2021 Annual Groundwater Monitoring and Corrective Action Report

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25221068.00 | January 31, 2022

2830 Dairy Drive
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OVERVIEW OF CURRENT STATUS

Edgewater Generating Station, Surface Impoundments
2021 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>April 2021</u> Boron: MW-301, MW-302, MW-303 Fluoride: MW-302 Sulfate: MW-301, MW-302 <u>October 2021</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 2020 and April 2021 events during 2021. Assessment monitoring not required. Alternative sources for October 2021 SSIs will be evaluated in 2022.

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 2021 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 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

This report covers the period of groundwater monitoring from January 1, 2021, through December 31, 2021.

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 CCR surface impoundments. 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 is regulated by the Wisconsin Department of Natural Resources (License #2524). A groundwater monitoring network 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 2021 and October 2021 detection monitoring events. A summary of the sampling events that occurred throughout 2021 is shown in **Table 2**. The water table maps show a generally southward flow direction, with localized groundwater mounding in the area of the closed EDG landfill and 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 2021.

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 2021 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 sampling results for Appendix III parameters in 2021 are summarized in **Table 5.** Field parameter results for the 2021 sampling events are provided in **Table 6**. The analytical laboratory reports for 2021 are provided in **Appendix C**. Historical results for each monitoring well 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 2021. The EDG CCR units remained in the detection monitoring program.

In 2021, the monitoring results for the October 2020 and April 2021 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 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. The UPL calculations are included in **Appendix E**. The UPLs calculated in January 2021 were applied to the evaluation of the October 2020 and April 2021 monitoring results, completed in 2021, and will be applied to the evaluation of the October 2021 monitoring results, to be completed in 2022.

SSIs for boron and sulfate were identified for both the October 2020 and April 2021 events, and an additional SSI for fluoride was identified during the April 2021 event; 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 F**.

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 2021 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 2021.

Summary of Key Actions Completed (2021):

- Statistical evaluation and determination of SSIs for the October 2020 and April 2021 monitoring events.
- ASD reports for the SSIs identified from the October 2020 and April 2021 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2021).

Description of Any Problems Encountered. No problems were encountered in 2021.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2022):

- Statistical evaluation and determination of any SSIs for the October 2021 and April 2022 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 2022).

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 2020 and April 2021 sampling events are provided in **Appendix F**. 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 Closed Landfill
SCS Engineers Project #25221068.00

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: RM Date: 12/14/2020
Last revision by: RM Date: 1/7/2021
Checked by: NDK Date: 1/7/2021

Table 2. CCR Rule Groundwater Samples Summary
Edgewater Generating Station
SCS Engineers Project #25221068.00

Sample Dates	Compliance Wells			Background Well
	MW-301	MW-302	MW-303	2R-OW
4/14/2021	D	D	D	D
10/26/2021	D	D	D	D
Total Samples	2	2	2	2

Abbreviations:
D = Required by Detection Monitoring Program
D-R = Detection Monitoring Retest Sample

Created by:	MDB	Date:	12/14/2021
Last revision by:	MDB	Date:	12/14/2021
Checked by:	RM	Date:	12/22/2021

I:\25221068.00\Deliverables\2021 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 #25221068.00

	Ground Water Elevation in feet above mean sea level (amsl)																					
Well Number	**1-OW**	**2R-OW**	**3R-OW**	**4R-OW**	**5-OW**	**W-5A**	**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	
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	591.71	589.56	583.49	585.16	586.60	586.40	582.58	583.63	599.77	599.42	599.38	598.05		597.60
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	596.34	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: REO Date: 11/8/2021
Checked by: MDB Date: 11/8/2021

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

\\Mad-fs01\data\Projects\25221068.00\Data and Calculations\Tables\[wlstat_Edgewater_Closed.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

\\Mad-fs01\data\Projects\25221068.00\Data and Calculations\Tables\[EGS_wlstat_CCR.xls]levels

Table 4. Horizontal Gradients and Flow Velocity
Edgewater Closed Landfill
SCS Engineers Project #25221068.00
January - December 2021

	South				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/14/2021	595.0	590.0	65	0.08	0.05
10/26-28/2021	595.0	585.0	374	0.03	0.02

	Southeast				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/14/2021	600.6	589.9	207	0.05	0.04
10/26-28/2021	599.8	587.4	209	0.06	0.04

Sampling Dates	**K (ft/d)**	**n**	**Average Δh/Δl (ft/ft)**	**V (ft/d)**
4/14/2021	0.274	0.40	0.064	0.044
10/26-28/2021	0.274	0.40	0.043	0.030

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

Created by: RM Date: 12/29/2020
Last revision by: MDB Date: 1/4/2022
Checked by: RM Date: 1/4/2022

Table 5. 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	
		4/14/2021	10/26/2021	4/14/2021	10/26/2021	4/14/2021	10/26/2021	4/14/2021	10/26/2021
Appendix III									
Boron, µg/L	86	45.7	47.2	7,200	6,710	1,550	1,580	4,600	3,650
Calcium, µg/L	200,000	154,000	192,000	118,000	102,000	81,200	78,200	176,000	148,000
Chloride, mg/L	400	116	493	13.5	13.8 M0	20.6	20.7	22.5	21.6
Fluoride, mg/L	0.2	<0.095	<4.8 D3	0.25 J	0.24 J, M0	0.88	0.88	<0.095	<0.48 D3
Field pH, Std. Units	8.57	7.52	7.01	7.96	7.01	8.19	7.60	7.27	6.92
Sulfate, mg/L	36	15.3	35.7 J, D3	195	203 M0	70.5	71.2	0.54 J	<2.2 D3
Total Dissolved Solids, mg/L	1,190	737	1,170	614	538	342	290	710	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 1-of-2 retesting approach. The interwell UPLs were updated in January 2021 using data from April 2016 through October 2020.

Created by: MDB Date: 12/22/2021
Last revision by: MDB Date: 12/22/2021
Checked by: RM Date: 12/22/2021
Scientist/PM QA/QC: TK Date: 1/5/2022

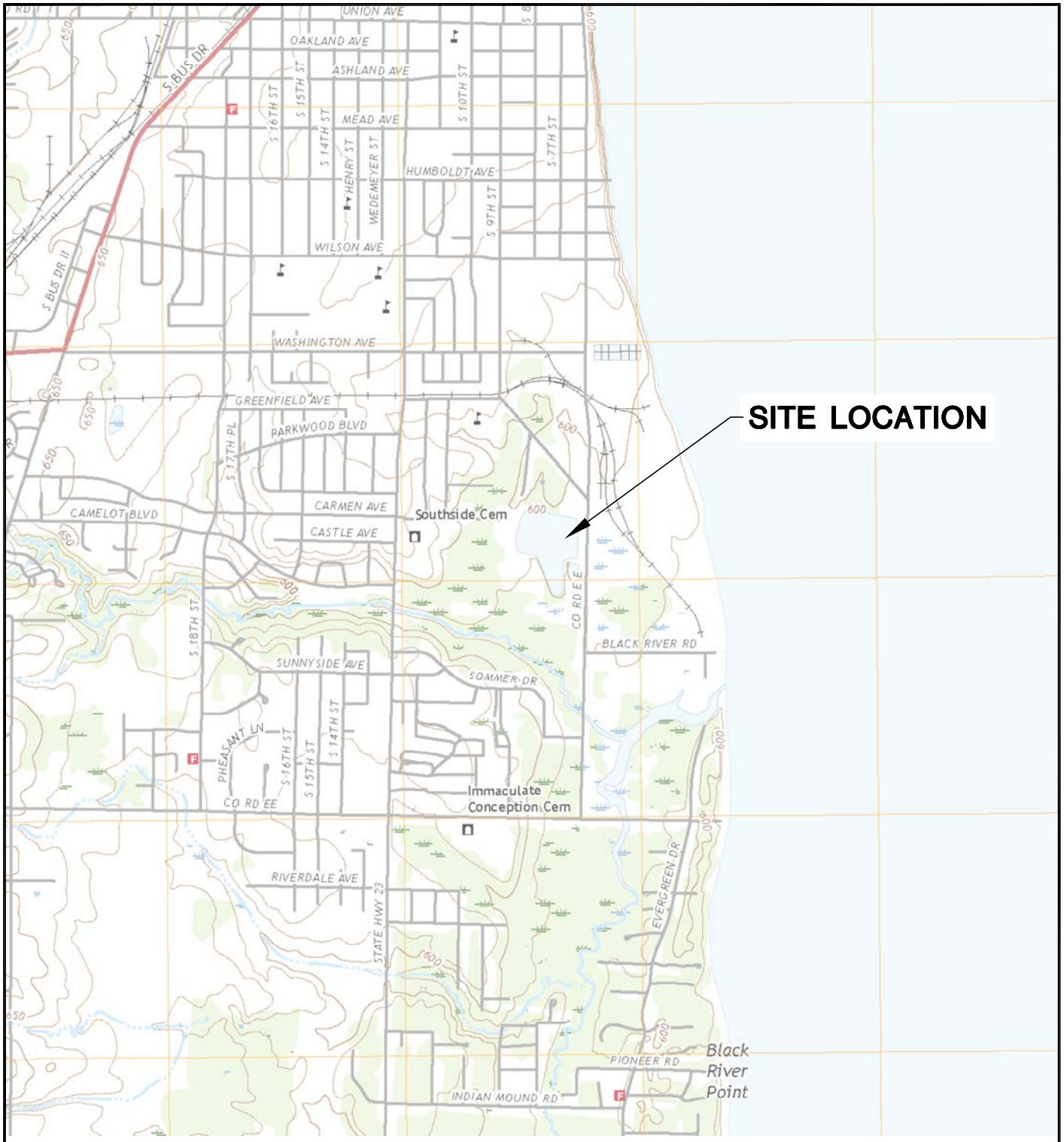
Table 6. Groundwater Field Data Summary
Edgewater 1-4 (Closed) Ash Disposal Facility / SCS Engineers Project #25221068.00

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	4/14/2021	595.17	7.8	7.96	8.2	815	226	124
	10/26/2021	590.68	11.2	7.01	5.4	811	196	88.4
MW-302	4/14/2021	600.56	7.5	8.19	1.8	517	41	252
	10/26/2021	599.82	11.1	7.60	0.1	496	134	69.8
MW-303	4/14/2021	595.01	7.7	7.27	2.3	1,222	-41	408
	10/26/2021	594.07	12.3	6.92	1.6	1,171	170	88.4
2R-OW	4/14/2021	608.50	6.6	7.52	6.9	1,229	282	413
	10/26/2021	604.04	14.0	7.01	0.6	2,290	242	95.2

Created by: MDB Date: 12/14/2021
Last revision by: MDB Date: 12/14/2021
Checked by: RM Date: 12/22/2021

I:\25221068.00\Deliverables\2021 Fed CCR Annual Report\Tables\[Table 6 - EGS_2021 Field Parameters.xlsx]Sheet1

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

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N

LEGEND

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

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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.	25220068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/09/2020	APPROVED BY:	TK 01/28/2021

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

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LEGEND

- ⊕ ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- CCR UNITS
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- **598.54** WATER TABLE ELEVATION (APRIL 14, 2021)
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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 APRIL 14, 2021.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25221068.00	DRAWN BY:	KP/ZW
DRAWN:	05/21/2021	CHECKED BY:	NDK
REVISED:	06/29/2021	APPROVED BY:	TK 1/6/2022

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 2021

FIGURE
3

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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 JULY 24, 2019.
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.	25221068.00	DRAWN BY:	KP/ZW
DRAWN:	12/17/2021	CHECKED BY:	NDK
REVISED:	12/23/2021	APPROVED BY:	TK 1/6/2022

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
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.

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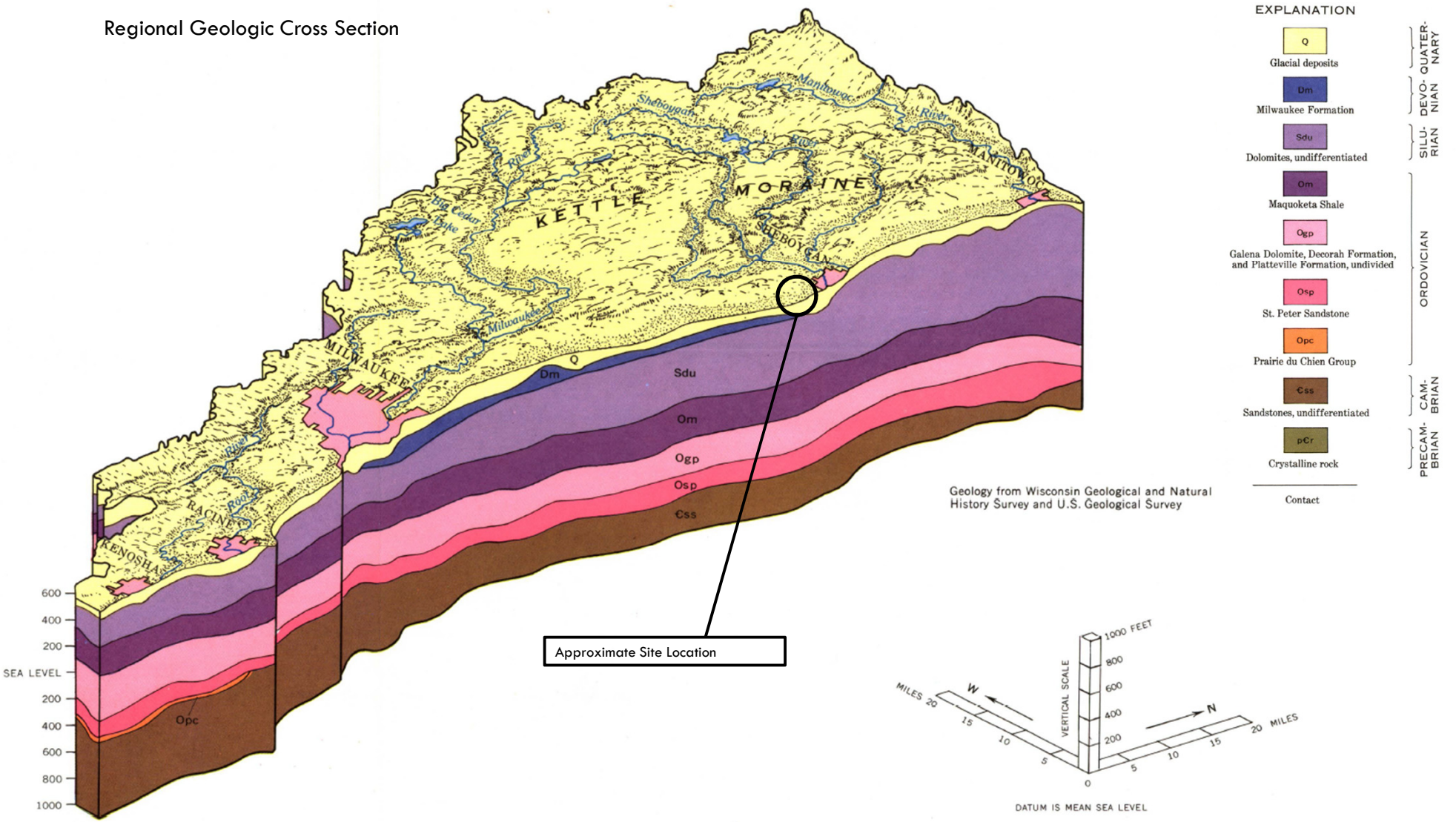
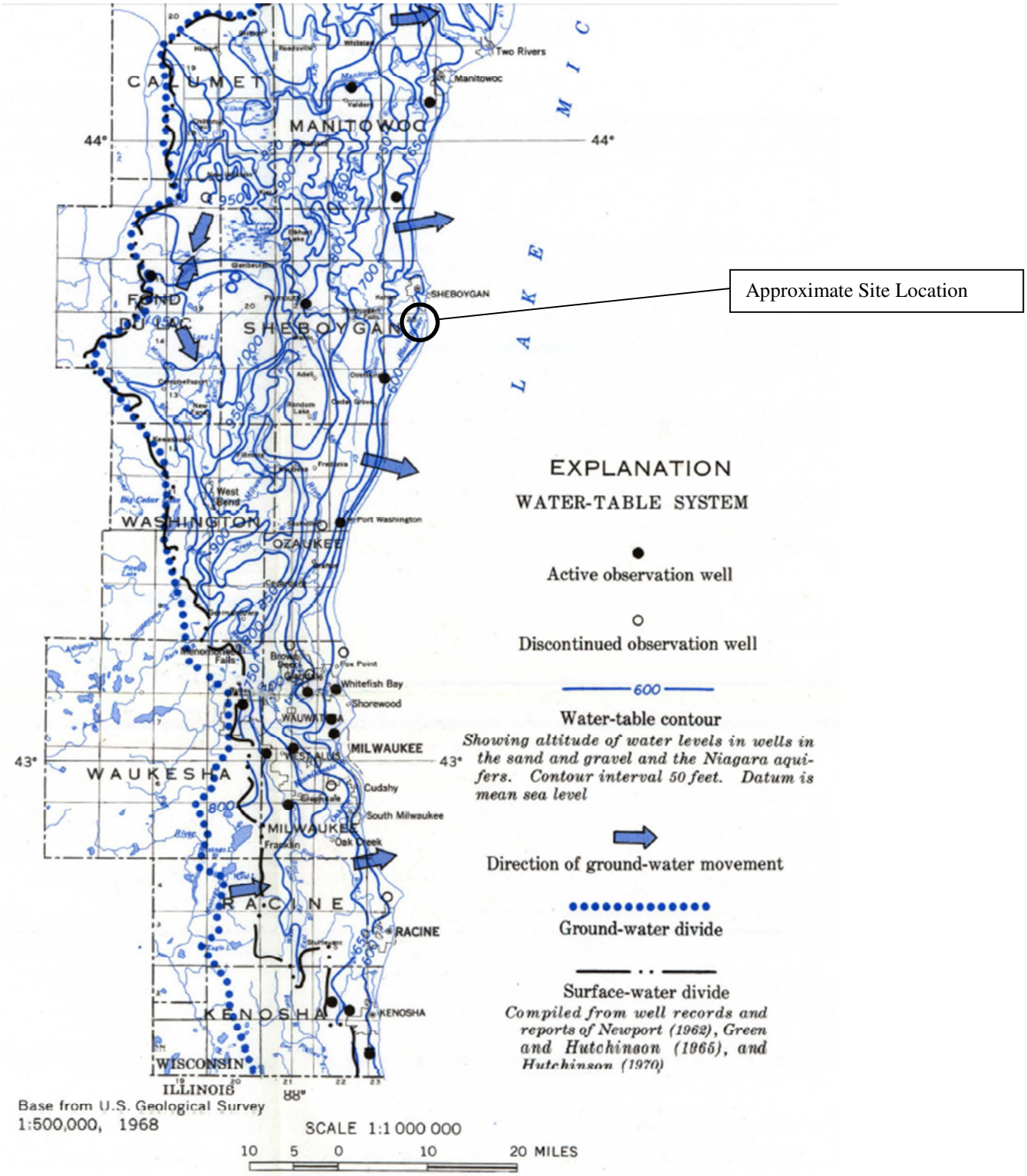
Regional Geologic Cross Section



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
☐ 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									
			2	LEAN CLAY - moist, stiff, yellowish brown (10YR 5/6), silty sand seams.	CL									
1	18	12	3						12	23.6				
			4											
2	18	22	5	...very stiff.					22	16.6				
			6											
			7											
3	18	46	8	...hard.					46	16.8				
			9											
4	18	26	10	...wet, very stiff, dark brown (10YR 4/3), occasional sand seams.					26	19.7			98.4	
			11											
			12											
5	18	15	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.

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 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 for Kyle Kramer
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-303 Use only as an attachment to Form 4400-122.

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.										

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 McArole
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

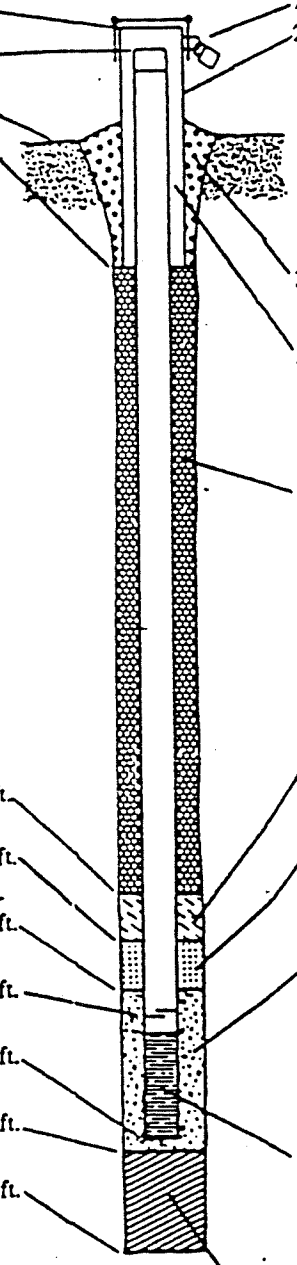
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ __

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.

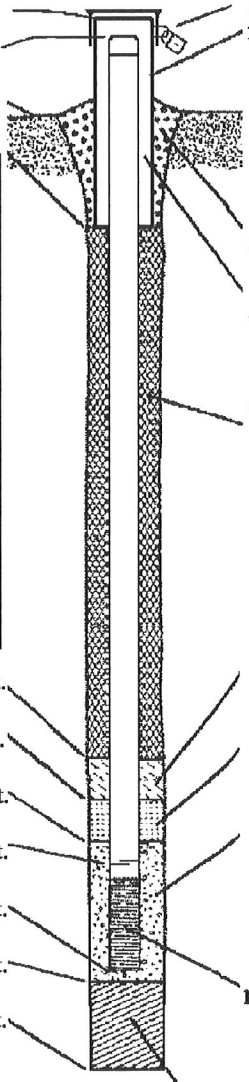
J. Filter pack, bottom 573.95 ft. MSL or 28 ft.

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: 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.

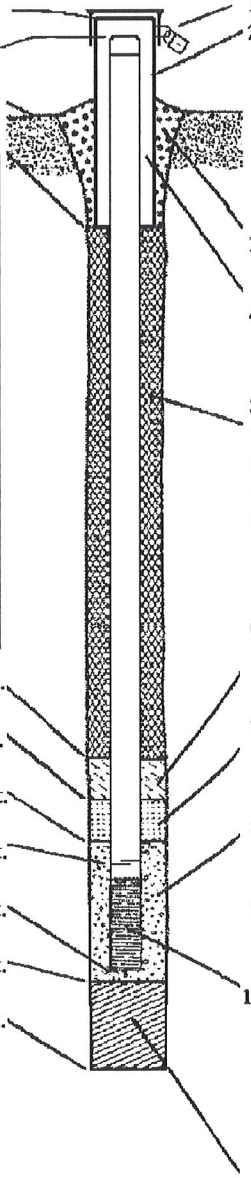
J. Filter pack, bottom 572.65 ft. MSL or 40 ft.

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 Ohio #5 Sand Other ☐ ___

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

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

7. Fine sand material: Manufacturer, product name & mesh size
a. 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 2" dia sch 40 PVC 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.

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

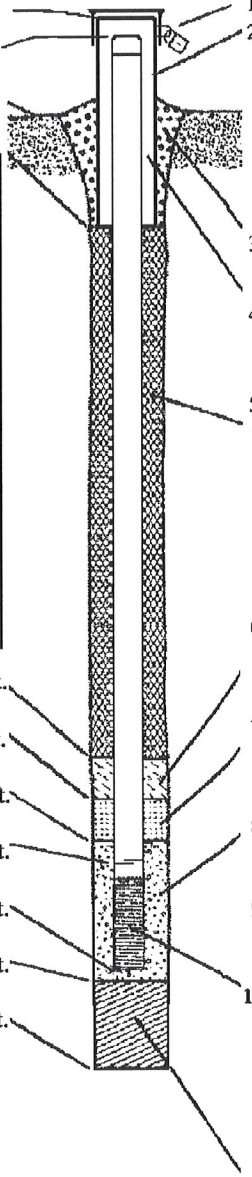
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

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

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? (If yes, attach results) ☐ Yes ☐ No

	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 (m m d d y y y y)	3/7/2016 (m m d d y y y y)
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)

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-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 9.6 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.

Appendix C

Laboratory Reports

C1 April 2021 Detection Monitoring
C2 October 2021 Detection Monitoring

C1 April 2021 Detection Monitoring

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

May 24, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 16, 2021. 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: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

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

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

SAMPLE SUMMARY

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40225280001	**2R-OW**	Water	04/14/21 13:05	04/16/21 07:45
40225280002	**MW-301**	Water	04/14/21 09:45	04/16/21 07:45
40225280003	**MW-302**	Water	04/14/21 09:15	04/16/21 07:45
40225280004	**MW-303**	Water	04/14/21 10:20	04/16/21 07:45
40225280005	**FIELD BLANK**	Water	04/14/21 13:25	04/16/21 07:45

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40225280001	**2R-OW**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	JXM	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225280002	**MW-301**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	JXM	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225280003	**MW-302**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	JXM	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225280004	**MW-303**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	JXM	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225280005	**FIELD BLANK**	EPA 6020	KXS	2
		SM 2540C	JXM	1
		EPA 9040	ALY	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 EDGEWATER
Pace Project No.: 40225280

Sample: 2R-OW **Lab ID: 40225280001** Collected: 04/14/21 13:05 Received: 04/16/21 07:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**45.7**	ug/L	20.0	6.1	2	04/20/21 06:26	04/22/21 14:03	7440-42-8	
Calcium	**154000**	ug/L	508	152	2	04/20/21 06:26	04/22/21 14:03	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.52**	Std. Units			1		04/14/21 13:05		
Field Specific Conductance	**1229**	umhos/cm			1		04/14/21 13:05		
Oxygen, Dissolved	**6.9**	mg/L			1		04/14/21 13:05	7782-44-7	
REDOX	**282**	mV			1		04/14/21 13:05		
Turbidity	**413**	NTU			1		04/14/21 13:05		
Static Water Level	**608.50**	feet			1		04/14/21 13:05		
Temperature, Water (C)	**6.6**	deg C			1		04/14/21 13:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**737**	mg/L	33.3	14.5	1		04/20/21 15:04		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/19/21 10:31		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**116**	mg/L	20.0	4.3	10		04/30/21 22:43	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/30/21 19:36	16984-48-8	
Sulfate	**15.3**	mg/L	2.0	0.44	1		04/30/21 19:36	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 EDGEWATER
Pace Project No.: 40225280

Sample: MW-301 **Lab ID: 40225280002** Collected: 04/14/21 09:45 Received: 04/16/21 07:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**7200**	ug/L	100	30.3	10	04/20/21 06:26	04/22/21 14:10	7440-42-8	
Calcium	**118000**	ug/L	2540	762	10	04/20/21 06:26	04/22/21 14:10	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.96**	Std. Units			1		04/14/21 09:45		
Field Specific Conductance	**815**	umhos/cm			1		04/14/21 09:45		
Oxygen, Dissolved	**8.2**	mg/L			1		04/14/21 09:45	7782-44-7	
REDOX	**226**	mV			1		04/14/21 09:45		
Turbidity	**124**	NTU			1		04/14/21 09:45		
Static Water Level	**595.17**	feet			1		04/14/21 09:45		
Temperature, Water (C)	**7.8**	deg C			1		04/14/21 09:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**614**	mg/L	20.0	8.7	1		04/20/21 15:04		
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		04/19/21 10:32		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**13.5**	mg/L	2.0	0.43	1		04/30/21 19:50	16887-00-6	
Fluoride	**0.25J**	mg/L	0.32	0.095	1		04/30/21 19:50	16984-48-8	
Sulfate	**195**	mg/L	20.0	4.4	10		05/03/21 10:27	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 EDGEWATER
Pace Project No.: 40225280

Sample: MW-302 **Lab ID: 40225280003** Collected: 04/14/21 09:15 Received: 04/16/21 07:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**1550**	ug/L	20.0	6.1	2	04/20/21 06:26	04/22/21 14:17	7440-42-8	
Calcium	**81200**	ug/L	508	152	2	04/20/21 06:26	04/22/21 14:17	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.19**	Std. Units			1		04/14/21 09:15		
Field Specific Conductance	**517**	umhos/cm			1		04/14/21 09:15		
Oxygen, Dissolved	**1.8**	mg/L			1		04/14/21 09:15	7782-44-7	
REDOX	**41**	mV			1		04/14/21 09:15		
Turbidity	**252**	NTU			1		04/14/21 09:15		
Static Water Level	**600.56**	feet			1		04/14/21 09:15		
Temperature, Water (C)	**7.5**	deg C			1		04/14/21 09:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**342**	mg/L	20.0	8.7	1		04/20/21 15:04		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		04/19/21 10:33		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**20.6**	mg/L	2.0	0.43	1		04/30/21 20:05	16887-00-6	
Fluoride	**0.88**	mg/L	0.32	0.095	1		04/30/21 20:05	16984-48-8	
Sulfate	**70.5**	mg/L	10.0	2.2	5		05/03/21 10:41	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 EDGEWATER
Pace Project No.: 40225280

Sample: MW-303 **Lab ID: 40225280004** Collected: 04/14/21 10:20 Received: 04/16/21 07:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**4600**	ug/L	100	30.3	10	04/20/21 06:26	04/22/21 14:23	7440-42-8	
Calcium	**176000**	ug/L	2540	762	10	04/20/21 06:26	04/22/21 14:23	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.27**	Std. Units			1		04/14/21 10:20		
Field Specific Conductance	**1222**	umhos/cm			1		04/14/21 10:20		
Oxygen, Dissolved	**2.3**	mg/L			1		04/14/21 10:20	7782-44-7	
REDOX	**-41**	mV			1		04/14/21 10:20		
Turbidity	**408**	NTU			1		04/14/21 10:20		
Static Water Level	**595.01**	feet			1		04/14/21 10:20		
Temperature, Water (C)	**7.7**	deg C			1		04/14/21 10:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**710**	mg/L	20.0	8.7	1		04/20/21 15:05		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.1**	Std. Units	0.10	0.010	1		04/19/21 10:34		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**22.5**	mg/L	2.0	0.43	1		04/30/21 20:19	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/30/21 20:19	16984-48-8	
Sulfate	**0.54J**	mg/L	2.0	0.44	1		04/30/21 20:19	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 EDGEWATER
Pace Project No.: 40225280

Sample: FIELD BLANK **Lab ID: 40225280005** Collected: 04/14/21 13:25 Received: 04/16/21 07:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**<3.0**	ug/L	10.0	3.0	1	04/21/21 06:55	04/21/21 18:56	7440-42-8	
Calcium	**81.2J**	ug/L	254	76.2	1	04/21/21 06:55	04/21/21 18:56	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**18.0J**	mg/L	20.0	8.7	1		04/20/21 15:05		
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		04/19/21 10:37		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**0.63J**	mg/L	2.0	0.43	1		04/30/21 20:33	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/30/21 20:33	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		04/30/21 20:33	14808-79-8	

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 EDGEWATER
Pace Project No.: 40225280

QC Batch: 382877
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225280001, 40225280002, 40225280003, 40225280004

METHOD BLANK: 2208603 Matrix: Water
Associated Lab Samples: 40225280001, 40225280002, 40225280003, 40225280004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	04/22/21 12:26	
Calcium	ug/L	<76.2	254	04/22/21 12:26	

LABORATORY CONTROL SAMPLE: 2208604

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	476	95	80-120	
Calcium	ug/L	5000	5040	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2208605 2208606

Parameter	Units	40225338001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	299	500	500	747	742	90	89	75-125	1	20	
Calcium	ug/L	138000	5000	5000	144000	144000	110	128	75-125	1	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
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

QC Batch: 383007
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225280005

METHOD BLANK: 2209295 Matrix: Water
Associated Lab Samples: 40225280005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	04/21/21 18:28	
Calcium	ug/L	<76.2	254	04/21/21 18:28	

LABORATORY CONTROL SAMPLE: 2209296

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	486	97	80-120	
Calcium	ug/L	5000	4980	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2209297 2209298

Parameter	Units	40225276001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	22.2	500	500	519	512	99	98	75-125	1	20	
Calcium	ug/L	117000	5000	5000	122000	120000	104	64	75-125	2	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
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

QC Batch: 382972 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225280001, 40225280002, 40225280003, 40225280004, 40225280005

METHOD BLANK: 2209087 Matrix: Water
Associated Lab Samples: 40225280001, 40225280002, 40225280003, 40225280004, 40225280005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/20/21 14:59	

LABORATORY CONTROL SAMPLE: 2209088

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	564	554	98	80-120	

SAMPLE DUPLICATE: 2209089

Parameter	Units	40225276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	472	486	3	10	

SAMPLE DUPLICATE: 2209090

Parameter	Units	40225343004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	850	808	5	10	

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

QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

QC Batch: 382737
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225280001, 40225280002, 40225280003, 40225280004, 40225280005

SAMPLE DUPLICATE: 2207896

Parameter	Units	40225270004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.3	6.4	1	20	H6

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

QUALITY CONTROL DATA

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

QC Batch: 383892
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: 40225280001, 40225280002, 40225280003, 40225280004, 40225280005

METHOD BLANK: 2214475 Matrix: Water
Associated Lab Samples: 40225280001, 40225280002, 40225280003, 40225280004, 40225280005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	04/30/21 17:21	
Fluoride	mg/L	<0.095	0.32	04/30/21 17:21	
Sulfate	mg/L	<0.44	2.0	04/30/21 17:21	

LABORATORY CONTROL SAMPLE: 2214476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.3	102	90-110	
Fluoride	mg/L	2	2.0	100	90-110	
Sulfate	mg/L	20	20.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2213291 2213292

Parameter	Units	40225302001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	437	400	400	844	857	102	105	90-110	1	15	
Fluoride	mg/L	<1.9	40	40	32.6	31.7	77	75	90-110	3	15	M0
Sulfate	mg/L	171	400	400	594	597	106	106	90-110	0	15	

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

QUALIFIERS

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

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.

WORKORDER QUALIFIERS

WO: 40225280

[1] Revised Report: The client provided a new groundwater elevation value to 2R-OW.

ANALYTE QUALIFIERS

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.

Pace Analytical Services, LLC
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Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25216068 CCR RULE EDGEWATER
Pace Project No.: 40225280

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40225280001	**2R-OW**	EPA 3010	382877	EPA 6020	382963
40225280002	**MW-301**	EPA 3010	382877	EPA 6020	382963
40225280003	**MW-302**	EPA 3010	382877	EPA 6020	382963
40225280004	**MW-303**	EPA 3010	382877	EPA 6020	382963
40225280005	**FIELD BLANK**	EPA 3010	383007	EPA 6020	383093
40225280001	**2R-OW**				
40225280002	**MW-301**				
40225280003	**MW-302**				
40225280004	**MW-303**				
40225280001	**2R-OW**	SM 2540C	382972		
40225280002	**MW-301**	SM 2540C	382972		
40225280003	**MW-302**	SM 2540C	382972		
40225280004	**MW-303**	SM 2540C	382972		
40225280005	**FIELD BLANK**	SM 2540C	382972		
40225280001	**2R-OW**	EPA 9040	382737		
40225280002	**MW-301**	EPA 9040	382737		
40225280003	**MW-302**	EPA 9040	382737		
40225280004	**MW-303**	EPA 9040	382737		
40225280005	**FIELD BLANK**	EPA 9040	382737		
40225280001	**2R-OW**	EPA 300.0	383892		
40225280002	**MW-301**	EPA 300.0	383892		
40225280003	**MW-302**	EPA 300.0	383892		
40225280004	**MW-303**	EPA 300.0	383892		
40225280005	**FIELD BLANK**	EPA 300.0	383892		

4022528O

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison, WI
Project Contact:	Meghan Blodgett
Phone:	608-216-7362
Project Number:	25216068
Project Name:	CCR Rule Edgewater
Project State:	WI
Sampled By (Print):	Michael Krout
Sampled By (Sign):	
PO #:	Regulatory Program:

Pace Analytical®
www.pacelabs.com

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	SCS Engineers
Invoice To Address:	2830 Dairy Dr. Madison, WI 53718
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, W = Water, B = Biota, DW = Drinking Water, C = Charcoal, GW = Ground Water, O = Oil, SW = Surface Water, S = Soil, WW = Waste Water, SI = Sludge, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Analyses Requested: Metals - Ca+B	pH	TDS, Cl, F, SO4
					N	D	A	A	
001	2 Row	4/14	1305	GW					
002	MW-301		945						
003	MW-302		915						
004	MW-303		1020						
005	Field Blank		1325	W					

CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1:
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
	4/15/21 800	Mary Fanin	4/15/21 8:35
Mary Fanin	4/15/21 1400		
C.S Logistics	4/16/21 0745		4/16/21 0745

PACE Project No. 4022528O
Receipt Temp = 5 °C
Sample Receipt pH OK / Adjusted
Cooler Custody Seal Present / Not Present Intact / Not Intact

Version 6.0 08/14/06

C019a(27Jun2006)

ORIGINAL

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 40225280

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

All containers needing preservation have been checked and noted below: ☒Yes ☐No ☐N/A

Lab Lot# of pH paper: 10036601 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: LP Date/ Time:

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																		X		2.5 / 5 / 10
002										2		1																		X		2.5 / 5 / 10
003										2		1																		X		2.5 / 5 / 10
004										2		1																		X		2.5 / 5 / 10
005										2		1																		X		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																																2.5 / 5 / 10
014																																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	

Pace Analytical® 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 26Mar2020
	Document No.: ENV-FRM-GBAY-0014-Rev.00	Author: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS Engineers

Project #: WO# : 40225280

40225280

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

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no 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 - 90 **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 1 /Corr: 1.5

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

Person examining contents: Date: 4/16/21 /Initials: LP

Labeled By Initials: LP

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

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. Mail, DJH 4/16/21 LP
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: For Analysis: ☒Yes ☐No MS/MSD: ☐Yes ☐No ☐N/A		8.
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		No Date/time 4/16/21 LP
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: _____

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

C2 October 2021 Detection Monitoring

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

November 16, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 29, 2021. 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

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

CERTIFICATIONS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

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: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40235999001	**MW-301**	Water	10/26/21 10:55	10/29/21 07:20
40235999002	**MW-302**	Water	10/26/21 09:35	10/29/21 07:20
40235999003	**MW-303**	Water	10/26/21 10:15	10/29/21 07:20
40235999004	**FIELD BLANK**	Water	10/26/21 10:50	10/29/21 07:20
40235999005	**2R-OW**	Water	10/26/21 11:55	10/29/21 07:20

Pace Analytical Services, LLC
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Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40235999001	**MW-301**	EPA 6020B	DS1, KXS	2
			MEA	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40235999002	**MW-302**	EPA 6020B	DS1, KXS	2
			MEA	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40235999003	**MW-303**	EPA 6020B	DS1, KXS	2
			MEA	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40235999004	**FIELD BLANK**	EPA 6020B	KXS	2
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40235999005	**2R-OW**	EPA 6020B	KXS	2
			MEA	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

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

ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Sample: MW-301 **Lab ID: 40235999001** Collected: 10/26/21 10:55 Received: 10/29/21 07:20 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	**6710**	ug/L	200	60.6	20	11/03/21 05:24	11/12/21 13:02	7440-42-8	
Calcium	**102000**	ug/L	254	76.2	1	11/03/21 05:24	11/11/21 19:51	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.01**	Std. Units			1		10/26/21 10:55		
Field Specific Conductance	**811**	umhos/cm			1		10/26/21 10:55		
Oxygen, Dissolved	**5.4**	mg/L			1		10/26/21 10:55	7782-44-7	
REDOX	**196**	mV			1		10/26/21 10:55		
Turbidity	**88.4**	NTU			1		10/26/21 10:55		
Static Water Level	**590.68**	feet			1		10/26/21 10:55		
Temperature, Water (C)	**11.2**	deg C			1		10/26/21 10:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**538**	mg/L	20.0	8.7	1		11/01/21 00:53		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.1**	Std. Units	0.10	0.010	1		11/05/21 09:58		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**13.8**	mg/L	2.0	0.43	1		11/16/21 05:58	16887-00-6	M0
Fluoride	**0.24J**	mg/L	0.32	0.095	1		11/16/21 05:58	16984-48-8	M0
Sulfate	**203**	mg/L	20.0	4.4	10		11/16/21 13:22	14808-79-8	M0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Sample: MW-302 **Lab ID: 40235999002** Collected: 10/26/21 09:35 Received: 10/29/21 07:20 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	**1580**	ug/L	100	30.3	10	11/03/21 05:24	11/12/21 13:10	7440-42-8	
Calcium	**78200**	ug/L	254	76.2	1	11/03/21 05:24	11/11/21 19:59	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.60**	Std. Units			1		10/26/21 09:35		
Field Specific Conductance	**496**	umhos/cm			1		10/26/21 09:35		
Oxygen, Dissolved	**0.1**	mg/L			1		10/26/21 09:35	7782-44-7	
REDOX	**134**	mV			1		10/26/21 09:35		
Turbidity	**69.8**	NTU			1		10/26/21 09:35		
Static Water Level	**599.82**	feet			1		10/26/21 09:35		
Temperature, Water (C)	**11.1**	deg C			1		10/26/21 09:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**290**	mg/L	20.0	8.7	1		11/01/21 00:53		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		11/05/21 10:02		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**20.7**	mg/L	2.0	0.43	1		11/16/21 06:41	16887-00-6	
Fluoride	**0.88**	mg/L	0.32	0.095	1		11/16/21 06:41	16984-48-8	
Sulfate	**71.2**	mg/L	10.0	2.2	5		11/16/21 08:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Sample: MW-303 **Lab ID: 40235999003** Collected: 10/26/21 10:15 Received: 10/29/21 07:20 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	**3650**	ug/L	200	60.6	20	11/03/21 05:24	11/12/21 13:17	7440-42-8	
Calcium	**148000**	ug/L	254	76.2	1	11/03/21 05:24	11/11/21 20:06	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.92**	Std. Units			1		10/26/21 10:15		
Field Specific Conductance	**1,171**	umhos/cm			1		10/26/21 10:15		
Oxygen, Dissolved	**1.6**	mg/L			1		10/26/21 10:15	7782-44-7	
REDOX	**170**	mV			1		10/26/21 10:15		
Turbidity	**88.4**	NTU			1		10/26/21 10:15		
Static Water Level	**594.07**	feet			1		10/26/21 10:15		
Temperature, Water (C)	**12.3**	deg C			1		10/26/21 10:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**640**	mg/L	20.0	8.7	1		11/01/21 00:54		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		11/05/21 10:04		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**21.6**	mg/L	10.0	2.2	5		11/13/21 13:02	16887-00-6	
Fluoride	**<0.48**	mg/L	1.6	0.48	5		11/13/21 13:02	16984-48-8	D3
Sulfate	**<2.2**	mg/L	10.0	2.2	5		11/13/21 13:02	14808-79-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Sample: FIELD BLANK **Lab ID: 40235999004** Collected: 10/26/21 10:50 Received: 10/29/21 07:20 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	11/03/21 05:24	11/11/21 18:30	7440-42-8	
Calcium	**<76.2**	ug/L	254	76.2	1	11/03/21 05:24	11/11/21 18:30	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		11/01/21 00:54		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.6**	Std. Units	0.10	0.010	1		11/05/21 10:05		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		11/15/21 13:47	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		11/15/21 13:47	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		11/15/21 13:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Sample: 2R-OW **Lab ID: 40235999005** Collected: 10/26/21 11:55 Received: 10/29/21 07:20 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	**47.2**	ug/L	10.0	3.0	1	11/03/21 05:24	11/11/21 20:14	7440-42-8	
Calcium	**192000**	ug/L	254	76.2	1	11/03/21 05:24	11/11/21 20:14	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.01**	Std. Units			1		10/26/21 11:55		
Field Specific Conductance	**2,290**	umhos/cm			1		10/26/21 11:55		
Oxygen, Dissolved	**0.6**	mg/L			1		10/26/21 11:55	7782-44-7	
REDOX	**242**	mV			1		10/26/21 11:55		
Turbidity	**95.2**	NTU			1		10/26/21 11:55		
Static Water Level	**604.04**	feet			1		10/26/21 11:55		
Temperature, Water (C)	**14.0**	deg C			1		10/26/21 11:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**1170**	mg/L	20.0	8.7	1		11/01/21 00:54		
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		11/05/21 10:07		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**493**	mg/L	100	21.6	50		11/15/21 14:01	16887-00-6	
Fluoride	**<4.8**	mg/L	15.8	4.8	50		11/15/21 14:01	16984-48-8	D3
Sulfate	**35.7J**	mg/L	100	22.2	50		11/15/21 14:01	14808-79-8	D3

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

QC Batch: 400458
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235999001, 40235999002, 40235999003, 40235999004, 40235999005

METHOD BLANK: 2312698 Matrix: Water
Associated Lab Samples: 40235999001, 40235999002, 40235999003, 40235999004, 40235999005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	11/11/21 18:23	
Calcium	ug/L	<76.2	254	11/11/21 18:23	

LABORATORY CONTROL SAMPLE: 2312699

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	243	97	80-120	
Calcium	ug/L	10000	10200	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2312700 2312701

Parameter	Units	40235995001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1040	250	250	1240	1250	84	86	75-125	0	20	
Calcium	ug/L	65600	10000	10000	74200	75300	86	98	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

QC Batch: 400145 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235999001, 40235999002, 40235999003, 40235999004, 40235999005

METHOD BLANK: 2311329 Matrix: Water
Associated Lab Samples: 40235999001, 40235999002, 40235999003, 40235999004, 40235999005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	11/01/21 00:50	

LABORATORY CONTROL SAMPLE: 2311330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	575	534	93	80-120	

SAMPLE DUPLICATE: 2311331

Parameter	Units	40235907001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	346	384	10	10	

SAMPLE DUPLICATE: 2311332

Parameter	Units	40235999001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	538	548	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

QC Batch: 400795
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235999001, 40235999002, 40235999003, 40235999004, 40235999005

SAMPLE DUPLICATE: 2314419

Parameter	Units	40235873001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.4	1	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

QC Batch: 401294
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: 40235999003, 40235999004, 40235999005

METHOD BLANK: 2316943 Matrix: Water
Associated Lab Samples: 40235999003, 40235999004, 40235999005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	11/13/21 10:50	
Fluoride	mg/L	<0.095	0.32	11/13/21 10:50	
Sulfate	mg/L	<0.44	2.0	11/13/21 10:50	

LABORATORY CONTROL SAMPLE: 2316944

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	18.8	94	90-110	
Fluoride	mg/L	2	1.8	91	90-110	
Sulfate	mg/L	20	18.3	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2316945 2316946

Parameter	Units	40235999003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.6	100	100	127	132	106	110	90-110	4	15	
Fluoride	mg/L	<0.48	10	10	10.0	10.6	100	106	90-110	6	15	
Sulfate	mg/L	<2.2	100	100	101	108	101	108	90-110	6	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2316947 2316948

Parameter	Units	40236058005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.4	20	20	28.2	28.2	114	114	90-110	0	15	M0
Fluoride	mg/L	1.2	2	2	3.4	3.4	109	109	90-110	0	15	
Sulfate	mg/L	75.2	100	100	183	183	108	108	90-110	0	15	

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

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

QC Batch: 401491
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: 40235999001, 40235999002

METHOD BLANK: 2318065 Matrix: Water
Associated Lab Samples: 40235999001, 40235999002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	11/16/21 05:29	
Fluoride	mg/L	<0.095	0.32	11/16/21 05:29	
Sulfate	mg/L	<0.44	2.0	11/16/21 05:29	

LABORATORY CONTROL SAMPLE: 2321189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.0	100	90-110	
Fluoride	mg/L	2	1.9	97	90-110	
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318067 2318068

Parameter	Units	40235999001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.8	20	20	36.7	36.6	114	114	90-110	0	15	M0
Fluoride	mg/L	0.24J	2	2	2.5	2.5	112	111	90-110	0	15	M0
Sulfate	mg/L	203	200	200	434	428	115	112	90-110	1	15	M0

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

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

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40235999

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40235999001	**MW-301**	EPA 3010A	400458	EPA 6020B	400581
40235999002	**MW-302**	EPA 3010A	400458	EPA 6020B	400581
40235999003	**MW-303**	EPA 3010A	400458	EPA 6020B	400581
40235999004	**FIELD BLANK**	EPA 3010A	400458	EPA 6020B	400581
40235999005	**2R-OW**	EPA 3010A	400458	EPA 6020B	400581
40235999001	**MW-301**				
40235999002	**MW-302**				
40235999003	**MW-303**				
40235999005	**2R-OW**				
40235999001	**MW-301**	SM 2540C	400145		
40235999002	**MW-302**	SM 2540C	400145		
40235999003	**MW-303**	SM 2540C	400145		
40235999004	**FIELD BLANK**	SM 2540C	400145		
40235999005	**2R-OW**	SM 2540C	400145		
40235999001	**MW-301**	EPA 9040	400795		
40235999002	**MW-302**	EPA 9040	400795		
40235999003	**MW-303**	EPA 9040	400795		
40235999004	**FIELD BLANK**	EPA 9040	400795		
40235999005	**2R-OW**	EPA 9040	400795		
40235999001	**MW-301**	EPA 300.0	401491		
40235999002	**MW-302**	EPA 300.0	401491		
40235999003	**MW-303**	EPA 300.0	401294		
40235999004	**FIELD BLANK**	EPA 300.0	401294		
40235999005	**2R-OW**	EPA 300.0	401294		

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

40235999

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	SCS ENGINEERS	Report To:	Meghan Blodgett	Attention:	
Address:	2830 Dairy Drive	Copy To:		Company Name:	
Madison, WI 53718				Address:	
Email:	mblodgett@scsengineers.com	Purchase Order #:		Pace Quote:	
Phone:	608-216-7362 Fax	Project Name:	CCR Rule Edgewater I-4 Closed (25216068)	Pace Project Manager:	dan.milewsky@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	3946

Regulatory Agency

State / Location

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	Ca/B only
1	MW-301	WT		10-26	1055														X	X	X		001
2	MW-302	WT			935														X	X	X		002
3	MW-303	WT			1015														X	X	X		003
4	FIELD BLANK	WT			1050														X	X	X		004
5	2R-OW	WT			[illegible]														X	X	X		005
6					1155																		
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
ALL SAMPLES UNFILTERED, metals=Calcium/boron	SCS	10-28	1600							
	CS Logistics	10/29/21	0720	Will Contract PACK	10/29/21	0720	4.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ZACH WATSON

SIGNATURE of SAMPLER: [signature] DATE Signed: 10-28-21

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
4.1	Y	Y	Y

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

40235999

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	SCS ENGINEERS	Report To:	Meghan Blodgett	Attention:	
Address:	2830 Dairy Drive	Copy To:		Company Name:	
Madison, WI 53718				Address:	Regulatory Agency
Email:	mblodgett@scsengineers.com	Purchase Order #:		Pace Quote:	
Phone:	608-216-7362 Fax:	Project Name:	CCR Rule Edgewater I-4 Closed (25216068)	Pace Project Manager:	dan.milewsky@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	3946

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	
1	MW-301	WT																	X	X	X		Ca/B only
2	MW-302	WT																	X	X	X		Ca/B only
3	MW-303	WT																	X	X	X		Ca/B only
4	FIELD BLANK	WT																	X	X	X		Ca/B only
5	2R-OW	WT																	X	X	X		Ca/B only
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
ALL SAMPLES UNFILTERED, metals=Calcium/boron							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed:

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Container Order #869034 40235999

Addresses

Order By :		Ship To :		Return To:	
Company	SCS ENGINEERS	Company	SCS Engineers	Company	Pace Analytical Green Bay
Contact	Blodgett, Meghan	Contact	Zach Watson	Contact	Milewsky, Dan
Email	mblodgett@scsengineers.com	Email	zwatson@scsengineers.com	Email	dan.milewsky@pacelabs.com
Address	2830 Dairy Drive	Address	N84 W13540 Leon Road	Address	1241 Bellevue Street
Address 2		Address 2		Address 2	Suite 9
City	Madison	City	Menomonee Falls	City	Green Bay
State	WI Zip 53718	State	WI Zip 53051	State	WI Zip 54302
Phone	608-216-7362	Phone	(608) 225-2972	Phone	(920)469-2436

Info

Project Name	CCR Rule Edgewater I-4 Closed (25216068)	**Due Date**	10/22/2021	**Profile**	3946	**Quote**	
Project Manager	Milewsky, Dan	**Return Date**		**Carrier**	FedEx Ground	**Location**	

Trip Blanks

- [ ] Include Trip Blanks

Bottle Labels

- [ ] Blank
- [ ] Pre-Printed No Sample IDs
- [x] Pre-Printed With Sample IDs

Bottles

- [ ] Boxed Cases
- [ ] Individually Wrapped
- [x] Grouped By Sample ID/Matrix

Return Shipping Labels

- [ ] No Shipper
- [ ] With Shipper

COC Options

- [ ] Number of Blanks
- [x] Pre-Printed

Misc

- [ ] Sampling Instructions
- [ ] Custody Seal
- [ ] Temp. Blanks
- [x] Coolers
- [ ] Syringes
- [ ] Extra Bubble Wrap
- [ ] Short Hold/Rush Stickers
- [x] DI Water 1 Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
5	WT	Metals	250mL plastic w/HNO3	5	0	M-1-203-04BB	Ca/B only
5	WT	pH	250mL plastic unpres	5	0	M-1-203-03BB	
5	WT	TDS, Cl, F, SO4	250mL plastic unpres	5	0	M-1-203-03BB	

Hazard Shipping Placard In Place : NA

'Sample receiving hours are typically 8am-5pm, but may differ by location. Please check with your Pace Project Manager.

'Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.

'Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage/disposal.

'Payment term are net 30 days.

'Please include the proposal number on the chain of custody to insure proper billing.

LAB USE:

Ship Date :	10/20/2021
Prepared By:	Mai Yer Her
Verified By:	

Sample

ALL SAMPLES UNFILTERED, metals=Calcium/boron

CLIENT USE (Optional):

Date Rec'd:	
Received By:	
Verified By:	

UC
10/29/21

Sample Preservation Receipt Form

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Client Name: SCS Engineers Project # 40235999

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

Lab Lot# of pH paper: 10D0104 Lab Std #ID of preservation (if pH adjusted):

	Glass								Plastic					Vials						Jars				General							
Pace Lab #	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	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
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																																2.5 / 5 / 10
014																																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

WC 10/29/21

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	

Pace Analytical® 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 26Mar2020
	Document No.: ENV-FRM-GBAY-0014-Rev.00	Author: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: WO# : 40235999

40235999

Client Name: SCS Engineers

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

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no 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 - 113 **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 4.0 /Corr: 4.1

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

Person examining contents:
Date: 10/29/21 /Initials: LRC

Labeled By Initials: CCR

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

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
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: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A		8.
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: WT		
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: _____

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

Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Edgewater Closed

Location ID: 2R-OW
Number of Sampling Dates: 17

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
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
Calcium	ug/L	205000	148000	145000	155000	152000	143000	145000	164000	170000	121000	190000	121000	132000	117000	124000	154000	192000
Chloride	mg/L	91.7	232	215	217	201	102	115	272	305	108	462	55.3	88.8	67.5	179	116	493
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
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
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
Total Dissolved Solids	mg/L	774	908	974	944	854	750	744	1000	1010	680	1260	610	706	604	806	737	1170
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
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
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
Field Oxidation Potential	mV	130	82	140	117	87	120	-20	-22	131	85	180	75	148	43.7	282	282	242
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
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
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

Single Location

Name: WPL - Edgewater Closed

Location ID: MW-301
Number of Sampling Dates: 18

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
Boron	ug/L	8550	8190	8450	8620	9280	8370	9160	8610	8820	7950	8230	7310	7220	7450	--	6550	7200	6710
Calcium	ug/L	88700	92200	84000	89400	89200	98800	94900	83600	87200	78900	88800	77500	87600	80800	--	114000	118000	102000
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
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
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
Sulfate	mg/L	372	343	368	369	372	367	362	340	341	332	318	322	312	298	--	293	195	203
Total Dissolved Solids	mg/L	838	794	862	838	826	838	804	780	772	752	722	724	694	718	--	678	614	538
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
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
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
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
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
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
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

Single Location

Name: WPL - Edgewater Closed

Location ID: MW-302
Number of Sampling Dates: 17

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
Boron	ug/L	1950	2010	2000	2150	2000	1970	1970	1890	1760	1800	1570	1670	1730	1570	1410	1550	1580
Calcium	ug/L	122000	116000	75900	72100	87400	114000	72200	62600	68100	68000	64700	64800	67500	66800	124000	81200	78200
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
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
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
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
Total Dissolved Solids	mg/L	352	364	396	348	328	358	350	360	316	314	306	324	290	316	182	342	290
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
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
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
Field Oxidation Potential	mV	-41	-123	-123	-111	-87	-517	-40	-121	-118	-123	-96	-95	124	-107.6	-83	41	134
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
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
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

Single Location

Name: WPL - Edgewater Closed

Location ID: MW-303
Number of Sampling Dates: 17

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
Boron	ug/L	4210	3360	3860	3740	4210	4170	4570	3780	3480	3040	2360	2930	2830	3380	3310	4600	3650
Calcium	ug/L	176000	138000	145000	147000	147000	135000	154000	139000	173000	146000	139000	135000	136000	144000	132000	176000	148000
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
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
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
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
Total Dissolved Solids	mg/L	660	716	732	744	738	700	714	714	566	630	620	668	584	692	620	710	640
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
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
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
Field Oxidation Potential	mV	-48	-71	-81	-102	-89	-20	-58	-116	-108	-97	-93	-85	122	-102.9	-32	-41	170
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
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
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

Appendix E

Statistical Evaluation

January 14, 2021
File No. 25220068.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results – UPL Update
Edgewater Generating Station

PREPARED BY: Nicole Kron

CHECKED BY: Sherren Clark

STATISTICAL METHOD

Groundwater monitoring data for the multiunit system at the Edgewater Generating Station (EDG), is evaluated in accordance with 40 CFR 257.93(f)(3), using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit.

Statistical evaluation is performed using commercially available software (*Sanitas for Groundwater*© or similar) in general accordance with the USEPA's *Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* dated March 2009 (Unified Guidance) (USEPA, 2009) and generally accepted procedures.

The EDG monitoring data includes one background monitoring well, 2R-OW, and three compliance monitoring wells, MW-301, MW-302, and MW-303. The statistical analysis includes an interwell evaluation for the Appendix III parameters.

The initial UPLs were calculated based on eight rounds of background monitoring performed prior to the initiation of compliance monitoring for the EDG CCR units, from April 2016 through August 2017. Since then, additional rounds of monitoring for Appendix III parameters have been performed at the background well. As part of the evaluation of the October 2020 monitoring results, the background data set for the UPL calculations is being updated to include data from the background well collected through October 2020. This memo addresses updated UPLs for Appendix III parameters.

TIME SERIES PLOTS

Time series plots are prepared for the required monitoring parameters to show the concentration variations over time. Time series graphs are included in **Attachment 1**.

OUTLIER ANALYSIS - INTERWELL

For interwell analysis, an outlier evaluation is performed for background monitoring results at the upgradient wells. A statistical outlier is a value that is extremely different from the other values in the data set. The Sanitas outlier tests identify data points that do not appear to fit the distribution of the

rest of the data set and determine if they differ significantly from the rest of the data. The outlier analysis performed in Sanitas includes the following steps:

1) Run normality test (Shapiro Wilk/Francia).

2) If normally distributed, run USEPA's 1989 Outlier Test to identify suspected outliers.
   a) If number of background samples is less than or equal to 25, run Dixon's test for suspected outliers.
   b) If number of background samples is more than 25, run Rosner's test for suspected outliers.

3) If not normally distributed, run Tukey's test for outliers.

4) Review data flagged as possible outliers to evaluate whether they should be removed from the background data set. Also review time series plots for possible outliers that were not picked up in the statistical evaluation (e.g., outlier test may not identify outliers when two values are similar to each other, but very different from all other data).

Results identified as statistical outliers are checked for possible lab instrument failure, field collection problems, or data entry errors; however, outliers may exist naturally in the data if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed.

For the interwell evaluation of the October 2020 sampling event, the following background values were identified as potential outliers and handled as described:

- **Field pH.** Two results from the August 2016 and April 2019 events were flagged as statistical outliers. The low result (August 2016) was removed from the dataset because all field pH results for that event at the background and compliance wells were low, suggesting a likely field measurement issue or calibration error. The high result (April 2019) was not removed from the dataset because there was no known explanation for the higher result and it appeared to be within the range of potential natural variation.

Outlier analysis output from Sanitas is included in **Attachment 2.**

BACKGROUND UPDATE

The background data pool was updated in accordance with the Unified Guidance, which recommends updating background every 2 to 3 years for semiannual sampling. Prior to expanding the data pool, the original background data set (4/2016 through 8/2017) and the data to be added (10/2017 through 10/2020) were compared. The Unified Guidance states that recently collected measurements from the background wells can be added to the existing pool if a Student's t-test or Wilcoxon rank-sum test finds no significant difference between the two groups at the 1% level of significance.

The Sanitas background group comparison for the EDG background data sets, included in **Attachment 3**, indicated no signficant difference at the 1% level; therefore, the more recent data can be added to the background pool. The comparison uses Welch's t-test for normally distributed data and the Mann-Whitney test for non-normal data. (Note: The Sanitas output labels the earlier

background dataset as “Background” and the later background dataset as “Compliance,” but all data from background well 2R-OW is background data.)

INTERWELL PREDICTION LIMITS

Interwell prediction limits are calculated using background data from the upgradient monitoring well (2R-OW) for each monitored constituent, with outliers removed as noted above. During this evaluation of compliance monitoring, groundwater results from April 2016 through October 2020 were included to calculate the interwell prediction limits. The prediction limit analysis performed in Sanitas includes the following steps:

1) If 100% of the background values are non-detect, the Double Quanitification rule applies and no prediction limit is calculated.

2) If more than 50% of results are non-detect, then a non-parametric prediction limit is calculated.

3) If 50% or fewer of the results are non-detect, run normality test (Shapiro Wilk/Francia) to assess whether the data fit a normal distribution or can be transformed to fit a normal distribution (e.g., lognormal).

4) If normal or transformed normal, calculate parametric prediction limit.

5) If not normal or transformed normal, calculate non-parametric prediction limit.

Consistent with the Unified Guidance, parametric prediction limits are calculated based on a 1-of-2 retesting protocol and a 10 percent site-wide false positive rate. Sanitas establishes the per-test significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For the October 2020 event, the following values were used:

Parameter	Value	Comments
Evaluations per year	2	Spring and Fall events
Constituents analyzed	7	Appendix III parameters
Compliance wells	3	MW-301, MW-302, MW-303

Non-parametric prediction limits are also based on a 1-of-2 retesting protocol. The non-parametric limit is the highest value in the background dataset. Due to the small sample size, the false positive rate for the non-parametric tests is higher than for the parametric tests, but will go down as more background data are obtained.

For results with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule means that a statistically significant increase (SSI) has not occurred for a compliance well unless two sample results from the well exceed the laboratory’s reporting limit or quanitification limit. For the current background dataset, none of the Appendix III parameters had 100 percent non-detects, so the Double Quantification rule was not applied.

For evaluation of parameters with less than 100 percent non-detects in the background sampling, the non-detects were adjusted using the Kaplan-Meier technique, unless the non-detects represent less than 15 percent of the total samples, in which case one-half of the detection limit was used.

Interwell prediction limit analysis results are included in **Attachment 4**.

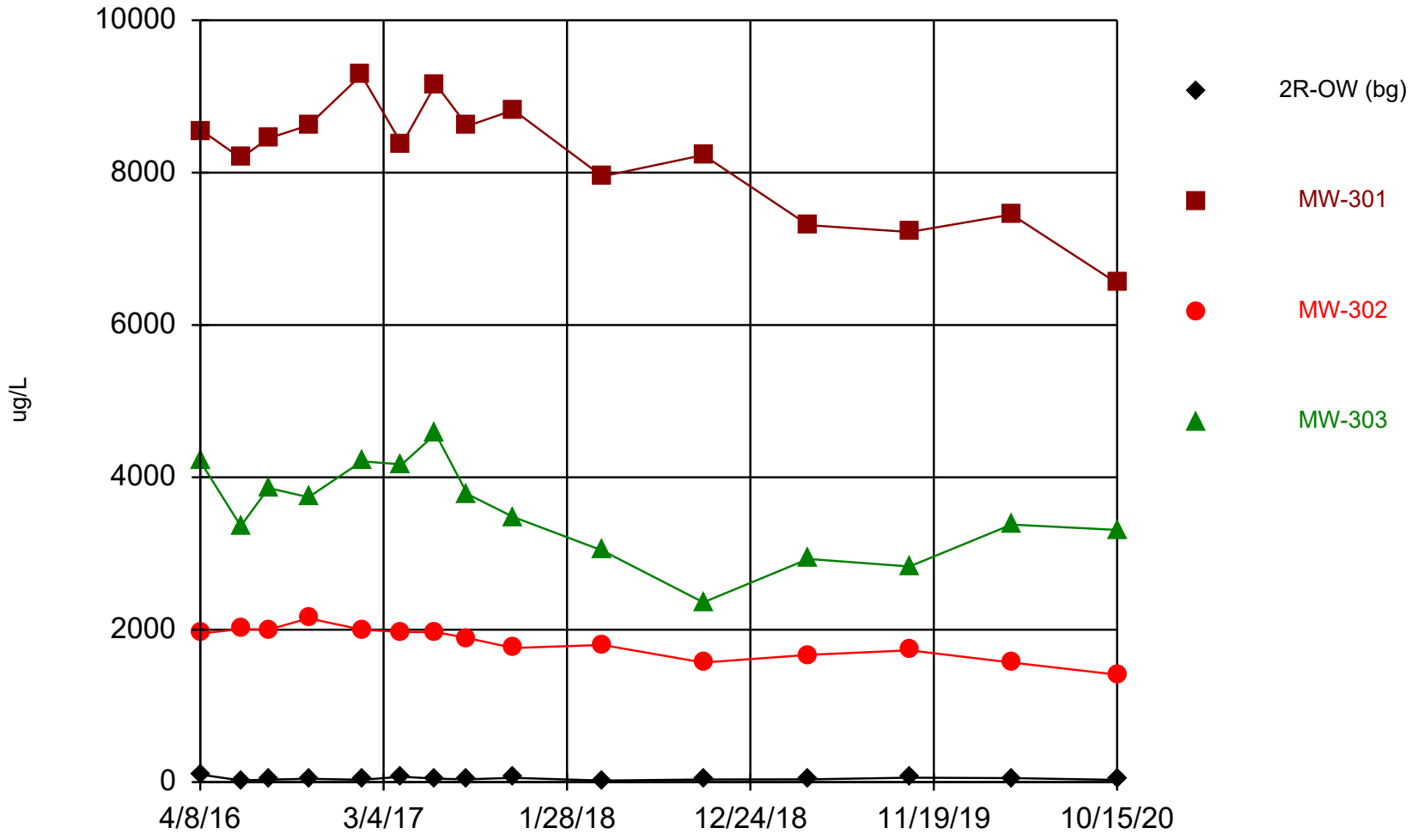
NDK/SCC

I:\25220068.00\Data and Calculations\Sanitas\EDG_Clsd - UPL calcs\Edg Closed CCR Stats Memo.docx

Attachment 1

Times Series Graphs

Boron



Time Series Analysis Run 12/21/2020 5:35 PM

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

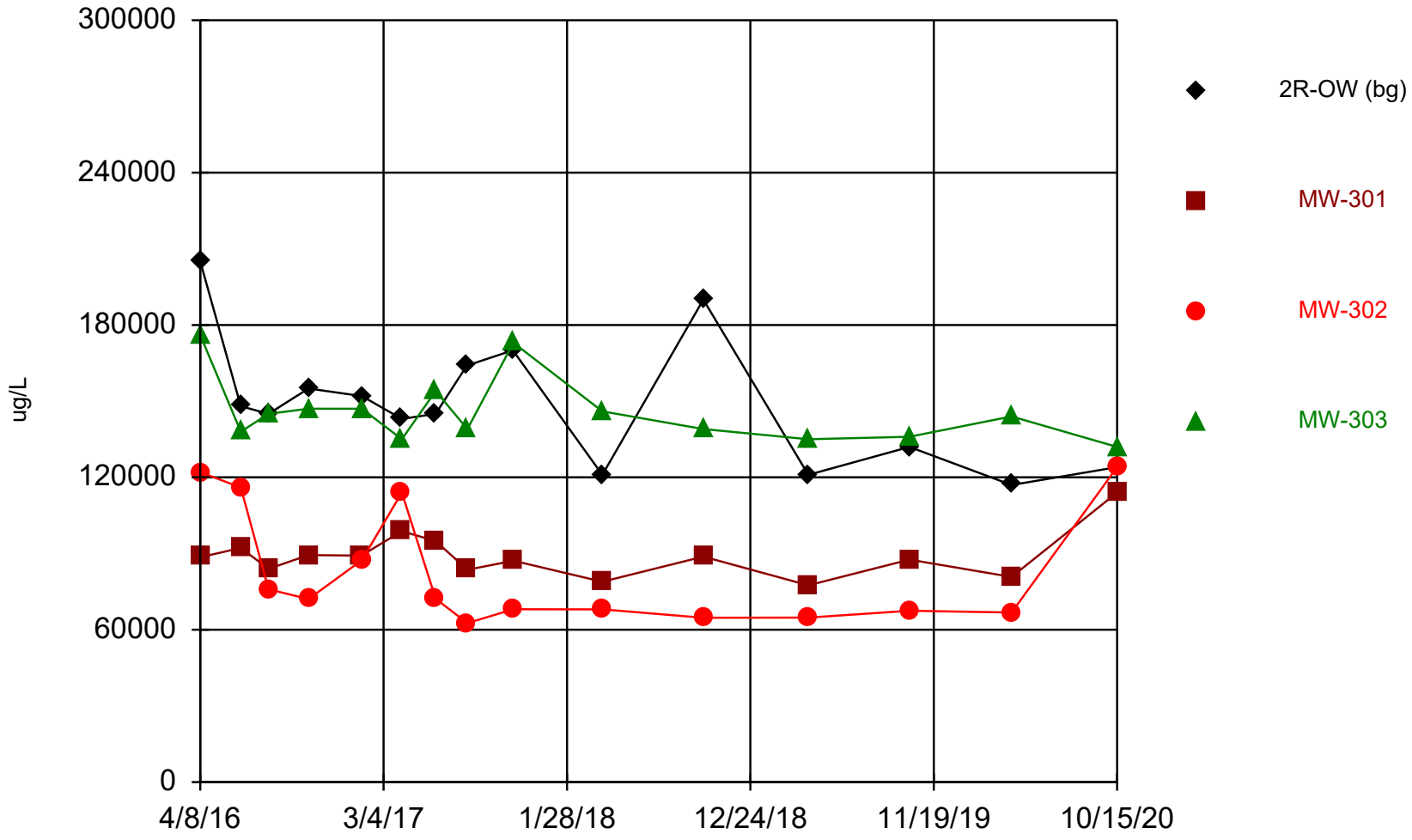
Time Series

Constituent: Boron (ug/L) Analysis Run 12/21/2020 5:36 PM

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

Calcium



Time Series Analysis Run 12/21/2020 5:35 PM

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

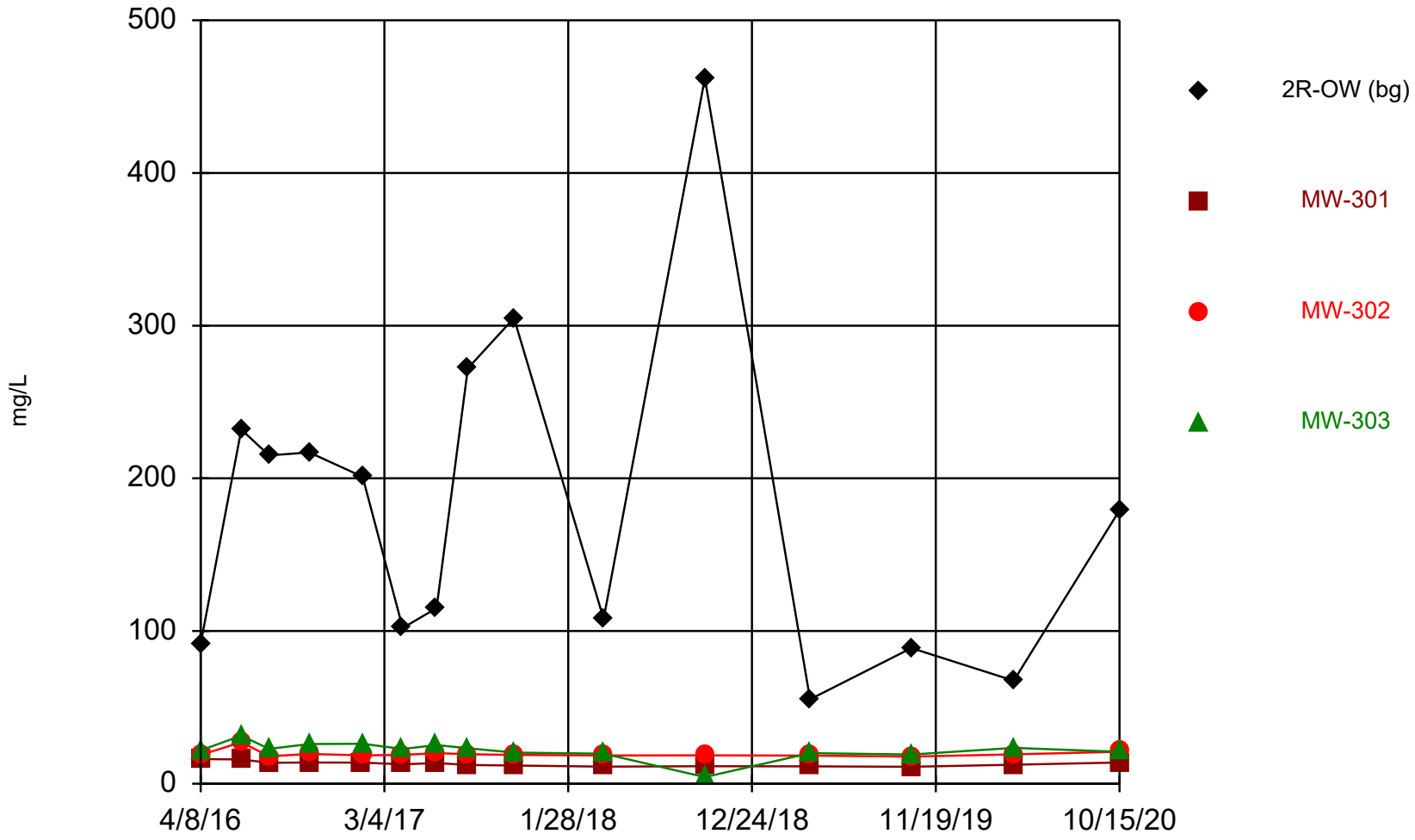
Time Series

Constituent: Calcium (ug/L) Analysis Run 12/21/2020 5:36 PM

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	205000		122000	176000
4/11/2016		88700		
6/20/2016	148000	92200	116000	138000
8/9/2016	145000	84000	75900	145000
10/20/2016	155000	89400	72100	147000
1/23/2017		89200		
1/24/2017	152000		87400	147000
4/6/2017	143000	98800	114000	135000
6/6/2017	145000	94900	72200	154000
8/1/2017	164000			
8/2/2017		83600	62600	139000
10/23/2017	170000			
10/24/2017		87200	68100	173000
4/2/2018	121000	78900	68000	146000
10/1/2018	190000	88800	64700	139000
4/8/2019	121000	77500	64800	135000
10/7/2019	132000	87600	67500	136000
4/8/2020	117000	80800	66800	144000
10/15/2020	124000	114000	124000	132000

Chloride



Time Series Analysis Run 12/21/2020 5:35 PM

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

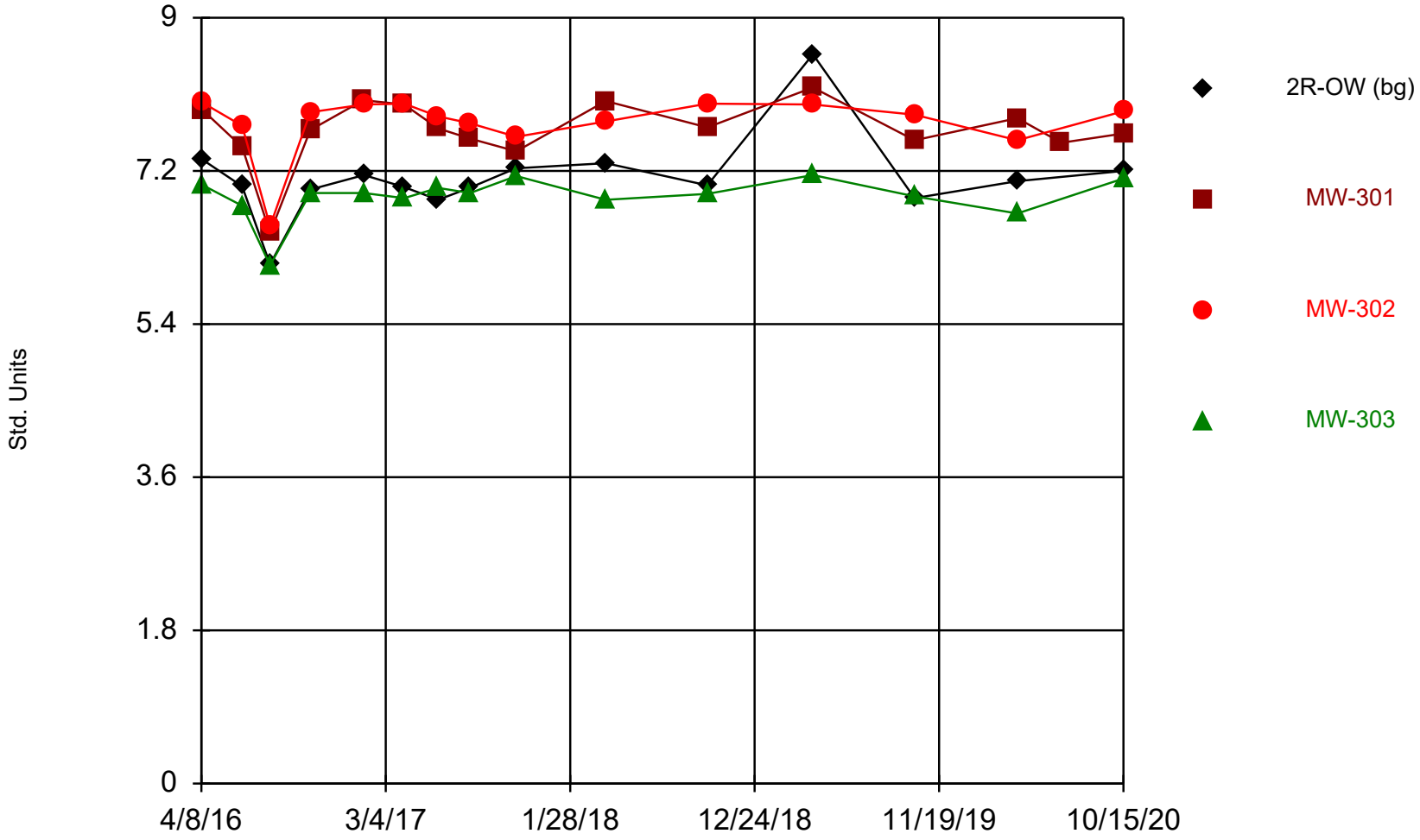
Time Series

Constituent: Chloride (mg/L) Analysis Run 12/21/2020 5:36 PM

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	91.7		18.9	21.8
4/11/2016		16.2		
6/20/2016	232	15.9	27.2	31.5
8/9/2016	215	13.7	18	22.8
10/20/2016	217	13.9	19.5	26
1/23/2017		13.8		
1/24/2017	201		18.6	26.2
4/6/2017	102	12.7	18.9	22.7
6/6/2017	115	13.5	20	25.4
8/1/2017	272			
8/2/2017		12.3	19.3	23.2
10/23/2017	305			
10/24/2017		11.9	18.9	20.4
4/2/2018	108	11.2	18.5	19.7
10/1/2018	462	11.5	18.6	4.3
4/8/2019	55.3	11.4	18.4	20
10/7/2019	88.8	11.1	17.8	19.1
4/8/2020	67.5	12.5	19.2	23.5
10/15/2020	179	13.9	20.9	20.9

Field pH



Time Series Analysis Run 12/21/2020 5:35 PM

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

Time Series

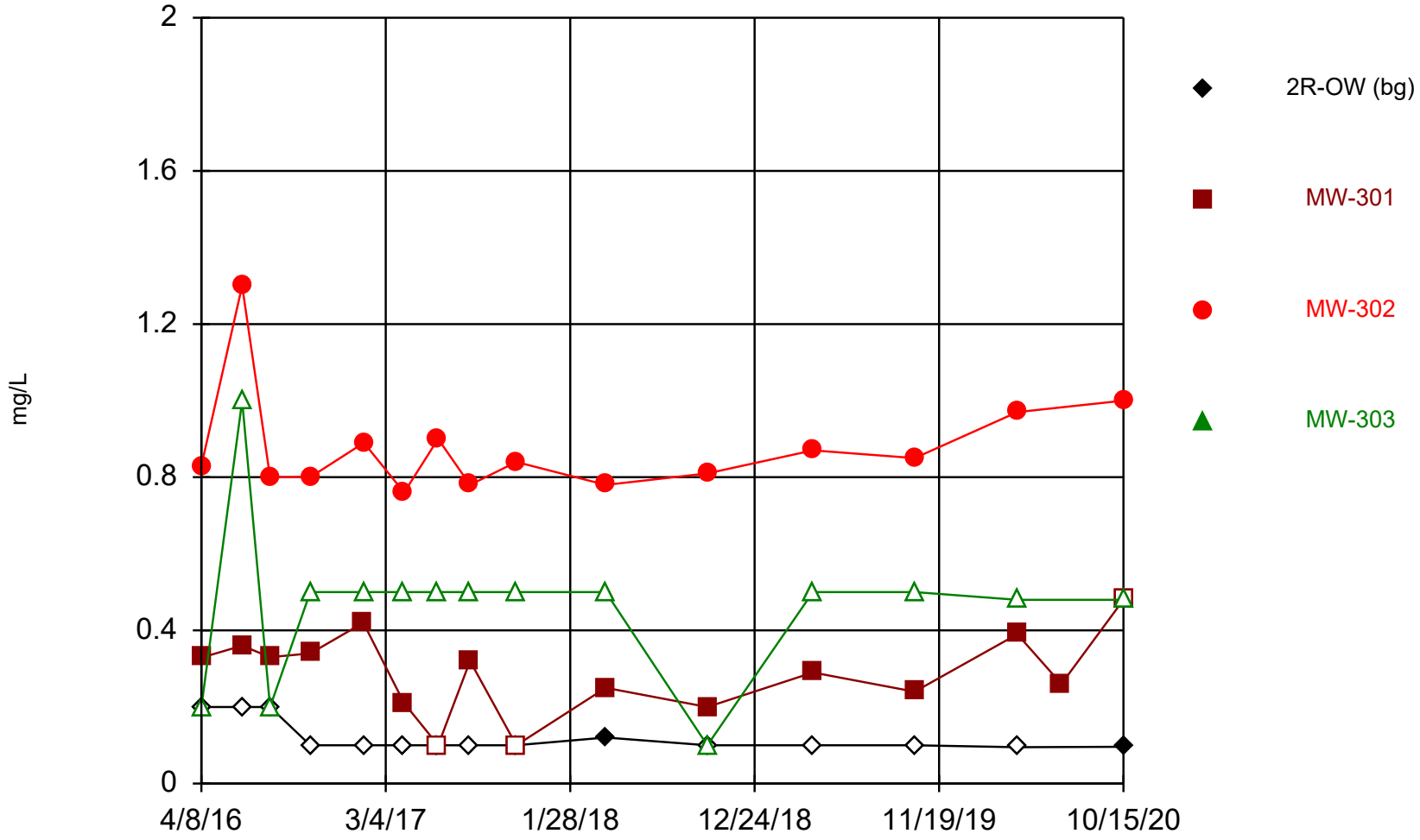
Constituent: Field pH (Std. Units) Analysis Run 12/21/2020 5:36 PM

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	7.34		8.01	7.04
4/11/2016		7.91		
6/20/2016	7.02	7.48	7.73	6.79
8/9/2016	6.1	6.47	6.55	6.09
10/20/2016	6.98	7.68	7.89	6.94
1/23/2017		8.03		
1/24/2017	7.15		7.98	6.94
4/6/2017	7.01	7.98	7.99	6.88
6/6/2017	6.86	7.7	7.84	7
8/1/2017	7			
8/2/2017		7.58	7.76	6.94
10/23/2017	7.23			
10/24/2017		7.43	7.6	7.14
4/2/2018	7.29	8.02	7.78	6.86
10/1/2018	7.03	7.71	7.99	6.93
4/8/2019	8.57	8.18	7.98	7.15
10/7/2019	6.88	7.56	7.86	6.9
4/8/2020	7.08	7.82	7.56	6.7
6/26/2020		7.53		
10/15/2020	7.2	7.64	7.9	7.11

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 12/21/2020 5:35 PM

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

Time Series

Constituent: Fluoride (mg/L) Analysis Run 12/21/2020 5:36 PM

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)

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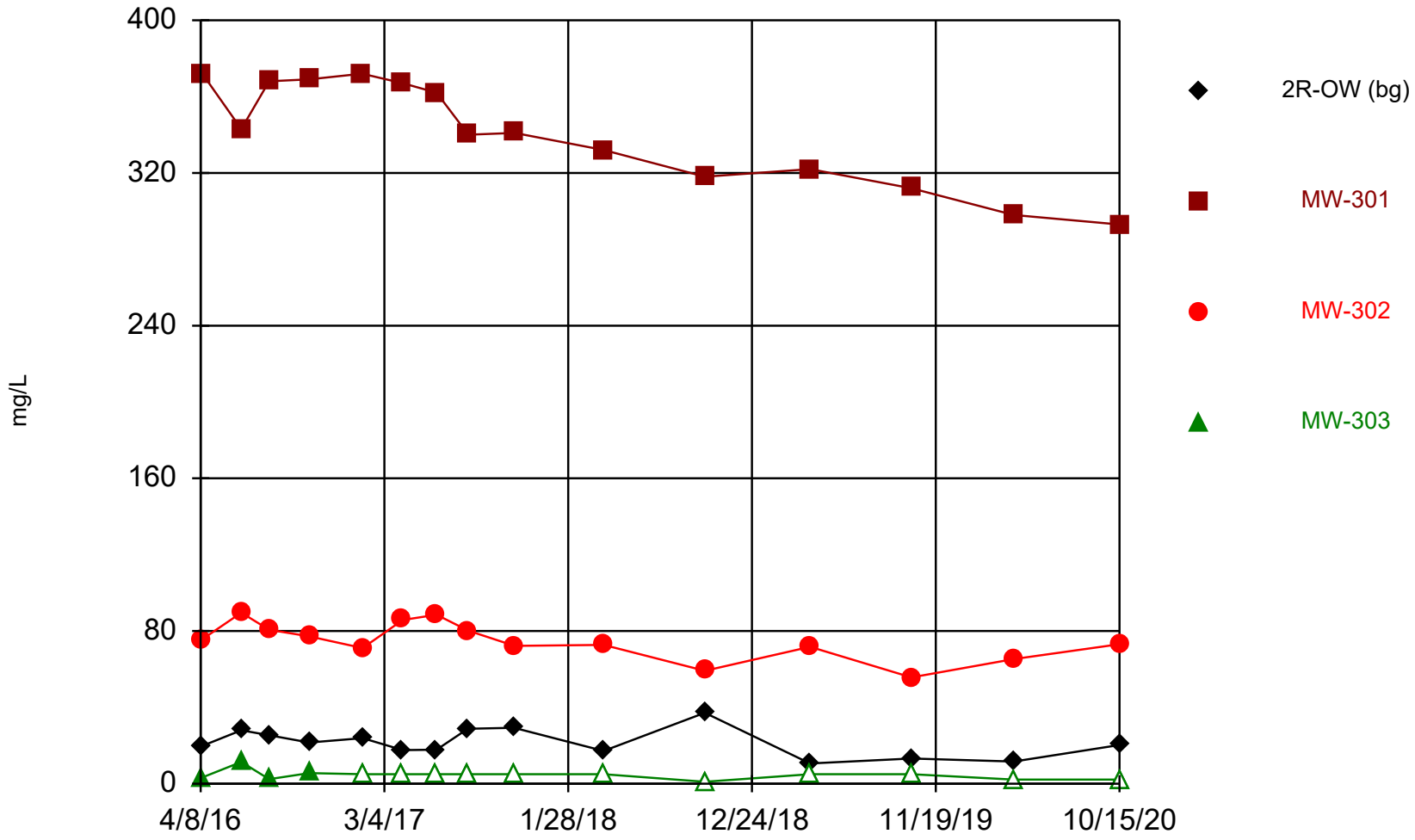
Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 12/21/2020 5:35 PM

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

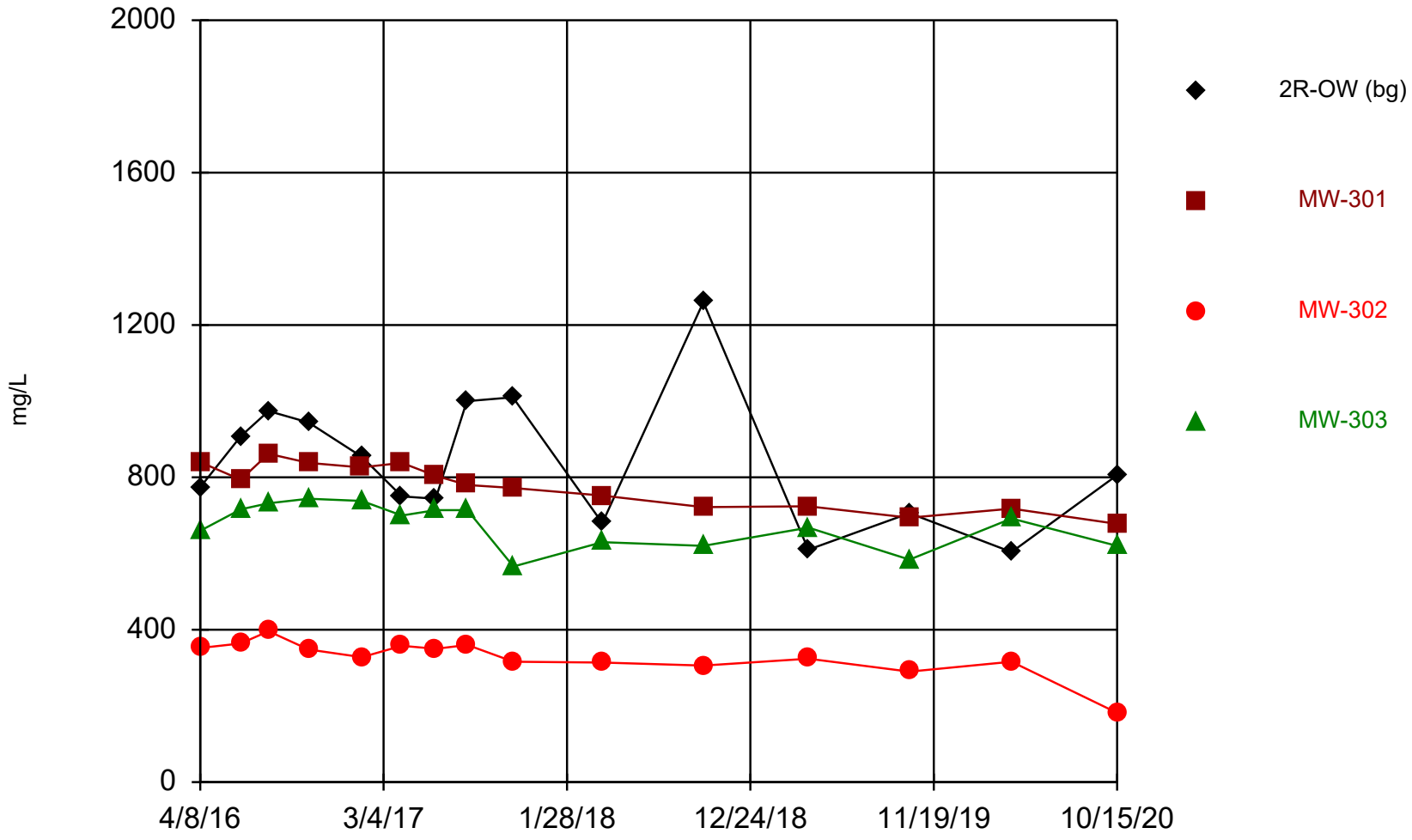
Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/21/2020 5:36 PM

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)

Total Dissolved Solids



Time Series Analysis Run 12/21/2020 5:35 PM

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

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/21/2020 5:36 PM

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	774		352	660
4/11/2016		838		
6/20/2016	908	794	364	716
8/9/2016	974	862	396	732
10/20/2016	944	838	348	744
1/23/2017		826		
1/24/2017	854		328	738
4/6/2017	750	838	358	700
6/6/2017	744	804	350	714
8/1/2017	1000			
8/2/2017		780	360	714
10/23/2017	1010			
10/24/2017		772	316	566
4/2/2018	680	752	314	630
10/1/2018	1260	722	306	620
4/8/2019	610	724	324	668
10/7/2019	706	694	290	584
4/8/2020	604	718	316	692
10/15/2020	806	678	182	620

Attachment 2

Outlier Analysis

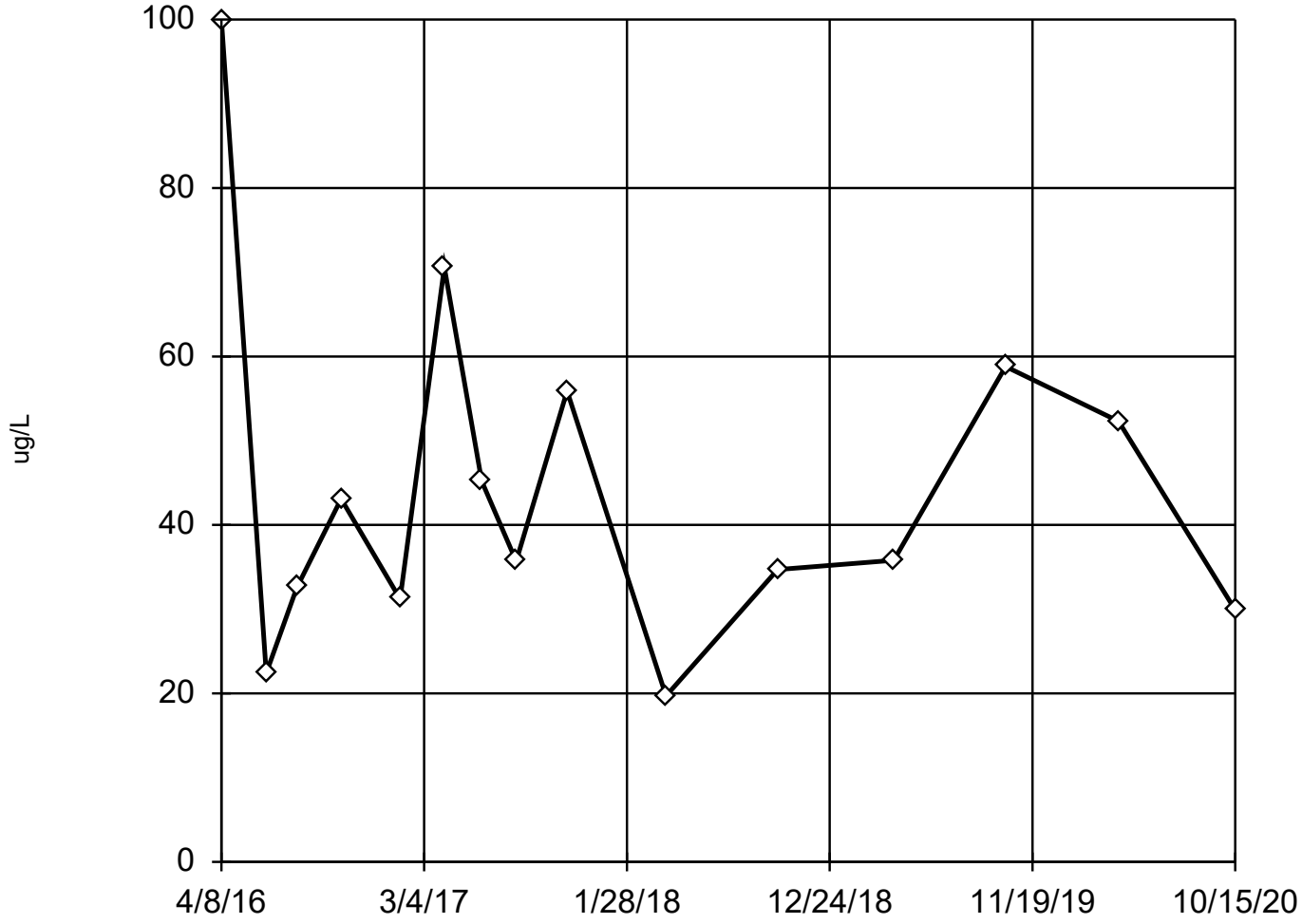
Outlier Analysis

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020 Printed 12/28/2020, 6:04 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron (ug/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	44.53	20.78	ln(x)	ShapiroWilk
Calcium (ug/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	148800	25498	normal	ShapiroWilk
Chloride (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	180.8	109.9	ln(x)	ShapiroWilk
Field pH (Std. Units)	**2R-OW (bg)**	**Yes**	**8.57,6.1**	**4/8/2019,...**	**Dixon`s**	**0.05**	**15**	**7.116**	**0.495**	**normal**	**ShapiroWilk**
Sulfate (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	21.47	7.379	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	841.6	177.2	normal	ShapiroWilk

EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 44.53, std. dev. 20.78, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9789
Critical = 0.901 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Boron Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

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

EPA 1989 Outlier Screening

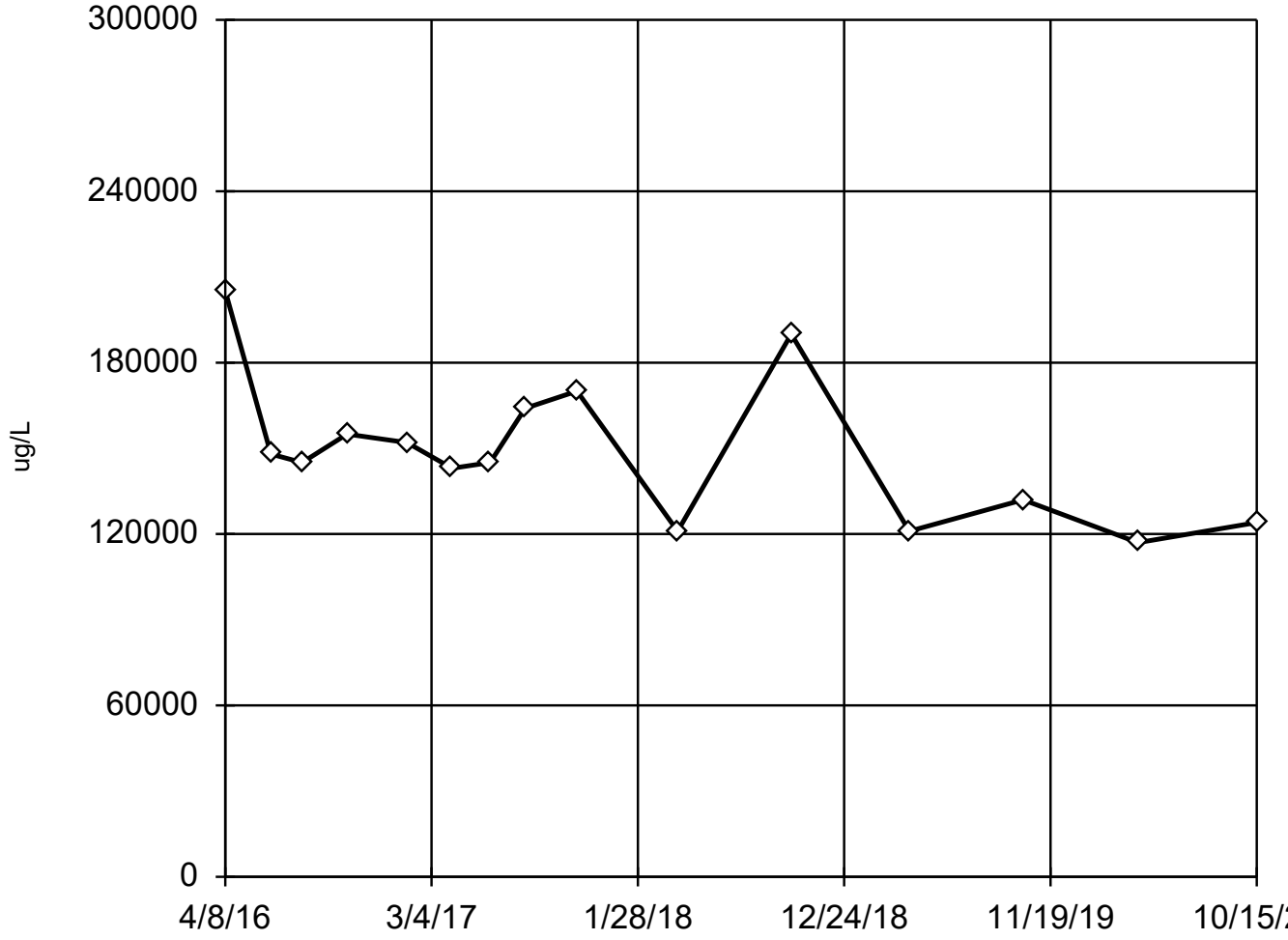
Constituent: Boron (ug/L) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020

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

	2R-OW (bg)
4/8/2016	100
6/20/2016	22.4
8/9/2016	32.6
10/20/2016	43.1
1/24/2017	31.2
4/6/2017	70.6
6/6/2017	45.2
8/1/2017	35.7
10/23/2017	55.9
4/2/2018	19.7
10/1/2018	34.7
4/8/2019	35.8
10/7/2019	58.8
4/8/2020	52.3
10/15/2020	29.9

EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 148800, std. dev. 25498, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9279
Critical = 0.901
The distribution was found to be normally distrib-uted.

Constituent: Calcium Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

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

EPA 1989 Outlier Screening

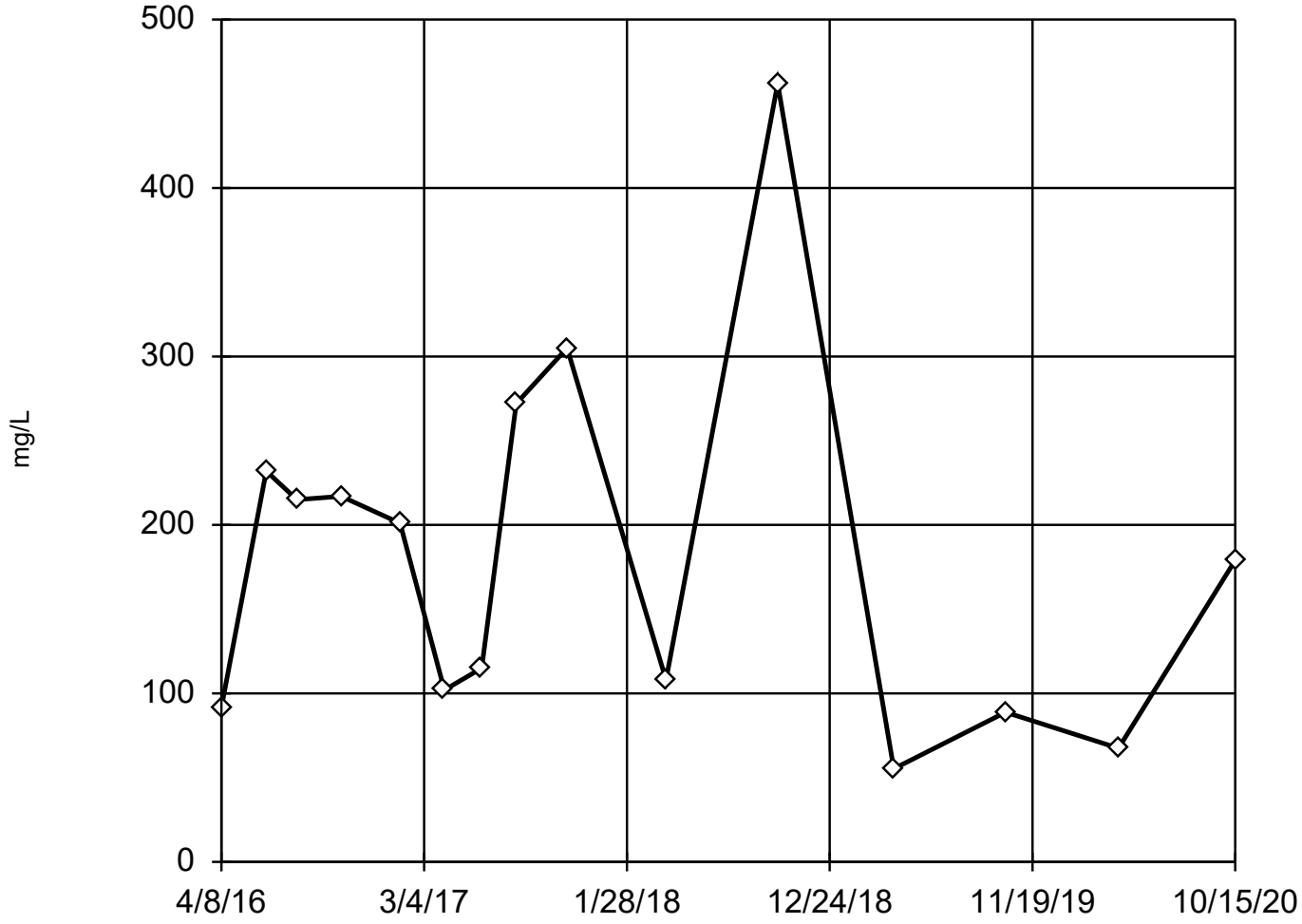
Constituent: Calcium (ug/L) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020

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

	2R-OW (bg)
4/8/2016	205000
6/20/2016	148000
8/9/2016	145000
10/20/2016	155000
1/24/2017	152000
4/6/2017	143000
6/6/2017	145000
8/1/2017	164000
10/23/2017	170000
4/2/2018	121000
10/1/2018	190000
4/8/2019	121000
10/7/2019	132000
4/8/2020	117000
10/15/2020	124000

EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 180.8, std. dev. 109.9, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9641
Critical = 0.901 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Chloride Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

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

EPA 1989 Outlier Screening

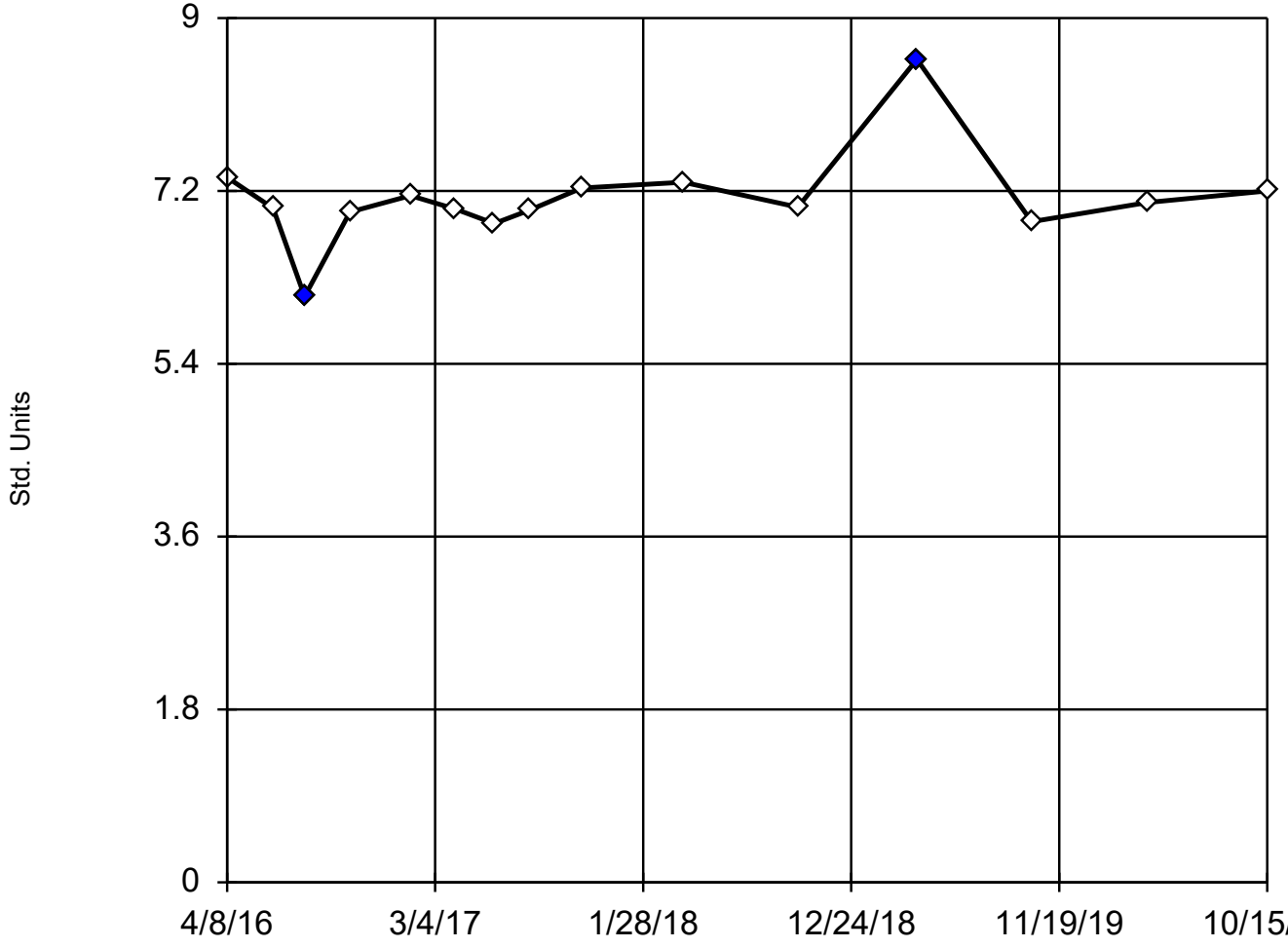
Constituent: Chloride (mg/L) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020

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

	2R-OW (bg)
4/8/2016	91.7
6/20/2016	232
8/9/2016	215
10/20/2016	217
1/24/2017	201
4/6/2017	102
6/6/2017	115
8/1/2017	272
10/23/2017	305
4/2/2018	108
10/1/2018	462
4/8/2019	55.3
10/7/2019	88.8
4/8/2020	67.5
10/15/2020	179

Dixon's Outlier Test

2R-OW (bg)



n = 15

Statistical outliers are drawn as solid.
Testing for 1 high and 1 low outliers.
Mean = 7.116.
Std. Dev. = 0.495.
8.57: c = 0.7574
tabl = 0.525.
6.1: c = 0.6555
tabl = 0.525.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9533
Critical = 0.889
The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: Field pH Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

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

Dixon's Outlier Test

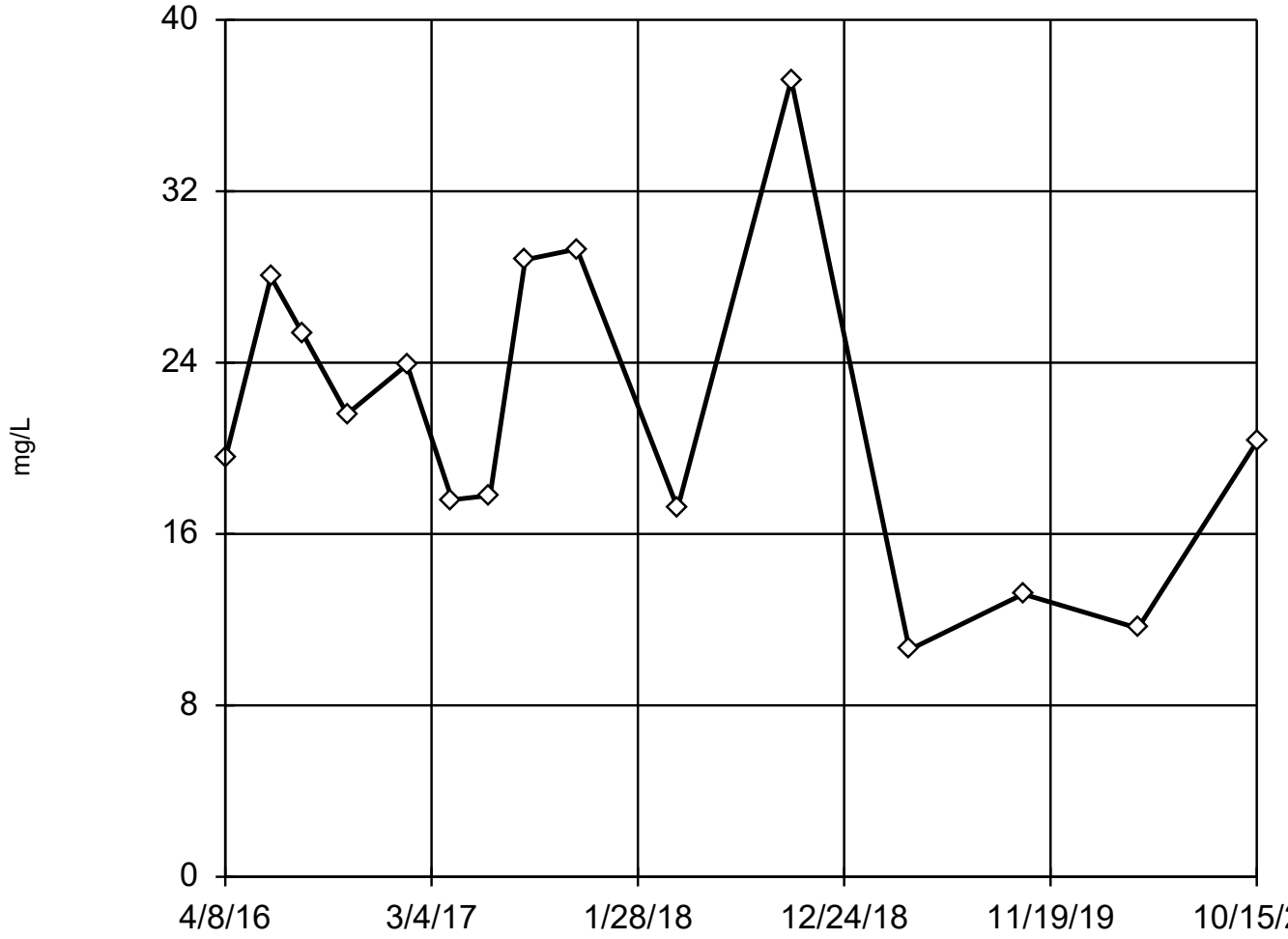
Constituent: Field pH (Std. Units) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020

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

	2R-OW (bg)
4/8/2016	7.34
6/20/2016	7.02
8/9/2016	6.1 (O)
10/20/2016	6.98
1/24/2017	7.15
4/6/2017	7.01
6/6/2017	6.86
8/1/2017	7
10/23/2017	7.23
4/2/2018	7.29
10/1/2018	7.03
4/8/2019	8.57 (O)
10/7/2019	6.88
4/8/2020	7.08
10/15/2020	7.2

EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 21.47, std. dev. 7.379, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9672
Critical = 0.901
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

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

EPA 1989 Outlier Screening

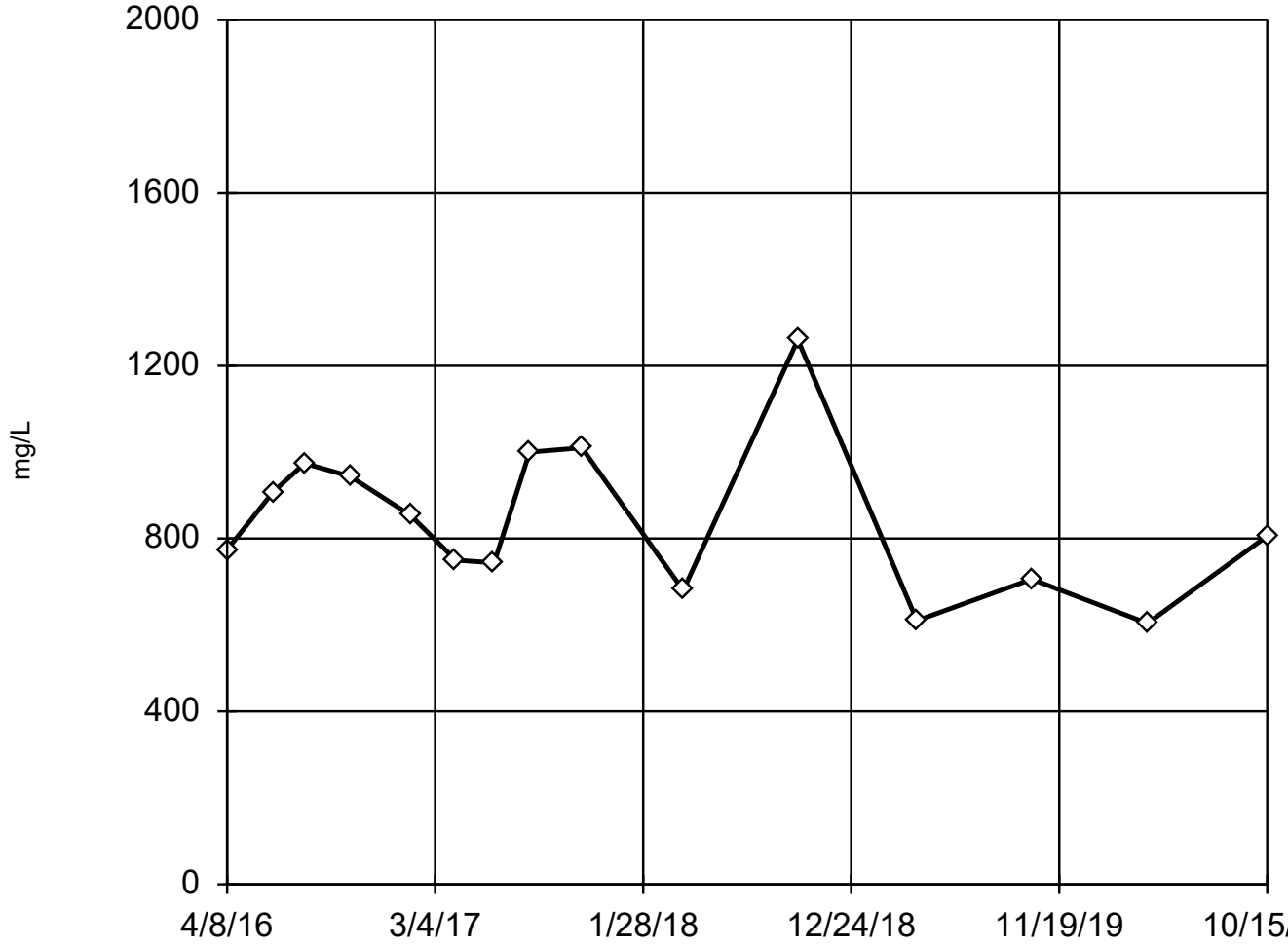
Constituent: Sulfate (mg/L) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020

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

	2R-OW (bg)
4/8/2016	19.5
6/20/2016	28
8/9/2016	25.4
10/20/2016	21.6
1/24/2017	23.9
4/6/2017	17.6
6/6/2017	17.8
8/1/2017	28.8
10/23/2017	29.3
4/2/2018	17.2
10/1/2018	37.2
4/8/2019	10.6
10/7/2019	13.2
4/8/2020	11.6
10/15/2020	20.3

EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 841.6, std. dev. 177.2, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9458
Critical = 0.901
The distribution was found to be normally distrib-uted.

Constituent: Total Dissolved Solids Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

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

EPA 1989 Outlier Screening

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020

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

	2R-OW (bg)
4/8/2016	774
6/20/2016	908
8/9/2016	974
10/20/2016	944
1/24/2017	854
4/6/2017	750
6/6/2017	744
8/1/2017	1000
10/23/2017	1010
4/2/2018	680
10/1/2018	1260
4/8/2019	610
10/7/2019	706
4/8/2020	604
10/15/2020	806

Attachment 3

Welch's/Mann-Whitney Comparison

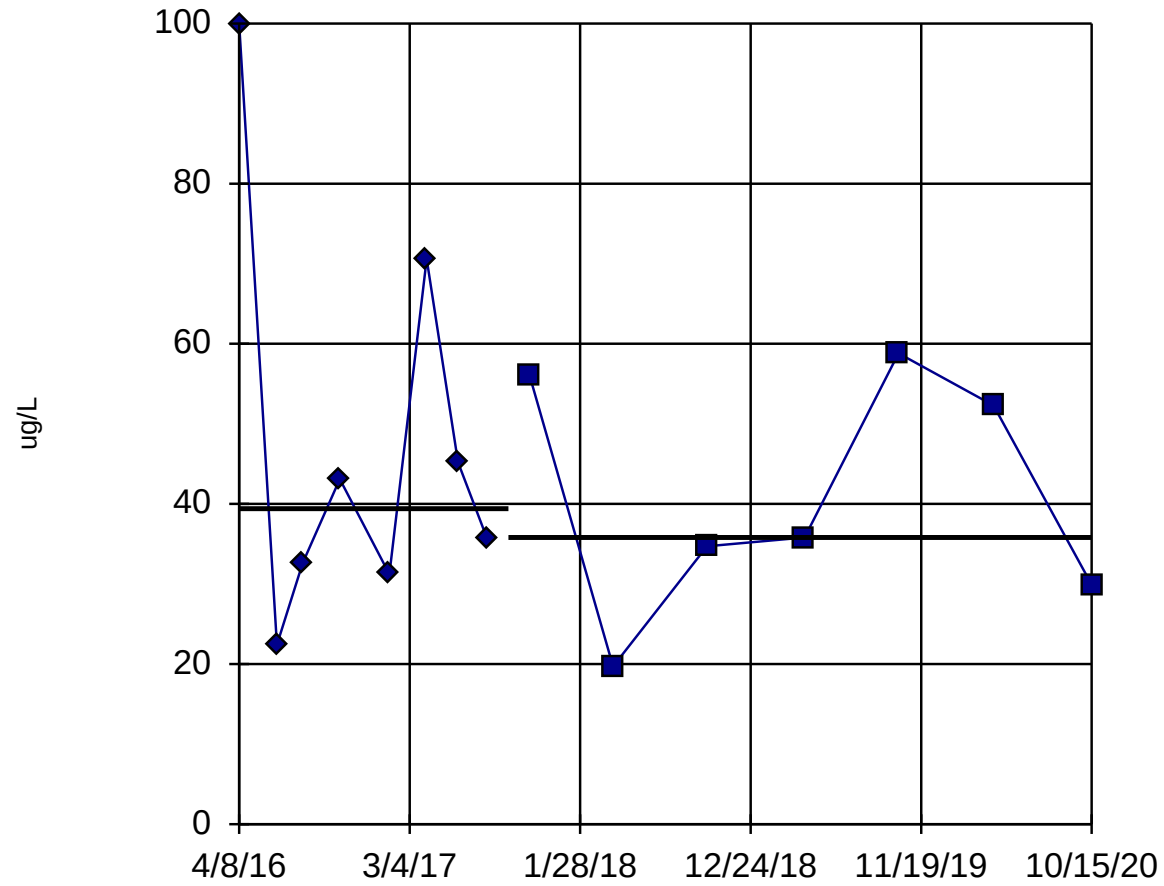
Welch's t-test/Mann-Whitney

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020 Printed 1/3/2021, 4:20 PM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Alpha	Sig.	Bg. Wells	Method
Boron (ug/L)	2R-OW (bg)	-0.62	No	No	No	No	0.01	No	(intrawell)	Welch`s
Calcium (ug/L)	2R-OW (bg)	-1.681	No	No	No	No	0.01	No	(intrawell)	Mann-W (normality)
Chloride (mg/L)	2R-OW (bg)	0.0...	No	No	No	No	0.01	No	(intrawell)	Welch`s
Field pH (Std. Units)	2R-OW (bg)	1.238	No	No	No	No	0.01	No	(intrawell)	Welch`s
Fluoride (mg/L)	2R-OW (bg)	-1.771	No	No	No	No	0.01	No	(intrawell)	Mann-W (NDs)
Sulfate (mg/L)	2R-OW (bg)	-0....	No	No	No	No	0.01	No	(intrawell)	Welch`s
Total Dissolved Solids (mg/L)	2R-OW (bg)	-0....	No	No	No	No	0.01	No	(intrawell)	Welch`s

Boron

2R-OW (bg)



2R-OW background

2R-OW compliance

background median = 39.4

compliance median = 35.8

t = -0.62

Alpha	Table	Sig.
0.1	1.363	No
0.05	1.796	No
0.025	2.201	No
0.01	2.718	No

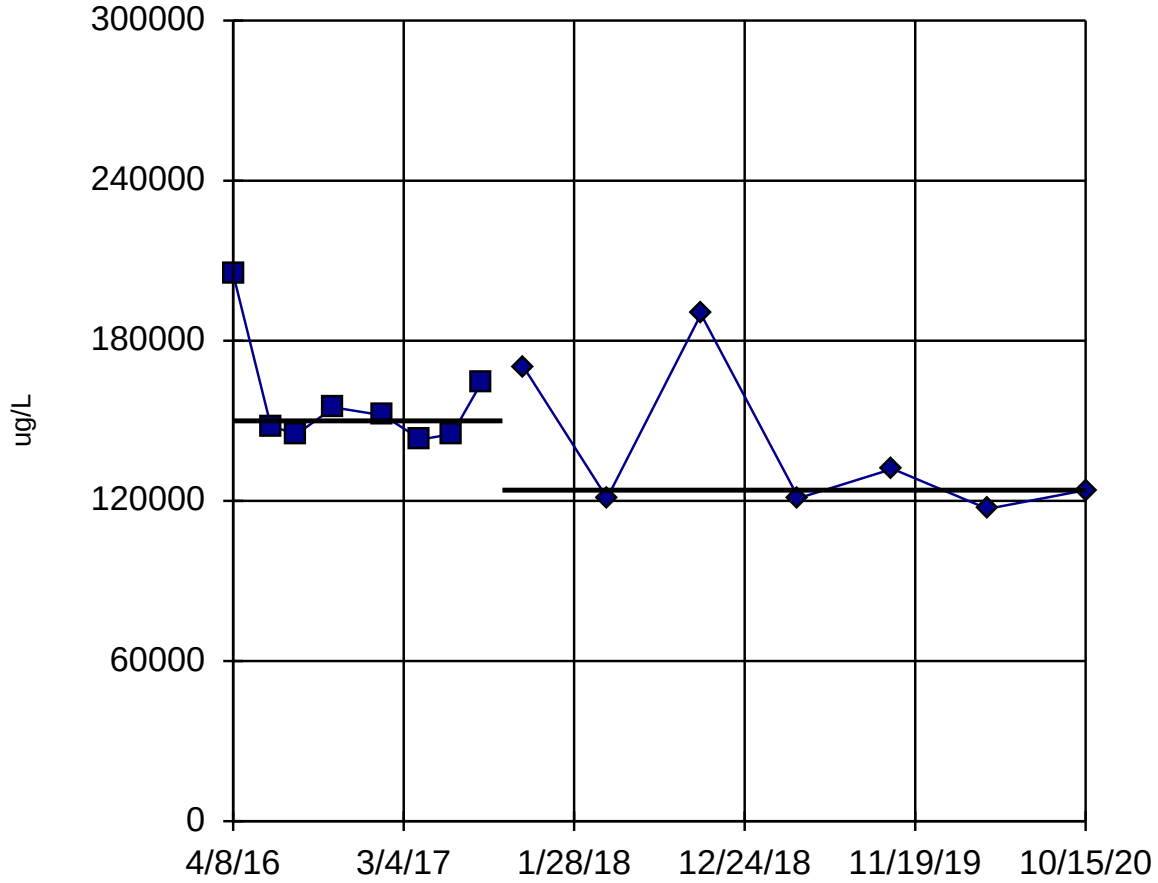
Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.842, critical = 0.818.

Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

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

Calcium

2R-OW (bg)



Z = -1.681

Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

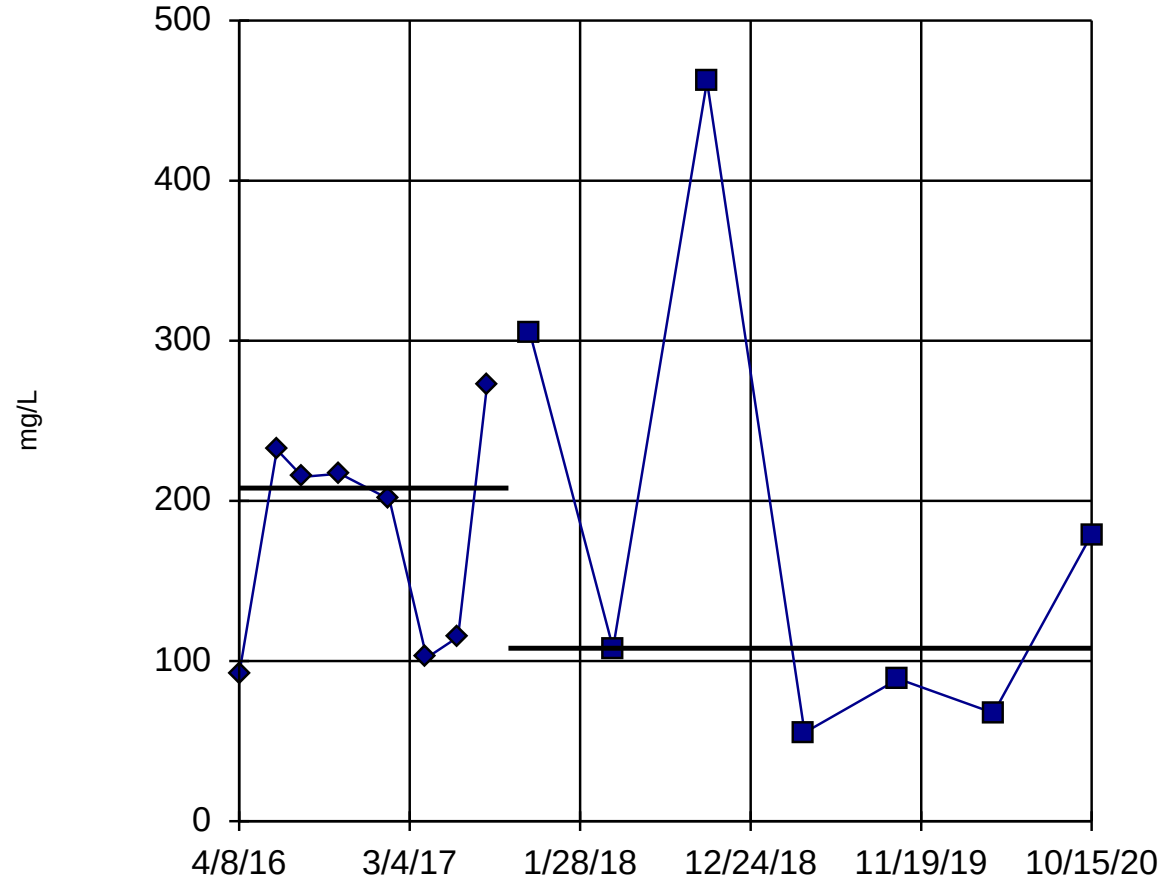
Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level.

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

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

Chloride

2R-OW (bg)



◆ 2R-OW background

■ 2R-OW compliance

background median = 208

compliance median = 108

t = 0.001413

Alpha	Table	Sig.
0.1	1.397	No
0.05	1.86	No
0.025	2.306	No
0.01	2.896	No

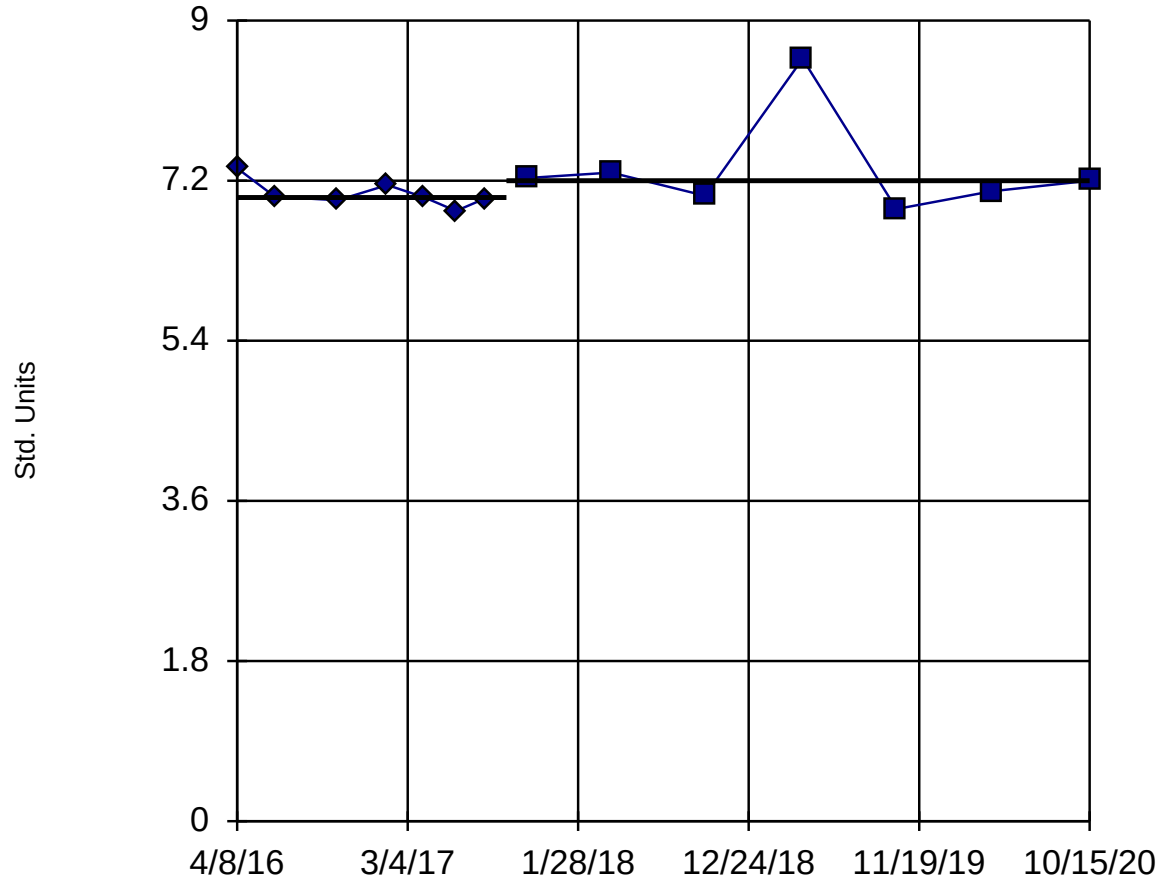
Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8822, critical = 0.818.

Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

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

Field pH

2R-OW (bg)



2R-OW background

2R-OW compliance

background median = 7.01

compliance median = 7.2

t = 1.238

Alpha	Table	Sig.
0.1	1.415	No
0.05	1.895	No
0.025	2.365	No
0.01	2.998	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8921, critical = 0.803.

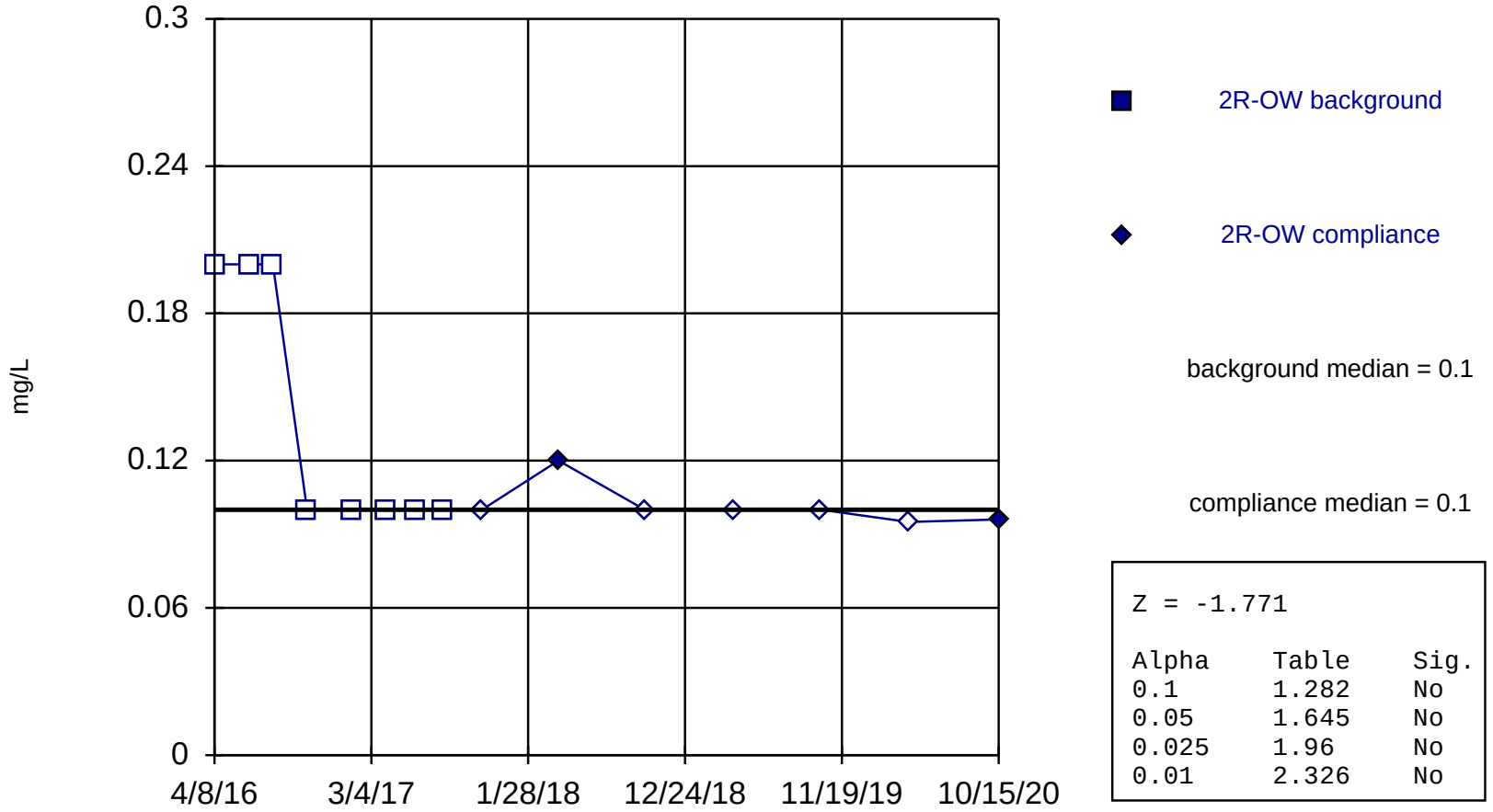
Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

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

Hollow symbols indicate censored values.

Fluoride

2R-OW (bg)




```
Z = -1.771

Alpha     Table     Sig.
0.1       1.282     No
0.05      1.645     No
0.025     1.96      No
0.01      2.326     No
```

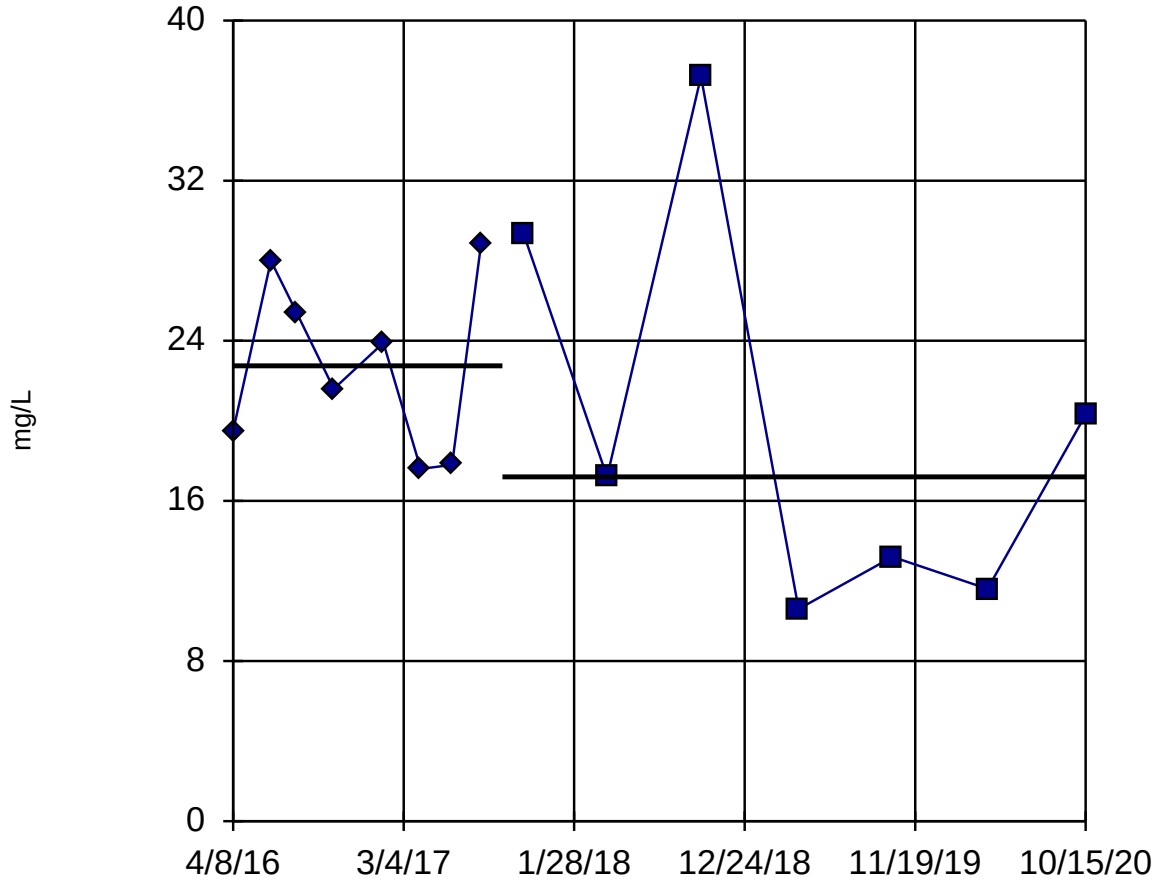
Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because censored data exceeded 75%.

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

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

Sulfate

2R-OW (bg)



◆ 2R-OW background

■ 2R-OW compliance

background median = 22.75

compliance median = 17.2

t = -0.7146

Alpha	Table	Sig.
0.1	1.397	No
0.05	1.86	No
0.025	2.306	No
0.01	2.896	No

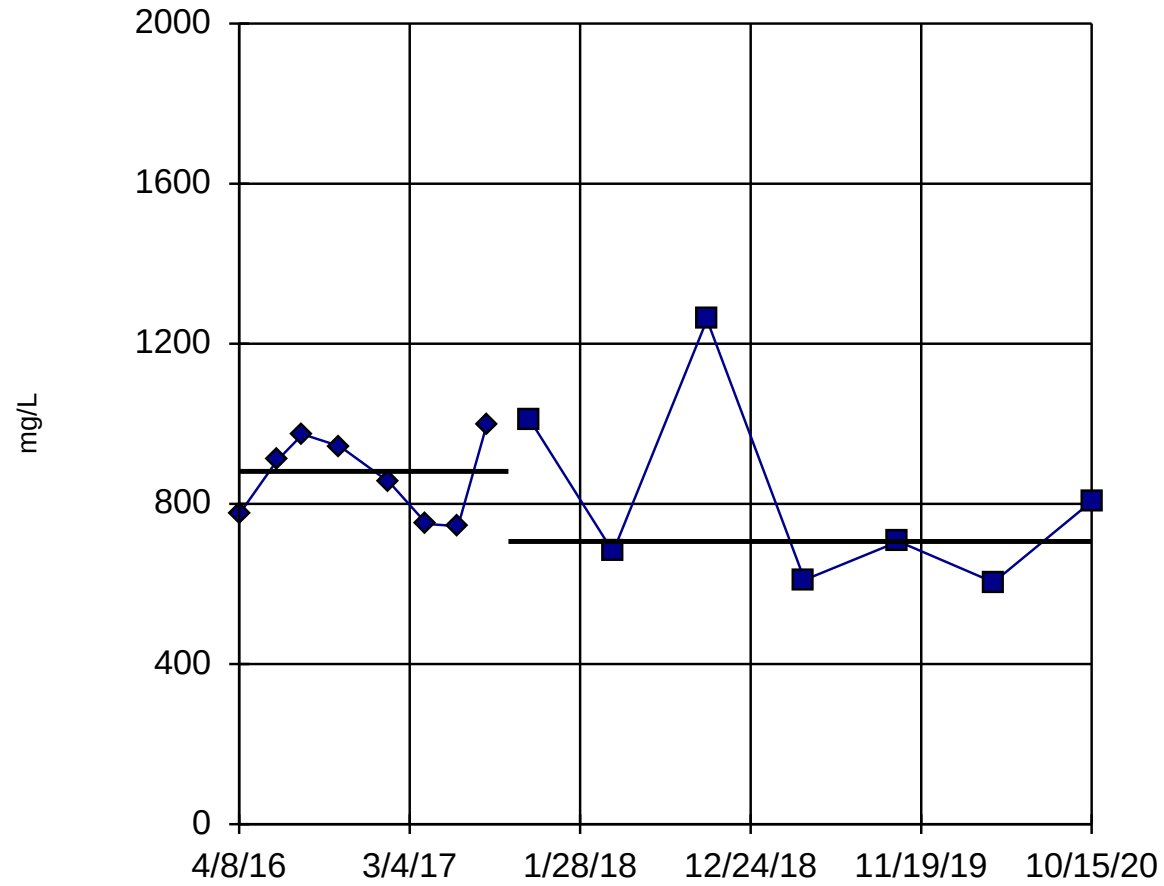
Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9205, critical = 0.818.

Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

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

Total Dissolved Solids

2R-OW (bg)



2R-OW background

2R-OW compliance

background median = 881

compliance median = 706

t = -0.5845

Alpha	Table	Sig.
0.1	1.397	No
0.05	1.86	No
0.025	2.306	No
0.01	2.896	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8983, critical = 0.818.

Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

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

Attachment 4

Interwell Prediction Limit Analysis

Prediction Limit

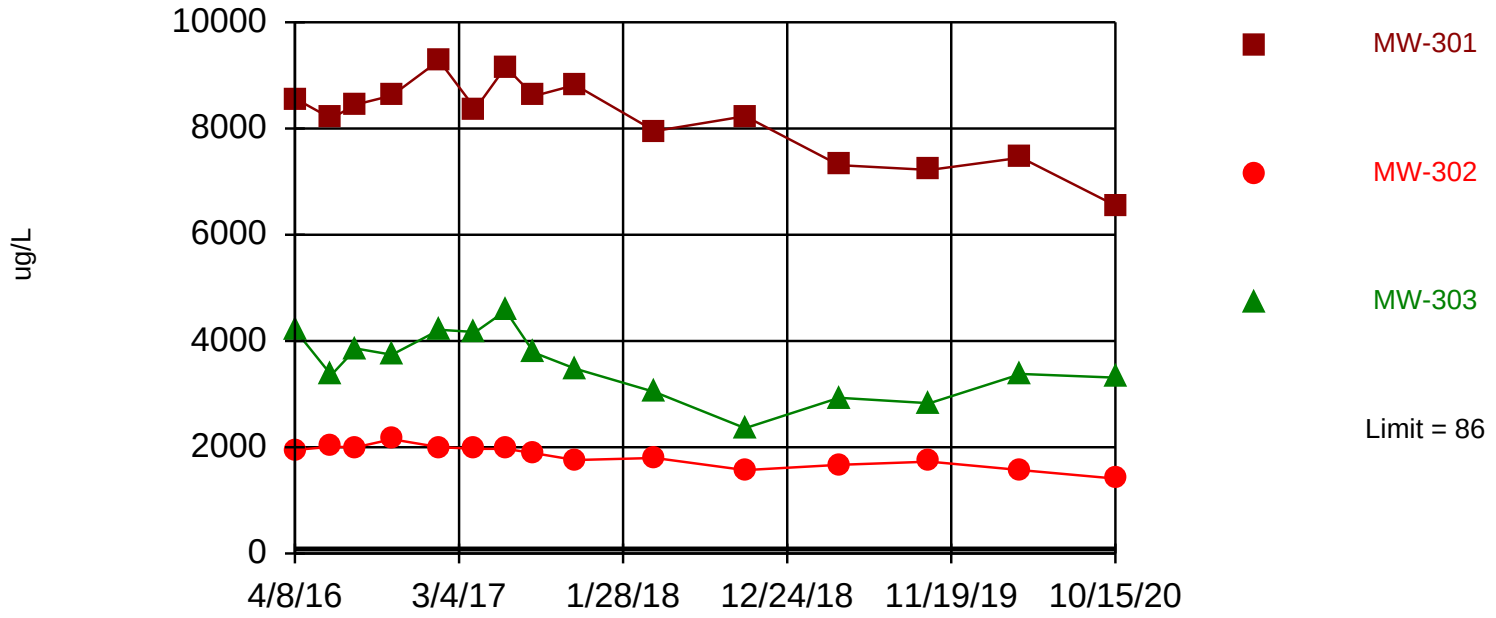
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020 Printed 1/14/2021, 8:04 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (ug/L)	**MW-301**	**86**	**n/a**	**10/15/2020**	**6550**	**Yes**	**15**	**2R-OW**	**44.53**	**20.78**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-302**	**86**	**n/a**	**10/15/2020**	**1410**	**Yes**	**15**	**2R-OW**	**44.53**	**20.78**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-303**	**86**	**n/a**	**10/15/2020**	**3310**	**Yes**	**15**	**2R-OW**	**44.53**	**20.78**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Calcium (ug/L)	MW-301	200000	n/a	10/15/2020	114000	No	15	2R-OW	148800	25498	0	None	No	0.002505	Param Inter 1 of 2
Calcium (ug/L)	MW-302	200000	n/a	10/15/2020	124000	No	15	2R-OW	148800	25498	0	None	No	0.002505	Param Inter 1 of 2
Calcium (ug/L)	MW-303	200000	n/a	10/15/2020	132000	No	15	2R-OW	148800	25498	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-301	400	n/a	10/15/2020	13.9	No	15	2R-OW	180.8	109.9	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-302	400	n/a	10/15/2020	20.9	No	15	2R-OW	180.8	109.9	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-303	400	n/a	10/15/2020	20.9	No	15	2R-OW	180.8	109.9	0	None	No	0.002505	Param Inter 1 of 2
Field pH (Std. Units)	MW-301	8.57	n/a	10/15/2020	7.64	No	14	2R-OW	n/a	n/a	0	n/a	n/a	0.008038	NP Inter (normality) ...
Field pH (Std. Units)	MW-302	8.57	n/a	10/15/2020	7.9	No	14	2R-OW	n/a	n/a	0	n/a	n/a	0.008038	NP Inter (normality) ...
Field pH (Std. Units)	MW-303	8.57	n/a	10/15/2020	7.11	No	14	2R-OW	n/a	n/a	0	n/a	n/a	0.008038	NP Inter (normality) ...
Fluoride (mg/L)	MW-301	0.200	n/a	10/15/2020	0.48ND	No	15	2R-OW	n/a	n/a	86.67	n/a	n/a	0.007081	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-302	0.200	n/a	10/15/2020	1J	No	15	2R-OW	n/a	n/a	86.67	n/a	n/a	0.007081	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-303	0.200	n/a	10/15/2020	0.48ND	No	15	2R-OW	n/a	n/a	86.67	n/a	n/a	0.007081	NP Inter (NDs) 1 of 2
Sulfate (mg/L)	**MW-301**	**36.2**	**n/a**	**10/15/2020**	**293**	**Yes**	**15**	**2R-OW**	**21.47**	**7.379**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Sulfate (mg/L)	**MW-302**	**36.2**	**n/a**	**10/15/2020**	**73.1**	**Yes**	**15**	**2R-OW**	**21.47**	**7.379**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-303	36.2	n/a	10/15/2020	2.2ND	No	15	2R-OW	21.47	7.379	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-301	1190	n/a	10/15/2020	678	No	15	2R-OW	841.6	177.2	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-302	1190	n/a	10/15/2020	182	No	15	2R-OW	841.6	177.2	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-303	1190	n/a	10/15/2020	620	No	15	2R-OW	841.6	177.2	0	None	No	0.002505	Param Inter 1 of 2

Exceeds Limit: MW-301, MW-302, MW-303

Boron

Interwell Parametric



Background Data Summary: Mean=44.53, Std. Dev.=20.78, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8829, critical = 0.835. Kappa = 1.994 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Prediction Limit

Constituent: Boron (ug/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020

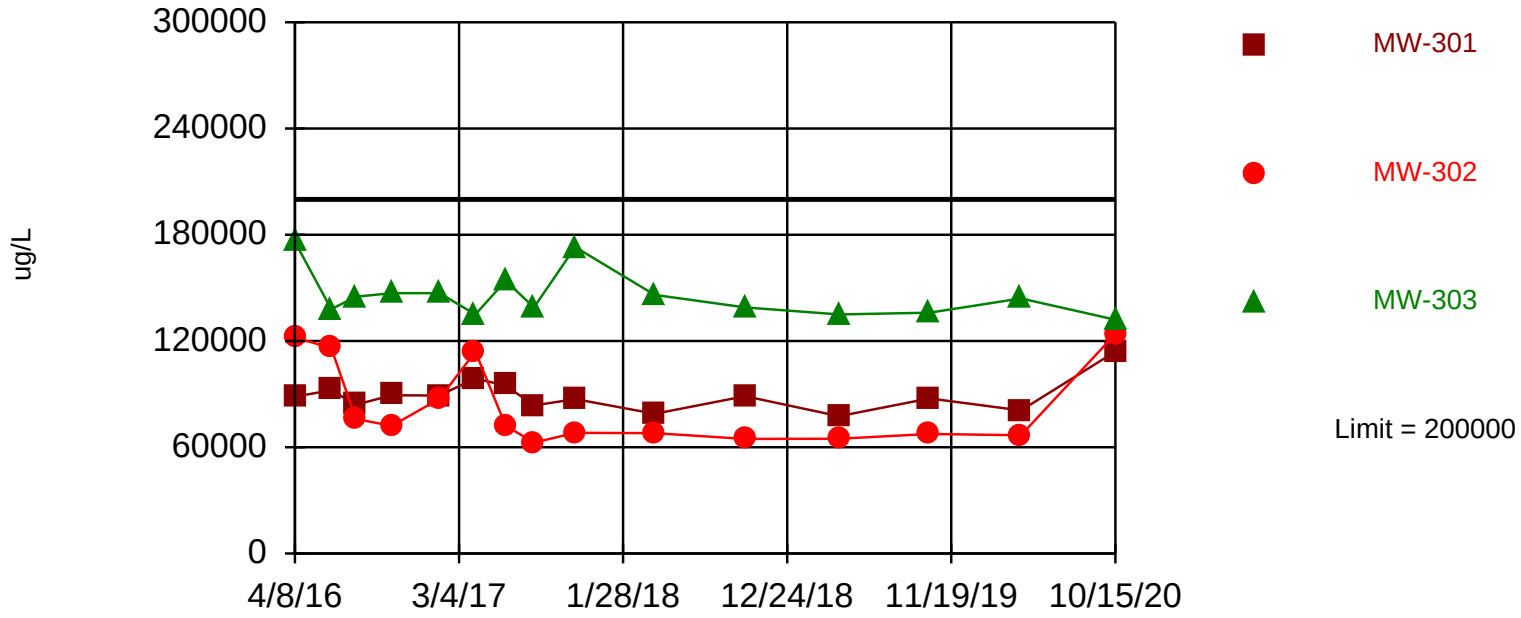
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

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

Within Limit

Calcium

Interwell Parametric



Background Data Summary: Mean=148800, Std. Dev.=25498, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9279, critical = 0.835. Kappa = 1.994 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Prediction Limit

Constituent: Calcium (ug/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020

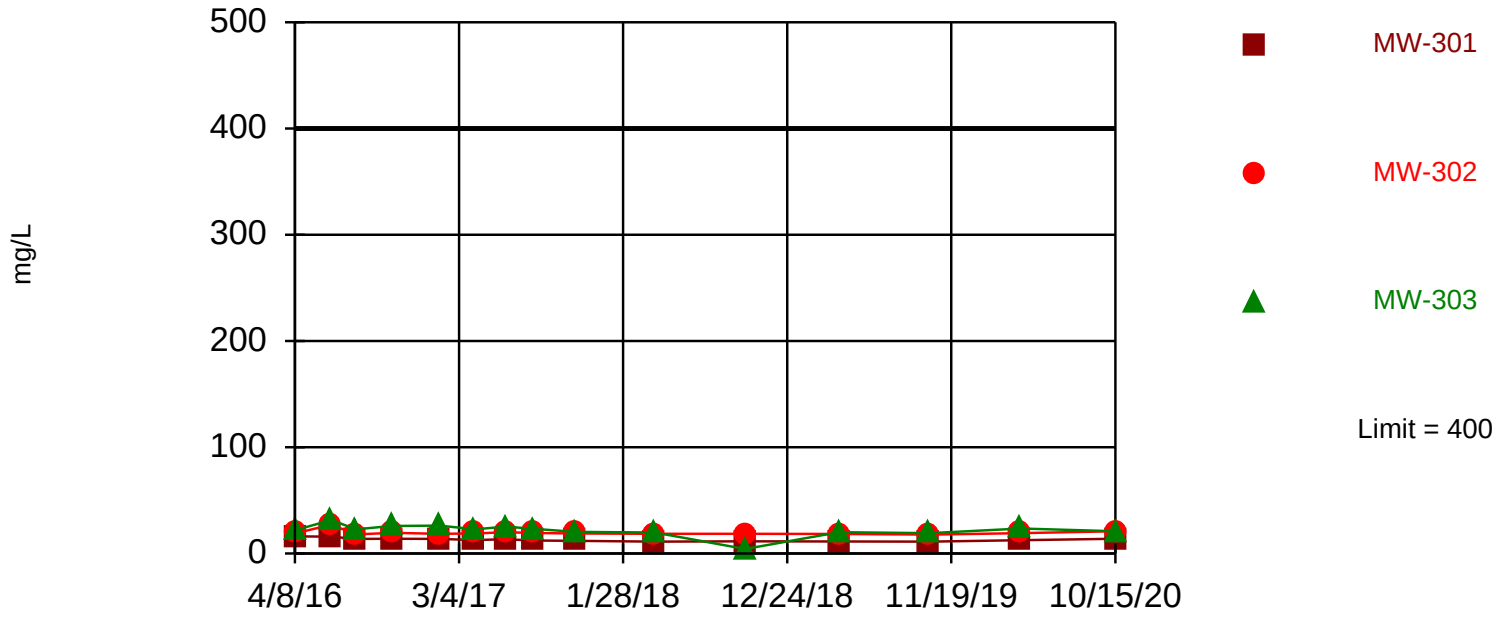
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	205000	122000	176000	
4/11/2016				88700
6/20/2016	148000	116000	138000	92200
8/9/2016	145000	75900	145000	84000
10/20/2016	155000	72100	147000	89400
1/23/2017				89200
1/24/2017	152000	87400	147000	
4/6/2017	143000	114000	135000	98800
6/6/2017	145000	72200	154000	94900
8/1/2017	164000			
8/2/2017		62600	139000	83600
10/23/2017	170000			
10/24/2017		68100	173000	87200
4/2/2018	121000	68000	146000	78900
10/1/2018	190000	64700	139000	88800
4/8/2019	121000	64800	135000	77500
10/7/2019	132000	67500	136000	87600
4/8/2020	117000	66800	144000	80800
10/15/2020	124000	124000	132000	114000

Within Limit

Chloride

Interwell Parametric



Background Data Summary: Mean=180.8, Std. Dev.=109.9, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8933, critical = 0.835. Kappa = 1.994 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020

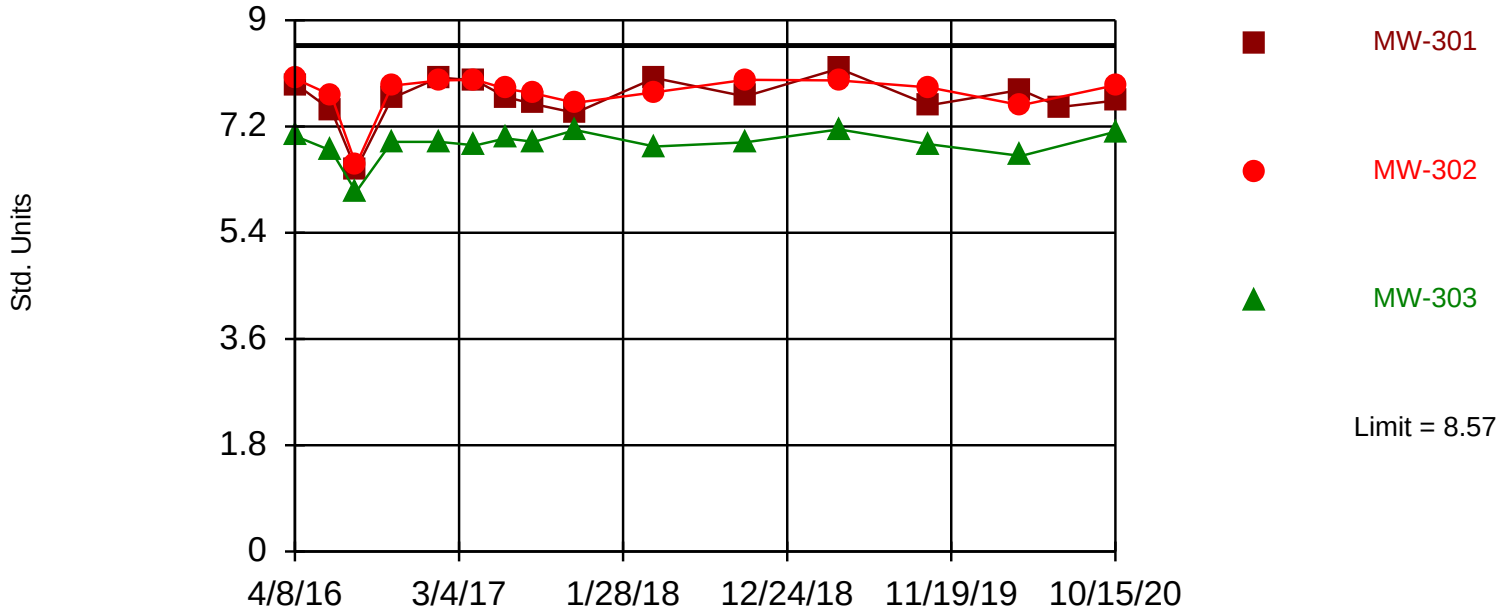
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	91.7	18.9	21.8	
4/11/2016				16.2
6/20/2016	232	27.2	31.5	15.9
8/9/2016	215	18	22.8	13.7
10/20/2016	217	19.5	26	13.9
1/23/2017				13.8
1/24/2017	201	18.6	26.2	
4/6/2017	102	18.9	22.7	12.7
6/6/2017	115	20	25.4	13.5
8/1/2017	272			
8/2/2017		19.3	23.2	12.3
10/23/2017	305			
10/24/2017		18.9	20.4	11.9
4/2/2018	108	18.5	19.7	11.2
10/1/2018	462	18.6	4.3	11.5
4/8/2019	55.3	18.4	20	11.4
10/7/2019	88.8	17.8	19.1	11.1
4/8/2020	67.5	19.2	23.5	12.5
10/15/2020	179	20.9	20.9	13.9

Within Limit

Field pH

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 14 background values. Annual per-constituent alpha = 0.04727. Individual comparison alpha = 0.008038 (1 of 2). Comparing 3 points to limit.

Prediction Limit

Constituent: Field pH (Std. Units) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020

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

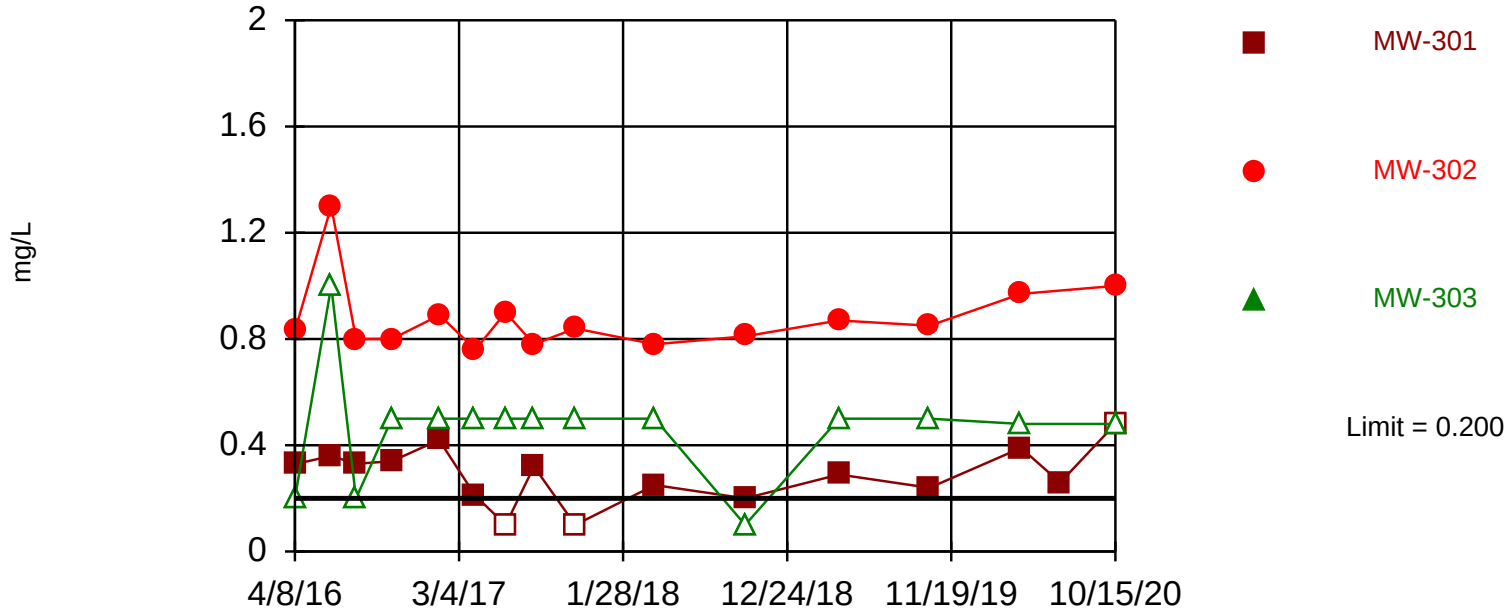
	2R-OW (bg)	MW-303	MW-302	MW-301
4/8/2016	7.34	7.04	8.01	
4/11/2016				7.91
6/20/2016	7.02	6.79	7.73	7.48
8/9/2016	6.1 (X)	6.09	6.55	6.47
10/20/2016	6.98	6.94	7.89	7.68
1/23/2017				8.03
1/24/2017	7.15	6.94	7.98	
4/6/2017	7.01	6.88	7.99	7.98
6/6/2017	6.86	7	7.84	7.7
8/1/2017	7			
8/2/2017		6.94	7.76	7.58
10/23/2017	7.23			
10/24/2017		7.14	7.6	7.43
4/2/2018	7.29	6.86	7.78	8.02
10/1/2018	7.03	6.93	7.99	7.71
4/8/2019	8.57	7.15	7.98	8.18
10/7/2019	6.88	6.9	7.86	7.56
4/8/2020	7.08	6.7	7.56	7.82
6/26/2020				7.53
10/15/2020	7.2	7.11	7.9	7.64

Hollow symbols indicate censored values.

Within Limit

Fluoride

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 15 background values. 86.67% NDs. Annual per-constituent alpha = 0.04174. Individual comparison alpha = 0.007081 (1 of 2). Comparing 3 points to limit.

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020

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

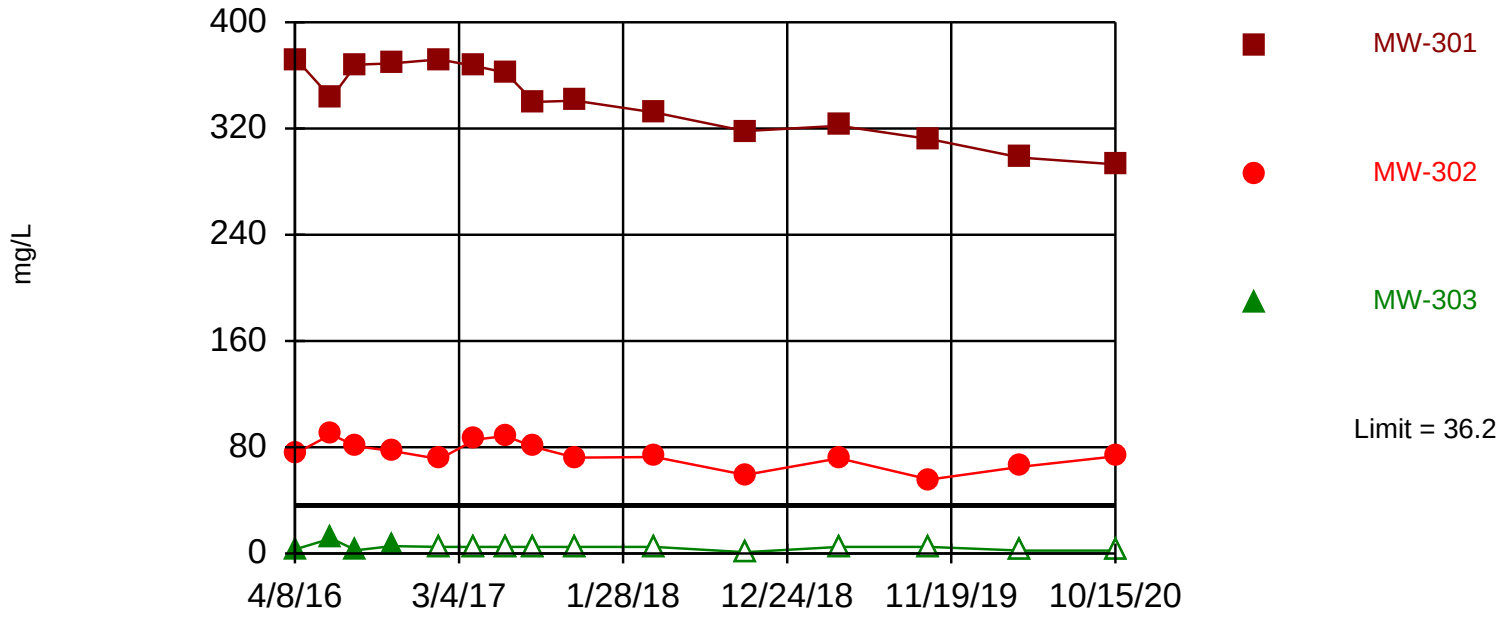
	2R-OW (bg)	MW-303	MW-302	MW-301
4/8/2016	<0.2 (U)	<0.2 (U)	0.83	
4/11/2016				0.33 (J)
6/20/2016	<0.2 (U)	<1 (U)	1.3 (J)	0.36 (J)
8/9/2016	<0.2 (U)	<0.2 (U)	0.8	0.33 (J)
10/20/2016	<0.1 (U)	<0.5 (U)	0.8	0.34
1/23/2017				0.42
1/24/2017	<0.1 (U)	<0.5 (U)	0.89 (J)	
4/6/2017	<0.1 (U)	<0.5 (U)	0.76	0.21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

Hollow symbols indicate censored values.

Exceeds Limit: MW-301, MW-302

Sulfate

Interwell Parametric



Background Data Summary: Mean=21.47, Std. Dev.=7.379, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9672, critical = 0.835. Kappa = 1.994 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020

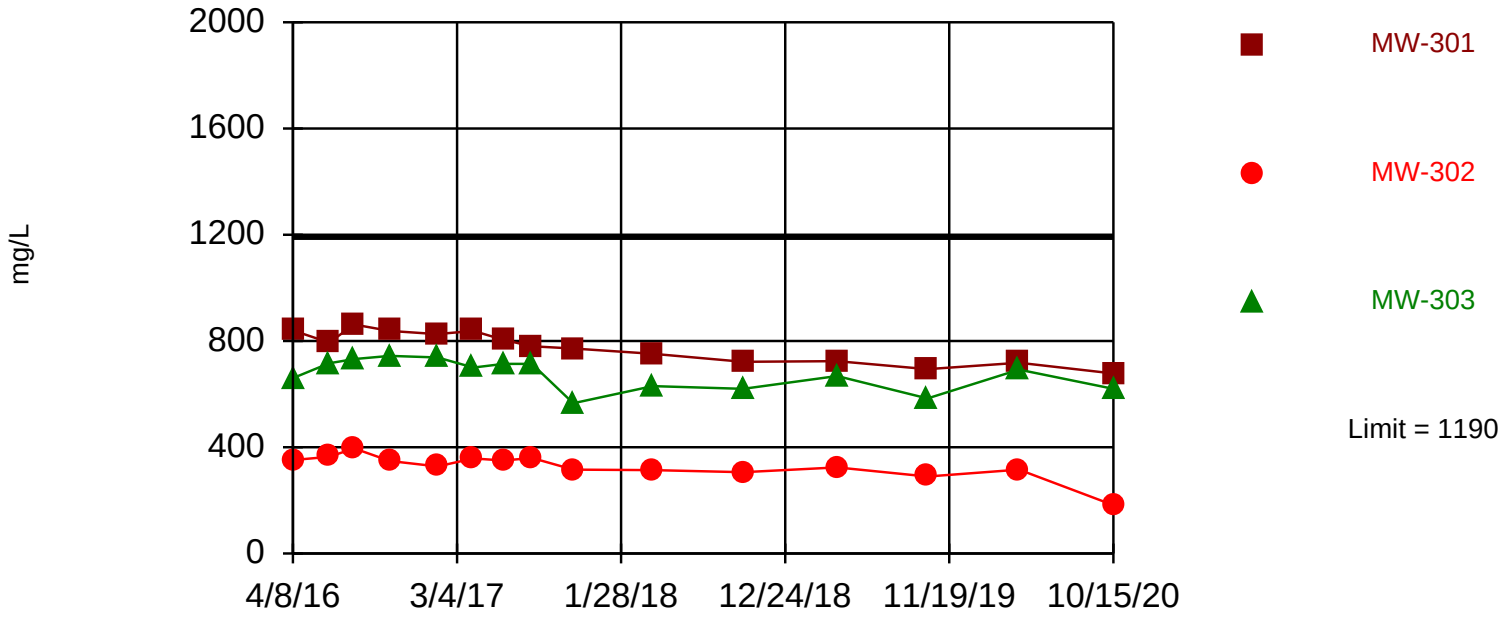
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

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

Within Limit

Total Dissolved Solids

Interwell Parametric



Background Data Summary: Mean=841.6, Std. Dev.=177.2, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9458, critical = 0.835. Kappa = 1.994 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020

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

	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	774	352	660	
4/11/2016				838
6/20/2016	908	364	716	794
8/9/2016	974	396	732	862
10/20/2016	944	348	744	838
1/23/2017				826
1/24/2017	854	328	738	
4/6/2017	750	358	700	838
6/6/2017	744	350	714	804
8/1/2017	1000			
8/2/2017		360	714	780
10/23/2017	1010			
10/24/2017		316	566	772
4/2/2018	680	314	630	752
10/1/2018	1260	306	620	722
4/8/2019	610	324	668	724
10/7/2019	706	290	584	694
4/8/2020	604	316	692	718
10/15/2020	806	182	620	678

Appendix F

Alternative Source Demonstrations (ASDs)

F1 October 2020 ASD
F2 April 2021 ASD

F1 October 2020 ASD

Alternative Source Demonstration
October 2020 Detection Monitoring

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

SCS ENGINEERS

25221068.00 | April 15, 2021

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

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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.

(signature)	4-15-21 (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 2020 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 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 2020 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 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 2020 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. EDG has four existing 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 CCR surface impoundment)

Closure of the four CCR surface impoundments was initiated in 2020 and will be completed in 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 as **Figure 2**.

The closed CCR landfill (Wisconsin Department of Natural Resources [WDNR] Permit No. 2524) is located immediately west of the ponds. 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 and sulfate at one or more wells based on the October 2020 detection monitoring event. A summary of the October 2020 constituent concentrations and the established benchmark concentrations is 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 and sulfate results from background and compliance sampling are provided in **Table 2**. The laboratory report for the October 2020 detection monitoring event was included in the 2020 annual groundwater monitoring and corrective action report submitted in January 2021. 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, 2018).

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 slight 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.

To accommodate regrading due to pond closure construction activities occurring at the site, the casing of downgradient monitoring well MW-301 was extended during November 2020 and the casings of monitoring wells MW-302 and MW-303 were shortened during September 2020. A small amount of filter pack sand, originally placed above ground between the well casing and protective casing, fell into the well during the casing height reduction work. The sand was removed and the well was redeveloped prior to the October sampling event. The well casing elevations were resurveyed after the casing modifications were completed, as shown in Table 3B.

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 2020 detection monitoring event. The water table map shows a generally southward flow direction, with localized groundwater mounding in the area of the EDG ponds. The groundwater elevations at the CCR and state monitoring wells during the October 2020 detection monitoring event are in **Table 3A** and **3B**. Water levels measured in October 2020 were lower than in previous monitoring events as a result 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 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 other 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 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 2020 detection monitoring was reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs for boron 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.

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. The October 2020 boron 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 2020 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 2020 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 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 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 2020 detection monitoring results to the UPLs calculated based on 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.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron and sulfate SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based on the groundwater flow directions and on 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 EVIDENCES

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 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.

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, 2018). 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 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.

- 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, sulfate, fluoride, and pH 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 2020). 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.

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

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 these 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 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.

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 2021 Annual Report due January 31, 2022.

7.0 REFERENCES

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

RMT, Inc., 1997, Groundwater Assessment Report, Edgewater Closed Ash Disposal Facility, September 30, 1997.

SCS Engineers, 2016, Biennial Groundwater Monitoring Report for 2014-2015, Wisconsin Power and Light Company – Edgewater 1-4 (Closed) Ash Disposal Facility, Sheboygan, WI, License #02524, March 2016.

SCS Engineers, 2018, Alternative Source Demonstration, October 2017 Monitoring Event, Edgewater Generating Station, April 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.

Tables

Table 1. Groundwater Analytical Results Summary - October 2020
Edgewater Generating Station / SCS Engineers Project #25221068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	**MW-301**	**MW-302**	**MW-303**
		10/15/2020	10/15/2020	10/15/2020	10/15/2020
Appendix III					
Boron, µg/L	86.0	29.9	6,550	1,410	3,310
Calcium, µg/L	200,000	124,000	114,000	124,000	132,000
Chloride, mg/L	400	179	13.9	20.9	20.9
Fluoride, mg/L	0.200	0.096 J	<0.48 D3, M0	1.0 J, D3	<0.48 D3
Field pH, Std. Units	8.57	7.20	7.64	7.90	7.11
Sulfate, mg/L	36.2	20.3	293	73.1	<2.2 D3
Total Dissolved Solids, mg/L	1,190	806	678	182	620

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
SSI = Statistically Significant Increase
mg/L = milligrams per liter
µg/L = micrograms per liter
LOD = Limit of Detection
LOQ = Limit of Quantitation

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 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: 5/1/2018
Last revision by: SCC Date: 1/15/2021
Checked by: NDK Date: 1/15/2021
Scientist/PM QA/QC: TK Date: 1/15/2021

I:\25221068.00\Deliverables\2020 Oct ASD Edg Closed\Tables\[Table 1. CCR GW Screening Summary_EDG-Oct 2020.xlsx]Current Event Table- Upd

Table 2. Analytical Results - CCR Ponds Detection Monitoring Program
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25221068.00

Well Group	Well	Collection Date	Boron (µg/L)	Sulfate (mg/L)
Background	2R-OW	4/8/2016	100	19.5
		6/20/2016	22.4	28.0
		8/9/2016	32.6	25.4
		10/20/2016	43.1	21.6
		1/24/2017	31.2	23.9
		4/6/2017	70.6	17.6
		6/6/2017	45.2	17.8
		8/1/2017	35.7	28.8
		10/23/2017	55.9	29.3
		4/2/2018	19.7	17.2
		10/1/2018	34.7	37.2
		4/8/2019	35.8	10.6
		10/7/2019	58.8	13.2
		4/8/2020	52.3	11.6
		10/15/2020	29.9	20.3
Compliance	MW-301	4/11/2016	8,550	372
		6/20/2016	8,190	343
		8/9/2016	8,450	368
		10/20/2016	8,620	369
		1/23/2017	9,280	372
		4/6/2017	8,370	367
		6/6/2017	9,160	362
		8/2/2017	8,610	340
		10/24/2017	8,820	341
		4/2/2018	7,950	332
		10/1/2018	8,230	318
		4/8/2019	7,310	322
		10/7/2019	7,220	312
		4/8/2020	7,450	298
		10/15/2020	6,550	293
	MW-302	4/8/2016	1,950	75.1
		6/20/2016	2,010	89.6
		8/9/2016	2,000	80.7
		10/20/2016	2,150	77.2
		1/24/2017	2,000	71.1
		4/6/2017	1,970	85.8
		6/6/2017	1,970	88.5
		8/2/2017	1,890	80.2
		10/24/2017	1,760	72.2
		4/2/2018	1,800	72.7
		10/1/2018	1,570	59.2
		4/8/2019	1,670	71.7
		10/7/2019	1,730	55.7
		4/8/2020	1,570	65.3
		10/15/2020	1,410	73.1

Table 2. Analytical Results - CCR Ponds Detection Monitoring Program
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25221068.00

Well Group	Well	Collection Date	Boron (µg/L)	Sulfate (mg/L)
Compliance	MW-303	4/8/2016	4,210	3 J
		6/20/2016	3,360	11.4 J
		8/9/2016	3,860	2.4 J
		10/20/2016	3,740	5.6 J
		1/24/2017	4,210	<5
		4/6/2017	4,170	<5
		6/6/2017	4,570	<5
		8/2/2017	3,780	<5
		10/24/2017	3,480	<5
		4/2/2018	3,040	<5
		10/1/2018	2,360	<1.0
		4/8/2019	2,930	<5.0
		10/7/2019	2,830	<5.0
		4/8/2020	3,380	<2.2
		10/15/2020	3,310	<2.2 D3

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
J = Estimated value below laboratory's limit of quantitation (LOQ)
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:	2/11/2021
Checked by:	NDK	Date:	3/15/2021

I:\25221068.00\Deliverables\2020 Oct ASD Edg Closed\Tables\[EDG-closed-Tables 2 and 4.xlsx]Table 2. CCR Analytical

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

	Ground Water Elevation in feet above mean sea level (amsl)																					
Well Number	**1-OW**	**2R-OW**	**3R-OW**	**4R-OW**	**5-OW**	**W-5A**	**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 24, 2012	588.11	607.82	582.64	585.24	595.63	596.69	587.42	587.40	591.71	589.56	583.49	585.16	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
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: JSN Date: 10/20/2020
Checked by: RM Date: 10/21/2020

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

I:\25221068.00\Deliverables\2020 Oct ASD Edg Closed\Tables\[Table 3A_Groundwater Elevation Summary - State.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
Revised Top of Casing Elevation (feet amsl)	--	606.77	603.87	--
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
April 8, 2020	599.17	595.33	588.66	608.97
June 26, 2020	597.89	--	--	--
October 15, 2020	595.10	590.18	585.07	604.27
Bottom of Well Elevation (ft)	576.95	575.15	578.73	598.22

Notes:
NM = not measured

Created by:	NDK	Date:	4/8/2020
Last rev. by:	ZTW	Date:	1/15/2021
Checked by:	TK	Date:	1/16/2021

I:\25221068.00\Deliverables\2020 Oct ASD Edg Closed\Tables\[Table 3B_Groundwater Elevation Summary - CCR.xls]levels

Table 4. 2016 - 2020 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068
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
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
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	8630	129
4R-OW	2019-Apr	10200	158
4R-OW	2019-Oct	9,200	161
4R-OW	2020-Apr	9,320	90.9
4R-OW	2020-Oct	10,200	134
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

Table 4. 2016 - 2020 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
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
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
Monitoring Wells (continued)			
29-OW	2016-Apr	10,600	120
29-OW	2016-Oct	10,900	85.7
29-OW	2017-Apr	9,500	77
29-OW	2017-Oct	9,060	62
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
30-OW	2016-Apr	79	4.8
30-OW	2016-Oct	113	4.6
30-OW	2017-Apr	176	7.5
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	2.4 J
30-OW	2019-Oct	84.9	5.6
30-OW	2020-Apr	54.4	2.8
30-OW	2020-Oct	118	15.2

Table 4. 2016 - 2020 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068
Sheboygan, Wisconsin

Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
31-OW	2016-Apr	114	91.2
31-OW	2016-Oct	35	63.3
31-OW	2017-Apr	77	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
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	8620	636
40-OW	2019-Oct	10,600	836
40-OW	2020-Apr	10,900	836
40-OW	2020-Oct	9,870	818
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	--	--
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	--	--

Table 4. 2016 - 2020 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068
Sheboygan, Wisconsin

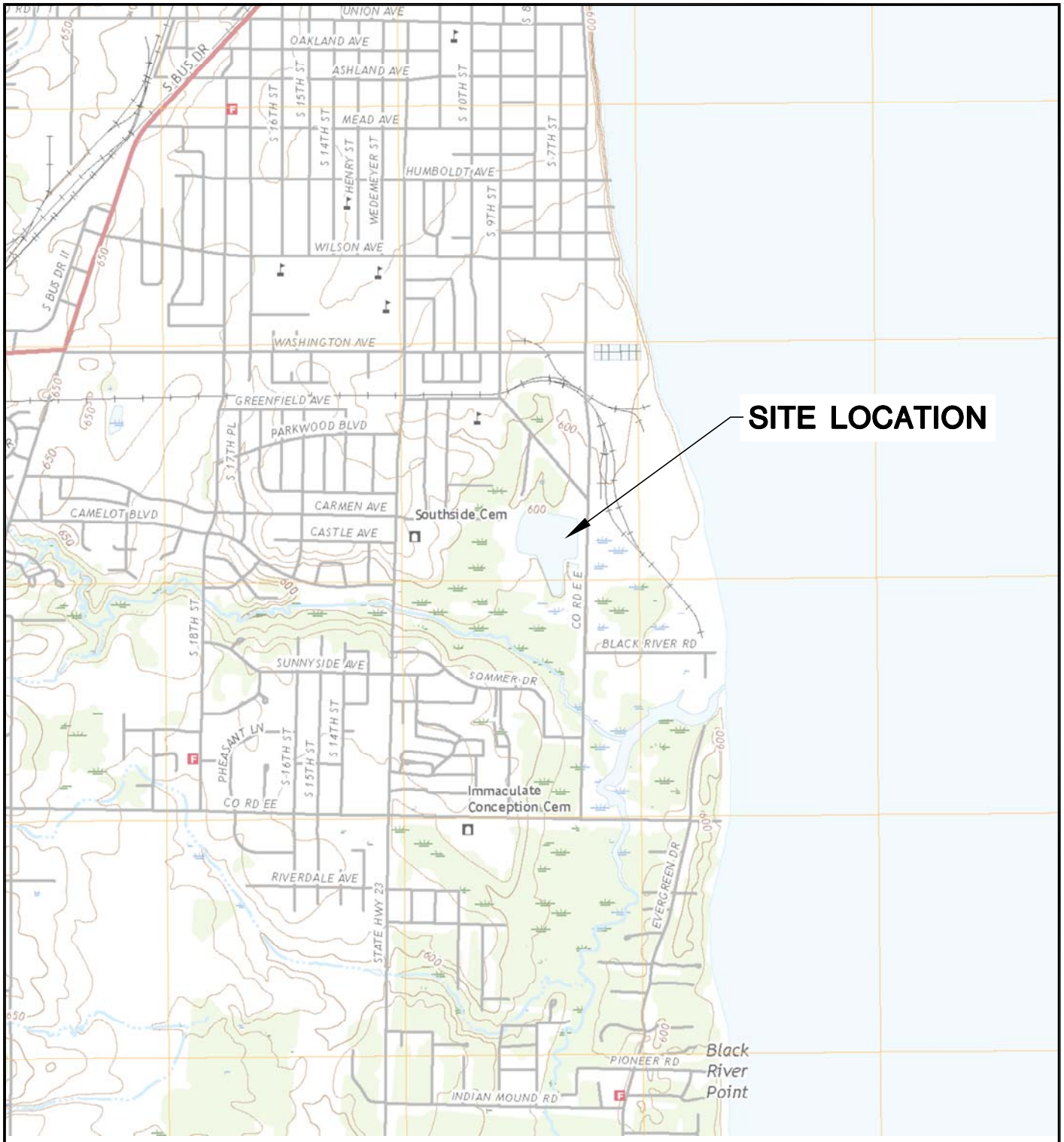
Point Name	Reporting Period	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Leachate Monitoring Wells (continued)			
39R-OW	2016-Apr	10,100	534
39R-OW	2016-Oct	29,900	1,390
39R-OW	2017-Apr	22,400	1,150
39R-OW	2017-Oct	32,800	1,400
39R-OW	2018-Apr	28,800	772
39R-OW	2018-Oct	24,700	1,160
39R-OW	2019-Apr	26,000	1,520
39R-OW	2019-Oct	17,100	601
39R-OW	2020-Apr	19,100	1160
39R-OW	2020-Oct	34,200	1190

Abbreviations:
µg/L = micrograms per liter or parts per billic-- : 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:	2/11/2021
Checked by:	NDK	Date:	3/15/2021

I:\25221068.00\Deliverables\2020 Oct ASD Edg Closed\Tables\[EDG-closed-Tables 2 and 4.xlsx]Table 4. GW quality Data

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
- CCR UNITS
- CLOSED LANDFILL LIMITS

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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.	25220068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/09/2020	APPROVED BY:	TK 01/28/2021

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:\25220068.00\Drawings\ASD\Site Plan and Monitoring Well Locations.dwg, 1/26/2021 10:31 AM

N

LEGEND

⊕	ABANDONED MONITORING WELL
◒	CCR MONITORING WELL
◒	CCR BACKGROUND MONITORING WELL
◒	MONITORING WELL
◎	PIEZOMETER
▬	CCR UNITS
— — —	CLOSED LANDFILL LIMITS
- - - - - -	DESIGN MANAGEMENT ZONE
598.54	WATER TABLE ELEVATION (OCTOBER 14–15, 2020)
———	WATER TABLE CONTOUR (5' INTERVAL)
→	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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 14–15, 2020.
7. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER 1–4 (CLOSED) ASH DISPOSAL FACILITY IS 2R–OW.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25220068.00	DRAWN BY:	KP/ZW
DRAWN:	02/10/2020	CHECKED BY:	TK
REVISED:	01/15/2021	APPROVED BY:	TK 01/28/2021

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

WATER TABLE MAP
OCTOBER 2020

FIGURE
3

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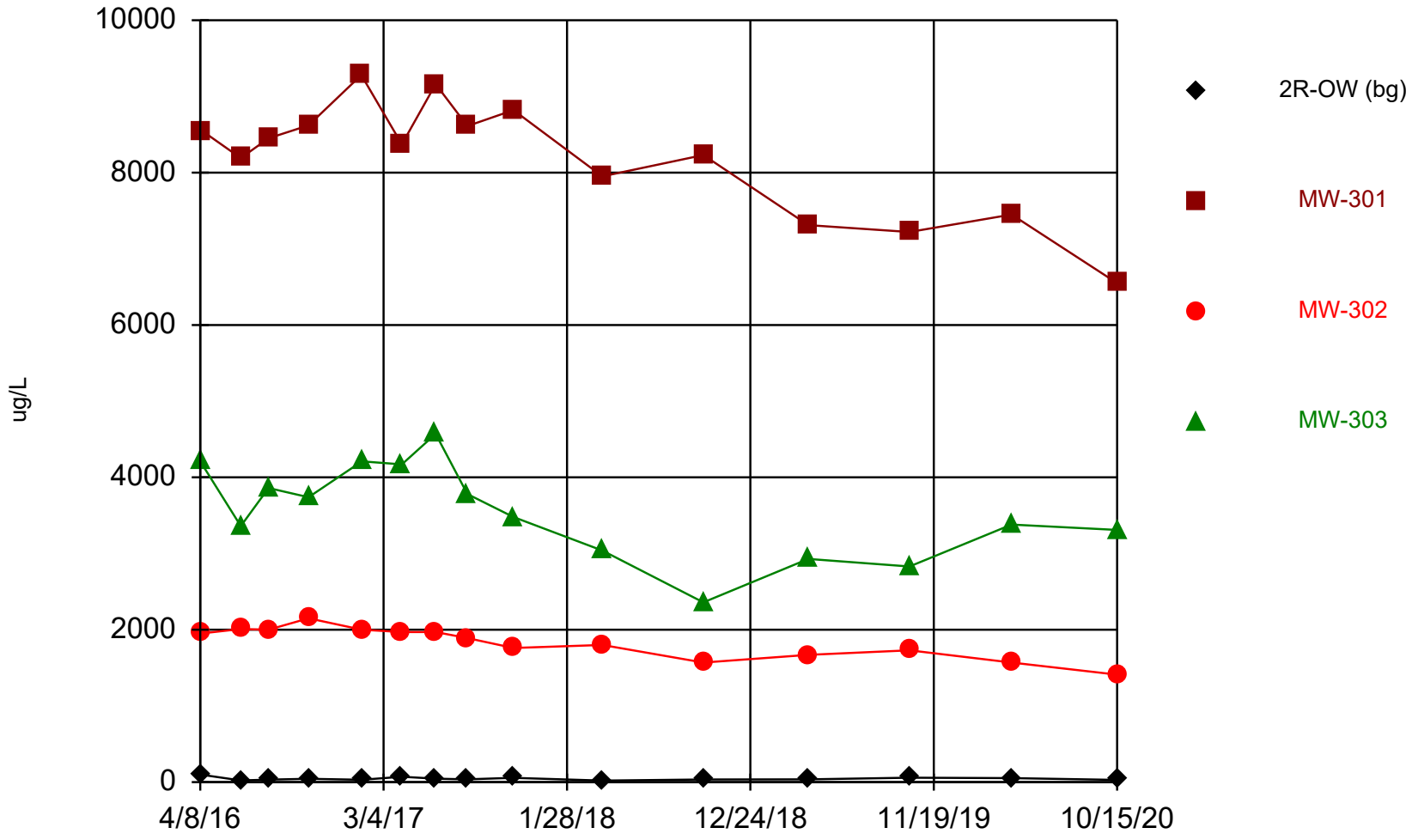
Appendix A

Trend Plots for CCR Wells

Boron

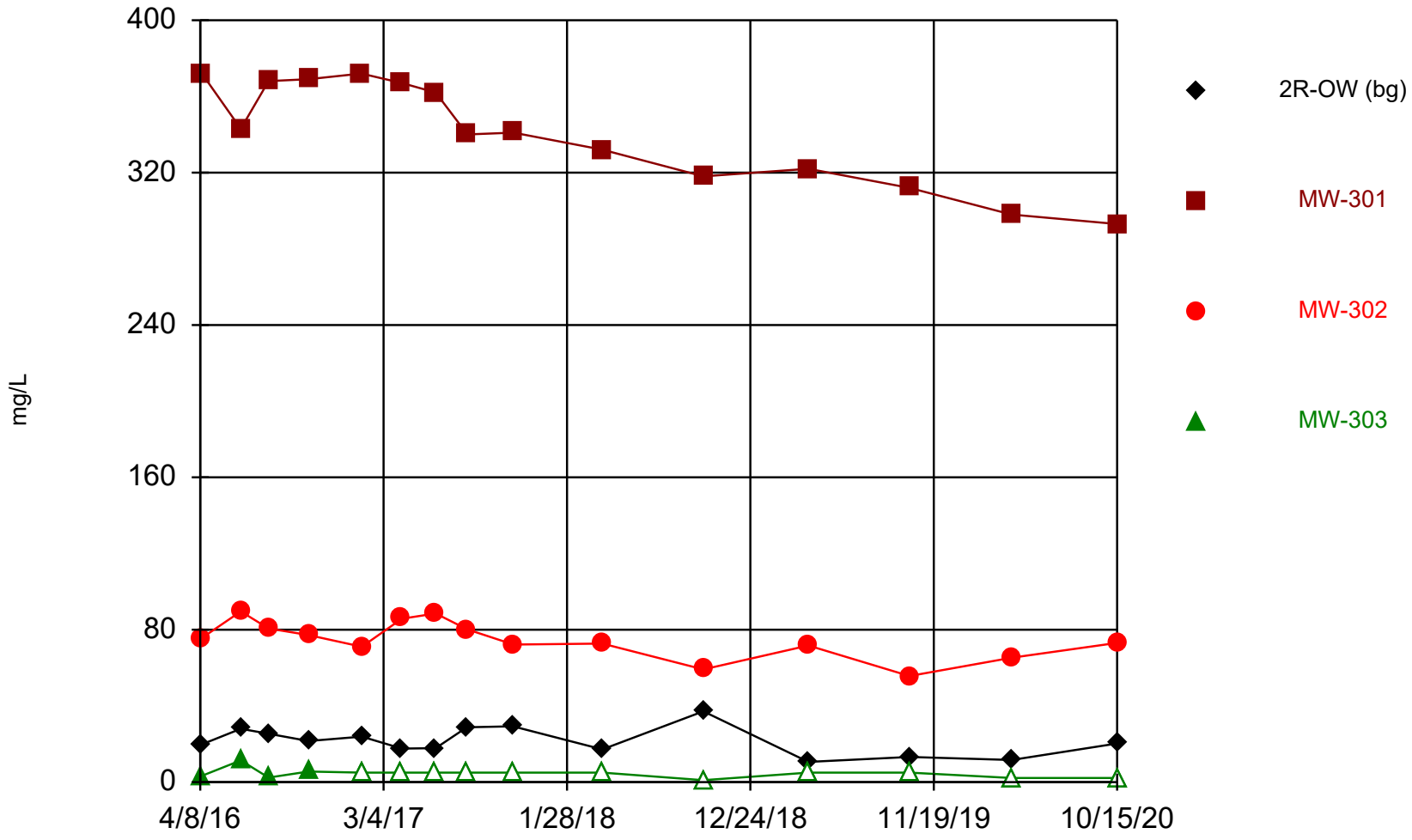


Time Series Analysis Run 2/10/2021 3:19 PM View: CCR - UPL - 2020

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

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 2/10/2021 3:19 PM View: CCR - UPL - 2020

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

F2 April 2021 ASD

Alternative Source Demonstration
April 2021 Detection Monitoring

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

SCS ENGINEERS

25221068.00 | October 13, 2021

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

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Appendix

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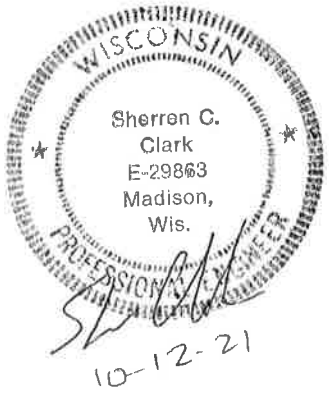
PE CERTIFICATION



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.

10-12-2021

(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 – April 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 April 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 April 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. EDG has four existing 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 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 as **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 2021 detection monitoring event. A summary of the April 2021 constituent concentrations and the established benchmark concentrations is 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 April 2021 detection monitoring event will be included in the 2021 annual groundwater monitoring and corrective action report to be submitted 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, 2018).

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-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

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 April 2021 detection monitoring event. The water table map shows a generally southward flow direction, with localized groundwater mounding in the area of the EDG ponds. The groundwater elevations at the CCR and state monitoring wells during the April 2021 detection monitoring event are in **Table 3A** and **3B**. Water levels measured in

April 2021 were lower than in previous monitoring events as a result 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 April 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.

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. The April 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 April 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 April 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 April 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 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 were just above the laboratory's LOQ, ranging from 0.78 mg/L in April 2018 to 0.88 mg/L in April 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 EVIDENCES

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 below 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, 2018). 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 2020). 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 2021 Annual Report due January 31, 2022.

7.0 REFERENCES

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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**
		4/14/2021	4/14/2021	4/14/2021	4/14/2021
Appendix III					
Boron, µg/L	86	45.7	7,200	1,550	4,600
Calcium, µg/L	200,000	154,000	118,000	81,200	176,000
Chloride, mg/L	400	116	13.5	20.6	22.5
Fluoride, mg/L	0.2	<0.095	0.25 J	0.88	<0.095
Field pH, Std. Units	8.57	7.52	7.96	8.19	7.27
Sulfate, mg/L	36	15.3	195	70.5	0.54 J
Total Dissolved Solids, mg/L	1,190	737	614	342	710

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

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: 1/7/2021
Last revision by: MDB Date: 5/12/2021
Checked by: NDK Date: 5/21/2021
Scientist/PM QA/QC: TK Date: 6/23/2021

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
Compliance	MW-301	4/11/2016	8,550	0.33 J	0.33 J
		6/20/2016	8,190	0.36 J	0.36 J
		8/9/2016	8,450	0.33 J	0.33 J
		10/20/2016	8,620	0.34	0.34
		1/23/2017	9,280	0.42	0.42
		4/6/2017	8,370	0.21 J	0.21 J
		6/6/2017	9,160	<0.10	<0.10
		8/2/2017	8,610	0.32	0.32
		10/24/2017	8,820	<0.10	<0.10
		4/2/2018	7,950	0.25 J	0.25 J
		10/1/2018	8,230	0.2 J	0.2 J
		4/8/2019	7,310	0.29 J	0.29 J
		10/7/2019	7,220	0.24 J	0.24 J
		4/8/2020	7,450	0.39 M0	0.39 M0
		10/15/2020	6,550	<0.48 D3,M0	<0.48 D3,M0
		4/14/2021	7,200	0.25 J	0.25 J
	MW-302	4/8/2016	1,950	0.83	0.83
		6/20/2016	2,010	1.3 J	1.3 J
		8/9/2016	2,000	0.8	0.8
		10/20/2016	2,150	0.8	0.8
		1/24/2017	2,000	0.89 J	0.89 J
		4/6/2017	1,970	0.76	0.76
		6/6/2017	1,970	0.9	0.9
		8/2/2017	1,890	0.78	0.78
		10/24/2017	1,760	0.84	0.84
		4/2/2018	1,800	0.78	0.78
		10/1/2018	1,570	0.81	0.81
		4/8/2019	1,670	0.87	0.87
		10/7/2019	1,730	0.85	0.85
		4/8/2020	1,570	0.97	0.97
		10/15/2020	1,410	1.0 J, D3	1.0 J, D3
		4/14/2021	1,550	0.88	0.88

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	<0.20
		6/20/2016	3,360	<1.0	<1.0
		8/9/2016	3,860	<0.20	<0.20
		10/20/2016	3,740	<0.50	<0.50
		1/24/2017	4,210	<0.50	<0.50
		4/6/2017	4,170	<0.50	<0.50
		6/6/2017	4,570	<0.50	<0.50
		8/2/2017	3,780	<0.50	<0.50
		10/24/2017	3,480	<0.50	<0.50
		4/2/2018	3,040	<0.50	<0.50
		10/1/2018	2,360	<0.10	<0.10
		4/8/2019	2,930	<0.50	<0.50
		10/7/2019	2,830	<0.50	<0.50
		4/8/2020	3,380	<0.48	<0.48
		10/15/2020	3,310	<0.48 D3,	<0.48 D3,
		4/14/2021	4,600	<0.095	<0.095

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
J = Estimated value below laboratory's limit of quantitation (LOQ)
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:	7/7/2021
Checked by:	NDK	Date:	9/10/2021

I:\25221068.00\Deliverables\2021 April 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

	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 24, 2012	588.11	607.82	582.64	585.24	595.63	596.69	587.42	587.40	591.71	589.56	583.49	585.16	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	596.34	593.95	583.08	NM
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: LMH Date: 4/20/2021
Checked by: NDK Date: 4/21/2021

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 adjuste
*: Well was frozen

I:\25221068.00\Deliverables\2021 April 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

Raw Data	Depth to Water in feet below top of well casing			
	MW-301	MW-302	MW-303	2R-OW
Measurement Date				
April 8, 2016	4.67	18.96	22.95	3.04
June 20, 2016	6.12	19.47	24.77	6.02
August 9, 2016	6.42	19.62	24.27	6.98
October 20, 2016	5.92	19.69	23.62	5.45
January 23-24, 2017	7.32	18.85	23.15	3.08
April 6, 2017	4.38	21.58	22.95	3.00
June 6, 2017	5.65	19.29	23.55	5.09
August 1, 2017	7.02	19.93	24.63	8.13
October 24, 2017	7.22	19.90	24.02	10.98
April 2, 2018	5.88	19.44	23.22	4.85
October 1, 2018	6.82	19.87	23.82	8.11
April 8, 2019	5.50	19.47	23.11	3.22
October 7, 2019	4.86	19.57	23.22	3.33
June 26, 2020	6.53	--	--	--
October 15, 2020	9.32	16.59	18.80	8.45
April 14, 2021	9.25	14.59	16.98	4.22

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	--	--	--
October 15, 2020	595.10	598.56	593.19	604.27
April 14, 2021	595.17	600.56	595.01	608.50
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:	LMH	Date:	4/20/2021
Checked by:	NDK	Date:	4/21/2021

I:\25221068.00\Deliverables\2021 April 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
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
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
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
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

Table 4. 2016 - 2021 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068
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
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-OW	2016-Apr	10,600	120
29-OW	2016-Oct	10,900	85.7
29-OW	2017-Apr	9,500	77
29-OW	2017-Oct	9,060	62
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
30-OW	2016-Apr	79	4.8
30-OW	2016-Oct	113	4.6
30-OW	2017-Apr	176	7.5
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	2.4 J
30-OW	2019-Oct	84.9	5.6
30-OW	2020-Apr	54.4	2.8
30-OW	2020-Oct	118	15.2
30-OW	2021-Apr	42.3	5.5

Table 4. 2016 - 2021 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068
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	35	63.3
31-OW	2017-Apr	77	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
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
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	--	--
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

Table 4. 2016 - 2021 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25221068
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	1160
39R-OW	2020-Oct	34,200	1190
39R-OW	2021-Apr	24,800	1140

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:	7/7/2021
Checked by:	NDK	Date:	9/10/2021

I:\25221068.00\Deliverables\2021 April 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

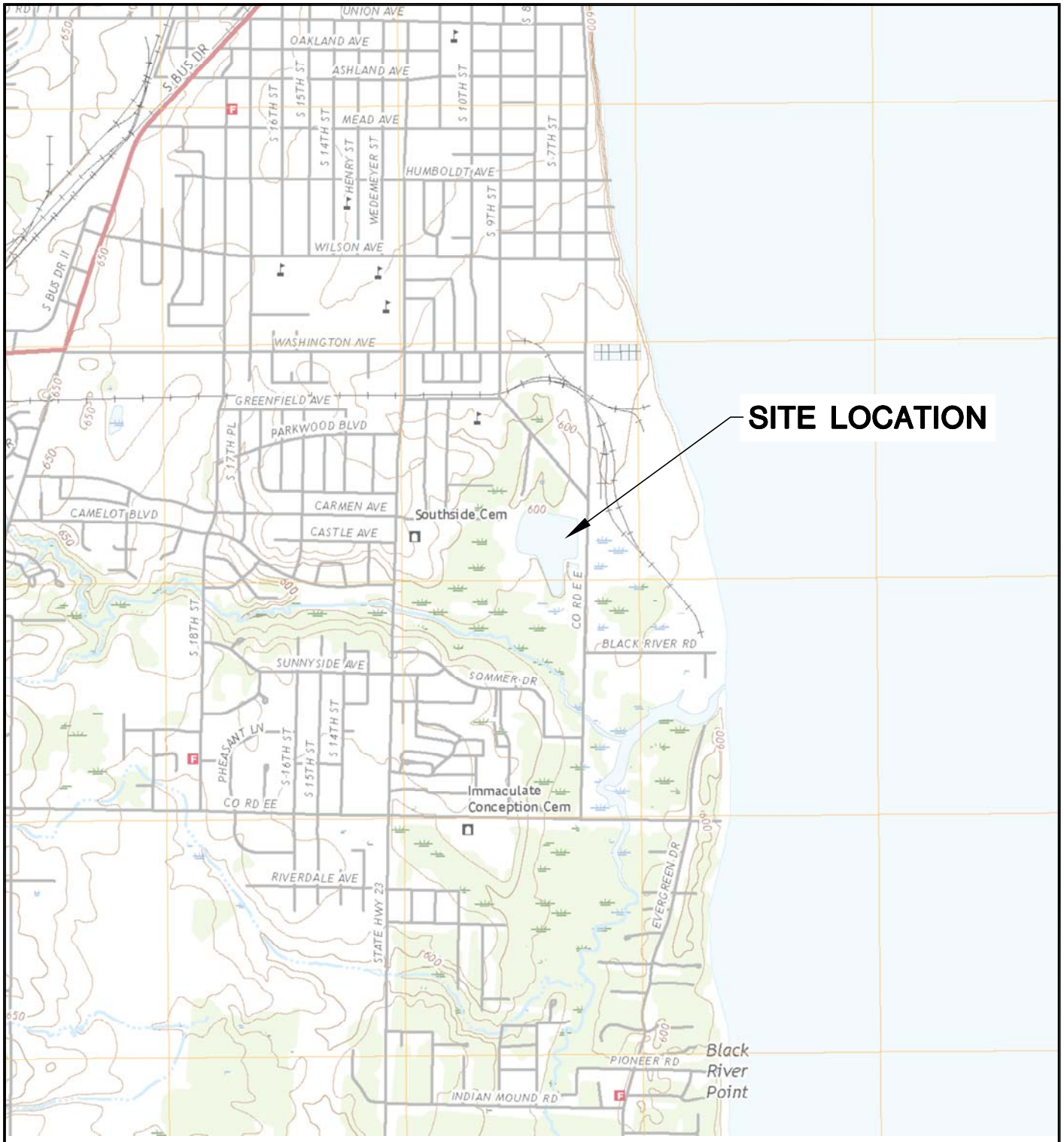
Abbreviations:
mg/L = milligrams per liter or parts per million (ppm)

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 April ASD Edg Closed\Tables\[Table 5 - EDG - closed-Leachate Floride 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

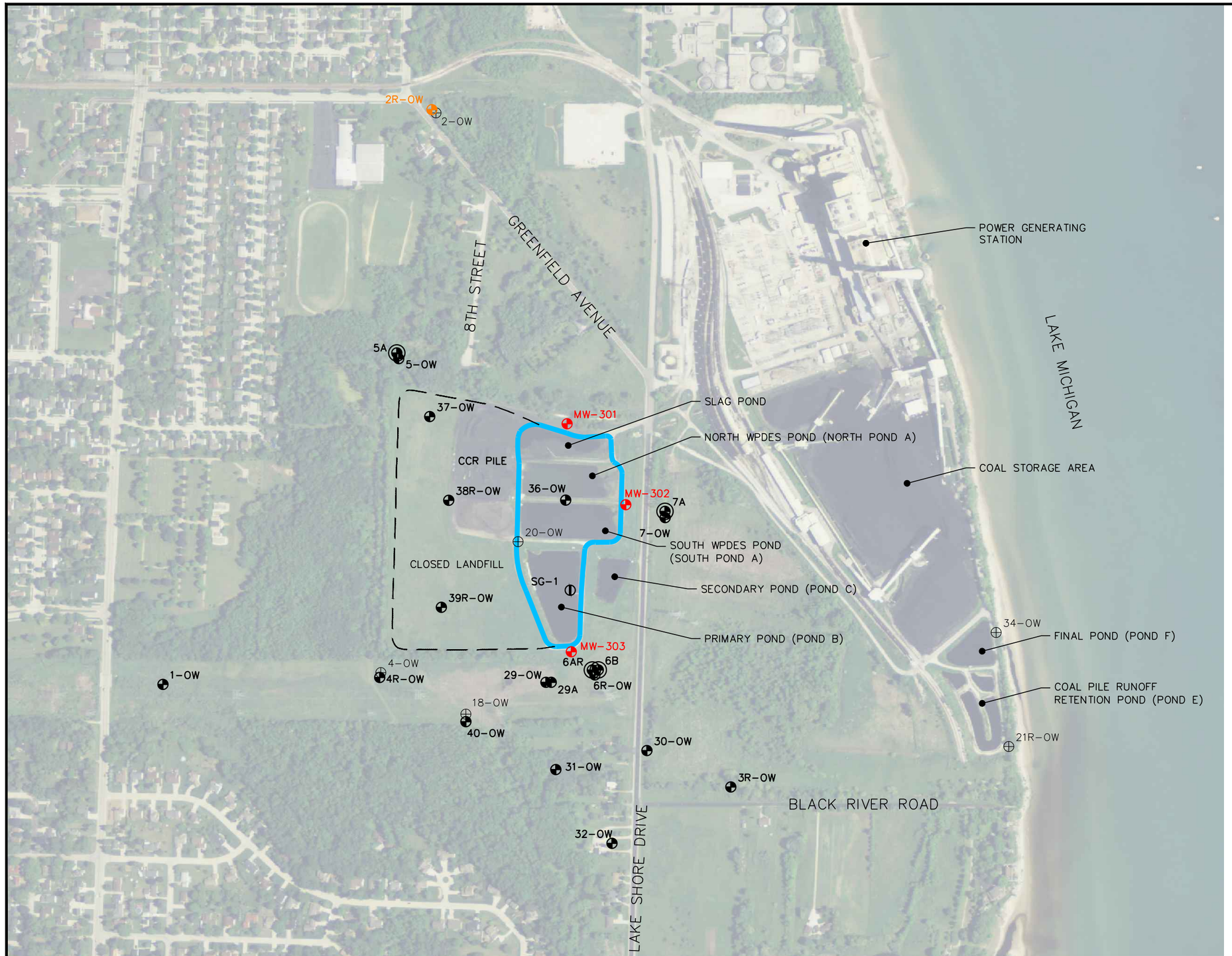
PROJECT NO.	25220068.00	DRAWN BY:	BSS
DRAWN:	11/20/19	CHECKED BY:	MDB
REVISED:	11/20/19	APPROVED BY:	TK 04/10/2020

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
- CCR UNITS
- CLOSED LANDFILL LIMITS

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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.	25221068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	09/13/2021	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:\25221068.00\Drawings\Site Plan and Monitoring Well Locations.dwg, 9/13/2021 11:01:22 AM

N

LEGEND

- ⊕ ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- CCR UNITS
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- 598.54 WATER TABLE ELEVATION (APRIL 14, 2021)
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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 APRIL 14, 2021.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25221068.00	DRAWN BY:	KP/ZW
DRAWN:	05/21/2021	CHECKED BY:	NDK
REVISED:	06/29/2021	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: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
APRIL 2021

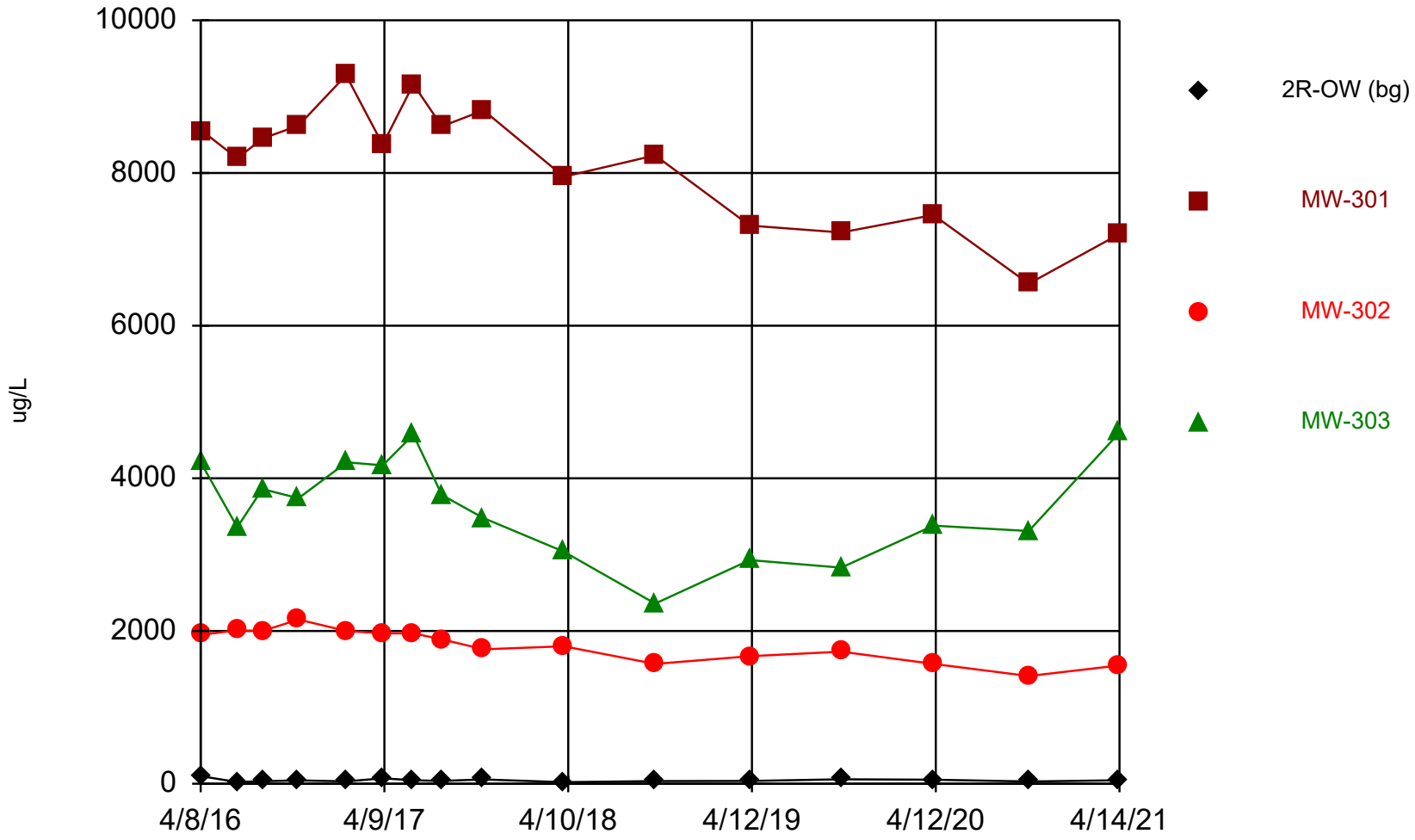
FIGURE
3

I:\25221068.00\Drawings\Water Tables.dwg, 6/2□/2021 □:32:□2 AM

Appendix A

Trend Plots for CCR Wells

Boron



Time Series Analysis Run 7/2/2021 9:39 AM View: CCR - UPL - 2020

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

Time Series

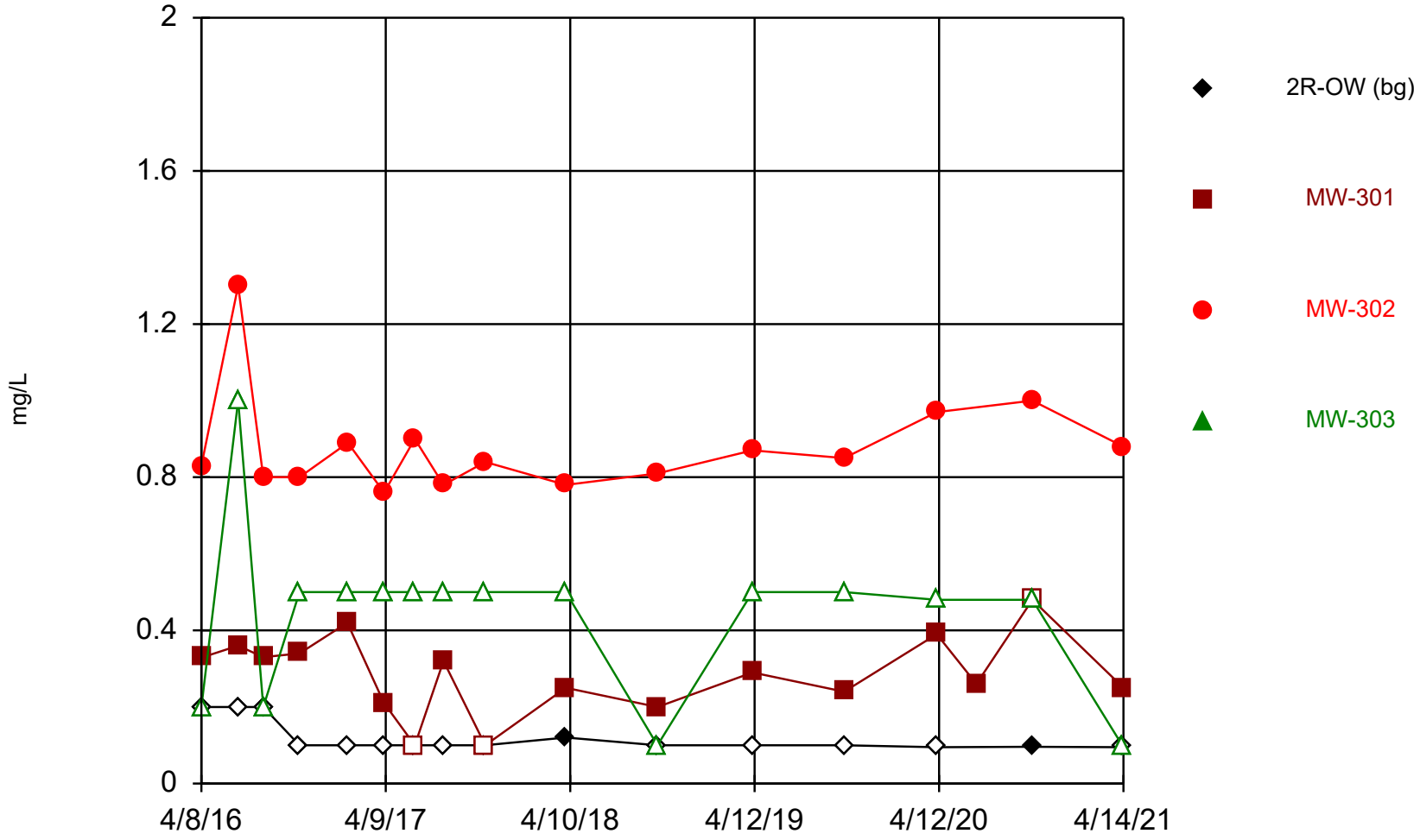
Constituent: Boron (ug/L) Analysis Run 7/2/2021 9:40 AM View: CCR - UPL - 2020

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

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 7/2/2021 9:39 AM View: CCR - UPL - 2020

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

Time Series

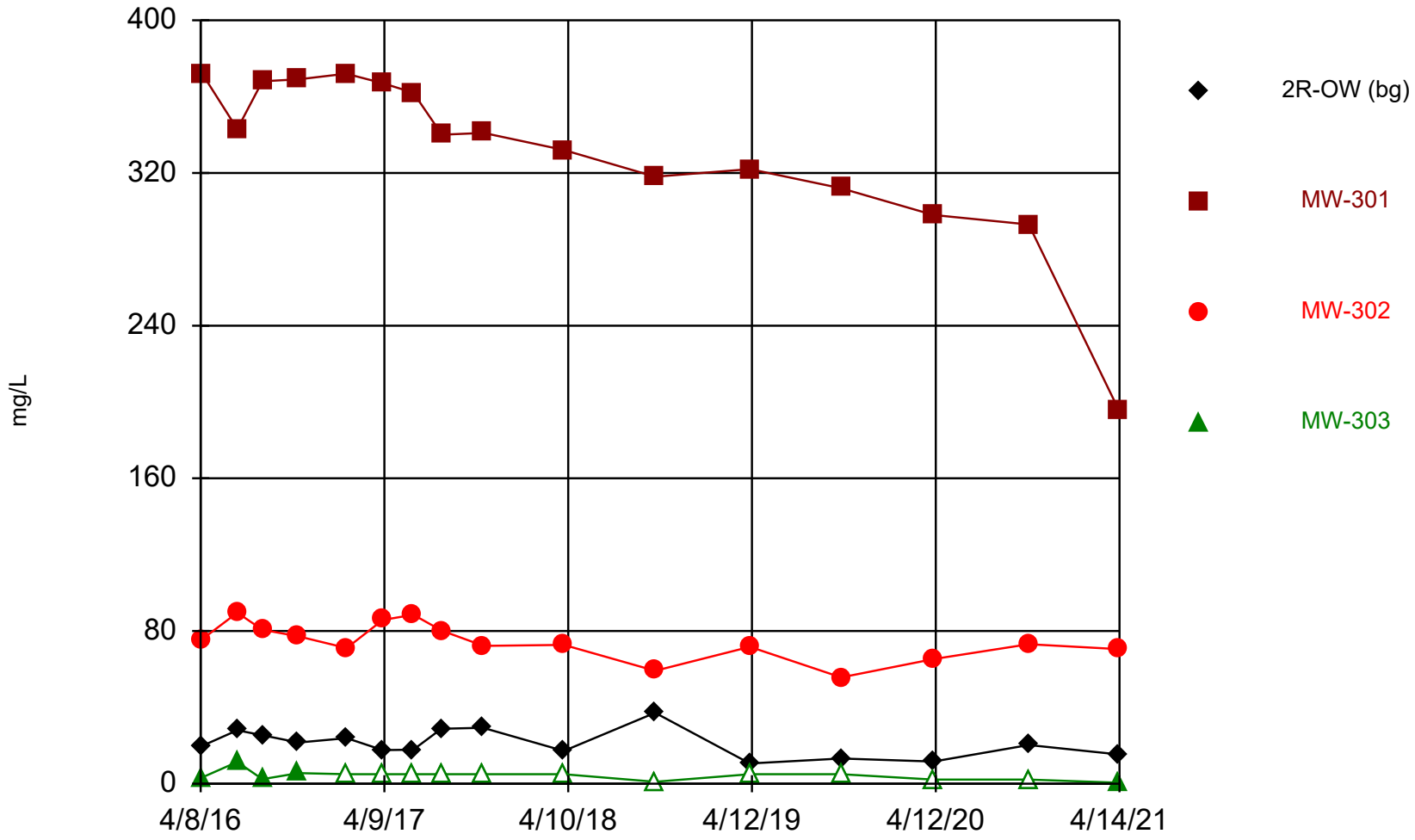
Constituent: Fluoride (mg/L) Analysis Run 7/2/2021 9:40 AM View: CCR - UPL - 2020

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

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 7/2/2021 9:39 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 7/2/2021 9:40 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)