DEMONSTRATION

NEWTON POWER PLANT
NEWTON, ILLINOIS

FIGURE 2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\Mapping\Projects\222285\MXD\AltSource_Dem\Newton\Figure 2_NEW PAP_Top of Uppermost Aquifer.mxd
PROJECT: 169000XXXX | DATED: 10/6/2021 | DESIGNER: STOLZSD

SOIL BORING AND BOTTOM OF ASH ELEVATION

10 FOOT HISTORIC ELEVATION CONTOUR

2 FOOT HISTORIC ELEVATION CONTOUR

CONSTRUCTION DRAWING S-69 INDICATES DRAINAGE FEATURE WAS TO BE FILLED TO MAX ELEVATION 508 PRIOR TO OPERATION OF THE UNIT.

PART 845 REGULATED UNIT FACILITY BOUNDARY

OTHER UNIT

PROPERTY BOUNDARY

NOTES

1. CONTOUR LINES ARE A HISTORIC LAND SURFACE. THIS SURFACE IS BEING FURTHER EVALUATED AS THE CONSTRUCTION PERMIT IS BEING DEVELOPED.

0 400 800
Feet

BOTTOM OF ASH MAP

NEWTON PRIMARY ASH POND (UNIT ID: 501) ALTERNATE SOURCE DEMONSTRATION

NEWTON POWER PLANT
NEWTON, ILLINOIS

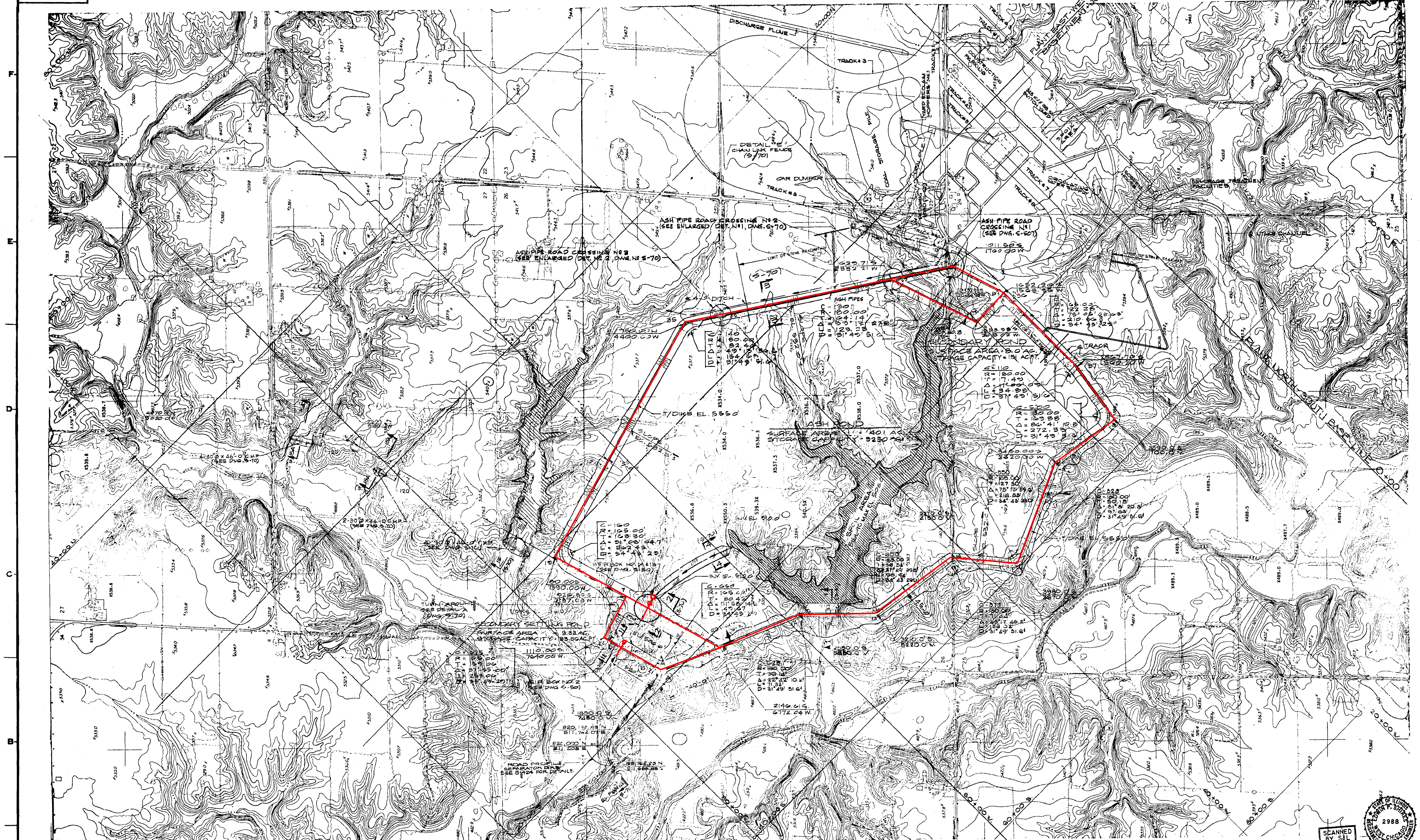
FIGURE 3

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

APPENDIX A
PRIMARY ASH POND CONSTRUCTION DRAWING S-69

69-S



POINT No.	SIDE	CURVE No.	R	T	Δ	L	D
8	ASH POND		100'	52.87'	49°43' 13.6"	86.78	57°17' 45.60"
8	SECONDARY ASH POND		65'	140.29'	130°16' 46.4"	147.80	88°08' 51.69"
21	LAKESIDE (A)		165'	49.55	33°25' 06.4"	96.27	34°43' 29.00"
21	LAKESIDE (B)		65'	70.49'	94°36' 00.0"	107.32	88°08' 51.69"
36	ASH POND (A)		57.5'	57.50	90°00' 00.0"	90.27	99°38' 41.53"
36	SECONDARY (B) POND		57.5	77.59	106°54' 52.35"	107.24	99°38' 41.53"
39	SECONDARY POND		57.5	161.37	140°46' 29.17"	141.21	99°58' 41.53"

NORTH
PLANT NORTH

NOTES

7. THE WATER LEVEL IN ASH POND SHALL BE MAINTAINED AT AN ELEVATION 10'-0" ABOVE THE SEDIMENT LEVEL FOR ENVIRONMENTAL PURPOSES.

NOTES

1. FOR GENERAL NOTES SEE DWG. S-14.
2. ALL WORK SHOWN IN THIS DRAWING SHALL BE DONE BY SUPERSTRUCTURE CONTRACTOR IN ACCORDANCE WITH JOB SPEC. A-3022.
3. ALL EXTERIOR SIDE SLOPES OF DIKE BELOW ELEV. 510.0' THAT IS TO BE CONSTRUCTED BEFORE LAKE FILLING. SHALL BE PROVIDED WITH 24" STONE RIPRAP ON 24" SAND AND GRAVEL FILTER BEDDING AS SHOWN ON DWG. S-70. AND ALL DIKE CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH JOB SPEC. A-3017 AND A-3022.
4. ALL DIKE TOPS AND SIDE SLOPES AND ALL EXTERNAL DITCHES SHALL BE PROVIDED WITH 4" TOPSOIL AND SEEDED IN ACCORDANCE WITH JOB SPEC. A-3017 AND A-3022.
5. EXISTING LOW AREAS SHALL BE FILLED WITH SPOILMATERIAL AS REQUIRED FOR SPOIL DISPOSAL SPOILS SHALL BE PLACED IN LAYERS AND GRADED PROPERLY FOR DRAINAGE.
6. REMOVED "HOLD" FROM SO_2 POND AREAS FOR CLEARING. SLOPE STAKING & CROSS- SECTIONING ONLY.

REFERENCE DRAWINGS

S-19	SITE CONTOURS AND DEVELOPMENT PLAN SHEET 4.
S-39	GRADING AND DRAINAGE PLAN, PLANT AREA SHEET 2.
S-40	GRADING AND DRAINAGE PLAN, PLANT AREA SHEET 3.
S-50	WEIR BOX STRUCTURES AT PRIMARY AND SECONDARY SETTLING PONDS.
S-70	ASH POND DIKE PROFILE DETAILS & SECTION
S-507	GRADING & DRAINAGE PLAN- PLANT AREA- SHT7.

Drawing Release Record

Rev	Date	Init	Description
N	07-29-94	TM	SCANNED BY S&L
A	11-29-74	CRB	[illegible]
B	2-10-75	[illegible]	REMOVED SO_2 [illegible]
C			HOLD [illegible]
D	7-15-75	[illegible]	[illegible]
E	12-21-75	CRB	REMOVED HOLD OF SO_2 [illegible]
F	7-12-76	CRB	[illegible]
G	9-13-76	CRB	ADD WEIR BOXES & REMOVE HOLD ON
	—	—	WEIR BOX [illegible]
	—	—	REV. ROAD [illegible]
H	1-24-77	CRB	ADD. SEC. 15-15
J	10-21-77	SPL	SHOWN LIMIT OF STONE RIPRAP
K	11-8-79	[illegible]	REV. STORAGE CAPACITIES CORRESPONDING TO T/DIKE [illegible]
L	7-8-80	[illegible]	REC. REVISION
M	2-2?-8?	[illegible]	SENT TO CLIENT

ASH POND & SO_2 DISPOSAL POND
NEWTON POWER STATION UNIT 1
CENTRAL ILL PUBLIC SERVICE CO.
NEWTON, ILLINOIS

SCALE 1" = 400'-0" & U.N.
DRAWN B. SANCHEZ 8-6-74
CHECKED C. R. Bhattacharya 8-6-74
ENGINEER A. J. Skale 8-6-74
APPROVED [illegible]
JOB NO. 4486 05 4486 15

SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO. S-69