2022 Annual Groundwater Monitoring and Corrective Action Report

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25222068.00 | January 31, 2023

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OVERVIEW OF CURRENT STATUS

Edgewater Generating Station, Surface Impoundments
2022 Annual Report

In accordance with §257.90(e)(6), this section at the beginning of the annual report provides an overview of the current status of groundwater monitoring and corrective action programs for the coal combustion residual (CCR) units. The groundwater monitoring system at the Edgewater Generating Station is a multiunit system. Supporting information is provided in the text of the annual report.

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(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;	Detection
Monitoring Status – End of Year	(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;	Detection
Statistically Significant Increases (SSIs)	(iii) If it was determined that there was an SSI over background for one or more constituents listed in appendix III to this part pursuant to §257.94(e):	
	(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and	<u>October 2021</u> Boron: MW-301, MW-302, MW-303 Fluoride: MW-302 Sulfate: MW-301, MW-302 <u>April 2022</u> Boron: MW-301, MW-302, MW-303 Fluoride: MW-302 Sulfate: MW-301, MW-302
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Alternative Source Demonstrations prepared for October 2021 and April 2022 events during 2022. Assessment monitoring not required.

Category	Rule Requirement	Site Status
Statistically Significant Levels (SSL) Above Groundwater Protection Standard (GPS)	(iv) If it was determined that there was an SSL above the GPS for one or more constituents listed in appendix IV to this part pursuant to §257.95(g) include all of the following:	Not applicable – Appendix IV parameter sampling not required
	(A) Identify those constituents listed in appendix IV to this part 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; and	
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not applicable – Site is in detection monitoring
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable – Site is in detection monitoring

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1.0 INTRODUCTION

This 2022 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 Code of Federal Regulations (CFR) 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in italics, followed by applicable information relative to the 2022 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

This report covers the period of groundwater monitoring from January 1, 2022, through December 31, 2022.

The groundwater monitoring system at the Edgewater Generating Station (EDG) is a multiunit system. EDG has four closed CCR units, which are contiguous:

- EDG Slag Pond (existing CCR surface impoundment)
- EDG North A-Pond (existing CCR surface impoundment)
- EDG South A-Pond (existing CCR surface impoundment)
- EDG B-Pond (existing surface CCR impoundment)

The system is designed to detect monitored constituents at the waste boundary of the CCR units as required by 40 CFR 257.91(d). The groundwater monitoring system consists of one upgradient and three downgradient monitoring wells (**Table 1**, **Figure 1**, and **Figure 2**).

Closure of the four ponds was completed in 2021. The Notification of Completion of Closure pursuant to 40 CFR 257.102(d) was entered into the EDG CCR Operating Record on August 10, 2021.

2.0 BACKGROUND

To provide context for the required annual report information, the following background information is provided in this section of the report, prior to the required information:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

For the purposes of groundwater monitoring, the unconsolidated sand and gravel aquifer is considered to be the uppermost aquifer, as defined under 40 CFR 257.53, at the EDG ponds. A summary of the regional hydrogeologic stratigraphy and a regional geologic cross section are included in **Appendix A**.

The sand and gravel aquifer is present in some parts of Sheboygan County (Skinner and Borman, 1973). Boring logs from monitoring wells at the EDG ponds and for nearby private wells indicate that the unconsolidated material at and near the site contains a significant amount of sand. Private well logs from the surrounding area indicate that the sand and gravel aquifer has been used as a water

source; however, several older sand wells in the area have been replaced with bedrock water supply wells. In a search of area well records, SCS Engineers (SCS) did not find any records indicating that shallow wells are still being used in the area around EDG.

The dolomite aquifer underlies the unconsolidated material at the site. The total thickness of the dolomite aquifer at the site is unknown. The dolomite aquifer is underlain by the Maquoketa shale, which is a confining unit. The Maquoketa shale is underlain by the Cambrian-Ordovician sandstone aquifer. This sequence of sedimentary bedrock units is over 1,500 feet thick in the site vicinity. The sedimentary sequence is underlain by Precambrian crystalline rocks that are not considered an aquifer in eastern Wisconsin.

2.1.2 Site Information

The site consists of four closed CCR surface impoundments that are monitored as a single Closure Area. Closure of the impoundments began in 2020 and was completed in 2021. Adjacent to the surface impoundments is an inactive CCR landfill that was closed prior to 2015 and the area as a whole is regulated by the Wisconsin Department of Natural Resources (Edgewater 1-4 Closed Ash Disposal Facility, License #2524). A groundwater monitoring network of 19 wells was installed at the site to meet state requirements prior to installation of additional monitoring wells to meet CCR Rule requirements. Soils at the site are primarily silt, sand, and some clay to a depth of approximately 80 to 140 feet and overlie dolomite bedrock. During drilling of CCR wells MW-301, MW-302, and MW-303, the unconsolidated materials were identified as consisting primarily of lean clay overlying sandy silt. The boring log for the previously installed background monitoring well 2R-OW shows lean clay as the primary unconsolidated material at this location. The boring logs for Ash Ponds CCR monitoring wells are provided in **Appendix B**. All CCR monitoring wells are screened within the unconsolidated glacial aquifer.

Shallow groundwater in the area of the EDG site generally flows to the south-southeast. There is some localized groundwater mounding associated with the topographic highs of the closed EDG landfill and ponds. The water table maps shown on **Figures 3** and **4** are based on groundwater levels measured in the unconsolidated deposits during the April 2022 and October 2022 detection monitoring events. A summary of the sampling events that occurred throughout 2022 is shown in **Table 2**. The water table maps show a generally southward flow direction. The localized groundwater mounding in the area of the closed EDG landfill and ponds has decreased since closure of the ponds. The groundwater elevations are summarized in **Table 3A** (state wells) and **Table 3B** (CCR wells). Horizontal gradients and flow velocities for each of the flow paths are provided in **Table 4.**

2.2 CCR MONITORING SYSTEM

The groundwater monitoring system established under the CCR Rule consists of one upgradient (background) monitoring well and three downgradient monitoring wells (**Table 1** and **Figure 2**). The upgradient monitoring well is 2R-OW. The downgradient monitoring wells include MW-301, MW-302, and MW-303. The CCR compliance monitoring wells were installed in the unconsolidated sediments with screens in the uppermost soil layer producing appreciable water, which was a sandy silt unit. Well depths range from approximately 14.5 to 40 feet, measured from the top of the well casing.

3.0 §257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR*

landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by §257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

3.1 §257.90(E)(1) SITE MAP

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;

A map of the site location is provided as **Figure 1**. A map with an aerial image showing the CCR units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 2**.

3.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

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;

No new monitoring wells were installed, and no wells were decommissioned as part of the groundwater monitoring program for the CCR units in 2022.

3.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

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;

Two semiannual groundwater sampling events were completed in April and October 2022 for Appendix III constituents. 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 or assessment monitoring programs is included in **Table 2**.

The validation and evaluation of the April 2022 monitoring event data was completed and transmitted to WPL on July 29, 2022. The validation and evaluation of the October 2022 monitoring event data was in progress at the end of 2022 and will be transmitted to WPL in 2023; therefore, the October 2022 monitoring results and analytical report will be included in the 2023 annual report. The groundwater elevations are included in this report.

The sampling results for Appendix III parameters in April 2022 are summarized in **Table 5.** Field parameter results for the April 2022 sampling event are provided in **Table 6**. The analytical

laboratory reports for April 2022 are provided in **Appendix C**. Historical results for each monitoring well through April 2022 are summarized in **Appendix D**.

3.4 §257.90(E)(4) MONITORING TRANSITION NARRATIVE

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 over background levels);

There were no transitions between monitoring programs in 2022. The EDG CCR units remained in the detection monitoring program.

In 2022, the monitoring results for the October 2021 and April 2022 monitoring events were evaluated for statistically significant increases (SSIs) in detection monitoring parameters relative to background. The comparison to background was based on a prediction limit approach, comparing the results to interwell upper prediction limits (UPLs) based on background monitoring results from the upgradient well (2R-OW). The interwell UPLs were most recently updated in January 2021 using background data collected through October 2020. The January 2021 Statistical Analysis was included as an appendix in the 2021 Annual Groundwater Monitoring Report. The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (U.S. EPA, 2009; Section 5.3.1) recommends periodic updating of background for both intrawell and interwell analyses. For semiannual monitoring, an update interval of 2 to 3 years is recommended; therefore, the next UPL update is planned for 2023.

SSIs for boron, fluoride, and sulfate were identified for both the October 2021 and April 2022 events; however, alternative source demonstrations (ASDs) were completed, demonstrating that a source other than the CCR units was the likely cause of the observed concentrations. The ASD reports are provided in **Appendix E**.

3.5 §257.90(E)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §257.90 through 257.98.

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in italics, followed by applicable information relative to the 2022 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

3.5.1 §257.90(e) General Requirements

For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year.

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program was in detection monitoring throughout 2022.

Summary of Key Actions Completed (2022):

- Statistical evaluation and determination of SSIs for the October 2021 and April 2022 monitoring events.
- ASD reports for the SSIs identified from the October 2021 and April 2022 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2022).

Description of Any Problems Encountered. No problems were encountered in 2022.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2023):

- Statistical evaluation and determination of any SSIs for the October 2022 and April 2023 monitoring events.
- If an SSI is determined, then within 90 days either:
  - Complete alternative source demonstration (if applicable), or
  - Establish an assessment monitoring program.
- Two semiannual groundwater sampling and analysis events (April and October 2023).

3.5.2 §257.94(d) Alternative Detection Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by §257.90(e).

Not applicable. No alternative detection monitoring frequency has been proposed.

3.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by §257.90(e), in addition to the certification by a qualified professional engineer.

The ASD reports prepared to address the SSIs observed for the October 2021 and April 2022 sampling events are provided in **Appendix E**. The ASD reports are certified by a qualified professional engineer.

3.5.4 §257.95(c) Alternative Assessment Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by §257.90(e).

Not applicable. Assessment monitoring has not been initiated.

3.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under §257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by §257.90(e).

Not applicable. Assessment monitoring has not been initiated.

3.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by §257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Assessment monitoring has not been initiated.

3.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by §257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Corrective measures assessment has not been initiated.

3.6 §257.90(E)(6) OVERVIEW

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.

The specific requirements for the overview under §257.90(e)(6) are listed and the information is provided at the beginning of this report, before the Table of Contents.

4.0 REFERENCES

Skinner, Earl L., and Borman, Ronald G., 1973, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigation Atlas HA-432.

U.S. EPA, 2009, The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities.

Tables

Table 1. Groundwater Monitoring Well Network
Edgewater 1-4 Closed Ash Disposal Facility
SCS Engineers Project #25222068.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
2R-OW	Upgradient	Background
MW-301	Downgradient	Compliance
MW-302	Downgradient	Compliance
MW-303	Downgradient	Compliance

Created by: NDK Date: 9/19/2022
Last revision by: NDK Date: 9/19/2022
Checked by: RM Date: 12/20/2022

Table 2. CCR Rule Groundwater Samples Summary
Edgewater 1-4 Closed Ash Disposal Facility
SCS Engineers Project #25222068.00

Sample Dates	Compliance Wells			Background Well
	MW-301	MW-302	MW-303	2R-OW
4/13/2022	D	D	D	D
10/6/2022	D	D	D	D
Total Samples	2	2	2	2

Abbreviations:
D = Required by Detection Monitoring Program

Created by: NDK Date: 9/19/2022
Last revision by: NDK Date: 10/18/2022
Checked by: RM Date: 12/20/2022

I:\25222068.00\Deliverables\2022 Fed CCR Annual Report\Tables\[Table 2 - Groundwater Samples Summary.xlsx]GW Summary

Table 3A. Groundwater Elevations - State Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25222068.00

	Ground Water Elevation in feet above mean sea level (amsl)																					
Well Number	**1-OW**	**2R-OW**	**3R-OW**	**4R-OW**	**5-OW**	**W-5A**	**6-AR**	**6R-OW**	**7A-OW**	**7-OW**	**18-OW**	**29-OW**	**29-A**	**30-OW**	**31-OW**	**32-OW**	**36-OW**	**37-OW**	**38R-OW**	**39R-OW**	**40-OW**	**SG-01**
Top of Casing Elevation (ft amsl)^	592.18	611.85	591.59	594.68	600.94	600.66	590.78	591.74	593.45	593.19	ABAND	588.72	588.43	591.13	589.22	589.21	ABAND	615.30	620.24	614.27	586.69	ABAND
Total Depth (ft from top of casing)	11.10	17.53	15.82	16.48	10.65	21.51	19.86	10.37	20.21	9.93	14.25	19.96	43.12	14.88	14.98	14.95	21.01	18.55	29.00	22.29	17.3	
Measurement Date																						
October 24, 2012	588.11	607.82	582.64	585.24	595.63	596.69	587.42	587.40	592.00	589.78	583.49	585.33	586.60	586.40	582.58	583.63	599.77	599.42	599.38	598.05		597.60
April 18, 2012					595.89	597.13	587.33	587.35	592.35	589.79		585.32	588.39									
October 24, 2012					595.63	596.69	587.42	587.40	592.00	589.78		585.33	586.60									
April 8, 2013	588.50	609.92	588.37	586.35	596.66	597.65	588.40	587.34	592.79	589.95	583.97	585.78	588.07	588.57	584.35	584.50	600.79	600.24	600.16	598.30	--	597.9
October 22, 2013	584.88	601.15	580.90	584.46	594.23	595.64	582.64	584.83	591.23	587.24	NM [1]	584.70	586.76	582.19	580.40	580.76	599.13	598.22	598.42	596.56	--	598.0
April 22, 2014	588.05	609.22	587.99	586.11	595.18	597.10	587.00	587.37	589.27	589.51	NM [1]	585.38	588.22	587.53	583.75	583.75	NM [1]	599.67	599.38	598.56	--	597.8
October 28, 2014	586.14	607.27	586.30	585.08	595.33	596.51	587.68	586.99	591.92	589.29	NM [1]	585.00	587.84	585.48	582.88	582.68	600.07	599.81	599.26	598.37	--	595.85
April 7 - 9, 2015	587.90	608.47	587.44	585.52	595.66	596.76	586.99	587.50	591.95	588.50	ABAND	585.44	587.55	586.29	583.21	583.87	599.69	599.21	599.21	597.46	583.77	597.6
October 8, 2015	584.78	604.22	583.34	584.52	594.76	594.47	582.65	585.67	591.23	589.71	ABAND	584.69	587.27	584.26	581.60	582.52	600.29	599.47	599.70	598.09	583.01	--
April 4-5, 2016	588.40	610.02	587.72	586.69	596.70	597.81	584.52	585.68	592.41	587.93	ABAND	582.95	587.25	586.91	584.35	584.47	601.05	601.37	601.18	601.13	579.28	599
October 17, 2016 [2]	587.50	607.27	586.71	585.15	595.41	596.82	584.34	586.61	592.01	587.65	ABAND	581.25	586.10	586.23	583.02	583.83	600.87	600.70	600.74	599.49	579.42	
April 12-13, 2017	588.23	609.80	587.95	586.31	596.08	597.69	586.77	587.32	592.19	587.06	ABAND	583.74	585.43	585.36	583.68	584.52	602.01	602.11	602.08	601.29	584.02	
October 9, 2017	584.14	600.87	581.00	584.49	594.68	596.04	583.03	583.51	590.50	585.96	ABAND	583.01	584.88	582.76	580.93	581.18	600.18	598.48	599.65	598.07	583.05	
April 2, 2018	587.79	607.87	586.63	586.68	595.73	596.88	586.80	587.44	591.76	589.62	ABAND	585.51	587.11	585.68	582.95	582.85	600.71	600.00	600.04	597.99	583.64	
June 19, 2018	NM	605.70	585.49	585.20	595.41	NM	NM	NM	NM	587.20	ABAND	585.43	585.79	584.96	582.29	NM	NM (1)	600.44	600.68	599.61	583.07	NM
October 1, 2018	585.37	604.61	584.18	584.86	595.24	596.44	586.10	586.86	591.01	588.75	ABAND	585.04	584.94	584.79	582.11	582.81	600.30	600.12	600.27	599.79	583.17	
April 8, 2019	588.57	609.50	588.01	591.93	596.03	597.33	584.61	587.35	591.92	590.06	ABAND	585.76	586.75	587.83	584.18	584.85	600.21	599.60	599.74	598.49	583.75	
October 9-10, 2019	587.85	609.39	587.39	585.99	595.68	596.92	586.42	587.24	591.66	587.53	ABAND	585.14	585.10	587.15	583.63	584.48	599.92	600.25	600.01	599.82	583.08	
April 8-9, 2020	588.03	608.97	587.70	586.05	595.57	596.89	585.74	586.95	591.61	587.76	ABAND	584.98	587.35	587.29	583.70	584.59	599.40	599.52	599.48	599.38	583.01	
October 14-15, 2020	584.62	604.37	582.20	584.54	593.27	594.86	582.71	583.45	588.81	586.53	ABAND	583.95	586.83	583.83	582.60	582.82	ABAND	596.87	NM	594.72	583.26	NM
April 14, 2021	587.95	608.50	587.64	585.42	594.87	596.13	586.53	587.29	591.28	589.89	ABAND	585.16	587.64	587.06	583.46	584.25	ABAND	DRY	596.50	593.95	583.08	NM
October 27-28, 2021	584.53	603.62	580.74	584.47	593.06	594.70	579.90	584.60	590.45	587.39	ABAND	584.60	586.65	582.89	581.88	582.02	ABAND	DRY	595.49	592.34	582.74	ABAND
February 28, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	ABAND	NM	NM	NM	NM	NM	ABAND	DRY	595.25	NM	NM	ABAND
April 13, 2022	588.64	608.63	588.30	585.06	595.72	595.11	586.08	588.15	591.60	590.70	ABAND	584.69	584.82	588.02	584.10	585.09	ABAND	DRY	594.43	DRY	583.09	ABAND
October 6, 2022	584.39	601.93	580.62	583.52	593.16	593.41	582.43	584.86	590.02	587.38	ABAND	583.21	584.18	583.09	581.55	581.98	ABAND	DRY	594.62	593.36	582.60	ABAND

Notes:
NM = not measured
ABAND = abandoned

Created by: MDB Date: 5/6/2013
Last revision by: MDB Date: 1/30/2023
Checked by: LMH Date: 1/30/2023

1: Well broken
2: Well casings at 7-OW, 7A, and 29-OW were cut down to allow the protective covers to close. 7-OW was cut down by 0.22 ft, 7A was cut down by 0.29 ft, and 29-OW was cut down by 0.17 ft. Top of casing elevations in this table were adjusted ac
*: Well was frozen

^: Monitoring well adjustments and resurveys:
Monitoring well 38R-OW was extended on October 30, 2020 during repairs following well damage by pond c losure construction equipment.
Monitoring Well 40-OW cut down to have a top of casing elevation of 586.05 famsl on December 3, 2021.
All active monitoring wells were resurveyed in January 2023. These elevations are retroactively applied to 2022 monitoring events.

I:\25222068.00\Deliverables\2022 Fed CCR Annual Report\Tables\[Table 3A - wlstat_Edgewater_Closed.xls]levels

Table 3B. Groundwater Elevations - CCR Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility /
SCS Engineers Project #25222068.00

Ground Water Elevation in feet above mean sea level (amsl)				
Well Number	**MW-301**	**MW-302**	**MW-303**	**2R-OW**
Top of Casing Elevation (feet AMSL)[1,2,4]	606.90	607.70	604.78	611.85
Screen Length (ft)	5.00	5.00	5.00	10.00
Total Depth (ft from top of casing)	27.47	40.00	33.26	14.50
Top of Well Screen Elevation (ft)	581.95	580.15	579.60	608.22
Measurement Date				
April 8, 2016	599.75	596.19	589.04	609.68
June 20, 2016	598.30	595.68	587.22	606.70
August 9, 2016	598.00	595.53	587.72	605.74
October 20, 2016	598.50	595.46	588.37	607.27
January 23-24, 2017	597.10	596.30	588.84	609.64
April 6, 2017	600.04	593.57	589.04	609.72
October 24, 2017	598.77	595.86	588.44	607.63
August 1, 2017	597.40	595.22	587.36	604.59
October 24, 2017	597.20	595.25	587.97	601.74
April 2, 2018	598.54	595.71	588.77	607.87
October 1, 2018	597.60	595.28	588.17	604.61
April 8, 2019	598.92	595.68	588.88	609.50
October 7, 2019	599.56	595.58	588.77	609.39
June 26, 2020	597.89	NM	NM	NM
October 15, 2020	595.10	590.18	585.07	604.27
April 14, 2021[3]	596.81	592.18	586.89	608.50
October 26, 2021[3]	592.32	591.44	585.95	604.04
April 13, 2022	597.37	593.05	587.99	608.63
October 6, 2022	592.69	591.96	586.42	601.93
Bottom of Well Elevation (ft)	576.95	575.15	578.73	598.22

Notes:
NM = not measured
(1): MW-302 and MW-303 were shortened in September 2020 due to site regrading during pond closure. The wells were resurveyed in November 2020.
(2): MW-301 was extended in November 2020 due to site regrading during pond closure. The well was resurveyed in November 2020.
(3): April and October 2021 groundwater elevations for MW-301, MW-302, and MW-303 were reported based on the original top of casing elevations in the April 2021 Annual Report. Groundwater elevations for these events are corrected in this table to reflect top of casing elevations surveyed in November 2020.
(4): All site wells were re-surveyed in January 2023, and elevations were tied to NGS benchmark PID #DE7593. Top of Casing elevations surveyed in January 2023 are shown in this table and were used to calculated April and October 2022 groundwater elevations.

Notes:
NM = not measured

Created by:	MDB	Date:	6/27/2016
Last rev. by:	MDB	Date:	1/30/2023
Checked by:	LMH	Date:	1/30/2023
Scientist QA/QC:	MDB	Date:	1/30/2023

I:\25222068.00\Deliverables\2022 Fed CCR Annual Report\Tables\[Table 3B - EGS_wlstat_CCR.xls]levels

Table 4. Horizontal Gradients and Flow Velocity - CCR Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility
SCS Engineers Project #25222068.00
January - December 2022

	Flow Path A - South				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/13/2022	590.00	587.99	300.31	0.01	0.00
10/6/2022	586.42	585.00	83.71	0.02	0.01

	Flow Path B - Southeast				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
10/6/2022	591.96	587.38	204.81	0.02	0.02

Wells	**K Value (cm/sec)**	**K Value (ft/d)**
MW-301	2.1E-05	0.060
MW-302	4.0E-04	1.139
MW-303	1.1E-04	0.304
Geometric	9.7E-05	0.274

Assumed Porosity, n
0.40

Groundwater flow velocity equation: V = [K*(Δh/Δl)] / n

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity
V = groundwater flow velocity
h1, h2 = point interpreted groundwater elevation at locations 1
Δl = distance between location 1 and 2
Δh/Δl = hydraulic gradient

Note:
1. See Figures 3 and 4 for velocity calculation flow path locations

Created by: NDK Date: 9/19/2022
Last revision by: RM Date: 1/13/2022
Checked by: TK Date: 1/14/2023

Table 5. Groundwater Analytical Results Summary - CCR Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25222068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	MW-301	MW-302	MW-303
		4/13/2022	4/13/2022	4/13/2022	4/13/2022
Appendix III					
Boron, µg/L	86	27.9 1q	7,240	1,460	4,360
Calcium, µg/L	200,000	160,000	89,300	61,500	139,000
Chloride, mg/L	400	275	14.0	21.2	23.4
Fluoride, mg/L	0.2	<0.95 D3	<0.095	0.91	<0.48 D3
Field pH, Std. Units	8.57	7.20	7.38	7.70	6.78
Sulfate, mg/L	36	18.5 J, D3	212	68.5	<2.2 D3
Total Dissolved Solids, mg/L	1,190	866	560	318	722

4.4 Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:
UPL = Upper Prediction Limit
-- = Not Applicable
LOD = Limit of Dete mg/L = milligrams per liter
LOQ = Limit of Quar µg/L = micrograms per liter

Lab Notes:
D3 = Sample was diluted due to the presence of high levels of non-target analytes
J = Estimated concentration at or above the LOD and below the LOQ.
1q = Analyte was measured in the associated method blank at -3.1 ug/L.

Notes:
1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well 2R-OW. Interwell UPLs based on 1-of-2 retesting approach. The interwell UPLs were updated in January 2021 using data from April 2016 through October 2020.

Created by: NDK Date: 9/19/2022
Last revision by: RM Date: 11/22/2022
Checked by: NDK Date: 11/22/2022
Scientist/PM QA/QC: NDK Date: 11/22/2022

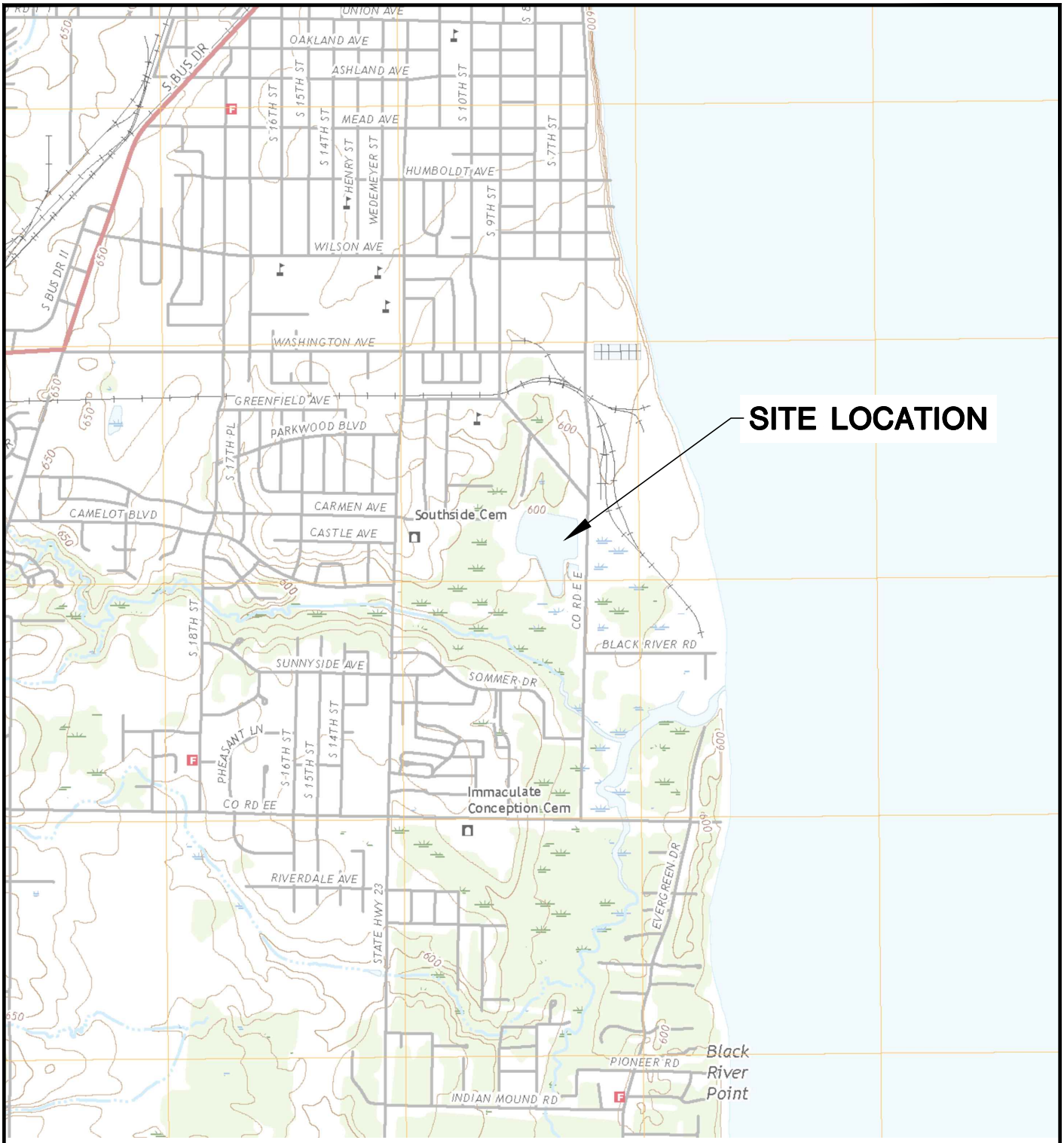
Table 6. Groundwater Field Data Summary - CCR Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25222068.00

Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-301	4/13/2022	594.89	9.0	7.38	2.82	777	417.1	25.6
MW-302	4/13/2022	600.50	8.7	7.70	1.39	488	337.4	26.2
MW-303	4/13/2022	595.20	8.6	6.78	1.98	1,224	330.2	75.1
2R-OW	4/13/2022	609.50	7.5	7.20	6.72	1,549	425.6	205

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
mV = millivolts
ft amsl = feet above mean sea level
ORP = Oxidation-reduction potential

Created by:	NDK	Date:	9/19/2022
Last revision by:	AJR	Date:	10/19/2022
Checked by:	NDK	Date:	11/18/2022

Figures



N

SHEBOYGAN SOUTH QUADRANGLE
WISCONSIN–SHEBOYGAN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	WISCONSIN POWER AND LIGHT EDGEWATER GENERATING STATION 3739 LAKESHORE DRIVE SHEBOYGAN, WI 53081	SITE	EDGEWATER 1–4 (CLOSED) ASH DISPOSAL FACILITY SHEBOYGAN, WISCONSIN

SITE LOCATION MAP

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/16/2023	APPROVED BY:	TK, 1/16/2023

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE 1

I:\25222068.00\Drawings\Site Location Map.dwg, 1/16/2023 1:42:33 PM

LEGEND

- CCR RULE MONITORING WELL
- CCR RULE BACKGROUND MONITORING WELL
- ADDITIONAL MONITORING WELL
- ADDITIONAL PIEZOMETER
- ABANDONED MONITORING WELL
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. CCR UNIT LIMITS AND CLOSED LANDFILL LOCATION ARE APPROXIMATE.
4. MONITORING WELLS MW-301, MW-302, AND MW-303 WERE INSTALLED BY BADGER STATE DRILLING BETWEEN JANUARY 14 AND FEBRUARY 4, 2016.
5. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER GENERATING STATION IS 2R-OW.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/16/2023	APPROVED BY:	TK, 1/16/2023

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT

WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE

EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

\\Mad-fs01\data\Projects\25222068.00\Drawings\Site Plan and Monitoring Well Locations.dwg, 1/16/2023 1:43:35 PM

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LEGEND

- ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- ABANDONED STAFF GAUGE
- CCR UNITS
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- 598.54 WATER TABLE ELEVATION (APRIL 13, 2022)
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. EXISTING WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. DESIGN MANAGEMENT ZONE LOCATION IS APPROXIMATE
4. NEW MONITORING WELL LOCATIONS WERE SURVEYED BY CQM, INC. ON FEBRUARY 12, 2016.
5. MW-301, MW-302, AND MW-303 ARE NOT INCLUDED IN THE WDNR-APPROVED SITE-SPECIFIC MONITORING PLAN
6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON APRIL 13, 2022.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	KP
DRAWN:	05/12/2022	CHECKED BY:	NDK
REVISED:	01/30/2023	APPROVED BY:	TK, 1/30/23

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
APRIL 2022

FIGURE 3

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N

LEGEND

- ⊕ ABANDONED MONITORING WELL
- ◔ CCR MONITORING WELL
- ◔ MONITORING WELL
- ◎ PIEZOMETER
- ◐ ABANDONED STAFF GAUGE
- CCR UNITS
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- — — — CLOSED LANDFILL LIMITS
- ---------- DESIGN MANAGEMENT ZONE
- **598.54** WATER TABLE ELEVATION (OCTOBER 6, 2022)
- WATER TABLE CONTOUR (5' INTERVAL)
- → APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. EXISTING WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. DESIGN MANAGEMENT ZONE LOCATION IS APPROXIMATE
4. NEW MONITORING WELL LOCATIONS WERE SURVEYED BY CQM, INC. ON FEBRUARY 12, 2016.
5. MW-301, MW-302, AND MW-303 ARE NOT INCLUDED IN THE WDNR-APPROVED SITE-SPECIFIC MONITORING PLAN
6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON OCTOBER 6, 2022.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	KP
DRAWN:	10/14/2022	CHECKED BY:	NDK
REVISED:	01/30/2023	APPROVED BY:	TK, 1/30/23

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT

WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE

EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
OCTOBER 2022

FIGURE
4

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Appendix A

Summary of the Regional Hydrogeologic Stratigraphy

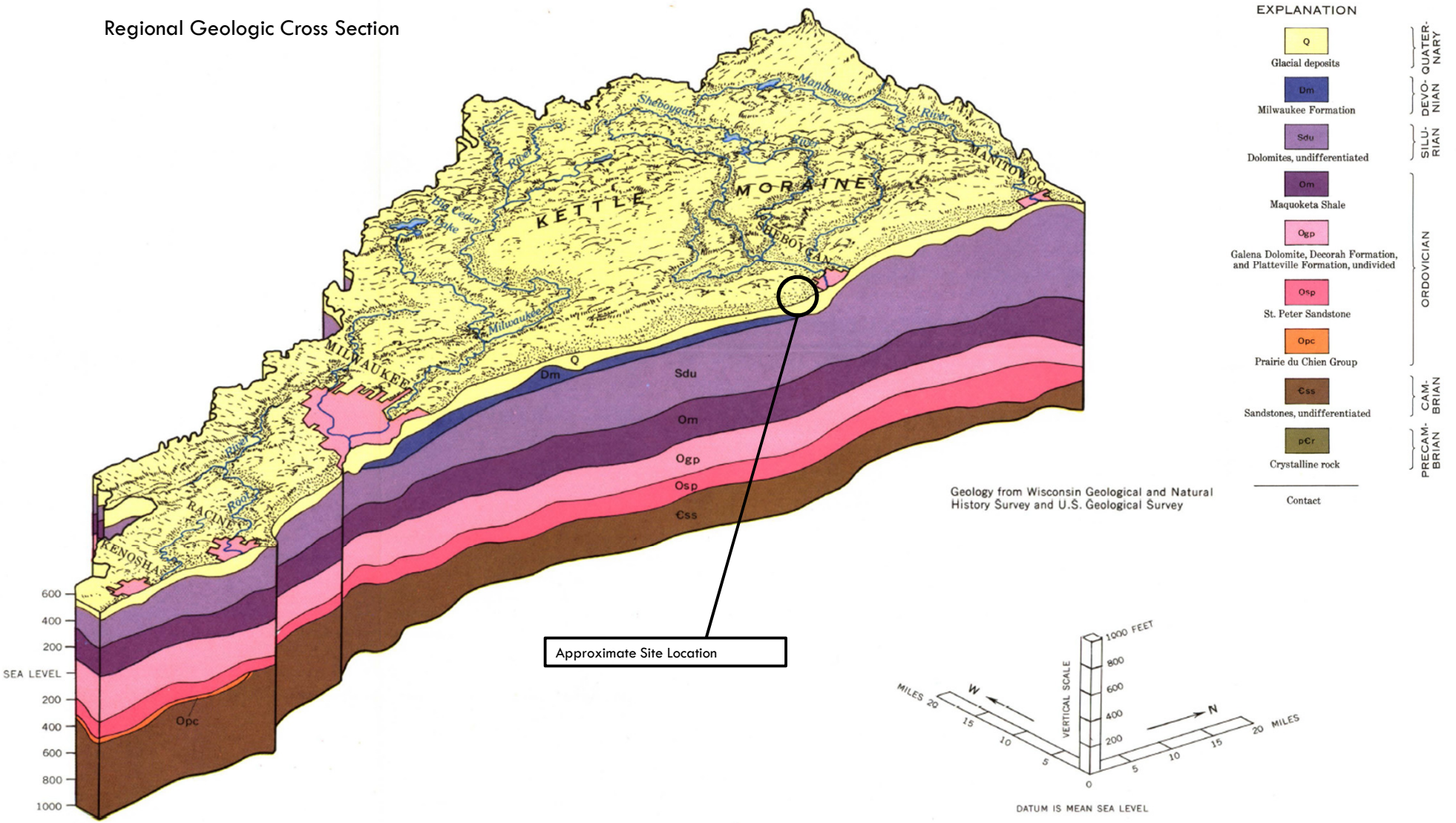
Table EGS-3. Regional Hydrogeologic Stratigraphy
Edgewater Generating Station / SCS Engineers Project #25215053

Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary	Sand and Gravel Aquifer	0 to 235	Surface sand and gravel	Sand and Gravel
		0 to 300	Buried sand and gravel	
Devonian	Niagara Dolomite Aquifer	0 to 750	Dolomite (undifferentiated)	Dolomite
Silurian				
Ordovician	Confining Unit	0 to 400	Maquoketa Shale	Shale and dolomite
	Sandstone Aquifer	100 to 340	Galena Decorah Platteville	Dolomite
		0 to 330	St. Peter	Sandstone
		0 to 140	Prairie du Chien	Dolomite
Cambrian		0 to 3,500?	Trempeleau Franconia Galesville Eau Claire Mt. Simon	Sandstone, some Dolomite and Shale
Precambrian	Not an Aquifer	Unknown	Crystalline Rocks	Igneous and metamorphic rocks

Source:
Skinner, Earl L. and Ronald G. Borman, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigations Atlas HA-432, 1973.

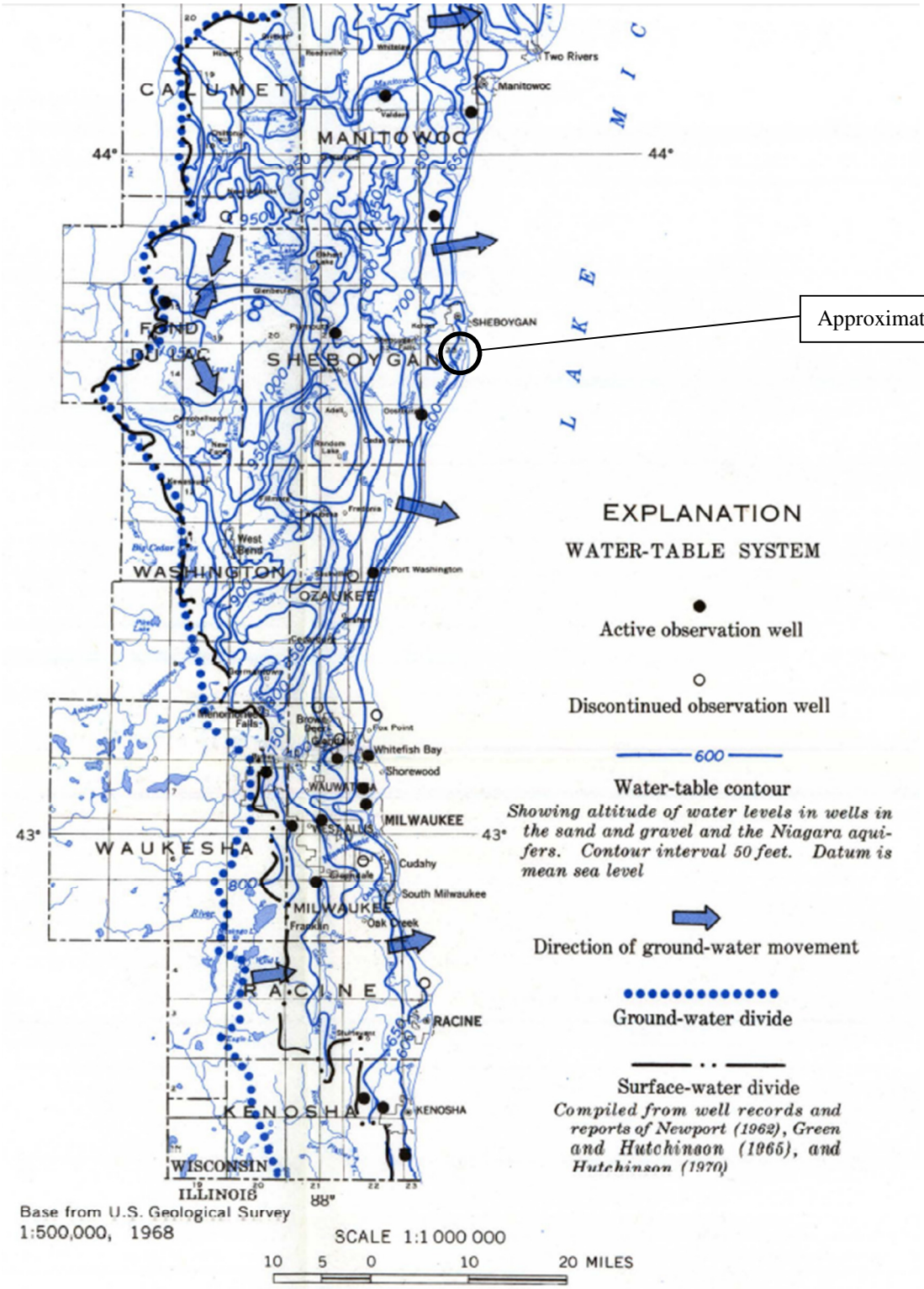
I:\25215053\Reports\Report 6 - EGS\Tables\Table_2_Regional_Hydrogeologic_Stratigraphy_I43.doc

Regional Geologic Cross Section



Source: Skinner, Earl L. and Ronald G. Borman, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigations Atlas HA-432, 1973.

Regional Groundwater Flow Map – Uppermost Aquifer



Source: Skinner, Earl L. and Ronald G. Borman, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigations Atlas HA-432, 1973.

Appendix B

Boring Logs and Well Construction Documentation

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: WPL Edgewater Site
Facility License, Permit or Monitoring Number: 025524
Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12
Distance Well Is From Waste/Source Boundary: ____ ft.
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No

Local Grid Location of Well: 1771.89 ft. ☒ N. ☐ S. 1599.69 ft. ☐ E. ☒ W.
Grid Origin Location: Lat. ____ Long. ____ or
St. Plane ____ ft. N, ____ ft. E.
Section Location of Waste/Source: NW 1/4 of NE 1/4 of Sec. 2, T. 14 N, R. 23 ☒ E. ☐ W.
Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known

Well Name: 2A-OW
Wis. Unique Well Number / DNR Well Number: ____
Date Well Installed: 4/29/98 (m m d d y y)
Well Installed By: (Person's Name and Firm)
Mike McArdle
M+K Environmental

A. Protective pipe, top elevation 612.80 ft. MSL
B. Well casing, top elevation 612.72 ft. MSL
C. Land surface elevation 610.3 ft. MSL
D. Surface seal, bottom ____ ft. MSL or 1.0 ft.

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

13. Sieve analysis attached? ☐ Yes ☐ No

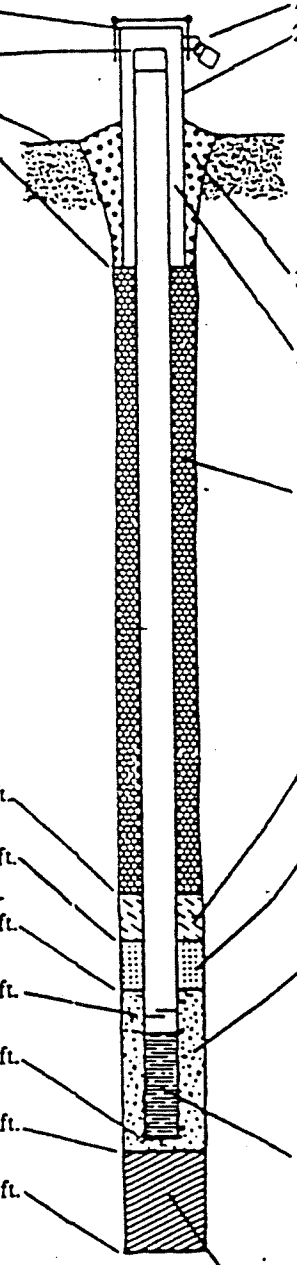
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ __

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):
____

E. Bentonite seal, top ____ ft. MSL or 1.0 ft.
F. Fine sand, top ____ ft. MSL or 3.5 ft.
G. Filter pack, top ____ ft. MSL or 3.5 ft.
H. Screen joint, top ____ ft. MSL or 4.5 ft.
I. Well bottom ____ ft. MSL or 14.5 ft.
J. Filter pack, bottom ____ ft. MSL or 14.5 ft.
K. Borehole, bottom ____ ft. MSL or 14.5 ft.
L. Borehole, diameter 8.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.00 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: ___.__ in.
b. Length: ___.__ ft.
c. Material: 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; Annular space seal ☐ __; Other ☐ __
5. Annular space seal: a. Granular 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 pellets ☐ 32
c. ____ Other ☐ __
7. Fine sand material: Manufacturer, product name & mesh size
a. Badger Mine 65-75
b. Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Badger Mine 65-75
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 Geotech Inc.
c. Slot size: 0.010 in.
d. Slotted length: ___.__ 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: [signature] Firm: Miller Engineers + Scientists

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

SCS # 25215135.10

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: WPL-Edgewater Generating Station	Local Grid Location of Well: ____ ft. ☐N ☐S, ____ ft. ☐E ☐W	Well Name: MW-301
Facility License, Permit or Monitoring No.: 02524	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒; Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VV862 ____ ____ ____ DNR Well ID No.: ____ ____ ____
Facility ID: 460021980	St. Plane 632740.8 ft. N, 2573428.5 ft. E. S/C/N	Date Well Installed: 1 / 15 / 2016 (m m d d y y y y)
Type of Well: Well Code 12 / PZ	Section Location of Waste/Source: NE 1/4 of NW 1/4 of Sec. 02, T. 14 N, R. 23 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Durst; Badger State Drilling
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 604.61 ft. MSL

B. Well casing, top elevation 604.42 ft. MSL

C. Land surface elevation 601.95 ft. MSL

D. Surface seal, bottom 601.45 ft. MSL or 0.5 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): None

E. Bentonite seal, top 601.45 ft. MSL or 0.5 ft.

F. Fine sand, top 585.95 ft. MSL or 16 ft.

G. Filter pack, top 583.95 ft. MSL or 18 ft.

H. Screen joint, top 581.95 ft. MSL or 20 ft.

I. Well bottom 576.95 ft. MSL or 25 ft.

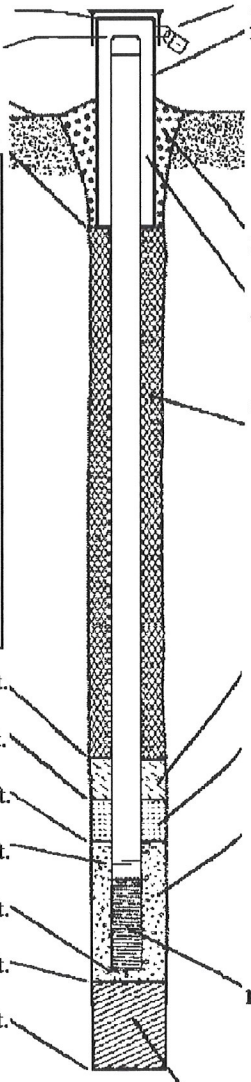
J. Filter pack, bottom 573.95 ft. MSL or 28 ft.

K. Borehole, bottom 565.95 ft. MSL or 36 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.04 in.

N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Steel Posts -3

3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Other ☒ ____
Ohio #5 Sand

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. Ohio #7 ☐
b. Volume added 0.5 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. Ohio #5 ☐
b. Volume added 2 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ____

10. Screen material: 2" dia PVC Sch 40
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☒ ____
3/8 Bentonite Chips

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

Signature: John P. for Kyle Kramer

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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.

SCS # 25215135.10

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: WPL-Edgewater Generating Station	Local Grid Location of Well: ___ ft. ☐N ☐S ___ ft. ☐E ☐W	Well Name: MW-302
Facility License, Permit or Monitoring No.: 02524	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: VV861 / DNR Well ID No.:
Facility ID: 460021980	St. Plane 632342.6 ft. N, 2573726.3 ft. E. S/C/N	Date Well Installed: 1 / 15 / 2016 (m m d d y y y y)
Type of Well: Well Code 12 / PZ	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 02, T. 14 N, R. 23 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Durst / Badger State Drilling
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 615.35 ft. MSL
B. Well casing, top elevation 615.15 ft. MSL
C. Land surface elevation 612.65 ft. MSL
D. Surface seal, bottom 612.15 ft. MSL or 0.5 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

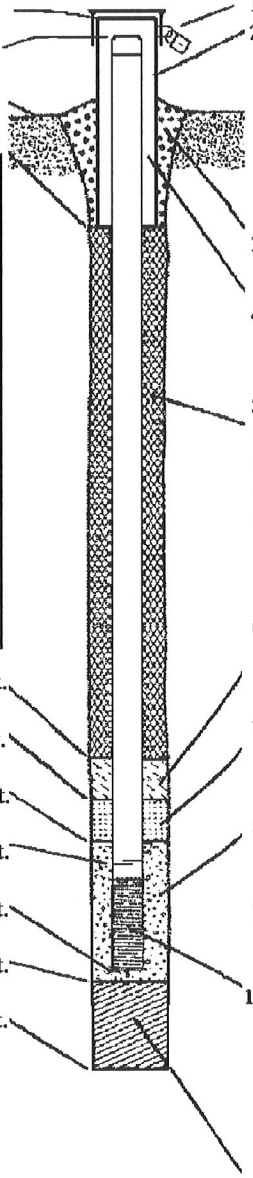
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

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):
None

E. Bentonite seal, top 612.15 ft. MSL or 0.5 ft.
F. Fine sand, top 584.15 ft. MSL or 28.5 ft.
G. Filter pack, top 582.15 ft. MSL or 30.5 ft.
H. Screen joint, top 580.15 ft. MSL or 32.5 ft.
I. Well bottom 575.15 ft. MSL or 37.5 ft.
J. Filter pack, bottom 572.65 ft. MSL or 40 ft.
K. Borehole, bottom 572.65 ft. MSL or 40 ft.
L. Borehole, diameter 8.5 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: 6.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ 04 / Other ☐ ___
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Steel posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ___
4. Material between well casing and protective pipe: Bentonite ☐ 30 / Other ☐ ___
Ohio #5 Sand
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. Ohio #7 sand ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. Ohio #5 sand ☐
b. Volume added 2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ ___
10. Screen material: ___
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ___
2" dia sch 40 PVC
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 5.0 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: for Kyle Kramer | Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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.

SCS # 25215135.10

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Managemen ☐ Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name: WPL-Edgewater Generating Station	Local Grid Location of Well ___ ft. ☐N ☐S ___ ft. ☐E ☐W	Well Name: MW-303
Facility License, Permit or Monitoring No.: 02524	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: VV860 / DNR Well ID No.: ___
Facility ID: 460021980	St. Plane 631609.4 ft. N, 2573496.7 ft. E. S/C/N	Date Well Installed: 2 / 4 / 2016 (m m d d y y y y)
Type of Well: Well Code 12 / PZ	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 02, T. 14 N, R. 23 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Durst / Badger State Drilling
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 612.19 ft. MSL
B. Well casing, top elevation 611.99 ft. MSL
C. Land surface elevation 609.73 ft. MSL
D. Surface seal, bottom 609.23 ft. MSL or 0.5 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

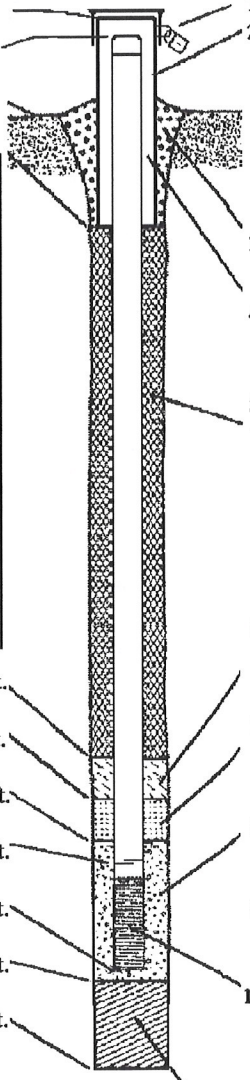
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

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):
None

E. Bentonite seal, top 609.23 ft. MSL or 0.5 ft.
F. Fine sand, top 587.73 ft. MSL or 22 ft.
G. Filter pack, top 585.73 ft. MSL or 24 ft.
H. Screen joint, top 583.73 ft. MSL or 26 ft.
I. Well bottom 578.73 ft. MSL or 31 ft.
J. Filter pack, bottom 576.73 ft. MSL or 33 ft.
K. Borehole, bottom 576.73 ft. MSL or 33 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.04 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: ___ in.
b. Length: ___ ft.
c. Material: Steel ☒ 04 / Other ☐ ___
d. Additional protection? ☐ Yes ☐ No
If yes, describe: Steel Posts-3
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ___
4. Material between well casing and protective pipe: Bentonite ☐ 30 / Other ☐ ___
Ohio #5 sand
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. Ohio #7 sand ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. Ohio #5 ☐
b. Volume added 1.5 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ ___
10. Screen material: sch PVC 40
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ___
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 5.0 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: for Kyle Kramer | Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
WPL Edgewater Site	Sheboygan	ZB-OW
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number** / **DNR Well Number**
02524		

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 5.57 ft.	15.42 ft.
Date	b. 5/04/98 (m m d d y y)	5/08/98 (m m d d y y)
Time	c. 11:05 ☒ a.m. ☐ p.m.	10:45 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.5 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 90 min.

4. Depth of well (from top of well casisng) 16.5 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing ____.__ gal.

7. Volume of water removed from well 30.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☒ No
(If yes, attach results)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Additional comments on development:

Well were developed over 3 days due to slow recovery. Volume of water removed is total amount removed during the three developments.

Well developed by: Person's Name and Firm

Name: Brian Leidham

Firm: Miller Engineers + Scientists

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

Signature: Brian Leidham

Print Initials: BJL

Firm: Miller Engineers + Scientists

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
WPL-Edgewater Generating Station	Sheyboygan	MW-301
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well ID Number**
FID 460021980, License #02524	59	VV862	

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☒ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 28.05 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 10.93 gal.

7. Volume of water removed from well 12.5 gal.

8. Volume of water added (if any) ____.__ gal.

9. Source of water added NA

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 5.23 ft.	27.62 ft.
Date	b. 2/15/2016	3/7/2016
Time	c. 12:00 ☐ a.m. ☒ p.m.	10:40 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0. inches	0. inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Kyle Last Name: Kramer
Firm: SCS ENGINEERS

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jim Last Name: Jakubiak
Facility/Firm: Wisconsin Power and Light
Street: 3739 Lakeshore Drive
City/State/Zip: Sheyboygan,WI 53081

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature]
Print Name: Meghan Blodgett for Kyle Kramer
Firm: SCS ENGINEERS

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
WPL-Edgewater Generating Station	Sheyboygan	MW-302

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
FID 460021980, License #02524	59	VV861	

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☒ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 150 min.

4. Depth of well (from top of well casisng) 36.15 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 96. gal.

7. Volume of water removed from well 135.0 gal.

8. Volume of water added (if any) ____. gal.

9. Source of water added NA

10. Analysis performed on water added? ☐ Yes ☐ No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 19.14 ft.	____. ft.
Date	b. 2/15/2016 (m m d d y y y y)	2/15/2016 (m m d d y y y y)
Time	c. 1:35 ☐ a.m. ☒ p.m.	4:05 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	___. inches	___. inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____. mg/l	____. mg/l
15. COD	____. mg/l	____. mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Kyle Last Name: Kramer
Firm: SCS ENGINEERS

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jim Last Name: Jakubiak
Facility/Firm: Wisconsin Power and Light
Street: 3739 Lakeshore Drive
City/State/Zip: Sheyboygan,WI 53081

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature]
Print Name: Meghan Blodgett for Kyle Kramer
Firm: SCS ENGINEERS

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
WPL-Edgewater Generating Station	Sheyboygan	MW-303

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
FID 460021980, License #02524	59	VV860	

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☒ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 70 min.

4. Depth of well (from top of well casisng) 33.15 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 8.03 gal.

7. Volume of water removed from well 23.0 gal.

8. Volume of water added (if any) ____.__ gal.

9. Source of water added NA

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 23.41 ft.	33.1 ft.
Date	b. 2/4/2016 (mm/dd/yyyy)	3/7/2016 (mm/dd/yyyy)
Time	c. 1:00 ☐ a.m. ☒ p.m.	10:15 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	____.__ inches	____.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Kyle Last Name: Kramer
Firm: SCS ENGINEERS

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jim Last Name: Jakubiak
Facility/Firm: Wisconsin Power and Light
Street: 3739 Lakeshore Drive
City/State/Zip: Sheyboygan,WI 53081

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature]
Print Name: Meghan Blodgett for Kyle Kramer
Firm: SCS ENGINEERS

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Monitoring Well Installation	02524	2R-OW

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
M&K Environmental Drilling. Chief Driller Michael McCardle.	04/29/98	04/29/98	HSA

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			607.2 Feet MSL	610.3 Feet MSL	8.0 Inches

Boring Location: NW 1/4 of NE 1/4 of Section 2 T 14 N,R 23E
Lat ° ' "
Long ° ' "
Local Grid Location (If applicable): 1772 Feet ☐ S ☒ N 1600 Feet ☐ W ☒ E

County	DNR County Code	Civil Town/City/ or Village
SHEBOYGAN	60	SHEBOYGAN

Sample Number	Sample Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			1	TOPSOIL	TS									
1	18	12	2–3	LEAN CLAY - moist, stiff, yellowish brown (10YR 5/6), silty sand seams.	CL				12	23.6				
2	18	22	5–6	...very stiff.					22	16.6				
3	18	46	7–8	...hard.					46	16.8				
4	18	26	10–11	...wet, very stiff, dark brown (10YR 4/3), occasional sand seams.					26	19.7			98.4	
5	18	15	12–13	...moist.					15	22.8				
			14											

NOTES:
1) End of boring at 14.5 feet.
2) Monitoring Well 2R-OW constructed at completion.

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

Signature

Firm: Miller Engineers & Scientists
5308 South 12th Street, Sheboygan, WI 53081
Tel: (920)458-6164 Fax: (920)458-0369

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Edgewater Generating Station SCS#: 25215135.10		MW-301

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State	1/14/2016	1/14/2016	4 1/4 Hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VV862		MW-301	13.7 Feet	601.95 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 632,741 N, 2,573,429 E S/C/N
NE 1/4 of NW 1/4 of Section 2, T 14 N, R 23 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Shawano	59	Sheboygan

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Boring already cleared to 8' bgs by hydrovac.										
			2											
			3	Standing water at 3' in existing hydrovac hole and boring at toe of berm.										Standing water at 3 ft bgs in existing hole and boring at toe of berm.
			4											
			5											
			6											
			7											
			8	SILTY CLAY, brown (7.5YR 4/6).										
S1	22	5 7 9 13	9						3.5	M				water @ 11.9 ft bgs after sitting an hour with augers at 20 ft bgs.
			10											
			11		CL-ML									
			12											
			13											
S2	20	7 13 23 21	14	SANDY SILT, grey brown (10YR 4/2).	ML				2.75	W				
			15											

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

Signature: for Joe Larson
Firm: SCS Engineers
2830 Dairy Drive Madison, WI 53718
Tel: (608) 224-2830
Fax:

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 be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-301 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SANDY SILT, grey brown.										
			17											
			18											
S3	20	5 7 18 13	19							W				
			20	Same as above, except brown (7.5 YR 4/6).										
			21											
			22											
			23											
S4	22	2 2 3 4	24							W				
			25		ML									
S5	20	3 3 4 9	26							W				screen 20-25 ft bgs.
			27											
			28											
S6	24	2 2 2 2	29							W				
			30											
S7	24	2 2 4 8	31							W				
			32											
S8	16	2 3 4 5	33							W				
			34											
S9	24	2 2 2 2	35						1.0	M				water at 16.8 ft bgs with augers at 34 ft bgs.
			36	CLAY, grey (7.5YR 4/6).	CL									
				End of boring at 36 ft bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Edgewater Generating Station SCS#: 25215135.10		MW-302

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State	1/15/2016	1/15/2016	4-1/4 Hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VV861		MW-302	Feet	612.65 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 632,343 N, 2,573,726 E S/C/N
SE 1/4 of NW 1/4 of Section 2, T 14 N, R 23 E
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location
Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Shawano	59	Sheboygan

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Boring already cleared to 8' bgs by hydrovac.										
			2											
			3											
			4											
			5											
			6											
			7											
			8	SANDY CLAY, various colors (fill).										
S1	16	6 8 11 10	9		CL				2.5/1.75	M				
			10											
			11											
			12											
			13											
S2	16	5 6 11 19	14						3.5	M				
			15											

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

Signature	Firm	Tel: (608) 224-2830
for Joe Larson	SCS Engineers 2830 Dairy Drive Madison, WI 53718	Fax:

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 be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-302 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	SANDY CLAY, (fill).	CL									
			17											
			18											
S3	16	6 7 9 12	19						3.25	M				
			20	CLAY, dark brown, some gravel and fill (topsoil).	CL									
			21											
			22	LEAN CLAY, brown (7.5YR 4/6).										
			23											
S4	24	4 7 10 13	24						2.75	M				
			25		CL									
			26											
			27											
			28											
S5	24	6 6 7 8	29	SANDY SILT, brown (7.5YR 4/6).					1.5	W				
			30											
S6	12	5 7 8 8	31											
			32											
S7	22	2 2 4 9	33											
			34		ML									
S8	24	2 2 4 7	35	6 inch sandier zone at 35-35.5 ft bgs, soil less cohesive, more water.										
			36											
S9	24	2 2 2 4	37							W				
			38											
S10	24	2 2 4 6	39											water at 17.8 ft bgs after well installation.
			40	End of boring at 40 ft bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Edgewater Generating Station SCS#: 25215135.10		MW-303

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State	2/4/2016	2/4/2016	4-1/4 Hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VV860		MW-303	Feet	609.73 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 631,609 N, 2,573,497 E S/C/N
SE 1/4 of NW 1/4 of Section 2, T 14 N, R 23 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Shawano	59	Sheboygan

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Boring already cleared to 8' bgs by hydrovac.										
			2											
			3											
			4											
			5											
			6											
			7											
			8	SANDY LEAN CLAY, yellowish brown (10YR 5/4).										
S1	15	5 9 9 12	9		CL				3.0	W				
			10											
			11											
			12											
			13	Same as above except, very dark grayish brown (10YR 3/2).										
S2	18	11 11 12 14	14						>4.5	W				
			15											

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

Signature	Firm	Tel: (608) 224-2830
for Kyle Kramer	SCS Engineers 2830 Dairy Drive Madison, WI 53718	Fax:

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 be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-303 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16											
			17											
			18	Same as above except, yellowish brown (10YR 5/4).										
S3	20	6 8 13 14	19		CL				2.0	W				
			20											
			21											
			22											
			23	Same as above except, very dark grayish brown (10YR 3/2).										
S4	22	5 8 8 12	24	SANDY SILT, yellowish brown (10YR 5/4).					1.75	W				
			25											
S5	16	8 12 14 17	26							W				
			27											
S6	24	4 5 3 3	28		ML					W				
			29											
S7	24	3 6 9 14	30							W				
			31											
			32											
			33	End of boring at 33 ft bgs.										

Appendix C

Laboratory Reports

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

May 02, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 14, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:
- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Sherren Clark, SCS Engineers
Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40243424001	**MW-301**	Water	04/13/22 09:25	04/14/22 07:50
40243424002	**FIELD BLANK**	Water	04/13/22 09:45	04/14/22 07:50
40243424003	**MW-303**	Water	04/13/22 10:30	04/14/22 07:50
40243424004	**MW-302**	Water	04/13/22 11:37	04/14/22 07:50
40243424005	**2R-OW**	Water	04/13/22 12:45	04/14/22 07:50

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40243424001	**MW-301**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40243424002	**FIELD BLANK**	EPA 6020B	KXS	2
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40243424003	**MW-303**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40243424004	**MW-302**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40243424005	**2R-OW**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Sample: MW-301 **Lab ID: 40243424001** Collected: 04/13/22 09:25 Received: 04/14/22 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**7240**	ug/L	500	152	50	04/18/22 06:44	04/29/22 19:11	7440-42-8	
Calcium	**89300**	ug/L	254	76.2	1	04/18/22 06:44	04/28/22 17:08	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.38**	Std. Units			1		04/13/22 09:25		
Field Specific Conductance	**777**	umhos/cm			1		04/13/22 09:25		
Oxygen, Dissolved	**2.82**	mg/L			1		04/13/22 09:25	7782-44-7	
REDOX	**417.1**	mV			1		04/13/22 09:25		
Turbidity	**25.6**	NTU			1		04/13/22 09:25		
Static Water Level	**594.89**	feet			1		04/13/22 09:25		
Temperature, Water (C)	**9.0**	deg C			1		04/13/22 09:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**560**	mg/L	20.0	8.7	1		04/15/22 15:13		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.5**	Std. Units	0.10	0.010	1		04/15/22 11:30		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**14.0**	mg/L	2.0	0.43	1		04/26/22 19:49	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/26/22 19:49	16984-48-8	
Sulfate	**212**	mg/L	20.0	4.4	10		04/27/22 08:11	14808-79-8	

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Sample: FIELD BLANK **Lab ID: 40243424002** Collected: 04/13/22 09:45 Received: 04/14/22 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**<3.0**	ug/L	10.0	3.0	1	04/18/22 06:44	04/28/22 15:25	7440-42-8	1q
Calcium	**<76.2**	ug/L	254	76.2	1	04/18/22 06:44	04/28/22 15:25	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		04/15/22 15:13		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**5.7**	Std. Units	0.10	0.010	1		04/15/22 12:37		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		04/26/22 20:04	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/26/22 20:04	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		04/26/22 20:04	14808-79-8	

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Sample: MW-303 **Lab ID: 40243424003** Collected: 04/13/22 10:30 Received: 04/14/22 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**4360**	ug/L	200	60.6	20	04/18/22 06:44	04/29/22 23:08	7440-42-8	
Calcium	**139000**	ug/L	254	76.2	1	04/18/22 06:44	04/28/22 17:23	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.78**	Std. Units			1		04/13/22 10:30		
Field Specific Conductance	**1224**	umhos/cm			1		04/13/22 10:30		
Oxygen, Dissolved	**1.98**	mg/L			1		04/13/22 10:30	7782-44-7	
REDOX	**330.2**	mV			1		04/13/22 10:30		
Turbidity	**75.1**	NTU			1		04/13/22 10:30		
Static Water Level	**595.20**	feet			1		04/13/22 10:30		
Temperature, Water (C)	**8.6**	deg C			1		04/13/22 10:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**722**	mg/L	20.0	8.7	1		04/15/22 15:13		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.8**	Std. Units	0.10	0.010	1		04/15/22 12:39		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**23.4**	mg/L	10.0	2.2	5		04/26/22 20:19	16887-00-6	
Fluoride	**<0.48**	mg/L	1.6	0.48	5		04/26/22 20:19	16984-48-8	D3
Sulfate	**<2.2**	mg/L	10.0	2.2	5		04/26/22 20:19	14808-79-8	D3

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Sample: MW-302 **Lab ID: 40243424004** Collected: 04/13/22 11:37 Received: 04/14/22 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**1460**	ug/L	100	30.3	10	04/18/22 06:44	04/29/22 23:15	7440-42-8	
Calcium	**61500**	ug/L	254	76.2	1	04/18/22 06:44	04/28/22 17:30	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.70**	Std. Units			1		04/13/22 11:37		
Field Specific Conductance	**488**	umhos/cm			1		04/13/22 11:37		
Oxygen, Dissolved	**1.39**	mg/L			1		04/13/22 11:37	7782-44-7	
REDOX	**337.4**	mV			1		04/13/22 11:37		
Turbidity	**26.2**	NTU			1		04/13/22 11:37		
Static Water Level	**600.50**	feet			1		04/13/22 11:37		
Temperature, Water (C)	**8.7**	deg C			1		04/13/22 11:37		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**318**	mg/L	20.0	8.7	1		04/15/22 15:14		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		04/15/22 12:42		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**21.2**	mg/L	2.0	0.43	1		04/26/22 23:31	16887-00-6	
Fluoride	**0.91**	mg/L	0.32	0.095	1		04/26/22 23:31	16984-48-8	
Sulfate	**68.5**	mg/L	10.0	2.2	5		04/27/22 09:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Sample: 2R-OW **Lab ID: 40243424005** Collected: 04/13/22 12:45 Received: 04/14/22 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**27.9**	ug/L	10.0	3.0	1	04/18/22 06:44	04/29/22 23:23	7440-42-8	1q
Calcium	**160000**	ug/L	254	76.2	1	04/18/22 06:44	04/28/22 17:52	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.20**	Std. Units			1		04/13/22 12:45		
Field Specific Conductance	**1549**	umhos/cm			1		04/13/22 12:45		
Oxygen, Dissolved	**6.72**	mg/L			1		04/13/22 12:45	7782-44-7	
REDOX	**425.6**	mV			1		04/13/22 12:45		
Turbidity	**205**	NTU			1		04/13/22 12:45		
Static Water Level	**609.50**	feet			1		04/13/22 12:45		
Temperature, Water (C)	**7.5**	deg C			1		04/13/22 12:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**866**	mg/L	20.0	8.7	1		04/15/22 15:14		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.2**	Std. Units	0.10	0.010	1		04/15/22 12:44		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**275**	mg/L	20.0	4.3	10		04/26/22 23:46	16887-00-6	
Fluoride	**<0.95**	mg/L	3.2	0.95	10		04/26/22 23:46	16984-48-8	D3
Sulfate	**18.5J**	mg/L	20.0	4.4	10		04/26/22 23:46	14808-79-8	D3

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

QC Batch: 413363
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243424001, 40243424002, 40243424003, 40243424004, 40243424005

METHOD BLANK: 2380558 Matrix: Water
Associated Lab Samples: 40243424001, 40243424002, 40243424003, 40243424004, 40243424005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	04/28/22 15:11	
Calcium	ug/L	<76.2	254	04/28/22 15:11	

LABORATORY CONTROL SAMPLE: 2380559

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	233	93	80-120	
Calcium	ug/L	10000	9490	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2380560 2380561

Parameter	Units	40243427001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	83.4	250	250	329	321	98	95	75-125	3	20	
Calcium	ug/L	50000	10000	10000	65000	62100	150	121	75-125	5	20	P6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

QC Batch: 413332 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243424001, 40243424002, 40243424003, 40243424004, 40243424005

METHOD BLANK: 2380052 Matrix: Water
Associated Lab Samples: 40243424001, 40243424002, 40243424003, 40243424004, 40243424005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/15/22 15:10	

LABORATORY CONTROL SAMPLE: 2380053

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	555	510	92	80-120	

SAMPLE DUPLICATE: 2380054

Parameter	Units	40243353001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	602	620	3	10	

SAMPLE DUPLICATE: 2380055

Parameter	Units	40243379003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	118	112	5	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

QC Batch: 413287
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243424001, 40243424002, 40243424003, 40243424004, 40243424005

SAMPLE DUPLICATE: 2379732

Parameter	Units	10604043001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.3	8.4	1	20	2q,H6

SAMPLE DUPLICATE: 2379799

Parameter	Units	40243424001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.4	1	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

QC Batch: 413910
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243424001, 40243424002, 40243424003, 40243424004, 40243424005

METHOD BLANK: 2383323 Matrix: Water
Associated Lab Samples: 40243424001, 40243424002, 40243424003, 40243424004, 40243424005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	04/26/22 17:06	
Fluoride	mg/L	<0.095	0.32	04/26/22 17:06	
Sulfate	mg/L	<0.44	2.0	04/26/22 17:06	

LABORATORY CONTROL SAMPLE: 2383324

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.9	105	90-110	
Fluoride	mg/L	2	2.0	100	90-110	
Sulfate	mg/L	20	21.1	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2383325 2383326

Parameter	Units	40243405002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	79.0	100	100	184	180	105	101	90-110	3	15	
Fluoride	mg/L	<0.48	10	10	11.3	11.0	113	110	90-110	2	15	M0
Sulfate	mg/L	10.6	100	100	129	124	118	113	90-110	4	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2383327 2383328

Parameter	Units	40243448003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1340	2000	2000	3590	3650	113	115	90-110	1	15	M0
Fluoride	mg/L	191	1000	1000	1280	1310	109	112	90-110	2	15	M0
Sulfate	mg/L	187J	2000	2000	2380	2390	110	110	90-110	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Analyte was measured in the associated method blank at -3.1 ug/L
2q	Due to the sample matrix, DI water was added to this sample on a one to one basis and the sample was stirred before analysis.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25216068 CCR RULE EDGWATER
Pace Project No.: 40243424

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40243424001	**MW-301**	EPA 3010A	413363	EPA 6020B	413523
40243424002	**FIELD BLANK**	EPA 3010A	413363	EPA 6020B	413523
40243424003	**MW-303**	EPA 3010A	413363	EPA 6020B	413523
40243424004	**MW-302**	EPA 3010A	413363	EPA 6020B	413523
40243424005	**2R-OW**	EPA 3010A	413363	EPA 6020B	413523
40243424001	**MW-301**				
40243424003	**MW-303**				
40243424004	**MW-302**				
40243424005	**2R-OW**				
40243424001	**MW-301**	SM 2540C	413332		
40243424002	**FIELD BLANK**	SM 2540C	413332		
40243424003	**MW-303**	SM 2540C	413332		
40243424004	**MW-302**	SM 2540C	413332		
40243424005	**2R-OW**	SM 2540C	413332		
40243424001	**MW-301**	EPA 9040	413287		
40243424002	**FIELD BLANK**	EPA 9040	413287		
40243424003	**MW-303**	EPA 9040	413287		
40243424004	**MW-302**	EPA 9040	413287		
40243424005	**2R-OW**	EPA 9040	413287		
40243424001	**MW-301**	EPA 300.0	413910		
40243424002	**FIELD BLANK**	EPA 300.0	413910		
40243424003	**MW-303**	EPA 300.0	413910		
40243424004	**MW-302**	EPA 300.0	413910		
40243424005	**2R-OW**	EPA 300.0	413910		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here: 40243424

ALL SHADED AREAS are for LAB USE ONLY

Company: SCS Engineers	Billing Information:
Address: 2830 Dairy Dr. 53718	
Report To: Meg Blodgett	Email To: mblodgett@scsengineers.com
Copy To:	Site Collection Info/Address:
Customer Project Name/Number: CCR Rule Edgewater Closed (25216068)	State: WI/ County/City: Time Zone Collected: [ ]PT [ ]MT [ ]CT [ ]ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Michael Kiaer	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (Signature):	Turnaround Date Required: Immediately Packed on Ice: [ ] Yes [ ] No
Sample Disposal: [x] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [X] No Analysis:

Container Preservative Type **: U U 1

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Analyses: pH, TDS, Cl, F, SO_4, Metals (Ca + B)

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips:	
Sample pH Acceptable	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

LAB USE ONLY:
Lab Sample # / Comments:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Lab Sample # / Comments
MW-301	GW	G	4/13	925				3	001
Field Blank	W			9:45					002
MW-303	GW			1030					003
MW-302				11:37					004
2R-OW				1245					005

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used: (1)

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2764136

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#:
Cooler 1 Temp Upon Receipt: ____oC
Cooler 1 Therm Corr. Factor: ____oC
Cooler 1 Corrected Temp: ____oC
Comments: (1)

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: 1 of: 1

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
SCS	4/13/22 1630		
CS Logistics	4/14/22 0750		4/14/22 0750

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 402434424

All containers needing preservation have been checked and noted below: ☒Yes ☐No ☐N/A Initial when completed: AL Date/ Time:

Lab Lot# of pH paper: 1003112 Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass							Plastic					Vials						Jars				General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN							
001										2		1																				2.5 / 5 / 10
002										2		1																				2.5 / 5 / 10
003										2		1																				2.5 / 5 / 10
004										2		1																				2.5 / 5 / 10
005										2		1																				2.5 / 5 / 10
006																																2.5 / 5 / 10
007																																2.5 / 5 / 10
008																																2.5 / 5 / 10
009																																2.5 / 5 / 10
010																																2.5 / 5 / 10
011																																2.5 / 5 / 10
012																																2.5 / 5 / 10
013																4/14/22																2.5 / 5 / 10
014																				AL												2.5 / 5 / 10
015																																2.5 / 5 / 10
016																																2.5 / 5 / 10
017																																2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☒N/A *If yes look in headspace column

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG4U	120 mL amber glass unpres
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4

VG9A	40 mL clear ascorbic
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN	

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40243424

40243424

Client Name: SCS Engineers

Courier: ☒ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other:

Tracking #: —

Custody Seal on Cooler/Box Present: ☐ yes ☒ no (1) Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other

Thermometer Used SR-107 **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 5.5 /Corr: 5.3

Temp Blank Present: ☒ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
Date: 4/14/22 Initials: AZ

Labeled By Initials: SKW

Chain of Custody Present:	☒Yes	☐No	☐N/A	1. +CC 4/14/22 AZ
Chain of Custody Filled Out:	☐Yes	☒No	☐N/A	2. no billing phone 4/14/22 AZ
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☒Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☒Yes	☐No		5.
- VOA Samples frozen upon receipt	☐Yes	☐No		Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes	☒No		6.
Rush Turn Around Time Requested:	☐Yes	☒No		7.
Sufficient Volume:				8.
For Analysis:	☒Yes	☐No		
MS/MSD:	☐Yes	☒No	☐N/A	
Correct Containers Used:	☒Yes	☐No		9.
-Pace Containers Used:	☒Yes	☐No	☐N/A	
-Pace IR Containers Used:	☐Yes	☐No	☒N/A	
Containers Intact:	☒Yes	☐No		10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A	11.
Sample Labels match COC:	☒Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix:	W			
Trip Blank Present:	☐Yes	☐No	☒N/A	13.
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased):				

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution (1) cust. seal present, not signed/dated 4/14/22 AZ

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample login

Page 2 of 2

Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Edgewater Closed

Location ID: 2R-OW
Number of Sampling Dates: 18

Parameter Name	Units	4/8/2016	6/20/2016	8/9/2016	10/20/2016	1/24/2017	4/6/2017	6/6/2017	8/1/2017	10/23/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020	4/14/2021	10/26/2021	4/13/2022
Boron	ug/L	100	22.4	32.6	43.1	31.2	70.6	45.2	35.7	55.9	19.7	34.7	35.8	58.8	52.3	29.9	45.7	47.2	27.9
Calcium	ug/L	205000	148000	145000	155000	152000	143000	145000	164000	170000	121000	190000	121000	132000	117000	124000	154000	192000	160000
Chloride	mg/L	91.7	232	215	217	201	102	115	272	305	108	462	55.3	88.8	67.5	179	116	493	275
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.095	0.096	<0.095	<4.8	<0.95
Field pH	Std. Units	7.34	7.02	6.1	6.98	7.15	7.01	6.86	7	7.23	7.29	7.03	8.57	6.88	7.08	7.2	7.52	7.01	7.2
Sulfate	mg/L	19.5	28	25.4	21.6	23.9	17.6	17.8	28.8	29.3	17.2	37.2	10.6	13.2	11.6	20.3	15.3	35.7	18.5
Total Dissolved Solids	mg/L	774	908	974	944	854	750	744	1000	1010	680	1260	610	706	604	806	737	1170	866
Antimony	ug/L	0.3	<0.073	<0.073	<0.073	0.073	<0.073	0.32	<0.15	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/L	5.2	0.34	0.39	0.39	0.65	0.35	0.71	1.2	--	--	--	--	--	--	--	--	--	--
Barium	ug/L	344	110	155	189	158	150	172	154	--	--	--	--	--	--	--	--	--	--
Beryllium	ug/L	0.83	<0.13	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	--	--	--	--	--	--	--	--	--
Cadmium	ug/L	0.21	<0.089	<0.089	<0.089	<0.089	<0.089	0.2	<0.081	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	23.6	3.1	2.9	1.7	2.6	2.2	1.6	4.3	--	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	6	0.081	0.05	0.21	0.22	0.28	0.7	1.7	--	--	--	--	--	--	--	--	--	--
Lead	ug/L	13	0.17	0.14	0.074	0.38	0.48	0.4	1.2	--	--	--	--	--	--	--	--	--	--
Lithium	ug/L	19.6	9.6	9	8.2	8.2	5.3	6.2	15.1	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/L	0.58	0.28	0.32	0.25	0.28	0.5	0.54	0.44	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	2.2	<0.21	<0.21	<0.21	<0.21	<0.21	0.34	<0.32	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	0.19	<0.14	<0.14	<0.14	<0.14	<0.14	0.45	<0.14	--	--	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	--	--	--	--	--	--	--	--
Total Radium	pCi/L	0.945	0.815	0.432	0.896	0.627	1.02	1.58	2.12	--	--	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.4	7.4	7	7.4	7.4	7.1	6.9	7.1	7.1	7.4	7	7.5	7.1	7.1	7.4	7.4	7.2	7.2
Radium-226	pCi/L	0.304	0.433	0.0836	0.193	0	0.418	0.531	0.658	--	--	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.641	0.382	0.348	0.703	0.627	0.605	1.05	0.502	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1332	1277	1697	1533	1579	1387	1294	1651	1864	1177	2202	1077	1261	1081	1490	1229	2290	1549
Oxygen, Dissolved	mg/L	4.6	0.9	1	0.6	1	0.5	0.1	0	4.9	6.7	1.6	0.6	2.5	1.5	3.5	6.9	0.6	6.72
Field Oxidation Potential	mV	130	82	140	117	87	120	-20	-22	131	85	180	75	148	43.7	282	282	242	425.6
Groundwater Elevation	feet	610.02	606.7	605.74	607.27	609.64	609.27	607.63	604.59	601.74	607.87	604.61	609.5	609.39	608.97	604.27	608.5	604.04	609.5
Temperature, Water (C)	deg C	5.6	10.6	13.9	14.1	7.5	7	10.1	13	13	5.2	13.4	6.7	14	6.1	13.6	6.6	14	7.5
Turbidity	NTU	612.3	10.97	3.64	3.32	11.71	16.46	0.55	41.3	2.24	6.38	7.09	8.59	--	15.24	28.74	413	95.2	205

Single Location

Name: WPL - Edgewater Closed

Location ID: MW-301
Number of Sampling Dates: 19

Parameter Name	Units	4/11/2016	6/20/2016	8/9/2016	10/20/2016	1/23/2017	4/6/2017	6/6/2017	8/2/2017	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	6/26/2020	10/15/2020	4/14/2021	10/26/2021	4/13/2022
Boron	ug/L	8550	8190	8450	8620	9280	8370	9160	8610	8820	7950	8230	7310	7220	7450	--	6550	7200	6710	7240
Calcium	ug/L	88700	92200	84000	89400	89200	98800	94900	83600	87200	78900	88800	77500	87600	80800	--	114000	118000	102000	89300
Chloride	mg/L	16.2	15.9	13.7	13.9	13.8	12.7	13.5	12.3	11.9	11.2	11.5	11.4	11.1	12.5	--	13.9	13.5	13.8	14
Fluoride	mg/L	0.33	0.36	0.33	0.34	0.42	0.21	<0.1	0.32	<0.1	0.25	0.2	0.29	0.24	0.39	0.26	<0.48	0.25	0.24	<0.095
Field pH	Std. Units	7.91	7.48	6.47	7.68	8.03	7.98	7.7	7.58	7.43	8.02	7.71	8.18	7.56	7.82	7.53	7.64	7.96	7.01	7.38
Sulfate	mg/L	372	343	368	369	372	367	362	340	341	332	318	322	312	298	--	293	195	203	212
Total Dissolved Solids	mg/L	838	794	862	838	826	838	804	780	772	752	722	724	694	718	--	678	614	538	560
Antimony	ug/L	0.49	0.21	<0.073	0.083	0.2	<0.15	0.33	<0.15	--	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/L	4.3	2.4	2.3	4.2	1.8	2.8	1.9	1.5	--	--	--	--	--	--	--	--	--	--	--
Barium	ug/L	48.7	32.6	30.5	31.4	32.2	53.8	30.3	28.2	--	--	--	--	--	--	--	--	--	--	--
Beryllium	ug/L	0.18	<0.13	<0.13	<0.13	0.28	<0.25	<0.18	<0.18	--	--	--	--	--	--	--	--	--	--	--
Cadmium	ug/L	0.2	0.22	<0.089	<0.089	0.17	<0.18	<0.081	<0.081	--	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	3.5	0.55	<0.39	0.86	1.1	6.4	<1	<1	--	--	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	1.2	0.39	0.38	0.39	0.24	1.5	0.24	0.2	--	--	--	--	--	--	--	--	--	--	--
Lead	ug/L	2.2	0.3	<0.04	0.29	0.47	2.1	0.28	0.29	--	--	--	--	--	--	--	--	--	--	--
Lithium	ug/L	21.4	14.2	15.6	15.8	16.3	20.6	17	15.8	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/L	2200	2040	2160	2300	2210	2090	2460	2070	--	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	0.52	<0.21	<0.21	<0.21	<0.21	<0.42	<0.32	<0.32	--	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	0.31	<0.14	<0.14	<0.14	0.22	<0.29	0.17	<0.14	--	--	--	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	--	--	--	--	--	--	--	--	--
Total Radium	pCi/L	0.41	1.62	0.456	0.729	1.09	1.51	0.494	1.67	--	--	--	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.9	7.6	7.4	7.5	7.9	7.9	7.7	7.5	7.5	7.8	7.7	7.9	7.8	7.9	--	7.6	7.7	7.1	7.5
Radium-226	pCi/L	0.32	0.958	-0.17	0.193	0.136	0.734	0.179	0.548	--	--	--	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.0904	0.661	0.456	0.536	0.951	0.774	0.315	0.296	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1206	1173	1230	1214	1198	1213	1147	1111	1096	1071	1086	1022	1052	977	983	996	815	811	777
Oxygen, Dissolved	mg/L	4.8	1.6	0.1	0.2	7.4	5.5	3	0.5	0	6.5	4.5	6.2	2.7	6.9	5.47	0.8	8.2	5.4	2.82
Field Oxidation Potential	mV	5.2	89	-31	-24	173	51	-15	-13	-18	44	53	55	146	17.1	49.1	140	226	196	417.1
Groundwater Elevation	feet	599.94	598.3	598	598.5	597.1	600.04	598.77	597.4	597.2	598.54	597.6	598.92	599.56	599.17	597.89	595.1	595.17	590.68	594.89
Temperature, Water (C)	deg C	7.2	10.1	10.5	10.8	8.8	8.9	9.5	11.6	10.7	7.8	11	9	12.2	8.5	16.8	11.2	7.8	11.2	9
Turbidity	NTU	10.88	3.13	2.42	46.07	21.84	168.6	16.11	6.51	11.58	12.19	13.32	32.91	79.44	37.12	62.57	130	124	88.4	25.6

Single Location

Name: WPL - Edgewater Closed

Location ID: MW-302
Number of Sampling Dates: 18

Parameter Name	Units	4/8/2016	6/20/2016	8/9/2016	10/20/2016	1/24/2017	4/6/2017	6/6/2017	8/2/2017	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020	4/14/2021	10/26/2021	4/13/2022
Boron	ug/L	1950	2010	2000	2150	2000	1970	1970	1890	1760	1800	1570	1670	1730	1570	1410	1550	1580	1460
Calcium	ug/L	122000	116000	75900	72100	87400	114000	72200	62600	68100	68000	64700	64800	67500	66800	124000	81200	78200	61500
Chloride	mg/L	18.9	27.2	18	19.5	18.6	18.9	20	19.3	18.9	18.5	18.6	18.4	17.8	19.2	20.9	20.6	20.7	21.2
Fluoride	mg/L	0.83	1.3	0.8	0.8	0.89	0.76	0.9	0.78	0.84	0.78	0.81	0.87	0.85	0.97	1	0.88	0.88	0.91
Field pH	Std. Units	8.01	7.73	6.55	7.89	7.98	7.99	7.84	7.76	7.6	7.78	7.99	7.98	7.86	7.56	7.9	8.19	7.6	7.7
Sulfate	mg/L	75.1	89.6	80.7	77.2	71.1	85.8	88.5	80.2	72.2	72.7	59.2	71.7	55.7	65.3	73.1	70.5	71.2	68.5
Total Dissolved Solids	mg/L	352	364	396	348	328	358	350	360	316	314	306	324	290	316	182	342	290	318
Antimony	ug/L	0.3	0.085	<0.073	<0.073	0.86	<0.36	0.16	<0.15	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/L	10.3	9.7	10.2	8.4	10.9	9.6	8.7	9	--	--	--	--	--	--	--	--	--	--
Barium	ug/L	152	109	66.7	57.2	90.1	104	58.4	50.9	--	--	--	--	--	--	--	--	--	--
Beryllium	ug/L	0.59	0.35	<0.13	<0.13	0.78	<0.63	<0.18	<0.18	--	--	--	--	--	--	--	--	--	--
Cadmium	ug/L	0.24	<0.089	<0.089	<0.089	0.49	<0.44	<0.081	<0.081	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	18.7	11.1	3.5	2.5	7.1	10	6.6	1.1	--	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	6.2	3.6	1.1	0.84	2.6	3.2	1.5	0.53	--	--	--	--	--	--	--	--	--	--
Lead	ug/L	5.5	3.3	0.84	0.71	2.3	5.2	0.7	0.44	--	--	--	--	--	--	--	--	--	--
Lithium	ug/L	58.1	62.3	55.4	51.8	54.8	58.7	52.3	52.2	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/L	610	640	652	685	674	654	631	649	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	1.3	0.76	<0.21	0.22	<1	<1	<0.32	<0.32	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	0.35	<0.14	<0.14	<0.14	1.6	<0.71	<0.14	<0.14	--	--	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	--	--	--	--	--	--	--	--
Total Radium	pCi/L	1.47	0.505	0.0999	0.771	1.9	1.18	1.66	1.08	--	--	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.3	7.8	7.7	7.8	7.7	7.9	7.5	7.7	7.7	7.8	7.6	7.8	7.6	7.8	7.7	7.8	7.8	7.7
Radium-226	pCi/L	0.843	-0.408	-0.153	0.331	0.37	0.371	0.706	0.474	--	--	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.623	0.505	0.0999	0.44	1.53	0.813	0.95	0.604	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	531	564	539	525	519	552	465	532	505	517	504	519	487	476	523	517	496	488
Oxygen, Dissolved	mg/L	1	0.2	0.1	1	0.1	0	0.5	0	0	0.6	0.8	1.6	1.3	0.4	0.3	1.8	0.1	1.39
Field Oxidation Potential	mV	-41	-123	-123	-111	-87	-517	-40	-121	-118	-123	-96	-95	124	-107.6	-83	41	134	337.4
Groundwater Elevation	feet	596.39	595.68	595.53	595.46	596.3	593.57	595.86	595.22	595.25	595.71	595.28	595.68	595.58	595.33	598.56	600.56	599.82	600.5
Temperature, Water (C)	deg C	9	13.1	13.2	11.2	9.3	9.6	12.2	12.6	11.1	10.3	11.6	11.9	13.5	11.3	11.2	7.5	11.1	8.7
Turbidity	NTU	885.4	369.4	108.3	62.99	161.1	367.5	94.92	39.69	42.45	24.89	55.15	59.51	32.69	69.22	161.8	252	69.8	26.2

Single Location

Name: WPL - Edgewater Closed

Location ID: MW-303
Number of Sampling Dates: 18

Parameter Name	Units	4/8/2016	6/20/2016	8/9/2016	10/20/2016	1/24/2017	4/6/2017	6/6/2017	8/2/2017	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020	4/14/2021	10/26/2021	4/13/2022
Boron	ug/L	4210	3360	3860	3740	4210	4170	4570	3780	3480	3040	2360	2930	2830	3380	3310	4600	3650	4360
Calcium	ug/L	176000	138000	145000	147000	147000	135000	154000	139000	173000	146000	139000	135000	136000	144000	132000	176000	148000	139000
Chloride	mg/L	21.8	31.5	22.8	26	26.2	22.7	25.4	23.2	20.4	19.7	4.3	20	19.1	23.5	20.9	22.5	21.6	23.4
Fluoride	mg/L	<0.2	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.48	<0.48	<0.095	<0.48	<0.48
Field pH	Std. Units	7.04	6.79	6.09	6.94	6.94	6.88	7	6.94	7.14	6.86	6.93	7.15	6.9	6.7	7.11	7.27	6.92	6.78
Sulfate	mg/L	3	11.4	2.4	5.6	<5	<5	<5	<5	<5	<5	<1	<5	<5	<2.2	<2.2	0.54	<2.2	<2.2
Total Dissolved Solids	mg/L	660	716	732	744	738	700	714	714	566	630	620	668	584	692	620	710	640	722
Antimony	ug/L	0.14	<0.073	<0.073	<0.073	<0.073	<0.073	0.32	0.25	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/L	12.8	9.7	10.7	18.1	25.3	21.8	25.2	21.9	--	--	--	--	--	--	--	--	--	--
Barium	ug/L	229	189	195	180	186	142	143	144	--	--	--	--	--	--	--	--	--	--
Beryllium	ug/L	0.3	<0.13	<0.13	<0.13	<0.13	<0.13	0.33	0.21	--	--	--	--	--	--	--	--	--	--
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	<0.089	<0.089	0.17	0.14	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	14.1	1.5	2	1.8	1.4	1.5	2.1	1.7	--	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	8.7	5.3	5	4.4	4.3	3	3.4	3.2	--	--	--	--	--	--	--	--	--	--
Lead	ug/L	4.7	0.28	0.35	0.21	0.19	0.16	0.56	0.66	--	--	--	--	--	--	--	--	--	--
Lithium	ug/L	17.6	9.1	10.4	8.9	8.3	8.3	9.3	10.7	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/L	25.1	11.6	12.7	9	7.7	5.1	4.5	5.9	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	1.2	0.48	0.31	0.55	0.71	0.38	0.5	0.6	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.36	0.26	--	--	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	--	--	--	--	--	--	--	--
Total Radium	pCi/L	1.44	1.93	1.22	1.48	1.16	1.31	1.2	1.81	--	--	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.2	7	6.9	7.2	7	6.8	6.9	7	6.8	7	6.8	6.9	7	6.8	7	7.1	7	6.8
Radium-226	pCi/L	0.239	1.03	0.651	0.521	0.386	0.123	0.276	0.772	--	--	--	--	--	--	--	--	--	--
Radium-228	pCi/L	1.2	0.898	0.567	0.962	0.772	1.19	0.926	1.04	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1273	1196	1220	1313	1335	1320	1112	1218	1095	1131	1105	1196	1127	1241	1123	1222	1171	1224
Oxygen, Dissolved	mg/L	0.49	0.9	0.1	0	0	0	0.8	0	0	0.3	0.2	0.3	0.2	0.2	0.2	2.3	1.6	1.98
Field Oxidation Potential	mV	-48	-71	-81	-102	-89	-20	-58	-116	-108	-97	-93	-85	122	-102.9	-32	-41	170	330.2
Groundwater Elevation	feet	589.24	587.22	587.72	588.37	588.84	589.04	588.44	587.36	587.97	588.77	588.17	588.88	588.77	588.66	593.19	595.01	594.07	595.2
Temperature, Water (C)	deg C	9.1	11.6	11.9	10.7	10.5	10	10.2	10.4	11	9.8	10.7	10.3	11.8	10	10.9	7.7	12.3	8.6
Turbidity	NTU	409.5	18.26	48.39	16.45	12.58	9.61	186.4	28.41	563	233.5	107.1	61.84	94.01	87.6	70.42	408	88.4	75.1

Appendix E

Alternative Source Demonstrations (ASDs)

E1 October 2021 ASD
E2 April 2022 ASD

E1 October 2021 ASD

Alternative Source Demonstration
October 2021 Detection Monitoring

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

SCS ENGINEERS

25222068.00 | April 15, 2022

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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Figures

Appendix

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PE CERTIFICATION

I, Sherren Clark, hereby certify that that the information in this alternate source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Edgewater Generating Station Ash Ponds. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

SC 4-14-2022

(signature) (date)

Sherren Clark, PE

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2022.

Pages or sheets covered by this seal:
Alternative Source Demonstration – October 2021 Detection Monitoring, Edgewater Generating Station, Sheboygan Wisconsin
(Entire Document)

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of the established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSIs observed in the statistical evaluation of the October 2021 detection monitoring event at the Edgewater Generating Station (EDG). The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018b). The October 2017 ASD and subsequent semiannual updates have concluded that several lines of evidence demonstrate that SSIs reported for boron, fluoride, and sulfate concentrations in the downgradient monitoring wells (MW-301, MW-302, and MW-303) were likely due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107.

As discussed in more detail in **Section 4.2** of this ASD, the findings for the October 2021 monitoring event were consistent with those for the previous events.

1.2 SITE INFORMATION AND MAP

EDG is located at 3739 Lakeshore Drive in Sheboygan, Sheboygan County, Wisconsin (**Figure 1**). EDG is an active coal-burning generating station. The EDG property includes a closed landfill and a series of CCR settling ponds, located on the opposite side of Lakeshore Drive from the plant itself (**Figure 1**). The EDG landfill is closed and no longer receives CCR. The groundwater monitoring system at EDG is a multi-unit system monitoring four former existing CCR Units which were contiguous:

- EDG Slag Pond (existing CCR surface impoundment)
- EDG North A-Pond (existing CCR surface impoundment)
- EDG South A-Pond (existing CCR surface impoundment)
- EDG B-Pond (existing CCR surface impoundment)

Closure of the four CCR surface impoundments was initiated in 2020, the cover was in place in June 2021, and the closure was certified on August 9, 2021. The existing monitoring system will be used to monitor the closure area. A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided on **Figure 2**.

The closed CCR landfill (Wisconsin Department of Natural Resources [WDNR] Permit No. 2524) is located immediately west of the former ponds location. The landfill contains primarily fly ash with some slag and was closed in 1987. Because this CCR landfill did not accept CCR after October 19, 2015, the landfill is not subject to the requirements of 40 CFR 257.50-107. The closed landfill is unlined and is known to be impacting groundwater at the site (SCS, 2016). Previous investigations done at the site (BT^2, Inc., 1993; RMT, 1997) concluded that the groundwater impacts downgradient of the landfill and ponds were attributable to groundwater interaction with the landfill, rather than leakage from the ponds.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

SSIs were identified for boron, fluoride, and sulfate at one or more wells based on the October 2021 detection monitoring event. A summary of the October 2021 constituent concentrations and the established benchmark concentrations are provided in **Table 1**. The constituent concentrations with SSIs above the background concentration are highlighted in the table.

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

The boron, fluoride, and sulfate results from background and compliance sampling are provided in **Table 2**. The laboratory report for the October 2021 detection monitoring event was included in the 2021 annual groundwater monitoring and corrective action report completed in January 2022. Complete laboratory reports for the background monitoring events and previous detection monitoring events were included in the previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

To provide context for the ASD evaluation, the following background information is provided in this section of the report, prior to the ASD evaluation sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells
- Groundwater Flow Direction

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018a).

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

For the purposes of groundwater monitoring, the unconsolidated sand and gravel aquifer is considered to be the uppermost aquifer, as defined under 40 CFR 257.53, at the EDG ponds. The sand and gravel aquifer is present in some parts of Sheboygan County (Skinner and Borman, 1973). Boring logs from monitoring wells at the EDG ponds and for nearby private wells indicate that the unconsolidated material at, and near, the site contains a significant amount of sand. Private well logs from the surrounding area indicate that the sand and gravel aquifer has been used as a water source; however, several older sand wells in the area have been replaced with bedrock water supply wells.

The dolomite aquifer underlies the unconsolidated material at the site. The total thickness of the dolomite aquifer at the site is unknown. The dolomite aquifer is underlain by the Maquoketa shale, which is a confining unit. The Maquoketa shale is underlain by the Cambrian-Ordovician sandstone aquifer. This sequence of sedimentary bedrock units is over 1,500 feet thick in the site vicinity.

The regional groundwater flow in the unconsolidated sand and gravel aquifer in the vicinity of the site is to the east and slightly southeast.

2.2 CCR MONITORING SYSTEM

The groundwater monitoring system established under the CCR Rule consists of one upgradient (background) monitoring well and three downgradient monitoring wells, as shown on **Figure 2**. The upgradient monitoring well is 2R-OW. The downgradient monitoring wells include MW-301, MW-302, and MW-303. The CCR compliance monitoring wells were installed in the unconsolidated sediments with screens in the uppermost soil layer producing appreciable water, which was a sandy silt unit. Well depths range from approximately 14.5 to 40 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Sixteen groundwater monitoring wells currently exist at the EDG site as part of the monitoring system developed for the state monitoring program for the closed landfill. The well locations are shown on **Figure 2**. These monitoring wells are used to monitor groundwater conditions at the site under the WDNR state monitoring program.

Monitoring wells for the state monitoring program are installed in the unconsolidated material at the site. This shallow monitoring system includes water table wells and piezometers. Well depths range from approximately 9 to 43 feet, measured from the top of the well casing.

2.4 GROUNDWATER FLOW DIRECTION

Shallow groundwater in the area of the EDG site generally flows to the south-southeast, toward Fish Creek, which discharges into Lake Michigan. There is some localized groundwater mounding associated with the EDG ponds. The water table map shown on **Figure 3** represents the site conditions of the unconsolidated deposits during the October 2021 detection monitoring event. The water table map shows a generally southward flow direction, with localized groundwater mounding in the area of the former EDG ponds. The groundwater elevations at the CCR and state monitoring wells during the October 2021 detection monitoring event are in **Tables 3A** and **3B**. Water levels measured in October 2021 were lower than in previous monitoring events, likely reflecting both the relatively dry year and effects of the pond closure; however, the general flow directions were consistent with prior results.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR Unit, SCS used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to the exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR Unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross-contamination during sampling, or another field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSI concentrations were due to a sampling error.

Because boron, fluoride, and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory report for the October 2021 detection monitoring was reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs for boron, fluoride, or sulfate. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring events were reviewed for the October 2017 ASD. Laboratory reports for subsequent detection monitoring events were reviewed as part of the ASD preparation for each event.

The October 2021 fluoride and sulfate results for wells 2R-OW and MW-303 were reported with D3 flags, indicating that the samples were diluted due to the presence of high levels of non-target analytes or other matrix interference. The fluoride and sulfate detection limits shown in Table 1 are the lowest the laboratory could achieve for the samples and the dilutions do not affect the usability of the data for determining compliance. The elevated detection limit for fluoride at upgradient well 2R-OW, due to the high chloride concentration, was higher than previous detection limits and previously detected fluoride concentrations at this well, and resulted in a non-detect result that will be evaluated as an outlier for future statistical analysis (Appendix A).

Chloride, fluoride, and sulfate results for compliance well MW-301 were reported with M0 flags, indicating that the matrix spike recovery and/or matrix spike duplicate (MS/MSD) recovery for the associated quality control sample was outside laboratory control limits. The MS/MSD recoveries were slightly higher than the upper control limits, indicating that the sample results may be slightly biased high. These MS/MSD results do not affect the usability of the data.

Based on the review of the laboratory reports, SCS did not identify any indication that the SSI concentrations were due to a laboratory analysis error. There were no laboratory quality control flags

or issues identified in the laboratory reports that affect the usability of the data for detection monitoring.

Time series plots of the analytical data were also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). Time series plots for the parameters with SSIs are provided in **Appendix A**. No indications of sampling or laboratory errors were noted based on the time series review. With the exception of the recent high fluoride detection limit at background well 2R-OW discussed above, the October 2021 boron, fluoride, and sulfate results for MW-301, MW-302, and MW-303 are consistent with the historical data.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods includes a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Review statistical method and outlier concentration lists for each monitoring well/CCR unit

Based on the review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for the October 2021 detection monitoring event.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the October 2021 monitoring event based on the methodology and analysis review, and no errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the boron, fluoride, and sulfate SSIs at MW-301, MW-302, and MW-303; identifies the most likely alternative source(s); and presents the lines of evidence indicating that an alternative source is most likely the cause of the observed SSIs for boron, fluoride, and sulfate.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the October 2021 detection monitoring results to the upper prediction limits (UPLs) calculated based on the sampling of the background well (2R-OW). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron and sulfate SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Natural variation may have caused or contributed to the SSI for fluoride at MW-302. Elevated natural fluoride concentrations significantly higher than those reported for the downgradient wells (above 2 milligrams per liter [mg/L]) have been observed in a region in eastern Wisconsin extending along the Lake Michigan shoreline from Kewaunee County in the north to the Illinois border in the south, as described in Luczaj, J., and Masarik, K, 2015, *Groundwater Quantity and Quality Issues in a Water-Rich Region: Examples from Wisconsin, USA*. The authors note that most of the wells with elevated fluoride appear to be drawing from the Pleistocene glacial sediments and Silurian dolomite units. Skinner and Borman (1973) and Kammerer (1995) also identify the Lake Michigan shoreline area of eastern Wisconsin as having somewhat elevated fluoride concentrations in groundwater.

The fluoride concentrations reported for MW-302 for October 2017 through April 2020 and April 2021 through October 2021 were just above the laboratory's limit of quantitation (LOQ), ranging from 0.78 mg/L in April 2018 to 0.88 mg/L in October 2021. These results are within the range of fluoride results at MW-302 during background monitoring for the CCR rule prior to October 2017 (Table 2). The result at MW-302 is within the range of reported regional natural concentrations, indicating that the fluoride concentration observed in these wells is potentially due to natural variability in the glacial sediments and shallow groundwater. As discussed below, there is also a potential that fluoride in MW-302 is associated with impacts from the closed CCR landfill.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, fluoride, and sulfate SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based on the groundwater flow directions and previous investigations at the site, the closed landfill appears to be the most likely cause of the SSIs for wells MW-301, MW-302, and MW-303.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron and sulfate in compliance wells MW-301, MW-302, and MW-303, relative to the background well, are due to an alternative source include:

1. A previous study of the CCR ponds and the closed CCR landfill determined that the landfill was the primary source of groundwater impacts in the area, based on multiple lines of evidence.

2. Past and current monitoring performed under the state monitoring program shows that boron, fluoride, and sulfate are present in the CCR landfill leachate.

3. Past and current monitoring performed under the state monitoring program shows that the highest boron and sulfate concentrations are in the monitoring wells near and downgradient from the CCR landfill.

Lines of evidence regarding natural variability as an additional alternative source of the fluoride SSIs are discussed above in Section 4.1.1.

Each of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018b). The lines of evidence are discussed briefly below, focusing on any updated information collected since the previous ASDs.

4.2.1 Previous CCR Pond and Landfill Study

A previous investigation titled *Field Investigation Report: Edgewater Closed Ash Disposal Facility*, completed by BT^2 in 1993, found that groundwater impacts were likely due to the closed landfill (**Figure 2**) located immediately west of the ponds (BT^2, 1993). The purpose of the 1993 investigation was to investigate the likely impact on groundwater quality of lining or abandoning the CCR impoundments (referred to in the report as the Wisconsin Pollutant Discharge Elimination System [WPDES] lagoons). The results from the investigation indicated that the CCR impoundments were not the primary source of downgradient groundwater impacts, and that closure or lining was not warranted at that time. The WDNR concurred with that finding in a letter dated April 20, 1994.

The primary lines of evidence from the 1993 report that supported this finding, and support the ASD for boron, fluoride, and sulfate, included:

- Water samples collected from each of the ponds met the Wisconsin groundwater enforcement standards established under NR 140, Wisconsin Administrative Code.

- Soil borings installed in the material below the larger ash pond, where the slag pond and the WDPES lagoons (North Pond A and South Pond A) were constructed, indicated that material below the ponds was almost entirely slag material. Water leaking out of the lagoons and moving downward would encounter primarily slag, which is relatively inert, and not fly ash. Additionally, results for water leach testing of site-wide composite samples of fly ash and slag confirmed that the fly ash had a higher potential than slag to impact groundwater. Water leach test results for the fly ash composite sample were higher for boron, sulfate, and fluoride in comparison to the slag composite sample.

- Ash disposal in the closed landfill is primarily fly ash. For seven borings in the landfill, the percent fly ash ranged from 60 to 86 percent.

- Results for water leach testing of site-wide composite samples of fly ash and slag confirmed that the fly ash had a higher potential than slag to impact groundwater. Water leach test results for the fly ash composite sample were higher for boron and sulfate in comparison to the slag composite sample.

- Water leach testing for individual boring samples of fly ash and/or slag also confirmed that fly ash leachate had significantly higher concentrations of boron and sulfate than slag leachate. For example, boron leach test results for seven samples from borings within the landfill, consisting mainly of fly ash, ranged from 624 to 3,370 micrograms per liter (µg/L), with most results over 2,000 µg/L. Boron leach test results for nine samples from borings around and between the ponds, consisting mainly of slag, ranged from less than 16 to 206 µg/L.

- Water sampling within the landfill and pond area, in CCR above the native soil, documented that groundwater/leachate within the landfill had significantly higher concentrations of boron than the groundwater/leachate within the slag berms immediately adjacent to and between the Slag Pond, North/South Pond A, and Pond B.

- Groundwater monitoring results indicated that the highest concentrations of boron and sulfate were in monitoring wells downgradient from the landfill, including 18-OW and 29-OW. Elevated boron and sulfate were also reported for samples from wells 4-OW and 5-OW, located near the southwest and northwest corners of the landfill. Monitoring

wells 6-OW and 7-OW, located east and southeast of the ponds, had much lower concentrations of boron and sulfate.

In the April 1994 approval letter, the WDNR approved the 1993 investigation of the WPDES lagoons/CCR impoundments and concurred with the findings of the report. The WDNR requested additional monitoring from the four new monitoring wells installed within the CCR (36-OW, 37-OW, 38R-OW, and 39R-OW) and requested the addition of fluoride and arsenic to the monitoring program for these groundwater/leachate head wells.

The results of the additional monitoring were reported to the WDNR in a Groundwater Assessment Report dated September 30, 1997. The WDNR responded to the 1997 report in a letter dated April 16, 1998, which stated, "We agree with the report's finding that the WPDES ponds [Slag Pond, North Pond A, and South Pond A] do not appear to be significantly contributing to the contaminant plume downgradient of the facility. No further remedial action concerning the influence of the ponds on the landfill is warranted at this time." The WDNR also noted that the leachable constituents migrating from the saturated portion of the closed landfill have stabilized or also decreased since the landfill's closure and capping.

4.2.2 CCR Constituents in Landfill Leachate

Past and current monitoring performed under the state monitoring program shows that boron and sulfate are present in the CCR landfill leachate. Recent groundwater and leachate monitoring results for boron and sulfate in samples from the state monitoring program wells are summarized in **Table 4** (April 2016 through October 2021). The leachate head wells monitoring conditions within the CCR landfill are 37-OW, 38R-OW, and 39R-OW, listed near the end of the table.

Boron: Boron concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Sulfate: Sulfate concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Fluoride: Fluoride is not part of the routine state monitoring program for the closed CCR landfill, but was sampled from the leachate wells (37-OW, 38R-OW, and 39R-OW) and the pond berm well (36-OW) from 1994 to 1997, as requested by the WDNR. The fluoride concentrations ranged from 0.25 to 0.97 mg/L (**Table 5**). The fluoride concentration for the sample collected at MW-302 (0.88 mg/L) was less than the highest observed concentration at the leachate wells.

Based on these results, fly ash disposal in the closed CCR landfill is a likely historical source of elevated boron and sulfate in groundwater, and is a potential source of fluoride.

4.2.3 State Program Groundwater Monitoring Results

Current monitoring performed under the state monitoring program continues to show that the highest boron and sulfate concentrations are in the monitoring wells near and downgradient from the CCR landfill. State program monitoring results for the CCR Rule detection monitoring parameters that overlap with the state program are summarized in **Table 4**, and well locations are on **Figure 2**.

Consistent with the conditions observed at the time of the 1993 report, the recent groundwater monitoring results indicate that the highest concentrations of boron and sulfate are in monitoring wells downgradient from the landfill, including 40-OW (replaced former 18-OW) and 29-OW. Elevated boron and sulfate also continue to be reported for samples from wells 4R-OW (replacement well

for 4-OW) and 5-OW, located near the southwest and northwest corners of the landfill. Concentrations of boron and sulfate in the CCR program monitoring wells are lower than in the downgradient state program wells, consistent with the closed CCR landfill as the primary source.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, fluoride, and sulfate concentrations in downgradient monitoring wells MW-301, MW-302, and/or MW-303 demonstrate that the SSIs are likely primarily due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program. Natural variation may also contribute to the SSI reported for fluoride in downgradient monitoring well MW-302.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the EDG pond site may continue with detection monitoring based on this ASD. The ASD report will be included in the 2022 Annual Report due January 31, 2023.

7.0 REFERENCES

BT^2, Inc., 1993, Field Investigation Report, Edgewater Closed Ash Disposal Facility, Wisconsin Power & Light Company, WDNR License #2524, June 1993.

Krammerer, P.A. Jr., 1995, Ground-Water Flow and Quality in Wisconsin's Shallow Aquifer System, U.S. Geological Survey, Water-Resources Investigations Report 90-4171.

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SCS Engineers, 2018b, 2017 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station, January 2018.

Skinner, Earl L., and Borman, Ronald G., 1973, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigation Atlas HA-432.

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Tables

Table 1. Groundwater Analytical Results Summary
Edgewater Generating Station / SCS Engineers Project #25221068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	**MW-301**	**MW-302**	**MW-303**
		10/26/2021	10/26/2021	10/26/2021	10/26/2021
Appendix III					
Boron, µg/L	86	47.2	6,710	1,580	3,650
Calcium, µg/L	200,000	192,000	102,000	78,200	148,000
Chloride, mg/L	400	493	13.8 M0	20.7	21.6
Fluoride, mg/L	0.2	<4.8 D3	0.24 J, M0	0.88	<0.48 D3
Field pH, Std. Units	8.57	7.01	7.01	7.60	6.92
Sulfate, mg/L	36	35.7 J, D3	203 M0	71.2	<2.2 D3
Total Dissolved Solids, mg/L	1,190	1,170	538	290	640

4.4 Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:
UPL = Upper Prediction Limit
-- = Not Applicable
LOD = Limit of Detection
LOQ = Limit of Quantitation
mg/L = milligrams per liter
µg/L = micrograms per liter

Lab Notes:
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
J = Estimated concentration at or above the LOD and below the LOQ.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Notes:
1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well 2R-OW. Interwell UPLs based on a 1-of-2 retesting approach. The interwell UPLs were updated in January 2021 using data from April 2016 through October 2020.

Created by: NDK Date: 1/7/2021
Last revision by: RM Date: 11/18/2021
Checked by: MDB Date: 12/8/2021
Scientist/PM QA/QC: MDB Date: 12/8/2021

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25221068.00

Well Group	Well	Collection Date	Boron (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)
Background	2R-OW	4/8/2016	100	<0.20	19.5
		6/20/2016	22.4	<0.20	28.0
		8/9/2016	32.6	<0.20	25.4
		10/20/2016	43.1	<0.10	21.6
		1/24/2017	31.2	<0.10	23.9
		4/6/2017	70.6	<0.10	17.6
		6/6/2017	45.2	<0.10	17.8
		8/1/2017	35.7	<0.10	28.8
		10/23/2017	55.9	<0.10	29.3
		4/2/2018	19.7	0.12 J	17.2
		10/1/2018	34.7	<0.10	37.2
		4/8/2019	35.8	<0.10	10.6
		10/7/2019	58.8	<0.10	13.2
		4/8/2020	52.3	<0.095	11.6
		10/15/2020	29.9	<0.096 J	20.3
		4/14/2021	45.7	<0.095	15.3
		10/27/2021	47.2	<4.8 D3	35.7 J, D3
Compliance	MW-301	4/11/2016	8,550	0.33 J	372
		6/20/2016	8,190	0.36 J	343
		8/9/2016	8,450	0.33 J	368
		10/20/2016	8,620	0.34	369
		1/23/2017	9,280	0.42	372
		4/6/2017	8,370	0.21 J	367
		6/6/2017	9,160	<0.10	362
		8/2/2017	8,610	0.32	340
		10/24/2017	8,820	<0.10	341
		4/2/2018	7,950	0.25 J	332
		10/1/2018	8,230	0.20 J	318
		4/8/2019	7,310	0.29 J	322
		10/7/2019	7,220	0.24 J	312
		4/8/2020	7,450	0.39 M0	298
		10/15/2020	6,550	<0.48 D3, M0	293
		4/14/2021	7,200	0.25 J	195
		10/26/2021	6,710	0.24 J,M0	203 M0
	MW-302	4/8/2016	1,950	0.83	75.1
		6/20/2016	2,010	1.3 J	89.6
		8/9/2016	2,000	0.80	80.7
		10/20/2016	2,150	0.80	77.2
		1/24/2017	2,000	0.89 J	71.1
		4/6/2017	1,970	0.76	85.8
		6/6/2017	1,970	0.9	88.5
		8/2/2017	1,890	0.78	80.2
		10/24/2017	1,760	0.84	72.2
		4/2/2018	1,800	0.78	72.7
		10/1/2018	1,570	0.81	59.2
		4/8/2019	1,670	0.87	71.7
		10/7/2019	1,730	0.85	55.7
		4/8/2020	1,570	0.97	65.3
		10/15/2020	1,410	1.0 J, D3	73.1
		4/14/2021	1,550	0.88	70.5
		10/26/2021	1,580	0.88	71.2

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25221068.00

Well Group	Well	Collection Date	Boron (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)
Compliance	MW-303	4/8/2016	4,210	<0.20	3.0 J
		6/20/2016	3,360	<1.0	11.4 J
		8/9/2016	3,860	<0.20	2.4 J
		10/20/2016	3,740	<0.50	5.6 J
		1/24/2017	4,210	<0.50	<5.0
		4/6/2017	4,170	<0.50	<5.0
		6/6/2017	4,570	<0.50	<5.0
		8/2/2017	3,780	<0.50	<5.0
		10/24/2017	3,480	<0.50	<5.0
		4/2/2018	3,040	<0.50	<5.0
		10/1/2018	2,360	<0.10	<1.0
		4/8/2019	2,930	<0.50	<5.0
		10/7/2019	2,830	<0.50	<5.0
		4/8/2020	3,380	<0.48	<2.2
		10/15/2020	3,310	<0.48 D3	<2.2 D3
		4/14/2021	4,600	<0.095	0.54 J
		10/26/2021	3,650	<0.48 D3	<2.2 D3

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
-- = not analyzed
J = Estimated value below laboratory's limit of quantitation (LOQ)
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

Notes:
1. Complete laboratory reports included in 2017 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station.

Created by:	NDK	Date:	3/2/2018
Last revision by:	RM	Date:	3/14/2022
Checked by:	JAO	Date:	3/14/2022

I:\25221068.00\Deliverables\2021 Oct ASD Edg Closed\Tables\[Tables 2 and 4 - Analytical CCR and State Monitoring.xlsx]Table 2. CCR Analytical

Table 3A. Groundwater Elevations - State Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25221068.00

Raw Data	Depth to Water in feet below top of well casing																				
	1-OW	2R-OW	3R-OW	4R-OW	5-OW	W-5A	6AR	6R-OW	7A-OW	7-OW	18-OW	29-OW	29-A	30-OW	31-OW	32-OW	36-OW	37-OW	38R-OW	39R-OW	40-OW	SG-01
Measurement Date																						
October 24, 2012	3.61	4.90	8.68	10.36	5.09	5.15	3.90	3.58	1.70	2.95	2.98	3.70	2.65	4.41	6.42	5.44	14.86	15.60	21.60	15.99		--
April 8, 2013	3.22	2.80	2.95	9.25	4.06	4.19	2.92	3.64	0.91	2.78	2.50	3.25	1.18	2.24	4.65	4.57	13.84	14.78	20.82	15.74		--
October 22, 2013	6.84	11.57	10.42	11.14	6.49	6.20	8.68	6.15	2.47	5.49	NM [1]	4.33	2.49	8.62	8.60	8.31	15.50	16.80	22.56	17.48	--	--
April 22, 2014	3.67	3.50	3.33	9.49	5.54	4.74	4.32	3.61	4.43	3.22	NM [1]	3.65	1.03	3.28	5.25	5.32	NM [1]	15.35	21.60	15.48	--	
October 28, 2014	5.58	5.45	5.02	10.52	5.39	5.33	3.64	3.99	1.78	3.44	NM [1]	4.03	1.41	5.33	6.12	6.39	14.56	15.21	21.72	15.67	--	
April 7 - 9, 2015	3.82	4.25	3.88	10.08	5.06	5.08	4.33	3.48	1.75	4.23	ABAND	3.59	1.70	4.52	5.79	5.20	14.94	15.81	21.77	16.58	3.65	
October 8, 2015	6.94	8.50	7.98	11.08	5.96	7.37	8.67	5.31	2.47	3.02	ABAND	4.34	1.98	6.55	7.40	6.55	14.34	15.55	21.28	15.95	4.41	
April 4-5, 2016	3.32	2.70	3.6	8.91	4.02	4.03	6.80	5.30	1.29	4.8	ABAND	6.08	2.0	3.9	4.65	4.6	13.58	13.65	19.80	12.91	8.14	--
October 17, 2016 [2]	4.22	5.45	4.61	10.45	5.31	5.02	6.98	4.37	1.4	4.86	ABAND	7.61	3.15	4.58	5.98	5.24	13.76	14.32	20.24	14.55	8.00	5
April 12-13, 2017	3.49	2.92	3.37	9.29	4.64	4.15	4.55	3.66	1.22	5.45	ABAND	5.12	3.82	5.45	5.32	4.55	12.62	12.91	18.90	12.75	3.40	5
October 9, 2017	7.58	11.85	10.32	11.11	6.04	5.80	8.29	7.47	2.91	6.55	ABAND	5.85	4.37	8.05	8.07	7.89	14.45	16.54	21.33	15.97	4.37	5
April 2, 2018	3.93	4.85	4.69	8.92	4.99	4.96	4.52	3.54	1.65*	2.89	ABAND	3.35	2.14	5.13	6.05	6.22	13.92	15.02	20.94	16.05	3.78	5
June 19, 2018	NM	7.02	5.83	10.40	5.31	NM	NM	NM	NM	5.31	ABAND	3.43	3.46	5.85	6.71	NM	NM	14.58	20.30	14.43	4.35	NM
October 1, 2018	6.35	8.11	7.14	10.74	5.48	5.40	5.22	4.12	2.4	3.76	ABAND	3.82	4.31	6.02	6.89	6.26	14.33	14.90	20.71	14.25	4.25	5.99
April 8, 2019	3.15	3.22	3.31	3.67	4.69	4.51	6.71	3.63	1.49	2.45	ABAND	3.1	2.5	2.98	4.82	4.22	14.42	15.42	21.24	15.55	3.67	5
October 9-10, 2019	3.87	3.33	3.93	9.61	5.04	4.92	4.90	3.74	1.75	4.98	ABAND	3.72	4.15	3.66	5.37	4.59	14.71	14.77	20.97	14.22	4.34	5.85
April 8-9, 2020	3.69	3.75	3.62	9.55	5.15	4.95	5.58	4.03	1.80	4.75	ABAND	3.88	1.90	3.52	5.30	4.48	15.23	15.50	21.50	14.66	4.41	5.99
October 14-15, 2020	7.10	8.35	9.12	11.06	7.45	6.98	8.61	7.53	4.60	5.98	ABAND	4.91	2.42	6.98	6.40	6.25	ABAND	18.15	NM	19.32	4.16	NM
April 14, 2021	3.77	4.22	3.68	10.18	5.85	5.71	4.79	3.69	2.13	2.62	ABAND	3.7	1.61	3.75	5.54	4.82	ABAND	DRY	24.64	20.09	4.34	NM
October 27-28, 2021	7.19	9.10	10.58	11.13	7.66	7.14	11.42	6.38	2.96	5.12	ABAND	4.26	2.6	7.92	7.12	7.05	ABAND	DRY	25.65	21.7	4.68	ABAND

	Ground Water Elevation in feet above mean sea level (amsl)																					
Well Number	**1-OW**	**2R-OW**	**3R-OW**	**4R-OW**	**5-OW**	**W-5A**	**6AR**	**6R-OW**	**7A-OW**	**7-OW**	**18-OW**	**29-OW**	**29-A**	**30-OW**	**31-OW**	**32-OW**	**36-OW**	**37-OW**	**38R-OW**	**39R-OW**	**40-OW**	**SG-01**
Top of Casing Elevation (feet amsl)	591.72	612.72	591.32	595.60	600.72	601.84	591.32	590.98	593.41	592.51	586.47	588.86	589.25	590.81	589.00	589.07	614.63	615.02	620.98	614.04	587.42	
Screen Length (ft)																						
Total Depth (ft from top of casing)	11.10	17.53	15.82	16.48	10.65	21.51	19.86	10.37	20.21	9.93	14.25	19.96	43.12	14.88	14.98	14.95	21.01	18.55	29.00	22.29	17.3	
Top of Well Screen Elevation (ft)	580.62	595.19	575.50	579.12	590.07	580.33	571.46	580.61	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62	596.47	591.98	591.75		0.00
Measurement Date																						
October 9, 2017	584.14	600.87	581.00	584.49	594.68	596.04	583.03	583.51	590.50	585.96	ABAND	583.01	584.88	582.76	580.93	581.18	600.18	598.48	599.65	598.07	583.05	
April 2, 2018	587.79	607.87	586.63	586.68	595.73	596.88	586.80	587.44	591.76	589.62	ABAND	585.51	587.11	585.68	582.95	582.85	600.71	600.00	600.04	597.99	583.64	
June 19, 2018	NM	605.70	585.49	585.20	595.41	NM	NM	NM	NM	587.20	ABAND	585.43	585.79	584.96	582.29	NM	NM (1)	600.44	600.68	599.61	583.07	NM
October 1, 2018	585.37	604.61	584.18	584.86	595.24	596.44	586.10	586.86	591.01	588.75	ABAND	585.04	584.94	584.79	582.11	582.81	600.30	600.12	600.27	599.79	583.17	
April 8, 2019	588.57	609.50	588.01	591.93	596.03	597.33	584.61	587.35	591.92	590.06	ABAND	585.76	586.75	587.83	584.18	584.85	600.21	599.60	599.74	598.49	583.75	
October 9-10, 2019	587.85	609.39	587.39	585.99	595.68	596.92	586.42	587.24	591.66	587.53	ABAND	585.14	585.10	587.15	583.63	584.48	599.92	600.25	600.01	599.82	583.08	
April 8-9, 2020	588.03	608.97	587.70	586.05	595.57	596.89	585.74	586.95	591.61	587.76	ABAND	584.98	587.35	587.29	583.70	584.59	599.40	599.52	599.48	599.38	583.01	
October 14-15, 2020	584.62	604.37	582.20	584.54	593.27	594.86	582.71	583.45	588.81	586.53	ABAND	583.95	586.83	583.83	582.60	582.82	ABAND	596.87	NM	594.72	583.26	NM
April 14, 2021	587.95	608.50	587.64	585.42	594.87	596.13	586.53	587.29	591.28	589.89	ABAND	585.16	587.64	587.06	583.46	584.25	ABAND	DRY	596.34	593.95	583.08	NM
October 27-28, 2021	584.53	603.62	580.74	584.47	593.06	594.70	579.90	584.60	590.45	587.39	ABAND	584.60	586.65	582.89	581.88	582.02	ABAND	DRY	595.33	592.34	582.74	ABAND

Bottom of Well Elevation (ft)	580.62	595.19	575.50	579.12	590.07	580.33	571.46	580.61	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62	596.47	591.98	591.75	570.12	0.00

Notes:
NM = not measured
ABAND = abandoned

Created by: MDB Date: 5/6/2013
Last revision by: JR Date: 1/20/2022
Checked by: RM Date: 1/20/2022

1: Well broken
2: Well casings at 7-OW, 7A, and 29-OW were cut down to allow the protective covers to close. 7-OW was cut down by 0.22 ft, 7A was cut down by 0.29 ft, and 29-OW was cut down by 0.17 ft. Top of casing elevations in this table were adjusted acc
*: Well was frozen
Monitoring Well 40-OW cut down to have a top of casing elevation of 586.05 famsl on December 3, 2021.

I:\25221068.00\Deliverables\2021 Oct ASD Edg Closed\Tables\[Table 3A - GW Elevations State Wells.xls]levels

Table 3B. Groundwater Elevations - CCR Monitoring Wells
WPL - Edgewater 1-4 (Closed) Ash Disposal Facility /
SCS Engineers Project #25221068.00

Ground Water Elevation in feet above mean sea level (amsl)				
Well Number	**MW-301**	**MW-302**	**MW-303**	**2R-OW**
Top of Casing Elevation (feet amsl)	604.42	615.15	611.99	612.72
Screen Length (ft)	5.00	5.00	5.00	10.00
Total Depth (ft from top of casing)	27.47	40.00	33.26	14.50
Top of Well Screen Elevation (ft)	581.95	580.15	579.60	608.22
Measurement Date				
April 8, 2016	599.75	596.19	589.04	609.68
June 20, 2016	598.30	595.68	587.22	606.70
August 9, 2016	598.00	595.53	587.72	605.74
October 20, 2016	598.50	595.46	588.37	607.27
January 23-24, 2017	597.10	596.30	588.84	609.64
April 6, 2017	600.04	593.57	589.04	609.72
June 6, 2017	598.77	595.86	588.44	607.63
August 1, 2017	597.40	595.22	587.36	604.59
October 24, 2017	597.20	595.25	587.97	601.74
April 2, 2018	598.54	595.71	588.77	607.87
October 1, 2018	597.60	595.28	588.17	604.61
April 8, 2019	598.92	595.68	588.88	609.50
October 7, 2019	599.56	595.58	588.77	609.39
June 26, 2020	597.89	NM	NM	NM
October 15, 2020	595.10	598.56	593.19	604.27
April 14, 2021	595.17	600.56	595.01	608.50
October 26, 2021	590.68	599.82	594.07	604.04
Bottom of Well Elevation (ft)	576.95	575.15	578.73	598.22

Notes:
NM = not measured

Created by:	MDB	Date:	6/27/2016
Last rev. by:	REO	Date:	11/8/2021
Checked by:	MDB	Date:	12/14/2021
Scientist QA/QC:	MDB	Date:	12/14/2021

I:\25221068.00\Deliverables\2021 Oct ASD Edg Closed\Tables\[Table 3B - GW Elevations CCR Wells.xls]levels

Table 4. 2016 - 2021 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells			
2R-OW	2016-Apr	26.6	30.9
2R-OW	2016-Oct	40.4	22.9
2R-OW	2017-Apr	69.3 J	28.6
2R-OW	2017-Oct	35.2	32.9
2R-OW	2018-Apr	23.3	18.2
2R-OW	2018-Oct	41.8	35.5
2R-OW	2019-Apr	40.6	12.2
2R-OW	2019-Oct	88.5	29.3
2R-OW	2020-Apr	45.8	16.9
2R-OW	2020-Oct	29.9	21.8
2R-OW	2021-Apr	31.1	22.7
2R-OW	2021-Oct	39.2	26
3R-OW	2016-Apr	392	533
3R-OW	2016-Oct	468	372
3R-OW	2017-Apr	400	409
3R-OW	2017-Oct	389	637
3R-OW	2018-Apr	351	498
3R-OW	2018-Oct	462	495
3R-OW	2019-Apr	337	279
3R-OW	2019-Oct	454	299
3R-OW	2020-Apr	473	498
3R-OW	2020-Oct	339	654
3R-OW	2021-Apr	316	172
3R-OW	2021-Oct	260	497
4R-OW	2016-Apr	7,710	120
4R-OW	2016-Oct	17,300	252
4R-OW	2017-Apr	12,600	180
4R-OW	2017-Oct	15,700	178
4R-OW	2018-Apr	12,700	164
4R-OW	2018-Oct	8,630	129
4R-OW	2019-Apr	10,200	158
4R-OW	2019-Oct	9,200	161
4R-OW	2020-Apr	9,320	90.9
4R-OW	2020-Oct	10,200	134
4R-OW	2021-Apr	10,800	191
4R-OW	2021-Oct	10,400	140
5-OW	2016-Apr	4,330	215
5-OW	2016-Oct	5,970	210
5-OW	2017-Apr	5,490	258
5-OW	2017-Oct	6,040	230
5-OW	2018-Apr	3,900	143
5-OW	2018-Oct	6,180	226
5-OW	2019-Apr	4,140	197
5-OW	2019-Oct	4,680	179
5-OW	2020-Apr	4,610	199
5-OW	2020-Oct	4,870	161
5-OW	2021-Apr	2,670	111
5-OW	2021-Oct	3,250	100

Table 4. 2016 - 2021 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells (continued)			
7-OW	2016-Apr	610	255
7-OW	2016-Oct	964	251
7-OW	2017-Apr	761	259
7-OW	2017-Oct	1,130	246
7-OW	2018-Apr	818	243
7-OW	2018-Oct	1150	218
7-OW	2019-Apr	914	254
7-OW	2019-Oct	1,200	224
7-OW	2020-Apr	928	214
7-OW	2020-Oct	1,290	242
7-OW	2021-Apr	961	247
7-OW	2021-Oct	1,350	224
29-A	2016-Apr	357	40.9
29-A	2016-Oct	264	39.6
29-A	2017-Apr	365	41.5
29-A	2017-Oct	278	42.1
29-A	2018-Apr	264	39.4
29-A	2018-Oct	268	39.2
29-A	2019-Apr	292	44.2
29-A	2019-Oct	258	39.1
29-A	2020-Apr	268	37.5
29-A	2020-Oct	263	42.9
29-A	2021-Apr	262	214
29-A	2021-Oct	233	40.8
29-OW	2016-Apr	10,600	120
29-OW	2016-Oct	10,900	85.7
29-OW	2017-Apr	9,500	77.0
29-OW	2017-Oct	9,060	62.0
29-OW	2018-Apr	8,640	102
29-OW	2018-Oct	11,000	109
29-OW	2019-Apr	10,600	190
29-OW	2019-Oct	10,800	114
29-OW	2020-Apr	9,160	69.9
29-OW	2020-Oct	8,480	73.3
29-OW	2021-Apr	7,120	66.4
29-OW	2021-Oct	8,700	86.7
30-OW	2016-Apr	79.1	4.80
30-OW	2016-Oct	113	4.60
30-OW	2017-Apr	176	7.50
30-OW	2017-Oct	135	16.7
30-OW	2018-Apr	94.5	21.5
30-OW	2018-Oct	115	11.4
30-OW	2019-Apr	52.1	2.40 J
30-OW	2019-Oct	84.9	5.60
30-OW	2020-Apr	54.4	2.80
30-OW	2020-Oct	118	15.2
30-OW	2021-Apr	42.3	5.5
30-OW	2021-Oct	108	14.9

Table 4. 2016 - 2021 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells (continued)			
31-OW	2016-Apr	114	91.2
31-OW	2016-Oct	34.7	63.3
31-OW	2017-Apr	76.9	82.4
31-OW	2017-Oct	190	70.3
31-OW	2018-Apr	30.8	51.5
31-OW	2018-Oct	36.7	62.7
31-OW	2019-Apr	18.5	68.6
31-OW	2019-Oct	38.6	57.5
31-OW	2020-Apr	25.8	39.1
31-OW	2020-Oct	30.8	58.5
31-OW	2021-Apr	51	59.5
31-OW	2021-Oct	39.5	35
40-OW	2016-Apr	8,030	731
40-OW	2016-Oct	29,400	768
40-OW	2017-Apr	8,680	849
40-OW	2017-Oct	8,800	873
40-OW	2018-Apr	9,790	771
40-OW	2018-Oct	11,300	797
40-OW	2019-Apr	8,620	636
40-OW	2019-Oct	10,600	836
40-OW	2020-Apr	10,900	836
40-OW	2020-Oct	9,870	818
40-OW	2021-Apr	8,010	827
40-OW	2021-Oct	9,180	839
Leachate Monitoring Wells			
37-OW	2016-Apr	19,100	759
37-OW	2016-Oct	12,500	439
37-OW	2017-Apr	15,900	633
37-OW	2017-Oct	9,440	264
37-OW	2018-Apr	5,890	159
37-OW	2018-Oct	16,600	555
37-OW	2019-Apr	15,800	492
37-OW	2019-Oct	16,300	798
37-OW	2020-Apr	20,200	769
37-OW	2020-Oct	--	--
37-OW	2021-Apr	--	--
37-OW	2021-Oct	--	--
38R-OW	2016-Apr	33,800	1,000
38R-OW	2016-Oct	17,100	514
38R-OW	2017-Apr	21,100	932
38R-OW	2017-Oct	10,800	364
38R-OW	2018-Apr	4,250	123
38R-OW	2018-Oct	32,400	956
38R-OW	2019-Apr	9,720	330
38R-OW	2019-Oct	30,400	1,020
38R-OW	2020-Apr	51,800	1,520
38R-OW	2020-Oct	--	--
38R-OW	2021-Apr	37400	1380
38R-OW	2021-Oct	38400	1310

Table 4. 2016 - 2021 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Leachate Monitoring Wells (continued)			
39R-OW	2016-Apr	10,100	534
39R-OW	2016-Oct	29,900	1,390
39R-OW	2017-Apr	22,400	1,150
39R-OW	2017-Oct	32,800	1,400
FIELD BLANK	2018-Apr	--	--
39R-OW	2018-Oct	24,700	1,160
39R-OW	2019-Apr	26,000	1,520
39R-OW	2019-Oct	17,100	601
39R-OW	2020-Apr	19,100	1,160
39R-OW	2020-Oct	34,200	1,190
39R-OW	2021-Apr	24,800	1,140
39R-OW	2021-Oct	--	--

Abbreviations:
µg/L = micrograms per liter or parts per billi-- : not measured
mg/L = milligrams per liter or parts per million (ppm)
Notes:
-- : not measured
Laboratory Notes:
J: Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Created by:	SCC	Date:	2/24/2014
Last revision by:	RM	Date:	3/14/2022
Checked by:	JAO	Date:	3/14/2022

\\10.2.18.8\data\Projects\25221068.00\Deliverables\2021 Oct ASD Edg Closed\Tables\[Tables 2 and 4 - Analytical CCR and State Monitoring.xlsx]Table 4. GW quality Data

Table 5. Analytical Results - Closed Landfill Leachate Fluoride Monitoring
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25221068.00

Collection Date	Fluoride (mg/L)			
	36-OW	37-OW	38R-OW	39R-OW
9/8/1994	0.25	0.62	0.57	0.79
9/14/1995	0.38	0.51	0.71	0.87
9/17/1996	0.56	0.42	0.71	0.97
9/16/1997	0.60	0.44	0.73	0.97

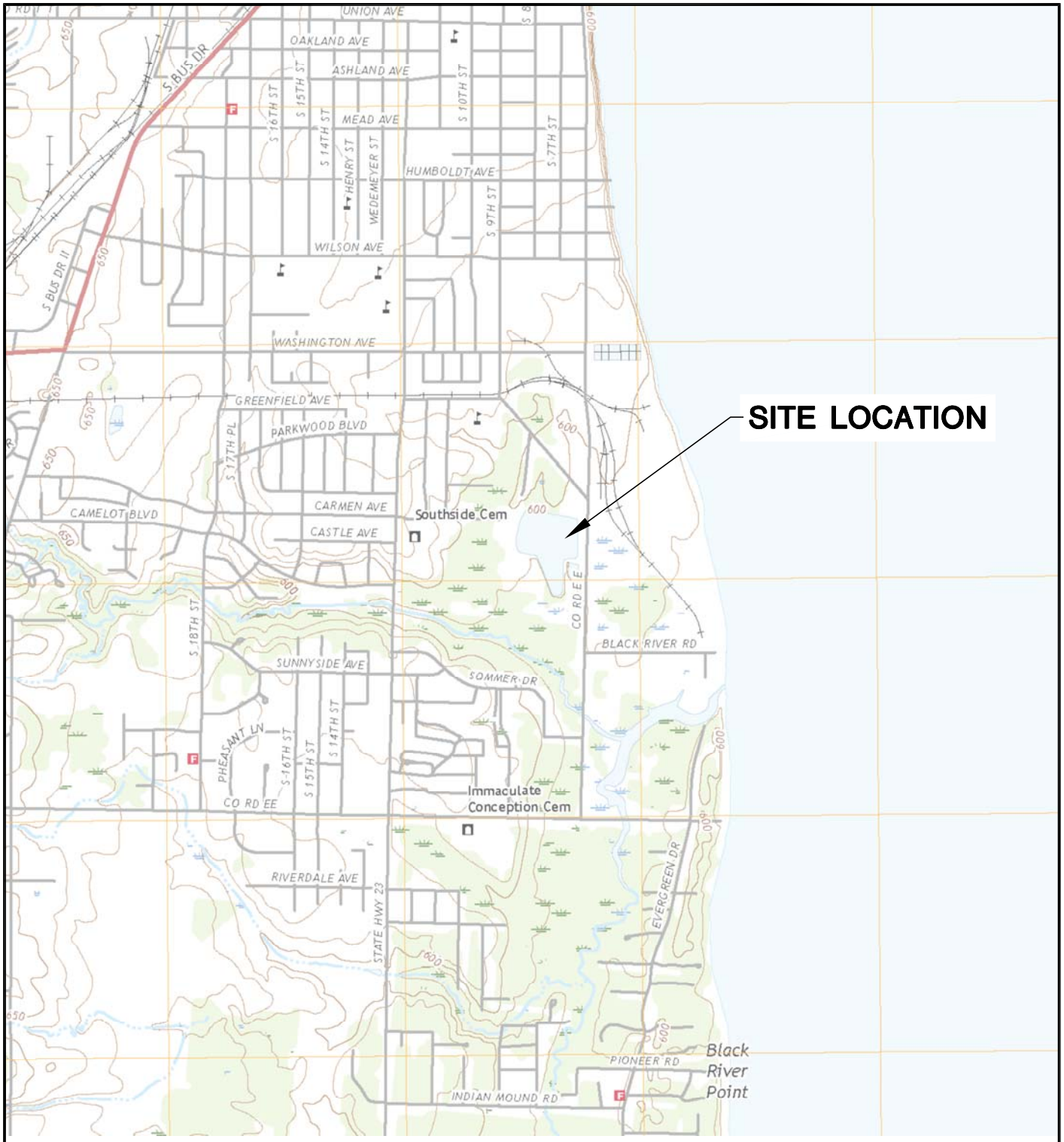
Abbreviations:
mg/L = milligrams per liter or parts per million (ppm)

Notes:
1. Data compiled from WDNR Groundwater Environmental Monitoring System (GEMS) website.

Created by:	NDK	Date:	3/5/2018
Last revision by:	NDK	Date:	3/5/2018
Checked by:	AJR	Date:	4/5/2018

I:\25221068.00\Deliverables\2021 Oct ASD Edg Closed\Tables\[Table 5 - EDG - closed-Leachate Fluoride Monitoring.xlsx]Table 5- Fl results

Figures



N

SHEBOYGAN SOUTH QUADRANGLE
WISCONSIN–SHEBOYGAN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	WISCONSIN POWER AND LIGHT EDGEWATER GENERATING STATION 3739 LAKESHORE DRIVE SHEBOYGAN, WI 53081	SITE	ALLIANT ENERGY EDGEWATER GENERATING STATION SHEBOYGAN, WI

SITE LOCATION MAP

PROJECT NO.	25220068.00	DRAWN BY:	BSS
DRAWN:	11/20/19	CHECKED BY:	MDB
REVISED:	11/20/19	APPROVED BY:	TK 04/10/2020

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE
1

I:\25220068.00\Drawings\ASD\Site Location Map.dwg, 4/12/2020 8:05:44 PM

LEGEND

- CCR RULE MONITORING WELL
- CCR RULE BACKGROUND MONITORING WELL
- ADDITIONAL MONITORING WELL
- ADDITIONAL PIEZOMETER
- ABANDONED MONITORING WELL
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. CCR UNIT LIMITS AND CLOSED LANDFILL LOCATION ARE APPROXIMATE.
4. MONITORING WELLS MW-301, MW-302, AND MW-303 WERE INSTALLED BY BADGER STATE DRILLING BETWEEN JANUARY 14 AND FEBRUARY 4, 2016.
5. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER GENERATING STATION IS 2R-OW.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	04/18/2022	APPROVED BY:	TK 9/23/2021

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: ALLIANT ENERGY
EDGEWATER GENERATING STATION
SHEBOYGAN, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25222068.00\Drawings\Site □lan and M□nit□ring Well L□□ati□ns.dwg, □/18/2022 5:22:1□ □M

N

LEGEND

- ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- 598.54 — WATER TABLE ELEVATION (OCTOBER 26–28, 2021)
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. EXISTING WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. DESIGN MANAGEMENT ZONE LOCATION IS APPROXIMATE
4. NEW MONITORING WELL LOCATIONS WERE SURVEYED BY CQM, INC. ON FEBRUARY 12, 2016.
5. MW–301, MW–302, AND MW–303 ARE NOT INCLUDED IN THE WDRN–APPROVED SITE–SPECIFIC MONITORING PLAN
6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON OCTOBER 26–28, 2021.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	KP/ZW
DRAWN:	12/17/2021	CHECKED BY:	NDK
REVISED:	04/18/2022	APPROVED BY:	TK 3/22/2022

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718–6751
PHONE: (608) 224–2830

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1–4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
OCTOBER 2021

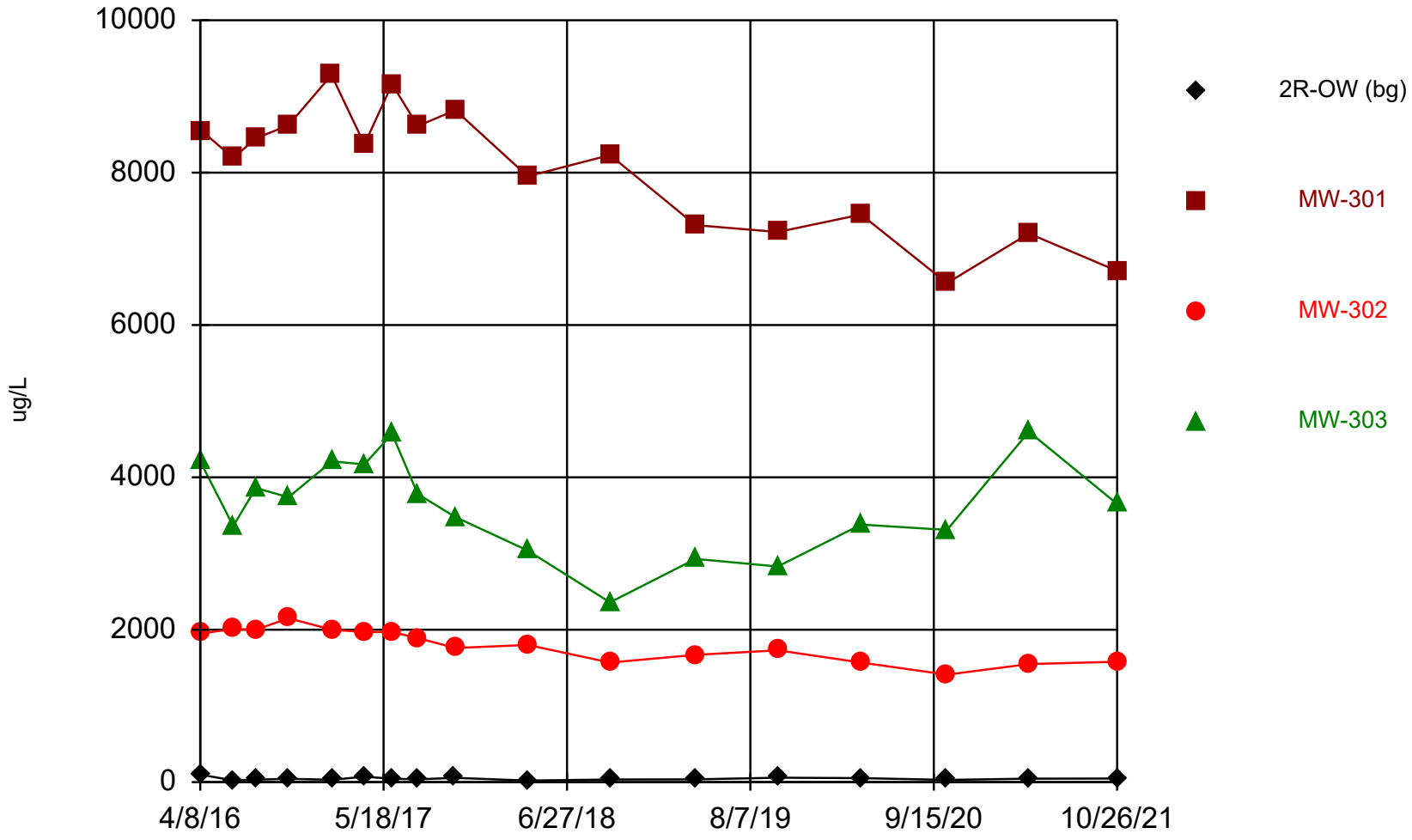
FIGURE
3

\\Mad□s01\data\□r□e□ts\25222068.00\Drawings\Water Tables.dwg, □1□/2022 8:□7:03 AM

Appendix A

Trend Plots for CCR Wells

Boron



Time Series Analysis Run 3/14/2022 11:52 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

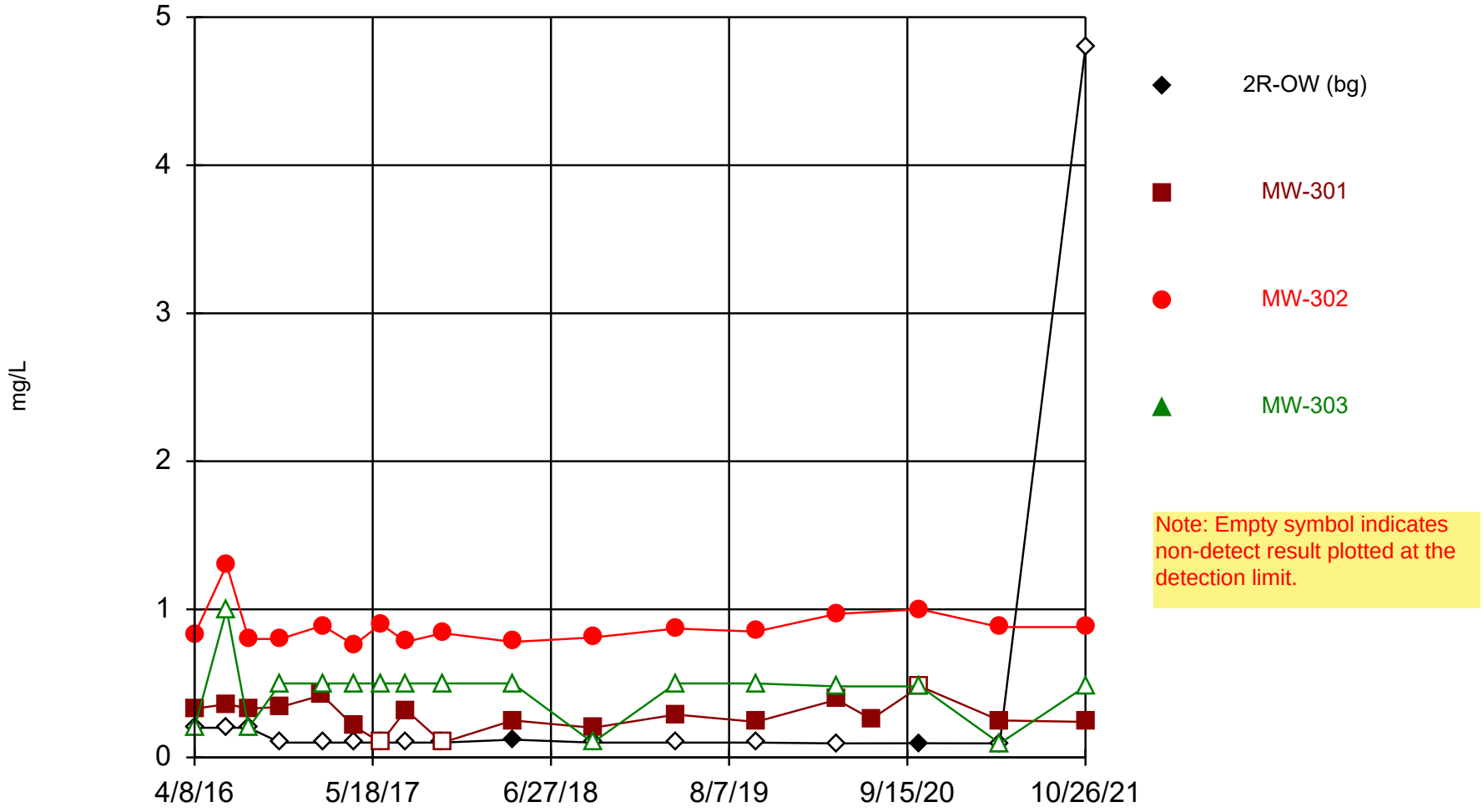
Constituent: Boron (ug/L) Analysis Run 3/14/2022 11:54 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	100		1950	4210
4/11/2016		8550		
6/20/2016	22.4	8190	2010	3360
8/9/2016	32.6	8450	2000	3860
10/20/2016	43.1	8620	2150	3740
1/23/2017		9280		
1/24/2017	31.2		2000	4210
4/6/2017	70.6	8370	1970	4170
6/6/2017	45.2	9160	1970	4570
8/1/2017	35.7			
8/2/2017		8610	1890	3780
10/23/2017	55.9			
10/24/2017		8820	1760	3480
4/2/2018	19.7	7950	1800	3040
10/1/2018	34.7	8230	1570	2360
4/8/2019	35.8	7310	1670	2930
10/7/2019	58.8	7220	1730	2830
4/8/2020	52.3	7450	1570	3380
10/15/2020	29.9	6550	1410	3310
4/14/2021	45.7	7200	1550	4600
10/26/2021	47.2	6710	1580	3650

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 3/14/2022 11:52 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

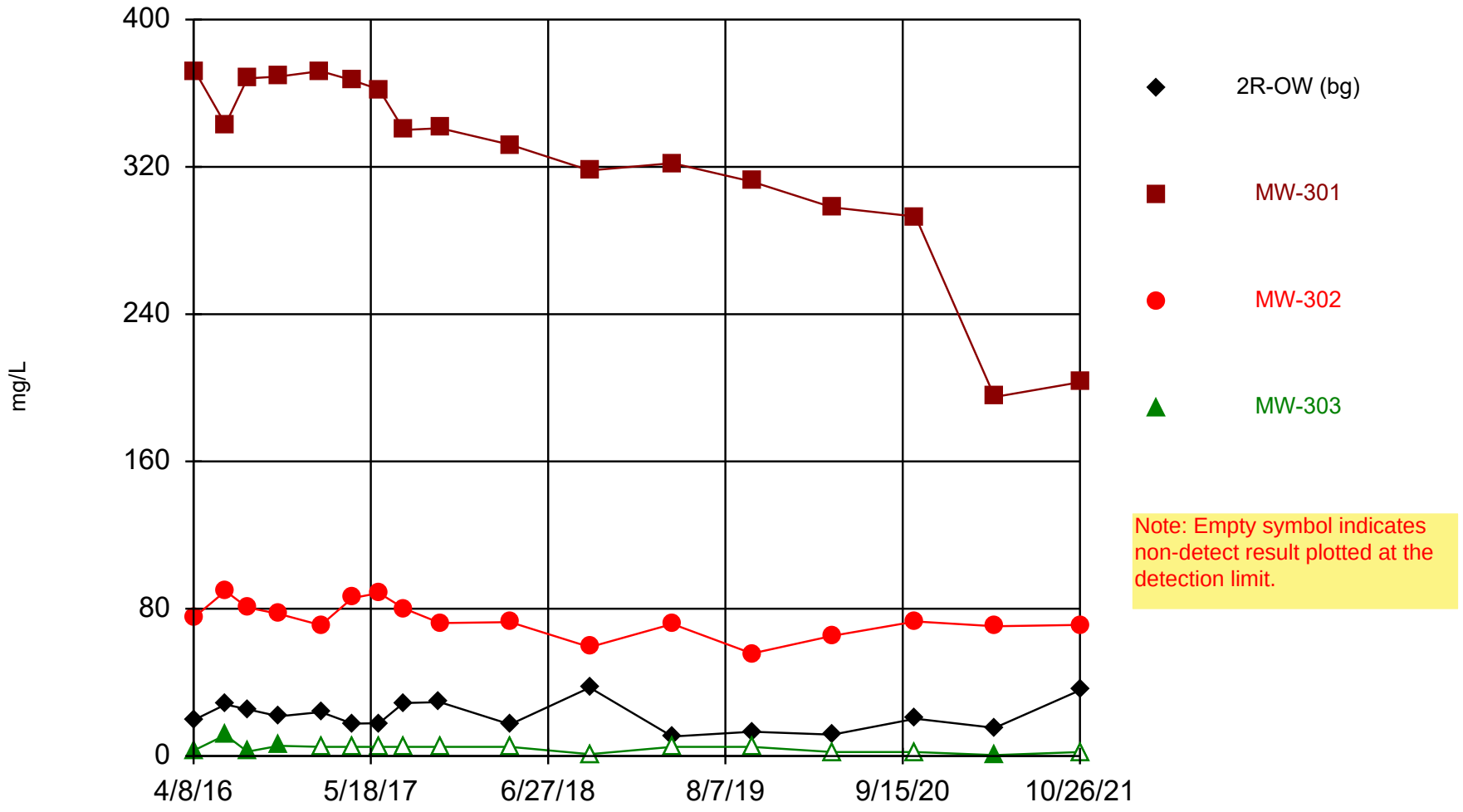
Constituent: Fluoride (mg/L) Analysis Run 3/14/2022 11:54 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	<0.2 (U)		0.83	<0.2 (U)
4/11/2016		0.33 (J)		
6/20/2016	<0.2 (U)	0.36 (J)	1.3 (J)	<1 (U)
8/9/2016	<0.2 (U)	0.33 (J)	0.8	<0.2 (U)
10/20/2016	<0.1 (U)	0.34	0.8	<0.5 (U)
1/23/2017		0.42		
1/24/2017	<0.1 (U)		0.89 (J)	<0.5 (U)
4/6/2017	<0.1 (U)	0.21 (J)	0.76	<0.5 (U)
6/6/2017	<0.1 (U)	<0.1 (U)	0.9	<0.5 (U)
8/1/2017	<0.1 (U)			
8/2/2017		0.32	0.78	<0.5 (U)
10/23/2017	<0.1 (U)			
10/24/2017		<0.1 (U)	0.84	<0.5 (U)
4/2/2018	0.12 (J)	0.25 (J)	0.78	<0.5 (U)
10/1/2018	<0.1 (U)	0.2 (J)	0.81	<0.1 (U)
4/8/2019	<0.1 (U)	0.29 (J)	0.87	<0.5 (U)
10/7/2019	<0.1 (U)	0.24 (J)	0.85	<0.5 (U)
4/8/2020	<0.095 (U)	0.39	0.97	<0.48 (U)
6/26/2020		0.26 (J)		
10/15/2020	0.096 (J)	<0.48 (U)	1 (J)	<0.48 (U)
4/14/2021	<0.095	0.25 (J)	0.88	<0.095
10/26/2021	<4.8 (U)	0.24 (J)	0.88	<0.48

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 3/14/2022 11:52 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Sulfate (mg/L) Analysis Run 3/14/2022 11:54 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	19.5		75.1	3 (J)
4/11/2016		372		
6/20/2016	28	343	89.6	11.4 (J)
8/9/2016	25.4	368	80.7	2.4 (J)
10/20/2016	21.6	369	77.2	5.6 (J)
1/23/2017		372		
1/24/2017	23.9		71.1	<5 (U)
4/6/2017	17.6	367	85.8	<5 (U)
6/6/2017	17.8	362	88.5	<5 (U)
8/1/2017	28.8			
8/2/2017		340	80.2	<5 (U)
10/23/2017	29.3			
10/24/2017		341	72.2	<5 (U)
4/2/2018	17.2	332	72.7	<5 (U)
10/1/2018	37.2	318	59.2	<1 (U)
4/8/2019	10.6	322	71.7	<5 (U)
10/7/2019	13.2	312	55.7	<5 (U)
4/8/2020	11.6	298	65.3	<2.2 (U)
10/15/2020	20.3	293	73.1	<2.2 (U)
4/14/2021	15.3	195	70.5	0.54 (J)
10/26/2021	35.7 (J)	203	71.2	<2.2 (U)

E2 April 2022 ASD

Alternative Source Demonstration
April 2022 Detection Monitoring

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

SCS ENGINEERS

25222068.00 | October 13, 2022

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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Section Page

Tables

Figures

Appendix

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PE CERTIFICATION

I, Sherren Clark, hereby certify that that the information in this alternate source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Edgewater Generating Station Ash Ponds. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

SC Clark 10-13-2022

(signature) (date)

Sherren Clark, PE

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2024.

Pages or sheets covered by this seal:
Alternative Source Demonstration – April 2022 Detection Monitoring, Edgewater Generating Station, Sheboygan Wisconsin
(Entire Document)

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (U.S. EPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (U.S. EPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program to determine if any other sources are likely causes of the identified exceedance(s) of the established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report evaluates the SSIs observed in the statistical evaluation of the April 2022 detection monitoring event at the Edgewater Generating Station (EDG). The first ASD was prepared for this facility evaluated the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018b). The October 2017 ASD and subsequent semiannual updates included several lines of evidence demonstrating that SSIs reported for boron, fluoride, and sulfate concentrations in the downgradient monitoring wells (MW-301, MW-302, and MW-303) were likely due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107.

As discussed in more detail in **Section 4.2** of this ASD, the findings for the April 2022 monitoring event are consistent with those for the previous events.

1.2 SITE INFORMATION AND MAP

EDG is located at 3739 Lakeshore Drive in Sheboygan, Sheboygan County, Wisconsin (**Figure 1**). EDG is an active coal-burning generating station. The EDG property includes a closed landfill and a series of closed CCR settling ponds, located on the opposite side of Lakeshore Drive from the plant itself (**Figure 1**). The EDG landfill is closed and no longer receives CCR. The groundwater monitoring system at EDG is a multi-unit system monitoring four former existing CCR Units which were contiguous:

- EDG Slag Pond (existing CCR surface impoundment)
- EDG North A-Pond (existing CCR surface impoundment)
- EDG South A-Pond (existing CCR surface impoundment)
- EDG B-Pond (existing CCR surface impoundment)

Closure of the four CCR surface impoundments was initiated in 2020, the cover was in place in June 2021, and the completion of closure was certified on August 9, 2021. The existing monitoring system will be used to monitor the closure area. A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided on **Figure 2**.

The closed CCR landfill (Wisconsin Department of Natural Resources [WDNR] Permit No. 2524) is located immediately west of the former ponds location. The landfill contains primarily fly ash with some slag and was closed in 1987. Because this CCR landfill did not accept CCR after October 19, 2015, the landfill is not subject to the requirements of 40 CFR 257.50-107. The closed landfill is unlined and is known to be impacting groundwater at the site (SCS, 2016). Previous investigations done at the site (BT^2, Inc., 1993; RMT, 1997) concluded that the groundwater impacts downgradient of the landfill and ponds were attributable to groundwater interaction with the landfill, rather than leakage from the ponds.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

SSIs were identified for boron, fluoride, and sulfate at one or more wells based on the April 2022 detection monitoring event. A summary of the April 2022 constituent concentrations and the established benchmark concentrations are provided in **Table 1**. The constituent concentrations with SSIs above the background concentration are highlighted in the table.

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

The boron, fluoride, and sulfate results from historical background and compliance sampling are provided in **Table 2**. The laboratory report for the April 2022 detection monitoring event will be included in the 2022 annual groundwater monitoring and corrective action report completed in January 2023. Complete laboratory reports for the background monitoring events and previous detection monitoring events were included in the previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

To provide context for the ASD evaluation, the following background information is provided in this section of the report, prior to the ASD evaluation sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells
- Groundwater flow direction

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018a).

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

For the purposes of groundwater monitoring, the unconsolidated sand and gravel aquifer is considered to be the uppermost aquifer, as defined under 40 CFR 257.53, at the EDG ponds. The sand and gravel aquifer is present in some parts of Sheboygan County (Skinner and Borman, 1973). Boring logs from monitoring wells at the EDG ponds and for nearby private wells indicate that the unconsolidated material at, and near, the site contains a significant amount of sand. Private well logs from the surrounding area indicate that the sand and gravel aquifer has been used as a water source; however, several older sand wells in the area have been replaced with bedrock water supply wells.

The dolomite aquifer underlies the unconsolidated material at the site. The total thickness of the dolomite aquifer at the site is unknown. The dolomite aquifer is underlain by the Maquoketa shale, which is a confining unit. The Maquoketa shale is underlain by the Cambrian-Ordovician sandstone aquifer. This sequence of sedimentary bedrock units is over 1,500 feet thick in the site vicinity.

The regional groundwater flow in the unconsolidated sand and gravel aquifer in the vicinity of the site is to the east and slightly southeast.

2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established under the CCR Rule consists of one upgradient (background) monitoring well and three downgradient monitoring wells, as shown on **Figure 2**. The upgradient monitoring well is 2R-0W. The downgradient monitoring wells include MW-301, MW-302, and MW-303. The CCR compliance monitoring wells were installed in the unconsolidated sediments with screens in the uppermost soil layer producing appreciable water, which was a sandy silt unit. Well depths range from approximately 14.5 to 40 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Seventeen groundwater monitoring wells currently exist at the EDG site as part of the monitoring system developed for the state monitoring program for the closed landfill. The well locations are shown on **Figure 2**. These monitoring wells are used to monitor groundwater conditions at the site under the WDNR state monitoring program.

Monitoring wells for the state monitoring program are installed in the unconsolidated material at the site. This shallow monitoring system includes water table wells and piezometers. Well depths range from approximately 9 to 43 feet, measured from the top of the well casing.

2.4 GROUNDWATER FLOW DIRECTION

Shallow groundwater in the area of the EDG site generally flows to the south-southeast, toward Fish Creek, which discharges into Lake Michigan. There has historically been localized groundwater mounding associated with the EDG ponds, which are now closed. The water table map shown on **Figure 3** represents the site conditions of the unconsolidated deposits during the April 2022 detection monitoring event. The water table map shows a generally southward flow direction. The groundwater elevations at the CCR and state monitoring wells during the April 2022 detection monitoring event are in **Tables 3A** and **3B**.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR Unit, SCS used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to the exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR Unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross-contamination during sampling, or another field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSI concentrations were due to a sampling error.

Because boron, fluoride, and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory report for the April 2022 detection monitoring was reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs for boron, fluoride, or sulfate. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring events were reviewed for the October 2017 ASD. Laboratory reports for subsequent detection monitoring events were reviewed as part of the ASD preparation for each event.

The April 2022 fluoride and sulfate results for wells 2R-OW and MW-303 were reported with D3 flags, indicating that the samples were diluted due to the presence of high levels of non-target analytes or other matrix interference. The fluoride and sulfate detection limits shown in Table 1 are the lowest the laboratory could achieve for the samples and the dilutions do not affect the usability of the data for determining compliance.

The boron results for the field blank and for well 2R-OW were reported with 1q flags, indicating that the analyte was measured in the associated method blank at -3.1 micrograms per liter (µg/L). These results do not affect the usability of the data.

Both of the matrix spike/matrix spike duplicate (MS/MSD) quality control analyses included with the sample batch had one of the two spike recoveries slightly exceeding the allowable limits, indicating a possible slight high bias in the fluoride results. One of the MS/MSD analyses also had high recovery for sulfate. The samples were accepted based on the acceptable laboratory control sample recoveries and were not flagged in the laboratory report.

Based on the review of the laboratory reports, SCS did not identify any indication that the SSI concentrations were due to a laboratory analysis error. Although there were some quality control issues noted, there were no laboratory quality control flags or issues identified in the laboratory reports that appeared to have a significant impact on the usability of the data for detection monitoring.

Time series plots of the analytical data were also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). Time series plots for the parameters with SSIs are provided in Appendix A. No indications of sampling or laboratory errors were noted based on the time series review. The April 2022 boron, fluoride, and sulfate results for MW-301, MW-302, and MW-303 are consistent with the historical data.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods includes a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Review statistical method and outlier concentration lists for each monitoring well/CCR unit

Based on the review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for the April 2022 detection monitoring event.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the April 2022 monitoring event based on the methodology and analysis review, and no errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the boron, fluoride, and sulfate SSIs at MW-301, MW-302, and MW-303; identifies the most likely alternative source(s); and presents the lines of evidence indicating that an alternative source is most likely the cause of the observed SSIs for boron, fluoride, and sulfate.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the April 2022 detection monitoring results to the upper prediction limits (UPLs) calculated based on the sampling of the background well (2R-OW). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron and sulfate SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Natural variation may have caused or contributed to the SSI for fluoride at MW-302. Elevated natural fluoride concentrations significantly higher than those reported for the downgradient wells (above 2 milligrams per liter [mg/L]) have been observed in a region in eastern Wisconsin extending along the Lake Michigan shoreline from Kewaunee County in the north to the Illinois border in the south, as described in Luczaj, J., and Masarik, K, 2015, *Groundwater Quantity and Quality Issues in a Water-Rich Region: Examples from Wisconsin, USA*. The authors note that most of the wells with elevated fluoride appear to be drawing from the Pleistocene glacial sediments and Silurian dolomite units. Skinner and Borman (1973) and Kammerer (1995) also identify the Lake Michigan shoreline area of eastern Wisconsin as having somewhat elevated fluoride concentrations in groundwater.

The fluoride concentrations reported for MW-302 for October 2017 through April 2020 and April 2021 through April 2022 were just above the laboratory's limit of quantitation (LOQ), ranging from 0.78 mg/L in April 2018 to 0.91 mg/L in April 2022. These results are within the range of fluoride results at MW-302 during background monitoring for the CCR rule prior to October 2017 (Table 2). The result at MW-302 is within the range of reported regional natural concentrations, indicating that the fluoride concentration observed in this well is potentially due to natural variability in the glacial sediments and shallow groundwater. As discussed below, there is also a potential that fluoride in MW-302 is associated with impacts from the closed CCR landfill.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, fluoride, and sulfate SSIs could include the closed CCR landfill, the coal storage area, or other historical plant operations. Based on the groundwater flow directions and previous investigations at the site, the closed landfill appears to be the most likely cause of the SSIs for wells MW-301, MW-302, and MW-303.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron, fluoride, and/or sulfate, relative to the background well, are due to an alternative source include:

1. A previous study of the CCR ponds and the closed CCR landfill determined that the landfill was the primary source of groundwater impacts in the area, based on multiple lines of evidence.

2. Past and current monitoring performed under the state monitoring program shows that boron, fluoride, and sulfate are present in the CCR landfill leachate.

3. Past and current monitoring performed under the state monitoring program shows that the highest boron and sulfate concentrations are in monitoring wells near and downgradient from the CCR landfill.

Lines of evidence regarding natural variability as an additional alternative source of the fluoride SSIs are discussed above in Section 4.1.1.

Each of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018b). The lines of evidence are discussed briefly below, focusing on any updated information collected since the previous ASD.

4.2.1 Previous CCR Pond and Landfill Study

A previous investigation titled *Field Investigation Report: Edgewater Closed Ash Disposal Facility*, completed by BT^2 in 1993, found that groundwater impacts were likely due to the closed landfill (**Figure 2**) located immediately west of the ponds (BT^2, 1993). The purpose of the 1993 investigation was to investigate the likely impact on groundwater quality of lining or abandoning the CCR impoundments (referred to in the report as the Wisconsin Pollutant Discharge Elimination System [WPDES] lagoons). The results from the investigation indicated that the CCR impoundments were not the primary source of downgradient groundwater impacts, and that closure or lining was not warranted at that time. The WDNR concurred with that finding in a letter dated April 20, 1994.

The primary lines of evidence from the 1993 report that supported this finding, and support the ASD for boron, fluoride, and sulfate, included:

- Water samples collected from each of the ponds met the Wisconsin groundwater enforcement standards established under NR 140, Wisconsin Administrative Code.

- Soil borings installed in the material below the larger ash pond, where the slag pond and the WPDES lagoons (North Pond A and South Pond A) were constructed, indicated that material below the ponds was almost entirely slag material. Water leaking out of the lagoons and moving downward would encounter primarily slag, which is relatively inert, and not fly ash. Additionally, results for water leach testing of site-wide composite samples of fly ash and slag confirmed that the fly ash had a higher potential than slag to impact groundwater. Leach test results for the fly ash composite sample were higher for boron, sulfate, and fluoride in comparison to the slag composite sample (ASTM Method D3987-85 and the EP toxicity method at a pH of 7).

- Ash disposal in the closed landfill is primarily fly ash. For seven borings in the landfill, the percent fly ash ranged from 60 to 86 percent.

- Water leach testing (ASTM method) for individual boring samples of fly ash and/or slag also confirmed that fly ash leachate had significantly higher concentrations of boron and sulfate than slag leachate. For example, boron leach test results for seven samples from borings within the landfill, consisting mainly of fly ash, ranged from 624 to 3,370 µg/L, with most results over 2,000 µg/L. Boron leach test results for nine samples from borings around and between the ponds, consisting mainly of slag, ranged from less than 16 to 206 µg/L.

- Water sampling within the landfill and pond area, in CCR above the native soil, documented that groundwater/leachate within the landfill had significantly higher concentrations of boron than the groundwater/leachate within the slag berms immediately adjacent to and between the Slag Pond, North/South Pond A, and Pond B.

- Groundwater monitoring results indicated that the highest concentrations of boron and sulfate were in monitoring wells downgradient from the landfill, including 18-OW and 29-OW. Elevated boron and sulfate were also reported for samples from wells 4-OW and 5-OW, located near the southwest and northwest corners of the landfill. Monitoring wells 6-OW and 7-OW, located east and southeast of the ponds, had much lower concentrations of boron and sulfate.

In the April 1994 approval letter, the WDNR approved the 1993 investigation of the WPDES lagoons/CCR impoundments and concurred with the findings of the report. The WDNR requested additional monitoring from the four new monitoring wells installed within the CCR (36-OW, 37-OW, 38R-OW, and 39R-OW) and requested the addition of fluoride and arsenic to the monitoring program for these groundwater/leachate head wells.

The results of the additional monitoring were reported to the WDNR in a Groundwater Assessment Report dated September 30, 1997. The WDNR responded to the 1997 report in a letter dated April 16, 1998, which stated, "We agree with the report's finding that the WPDES ponds [Slag Pond, North Pond A, and South Pond A] do not appear to be significantly contributing to the contaminant plume downgradient of the facility. No further remedial action concerning the influence of the ponds on the landfill is warranted at this time." The WDNR also noted that the leachable constituents migrating from the saturated portion of the closed landfill have stabilized or also decreased since the landfill's closure and capping.

4.2.2 CCR Constituents in Landfill Leachate

Past and current monitoring performed under the state monitoring program shows that boron and sulfate are present in the CCR landfill leachate. Recent groundwater and leachate monitoring results for boron and sulfate in samples from the state monitoring program wells are summarized in **Table 4** (April 2016 through April 2022). The leachate head wells monitoring conditions within the CCR landfill are 37-OW, 38R-OW, and 39R-OW, listed near the end of the table.

Boron: Boron concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Sulfate: Sulfate concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Fluoride: Fluoride is not part of the routine state monitoring program for the closed CCR landfill, but was sampled from the leachate wells (37-OW, 38R-OW, and 39R-OW) and the pond berm well (36-OW) from 1994 to 1997, as requested by the WDNR. The fluoride concentrations ranged from 0.25 to 0.97 mg/L (**Table 5**). The fluoride concentration for the sample collected at MW-302 (0.88 mg/L) was less than the highest observed concentration at the leachate wells.

Based on these results, fly ash disposal in the closed CCR landfill is a likely historical source of elevated boron and sulfate in groundwater, and is a potential source of fluoride.

4.2.3 State Program Groundwater Monitoring Results

Current monitoring performed under the state monitoring program continues to show that the highest boron and sulfate concentrations are in the monitoring wells near and downgradient from the CCR landfill. State program monitoring results for the CCR Rule detection monitoring parameters that overlap with the state program are summarized in **Table 4**, and well locations are on **Figure 2**.

Consistent with the conditions observed at the time of the 1993 report, the recent groundwater monitoring results indicate that the highest concentrations of boron and sulfate are in monitoring wells downgradient from the landfill, including 40-OW (replaced former 18-OW) and 29-OW. While 29-OW appears to be downgradient from both the landfill and the ponds, 40-OW has the highest concentrations and does not appear to be downgradient from the ponds. Elevated boron and sulfate also continue to be reported for samples from wells 4R-OW (replacement well for 4-OW) and 5-OW,

which are located near the southwest and northwest corners of the landfill and not downgradient from the ponds. Concentrations of boron and sulfate in the CCR program monitoring wells are lower than in the downgradient state program wells, consistent with the closed CCR landfill as the primary source.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, fluoride, and sulfate concentrations in downgradient monitoring wells MW-301, MW-302, and/or MW-303 demonstrate that the SSIs are likely primarily due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program. Natural variation may also contribute to the SSI reported for fluoride in downgradient monitoring well MW-302.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the EDG pond site may continue with detection monitoring based on this ASD. The ASD report will be included in the 2022 Annual Report due January 31, 2023.

7.0 REFERENCES

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Tables

Table 1. Groundwater Analytical Results Summary
Edgewater Generating Station / SCS Engineers Project #25222068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	**MW-301**	**MW-302**	**MW-303**
		4/13/2022	4/13/2022	4/13/2022	4/13/2022
Appendix III					
Boron, µg/L	86	27.9 1q	7,240	1,460	4,360
Calcium, µg/L	200,000	160,000	89,300	61,500	139,000
Chloride, mg/L	400	275	14.0	21.2	23.4
Fluoride, mg/L	0.2	<0.95 D3	<0.095	0.91	<0.48 D3
Field pH, Std. Units	8.57	7.20	7.38	7.70	6.78
Sulfate, mg/L	36	18.5 J, D3	212	68.5	<2.2 D3
Total Dissolved Solids, mg/L	1,190	866	560	318	722

4.4 Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:

UPL = Upper Prediction Limit
-- = Not Applicable
LOD = Limit of Detection
LOQ = Limit of Quantitation
mg/L = milligrams per liter
µg/L = micrograms per liter

Lab Notes:

D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
J = Estimated concentration at or above the LOD and below the LOQ.
1q = Analyte was measured in the associated method blank at -3.1 ug/L.

Notes:

1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well 2R-OW. Interwell UPLs based on a 1-of-2 retesting approach. The interwell UPLs were updated in January 2021 using data from April 2016 through October 2020.

Created by: NDK Date: 1/7/2021
Last revision by: RM Date: 5/6/2022
Checked by: JJK Date: 5/16/2022
Scientist/PM QA/QC: TK Date: 9/23/2022

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25222068.00

Well Group	Well	Collection Date	Boron (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)
Background	2R-OW	4/8/2016	100	<0.20	19.5
		6/20/2016	22.4	<0.20	28.0
		8/9/2016	32.6	<0.20	25.4
		10/20/2016	43.1	<0.10	21.6
		1/24/2017	31.2	<0.10	23.9
		4/6/2017	70.6	<0.10	17.6
		6/6/2017	45.2	<0.10	17.8
		8/1/2017	35.7	<0.10	28.8
		10/23/2017	55.9	<0.10	29.3
		4/2/2018	19.7	0.12 J	17.2
		10/1/2018	34.7	<0.10	37.2
		4/8/2019	35.8	<0.10	10.6
		10/7/2019	58.8	<0.10	13.2
		4/8/2020	52.3	<0.095	11.6
		10/15/2020	29.9	<0.096 J	20.3
		4/14/2021	45.7	<0.095	15.3
		10/27/2021	47.2	<4.8 D3	35.7 J, D3
		4/13/2022	27.9 1q	<0.95 D3	18.5 J, D3
Compliance	MW-301	4/11/2016	8,550	0.33 J	372
		6/20/2016	8,190	0.36 J	343
		8/9/2016	8,450	0.33 J	368
		10/20/2016	8,620	0.34	369
		1/23/2017	9,280	0.42	372
		4/6/2017	8,370	0.21 J	367
		6/6/2017	9,160	<0.10	362
		8/2/2017	8,610	0.32	340
		10/24/2017	8,820	<0.10	341
		4/2/2018	7,950	0.25 J	332
		10/1/2018	8,230	0.20 J	318
		4/8/2019	7,310	0.29 J	322
		10/7/2019	7,220	0.24 J	312
		4/8/2020	7,450	0.39 M0	298
		10/15/2020	6,550	<0.48 D3, M0	293
		4/14/2021	7,200	0.25 J	195
		10/26/2021	6,710	0.24 J, M0	203 M0
		4/13/2022	7,240	<0.095	212
	MW-302	4/8/2016	1,950	0.83	75.1
		6/20/2016	2,010	1.3 J	89.6
		8/9/2016	2,000	0.80	80.7
		10/20/2016	2,150	0.80	77.2
		1/24/2017	2,000	0.89 J	71.1
		4/6/2017	1,970	0.76	85.8
		6/6/2017	1,970	0.9	88.5
		8/2/2017	1,890	0.78	80.2
		10/24/2017	1,760	0.84	72.2
		4/2/2018	1,800	0.78	72.7
		10/1/2018	1,570	0.81	59.2
		4/8/2019	1,670	0.87	71.7
		10/7/2019	1,730	0.85	55.7
		4/8/2020	1,570	0.97	65.3
		10/15/2020	1,410	1.0 J, D3	73.1
		4/14/2021	1,550	0.88	70.5
		10/26/2021	1,580	0.88	71.2
		4/13/2022	1,460	0.91	68.5

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25222068.00

Well Group	Well	Collection Date	Boron (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)
Compliance	MW-303	4/8/2016	4,210	<0.20	3.0 J
		6/20/2016	3,360	<1.0	11.4 J
		8/9/2016	3,860	<0.20	2.4 J
		10/20/2016	3,740	<0.50	5.6 J
		1/24/2017	4,210	<0.50	<5.0
		4/6/2017	4,170	<0.50	<5.0
		6/6/2017	4,570	<0.50	<5.0
		8/2/2017	3,780	<0.50	<5.0
		10/24/2017	3,480	<0.50	<5.0
		4/2/2018	3,040	<0.50	<5.0
		10/1/2018	2,360	<0.10	<1.0
		4/8/2019	2,930	<0.50	<5.0
		10/7/2019	2,830	<0.50	<5.0
		4/8/2020	3,380	<0.48	<2.2
		10/15/2020	3,310	<0.48 D3	<2.2 D3
		4/14/2021	4,600	<0.095	0.54 J
		10/26/2021	3,650	<0.48 D3	<2.2 D3
		4/13/2022	4,360	<0.48 D3	<2.2 D3

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
-- = not analyzed
J = Estimated value below laboratory's limit of quantitation (LOQ)
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
1q = Analyte was measured in the associated method blank at -3.1 ug/L.

Notes:
1. Complete laboratory reports included in 2017 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station.

Created by:	NDK	Date:	3/2/2018
Last revision by:	RM	Date:	7/26/2022
Checked by:	JJK	Date:	8/3/2022

I:\25222068.00\Deliverables\2022 Apr ASD Edg Closed\Tables\[Tables 2 and 4 - Analytical CCR and State Monitoring.xlsx]Table 2. CCR Analytical

Table 3A. Groundwater Elevations - State Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25222068.00

	Ground Water Elevation in feet above mean sea level (amsl)																					
Well Number	**1-OW**	**2R-OW**	**3R-OW**	**4R-OW**	**5-OW**	**W-5A**	**6-AR**	**6R-OW**	**7A-OW**	**7-OW**	**18-OW**	**29-OW**	**29-A**	**30-OW**	**31-OW**	**32-OW**	**36-OW**	**37-OW**	**38R-OW**	**39R-OW**	**40-OW**	**SG-01**
Top of Casing (old)									**593.7**	**592.73**		**589.03**							**620.98**		**587.42**	
Top of Casing Elevation (feet amsl)	591.72	612.72	591.32	595.60	600.72	601.84	591.32	590.98	593.41	592.51	586.47	588.86	589.25	590.81	589.00	589.07	614.63	615.02	621.14	614.04	586.05	
Screen Length (ft)																						
Total Depth (ft from top of casing)	11.10	17.53	15.82	16.48	10.65	21.51	19.86	10.37	20.21	9.93	14.25	19.96	43.12	14.88	14.98	14.95	21.01	18.55	29.00	22.29	17.3	
Top of Well Screen Elevation (ft)	580.62	595.19	575.50	579.12	590.07	580.33	571.46	580.61	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62	596.47	591.98	591.75		0.00
Measurement Date																						
October 24, 2012	588.11	607.82	582.64	585.24	595.63	596.69	587.42	587.40	592.00	589.78	583.49	585.33	586.60	586.40	582.58	583.63	599.77	599.42	599.38	598.05		597.60
April 18, 2012					595.89	597.13	587.33	587.35	592.35	589.79		585.32	588.39									
October 24, 2012					595.63	596.69	587.42	587.40	592.00	589.78		585.33	586.60									
April 8, 2013	588.50	609.92	588.37	586.35	596.66	597.65	588.40	587.34	592.79	589.95	583.97	585.78	588.07	588.57	584.35	584.50	600.79	600.24	600.16	598.30	--	597.9
October 22, 2013	584.88	601.15	580.90	584.46	594.23	595.64	582.64	584.83	591.23	587.24	NM [1]	584.70	586.76	582.19	580.40	580.76	599.13	598.22	598.42	596.56	--	598.0
April 22, 2014	588.05	609.22	587.99	586.11	595.18	597.10	587.00	587.37	589.27	589.51	NM [1]	585.38	588.22	587.53	583.75	583.75	NM [1]	599.67	599.38	598.56	--	597.8
October 28, 2014	586.14	607.27	586.30	585.08	595.33	596.51	587.68	586.99	591.92	589.29	NM [1]	585.00	587.84	585.48	582.88	582.68	600.07	599.81	599.26	598.37	--	595.85
April 7 - 9, 2015	587.90	608.47	587.44	585.52	595.66	596.76	586.99	587.50	591.95	588.50	ABAND	585.44	587.55	586.29	583.21	583.87	599.69	599.21	599.21	597.46	583.77	597.6
October 8, 2015	584.78	604.22	583.34	584.52	594.76	594.47	582.65	585.67	591.23	589.71	ABAND	584.69	587.27	584.26	581.60	582.52	600.29	599.47	599.70	598.09	583.01	--
April 4-5, 2016	588.40	610.02	587.72	586.69	596.70	597.81	584.52	585.68	592.41	587.93	ABAND	582.95	587.25	586.91	584.35	584.47	601.05	601.37	601.18	601.13	579.28	599
October 17, 2016 [2]	587.50	607.27	586.71	585.15	595.41	596.82	584.34	586.61	592.01	587.65	ABAND	581.25	586.10	586.23	583.02	583.83	600.87	600.70	600.74	599.49	579.42	
April 12-13, 2017	588.23	609.80	587.95	586.31	596.08	597.69	586.77	587.32	592.19	587.06	ABAND	583.74	585.43	585.36	583.68	584.52	602.01	602.11	602.08	601.29	584.02	
October 9, 2017	584.14	600.87	581.00	584.49	594.68	596.04	583.03	583.51	590.50	585.96	ABAND	583.01	584.88	582.76	580.93	581.18	600.18	598.48	599.65	598.07	583.05	
April 2, 2018	587.79	607.87	586.63	586.68	595.73	596.88	586.80	587.44	591.76	589.62	ABAND	585.51	587.11	585.68	582.95	582.85	600.71	600.00	600.04	597.99	583.64	
June 19, 2018	NM	605.70	585.49	585.20	595.41	NM	NM	NM	NM	587.20	ABAND	585.43	585.79	584.96	582.29	NM	NM (1)	600.44	600.68	599.61	583.07	NM
October 1, 2018	585.37	604.61	584.18	584.86	595.24	596.44	586.10	586.86	591.01	588.75	ABAND	585.04	584.94	584.79	582.11	582.81	600.30	600.12	600.27	599.79	583.17	
April 8, 2019	588.57	609.50	588.01	591.93	596.03	597.33	584.61	587.35	591.92	590.06	ABAND	585.76	586.75	587.83	584.18	584.85	600.21	599.60	599.74	598.49	583.75	
October 9-10, 2019	587.85	609.39	587.39	585.99	595.68	596.92	586.42	587.24	591.66	587.53	ABAND	585.14	585.10	587.15	583.63	584.48	599.92	600.25	600.01	599.82	583.08	
April 8-9, 2020	588.03	608.97	587.70	586.05	595.57	596.89	585.74	586.95	591.61	587.76	ABAND	584.98	587.35	587.29	583.70	584.59	599.40	599.52	599.48	599.38	583.01	
October 14-15, 2020	584.62	604.37	582.20	584.54	593.27	594.86	582.71	583.45	588.81	586.53	ABAND	583.95	586.83	583.83	582.60	582.82	ABAND	596.87	NM	594.72	583.26	NM
April 14, 2021	587.95	608.50	587.64	585.42	594.87	596.13	586.53	587.29	591.28	589.89	ABAND	585.16	587.64	587.06	583.46	584.25	ABAND	DRY	596.50	593.95	583.08	NM
October 27-28, 2021	584.53	603.62	580.74	584.47	593.06	594.70	579.90	584.60	590.45	587.39	ABAND	584.60	586.65	582.89	581.88	582.02	ABAND	DRY	595.49	592.34	582.74	ABAND
February 28, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	ABAND	NM	NM	NM	NM	NM	ABAND	DRY	595.25	NM	NM	ABAND
April 13, 2022	588.18	609.50	588.03	585.98	595.50	596.29	586.62	587.39	591.56	590.02	ABAND	584.83	585.64	587.70	583.88	584.95	ABAND	DRY	595.33	DRY	582.45	ABAND
Bottom of Well Elevation (ft)	580.62	595.19	575.50	579.12	590.07	580.33	571.46	580.61	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62	596.47	592.14	591.75	568.75	0.00

Created by: MDB Date: 5/6/2013
Last revision by: MDB Date: 4/25/2022
Checked by: RM Date: 8/1/2022

Notes:
NM = not measured
ABAND = abandoned
DRY = Well was dry during sampling event, and didn't contain sufficent water for a measurement.

1: Well broken
2: Well casings at 7-OW, 7A, and 29-OW were cut down to allow the protective covers to close. 7-OW was cut down by 0.22 ft, 7A was cut down by 0.29 ft, and 29-OW was cut down by 0.17 ft. Top of casing elevations in this table were adjusted accordingly.
*: Well was frozen
Monitoring well 38R-OW was extended on October 30, 2020 during repairs following well damage by pond closure construction equipment.
Monitoring Well 40-OW cut down to have a top of casing elevation of 586.05 famsl on December 3, 2021.

I:\25222068.00\Deliverables\2022 Apr ASD Edg Closed\Tables\[Table 3A - GW Elevations State Wells.xls]levels

Table 3B. Groundwater Elevations - CCR Monitoring Wells
WPL - Edgewater 1-4 (Closed) Ash Disposal Facility /
SCS Engineers Project #25222068.00

Ground Water Elevation in feet above mean sea level (amsl)				
Well Number	**MW-301**	**MW-302**	**MW-303**	**2R-OW**
Top of Casing Elevation (feet amsl)	604.42	615.15	611.99	612.72
Screen Length (ft)	5.00	5.00	5.00	10.00
Total Depth (ft from top of casing)	27.47	40.00	33.26	14.50
Top of Well Screen Elevation (ft)	581.95	580.15	579.60	608.22
Measurement Date				
April 8, 2016	599.75	596.19	589.04	609.68
June 20, 2016	598.30	595.68	587.22	606.70
August 9, 2016	598.00	595.53	587.72	605.74
October 20, 2016	598.50	595.46	588.37	607.27
January 23-24, 2017	597.10	596.30	588.84	609.64
April 6, 2017	600.04	593.57	589.04	609.72
June 6, 2017	598.77	595.86	588.44	607.63
August 1, 2017	597.40	595.22	587.36	604.59
October 24, 2017	597.20	595.25	587.97	601.74
April 2, 2018	598.54	595.71	588.77	607.87
October 1, 2018	597.60	595.28	588.17	604.61
April 8, 2019	598.92	595.68	588.88	609.50
October 7, 2019	599.56	595.58	588.77	609.39
June 26, 2020	597.89	NM	NM	NM
October 15, 2020	595.10	598.56	593.19	604.27
April 14, 2021	595.17	600.56	595.01	608.50
October 26, 2021	590.68	599.82	594.07	604.04
April 13, 2022	594.89	600.50	595.20	609.50
Bottom of Well Elevation (ft)	576.95	575.15	578.73	598.22

Notes:
NM = not measured

Created by:	MDB	Date:	6/27/2016
Last rev. by:	RM	Date:	4/18/2022
Checked by:	JAO	Date:	4/19/2022

I:\25222068.00\Deliverables\2022 Apr ASD Edg Closed\Tables\[Table 3B - GW Elevations CCR Wells.xls]levels

Table 4. 2016 - 2022 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25222068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells			
2R-OW	2016-Apr	26.6	30.9
2R-OW	2016-Oct	40.4	22.9
2R-OW	2017-Apr	69.3 J	28.6
2R-OW	2017-Oct	35.2	32.9
2R-OW	2018-Apr	23.3	18.2
2R-OW	2018-Oct	41.8	35.5
2R-OW	2019-Apr	40.6	12.2
2R-OW	2019-Oct	88.5	29.3
2R-OW	2020-Apr	45.8	16.9
2R-OW	2020-Oct	29.9	21.8
2R-OW	2021-Apr	31.1	22.7
2R-OW	2021-Oct	39.2	26
2R-OW	2022-Apr	25.7	14.1 M0
3R-OW	2016-Apr	392	533
3R-OW	2016-Oct	468	372
3R-OW	2017-Apr	400	409
3R-OW	2017-Oct	389	637
3R-OW	2018-Apr	351	498
3R-OW	2018-Oct	462	495
3R-OW	2019-Apr	337	279
3R-OW	2019-Oct	454	299
3R-OW	2020-Apr	473	498
3R-OW	2020-Oct	339	654
3R-OW	2021-Apr	316	172
3R-OW	2021-Oct	260	497
3R-OW	2022-Apr	234	126
4R-OW	2016-Apr	7,710	120
4R-OW	2016-Oct	17,300	252
4R-OW	2017-Apr	12,600	180
4R-OW	2017-Oct	15,700	178
4R-OW	2018-Apr	12,700	164
4R-OW	2018-Oct	8,630	129
4R-OW	2019-Apr	10,200	158
4R-OW	2019-Oct	9,200	161
4R-OW	2020-Apr	9,320	90.9
4R-OW	2020-Oct	10,200	134
4R-OW	2021-Apr	10,800	191
4R-OW	2021-Oct	10,400	140
4R-OW	2022-Apr	8,930	76
5-OW	2016-Apr	4,330	215
5-OW	2016-Oct	5,970	210
5-OW	2017-Apr	5,490	258
5-OW	2017-Oct	6,040	230
5-OW	2018-Apr	3,900	143
5-OW	2018-Oct	6,180	226
5-OW	2019-Apr	4,140	197
5-OW	2019-Oct	4,680	179
5-OW	2020-Apr	4,610	199
5-OW	2020-Oct	4,870	161
5-OW	2021-Apr	2,670	111
5-OW	2021-Oct	3,250	100
5-OW	2022-Apr	2,280	82.1

Table 4. 2016 - 2022 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25222068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells (continued)			
7-OW	2016-Apr	610	255
7-OW	2016-Oct	964	251
7-OW	2017-Apr	761	259
7-OW	2017-Oct	1,130	246
7-OW	2018-Apr	818	243
7-OW	2018-Oct	1150	218
7-OW	2019-Apr	914	254
7-OW	2019-Oct	1,200	224
7-OW	2020-Apr	928	214
7-OW	2020-Oct	1,290	242
7-OW	2021-Apr	961	247
7-OW	2021-Oct	1,350	224
7-OW	2022-Apr	1,110	225
29-A	2016-Apr	357	40.9
29-A	2016-Oct	264	39.6
29-A	2017-Apr	365	41.5
29-A	2017-Oct	278	42.1
29-A	2018-Apr	264	39.4
29-A	2018-Oct	268	39.2
29-A	2019-Apr	292	44.2
29-A	2019-Oct	258	39.1
29-A	2020-Apr	268	37.5
29-A	2020-Oct	263	42.9
29-A	2021-Apr	262	214
29-A	2021-Oct	233	40.8
29-A	2022-Apr	250	39.6
29-OW	2016-Apr	10,600	120
29-OW	2016-Oct	10,900	85.7
29-OW	2017-Apr	9,500	77.0
29-OW	2017-Oct	9,060	62.0
29-OW	2018-Apr	8,640	102
29-OW	2018-Oct	11,000	109
29-OW	2019-Apr	10,600	190
29-OW	2019-Oct	10,800	114
29-OW	2020-Apr	9,160	69.9
29-OW	2020-Oct	8,480	73.3
29-OW	2021-Apr	7,120	66.4
29-OW	2021-Oct	8,700	86.7
29-OW	2022-Apr	9,160	77.2
30-OW	2016-Apr	79.1	4.80
30-OW	2016-Oct	113	4.60
30-OW	2017-Apr	176	7.50
30-OW	2017-Oct	135	16.7
30-OW	2018-Apr	94.5	21.5
30-OW	2018-Oct	115	11.4
30-OW	2019-Apr	52.1	2.40 J
30-OW	2019-Oct	84.9	5.60
30-OW	2020-Apr	54.4	2.80
30-OW	2020-Oct	118	15.2
30-OW	2021-Apr	42.3	5.5
30-OW	2021-Oct	108	14.9
30-OW	2022-Apr	35.9	3.6

Table 4. 2016 - 2022 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25222068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells (continued)			
31-OW	2016-Apr	114	91.2
31-OW	2016-Oct	34.7	63.3
31-OW	2017-Apr	76.9	82.4
31-OW	2017-Oct	190	70.3
31-OW	2018-Apr	30.8	51.5
31-OW	2018-Oct	36.7	62.7
31-OW	2019-Apr	18.5	68.6
31-OW	2019-Oct	38.6	57.5
31-OW	2020-Apr	25.8	39.1
31-OW	2020-Oct	30.8	58.5
31-OW	2021-Apr	51	59.5
31-OW	2021-Oct	39.5	35
31-OW	2022-Apr	32.2	26.5
40-OW	2016-Apr	8,030	731
40-OW	2016-Oct	29,400	768
40-OW	2017-Apr	8,680	849
40-OW	2017-Oct	8,800	873
40-OW	2018-Apr	9,790	771
40-OW	2018-Oct	11,300	797
40-OW	2019-Apr	8,620	636
40-OW	2019-Oct	10,600	836
40-OW	2020-Apr	10,900	836
40-OW	2020-Oct	9,870	818
40-OW	2021-Apr	8,010	827
40-OW	2021-Oct	9,180	839
40-OW	2022-Apr	10,000	807
Leachate Monitoring Wells			
37-OW	2016-Apr	19,100	759
37-OW	2016-Oct	12,500	439
37-OW	2017-Apr	15,900	633
37-OW	2017-Oct	9,440	264
37-OW	2018-Apr	5,890	159
37-OW	2018-Oct	16,600	555
37-OW	2019-Apr	15,800	492
37-OW	2019-Oct	16,300	798
37-OW	2020-Apr	20,200	769
37-OW	2020-Oct	--	--
37-OW	2021-Apr	--	--
37-OW	2021-Oct	--	--
37-OW	2022-Apr	--	--
38R-OW	2016-Apr	33,800	1,000
38R-OW	2016-Oct	17,100	514
38R-OW	2017-Apr	21,100	932
38R-OW	2017-Oct	10,800	364
38R-OW	2018-Apr	4,250	123
38R-OW	2018-Oct	32,400	956
38R-OW	2019-Apr	9,720	330
38R-OW	2019-Oct	30,400	1,020
38R-OW	2020-Apr	51,800	1,520
38R-OW	2020-Oct	--	--
38R-OW	2021-Apr	37400	1380
38R-OW	2021-Oct	38400	1310
38R-OW	2022-Apr	--	--

Table 4. 2016 - 2022 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25222068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Leachate Monitoring Wells (continued)			
39R-OW	2016-Apr	10,100	534
39R-OW	2016-Oct	29,900	1,390
39R-OW	2017-Apr	22,400	1,150
39R-OW	2017-Oct	32,800	1,400
39R-OW	2018-Apr	28,800	772
39R-OW	2018-Oct	24,700	1,160
39R-OW	2019-Apr	26,000	1,520
39R-OW	2019-Oct	17,100	601
39R-OW	2020-Apr	19,100	1,160
39R-OW	2020-Oct	34,200	1,190
39R-OW	2021-Apr	24,800	1,140
39R-OW	2021-Oct	--	--
39R-OW	2022-Apr	--	--

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
Notes:
-- : not measured
Laboratory Notes:
J: Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits

Created by:	SCC	Date:	2/24/2014
Last revision by:	RM	Date:	7/26/2022
Checked by:	JJK	Date:	8/3/2022

I:\25222068.00\Deliverables\2022 Apr ASD Edg Closed\Tables\[Tables 2 and 4 - Analytical CCR and State Monitoring.xlsx]Table 4. GW quality Data

Table 5. Analytical Results - Closed Landfill Leachate Fluoride Monitoring
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25222068.00

Collection Date	Fluoride (mg/L)			
	36-OW	37-OW	38R-OW	39R-OW
9/8/1994	0.25	0.62	0.57	0.79
9/14/1995	0.38	0.51	0.71	0.87
9/17/1996	0.56	0.42	0.71	0.97
9/16/1997	0.60	0.44	0.73	0.97

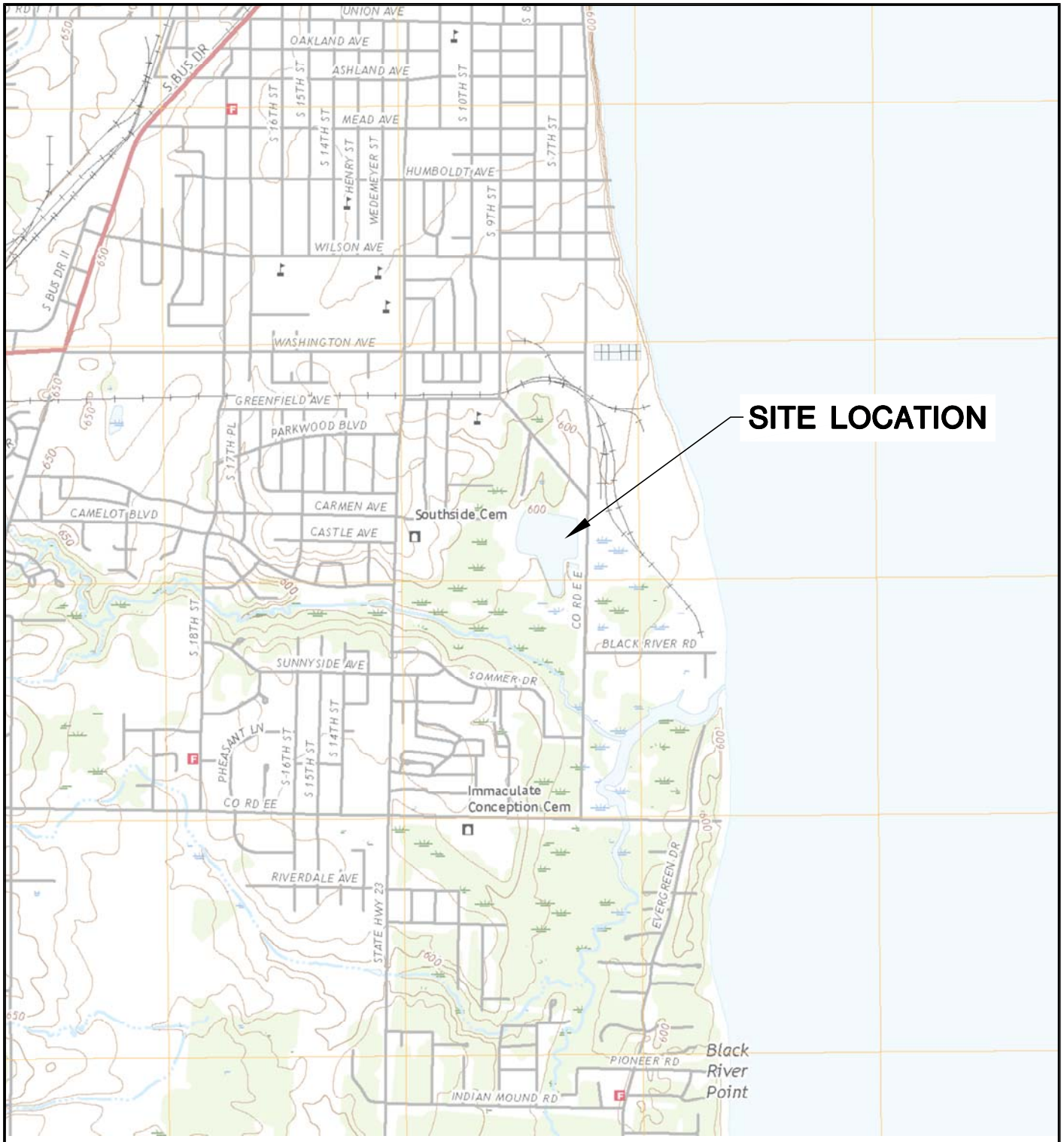
Abbreviations:
mg/L = milligrams per liter or parts per million (ppm)

Notes:
1. Data compiled from WDNR Groundwater Environmental Monitoring System (GEMS) website.

Created by:	NDK	Date:	3/5/2018
Last revision by:	NDK	Date:	3/5/2018
Checked by:	AJR	Date:	4/5/2018

I:\25222068.00\Deliverables\2022 Apr ASD Edg Closed\Tables\[Table 5 - EDG - closed-Leachate Fluoride Monitoring.xlsx]Table 5- Fl results

Figures



N

SHEBOYGAN SOUTH QUADRANGLE
WISCONSIN–SHEBOYGAN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	WISCONSIN POWER AND LIGHT EDGEWATER GENERATING STATION 3739 LAKESHORE DRIVE SHEBOYGAN, WI 53081	SITE	ALLIANT ENERGY EDGEWATER GENERATING STATION SHEBOYGAN, WI

SITE LOCATION MAP

PROJECT NO.	25220068.00	DRAWN BY:	BSS
DRAWN:	11/20/19	CHECKED BY:	MDB
REVISED:	11/20/19	APPROVED BY:	TK 04/10/2020

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE
1

I:\25220068.00\Drawings\ASD\Site Location Map.dwg, 4/12/2020 8:05:44 PM

N

LEGEND

- CCR RULE MONITORING WELL
- CCR RULE BACKGROUND MONITORING WELL
- ADDITIONAL MONITORING WELL
- ADDITIONAL PIEZOMETER
- ABANDONED MONITORING WELL
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. CCR UNIT LIMITS AND CLOSED LANDFILL LOCATION ARE APPROXIMATE.
4. MONITORING WELLS MW-301, MW-302, AND MW-303 WERE INSTALLED BY BADGER STATE DRILLING BETWEEN JANUARY 14 AND FEBRUARY 4, 2016.
5. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER GENERATING STATION IS 2R-OW.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	04/18/2022	APPROVED BY:	TK 10/12/2022

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT

WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE

ALLIANT ENERGY
EDGEWATER GENERATING STATION
SHEBOYGAN, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25222068.00\Drawings\Site Plan and Monitoring Well Locations.dwg, 4/18/2022 5:22:10 PM

N

LEGEND

- ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- 598.54 — WATER TABLE ELEVATION (APRIL 13, 2022)
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. EXISTING WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. DESIGN MANAGEMENT ZONE LOCATION IS APPROXIMATE
4. NEW MONITORING WELL LOCATIONS WERE SURVEYED BY CQM, INC. ON FEBRUARY 12, 2016.
5. MW-301, MW-302, AND MW-303 ARE NOT INCLUDED IN THE WDNR-APPROVED SITE-SPECIFIC MONITORING PLAN
6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON APRIL 13, 2022.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	KP
DRAWN:	05/12/2022	CHECKED BY:	NDK
REVISED:	09/29/2022	APPROVED BY:	TK 9/29/2022

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
APRIL 2022

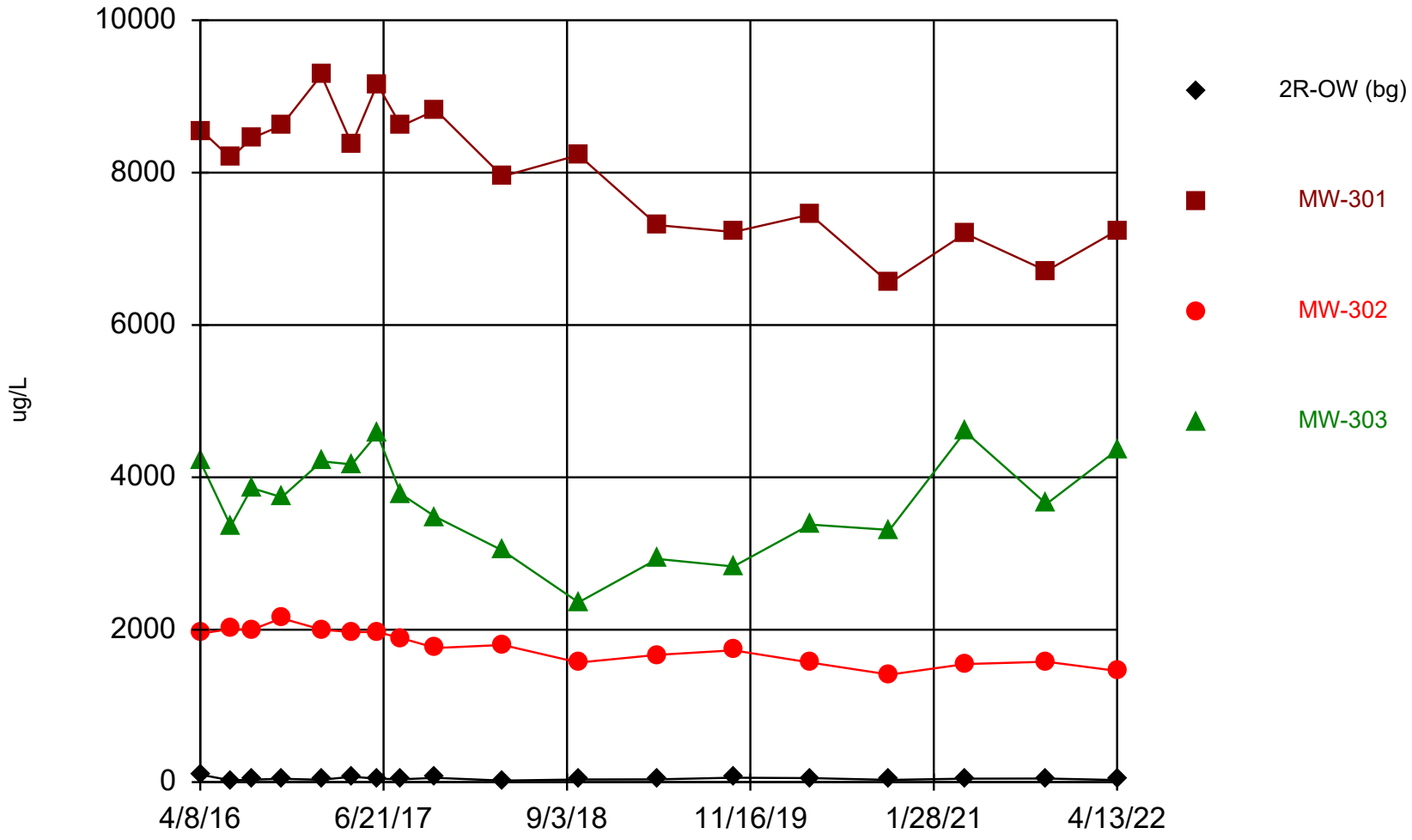
FIGURE
3

I:\25222068.00\Drawings\Water Tables.dwg, 2/2/2022 10:33:36 AM

Appendix A

Trend Plots for CCR Wells

Boron



Time Series Analysis Run 7/25/2022 2:54 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

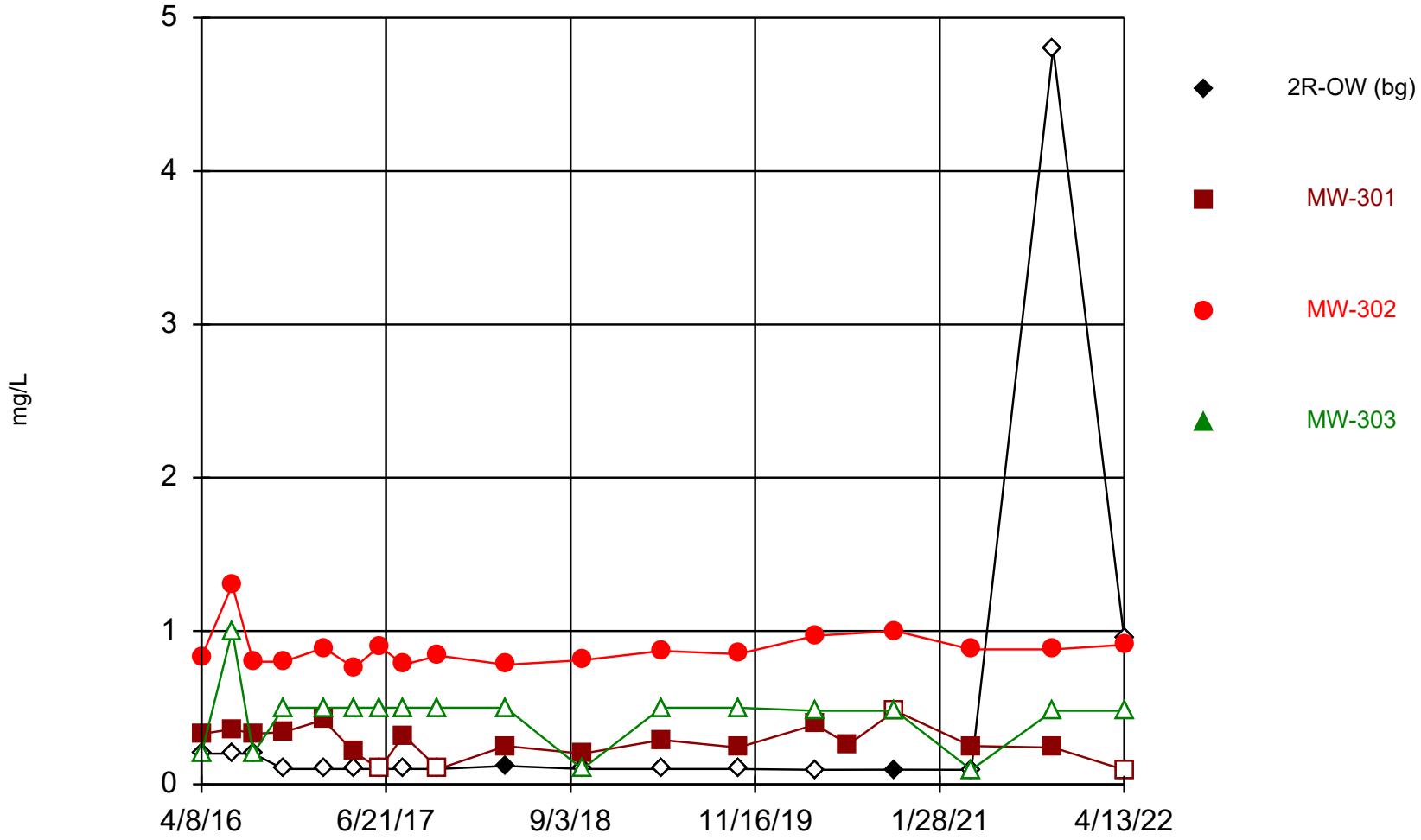
Constituent: Boron (ug/L) Analysis Run 7/25/2022 2:55 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	100		1950	4210
4/11/2016		8550		
6/20/2016	22.4	8190	2010	3360
8/9/2016	32.6	8450	2000	3860
10/20/2016	43.1	8620	2150	3740
1/23/2017		9280		
1/24/2017	31.2		2000	4210
4/6/2017	70.6	8370	1970	4170
6/6/2017	45.2	9160	1970	4570
8/1/2017	35.7			
8/2/2017		8610	1890	3780
10/23/2017	55.9			
10/24/2017		8820	1760	3480
4/2/2018	19.7	7950	1800	3040
10/1/2018	34.7	8230	1570	2360
4/8/2019	35.8	7310	1670	2930
10/7/2019	58.8	7220	1730	2830
4/8/2020	52.3	7450	1570	3380
10/15/2020	29.9	6550	1410	3310
4/14/2021	45.7	7200	1550	4600
10/26/2021	47.2	6710	1580	3650
4/13/2022	27.9	7240	1460	4360

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 7/25/2022 2:54 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

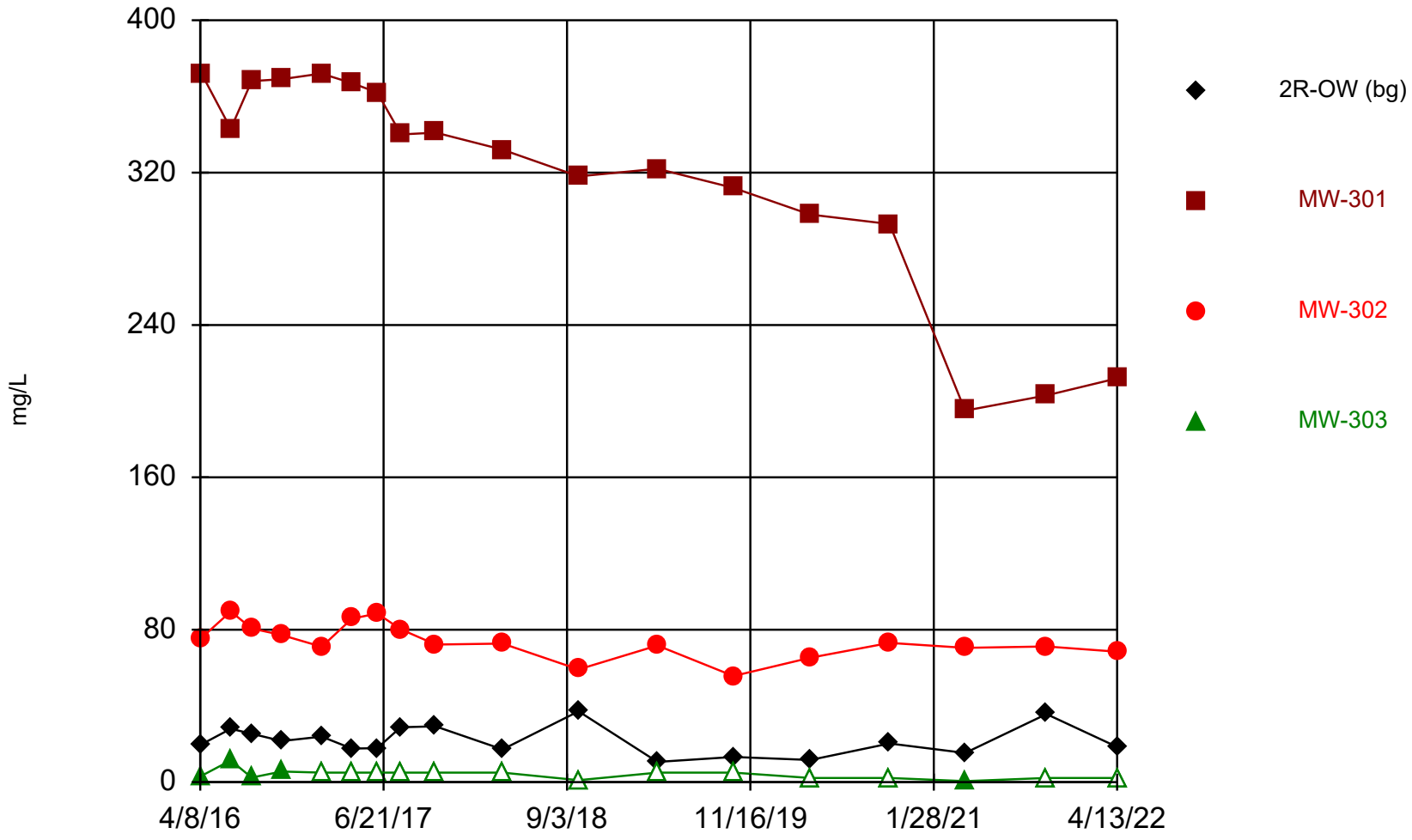
Constituent: Fluoride (mg/L) Analysis Run 7/25/2022 2:55 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	<0.2 (U)		0.83	<0.2 (U)
4/11/2016		0.33 (J)		
6/20/2016	<0.2 (U)	0.36 (J)	1.3 (J)	<1 (U)
8/9/2016	<0.2 (U)	0.33 (J)	0.8	<0.2 (U)
10/20/2016	<0.1 (U)	0.34	0.8	<0.5 (U)
1/23/2017		0.42		
1/24/2017	<0.1 (U)		0.89 (J)	<0.5 (U)
4/6/2017	<0.1 (U)	0.21 (J)	0.76	<0.5 (U)
6/6/2017	<0.1 (U)	<0.1 (U)	0.9	<0.5 (U)
8/1/2017	<0.1 (U)			
8/2/2017		0.32	0.78	<0.5 (U)
10/23/2017	<0.1 (U)			
10/24/2017		<0.1 (U)	0.84	<0.5 (U)
4/2/2018	0.12 (J)	0.25 (J)	0.78	<0.5 (U)
10/1/2018	<0.1 (U)	0.2 (J)	0.81	<0.1 (U)
4/8/2019	<0.1 (U)	0.29 (J)	0.87	<0.5 (U)
10/7/2019	<0.1 (U)	0.24 (J)	0.85	<0.5 (U)
4/8/2020	<0.095 (U)	0.39	0.97	<0.48 (U)
6/26/2020		0.26 (J)		
10/15/2020	0.096 (J)	<0.48 (U)	1 (J)	<0.48 (U)
4/14/2021	<0.095	0.25 (J)	0.88	<0.095
10/26/2021	<4.8 (U)	0.24 (J)	0.88	<0.48
4/13/2022	<0.95 (U)	<0.095 (U)	0.91	<0.48 (U)

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 7/25/2022 2:54 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Sulfate (mg/L) Analysis Run 7/25/2022 2:55 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	19.5		75.1	3 (J)
4/11/2016		372		
6/20/2016	28	343	89.6	11.4 (J)
8/9/2016	25.4	368	80.7	2.4 (J)
10/20/2016	21.6	369	77.2	5.6 (J)
1/23/2017		372		
1/24/2017	23.9		71.1	<5 (U)
4/6/2017	17.6	367	85.8	<5 (U)
6/6/2017	17.8	362	88.5	<5 (U)
8/1/2017	28.8			
8/2/2017		340	80.2	<5 (U)
10/23/2017	29.3			
10/24/2017		341	72.2	<5 (U)
4/2/2018	17.2	332	72.7	<5 (U)
10/1/2018	37.2	318	59.2	<1 (U)
4/8/2019	10.6	322	71.7	<5 (U)
10/7/2019	13.2	312	55.7	<5 (U)
4/8/2020	11.6	298	65.3	<2.2 (U)
10/15/2020	20.3	293	73.1	<2.2 (U)
4/14/2021	15.3	195	70.5	0.54 (J)
10/26/2021	35.7 (J)	203	71.2	<2.2 (U)
4/13/2022	18.5 (J)	212	68.5	<2.2 (U)