Prepared for
Wisconsin Public Service Corporation

Date
January 31, 2024

Project No.
1940102327

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

WESTON UNITS 3 & 4 BOTTOM ASH BASINS

RAMBOLL Bright ideas. Sustainable change.

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
WESTON UNITS 3 & 4 BOTTOM ASH BASINS

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Prepared by	**Kyle J. Schaefer**
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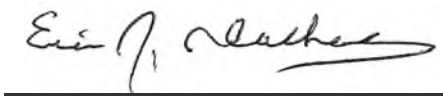

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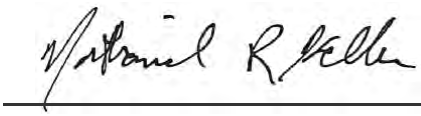

Nathaniel R. Keller, PG
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ACRONYMS AND ABBREVIATIONS

§	Section
40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
CCR	Coal Combustion Residuals
GWPS	Groundwater Protection Standard
NA	not applicable
NRT/OBG	Natural Resource Technology, an OBG Company
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SAP	Sampling and Analysis Plan
SSI	Statistically Significant Increase
TBD	to be determined
Weston	Weston Generating Station

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 Weston Generating Station (Weston) Units 3 & 4 Bottom Ash Basins (BABs) located in Rothschild, Wisconsin.

Groundwater is being monitored at Weston Units 3 & 4 BABs 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 2023 (no wells were installed or decommissioned).

In 2023, groundwater analytical data was evaluated for statistically significant increases (SSIs) over background concentrations for 40 C.F.R. § 257 Appendix III constituents in groundwater monitoring wells at the Weston Units 3 & 4 BABs. The following constituents and wells had SSIs detected in 2023:

- Calcium (Ca) – OW-45, OW-50
- pH – OW-50
- Sulfate (SO_4) – OW-50

Alternate Source Demonstrations (ASDs) prepared in 2023 or in prior years provide justification that the SSIs observed during the Detection Monitoring Program were not due to a release from the Weston Units 3 & 4 BABs but were likely due to naturally occurring conditions (*e.g.,* natural variation in groundwater quality).

The Weston Units 3 & 4 BABs remain in the Detection Monitoring Program in accordance with 40 C.F.R. § 257.94.

1. INTRODUCTION

This report has been prepared by Ramboll Americas Engineering Solutions, Inc. (Ramboll) on behalf of Wisconsin Public Service Corporation, to provide the information required by 40 C.F.R. § 257.90(e) for the Weston Units 3 & 4 BABs located in Rothschild, Wisconsin.

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 (**Section 2**), summarizes key actions completed (**Section 3**), describes any problems encountered, discusses actions to resolve the problems (**Section 4**), and projects key activities for the upcoming year (**Section 5**). 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 (**Figure 1**).
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 (**Section 3**).
3. In addition to all the monitoring data obtained under §§ 257.90 through 257.98 (**Tables 1 and 2**), 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 (**Section 3 and Table A**).
4. A narrative discussion of any transition between monitoring programs (*e.g.*, the date and circumstances for transitioning from Detection Monitoring to Assessment Monitoring (**Section 2**) in addition to identifying the constituent(s) detected at an SSI relative to background levels) (**Table A**).
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 (**Executive Summary**). 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 an 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 such an increase.

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 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 such an increase.

B. Provide the date when the assessment of corrective measures was initiated for the CCR unit.

C. Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit.

D. Provide the date when the assessment of corrective measures 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 Weston Units 3 & 4 BABs for calendar year 2023.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

No changes have occurred to the monitoring program status in calendar year 2023 the Weston Units 3 & 4 Bottom Ash Basins remain in the Detection Monitoring Program in accordance with 40 C.F.R. § 257.94.

3. KEY ACTIONS COMPLETED IN 2023

The Detection Monitoring Program is summarized in **Table A** on the following page. The groundwater monitoring system, including the CCR unit and all background (upgradient) and downgradient monitoring wells, is presented in **Figure 1**. No changes were made to the monitoring system in 2023. 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; Natural Resource Technology, an OBG Company [NRT/OBG], 2017) prepared for Weston Units 3 & 4 BABs. Potentiometric surface maps for the fourth quarter of 2022 and both monitoring events in 2023 are included in **Figures 2 through 4**. Water level data, collected from background and downgradient monitoring wells, are included in **Table 1**. All monitoring data and analytical results obtained under 40 C.F.R. §§ 257.90 through 257.98 (as applicable) in the fourth quarter of 2022 and both monitoring events in 2023 are presented in **Table 2**. Laboratory reports for both 2023 monitoring events are included in **Appendix A**[1].

Analytical data were evaluated in accordance with the *Statistical Analysis Plan, Weston Units 3 & 4 Bottom Ash Basins* (NRT/OBG, 2017) to determine any SSIs of Appendix III parameters relative to background concentrations. Statistical background values are provided in **Table 3**. A flow chart showing the statistical methodology for determination of background values is included as **Appendix B**.

Statistical evaluation, including SSI determinations, of analytical data from the Detection Monitoring Program for the December 5, 2022 (Detection Monitoring Round 11) and June 7, 2023 (Detection Monitoring Round 12) sampling events were completed in 2023 and within 90 days of receipt of the analytical data. SSIs over background concentrations for Appendix III constituents were identified; SSI parameters and well locations are provided in **Table A**.

An ASD for the SSIs determined during Detection Monitoring Round 11, dated July 5, 2023 was prepared within 90 days of the SSI determination and is included in **Appendix C**. The ASD was prepared in accordance with 40 CFR 257.94(e)(2) and provides a description, data, and pertinent information to support that the SSIs observed during Detection Monitoring Round 11 were not due to a release from the Weston Units 3 & 4 BABs but were either errors in sampling, analysis, statistical evaluation, or from naturally occurring conditions (e.g. natural variation in groundwater quality). The ASDs dated April 15, 2018 and January 8, 2022 for the Weston Units 3 & 4 BAs provided a description, data, and pertinent information supporting an alternate source for the wells and parameters with SSIs in Detection Monitoring Rounds 11-12.

[1] Laboratory reports for the fourth quarter of 2022 monitoring event were provided in the 2022 annual report.

Table A. 2022-2023 Detection Monitoring Program Summary

Detection Round	Sampling Date	Analytical Data Receipt Date	Parameters Collected	SSI Wells (Parameters)	SSI(s) Determination Date	ASD Completion Date[1]
11	December 5, 2022	January 6, 2023	Appendix III	OW-50 (Ca, SO_4, and pH - low)	April 6, 2023	July 5, 2023
11R	February 16, 2023	March 1, 2023	Ca, pH, and SO_4 OW-50	NA	NA	NA
12	June 7, 2023	June 21, 2023	Appendix III	OW-50 (pH – low, and SO_4)	September 19, 2023	NA
13	December 5, 2023	January 24, 2023	Appendix III	TBD	TBD Before April 23, 2024	TBD

Notes:

NA = not applicable

TBD = to be determined

[1] The ASDs dated April 15, 2018, January 8, 2022, and July 5, 2023 for Weston Units 3 & 4 BABs provided a description, data, and pertinent information supporting an alternate source for the wells and parameters with SSIs in Detection Monitoring Rounds 11-12.

4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the groundwater monitoring program during 2023. Groundwater samples were collected and analyzed in accordance with the SAP and all data were accepted.

5. KEY ACTIVITIES PLANNED FOR 2024

The following key activities are planned for 2024:

- Continuation of the Detection Monitoring Program with semi-annual sampling scheduled for the second and fourth quarters of 2024.
- 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 the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality) will be evaluated.
  - If an alternate source is identified to be the cause of the SSI, a written demonstration will be completed within 90 days of SSI determination and included in the 2024 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 2024 (*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), 2017, *Sampling and Analysis Plan, Weston Units 3 & 4 Bottom Ash Basins, Rothschild, Wisconsin, October 2, 2017.*

Natural Resource Technology, an OBG Company (NRT/OBG), 2017, *Statistical Analysis Plan, Weston Units 3 & 4 Bottom Ash Basins, Rothschild, Wisconsin, October 17, 2017.*

TABLES

TABLE 1. GROUNDWATER ELEVATIONS

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
WESTON GENERATING STATION UNITS 3 & 4 BOTTOM ASH BASINS
ROTHSCHILD, WI

Well ID	Well Type	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Groundwater Elevation (ft NAVD88)
OW-45	Background (Upgradient)	44.853310	-89.649109	12/05/2022	1147.20
				6/5/2023	1149.37
				12/5/2023	1147.74
OW-46	Background (Upgradient)	44.852081	-89.649947	12/05/2022	1147.42
				6/5/2023	1149.70
				12/5/2023	1148.00
OW-47R	Compliance (Downgradient)	44.854553	-89.654607	12/05/2022	1144.91
				6/5/2023	1146.75
				12/5/2023	1145.19
OW-48	Compliance (Downgradient)	44.854558	-89.655273	12/05/2022	1144.36
				6/5/2023	1146.35
				12/5/2023	1144.84
OW-49	Compliance (Downgradient)	44.854477	-89.656204	12/05/2022	1144.08
				6/5/2023	1146.10
				12/5/2023	1144.59
OW-50	Compliance (Downgradient)	44.853785	-89.656657	12/05/2022	1144.12
				6/5/2023	1146.13
				12/5/2023	1144.61

Notes:
ft = foot/feet
NAVD88 = North American Vertical Datum of 1988

Weston Unit 3&4 Bottom Ash CCR
Table 2. Analytical Results - Appendix III Parameters

Date Range: 12/01/2022 to 12/31/2023

Lab Methods:

Well Id	Date Sampled	Lab Id	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
OW-45	12/5/2022	AE64340	0.0316	24.9000	75.6	<0.10	6.4	11.4
	2/16/2023	40258414006		20.4000			6.5	
	6/5/2023	AE67000	0.0372	25.4000	56.9	<0.48	6.5	10.9
OW-46	12/5/2022	AE64342	0.0317	10.8000	40.9	<0.10	6.5	10.5
	6/5/2023	AE67001	0.0332	14.6000	61.7	<0.48	6.2	14.9
OW-47R	12/5/2022	AE64343	0.1110	29.9000	75.4	<0.10	6.1	30.5
	6/5/2023	AE67002	0.0413	25.3000	68.1	<0.48	5.9	24.8
OW-48	12/5/2022	AE64344	0.3000	33.3000	53.0	<0.10	6.3	82.5
	6/7/2023	AE67003	0.2750	40.3000	59.3	<0.48	6.4	86.0
OW-49	12/5/2022	AE64345	0.2220	32.8000	85.9	<0.10	6.0	82.1
	6/7/2023	AE67004	0.1510	25.6000	86.9	<0.48	6.1	52.9
OW-50	12/5/2022	AE64346	0.0358	28.4000	68.0	<0.48	5.6	20.7
	2/16/2023	40258414007		28.4000			5.7	23.2
	6/7/2023	AE67005	0.0320	25.5000	68.8	<0.48	5.7	22.0

Weston Unit 3&4 Bottom Ash CCR
Table 2. Analytical Results - Appendix III Parameters

Date Range: 12/01/2022 to 12/31/2023

Lab Methods:

Well Id	Date Sampled	Lab Id	TDS, mg/L
OW-45	12/5/2022	AE64340	228.0
	6/5/2023	AE67000	206.0
OW-46	12/5/2022	AE64342	142.0
	6/5/2023	AE67001	176.0
OW-47R	12/5/2022	AE64343	240.0
	6/5/2023	AE67002	240.0
OW-48	12/5/2022	AE64344	284.0
	6/7/2023	AE67003	294.0
OW-49	12/5/2022	AE64345	324.0
	6/7/2023	AE67004	274.0
OW-50	12/5/2022	AE64346	220.0
	6/7/2023	AE67005	262.0

Notes:

Exceedance of Background

TABLE 3

STATISTICAL BACKGROUND VALUES

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

WESTON GENERATING STATION

UNITS 3 & 4 BOTTOM ASH BASINS

ROTHSCHILD, WISCONSIN

Parameter	Well ID	Statistical Background Value (LPL/UPL)
40 C.F.R. Part 257 Appendix III		
Boron (mg/L)	OW-45	0.0442
Boron (mg/L)	OW-46	0.0402
Boron (mg/L)	OW-47/OW-47R	0.481
Boron (mg/L)	OW-48	1.02
Boron (mg/L)	OW-49	0.699
Boron (mg/L)	OW-50	0.0578
Calcium (mg/L)	OW-45	22.4
Calcium (mg/L)	OW-46	26.1
Calcium (mg/L)	OW-47/OW-47R	100
Calcium (mg/L)	OW-48	105
Calcium (mg/L)	OW-49	98.6
Calcium (mg/L)	OW-50	28.2
Chloride (mg/L)	OW-45	85.7
Chloride (mg/L)	OW-46	117
Chloride (mg/L)	OW-47/OW-47R	126
Chloride (mg/L)	OW-48	116
Chloride (mg/L)	OW-49	331
Chloride (mg/L)	OW-50	112
Fluoride (mg/L)	OW-45	0.840
Fluoride (mg/L)	OW-46	DQR
Fluoride (mg/L)	OW-47/OW-47R	0.100
Fluoride (mg/L)	OW-48	0.110
Fluoride (mg/L)	OW-49	DQR
Fluoride (mg/L)	OW-50	0.11
pH (field) (SU)	OW-45	6.0/9.0
pH (field) (SU)	OW-46	4.7/9.6
pH (field) (SU)	OW-47/OW-47R	4.8/9.7
pH (field) (SU)	OW-48	4.9/9.9
pH (field) (SU)	OW-49	5.0/9.8
pH (field) (SU)	OW-50	6.1/7.4
Sulfate (mg/L)	OW-45	31.3
Sulfate (mg/L)	OW-46	93.6
Sulfate (mg/L)	OW-47/OW-47R	171
Sulfate (mg/L)	OW-48	192
Sulfate (mg/L)	OW-49	171
Sulfate (mg/L)	OW-50	20.3
Total Dissolved Solids (mg/L)	OW-45	234
Total Dissolved Solids (mg/L)	OW-46	301

TABLE 3

STATISTICAL BACKGROUND VALUES

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

WESTON GENERATING STATION

UNITS 3 & 4 BOTTOM ASH BASINS

ROTHSCHILD, WISCONSIN

Parameter	Well ID	Statistical Background Value (LPL/UPL)
40 C.F.R. Part 257 Appendix III		
Total Dissolved Solids (mg/L)	OW-47/OW-47R	601
Total Dissolved Solids (mg/L)	OW-48	515
Total Dissolved Solids (mg/L)	OW-49	552
Total Dissolved Solids (mg/L)	OW-50	273

Notes:

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

LPL = Lower Prediction Limit (applicable for pH only)

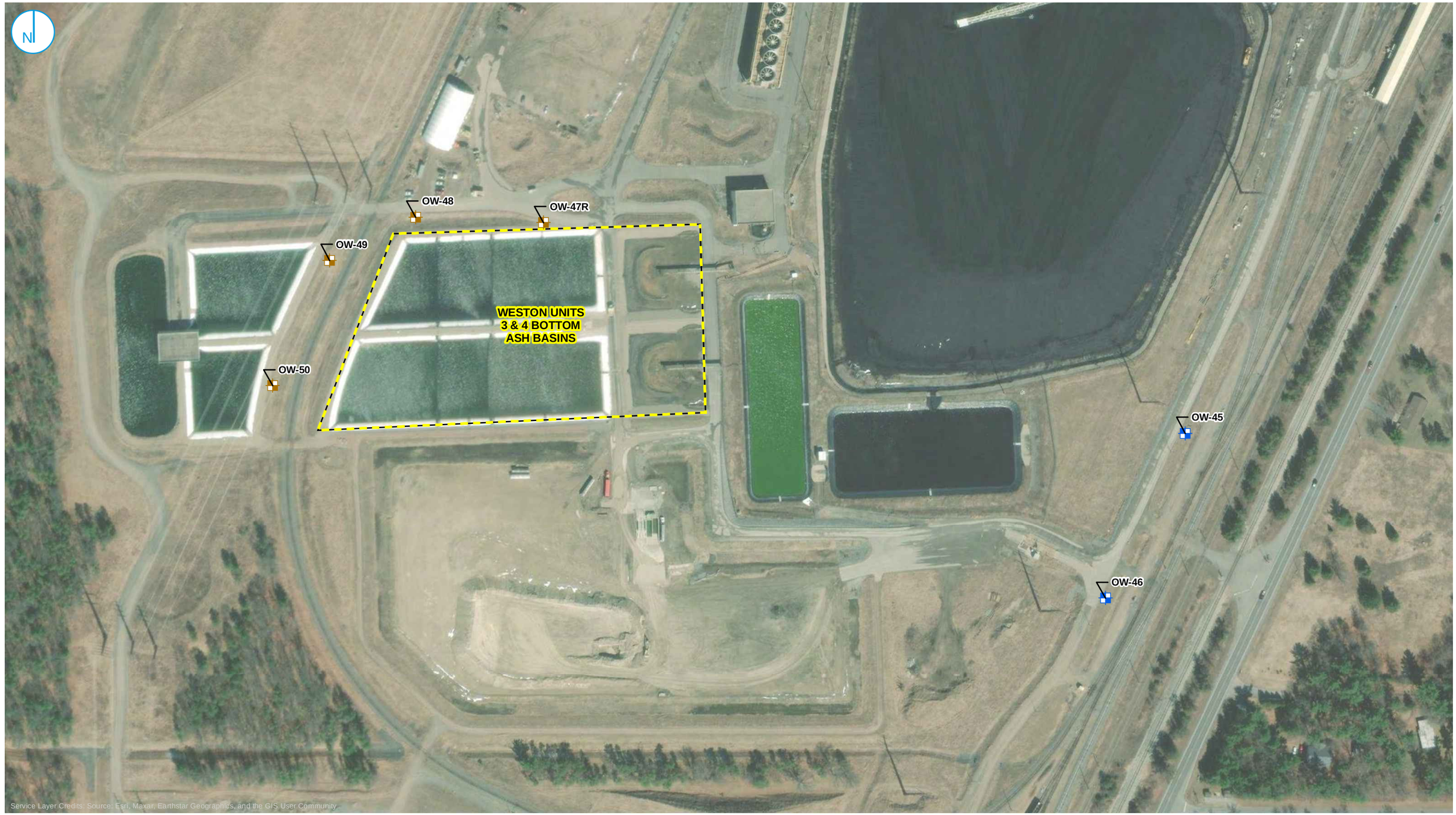
mg/L = milligrams per liter

DQR = Double quantification rule, background data set is non-detect. If parameter is detected in both the sample event and a resample it is considered an exceedance.

SU = Standard Units

UPL = Upper Prediction Limit

FIGURES



CCR RULE UPGRADIENT MONITORING WELL LOCATION

CCR RULE DOWNGRADIENT MONITORING WELL LOCATION

UNIT BOUNDARY

0 100 200 Feet

GROUNDWATER SAMPLING WELL LOCATION MAP

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
WESTON GENERATING STATION UNITS 3 & 4 BOTTOM ASH BASINS
ROTHSCHILD, WISCONSIN

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

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PROJECT: 71202 | DATED: 1/27/2023 | DESIGNER: galarmmc

CCR RULE MONITORING WELL LOCATION

GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD 88)

GROUNDWATER FLOW DIRECTION

UNIT BOUNDARY

0 125 250 Feet

POTENTIOMETRIC SURFACE MAP
DECEMBER 5, 2022

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
WESTON GENERATING STATION UNITS 3 & 4 BOTTOM ASH BASINS
ROTHSCHILD, WISCONSIN

FIGURE 2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

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Y:\GIS\Projects\161660\Weston_Units3_4_BABMXD\GM_CAR_2022\Figure 4_GW Contours 202212.mxd

PROJECT: 169000XXXX | DATED: 1/27/2023 | DESIGNER: galammc

Y:\GIS\Projects\161660\Weston_Units3_4_BABWMXD\GM_CAR_2023\Figure 3_GW Contours 202306.mxd

CCR RULE MONITORING WELL LOCATION

GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD 88)

GROUNDWATER FLOW DIRECTION

UNIT BOUNDARY

0 125 250 Feet

POTENTIOMETRIC SURFACE MAP
JUNE 5, 2023

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
WESTON GENERATING STATION UNITS 3 & 4 BOTTOM ASH BASINS
ROTHSCHILD, WISCONSIN

FIGURE 3

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

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PROJECT: 169000XXXX | DATED: 1/26/2024 | DESIGNER: GALARNMC

CCR RULE MONITORING WELL LOCATION

GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD 88)

GROUNDWATER FLOW DIRECTION

UNIT BOUNDARY

0 125 250 Feet

POTENTIOMETRIC SURFACE MAP
DECEMBER 5, 2023

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
WESTON GENERATING STATION UNITS 3 & 4 BOTTOM ASH BASINS
ROTHSCHILD, WISCONSIN

FIGURE 4

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

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Y:\GIS\Projects\1616\60\Weston_Units3_4_BABWMXD\GM_CAR_2023\Figure 4_GW Contours 202312.mxd

PROJECT: 169000XXXX | DATED: 1/26/2024 | DESIGNER: GALARNMC

APPENDICES

APPENDIX A
LABORATORY REPORTS

To: Eric Kovatch
PSB Annex A231

From: WEC Business Services
Laboratory Services PSBA-A070
WDNR Cert # 241329000

Report Date: Friday, January 26, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW45 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE71149 Sample Collection Date/Time: 02/16/2023 14:18
Sample Received: 01/26/2024 Sample Collector: R E LEE

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	28.52	0.05	feet		1		H2OD	2/16/23	R E LEE
Field Temperature	8.5	0.1	Degrees C		1		TEMP	2/16/23	R E LEE
Field Conductivity	319	0	umhos		1		FCOND25	2/16/23	R E LEE
Field pH	6.5	0.1	Units	0.1	1		FIELDPH	2/16/23	R E LEE
Dissolved Oxygen-Field	10.14	0.1	mg/l		1		FIELDDO	2/16/23	R E LEE
Turbidity	1.88	0.1	NTU'S		1		EPA 180.1	2/16/23	R E LEE
Redox Potential	122.3	1	mV		1		ASTM D1498-93	2/16/23	R E LEE
Total Calcium	20400	114	ug/L	500	1		EPA 200.7	2/21/23	020

Sample Comments:

Sample Description: **OW50 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE71150 Sample Collection Date/Time: 02/16/2023 15:05
Sample Received: 01/26/2024 Sample Collector: R E LEE

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	31.84	0.05	feet		1		H2OD	2/16/23	R E LEE
Field Temperature	9.3	0.1	Degrees C		1		TEMP	2/16/23	R E LEE
Field Conductivity	353	0	umhos		1		FCOND25	2/16/23	R E LEE
Field pH	5.7	0.1	Units	0.1	1		FIELDPH	2/16/23	R E LEE
Dissolved Oxygen-Field	5.01	0.1	mg/l		1		FIELDDO	2/16/23	R E LEE
Turbidity	3.09	0.1	NTU'S		1		EPA 180.1	2/16/23	R E LEE
Redox Potential	180.3	1	mV		1		ASTM D1498-93	2/16/23	R E LEE
Total Calcium	28400	114	ug/L	500	1		EPA 200.7	2/21/23	020
Total Sulfate	23.2	0.44	mg/L	2.0	1		EPA 300.0	2/27/23	020

Sample Comments:

LOD and LOQ are adjusted for dilution factor.
'J' Flag, if present indicates an estimated concentration at or above the LOD and below the LOQ.

If there are any questions concerning this report, please contact: Laboratory Services at (414) 221-4595.

To: Eric Kovatch
PSB Annex A231

From: WEC Business Services
Laboratory Services PSBA-A070
WDNR Cert # 241329000

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW-45 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67000 Sample Collection Date/Time: 06/05/2023 11:00
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	25.8	0.05	feet		1		H2OD	6/5/23	REL
Field Temperature	8.3	0.1	Degrees (		1		TEMP	6/5/23	REL
Field Conductivity	338	0	umhos		1		FCOND25	6/5/23	REL
Field pH	6.5	0.1	Units	0.1	1		FIELDPH	6/5/23	REL
Dissolved Oxygen-Field	11	0.1	mg/l		1		FIELDDO	6/5/23	REL
Turbidity	1.7	0.1	NTU'S		1		EPA 180.1	6/5/23	REL
Redox Potential	173	1	mV		1		ASTM D1498-93	6/5/23	REL
Total Boron	37.2	17.3	ug/L	40.0	1	J	EPA 200.7	6/12/23	020
Total Calcium	25400	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	56.9	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	D3	EPA 300.0	6/19/23	020
Total Sulfate	10.9	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Dissolved Solids	206	8.7	mg/L	20.0	1		Std Mtd 2540 C	6/12/23	020

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)
D3 - Sample dilued due to presence of high levels of non-target compounds or oth

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Sample Description: **OW-46 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67001 Sample Collection Date/Time: 06/05/2023 11:54
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	26.95	0.05	feet		1		H2OD	6/5/23	REL
Field Temperature	8.8	0.1	Degrees (		1		TEMP	6/5/23	REL
Field Conductivity	346	0	umhos		1		FCOND25	6/5/23	REL
Field pH	6.2	0.1	Units	0.1	1		FIELDPH	6/5/23	REL
Dissolved Oxygen-Field	9.9	0.1	mg/l		1		FIELDDO	6/5/23	REL
Turbidity	2.9	0.1	NTU'S		1		EPA 180.1	6/5/23	REL
Redox Potential	193	1	mV		1		ASTM D1498-93	6/5/23	REL
Total Boron	33.2	17.3	ug/L	40.0	1	J	EPA 200.7	6/12/23	020
Total Calcium	14600	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	61.7	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	D3	EPA 300.0	6/19/23	020
Total Sulfate	14.9	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Dissolved Solids	176	8.7	mg/L	20.0	1		Std Mtd 2540 C	6/12/23	020

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)
D3 - Sample dilued due to presence of high levels of non-target compounds or oth

Sample Description: **OW-47R Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67002 Sample Collection Date/Time: 06/05/2023 12:44
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	36.74	0.05	feet		1		H2OD	6/5/23	REL
Field Temperature	11	0.1	Degrees (		1		TEMP	6/5/23	REL
Field Conductivity	356	0	umhos		1		FCOND25	6/5/23	REL
Field pH	5.9	0.1	Units	0.1	1		FIELDPH	6/5/23	REL
Dissolved Oxygen-Field	3.3	0.1	mg/l		1		FIELDDO	6/5/23	REL
Turbidity	1.3	0.1	NTU'S		1		EPA 180.1	6/5/23	REL
Redox Potential	188	1	mV		1		ASTM D1498-93	6/5/23	REL
Total Boron	41.3	17.3	ug/L	40.0	1		EPA 200.7	6/12/23	020
Total Calcium	25300	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	68.1	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	D3	EPA 300.0	6/19/23	020
Total Sulfate	24.8	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Dissolved Solids	240	8.7	mg/L	20.0	1		Std Mtd 2540 C	6/12/23	020

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)
D3 - Sample dilued due to presence of high levels of non-target compounds or oth

Sample Description: **OW-48 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67003 Sample Collection Date/Time: 06/07/2023 14:07
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	30.02	0.05	feet		1		H2OD	6/5/23	REL
Field Temperature	10	0.1	Degrees (		1		TEMP	6/5/23	REL
Field Conductivity	498	0	umhos		1		FCOND25	6/5/23	REL
Field pH	6.4	0.1	Units	0.1	1		FIELDPH	6/5/23	REL
Dissolved Oxygen-Field	9.1	0.1	mg/l		1		FIELDDO	6/5/23	REL
Turbidity	4.7	0.1	NTU'S		1		EPA 180.1	6/5/23	REL
Redox Potential	189	1	mV		1		ASTM D1498-93	6/5/23	REL
Total Boron	275	17.3	ug/L	40.0	1		EPA 200.7	6/12/23	020
Total Calcium	40300	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	59.3	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	D3	EPA 300.0	6/19/23	020
Total Sulfate	86.0	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Dissolved Solids	294	8.7	mg/L	20.0	1		Std Mtd 2540 C	6/12/23	020

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)
D3 - Sample dilued due to presence of high levels of non-target compounds or oth

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW-49 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67004 Sample Collection Date/Time: 06/07/2023 14:58
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	28.98	0.05	feet		1		H2OD	6/5/23	REL
Field Temperature	10	0.1	Degrees C		1		TEMP	6/5/23	REL
Field Conductivity	486	0	umhos		1		FCOND25	6/5/23	REL
Field pH	6.1	0.1	Units	0.1	1		FIELDPH	6/5/23	REL
Dissolved Oxygen-Field	8.2	0.1	mg/l		1		FIELDDO	6/5/23	REL
Turbidity	1.0	0.1	NTU'S		1		EPA 180.1	6/5/23	REL
Redox Potential	216	1	mV		1		ASTM D1498-93	6/5/23	REL
Total Boron	151	17.3	ug/L	40.0	1		EPA 200.7	6/12/23	020
Total Calcium	25600	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	86.9	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	D3	EPA 300.0	6/19/23	020
Total Sulfate	52.9	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Dissolved Solids	274	8.7	mg/L	20.0	1		Std Mtd 2540 C	6/12/23	020

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)
D3 - Sample dilued due to presence of high levels of non-target compounds or oth

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Sample Description: **OW-50 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67005 Sample Collection Date/Time: 06/07/2023 15:40
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	29.43	0.05	feet		1		H2OD	6/5/23	REL
Field Temperature	10	0.1	Degrees C		1		TEMP	6/5/23	REL
Field Conductivity	351	0	umhos		1		FCOND25	6/5/23	REL
Field pH	5.7	0.1	Units	0.1	1		FIELDPH	6/5/23	REL
Dissolved Oxygen-Field	5.2	0.1	mg/l		1		FIELDDO	6/5/23	REL
Turbidity	3.2	0.1	NTU'S		1		EPA 180.1	6/5/23	REL
Redox Potential	234	1	mV		1		ASTM D1498-93	6/5/23	REL
Total Boron	32.0	17.3	ug/L	40.0	1	J	EPA 200.7	6/12/23	020
Total Calcium	25500	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	68.8	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	D3	EPA 300.0	6/19/23	020
Total Sulfate	22.0	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Dissolved Solids	262	8.7	mg/L	20.0	1		Std Mtd 2540 C	6/12/23	020

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)
D3 - Sample dilued due to presence of high levels of non-target compounds or oth

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Sample Description: **QA/QC1 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67006 Sample Collection Date/Time: 06/07/2023 00:00
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **QA/QC1 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67006 Sample Collection Date/Time: 06/07/2023 00:00
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Total Boron	29.9	17.3	ug/L	40.0	1	J	EPA 200.7	6/12/23	020
Total Calcium	25300	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	57.4	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	D3	EPA 300.0	6/19/23	020
Total Sulfate	11.0	2.2	mg/L	10.0	5		EPA 300.0	6/19/23	020
Total Dissolved Solids	208	8.7	mg/L	20.0	1		Std Mtd 2540 C	6/12/23	020

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)
D3 - Sample dilued due to presence of high levels of non-target compounds or oth

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Sample Description: **EB1 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE67007 Sample Collection Date/Time: 06/07/2023 18:15
Sample Received: 06/07/2023 Sample Collector: J OETTINGER - REL

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Total Boron	19.7	17.3	ug/L	40.0	1	J	EPA 200.7	6/12/23	020
Total Calcium	Less Than	114	ug/L	500	1		EPA 200.7	6/12/23	020
Total Chloride	Less Than	0.43	mg/L	2.0	1		EPA 300.0	6/19/23	020
Total Fluoride	Less Than	0.095	mg/L	0.32	1		EPA 300.0	6/19/23	020
Total Sulfate	Less Than	0.44	mg/L	2.0	1		EPA 300.0	6/19/23	020
Total Dissolved Solids	14.0	8.7	mg/L	20.0	1	J	Std Mtd 2540 C	6/12/23	020

Sample Comments:
Sample analyzed by Pace Analytical (WDNR Lab Certification #405132750)

LOD and LOQ are adjusted for dilution factor.
'J' Flag, if present indicates an estimated concentration at or above the LOD and below the LOQ.

If there are any questions concerning this report, please contact: Laboratory Services at (414) 221-4595.

To: Eric Kovatch
PSB Annex A231

From: WEC Business Services
Laboratory Services PSBA-A070
WDNR Cert # 241329000

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW-45 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70576 Sample Collection Date/Time: 12/05/2023 11:20
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	27.42	0.05	feet		1		H2OD	12/5/23	J OETTINGER
Field Temperature	9.2	0.1	Degrees C		1		TEMP	12/5/23	J OETTINGER
Field Conductivity	345	0	umhos		1		FCOND25	12/5/23	J OETTINGER
Field pH	6.5	0.1	Units	0.1	1		FIELDPH	12/5/23	J OETTINGER
Dissolved Oxygen-Field	11.5	0.1	mg/l		1		FIELDDO	12/5/23	J OETTINGER
Turbidity	0.5	0.1	NTU'S		1		EPA 180.1	12/5/23	J OETTINGER
Redox Potential	182	1	mV		1		ASTM D1498-93	12/5/23	J OETTINGER
Total Boron	30.4	17.3	ug/L	40.0	1	J	EPA 200.7	12/7/23	020
Total Calcium	24500	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	21900	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	4950	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	1680	325	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Sodium	33800	350	ug/L	500	1		EPA 200.7	12/7/23	020
Total Filtered Alkalinity as CaCO3	54.0	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	54.0	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020
Total Dissolved Solids	180	8.7	mg/L	20.0	1		Std Mtd 2540 C	12/7/23	020
Total Chloride	56.7	3.0	mg/L	10.0	5	M0	EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5	M0	EPA 300.0	12/8/23	020
Total Sulfate	12.3	2.2	mg/L	10.0	5	M0	EPA 300.0	12/8/23	020
Dissolved Chloride	66.0	3.0	mg/L	10.0	5		EPA 300.0	12/12/23	020
Dissolved Sulfate	13.9	2.2	mg/L	10.0	5		EPA 300.0	12/12/23	020

Sample Comments:

Sample Description: **OW-46 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70577 Sample Collection Date/Time: 12/05/2023 12:12
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	28.65	0.05	feet		1		H2OD	12/5/23	J OETTINGER
Field Temperature	8.9	0.1	Degrees C		1		TEMP	12/5/23	J OETTINGER
Field Conductivity	281	0	umhos		1		FCOND25	12/5/23	J OETTINGER
Field pH	6.6	0.1	Units	0.1	1		FIELDPH	12/5/23	J OETTINGER
Dissolved Oxygen-Field	10.3	0.1	mg/l		1		FIELDDO	12/5/23	J OETTINGER
Turbidity	1.5	0.1	NTU'S		1		EPA 180.1	12/5/23	J OETTINGER

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW-46 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70577 Sample Collection Date/Time: 12/05/2023 12:12
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Redox Potential	184	1	mV		1		ASTM D1498-93	12/5/23	J OETTINGER
Total Boron	27.8	17.3	ug/L	40.0	1	J	EPA 200.7	12/7/23	020
Total Calcium	12200	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	11700	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	2810	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	1260	325	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Sodium	35300	350	ug/L	500	1		EPA 200.7	12/7/23	020
Total Filtered Alkalinity as CaCO3	37.5	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	37.5	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020
Total Dissolved Solids	148	8.7	mg/L	20.0	1		Std Mtd 2540 C	12/7/23	020
Total Chloride	51.0	3.0	mg/L	10.0	5		EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5		EPA 300.0	12/8/23	020
Total Sulfate	9.5	2.2	mg/L	10.0	5	J	EPA 300.0	12/8/23	020
Dissolved Chloride	55.9	3.0	mg/L	10.0	5		EPA 300.0	12/12/23	020
Dissolved Sulfate	10.2	2.2	mg/L	10.0	5		EPA 300.0	12/12/23	020

Sample Comments:

Sample Description: **OW-47R Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70578 Sample Collection Date/Time: 12/05/2023 13:02
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	38.30	0.05	feet		1		H2OD	12/5/23	J OETTINGER
Field Temperature	9.1	0.1	Degrees C		1		TEMP	12/5/23	J OETTINGER
Field Conductivity	356	0	umhos		1		FCOND25	12/5/23	J OETTINGER
Field pH	6.1	0.1	Units	0.1	1		FIELDPH	12/5/23	J OETTINGER
Dissolved Oxygen-Field	5.9	0.1	mg/l		1		FIELDDO	12/5/23	J OETTINGER
Turbidity	0.3	0.1	NTU'S		1		EPA 180.1	12/5/23	J OETTINGER
Redox Potential	200	1	mV		1		ASTM D1498-93	12/5/23	J OETTINGER
Total Boron	53.6	17.3	ug/L	40.0	1		EPA 200.7	12/7/23	020
Total Calcium	25700	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	25000	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	6650	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	1740	325	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Sodium	27200	350	ug/L	500	1		EPA 200.7	12/7/23	020
Total Filtered Alkalinity as CaCO3	29.0	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	29.0	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020
Total Dissolved Solids	188	8.7	mg/L	20.0	1		Std Mtd 2540 C	12/7/23	020
Total Chloride	68.0	3.0	mg/L	10.0	5		EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5		EPA 300.0	12/8/23	020
Total Sulfate	26.0	2.2	mg/L	10.0	5		EPA 300.0	12/11/23	020

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW-47R Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70578 Sample Collection Date/Time: 12/05/2023 13:02
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Chloride	72.1	3.0	mg/L	10.0	5		EPA 300.0	12/12/23	020
Dissolved Sulfate	27.4	2.2	mg/L	10.0	5		EPA 300.0	12/12/23	020

Sample Comments:

Sample Description: **OW-48 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70579 Sample Collection Date/Time: 12/05/2023 13:46
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	31.57	0.05	feet		1		H2OD	12/5/23	J OETTINGER
Field Temperature	9.3	0.1	Degrees C		1		TEMP	12/5/23	J OETTINGER
Field Conductivity	516	0	umhos		1		FCOND25	12/5/23	J OETTINGER
Field pH	6.4	0.1	Units	0.1	1		FIELDPH	12/5/23	J OETTINGER
Dissolved Oxygen-Field	8.8	0.1	mg/l		1		FIELDDO	12/5/23	J OETTINGER
Turbidity	3.5	0.1	NTU'S		1		EPA 180.1	12/5/23	J OETTINGER
Redox Potential	198	1	mV		1		ASTM D1498-93	12/5/23	J OETTINGER
Total Boron	222	17.3	ug/L	40.0	1		EPA 200.7	12/7/23	020
Total Calcium	34800	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	35900	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	4830	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	2730	235	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Sodium	59700	350	ug/L	500	1		EPA 200.7	12/7/23	020
Total Filtered Alkalinity as CaCO3	46.9	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	46.9	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020
Total Dissolved Solids	292	8.7	mg/L	20.0	1		Std Mtd 2540 C	12/7/23	020
Total Chloride	64.3	3.0	mg/L	10.0	5		EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5		EPA 300.0	12/8/23	020
Total Sulfate	86.5	2.2	mg/L	10.0	5		EPA 300.0	12/11/23	020
Dissolved Chloride	66.9	3.0	mg/L	10.0	5		EPA 300.0	12/12/23	020
Dissolved Sulfate	97.9	0.385	mg/L	1.28	5		EPA 300.0	12/12/23	020

Sample Comments:

Sample Description: **OW-49 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70580 Sample Collection Date/Time: 12/05/2023 14:32
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	30.51	0.05	feet		1		H2OD	12/5/23	J OETTINGER
Field Temperature	9.7	0.1	Degrees C		1		TEMP	12/5/23	J OETTINGER

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW-49 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70580 Sample Collection Date/Time: 12/05/2023 14:32
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Conductivity	500	0	umhos		1		FCOND25	12/5/23	J OETTINGER
Field pH	6.1	0.1	Units	0.1	1		FIELDPH	12/5/23	J OETTINGER
Dissolved Oxygen-Field	8.3	0.1	mg/l		1		FIELDDO	12/5/23	J OETTINGER
Turbidity	1.5	0.1	NTU'S		1		EPA 180.1	12/5/23	J OETTINGER
Redox Potential	206	1	mV		1		ASTM D1498-93	12/5/23	J OETTINGER
Total Boron	152	17.3	ug/L	40.0	1		EPA 200.7	12/7/23	020
Total Calcium	25400	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	24800	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	3970	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	2490	325	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Sodium	65300	3500	ug/L	5000	10		EPA 200.7	12/8/23	020
Total Filtered Alkalinity as CaCO3	35.0	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	35.0	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020
Total Dissolved Solids	298	8.7	mg/L	20.0	1		Std Mtd 2540 C	12/7/23	020
Total Chloride	91.9	3.0	mg/L	10.0	5		EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5		EPA 300.0	12/8/23	020
Total Sulfate	53.0	2.2	mg/L	10.0	5		EPA 300.0	12/11/23	020
Dissolved Chloride	90.7	3.0	mg/L	10.0	5		EPA 300.0	12/12/23	020
Dissolved Sulfate	60.8	2.2	mg/L	10.0	5		EPA 300.0	12/12/23	020

Sample Comments:

Sample Description: **OW-50 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70581 Sample Collection Date/Time: 12/05/2023 15:08
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Field Water Level	31.00	0.05	feet		1		H2OD	12/5/23	J OETTINGER
Field Temperature	9.2	0.1	Degrees C		1		TEMP	12/5/23	J OETTINGER
Field Conductivity	361	0	umhos		1		FCOND25	12/5/23	J OETTINGER
Field pH	5.7	0.1	Units	0.1	1		FIELDPH	12/5/23	J OETTINGER
Dissolved Oxygen-Field	5.1	0.1	mg/l		1		FIELDDO	12/5/23	J OETTINGER
Turbidity	1.4	0.1	NTU'S		1		EPA 180.1	12/5/23	J OETTINGER
Redox Potential	224	1	mV		1		ASTM D1498-93	12/5/23	J OETTINGER
Total Boron	32.2	17.3	ug/L	40.0	1	J	EPA 200.7	12/7/23	020
Total Calcium	27400	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	26200	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	6420	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	1940	325	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Sodium	27400	350	ug/L	500	1		EPA 200.7	12/7/23	020
Total Filtered Alkalinity as CaCO3	34.9	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	34.9	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **OW-50 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70581 Sample Collection Date/Time: 12/05/2023 15:08
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Total Dissolved Solids	232	8.7	mg/L	20.0	1		Std Mtd 2540 C	12/7/23	020
Total Chloride	64.4	3.0	mg/L	10.0	5		EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5		EPA 300.0	12/8/23	020
Total Sulfate	28.3	2.2	mg/L	10.0	5		EPA 300.0	12/11/23	020
Dissolved Chloride	63.5	3.0	mg/L	10.0	5		EPA 300.0	12/12/23	020
Dissolved Sulfate	29.9	2.2	mg/L	10.0	5		EPA 300.0	12/12/23	020

Sample Comments:

Sample Description: **QAQC1 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70582 Sample Collection Date/Time: 12/05/2023 00:00
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Total Boron	30.7	17.3	ug/L	40.0	1	J	EPA 200.7	12/7/23	020
Total Calcium	23800	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	22100	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	4950	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	1650	325	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Sodium	34200	350	ug/L	500	1		EPA 200.7	12/7/23	020
Total Filtered Alkalinity as CaCO3	54.1	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	54.1	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020
Total Dissolved Solids	190	8.7	mg/L	20.0	1		Std Mtd 2540 C	12/7/23	020
Total Chloride	64.7	3.0	mg/L	10.0	5		EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.48	mg/L	1.6	5		EPA 300.0	12/8/23	020
Total Sulfate	11.8	2.2	mg/L	10.0	5		EPA 300.0	12/11/23	020
Dissolved Chloride	65.3	3.0	mg/L	10.0	5		EPA 300.0	12/13/23	020
Dissolved Sulfate	13.7	2.2	mg/L	10.0	5		EPA 300.0	12/13/23	020

Sample Comments:

Sample Description: **EB1 Weston Units 3-4 Bottom Ash Basins Well Sample**
Sample ID: AE70583 Sample Collection Date/Time: 12/05/2023 15:25
Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Total Boron	Less Than	17.3	ug/L	40.0	1		EPA 200.7	12/7/23	020
Total Calcium	Less Than	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Calcium	Less Than	114	ug/L	500	1		EPA 200.7	12/7/23	020
Dissolved Magnesium	Less Than	182	ug/L	1000	1		EPA 200.7	12/7/23	020
Dissolved Potassium	Less Than	325	ug/L	1000	1		EPA 200.7	12/7/23	020

Report Date: Wednesday, January 24, 2024

The following are the analytical results for samples received by Laboratory Services:

Sample Description: **EB1 Weston Units 3-4 Bottom Ash Basins Well Sample**

Sample ID: AE70583 Sample Collection Date/Time: 12/05/2023 15:25

Sample Received: 12/20/2023 Sample Collector: J OETINGER

Parameter	Result	LOD	Units	LOQ	DIL	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Sodium	Less Than	350	ug/L	500	1		EPA 200.7	12/7/23	020
Total Filtered Alkalinity as CaCO3	Less Than	5.0	mg/l	10.0	1		Std Mtd 2320 B	12/6/23	020
Bicarbonate Ion	Less Than	5.0	mg/L	10.0	1		HCO3	12/6/23	020
Carbonate Ion	Less Than	5.0	mg/L	10.0	1		CO3	12/6/23	020
Total Dissolved Solids	14.0	8.7	mg/L	20.0	1	J	Std Mtd 2540 C	12/7/23	020
Total Chloride	Less Than	0.59	mg/L	2.0	1		EPA 300.0	12/8/23	020
Total Fluoride	Less Than	0.095	mg/L	0.32	1		EPA 300.0	12/8/23	020
Total Sulfate	Less Than	0.44	mg/L	2.0	1		EPA 300.0	12/11/23	020
Dissolved Chloride	Less Than	0.59	mg/L	2.0	1		EPA 300.0	12/13/23	020
Dissolved Sulfate	Less Than	0.44	mg/L	2.0	1		EPA 300.0	12/13/23	020

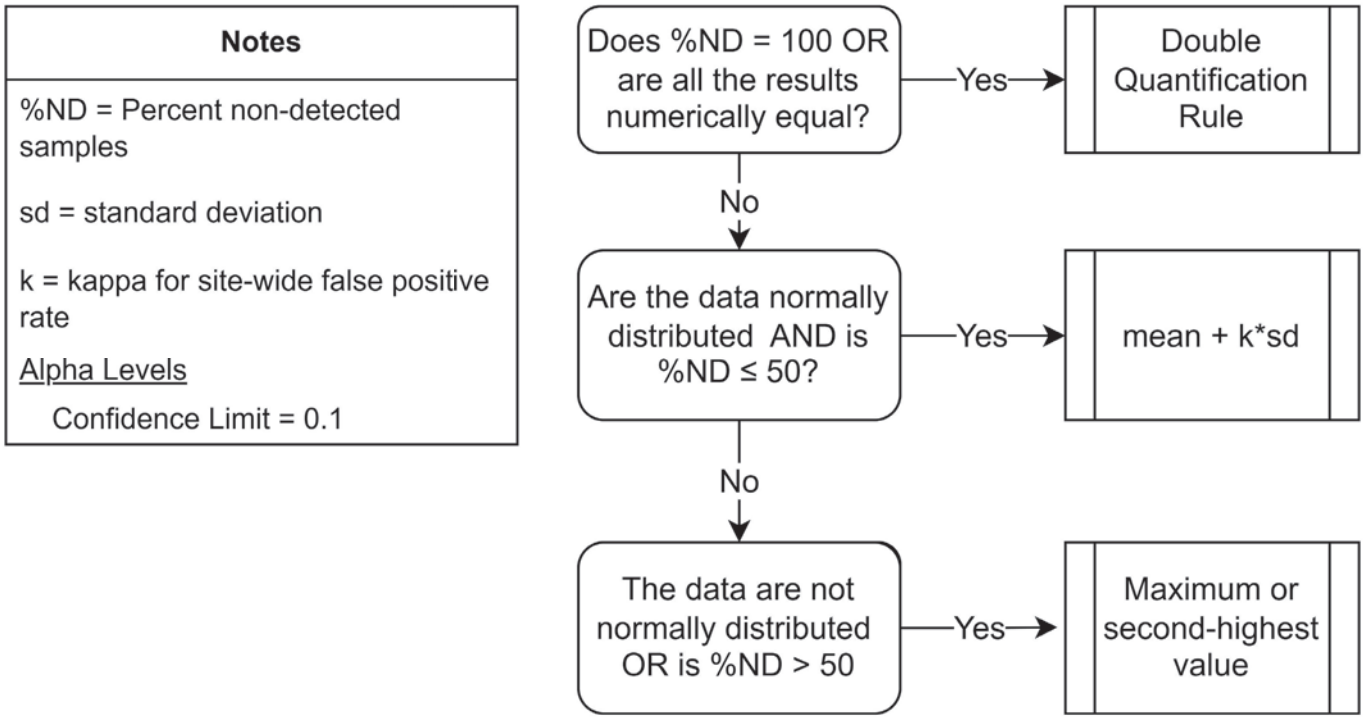
Sample Comments:

LOD and LOQ are adjusted for dilution factor.

'J' Flag, if present indicates an estimated concentration at or above the LOD and below the LOQ.

If there are any questions concerning this report, please contact: Laboratory Services at (414) 221-4595.

APPENDIX B
STATISTICAL METHODOLOGY FOR DETERMINATION OF BACKGROUND VALUES



When data are not normally distributed or %ND > 50, the maximum value is used if the background sample size is < 60. Where the background sample size is ≥ 60, the achievable per-constituent false positive rates for the maximum and second-highest background values will be compared, and the background value with the achievable per-constituent false positive rate that is closest to, but does not exceed, the target per-constituent false positive rate of 0.015% is used.

APPENDIX C
ALTERNATE SOURCE DEMONSTRATION

Prepared for
Wisconsin Public Service Corporation

Date
July 5, 2023

Project No.
1940102327

40 C.F.R. § 257.94(E)(2) ALTERNATE SOURCE DEMONSTRATION DETECTION MONITORING ROUND 11

WESTON UNITS 3 & 4 BOTTOM ASH BASINS

RAMBOLL Bright ideas. Sustainable change.

CERTIFICATIONS

I, Eric J. Tlachac, a qualified professional engineer in good standing in the State of Wisconsin, certify that enclosed information 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.

Eric J. Tlachac, PE
Senior Managing Engineer
Professional Engineer No. 36088-6
State of Wisconsin
Ramboll Americas Engineering Solutions, Inc.
Date: July 5, 2023

I, Nathaniel R. Keller, a qualified professional geologist, certify that the enclosed information 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.

Nathaniel R. Keller, PG
Senior Hydrogeologist
Professional Geologist No. 1283-013
State of Wisconsin
Ramboll Americas Engineering Solutions, Inc.
Date: July 5, 2023

CONTENTS

FIGURES (IN TEXT)

FIGURES (ATTACHED)

APPENDICES

ACRONYMS AND ABBREVIATIONS

§	Section
40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
CCR	coal combustion residuals
CCR Rule	40 C.F.R. Part 257 Subpart D
D11	eleventh semi-annual detection monitoring event
HDPE	high density polyethylene
mg/L	milligrams per liter
NRT/OBG	Natural Resource Technology, an OBG Company
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SSI	statistically significant increase
STD	standard units
TDS	total dissolved solids
WAC	Wisconsin Administrative Code
WDNR	Wisconsin Department of Natural Resources
WDS3	Weston Disposal Site No. 3

1. INTRODUCTION

This document has been prepared on behalf of Wisconsin Public Service Corporation (WPSC) by Ramboll Americas Engineering Solutions, Inc. (Ramboll) to provide pertinent information for an alternate source demonstration (ASD) as allowed by Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257.94(e)(2) for the Weston Power Plant Units 3 & 4 Bottom Ash Basins (BABs) located in Weston, Wisconsin.

The eleventh semi-annual detection monitoring event (D11) samples were collected on December 5, 2022 and analytical data were received on January 6, 2023. Analysis of the data for statistically significant increases (SSIs) of 40 C.F.R. Part 257 Appendix III parameters over background concentrations was completed within 90 days of receipt of sample results (April 6, 2023) in accordance with the *Statistical Analysis Plan* (Natural Resource Technology, an OBG Company, 2017). That statistical determination identified the following SSIs at uppermost aquifer downgradient monitoring wells:

- Calcium at upgradient well OW-45 (intrawell analysis) and downgradient well OW-50 (interwell analysis)
- pH (low) at downgradient well OW-50 (interwell analysis)
- Sulfate at downgradient well OW-50 (interwell analysis)

A resample event was completed on February 16, 2023 to evaluate the concentrations detected in December at these locations. The SSI for calcium at OW-45 was not confirmed and therefore an alternate source demonstration (ASD) is not required. SSIs requiring evaluation for an ASD include:

- Calcium at downgradient well OW-50 (interwell analysis)
- pH (low) at downgradient well OW-50 (interwell analysis)
- Sulfate at downgradient well OW-50 (interwell analysis)

40 C.F.R. § 257.94(e)(2) allows the owner or operator 90 days from the date of determination to demonstrate that a source other than the coal combustion residuals (CCR) unit caused the SSI, or that the SSI resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Pursuant to 40 C.F.R. § 257.94(e)(2), the following demonstrates that sources other than the Weston Units 3 & 4 BABs were the cause of the SSIs listed above. This ASD was completed within 90 days of determination of the SSIs (July 5, 2023) as required by 40 C.F.R. § 257.94(e)(2).

2. BACKGROUND

2.1 Site Location and Description

The Weston Units 3 and 4 BABs are located in Section 3, Township 27 North, Range 7 East, in the Village of Kronenwetter, Marathon County, Wisconsin, and adjacent to the Wisconsin River. Basins are split into four main units, the North and South Primary Basins, and the North and South Secondary Basins (**Figure 1**). The Secondary Basins are bisected by railroad tracks and are further defined as the Northwest and Northeast Secondary Basins, and the Southwest and Southeast Secondary basins.

The BABs receive sluiced bottom ash from Unit 3 and low volume wastewater sources from Units 3 & 4. Bottom ash from Unit 3 is collected from the boiler and sluiced to one of two primary settling ponds where the CCR quickly settles out and the sluice water flows to the secondary ponds. Generally, the primary basins are dry and the dewatered bottom ash is removed from the primary basins on a weekly basis using a front-end loader and transported via dump truck to the ash storage pad for future beneficial use. The secondary bottom ash basins are designed to provide residence time for the CCR fines to settle out from the sluice water. To improve residence time and assist in settling the fines, silt curtains are used in the secondary bottom ash basins. The secondary basins also receive low volume wastewater sources from Units 3 & 4. Water from the secondary bottom ash basins is treated for pH and suspended solids, as needed, and pumped to a tertiary pond for storage and reuse as carriage water for sluicing bottom ash in a close-loop system, as non-potable water for the power plant, or discharged to the Wisconsin River under WPDES Permit.

The Bottom Ash Basins were constructed and placed into service in 1981 and operate in accordance with Wisconsin Pollution Discharge Elimination System (WPDES) Permit No. WI-0042765. The impoundments were constructed and lined in accordance with the design requirements found in Wisconsin Administrative Code (WAC) Chapter NR 213 - Lining of Industrial Lagoons and Design of Storage Structures; however, the basins were not in compliance with 40 CFR Part 257 Subpart D (CCR Rule) when promulgated and therefore categorized as “unlined” impoundments with respect to the federal regulation. The basins required retrofitting to be considered lined.

Retrofitting of the Bottom Ash Basins was completed in 2017, and both sets of basins were placed into service by October 4, 2017. The timeline of retrofitting activities justified the use of intrawell statistics since observed groundwater concentrations were present prior to the completion of basin retrofitting and returning the existing basins to service. Intrawell statistics were used for Detection Monitoring Rounds 1-8 for all wells. In Detection Monitoring Round 8, an ASD was developed for concentrations of boron detected at OW-50, *40 CFR Section 257.94(e)(2) Alternate Source Demonstration (ASD) Detection Monitoring Round 8,* which identified increasing concentrations of boron in background wells as a potential source of the SSI for boron in OW-50. As a result, interwell statistical evaluation of concentrations in OW-50 have been completed since Detection Monitoring Round 8.

2.2 Geology and Hydrogeology

A previous investigation and report focused on Weston North Unit 4, located just north of the BABs (Black & Veatch Corporation, 2004), indicates the area is generally underlain by less than 1

foot of topsoil and fill, followed by unlithified alluvial sediments (Wisconsin River deposits), unlithified outwash sediments and weathered granite bedrock (Ninemile Granite).

The topsoil and fill encountered in soil borings completed as part of the installation of the CCR monitoring network in 2015 and 2017 at the BABs was typically black silt with variable amounts of sand and gravel. The alluvium encountered in the CCR monitoring network borings was mostly brown to dark brown sand. Sand particle distribution ranged from well-graded to poorly-graded, and sand grain size varied from fine to coarse with variable amounts of gravel. The deepest soil boring completed during the installation of the CCR Rule monitoring network in 2015 and 2017 ended in alluvial sands at a depth of 50 feet below ground surface (OW-47R) and did not encounter bedrock.

The 2004 B&V investigation for Weston North Unit 4 indicated the granite bedrock surface occurred at depths ranging from 61.1 to 107.5 feet below ground surface. The bedrock surface encountered near Weston North Unit 4 was generally extremely weathered (top 1 to 8 feet) and graded into competent bedrock with depth (typically within 5 feet).

Groundwater is generally encountered within the sand and gravel at depths of approximately 22 to 32 feet below ground surface, at elevations ranging from about 1144 to 1152 ft NAVD88. Groundwater flow is consistently from east to west toward the Wisconsin River, with limited localized variability based on season. The groundwater elevations and flow directions for the BABs during D11 sampling event are shown in **Figure 2** and are consistent with the flow direction described above.

2.3 Groundwater Monitoring

The 40 C.F.R. Part 257 Subpart D (CCR Rule) monitoring system for the landfill includes background wells OW-45 and OW-46 and downgradient well OW-47R, OW-48, OW-49, and OW-50. A map showing the groundwater monitoring system is presented on **Figures 1 and 2**.

3. ALTERNATE SOURCE DEMONSTRATION

As allowed by 40 C.F.R. § 257.94(e)(2), this ASD demonstrates that sources other than the BABs caused the SSIs or that the SSIs were a result of natural variation in groundwater quality. Lines of Evidence (LOEs) supporting this ASD include the following:

1. Recently retrofitted and compliant liner design.
2. Downgradient concentrations of CCR indicator parameter boron do not exceed background limits.
3. Historic concentrations of sulfate in groundwater upgradient of the BABs are similar to those currently observed in OW-50
4. Groundwater elevations are variable and result in natural variation in groundwater quality.
5. Measurements of pH in CCR leachate are elevated compared to groundwater.

These LOEs are described and supported in greater detail below.

3.1 LOE #1: Recently Retrofitted and Compliant Liner Design

A retrofit of the liner system was approved by the WDNR and constructed in 2017, and consists of the following components for the Primary Basins from the bottom up:

- Geosynthetic clay liner with a hydraulic conductivity of less than 3 x 10^{-9} cm/s (GEI, 2018)
- 60-mil high density polyethylene (HDPE) geomembrane liner
- A 16 oz/ square yard nonwoven cushion geotextile
- A 1-foot soil protective layer, and
- A 2-foot gravel operating layer.

The liner for the Secondary Basins consists of the following from the bottom up:

- The existing sand bentonite layer
- A 3-foot compacted soil layer,
- Geosynthetic clay liner with a hydraulic conductivity of less than 3 x 10^{-9} cm/s (GEI, 2018)
- An exposed 60-mil HDPE geomembrane liner and,
- Fabric formed concrete on the access ramps, toes of slopes, and silt screen locations

The WDNR-approved alternative composite basin liner exceeds the design criteria for a composite liner for new CCR impoundments established by 40 C.F.R. § 257.70. The composite liner design criteria were established to help prevent contaminants in CCR from leaking from the CCR unit

and impacting groundwater. The liner creates a barrier to groundwater, suggesting that the basins are not the source of the SSIs.

3.2 LOE #2: Downgradient Concentrations of CCR Indicator Parameter Boron Do Not Exceed Background Limits

Boron is a key indicator of CCR impacts to groundwater because it is typically present in CCR leachate, not a common anthropogenic contaminant, and non-reactive and mobile in most hydrogeological environments (EPRI, 2012). If the groundwater downgradient of the BAB had been impacted by CCR from the BABs, 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 comparing downgradient measurements to background.

In downgradient monitoring well OW-50, concentrations of boron are below the UPL (0.0664 mg/L), indicating that this well has not been affected by CCR (Figure A). In addition, slight increases in sulfate have occurred while boron has remained stable or decreased slightly (Figure B). Therefore, the BAB is not the source of the SSIs.

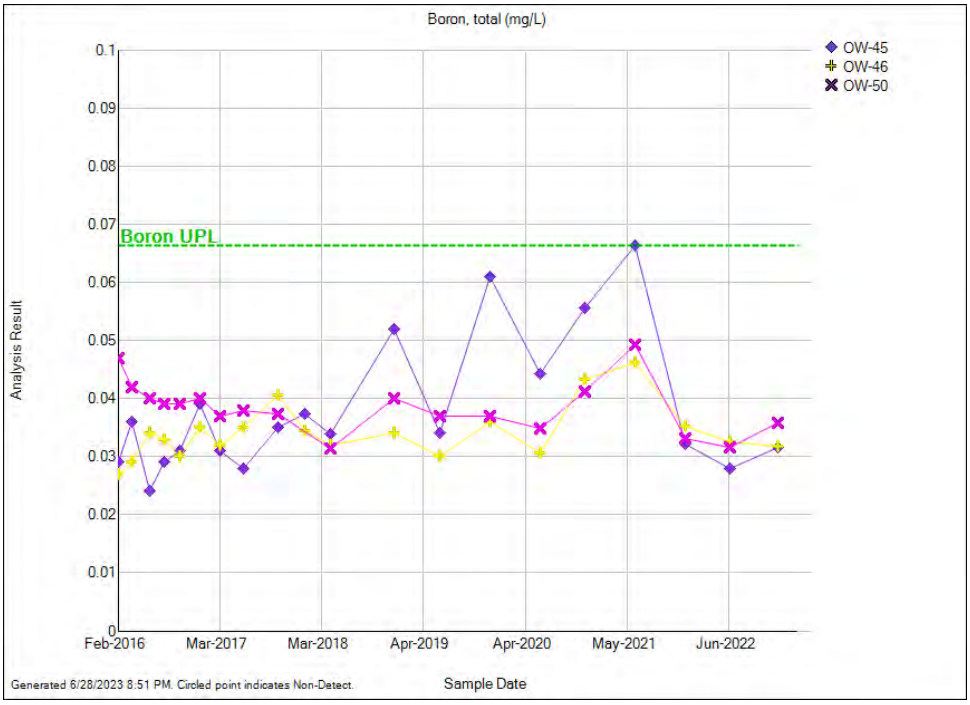


FIGURE A. Concentrations of boron in select monitoring wells.

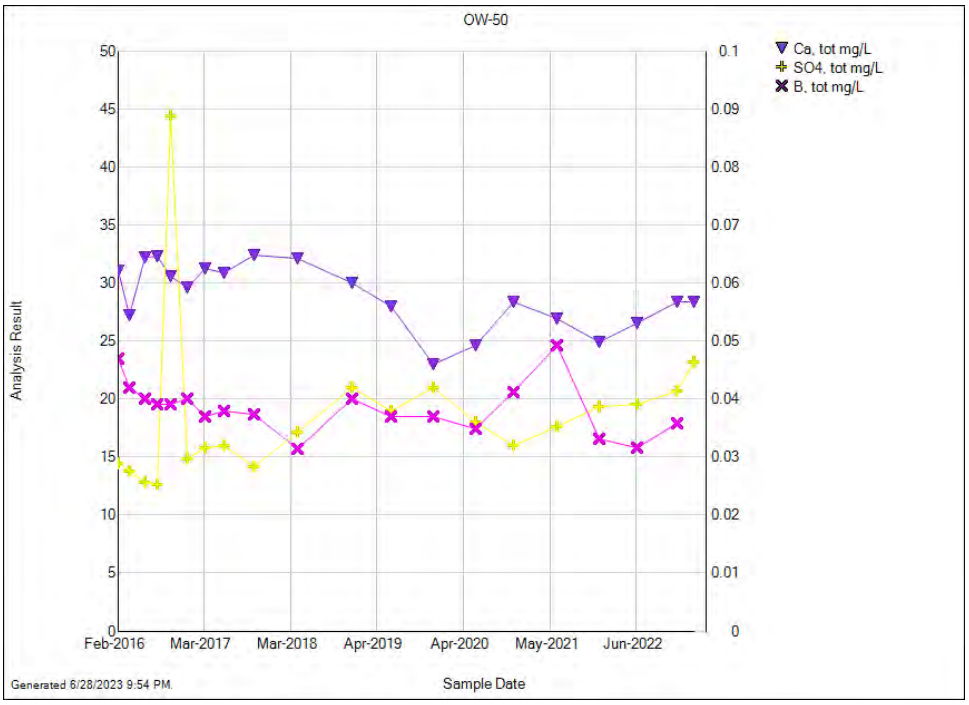


FIGURE B. Concentrations of calcium and sulfate compared to boron at OW-50.

3.3 LOE #3: Historic Concentrations of Sulfate in Groundwater Upgradient of the BABs are Similar to those Currently Observed in 0W-50

Sulfate has been detected historically in background monitoring wells at similar concentrations to those currently observed in OW-50 (Figure C). Sulfate was reported at elevated concentrations in OW-45 (23.9 mg/L) and in OW-46 (93.6 mg/L) in 2016. The concentration detected at OW-50 in D11 (20.7 mg/L) and D11R (23.2 mg/L) are less than these historic values.

The presence of historic sulfate concentrations in background wells at concentrations similar to those currently observed at OW-50 indicate that the SSIs detected at OW—50 are not attributable to the BABs.

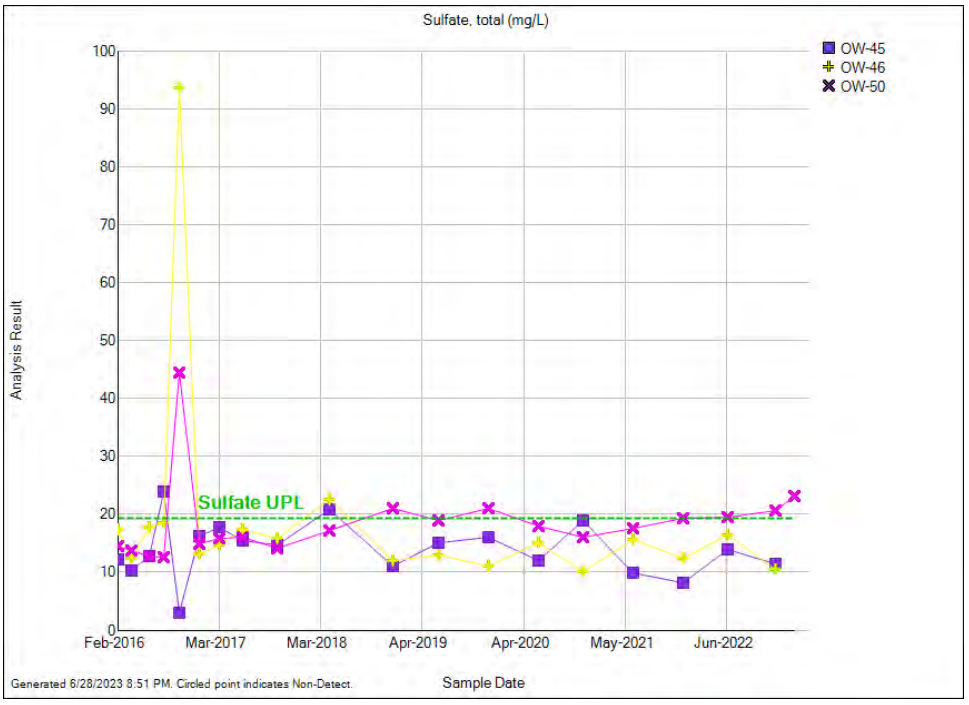


FIGURE C. Concentrations of sulfate in select monitoring wells.

3.4 LOE #4: Variable Groundwater Elevations Result in Natural Variability

Changes in groundwater elevation can expose aquifer materials to different geochemical conditions which affect the mobility of inorganic parameters. At OW-50 during D11 and D11R, the observed groundwater elevations (1144.12 ft and 1143.72 ft) are two of the lowest measured since the well was installed in 2016 (Figure D). Comparison or the water elevation to the screened interval elevation indicates that the water level was very near the top of the screen or within the screened interval (1144.09 ft, Appendix A).

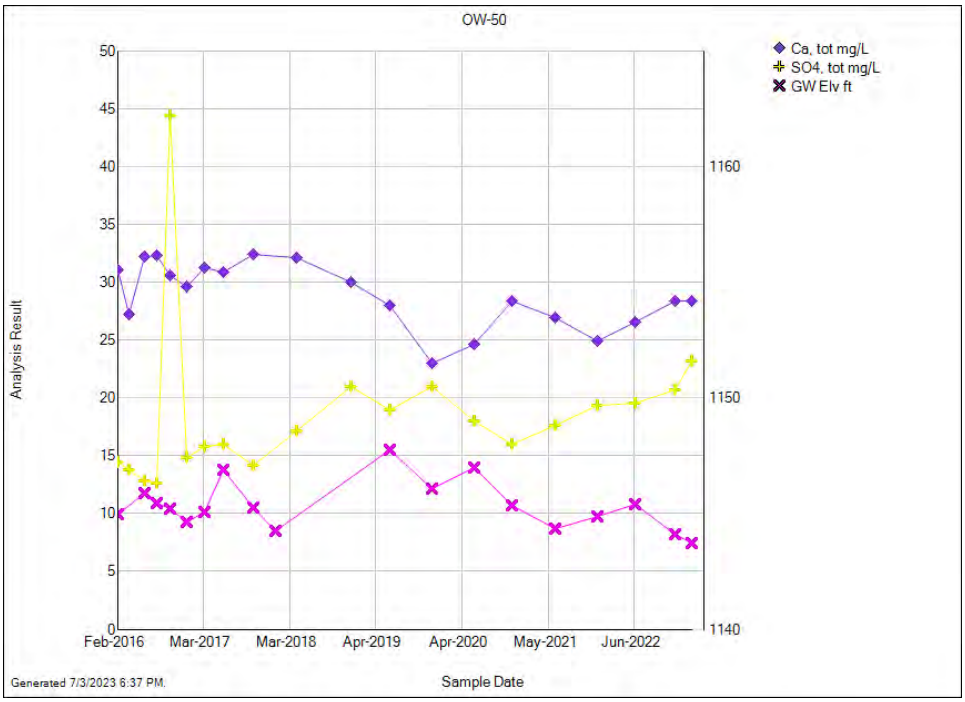


FIGURE D. Concentrations of calcium and sulfate compared to groundwater elevations in OW-50.

This condition allows oxygen to interact directly with materials in the screened interval and can affect the concentrations detected in OW-50. Comparing the concentrations of sulfate to dissolved oxygen show a low positive correlation, indicating that low water levels may result in higher sulfate (Figure F).

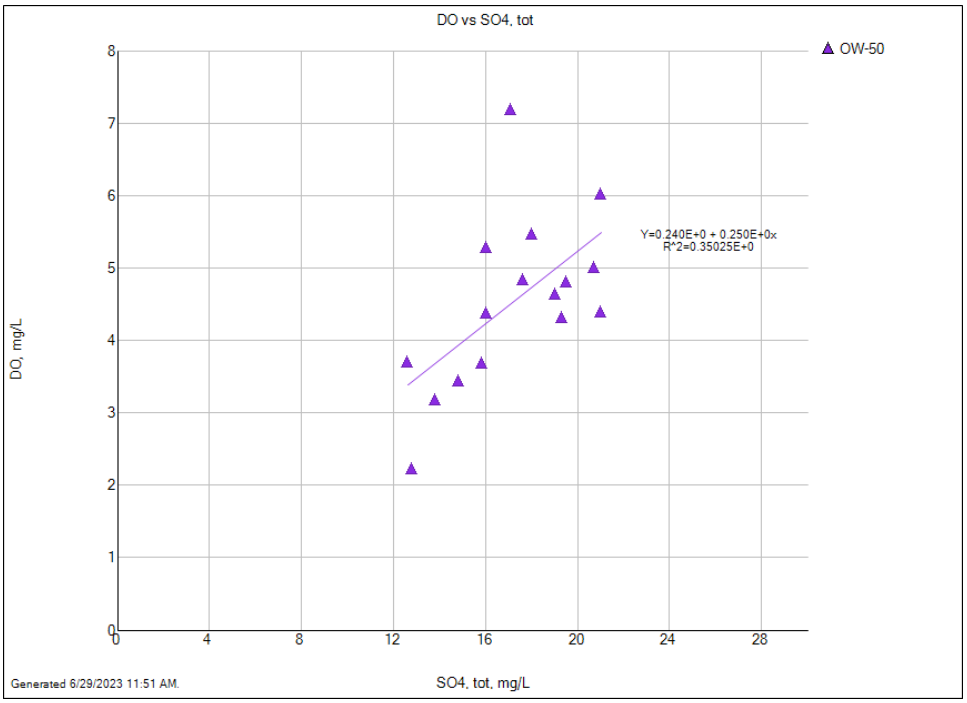


FIGURE E. Concentrations of dissolved oxygen versus sulfate in OW-50. Note a statistical outlier was removed from the data set.

3.5 LOE #5: Measurements of pH in CCR leachate are elevated compared to groundwater

The pH measured in OW-50 during D11 (5.6) and D11R (5.7) falls below the lower prediction limit calculated from background wells OW-45 and OW-46 (6.1). The pH measured within the CCR unit in October 2017 and January 2018 was 7.7 and 8.3, respectively. A release from the CCR unit would result in an increase in pH in the groundwater, not a decrease as reflected in the D11 and D11Rmeasurements in OW-50. This suggests the BABs are not the source of low pH measurements in OW-50 during D11 and D11R.

4. CONCLUSIONS

The following LOEs demonstrate that the SSIs observed during D11 are due to alternate sources as follows:

1. Recently retrofitted and compliant liner design.
2. Downgradient concentrations of CCR indicator parameter boron do not exceed background limits.
3. Historic concentrations of sulfate in groundwater upgradient of the BABs are similar to those currently observed in OW-50.
4. Groundwater elevations are variable and result in natural variability in groundwater quality.
5. Measurements of pH in CCR leachate are elevated compared to groundwater.

The preceding information serves as the ASD prepared in accordance with 40 C.F.R. §257.94(e)(2) and supports the position that the SSIs observed during the D11 detection monitoring event are not due to a release from the CCR unit but were from naturally occurring conditions and/or anthropogenic impacts in the area of the BAB. Therefore, no further action (i.e., assessment monitoring) is warranted and the BAB will remain in detection monitoring.

5. REFERENCES

Black & Veatch Corporation, 2004. January 14, 2004, Weston North Unit 4 Geotechnical Report Revision 0, Rothschild, Wisconsin prepared for Wisconsin Public Service Corporation.

Electric Power Research Institute [EPRI], (2012). Groundwater Quality Signatures for Assessing Potential Impacts from Coal Combustion Product Leachate, Report 1017923. October 2012.

GEI, 2018. Construction Documentation Report. Weston Units 3 & 4 Bottom Ash Basin Liner Retrofit, Weston Generating Station, Rothschild, WI, January 10, 2018.

Natural Resource Technology, an OBG Company, 2017. *Statistical Analysis Plan, Weston Disposal Site No. 3, Rothschild, Wisconsin*. October 17, 2017.

FIGURES

CCR RULE MONITORING WELL LOCATION

GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD 88)

GROUNDWATER FLOW DIRECTION

UNIT BOUNDARY

0 125 250 Feet

UPPERMOST AQUIFER UNIT
GROUNDWATER ELEVATION CONTOUR MAP
DETECTION MONITORING ROUND 11:
DECEMBER 5, 2022

ALTERNATE SOURCE DEMONSTRATION
DETECTION MONITORING ROUND 11
WESTON GENERATING STATION
UNITS 3 & 4 BOTTOM ASH BASINS
ROTHSCHILD, WISCONSIN

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\GIS\Projects\16\1660\Weston_Units3_4_BABM\MXD\ASD\Round_11\Figure 2_GW Contours 202212.mxd

PROJECT: 169000XXXX | DATED: 6/30/2023 | DESIGNER: GALARNMC

APPENDIX A
BORING LOG AND WELL CONSTRUCTION (OW-50)

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Wisconsin Public Service Corp/Weston	Local Grid Location of Well: _____ ft. ☐N. ☐S. _____ ft. ☐E. ☐W.	Well Name: OW50
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ■ Lat. 44° 51' 14" Long. 89° 39' 24" or	Wis. Unique Well No. _____ DNR Well ID No. _____
Facility ID _____	St. Plane 163447.30 ft. N, 274395.86 ft. E. S/C/N	Date Well Installed 12/08/2015 (m m d d y y y y)
Type of Well: Well Code 11 / mw	Section Location of Waste/Source: _____ 1/4 of _____ 1/4 of Sec. _____, T. _____ N, R. _____ ☐E ☐W	Well Installed By: Name (first, last) and Firm: John Noyes / Cabeno Environmental Field Services
Distance from Waste/Source _____ ft.	Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ■ Sidegradient d ☐ Downgradient n ☐ Not Known
		Gov. Lot Number _____

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation 1175.56 ft. MSL

C. Land surface elevation 1174.09 ft. MSL

D. Surface seal, bottom _____ ft. MSL or 28 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ■ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ■ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ■ 41
_____ Other ☐

15. Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ■ 99

16. Drilling additives used? ☐ Yes ■ No
Describe _____

17. Source of water (attach analysis, if required):
N/A

E. Bentonite seal, top _____ ft. MSL or 0 ft.

F. Fine sand, top _____ ft. MSL or _____ ft.

G. Filter pack, top 1146.09 ft. MSL or 28 ft.

H. Screen joint, top 1144.09 ft. MSL or 30 ft.

I. Well bottom _____ ft. MSL or 40 ft.

J. Filter pack, bottom _____ ft. MSL or 40 ft.

K. Borehole, bottom _____ ft. MSL or 40 ft.

L. Borehole, diameter 4.3 in.

M. O.D. well casing 2.4 in.

N. I.D. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: _____ ft.
c. Material: Aluminum Steel ☐ 04 Other ■
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____

3. Surface seal: Bentonite ■ 30 Concrete ☐ 01 Other ☐
_____

4. Material between well casing and protective pipe:
Bentonite ■ 30 Other ☐
_____

5. Annular space seal: a. Granular/Chipped Bentonite ■ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite chips ■ 32
c. _____ Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added _____ ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. #30
b. Volume added _____ ft^3

9. Well casing: Flush threaded PVC schedule 40 ■ 23
Flush threaded PVC schedule 80 ☐ 24
_____ Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ■ 11 Continuous slot ☐ 01
_____ Other ☐
b. Manufacturer _____
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None ■ 14
_____ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm: Hard Hat Environmental Services LLC

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Revelopment ☐ Other ☐ _____

Page 1 of 1

Facility/Project Name: WISCONSIN PUBLIC SERVICE CORP/WESTON	License/Permit/Monitoring Number	Boring Number: OW50	
Boring Drilled By: Name of crew chief (first, last) and Firm — First Name: JOHN Last Name: NOYES; Firm: CABELO ENVIRONMENTAL FIELD SERVICES	Date Drilling Started: 12/08/2015	Date Drilling Completed: 12/08/2015	Drilling Method: DIRECT PUSH GEOPROBE MODEL 7822
WI Unique Well No.	DNR Well ID No.	Well Name: OW50	Final Static Water Level: _____ Feet MSL
Surface Elevation: 1174.09 Feet MSL	Borehole Diameter: _____ inches		
Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐ State Plane 163447.30 N, 274395.86 E	Lat 44°51'14" Long 89°39'24"	Local Grid Location: _____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W	
_____ 1/4 of _____ 1/4 of Section _____, T _____ N, R _____			
Facility ID	County: MARATHON	County Code: 37	Civil Town/City/ or Village: ROTHSCHILD

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet (Below ground surface)	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	SILT; black; non-plastic; moist trace sand and gravel	ML									
SS1			5	SAND; brown; fine grained; well sorted; moist; trace gravels	SP									
SS2			10											
SS3			15											
SS4			20											
SS5			25	@22' grades fine to coarse; trace to some gravels	SW									
SS6			30	@30' grades wet										▽
SS7			35											
SS8			40	END OF BORING @40'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm: HARD HAT ENVIRONMENTAL SERVICES LLC

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.