2020 Annual Groundwater Monitoring and Corrective Action Report

Primary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25220067.00 | January 29, 2021

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OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Primary Ash Pond
2020 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) unit. The groundwater monitoring system for the Primary Ash Pond at the Columbia Energy Center (COL) monitors a single existing CCR unit. 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;	Assessment
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;	Assessment
Statistically Significant Increases (SSIs)	(iii) If it was determined that there was a statistically significant increase 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>May 2020</u> Boron: MW-4AR, MW-303 MW-304, MW-305 Chloride: MW-4AR, MW-304, MW-305 Field pH: MW-303, MW-305 Sulfate: MW-4AR, MW-303 MW-304, MW-305 Total Dissolved Solids: MW-4AR, MW-303, MW-305 <u>October 2020</u> Same as May 2020
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	July 16, 2018

Category	Rule Requirement	Site Status
Statistically Significant Levels (SSL) Above Groundwater Protection Standard	(iv) If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in Appendix IV to this part pursuant to §257.95(g) include all of the following:	
	(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;	None
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Not applicable – No SSLs above GPSs
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	Not applicable – ACM not required
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Not applicable – ACM not required
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 – Selection of remedy not required
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable – remedial activities not required

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1.0 INTRODUCTION

This 2020 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 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 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

This report covers the period of groundwater monitoring from January 1, 2020, through December 31, 2020.

The groundwater monitoring system for the Primary Ash Pond at the Columbia Energy Center (COL) monitors a single existing CCR unit:

- COL Primary Ash Pond (existing CCR surface impoundment)

The system is designed to detect monitored constituents at the waste boundary of the Primary Ash Pond as required by 40 CFR 257.91(d). The groundwater monitoring system consists of two upgradient and four downgradient monitoring wells (**Table 1** and **Figure 2**).

2.0 BACKGROUND

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

- 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 surficial sand and gravel aquifer is considered to be the uppermost aquifer unit, as defined under 40 CFR 257.53, at the COL Primary Ash Pond. Immediately underlying the surficial sand and gravel aquifer is the Cambrian-Ordovician sandstone aquifer. A summary of the regional hydrogeologic stratigraphy is presented in **Appendix A**.

The sand and gravel aquifer is capable of producing sufficient water for industrial or municipal use in some parts of Columbia County and is capable of producing sufficient water for domestic use in many areas, including along the Wisconsin River near the Columbia Energy Center (Harr et. al, 1978). A map showing expected well yields within the sand and gravel aquifer in Columbia County is included in **Appendix A**.

Regional groundwater flow in the site vicinity is generally west toward the Wisconsin River. A map showing the regional water table elevations is included with the regional hydrogeologic information in **Appendix A**.

2.1.2 Site Information

Soils at the site are primarily sand to a depth of approximately 50 to 100 feet and overlie sandstone bedrock. Soils encountered during the site feasibility study for the COL Ash Disposal Facility were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn, 1978). During drilling of CCR wells MW-301, MW-303, MW-304, and MW-305, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously-installed monitoring wells MW-84A and M-4R show silty sand and sand as the primary unconsolidated materials at these locations. The boring logs for Primary Ash Pond CCR monitoring wells are provided in **Appendix B**. All CCR monitoring wells are screened within the unconsolidated sand unit.

In the vicinity of the ash ponds, groundwater flow appears to be radially away from the ponds in all directions. The groundwater flow pattern in May 2020 is shown on **Figure 3**, and the groundwater flow pattern of the October 2020 sampling is shown on **Figure 4**. The groundwater elevation data for the CCR monitoring wells are provided in **Table 3**, and horizontal gradients and flow velocities for each of the flow paths are provided in **Table 4.**

2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of two upgradient (background) monitoring wells and four downgradient monitoring Wells (**Table 1** and **Figure 2**). The background wells include MW-84A and MW-301. The downgradient wells include MW-4R, MW-303, MW-304, and MW-305. The CCR Rule wells are installed in the surficial sand aquifer. Well depths range from approximately 26 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 showing the site location is provided on **Figure 1**. A map showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the

groundwater monitoring program is provided as **Figure 2**. Other CCR units are also shown on **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 unit in 2020.

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;

Three groundwater sampling events were completed for the Primary Ash Pond CCR unit in 2020. Two semiannual sampling events were completed in May 2020 and October 2020, as required by the assessment monitoring program. A resampling event for monitoring well MW-305 was completed in December 2020. 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 assessment monitoring programs is included in **Table 2**.

Groundwater samples collected in the May and October 2020 sampling events were analyzed for both Appendix III and Appendix IV constituents. The October 2020 samples were analyzed for Appendix IV constituents that were detected in the April 2020 event. The sample collected in the MW-305 resampling event in December 2020 was analyzed for molybdenum.

The sampling results for Appendix III and Appendix IV parameters in 2020 are summarized in **Table 5.** Field parameter results for the 2020 sampling events are provided in **Table 6**. The analytical laboratory reports for 2020 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 was no monitoring program transition in 2020.

Assessment monitoring for the Primary Ash Pond was initiated in April 2018 and continued through 2020. The statistical evaluation of the October 2019 assessment monitoring results was completed in January 2020. Evaluation of the April 2020 results was completed in July 2020. Evaluation of the October and December 2020 results was completed in January 2021.

In accordance with the Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (USEPA, 2009), the comparison of assessment monitoring results to the Groundwater Protection Standard (GPS) was based on the lower confidence limit (LCL) for the

arithmetic mean. The LCL evaluation was completed for each Appendix IV parameter that has been detected at a concentration exceeding the GPS in at least one sample result since assessment monitoring was initiated, which include arsenic, molybdenum, and selenium. The LCLs were calculated with Sanitas™ using historical concentrations measured since assessment monitoring began in April 2018. The most recent LCL evaluation, completed for the October and December 2020 events, is provided in **Appendix E**.

No Appendix IV parameters were detected at statistically significant levels above the GPS values established under §257.95(h). As shown in **Table 5**, several Appendix III and Appendix IV parameters continue to be detected at levels that represent statistically significant increases (SSIs) above background. Based on these results, the Primary Ash Pond will continue in the assessment monitoring program.

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 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

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 is currently in Assessment Monitoring.

Summary of Key Actions Completed.

- Statistical evaluation for the October 2019 assessment monitoring event completed on January 28, 2020.
- Statistical evaluation for the May 2020 monitoring event, completed August 14, 2020.
- Two semiannual groundwater sampling and analysis events and a resample event (May, October, and December 2020)

Description of Any Problems Encountered: No problems were encountered during the groundwater sampling events in 2020.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2021):

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the October 2020 monitoring events (by January 15, 2021);
- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the April 2021 monitoring events (by July 15, 2021);
- If one or more Appendix IV constituents is detected at a statistically significant level above the GPS, then within 30 days Wisconsin Power and Light Company (WPL) will prepare a notification in accordance with §257.95(g) and within 90 days complete an alternative source demonstration or initiate an assessment of corrective measures (§257.95(g)(3)). WPL will also characterize the release pursuant to §257.95(g)(1) and provide notice pursuant to §257.95(g)(2).
- Two semiannual groundwater sampling and analysis events (April and October 2021).

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. The Primary Ash Pond is no longer in detection monitoring.

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.

Not applicable. The Primary Ash Pond is no longer in detection monitoring.

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 been initiated at the site, but no alternative assessment monitoring frequency is proposed at this time.

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).

The 2020 assessment monitoring results, background upper prediction limits (UPLs), and GPSs established for the Primary Ash Pond are provided in Table 5. The laboratory reports are provided in Appendix C. Historical monitoring results are summarized in Appendix D.

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. No alternative source demonstration evaluation for assessment monitoring was completed in 2020.

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

Harr, C.A., L.C. Trotta, and R.G. Borman, 1978, "Ground-Water Resources and Geology of Columbia County, Wisconsin," University of Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.

U.S. Environmental Protection Agency (USEPA), 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530-R-09-007, March 2009.

Warzyn Engineering, Inc., 1978, Feasibility Study, Proposed Fly Ash and/or Scrubber Sludge Disposal Facility – Columbia Site, Wisconsin Power and Light Company, Town of Pacific, Columbia County, WI, January 1978.

Tables

Table 1. Groundwater Monitoring Well Network
Columbia Center Primary Ash Pond / SCS Engineers Project #25220067.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-84A	Upgradient	Background
MW-301	Upgradient	Background
MW-4R	Downgradient	Compliance
MW-303	Downgradient	Compliance
MW-304	Downgradient	Compliance
MW-305	Downgradient	Compliance

Created by: RM Date: 12/14/2020
Last revision by: RM Date: 12/30/2020
Checked by: NDK Date: 1/5/2021

I:\25220067.00\Deliverables\2020 Fed Annual Report - COL PP\Tables\[Table 1 - GW Monitoring Well Network.xlsx]GW Summary

Table 2. Groundwater Samples Summary
Columbia Energy Center Primary Ash Pond/ SCS Engineers Project #25220067.00

Sample Dates	Compliance Wells				Background Wells	
	MW-4R	MW-303	MW-304	MW-305	MW-84A	MW-301
5/27-29/2020	A	A	A	A	A	A
10/7-8/2020	A	A	A	A	A	A
12/11/2020	--	--	--	R-A	--	--
Total Samples	2	2	2	3	2	2

Abbreviations:
A = Required by Assessment Monitoring Program
R-A = Resample for the Assessment Monitoring Program

Created by:	NDK	Date:	1/4/2018
Last revision by:	RM	Date:	1/5/2021
Checked by:	NDK	Date:	1/5/2021

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Table 3. Groundwater Elevation
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25220067.00

	Well Number	MW-1AR	MW-4	MW-5R	MW-33AR	MW-33BR	MW-34A	MW-34B	MW-37A	MW-83	MW-84A	MW-84B	MW-86	MW-91AR	MW-91B	MW-92A	MW-92B
	Top of Casing Elevation (feet amsl)	822.55	819.74	805.44	808.29	808.39	805.95	806.05	813.04	807.96	814.28	814.26	824.79	809.03	808.45	808.47	808.41
	Screen Length (ft)																
	Total Depth (ft from top of casing)	44.40	39.58	25.97	31.08	57.50	35.43	56.95	31.80	25.42	40.21	52.02	45.43	32.90	52.38	28.94	51.75
	Top of Well Screen Elevation (ft)	778.15	780.16	779.47	777.21	750.89	770.52	749.10	781.24	782.54	774.07	762.24	779.36	776.13	756.07	779.53	756.66
	Measurement Date																
	October 2, 2012	783.41	783.70	784.96	782.38	782.23	783.03	782.99	782.66	dry	783.84	783.94	783.81	784.09	783.90	784.49	784.06
	April 15, 2013	785.44	784.02	786.09	784.16	784.14	784.74	784.79	783.87	784.49	785.83	785.76	785.22	785.14	785.01	785.75	785.34
	October 8, 2013													785.66	785.42	785.97	785.52
Dry Ash Facility (Facility ID #03025)	October 15, 2013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.42	785.97	785.52
	April 14, 2014	784.95	784.09	785.63	783.74	783.91	784.63	784.70	783.45	783.73	785.58	785.52	784.96	785.04	784.96	785.99	785.54
	October 2-3, 2014	785.03	785.39	786.08	784.37	784.28	784.57	784.54	784.56	dry	785.24	785.18	785.19	785.47	785.28	785.75	785.33
	April 13-14, 2015	783.96	783.63	785.25	783.01	782.74	783.65	783.95	782.87	dry	784.43	784.51	784.17	784.48	784.37	785.07	784.66
	October 6-7, 2015	784.28	784.44	785.72	783.68	783.33	784.05	784.02	783.66	dry	784.80	784.76	784.66	784.89	784.70	785.20	784.76
	April 4-6, 2016	785.82	aband	787.02	785.29	785.07	785.63	785.67	784.76	785.43	786.37	786.26	785.89	786.05	785.95	786.61	786.21
	October 11-13, 2016	786.64	aband	788.00	787.36	786.46	786.45	786.32	786.40	786.81	787.22	787.11	786.96	787.17	786.81	787.68	787.25
	April 10-13, 2017	786.96	aband	788.13	786.39	785.99	786.30	786.28	786.34	786.23	787.16	787.06	786.96	787.24	787.03	787.90	787.60
	October 3-5, 2017	785.48	aband	786.66	784.51	784.22	784.67	784.63	784.86	784.29	NM	786.49	785.58	786.08	785.83	786.47	786.02
	October 9-10, 2017	NM	aband	NM	NM	NM	NM	NM	NM	NM	785.56 [6]	NM	NM	NM	NM	NM	NM
	February 21, 2018	783.97	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.68	784.46	NM	NM
	April 23-25, 2018	783.99	aband	785.36	783.09	786.36	781.77	780.79	783.28	783.32	785.88	784.91	782.54	784.71	784.53	785.23	784.81
	October 23-25, 2018	788.25	aband	789.71	788.77	787.96	787.88	787.73	787.62	788.26	788.32	788.19	788.21	788.59	788.31	789.32	788.87
	April 1-4, 2019	787.05	aband	788.64	786.63	786.54	786.82	786.92	786.47	786.78	787.35	787.34	787.16	787.45	787.18	788.04	787.63
	October 7-9, 2019	787.26	aband	789.23	788.26	787.64	787.92	787.74	786.77	788.90	787.79	787.73	787.44	787.78	787.62	788.63	788.17
	May 27-28, 2020	786.92	aband	788.34	786.01	785.75	785.98	785.99	786.22	786.03	787.02	786.99	786.94	787.26	787.05	787.86	787.47

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR	SG-1	SG-2	SG-3	SG-4
	Top of Casing Elevation (feet amsl)	788.23	806.10	809.62	809.50	828.86	828.84	786.29	815.48	814.21	791.55	792.90	792.06	795.25	808.60	805.36
	Screen Length (ft)															
	Total Depth (ft from top of casing)	16.90	25.55	34.80	76.07	51.88	75.80	14.40	38.50	37.85	37.37	18.96	--	--	--	--
	Top of Well Screen Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94	--	--	--	--
	Measurement Date															
	October 2, 2012	780.13	786.76	781.49	781.34	782.03	781.93	780.58	779.88	781.91	780.95	780.55	789.14	793.85	dry	dry
	April 15, 2013	785.16	788.39	783.97	784.00	783.77	783.78	784.69	783.66	784.09	784.75	785.02	789.5 [1]	NM	dry	dry
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36	789.5 [1]	791.33	dry	dry
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	NM	NM	NM	NM	NM	NM	NM
Ash Pond Facility (Facility ID #02325)	April 14, 2014	786.04	788.96	783.57	783.68	783.56	783.57	785.51	783.41	783.73	785.25	785.87	788.90	dry	dry	dry
	October 1-3, 2014	781.16	787.55	783.42	783.32	784.05	783.94	782.32	783.55	783.79	782.63	783.03	NM	dry	dry	dry
	April 13-14, 2015	783.08	786.83	782.77	782.68	782.80	782.82	782.81	782.83	782.93	783.34	783.42	789.3	791.70	dry	dry
	October 6-7, 2015	780.66	786.12	782.97	782.81	783.10	783.01	781.82	783.25	783.18	781.95	782.26	788.48	791.58	dry	dry
	April 4-6, 2016	784.21	789.09	785.27	785.27	784.79	784.76	783.21	784.97	785.68	785.02	784.36	NM	793.40	dry	dry
	October 11-13, 2016	781.88	787.88	785.75	785.52	785.73	785.61	783.12	786.51	786.16	783.75	784.09	788.32	792.52	dry	dry
	April 10-13, 2017	782.94	787.95	785.44	785.20	785.82	785.69	782.77	786.09	785.95	784.29	784.09	788.31	793.85	dry	dry
	October 3-5, 2017	780.93	787.04	783.35	783.18	784.30	784.19	782.37	784.23	783.89	782.48	782.61	788.3	793.45	dry	dry
	April 23-25, 2018	782.89	790.43	782.86	782.87	783.14	783.09	783.04	783.02	783.23	783.26	783.45	788.38	>795.25	dry	dry
	October 23-25, 2018	782.95	788.47	787.12	786.88	787.12	786.99	783.48	787.73	787.49	784.90	784.52	787.76	793.25	dry	dry
	April 1-4, 2019	785.68	789.44	786.28	786.31	786.56	786.45	785.27	787.39	786.53	786.33	785.46	--	794.60	dry	dry
	October 7-9, 2019	785.33	790.65	787.10	787.02	786.68	786.65	785.29	786.68	787.07	786.01	785.42	748.48	795.20	dry	dry
	May 27-29, 2020	781.80	787.73	785.12	784.92	785.74	785.59	783.11	785.89	785.60	783.41	783.89	748.48	>795.25	dry	dry
	Bottom of Well Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94	--	--	--	--

Table 3. Groundwater Elevation
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25220067.00

	Well Number	MW-301	MW-302	MW-303	MW-304	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311
	Top of Casing Elevation (feet amsl)	806.89	813.00	811.52	805.42	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Total Depth (ft from top of casing)	29.40	33.6	35.80	25.7	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55
	Measurement Date													--	--	--
	December 21-22, 2015	NM	784.78	784.11	786.13	788.96	787.58	783.77	783.50	785.31	--	--	--	--	--	--
	April 4-5, 2016	786.78	785.81	785.48	788.08	789.61	789.09	785.29	785.63	786.37	--	--	--	--	--	--
	July 7-8, 2016	786.31	786.28	784.60	787.36	789.26	787.43	785.19	785.05	785.89	--	--	--	--	--	--
	July 28, 2016	NM	NM	784.35	NM	NM	NM	NM	784.86	785.61	--	--	--	--	--	--
	October 11-13, 2016	787.64	787.76	786.18	788.18	789.78	787.88	787.36	786.45	787.22	--	--	--	--	--	--
	December 29, 2016	787.37	787.05	NM	NM	NM	NM	785.66	785.72	786.63	--	--	--	--	--	--
	January 25-26, 2017	787.27	786.89	785.28	789.34	789.36	789.64	785.88	785.98	786.70	785.50	785.36	785.73	--	--	--
	April 10 & 11, 2017	787.89	787.55	786.00	788.22	789.57	787.95	786.39	786.30	787.16	786.22	785.64	786.51	--	--	--
	June 6, 2017	788.25	788.37	786.49	788.58	789.79	787.83	787.27	786.66	787.63	786.85	786.07	786.46	--	--	--
	August 7-9, 2017	787.34	787.55	785.42	789.52	789.30	788.54	786.11	785.81	786.68	785.69	785.19	785.37	--	--	--
	October 23-24, 2017	785.89	785.94	783.92	788.97	788.14	788.00	784.13	784.50	785.32	783.97	784.79	784.17	--	--	--
	February 21, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02
	March 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00
CCR Rule Wells	April 23-25, 2018	785.29	784.37	783.27	789.69	787.67	790.43	783.09	781.77	785.88	783.24	783.65	782.65	783.07	782.97	781.83
	May 24, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97	786.11
	June 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47
	July 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55
	August 7, 2018	787.06	NM	785.20	788.25	788.56	787.63	NM	NM	786.55	NM	NM	NM	NM	NM	NM
	August 22, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46
	September 21, 2018	NM	788.37	786.50	NM	NM	NM	787.90	787.01	NM	NM	NM	NM	787.08	787.24	787.66
	October 22-24, 2018	788.98	789.16	787.51	789.05	790.04	788.47	788.77	787.88	788.32	787.66	786.57	787.81	787.99	788.18	788.64
	April 1-4, 2019	787.04	787.56	786.52	789.72	790.07	789.44	786.63	786.82	787.35	786.72	786.71	787.53	786.30	786.38	786.38
	June 12, 2019	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.25	NM
	June 19, 2019	NM	NM	786.81	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 7-9,2019	788.47	788.31	787.02	790.41	790.36	790.65	NM	NM	NM	787.47	786.99	787.18	787.26	787.94	787.64
	December 13, 2019	--	--	--	--	--	--	--	--	--	787.03	785.68	786.43	--	--	--
	December 23, 2019	--	--	--	--	--	--	--	--	--	--	--	--	--	775.22	--
	January 17, 2020	--	--	785.58	--	--	--	--	--	--	--	--	--	--	--	--
	February 3, 2020	787.24	NM	NM	NM	NM	NM	NM	NM	786.50	785.77	785.57	786.48	NM	NM	NM
	May 27-29, 2020	787.77	787.29	785.56	789.30	787.78	787.73	786.01	785.98	787.02	785.77	785.35	786.28	785.98	785.81	785.85
	June 30, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM
	August 6, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM
	October 7-8, 2020	786.53	786.74	785.16	788.52	787.96	787.74	785.91	785.70	786.10	785.39	784.71	785.68	785.47	785.56	785.83
	December 11, 2020	--	--	--	--	788.19	--	--	--	--	--	--	--	785.26	785.26	--
	Bottom of Well Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	780.63	780.39	778.90	775.60	775.21	773.55

Notes:
NM = not measured

Created by: MDB Date: 5/6/2013
Last revision by: NDK Date: 12/11/2020
Checked by: JSN Date: 12/17/2020
Proj Mgr QA/QC: TK Date: 1/6/2021

(1) The elevation for SG-1 is read off of the staff gauge (rather than measured from the top of the gauge).
(2) SG-2 could not be located during the April 2013 event.
(3) SG-3 could not be located during the October 2013 event. SG-1 could not be safely accessed during the October 2013 event.
(4) LH-2 measurements are given as leachate depth, measured by a transducer.
(5) LH-2 and LH-3 measurements were collected by WPL staff on October 9, 2017.
(6) The depth to water at MW-84A was not measured prior to purging for sampling during the October 3-5 sampling event. The level was allowed to return to static and was measured on 10/10/2017.

Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - Primary Pond /
SCS Engineers Project #25220067.00
January - December 2020

	North				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
5/27-29/2020	789.00	786.00	102	0.03	3.4
10/7-8/2020	788.00	786.00	65	0.03	3.6

	West				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
5/27-29/2020	789.00	784.00	243	0.02	2.4
10/7-8/2020	788.00	784.00	166	0.02	2.8

	South				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
5/27-29/2020	789.00	786.00	110	0.03	3.2
10/7-8/2020	788.00	786.00	49	0.04	4.7

Wells	**K Values (cm/sec)**	**K Values (ft/d)**
M-4R	3.0E-03	8.4
M-303	4.0E-02	114
M-304	1.2E-02	34
M-305	5.0E-02	141
Geometric Mean	1.6E-02	46

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 and 2
Δl = distance between location 1 and 2
Δh/Δl = hydraulic gradient

Created by: RM Date: 12/29/2020
Last revision by: RM Date: 1/15/2021
Checked by: TK Date: 1/15/2021

Table 5. Groundwater Analytical Results Summary
Columbia Generating Station - Primary Pond / SCS Engineers Project #25220067.00

Parameter Name	UPL Method	UPL		Background Wells				Compliance Wells								
				MW-84A		MW-301		MW-4R		MW-303		MW-304		MW-305		
				5/29/2020	10/8/2020	5/29/2020	10/8/2020	5/27/2020	10/7/2020	5/27/2020	10/7/2020	5/27/2020	10/7/2020	5/27/2020	10/7/2020	12/11/2020
Appendix III																
Boron, ug/L	P	35.6		10	9.7 J	21.3	28.8	644	1,360	2,700	2,520	469	784	1,040	1,650	NA
Calcium, ug/L	NP	129,000		77,600	69,200	112,000	93,000	106,000	98,000	27,400 P6	19,700	84,000	75,100	103,000	112,000	NA
Chloride, mg/L	P	6.2		3.7	4.3	2.0 J	3.4 J	50	53	2.3 J	2.0 J	25	44	51	45	NA
Fluoride, mg/L	DQ	DQ		<0.095	<0.095	<0.095	<0.095	0.13 J	0.27 J	<0.48	0.19 J	<0.095	0.17 J	0.30 J	0.47	NA
Field pH, Std. Units	P	7.78		7.34	7.49	6.73	6.95	7.29	7.47	8.68	9.21	7.09	7.18	8.48	8.64	8.43
Sulfate, mg/L	P	30.3		1.5 J	1.3 J	11.5 J	25.1	162	203	326	312	42	56	305	391	NA
Total Dissolved Solids, mg/L	NP	514		340	320	452	412	594	604	570	532	412	442	556	572	NA
Appendix IV		**UPL**	**GPS**													
Antimony, ug/L	NP*	0.4	6	<0.15	<0.15	<0.15	0.33 J	<0.15	<0.15	0.22 J	<0.15	0.25 J	<0.15	0.3 J	0.42 J	NA
Arsenic, ug/L	P*	0.53	10	0.34 J	0.49 J	0.33 J	0.62 J	0.39 J	0.44 J	5.9	9.5	1.3	2.8	0.75 J	0.95 J	NA
Barium, ug/L	P	18.3	2000	13.9	12.6	9.8	9.4	24.2	25.3	13.8	10	30.8	37.4	14.2	20.2	NA
Beryllium, ug/L	NP*	0.37	4	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.36 J	<0.25	0.26 J	<0.25	<0.25	<0.25	NA
Cadmium, ug/L	NP*	0.32	5	<0.15	<0.15	<0.15	0.19 J	<0.15	<0.15	0.3 J	<0.15 J	0.19 J	<0.15	<0.15	<0.15	NA
Chromium, ug/L	P*	3.13	100	1.7 J	1.6 J	<1.0	<1.0	1.2 J	<1.0	42.8	46.4	<1.0	<1.0	<1.0	<1.0	NA
Cobalt, ug/L	NP*	0.38	6	<0.12	<0.12	<0.12	0.29 J	<0.12	<0.12	0.49 J	0.23 J	0.69 J	0.65 J	<0.12	<0.12	NA
Fluoride, mg/L	DQ	DQ	4	<0.095	<0.095	<0.095	<0.095	0.13 J	0.27 J	<0.48	0.19 J	<0.095	0.17 J	0.3 J	0.47	NA
Lead, ug/L	NP*	0.48	15	<0.24	<0.24	<0.24	0.25 J	<0.24	<0.24	0.32 J	<0.24	0.29 J	<0.24	<0.24	<0.24	NA
Lithium, ug/L	P*	0.86	40	0.4 J	0.39 J	0.47 J	0.46 J	1.4	2.2	1.2	0.69 J	0.3 J	<0.22	<0.22	<0.22	NA
Mercury, ug/L	DQ	DQ	2	<0.084	<0.066	<0.084	<0.066	<0.084	NA	<0.084	NA	<0.084	NA	<0.084	NA	NA
Molybdenum, ug/L	NP*	0.44	100	<0.44	<0.44	<0.44	<0.44	25.6	27.6	67.1	67.1	3.9	12	60.5	102	99.0
Selenium, ug/L	NP*	0.71	50	<0.32	<0.32	<0.32	<0.32	11.7	1.6	18.7	17.2	0.33 J	<0.32	4.2	7.6	NA
Thallium, ug/L	NP*	0.48	2	<0.14	<0.14	<0.14	0.3 J	<0.14	<0.14	0.28 J	<0.14	0.33 J	<0.14	<0.14	<0.14	NA
Radium 226/228 Combined, pCi/L	P	1.93	5	0.040	0.390	0.193	0.380	0.123	0.485	0.382	0.722	0.302	0.435	0.71	0.577	NA

Table 5. Groundwater Analytical Results Summary
Columbia Generating Station - Primary Pond / SCS Engineers Project #25220067.00

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

30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.

Abbreviations:

UPL = Upper Prediction Limit
NA = Not Analyzed
µg/L = micrograms per liter
LOD = Limit of Detection
LOQ = Limit of Quantitation
mg/L = milligrams per liter
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric UPL (highest background value)
P = Parametric UPL with 1-of-2 retesting
GPS = Groundwater Protection Standard

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.
P6= Matrix Spike recovery was outside laboratory control limits recovery was outside laboratory control limits.
* = UPL is below the LOQ for background sampling. For compliance wells, only results confirmed above the LOQ are evaluated as potential SSIs above background.

Notes:

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant level (SSL) above the GPS. See the accompanying report text for identification of statistically significant results.
2. GPS is the United States Environmental Protection Agency (USEPA) Maximum Contamination Level (MCLs), if established; otherwise, the values from 40 CFR 257.95(h)(2).
3. Interwell UPLs calculated based on results from background wells MW-84A and MW-301. Appendix III and IV UPLs last updated January 2020 based on data collected through October 2019.

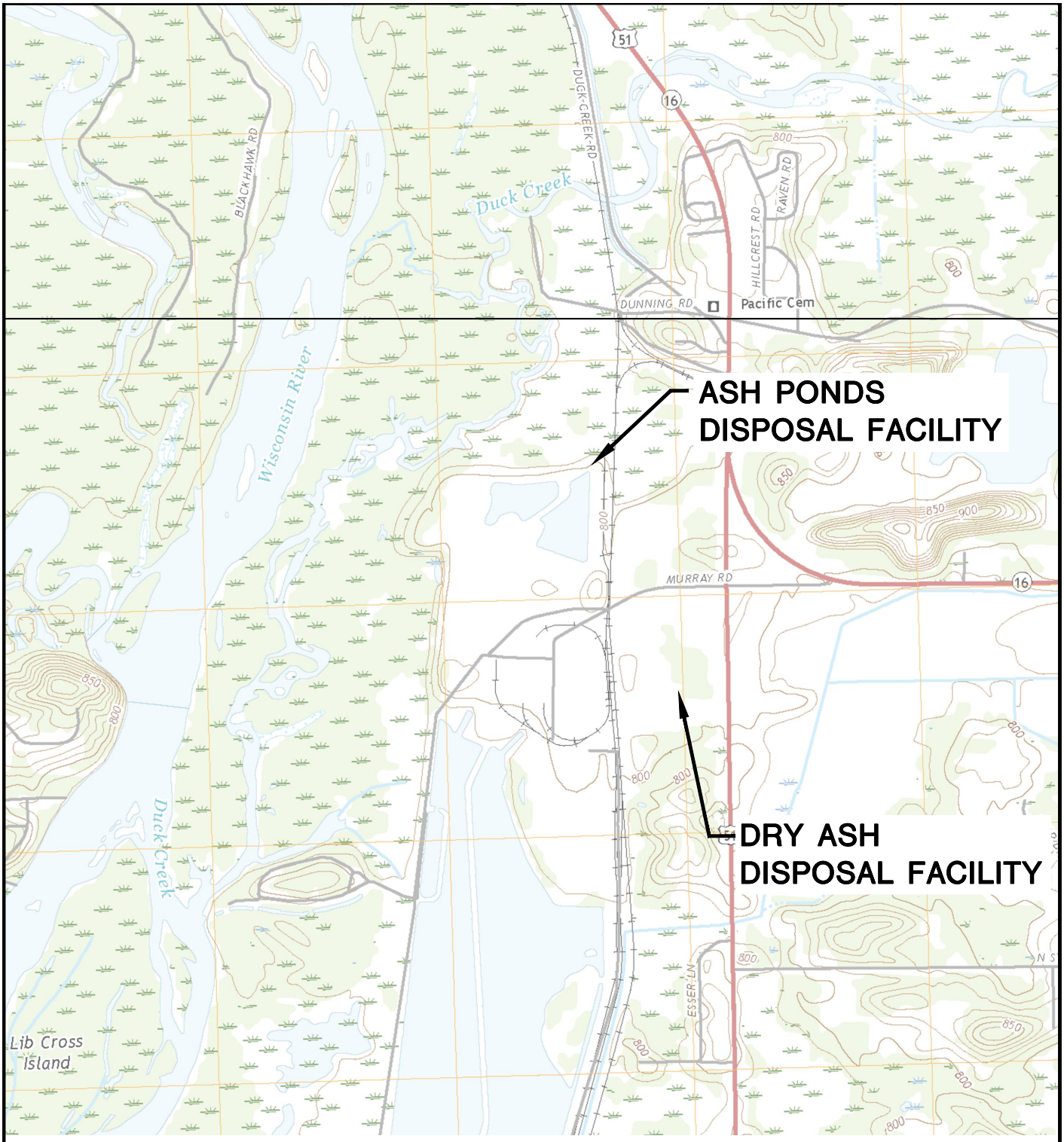
Created by:	NDK	Date:	1/5/2021
Last revision by:	NDK	Date:	1/17/2021
Checked by:	RM	Date:	1/18/2020

Table 6. 2020 Groundwater Field Data Summary
Columbia Energy Center - Primary Ash Pond / SCS Engineers Project #25220067.00
January - December 2020

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-84A	5/29/2020	787.02	10.6	7.34	9.81	613.7	135.0	2.15
	10/8/2020	786.10	11.9	7.49	9.39	610.1	153.2	0.00
MW-301	5/29/2020	787.77	8.1	6.73	2.00	797.0	118.7	0.00
	10/8/2020	786.53	11.0	6.95	1.22	760.0	183.9	0.00
M-4R	5/27/2020	787.73	11.0	7.29	4.00	869.0	203.6	0.16
	10/7/2020	787.74	14.3	7.47	0.11	948.0	217.8	0.00
MW-303	5/27/2020	785.56	11.6	8.68	9.15	828.0	116.1	0.00
	10/7/2020	785.16	12.6	9.21	7.62	801.0	183.0	0.00
MW-304	5/27/2020	789.30	16.2	7.09	0.61	711.0	54.20	4.35
	10/7/2020	788.52	18.3	7.18	0.31	776.0	-99.70	1.10
MW-305	5/27/2020	787.78	12.1	8.48	3.16	814.0	211.2	0.00
	10/7/2020	787.96	21.9	8.64	1.53	857.0	215.8	0.00
	12/11/2020	788.19	20.8	8.43	1.75	834.0	112.4	0.00

Created by: RM Date: 12/22/2020
Last revision by: RM Date: 1/6/2021
Checked by: NDK Date: 1/7/2021

Figures

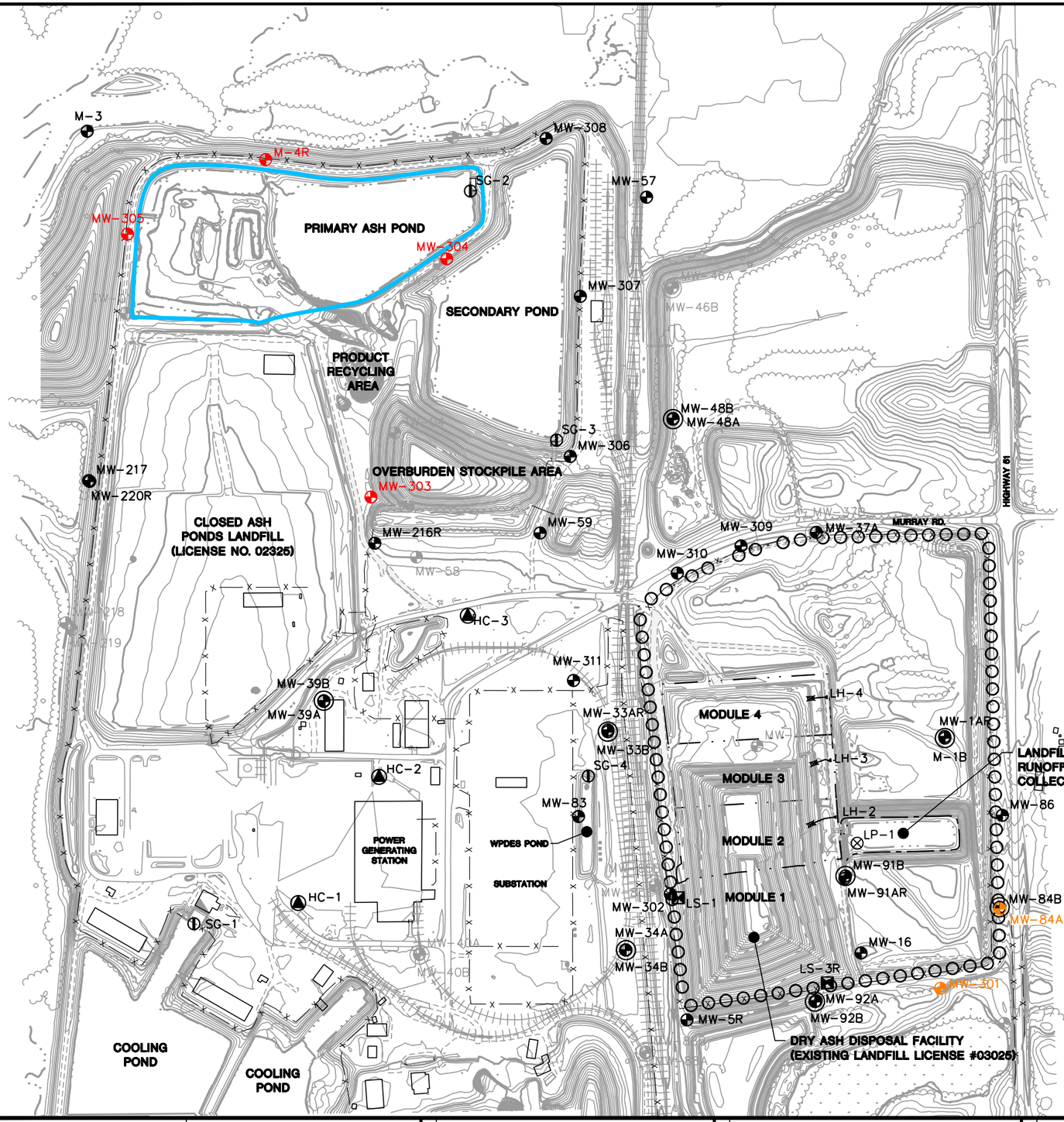


N

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

CLIENT: ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954	SITE: ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI	SITE LOCATION MAP	
PROJECT NO. 25219067.00	DRAWN BY: BSS	ENGINEER: SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE 1
DRAWN: 12/02/2019	CHECKED BY: MDB		
REVISED: 01/10/2020	APPROVED BY: TK 01/30/2020		

I:\25219067.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:38:21 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
- CONSTRUCTED LIMITS OF WASTE (DRY ASH LANDFILL)
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, MAY 2019 AND SEPTEMBER 2020.
2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND JANUARY 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11-13, 2015.
5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14-15, 2016.
6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
7. BACKGROUND MONITORING WELLS FOR THE PRIMARY ASH POND ARE: MW-301 AND MW-84A

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25220067.00	DRAWN BY:	BSS/ZTW
DRAWN:	12/02/2019	CHECKED BY:	TK
REVISED:	01/05/2021	APPROVED BY:	TK 01/28/2021

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

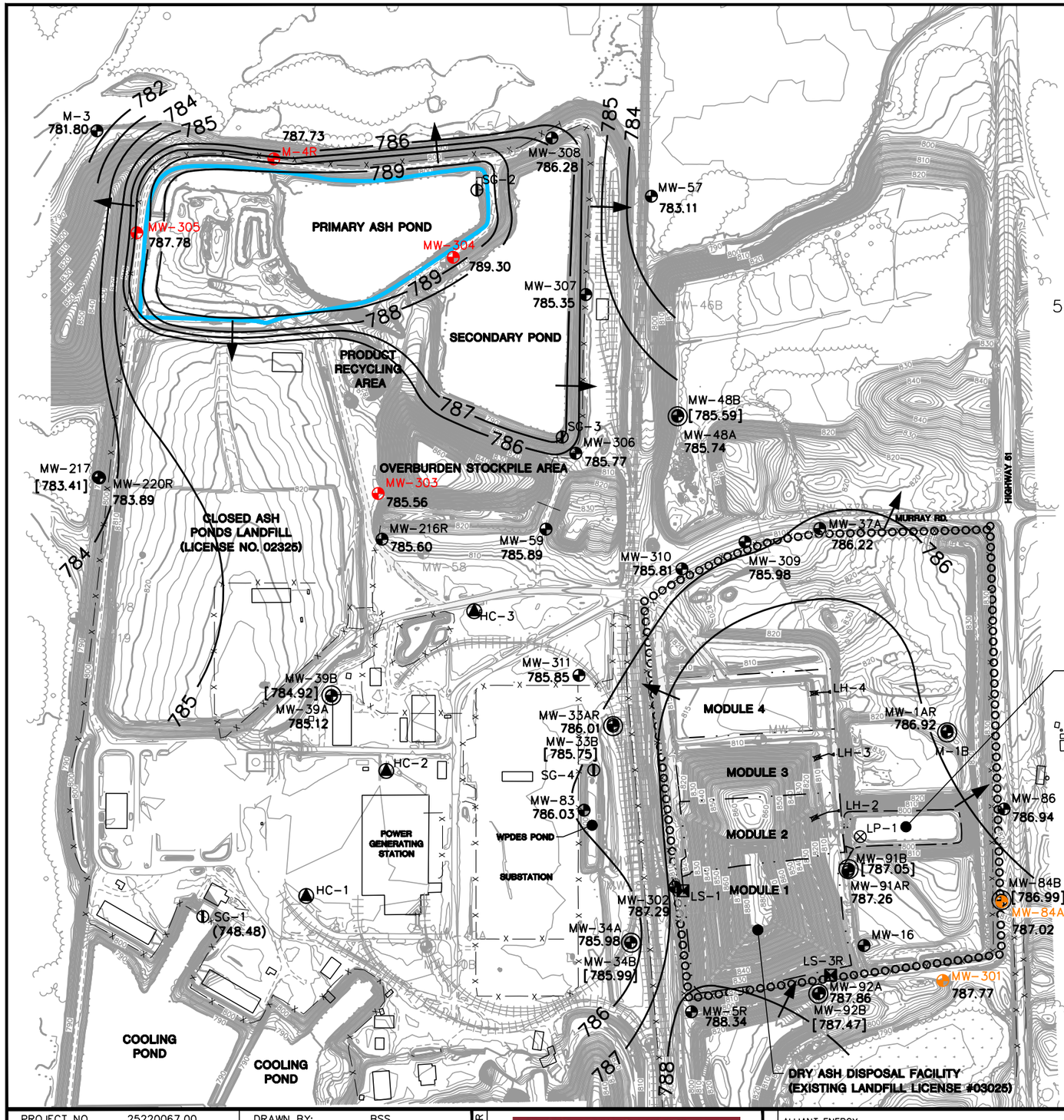
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25220067.00\Drawings\ASD Mod 1\3 L...\Site Plan and Monitoring ell LocationsPP.dwg, 1/20/2021 2:39:19 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCE LINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
- CONSTRUCTED LIMITS OF WASTE (DRY ASH LANDFILL)
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION MEASURED MAY 2020
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION MEASURED MAY 2020 (NOT CONTOURED)
- (795.20) — SURFACE WATER ELEVATION MEASURED MAY 2020 (NOT CONTOURED)
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, AND MAY 2019.
2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND JANUARY 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11-13, 2015.
5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14-15, 2016.
6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
7. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS AND PIEZOMETERS ON MAY 27 THROUGH MAY 29, 2020.
8. BACKGROUND MONITORING WELLS FOR THE PRIMARY ASH POND ARE: MW-301 AND MW-84A.

PROJECT NO.	25220067.00	DRAWN BY:	BSS
DRAWN:	08/26/2020	CHECKED BY:	NDK
REVISED:	08/26/2020	APPROVED BY:	SCC 09/25/2020

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

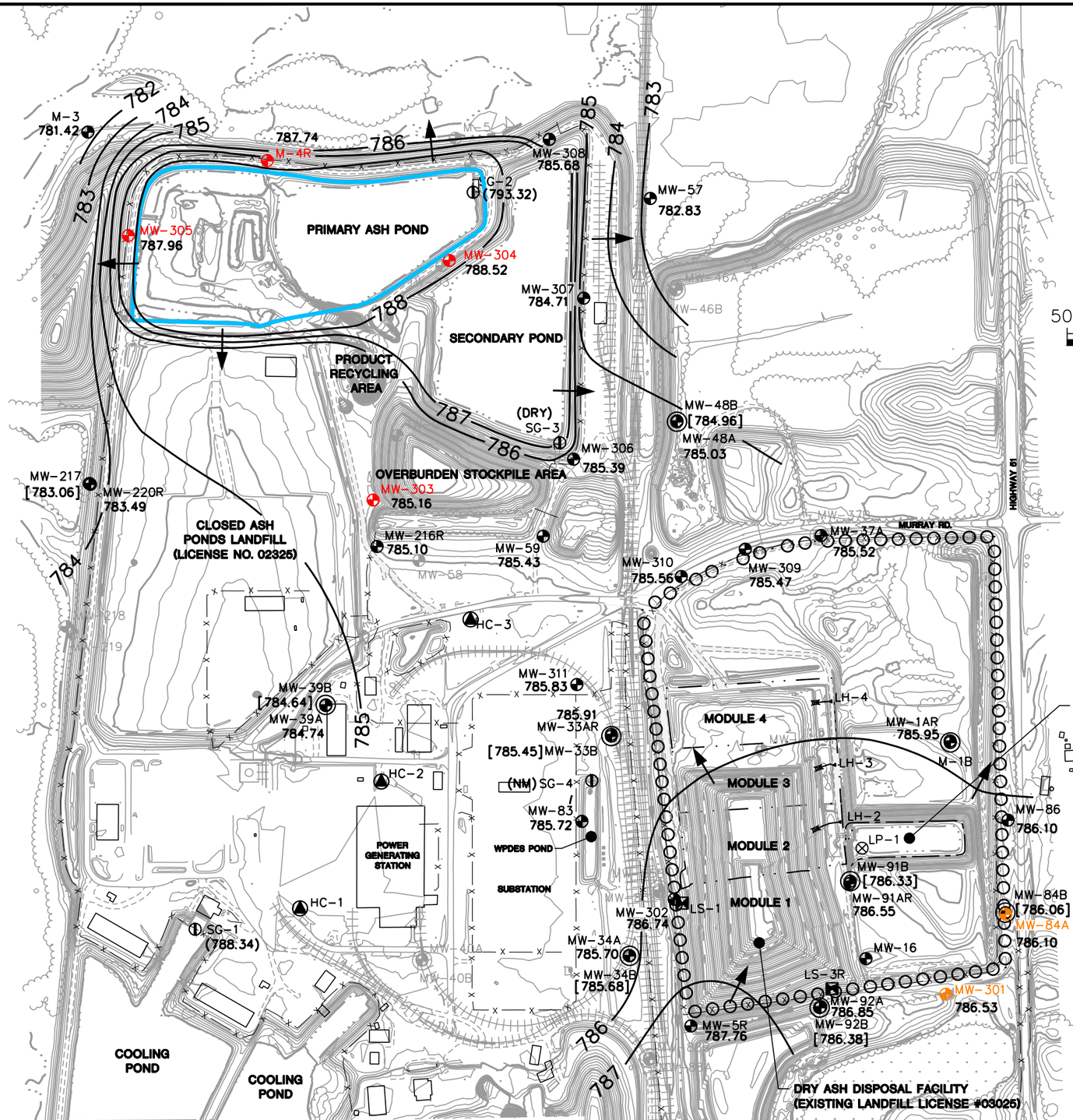
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
MAY 2020

FIGURE
3

I:\25220067.00\Drawings\□ater □a□le Map Ma□2020 PP.dwg, 1/20/2021 2:02:0□ PM



N

500 0 500

SCALE: 1" = 500'

LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCE LINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
- CONSTRUCTED LIMITS OF WASTE (DRY ASH LANDFILL)
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- **787.62** WATER TABLE ELEVATION MEASURED OCTOBER 2020
- **[788.87]** POTENTIOMETRIC SURFACE ELEVATION MEASURED OCTOBER 2020 (NOT CONTOURED)
- **(795.20)** SURFACE WATER ELEVATION MEASURED OCTOBER 2020 (NOT CONTOURED)
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- **(NM)** NOT MEASURED

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, MAY 2019, AND SEPTEMBER 2020.
2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND JANUARY 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11-13, 2015.
5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14-15, 2016.
6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
7. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS AND PIEZOMETERS ON OCTOBER 7, 8, and 17, 2020.
8. BACKGROUND MONITORING WELLS FOR THE PRIMARY ASH POND ARE: MW-301 AND MW-84A.

PROJECT NO.	25220067.00	DRAWN BY:	KP/ZTW
DRAWN:	08/07/2020	CHECKED BY:	TK
REVISED:	01/05/2021	APPROVED BY:	TK 01/28/2021

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

CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2020

FIGURE
4

I:\25220067.00\Drawings\ASD Mod 1\3 L\...\Water Table Map Oct 2020 PP.dwg, 1/20/2021 2:32:09 PM

Appendix A

Summary of Regional Hydrogeologic Stratigraphy

Table COL-3. Regional Hydrogeologic Stratigraphy
Columbia Energy Center / SCS Engineers Project #25215053

Approximate Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary (0-1 million years old)	Surficial Aquifer	0 to 300+	Holocene & Pleistocene Deposits	• Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic matter
Ordovician (460 to 490 million years old)	Sandstone Aquifer	0 to 800+	Galena Decorah Platteville St. Peter Prairie du Chien	• Dolomite and shaley dolomite • Sandstone
Cambrian (490 to 500 million years old)			Trempeleau Franconia Galesville Eau Claire Mt. Simon	• Sandstone
Precambrian (more than 1 billion years old)	Used for domestic supply in some areas	--	Precambrian	• Igneous and metamorphic rocks

*This nomenclature and classification of rock units in this report are those of the Wisconsin Geological and Natural History Survey and do not necessarily coincide with those accepted by the U.S. Geological Survey.

Sources:

Harr, C.A., L.C. Trotta, and R.G. Borman, "Ground-Water Resources and Geology of Columbia County, Wisconsin," University of Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.

Wisconsin Geological and Natural History Survey, Bedrock Stratigraphic Units in Wisconsin, UW Extension Educational Series 51, ISSN: 1052-2115, 2011.

I:\25215053\Reports\Report 3 - Columbia\Tables\Table_2_Regional_Hydrogeologic_Stratigraphy.doc

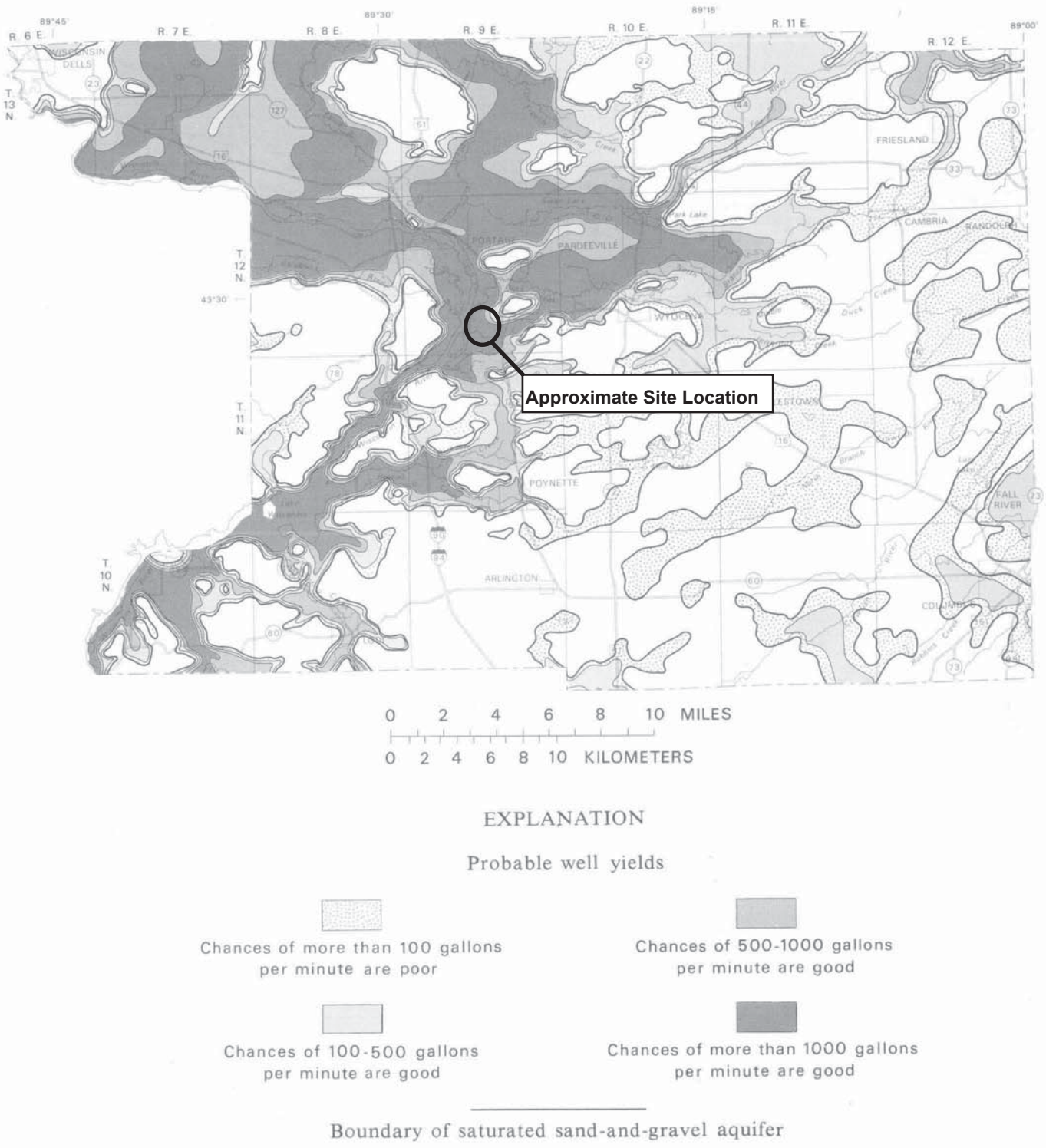
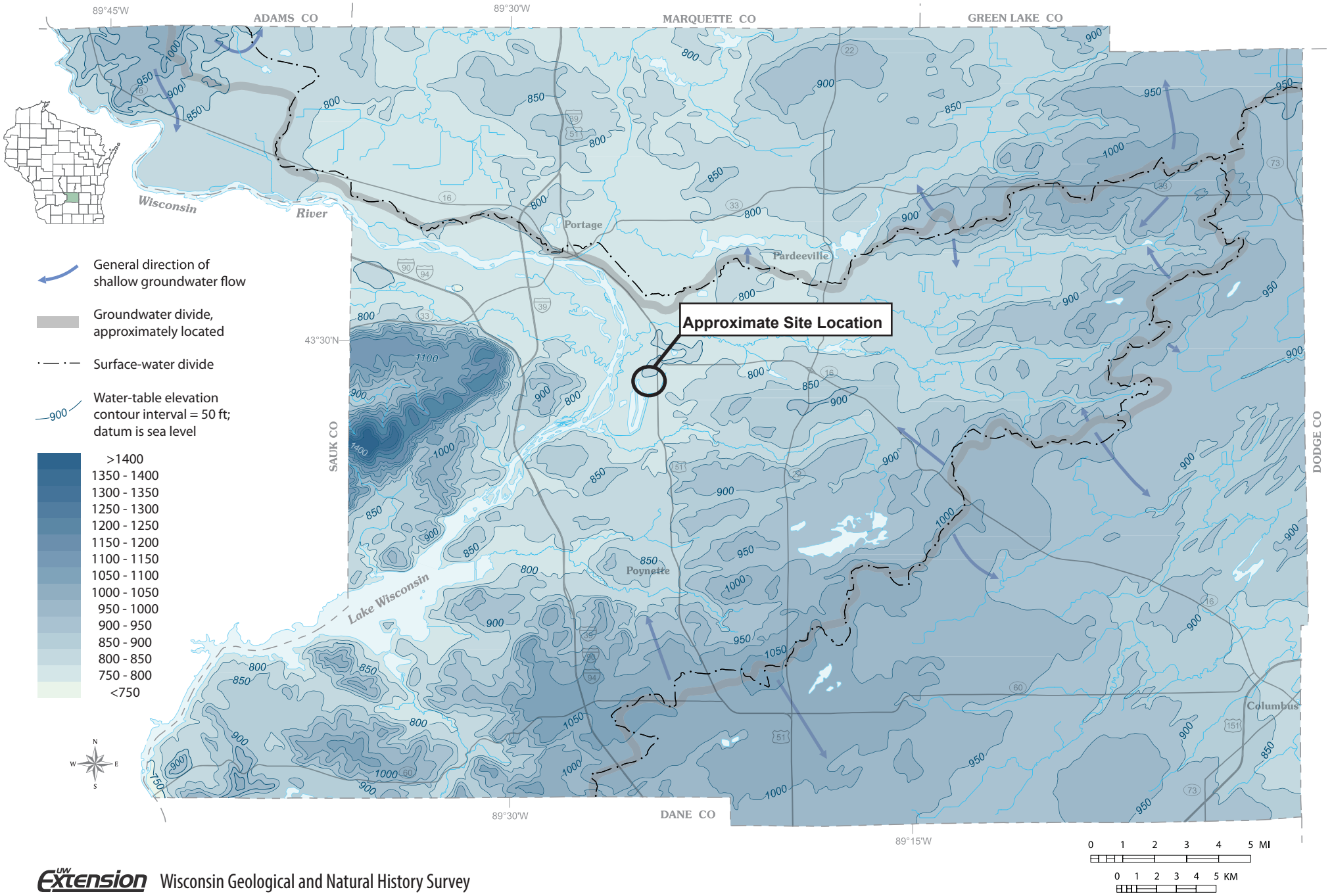


Figure 9. Probably well yields from the sand-and-gravel aquifer.

Source: Harr, C.A., L.C. Trotta, and R.G. Borman, "Ground-Water Resources and Geology of Columbia County, Wisconsin," University of Wisconisn-Extension Geological and Natural History Surevy Information Circular Number 37, 1978.

Generalized water-table elevation in Columbia County, Wisconsin



UW Extension Wisconsin Geological and Natural History Survey

Source: Sellwood, Stephen M., Wisconsin Geologic and Natural History Survey, Water Table Elevation, Groundwater Resources of Columbia County Wisconsin,

Appendix B

Boring Logs and Well Construction Documentation

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-Columbia SCS#: 25215135.00		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 Drilling	11/11/2015	11/11/2015	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY701			Feet	803.69 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 541562.2 N, 2025001.0 E S/C/N
1/4 of 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

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: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S1	21	7 6 9 10	1–2	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.						M				
S2	20	6 7 9 10	3–4	Same as above except, 10YR 5/4 (top section), 10YR 3/6 (bottom section), trace gravel.						M				
S3	22	7 6 9 6	5–7	Same as above except, 10YR 3/4 (bottom), 10YR 5/4 (top), trace little roots and sticks, trace gravel.	SM					M				
S4	21	4 5 6 5	8–10	Same as above except, 10YR (top), 10YR 4/6 (bottom), trace clay at bottom.						M				
S5	18	2 2 4 5	11–12	Same as above except, fine to coarse grained sand, little gravel, trace clay in top half, 10YR 3/6.						M				
S6	20	2 3 3 3	13–15	Same as above except, 10YR 6/8.						M				

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

Signature [signature] Firm SCS Engineers
2830 Dairy Drive Madison, WI 53711
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: Pocket Penetration (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.										
S7	20	5 4 4 3	17							M				
			18											
			19											
S8	20	2 4 4 5	20							W				
			21											
					SM									
S9	23	4 4 3 6	22							W				
			23											
			24	Same as above except, 10YR 6/4.										
S10	21	3 2 4 10	25							W				
			26											
			27											
			28	End of boring at 28 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-Columbia SCS#: 25215135.00		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 Drilling	11/12/2015	11/13/2015	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY714			Feet	808.69 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 543655.7 N, 2122574 E
1/4 of 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

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: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S1	20	5 8 15 10	1–3	SILTY SAND CLAY with GRAVEL, (fill), tan colored 10YR 7/6.	SM					M				
S2	24	7 7 7 17	4–5	Same as above except, grey/brown (10YR 5/4).						M				
S3	20	13 34 50/5	6–8	SILTY SAND, trace gravel, tan color (10YR 5/4).						M				
S4	14	30 50/5	9–10		SM					M				
S5	15	31 50/3	11–13							M				
S6	15	38 50/3	14–15	Same as above with an inch of rock (limestone).						M				

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

Signature for Zach Watson Firm SCS Engineers 2830 Dairy Drive Madison, WI 53711 Tel: (608) 224-2830 Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample Number and Type	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: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16											
S7	10	50/4	17	SILTY SAND, trace gravel, tan color (10YR 5/4), with trace gravel.						M				
			18											
			19											
S8	18	28 37 50/4	20							M				
			21											
S9	0	50	22											Lost spoon tip no sample.
			23											
			24	Same as above except, fine to coarse grained sand, little gravel.	SM									
S10	15	35 50/5	25							M				
			26	Same as above except, tan (10YR 5/6).										
S11	14	7 50/3	27							W				
			28											
			29											
			30											
			31											
			32											
			33	End of boring at 33 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-Columbia SCS#: 25215135.00		MW-304

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State Drilling	11/12/2015	11/12/2015	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY703			Feet	802.50 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 544671 N, 2122897 E /C/N
1/4 of 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

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: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL.	TOPSOIL									
				SILTY SAND, mostly fine, brown/tan (10YR 5/6).										
S1	24	7 8 10 12	2							M				
			3											
			4	Same as above except, trace gravel, brown tan to grey (top to bottom) 10YR 5/4.										
S2	24	14 22 26 31	5							M				
			6	Same as above except, brown/tan/grey assorted coloring.										
S3	24	16 18 22 24	7							M				
			8		SM									
			9	Same as above except, black/grey/brown, saturated area about 2" thick.										
S4	24	11 15 15 14	10							M				
			11	Same as above except, 10YR 5/3.										
S5	24	23 31 30 29	12							M				
			13											
			14	trace gravel.										
S6	20	9 10 7 5	15							M				

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

Signature for Zach Watson Firm SCS Engineers Tel: (608) 224-2830
2830 Dairy Drive Madison, WI 53711 Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-304 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	SILTY SAND, mostly fine, brown/tan (10YR 5/6).										
S7	4		17							W				dropped spoon
			18											
			19	Same as above except, 10YR 6/3.	SM									
S8			20							W				
			21											
			22											
			23	End of boring at 23 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-Columbia SCS#: 25215135.00		MW-305

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State Drilling	11/13/2015	11/13/2015	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY716			Feet	803.95 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 544776.1 N, 2121537 E S/C/N
1/4 of 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

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: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL	TOPSOIL									
S1	18	5 8 9 7	2	SILTY SAND, mostly fine, brown/tan 10YR 5/8.						M				
S2	18	2 3 3 4	5							M				
S3	18	2 8 9 8	7	Same as above except, trace gravel, tan 10YR 6/8 at bottom.	SM					M				
S4	20	5 7 6 5	10	Same as above except, light tan 10YR 6/6, trace gravel, some large gravel chunks.						M				
S5	20	9 12 17 22	12	POORLY GRADED SAND, tan (10YR 6/8), trace gravel, some saturated areas.	SP					M				
S6	24	16 19 22 34	15	SILTY SAND, trace gravel, tan (10YR 5/6).	SM					W				

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

Signature for Zach Watson Firm SCS Engineers 2830 Dairy Drive Madison, WI 53711 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-305 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S7		31 30 41 50/2	16	SILTY SAND, trace gravel, tan (10YR 5/6), some large dolomite chunks.	SM					W				
			17											
			18	End of boring at 18 ft bgs.										

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
Alliant-Columbia	Columbia	MW-301

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VY701	

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 120 min.

4. Depth of well (from top of well casisng) 29.4 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 7.6 gal.

7. Volume of water removed from well 84.0 gal.

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

9. Source of water added _____

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. 21.72 ft.	21.77 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015
Time	c. 08:30 ☒ a.m. ☐ p.m.	10:30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.__ inches	0.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

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

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

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Nate Last Name: Sievers
Facility/Firm: Wisconsin Power and Light
Street: W8375 Murray Rd.
City/State/Zip: Pardeville, WI 53954

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature] for Gary Sterkel
Print Name: Gary Sterkel
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
Alliant - Columbia	Columbia	MW-302

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VY702	

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 120 min.

4. Depth of well (from top of well casisng) 33.6 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 5.4 gal.

7. Volume of water removed from well 60.0 gal.

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

9. Source of water added _____

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. 28.37 ft.	28.41 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015 (m m d d y y y y)
Time	c. 02:00 ☐ a.m. ☒ p.m.	04:00 ☐ 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: Gary Last Name: Sterkel
Firm: SCS ENGINEERS

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Nate Last Name: Sievers
Facility/Firm: Wisconsin Power and Light
Street: W8375 Murray Rd.
City/State/Zip: Pardeeville, WI 53954

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature] for G.S.
Print Name: Gary Sterkel
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
Alliant - Columbia	Columbia	MW-303

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VY714	

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 120 min.

4. Depth of well (from top of well casisng) 35.8 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 7.5 gal.

7. Volume of water removed from well 83.0 gal.

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

9. Source of water added _____

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. 28.30 ft.	28.38 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015 (m m d d y y y y)
Time	c. 11:45 ☒ a.m. ☐ p.m.	1:45 ☐ 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: Gary Last Name: Sterkel
Firm: SCS ENGINEERS

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Nate Last Name: Sievers
Facility/Firm: Wisconsin Power and Light
Street: W8375 Murray Rd.
City/State/Zip: Pardeeville, WI 53954

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: for G.S.
Print Name: Gary Sterkel
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
Alliant - Columbia	Columbia	MW-304

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VY703	

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 135 min.

4. Depth of well (from top of well casisng) 25.7 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 8.0 gal.

7. Volume of water removed from well 88.0 gal.

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

9. Source of water added _____

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. 17.26 ft.	20.85 ft.
Date	b. 12/03/2015 (m m d d y y y y)	12/03/2015
Time	c. 11:00 ☒ a.m. ☐ p.m.	01:15 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	____.__ inches	____.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)
14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

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

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

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Nate Last Name: Sievers
Facility/Firm: Wisconsin Power and Light
Street: W8375 Murray Rd.
City/State/Zip: Pardeeville, WI 53954

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: for G. S.
Print Name: Gary Sterkel
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
Alliant - Columbia	Columbia	MW-305

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VY716	

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 120 min.

4. Depth of well (from top of well casisng) 25.6 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 7.7 gal.

7. Volume of water removed from well 85.0 gal.

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

9. Source of water added _____

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. 18.61 ft.	18.62 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015
Time	c. 08:30 ☒ a.m. ☐ p.m.	11:30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	____.__ inches	____.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

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

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

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Nate Last Name: Sievers
Facility/Firm: Wisconsin Power and Light
Street: W8375 Murray Rd.
City/State/Zip: Pardeeville, WI 53954

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: for G.S.
Print Name: Gary Sterkel
Firm: SCS ENGINEERS

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

SCS # 25215135

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-Columbia	Local Grid Location of Well: ____ ft. ☐N. ☐S. ____ ft. ☐E. ☐W.	Well Name: MW-301
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY701 / DNR Well ID No.:
Facility ID	St. Plane 541562.2 ft. N, 2125001 ft. E. S/C/N	Date Well Installed: 11 / 11 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SW 1/4 of SE 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst / 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 807.16 ft. MSL
B. Well casing, top elevation 806.89 ft. MSL
C. Land surface elevation 803.69 ft. MSL
D. Surface seal, bottom 791.69 ft. MSL or 12 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 ☐ ____

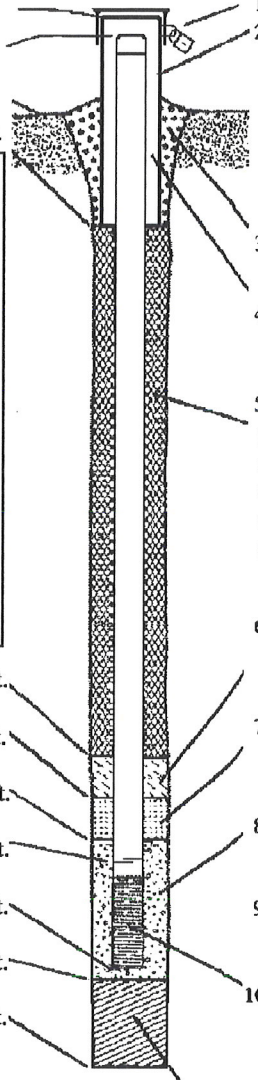
15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

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

E. Bentonite seal, top 803.69 ft. MSL or 0 ft.
F. Fine sand, top 791.69 ft. MSL or 12 ft.
G. Filter pack, top 789.69 ft. MSL or 14 ft.
H. Screen joint, top 787.69 ft. MSL or 16 ft.
I. Well bottom 777.69 ft. MSL or 26 ft.
J. Filter pack, bottom 776.69 ft. MSL or 27 ft.
K. Borehole, bottom 775.69 ft. MSL or 28 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 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 / Other ☐ ____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ____
4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐ ____
Bentonite to grade, sand above
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. 4 ft3 Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #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: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ____
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Native / 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: 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

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-Columbia	Local Grid Location of Well: ____ ft. ☐N ☐S ____ ft. ☐E ☐W	Well Name: MW-303
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY714 / DNR Well ID No.:
Facility ID	St. Plane 543655.7 ft. N, 2122574 ft. E. S/C/N	Date Well Installed: 11 / 13 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SW 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst / 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 811.81 ft. MSL
B. Well casing, top elevation 811.52 ft. MSL
C. Land surface elevation 808.69 ft. MSL
D. Surface seal, bottom 789.69 ft. MSL or 19 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 ☐ ____

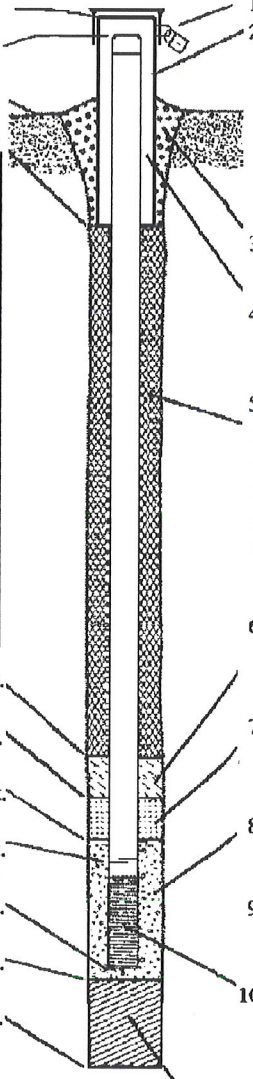
15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

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

E. Bentonite seal, top 808.69 ft. MSL or 0 ft.
F. Fine sand, top 789.69 ft. MSL or 19 ft.
G. Filter pack, top 787.69 ft. MSL or 21 ft.
H. Screen joint, top 785.69 ft. MSL or 23 ft.
I. Well bottom 775.69 ft. MSL or 33 ft.
J. Filter pack, bottom 775.69 ft. MSL or 33 ft.
K. Borehole, bottom 774.69 ft. MSL or 34 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 in.
b. Length: 5 ft.
c. Material: steel — Steel ☒ 04 / Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: yes, bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ____
4. Material between well casing and protective pipe: Bentonite to grade, sand in between — Bentonite ☒ 30 / Other ☐ ____
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft³ 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. 6.7 ft3 Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft³
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 2.5 ft³
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 Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Native — None ☐ 14 / Other ☒ ____

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

Signature: for Zach Watson
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

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-Columbia	Local Grid Location of Well: ___ ft. ☐N ☐S ___ ft. ☐E ☐W	Well Name: MW-304
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY703 ____ DNR Well ID No.: ____
Facility ID: ____	St. Plane 544671 ft. N, 2122897 ft. E. S/C/N	Date Well Installed: 11 / 12 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst; 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 805.67 ft. MSL

B. Well casing, top elevation 805.42 ft. MSL

C. Land surface elevation 802.50 ft. MSL

D. Surface seal, bottom 793.50 ft. MSL or 9 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):

E. Bentonite seal, top 802.50 ft. MSL or 0 ft.

F. Fine sand, top 793.50 ft. MSL or 9 ft.

G. Filter pack, top 791.50 ft. MSL or 11 ft.

H. Screen joint, top 789.50 ft. MSL or 13 ft.

I. Well bottom 779.50 ft. MSL or 23 ft.

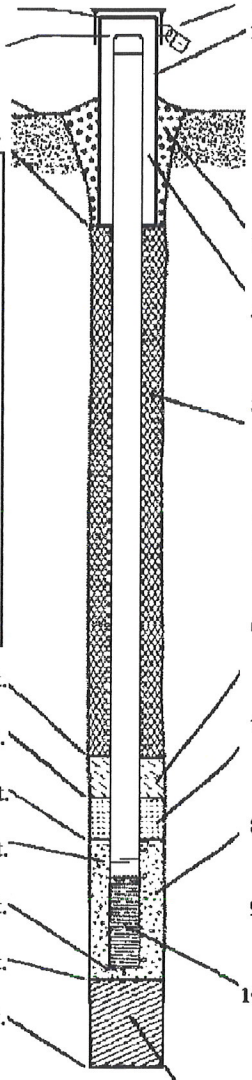
J. Filter pack, bottom 779.50 ft. MSL or 23 ft.

K. Borehole, bottom 779.50 ft. MSL or 23 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 in.
b. Length: 5 ft.
c. Material: steel — Steel ☐ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: yes, bumper posts
3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ ____
4. Material between well casing and protective pipe: Sand. Bentonite to grade — Bentonite ☒ 30; Other ☐ ____
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☐ 32
c. 3.4 ft3 Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #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: PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Native — None ☐ 14; Other ☒ ____

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

Signature: for Zach Watson | 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

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-Columbia	Local Grid Location of Well: ____ ft. ☐N ☐S ____ ft. ☐E ☐W	Well Name: MW-305
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ____ ° ____ ' ____ " Long. ____ ° ____ ' ____ " or	Wis. Unique Well No.: VY716 / DNR Well ID No.:
Facility ID	St. Plane 544776.1 ft. N, 2121537 ft. E. S/C/N	Date Well Installed: 11 / 13 / 2015 (m m d d y y y y)
Type of Well: Well Code ____ / ____	Section Location of Waste/Source: SW 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst / 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 806.88 ft. MSL
B. Well casing, top elevation 806.32 ft. MSL
C. Land surface elevation 803.95 ft. MSL
D. Surface seal, bottom 794.95 ft. MSL or 9 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

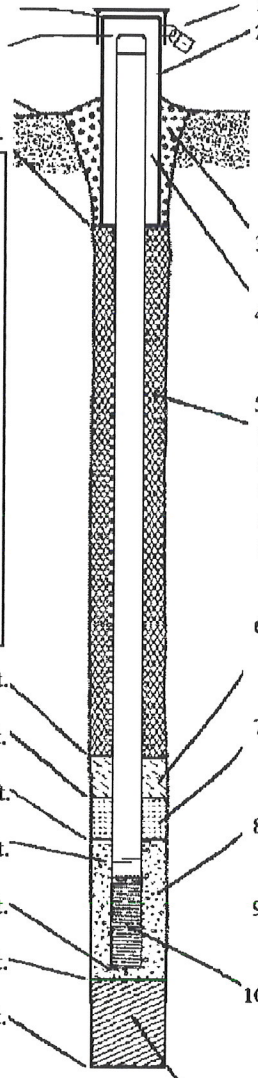
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ____

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):
____

E. Bentonite seal, top 803.95 ft. MSL or 0 ft.
F. Fine sand, top 794.95 ft. MSL or 9 ft.
G. Filter pack, top 792.95 ft. MSL or 11 ft.
H. Screen joint, top 789.95 ft. MSL or 13 ft.
I. Well bottom 779.95 ft. MSL or 23 ft.
J. Filter pack, bottom 779.95 ft. MSL or 23 ft.
K. Borehole, bottom 779.35 ft. MSL or 23.6 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 in.
b. Length: 5 ft.
c. Material: steel — Steel ☐ 04 / Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: yes, bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ____
4. Material between well casing and protective pipe: Bentonite to grade, sand in between — Bentonite ☐ 30 / Other ☐ ____
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. 2 ft3 Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 3 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 Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Native — None ☐ 14 / Other ☒ ____

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

Signature: for Zach Watson
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.

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Wisconsin Power & Light

Location Columbia Generating Station

Boring No. MW-84A

Surface Elevation 813.4

Job No. C 7134

Sheet 1 of 1

1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		q_u	W	LL	PL	D
						Dark Brown Silty SAND (SM)					
					5						
						Brown Fine to Medium SAND, Little Silt, Trace to Little Gravel and Boulders (SM)					
					10						
					15						
					20						
					25						
					30						
					35						
					40	End Boring at 37'					
						Well Installed at 37'					

WATER LEVEL OBSERVATIONS

While Drilling

Upon Completion of Drilling

Time After Drilling

Depth to Water

Depth to Cave In

GENERAL NOTES

Start 10/5/83 Complete 10/5/83

Crew Chief JVS Rig B-40

Drilling Method ED 0-37'

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
WP&L - Columbia 3024.07		**M4R**

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Environmental & Foundation Drilling, Crew: Frank, Jim, Leon	**8/22/96**	**8/22/96**	**4 1/4 HSA**

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		M4R	Feet MSL	**803.6** Feet MSL	**8.0** Inches

Boring Location
State Plane **545093.90 N, 2122125.90 E** Lat ° ' "
NW 1/4 of **NW** 1/4 of Section **27** T **12** N,R **9E** Long ° ' "

Local Grid Location (If applicable)
☐ N Feet ☐ E
☐ S Feet ☐ W

County	DNR County Code	Civil Town/City/ or Village
Columbia	**11**	**Pacific**

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	Comments
1	12	22	0–1	**SILTY SAND (SM)**, trace fine gravel, non-plastic, yellowish brown 10YR 5/6, no odor, loose, (Fill).	SM					M				SS
2	24	16	2–3	As above, occasional thin layers of light brown sand.										SS
3	15	17	4–5	As above. Color change to 10YR 5/4.										SS
4	24	25	6–7	As above, occasional 10YR 4/4 dark yellowish brown seams with more silt, trace clay.										SS
5	23	19	8–9	As above. 1" gravel (dark colored) at about 9.0 feet.										SS
			10–12											

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

Signature

Firm RMT
744 Heartland Trail, Madison Wisconsin
Tel: 608-831-4444, Fax: 608-831-3334

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

APPENDIX C

State of Wisconsin
Department of Natural Resources

Soil Boring Log Information Supplement
Form 4400-122A
7-91

Boring Number **M4R** Use only as an attachment to Form 4400-122.

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	Comments
6	22	34	13	As above.										SS
			14											
			15	Color change to 10YR 5/3 brown at 14.8 feet, (Native).						VM				
			16											
			17											
7	22	9	18	As above, no stratigraphy, 10YR 4/6 dark yellowish brown.						W	NV	NP	9.0%	SS
			19											
			20											
			21											
			22											
			23											
				End of boring at 23.5 feet.										

WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

BORING NO. MW-84A

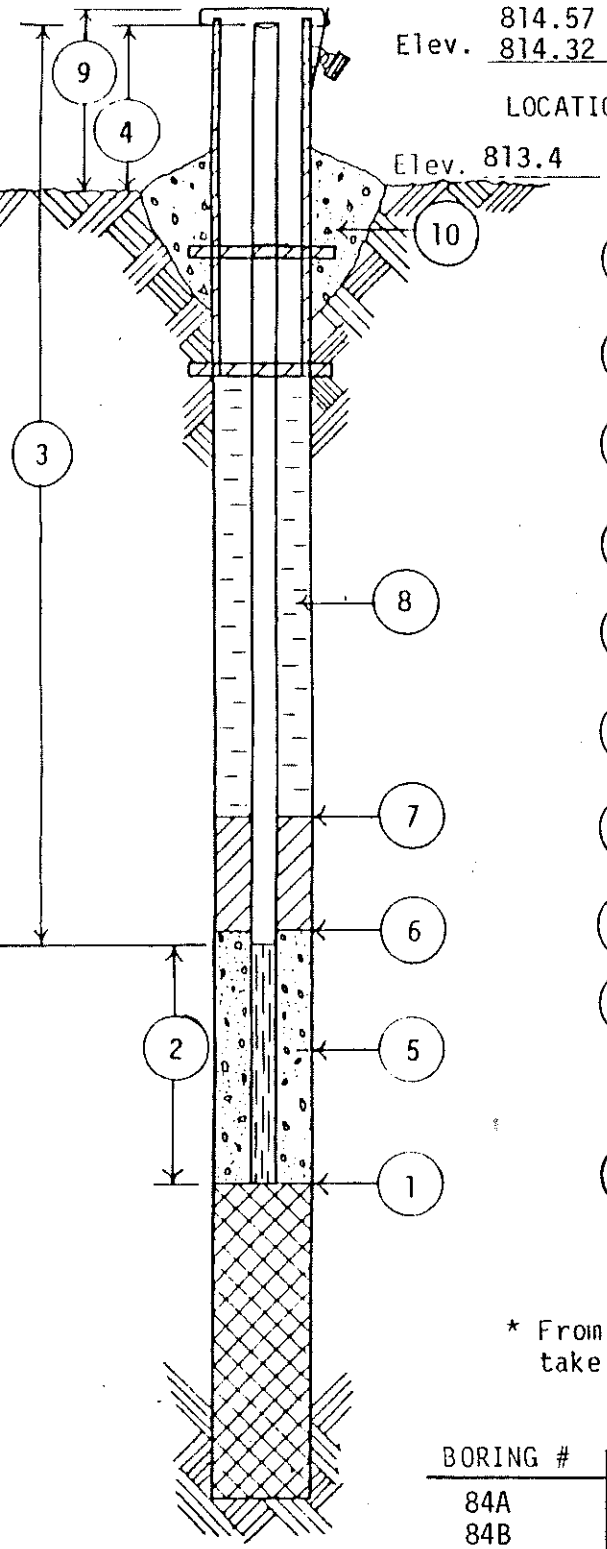
DATE 10/5/83

Elev. 814.57 Steel
814.32 PVC

CHIEF JS

LOCATION WP&L-Columbia Generating Station

All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.



(1) DEPTH TO BOTTOM OF BOREHOLE
37 FEET

(2) LENGTH OF WELL POINT, (WELL SCREEN,) OR SLOTTED PIPE 10 FEET

(3) TOTAL LENGTH OF SOLID PIPE 29 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND
2 FEET

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Flint Sand

(6) DEPTH OF LOWER OR BOTTOM SEAL
3 FEET

(7) DEPTH OF UPPER OR TOP SEAL
0 FEET

(8) TYPE OF BACKFILL Spoils (Sand)

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND 2'

LOCKING CAP (YES) NO

(10) CONCRETE CAP (YES) NO

WATER LEVEL CHECKS

* From top of casing, if protective casing higher take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS
84A	10/7/83	3 days	21'	
84B	10/7/83	3 days	19'6"	

WARZYN ENGINEERING INC.

FM1S-7-15]

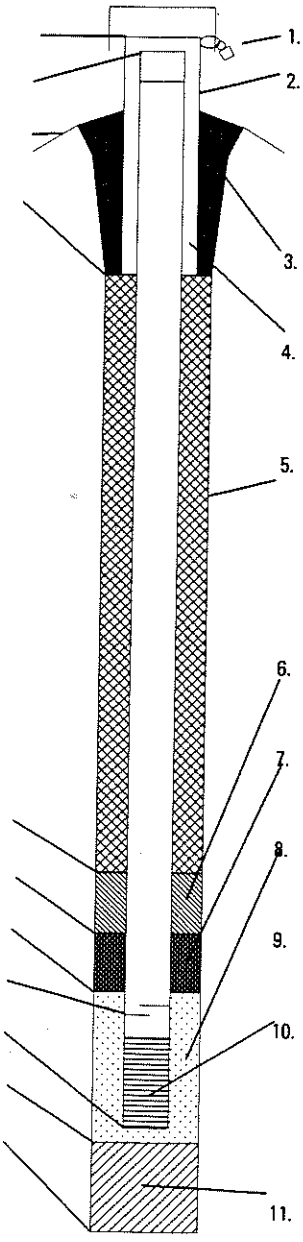
e of Wisconsin
partment of Natural Resources

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

...ONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4-9(

acility/Project Name P&L Columbia	Local Grid Location of Well ■ N. 545093.9 ft. ☐ S. ■ E. 2122125.9 ft. ☐ W.	Well Name M4R
acility License, Permit or Monitoring Number 2325	Grid Origin Location Lat. ___ ___ ___ Long. ___ ___ ___ or St. Plane ____ ft. N, ____ ft. E.	Wis. Unique Well Number ____ DNR Well Number 133
ype of Well: Water Table Observation Well ■ 11 Piezometer ☐ 12	Section Location of Waste/Source NW¼ of NW¼ of Sec. 27, T 12N, R 9 ■ E. ☐ W.	Date Well Installed 0 8 / 2 2 / 9 6 M M D D Y Y
Distance Well is From Waste/Source Boundary 120 ft.	Location of Well Relative to Waste/Source U ☐ Upgradient S ☐ Sidegradient D ■ Downgradient N ☐ Not Known	Well Installed By: (Persons' Name and Firm) Frank Badula Environmental & Foundation Drilling
s Well A Point of Enforcement Std. Application? ☐ Yes ■ No		



Protective pipe, top elevation	805.94 ft. MSL
Well casing, top elevation	806.10 ft. MSL
Land surface elevation	803.6 ft. MSL
Surface seal, bottom	803.1 ft. MSL or 0.5 ft.
Bentonite seal, top	803.1 ft. MSL or 0.5 ft.
Fine sand, top	794.6 ft. MSL or 9.0 ft.
Filter pack, top	792.6 ft. MSL or 11.0 ft.
Screen joint, top	790.6 ft. MSL or 13.0 ft.
Well bottom	780.6 ft. MSL or 23.0 ft.
Filter pack, bottom	780.1 ft. MSL or 23.5 ft.
Borehole, bottom	780.1 ft. MSL or 23.5 ft.
Borehole, diameter	8.0 in.
O.D. well casing	2.38 in.
D. well casing	2.03 in.

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):

1. Cap and lock? ■ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 i
b. Length: 7.0 f
c. Material: Steel ■ 04
Other ☐
d. Additional protection? ■ Yes ☐ No
If yes, describe: Bumper posts

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:
b. ___ Lbs/gal mud weight....
c. ___ Lbs/gal mud weight.....
d. ___ % Bentonite.....
e. ___ lb volume added for any of the above
f. How installed:
a. Granular Bentonite ☐ 33
Bentonite-sand slurry ☐ 35
Bentonite slurry ☐ 31
Bentonite-cement grout ☐ 50
Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ■ 08

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

7. Fine sand material: Manufacturer, product name, mesh size
a. Unimin silica sand
b. Volume added 75 lbs

8. Filter pack material: Manufacturer, product, mesh size
a. Badger Mining Co. (#30)
b. Volume added 400 lbs

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 Timco
c. Slot size: 0.010 in
d. Slotted length: 10.0 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

Firm
RMT, Inc.

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. Adm. 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 $5,000 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.

I:\WPMSN\PJT\00-03024\07\B0003024.07A 12/31/9

APPENDIX D
APPENDIX E
APPENDIX F
APPENDIX G

ate of Wisconsin
epartment 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 ☐ _____

cility/Project Name	County Name	Well Name	
P&L Columbia	Columbia	M4R	
cility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well Number
2325	11		133

		Before Development	After Development
Can this well be purged dry?	☐ Yes ■ No		
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 _____	☐		
11. Depth to Water (from top of well casing)		a. 19.90 ft.	20.05 ft.
Date		b. 08/23/96 m m d d y y ■ a.m.	08/23/96 m m d d y y ■ a.m.
Time		c. 8:30 ☐ p.m.	10:30 ☐ p.m.
12. Sediment in well bottom		0. inches	0. inches
13. Water clarity		Clear ☐ 10 Turbid ■ 15 (Describe) Brn, very silty	Clear ■ 20 Turbid ☐ 25 (Describe)
Time spent developing well	120 min.		
Depth of well (from top of well casing)	253. ft.		
Inside diameter of well	2.0 in.		
Volume of water in filter pack and well casing	4.2 gal.		
Volume of water removed from well	70. gal.		
Volume of water added (if any)	0. gal.		
Source of water added			
Fill in if drilling fluids were used and well is at solid waste facility:			
14. Total suspended solids		_____ mg/l	190. mg/l
15. COD		_____ mg/l	N/A. mg/l

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

. Additional comments on development: Well was surged w/PVC bailer for 30 nutes and then pumped.

me	Volume Removed (gal.)	pH	Temperature (°C)	Conductivity (μmhos)
40	0 (initial)	6.12	15.2	660
25	10	6.73	14.0	670
40	25	6.95	13.7	610
50	35	6.90	13.7	600
55	45	6.87	13.6	600
:00	55	6.92	13.6	600
:10	70	6.95	13.7	600

ell developed by: Person's Name and Firm

me: Meredith Westover

m: RMT, Inc.

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

Signature: _____

Print Initials: M L W

Firm: RMT, Inc.

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

I:\WPMSN\PJT\00-03024\07\B0003024.07A 12/31/96

APPENDIX D
APPENDIX E
APPENDIX F
APPENDIX G

Appendix C

Laboratory Reports

C1 May 2020 Assessment Monitoring

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

June 23, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on May 29, 2020. 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
- Pace Analytical Services - Greensburg

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: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40208496001	**MW-303**	Water	05/27/20 14:35	05/29/20 08:50
40208496002	**MW-304**	Water	05/27/20 12:45	05/29/20 08:50
40208496003	**MW-305**	Water	05/27/20 10:00	05/29/20 08:50
40208496004	**M-4R**	Water	05/27/20 11:00	05/29/20 08:50
40208496005	**FIELD BLANK-PPOND**	Water	05/27/20 11:00	05/29/20 08:05

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40208496001	**MW-303**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208496002	**MW-304**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208496003	**MW-305**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208496004	**M-4R**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208496005	**FIELD BLANK-PPOND**	EPA 6020	DS1	14	PASI-G

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SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: MW-303 **Lab ID: 40208496001** Collected: 05/27/20 14:35 Received: 05/29/20 08:50 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								
Antimony	**0.22J**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 06:19	7440-36-0	
Arsenic	**5.9**	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 06:19	7440-38-2	
Barium	**13.8**	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 06:19	7440-39-3	
Beryllium	**0.36J**	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 06:19	7440-41-7	
Boron	**2700**	ug/L	100	30.3	10	06/01/20 18:15	06/11/20 15:45	7440-42-8	
Cadmium	**0.30J**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 06:19	7440-43-9	
Calcium	**27400**	ug/L	2540	762	10	06/01/20 18:15	06/11/20 05:52	7440-70-2	P6
Chromium	**42.8**	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 06:19	7440-47-3	
Cobalt	**0.49J**	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 06:19	7440-48-4	
Lead	**0.32J**	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 06:19	7439-92-1	
Lithium	**1.2**	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 06:19	7439-93-2	
Molybdenum	**67.1**	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 06:19	7439-98-7	
Selenium	**18.7**	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 06:19	7782-49-2	
Thallium	**0.28J**	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 06:19	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.084**	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:18	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**8.68**	Std. Units			1		05/27/20 14:35		
Field Specific Conductance	**828**	umhos/cm			1		05/27/20 14:35		
Oxygen, Dissolved	**9.15**	mg/L			1		05/27/20 14:35	7782-44-7	
REDOX	**116.1**	mV			1		05/27/20 14:35		
Turbidity	**0.0**	NTU			1		05/27/20 14:35		
Static Water Level	**785.56**	feet			1		05/27/20 14:35		
Temperature, Water (C)	**11.6**	deg C			1		05/27/20 14:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**570**	mg/L	20.0	8.7	1		06/01/20 16:19		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.2**	Std. Units	0.10	0.010	1		06/01/20 09:19		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**2.3J**	mg/L	10.0	2.2	5		06/09/20 15:21	16887-00-6	D3
Fluoride	**<0.48**	mg/L	1.6	0.48	5		06/09/20 15:21	16984-48-8	D3
Sulfate	**326**	mg/L	40.0	8.9	20		06/13/20 09:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: MW-304 **Lab ID: 40208496002** Collected: 05/27/20 12:45 Received: 05/29/20 08:50 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								
Antimony	**0.25J**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:01	7440-36-0	
Arsenic	**1.3**	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 07:01	7440-38-2	
Barium	**30.8**	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 07:01	7440-39-3	
Beryllium	**0.26J**	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 07:01	7440-41-7	
Boron	**469**	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 16:13	7440-42-8	
Cadmium	**0.19J**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:01	7440-43-9	
Calcium	**84000**	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 07:01	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 07:01	7440-47-3	
Cobalt	**0.69J**	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 07:01	7440-48-4	
Lead	**0.29J**	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 07:01	7439-92-1	
Lithium	**0.30J**	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 07:01	7439-93-2	
Molybdenum	**3.9**	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 07:01	7439-98-7	
Selenium	**0.33J**	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 07:01	7782-49-2	
Thallium	**0.33J**	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 07:01	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.084**	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:21	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.09**	Std. Units			1		05/27/20 12:45		
Field Specific Conductance	**711**	umhos/cm			1		05/27/20 12:45		
Oxygen, Dissolved	**0.61**	mg/L			1		05/27/20 12:45	7782-44-7	
REDOX	**54.2**	mV			1		05/27/20 12:45		
Turbidity	**4.35**	NTU			1		05/27/20 12:45		
Static Water Level	**789.30**	feet			1		05/27/20 12:45		
Temperature, Water (C)	**16.2**	deg C			1		05/27/20 12:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**412**	mg/L	20.0	8.7	1		06/01/20 16:20		
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		06/01/20 09:21		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**25.2**	mg/L	2.0	0.43	1		06/09/20 15:34	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		06/09/20 15:34	16984-48-8	
Sulfate	**42.4**	mg/L	2.0	0.44	1		06/09/20 15:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: MW-305 **Lab ID: 40208496003** Collected: 05/27/20 10:00 Received: 05/29/20 08:50 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								
Antimony	**0.30J**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:14	7440-36-0	
Arsenic	**0.75J**	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 07:14	7440-38-2	
Barium	**14.2**	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 07:14	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 07:14	7440-41-7	
Boron	**1040**	ug/L	50.0	15.2	5	06/01/20 18:15	06/11/20 16:40	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:14	7440-43-9	
Calcium	**103000**	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 07:14	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 07:14	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 07:14	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 07:14	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 07:14	7439-93-2	
Molybdenum	**60.5**	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 07:14	7439-98-7	
Selenium	**4.2**	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 07:14	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 07:14	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.084**	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:28	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**8.48**	Std. Units			1		05/27/20 10:00		
Field Specific Conductance	**814**	umhos/cm			1		05/27/20 10:00		
Oxygen, Dissolved	**3.16**	mg/L			1		05/27/20 10:00	7782-44-7	
REDOX	**211.2**	mV			1		05/27/20 10:00		
Turbidity	**0.0**	NTU			1		05/27/20 10:00		
Static Water Level	**787.78**	feet			1		05/27/20 10:00		
Temperature, Water (C)	**12.1**	deg C			1		05/27/20 10:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**556**	mg/L	20.0	8.7	1		06/01/20 16:20		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.4**	Std. Units	0.10	0.010	1		06/01/20 09:25		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**51.3**	mg/L	2.0	0.43	1		06/09/20 16:27	16887-00-6	
Fluoride	**0.30J**	mg/L	0.32	0.095	1		06/09/20 16:27	16984-48-8	
Sulfate	**305**	mg/L	20.0	4.4	10		06/13/20 09:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: M-4R **Lab ID: 40208496004** Collected: 05/27/20 11:00 Received: 05/29/20 08:50 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:21	7440-36-0	
Arsenic	**0.39J**	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 07:21	7440-38-2	
Barium	**24.2**	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 07:21	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 07:21	7440-41-7	
Boron	**644**	ug/L	50.0	15.2	5	06/01/20 18:15	06/11/20 16:47	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:21	7440-43-9	
Calcium	**106000**	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 07:21	7440-70-2	
Chromium	**1.2J**	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 07:21	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 07:21	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 07:21	7439-92-1	
Lithium	**1.4**	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 07:21	7439-93-2	
Molybdenum	**25.6**	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 07:21	7439-98-7	
Selenium	**11.7**	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 07:21	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 07:21	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.084**	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:30	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.29**	Std. Units			1		05/27/20 11:00		
Field Specific Conductance	**869**	umhos/cm			1		05/27/20 11:00		
Oxygen, Dissolved	**4.00**	mg/L			1		05/27/20 11:00	7782-44-7	
REDOX	**203.6**	mV			1		05/27/20 11:00		
Turbidity	**0.16**	NTU			1		05/27/20 11:00		
Static Water Level	**787.73**	feet			1		05/27/20 11:00		
Temperature, Water (C)	**11.0**	deg C			1		05/27/20 11:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**594**	mg/L	20.0	8.7	1		06/01/20 16:20		
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		06/01/20 09:26		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**50.0**	mg/L	2.0	0.43	1		06/09/20 16:40	16887-00-6	
Fluoride	**0.13J**	mg/L	0.32	0.095	1		06/09/20 16:40	16984-48-8	
Sulfate	**162**	mg/L	20.0	4.4	10		06/13/20 10:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: FIELD BLANK-PPOND **Lab ID: 40208496005** Collected: 05/27/20 11:00 Received: 05/29/20 08:05 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 05:24	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 05:24	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 05:24	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 05:24	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 15:18	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 05:24	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 05:24	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 05:24	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 05:24	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 05:24	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 05:24	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 05:24	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 05:24	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 05:24	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.084**	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:32	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**24.0**	mg/L	20.0	8.7	1		06/01/20 16:21		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.9**	Std. Units	0.10	0.010	1		06/01/20 09:28		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		06/15/20 23:20	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		06/15/20 23:20	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		06/15/20 23:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 356263 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004, 40208496005

METHOD BLANK: 2060745 Matrix: Water
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004, 40208496005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.084	0.28	06/02/20 09:00	

LABORATORY CONTROL SAMPLE: 2060746

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2060747 2060748

Parameter	Units	40208305001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.28	5	5	5.1	5.0	102	100	85-115	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 356333
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004, 40208496005

METHOD BLANK: 2060982 Matrix: Water
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004, 40208496005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	06/11/20 05:17	
Arsenic	ug/L	<0.28	1.0	06/11/20 05:17	
Barium	ug/L	<0.70	2.3	06/11/20 05:17	
Beryllium	ug/L	<0.25	1.0	06/11/20 05:17	
Boron	ug/L	<3.0	10.0	06/11/20 15:11	
Cadmium	ug/L	<0.15	1.0	06/11/20 05:17	
Calcium	ug/L	<76.2	254	06/11/20 05:17	
Chromium	ug/L	<1.0	3.4	06/11/20 05:17	
Cobalt	ug/L	<0.12	1.0	06/11/20 05:17	
Lead	ug/L	<0.24	1.0	06/11/20 05:17	
Lithium	ug/L	<0.22	1.0	06/11/20 05:17	
Molybdenum	ug/L	<0.44	1.5	06/11/20 05:17	
Selenium	ug/L	<0.32	1.1	06/11/20 05:17	
Thallium	ug/L	<0.14	1.0	06/11/20 05:17	

LABORATORY CONTROL SAMPLE: 2060983

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	528	106	80-120	
Arsenic	ug/L	500	494	99	80-120	
Barium	ug/L	500	488	98	80-120	
Beryllium	ug/L	500	448	90	80-120	
Boron	ug/L	500	461	92	80-120	
Cadmium	ug/L	500	513	103	80-120	
Calcium	ug/L	5000	5060	101	80-120	
Chromium	ug/L	500	476	95	80-120	
Cobalt	ug/L	500	471	94	80-120	
Lead	ug/L	500	493	99	80-120	
Lithium	ug/L	500	425	85	80-120	
Molybdenum	ug/L	500	508	102	80-120	
Selenium	ug/L	500	471	94	80-120	
Thallium	ug/L	500	486	97	80-120	

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2060984 2060985

Parameter	Units	40208496001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.22J	500	500	552	539	110	108	75-125	2	20	
Arsenic	ug/L	5.9	500	500	521	508	103	100	75-125	3	20	
Barium	ug/L	13.8	500	500	524	514	102	100	75-125	2	20	
Beryllium	ug/L	0.36J	500	500	446	438	89	87	75-125	2	20	
Boron	ug/L	2700	500	500	3180	3090	94	78	75-125	3	20	
Cadmium	ug/L	0.30J	500	500	521	510	104	102	75-125	2	20	
Calcium	ug/L	27400	5000	5000	32700	30400	107	61	75-125	7	20	P6
Chromium	ug/L	42.8	500	500	530	525	98	96	75-125	1	20	
Cobalt	ug/L	0.49J	500	500	484	474	97	95	75-125	2	20	
Lead	ug/L	0.32J	500	500	514	516	103	103	75-125	0	20	
Lithium	ug/L	1.2	500	500	438	432	87	86	75-125	1	20	
Molybdenum	ug/L	67.1	500	500	604	587	107	104	75-125	3	20	
Selenium	ug/L	18.7	500	500	500	495	96	95	75-125	1	20	
Thallium	ug/L	0.28J	500	500	509	513	102	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 356322
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004, 40208496005

METHOD BLANK: 2060951 Matrix: Water
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004, 40208496005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	06/01/20 16:15	

LABORATORY CONTROL SAMPLE: 2060952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	559	552	99	80-120	

SAMPLE DUPLICATE: 2060953

Parameter	Units	40208420018 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	218	212	3	10	

SAMPLE DUPLICATE: 2060954

Parameter	Units	40208496001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	570	574	1	10	

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 356227
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004, 40208496005

SAMPLE DUPLICATE: 2060671

Parameter	Units	40208420014 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.3	1	20	H6

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 356728
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: 40208496001, 40208496002, 40208496003, 40208496004

METHOD BLANK: 2063188 Matrix: Water
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	06/09/20 13:31	
Fluoride	mg/L	<0.095	0.32	06/09/20 13:31	
Sulfate	mg/L	<0.44	2.0	06/09/20 13:31	

LABORATORY CONTROL SAMPLE: 2063189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.6	103	90-110	
Fluoride	mg/L	2	2.0	102	90-110	
Sulfate	mg/L	20	20.7	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2063190 2063191

Parameter	Units	40208474001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	48.4	100	100	154	158	106	109	90-110	2	15	
Fluoride	mg/L	<0.48	10	10	10.1	10.5	101	105	90-110	4	15	
Sulfate	mg/L	68.1	100	100	172	180	104	111	90-110	4	15	M0

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 356987
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: 40208496005

METHOD BLANK: 2064877 Matrix: Water
Associated Lab Samples: 40208496005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	06/15/20 20:54	
Fluoride	mg/L	<0.095	0.32	06/15/20 20:54	
Sulfate	mg/L	<0.44	2.0	06/15/20 20:54	

LABORATORY CONTROL SAMPLE: 2064878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	19.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064879 2064880

Parameter	Units	40208499001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.76J	20	20	21.1	20.4	102	98	90-110	3	15	
Fluoride	mg/L	<0.095	2	2	2.1	2.0	106	102	90-110	4	15	
Sulfate	mg/L	6.9	20	20	27.6	26.7	103	99	90-110	3	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064881 2064882

Parameter	Units	40208801002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	65.2	100	100	166	164	101	99	90-110	2	15	
Fluoride	mg/L	<0.48	10	10	10.2	10.1	102	101	90-110	1	15	
Sulfate	mg/L	23.1	100	100	122	121	99	98	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: MW-303 **Lab ID: 40208496001** Collected: 05/27/20 14:35 Received: 05/29/20 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.168 ± 0.442 (0.808) C:NA T:89%**	pCi/L	06/19/20 15:04	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.214 ± 0.424 (0.932) C:71% T:81%**	pCi/L	06/18/20 16:25	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.382 ± 0.866 (1.74)**	pCi/L	06/23/20 09:27	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: MW-304 **Lab ID: 40208496002** Collected: 05/27/20 12:45 Received: 05/29/20 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0533 ± 0.319 (0.520) C:NA T:97%**	pCi/L	06/19/20 14:52	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.249 ± 0.428 (0.932) C:68% T:83%**	pCi/L	06/18/20 16:25	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.302 ± 0.747 (1.45)**	pCi/L	06/23/20 09:27	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: MW-305 **Lab ID: 40208496003** Collected: 05/27/20 10:00 Received: 05/29/20 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0976 ± 0.417 (0.804) C:NA T:85%**	pCi/L	06/19/20 14:52	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.612 ± 0.443 (0.862) C:68% T:83%**	pCi/L	06/18/20 16:25	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.710 ± 0.860 (1.67)**	pCi/L	06/23/20 09:27	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: M-4R **Lab ID: 40208496004** Collected: 05/27/20 11:00 Received: 05/29/20 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.119 ± 0.316 (0.514) C:NA T:93%**	pCi/L	06/19/20 14:52	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.00360 ± 0.383 (0.890) C:71% T:80%**	pCi/L	06/18/20 16:25	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.123 ± 0.699 (1.40)**	pCi/L	06/23/20 09:27	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Sample: FIELD BLANK-PPOND **Lab ID: 40208496005** Collected: 05/27/20 11:00 Received: 05/29/20 08:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.283 ± 0.519 (0.926) C:NA T:88%**	pCi/L	06/22/20 15:33	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.157 ± 0.391 (0.871) C:74% T:79%**	pCi/L	06/18/20 10:58	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.440 ± 0.910 (1.80)**	pCi/L	06/23/20 09:27	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 399231
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004

METHOD BLANK: 1933427 Matrix: Water
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.293 ± 0.549 (0.929) C:NA T:91%	pCi/L	06/19/20 14:03	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 399236
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40208496005

METHOD BLANK: 1933438 Matrix: Water
Associated Lab Samples: 40208496005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.176 ± 0.245 (0.622) C:NA T:95%	pCi/L	06/22/20 15:33	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 399239
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40208496005

METHOD BLANK: 1933446 Matrix: Water
Associated Lab Samples: 40208496005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.173 ± 0.299 (0.652) C:77% T:94%	pCi/L	06/18/20 10:58	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

QC Batch: 399232
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004

METHOD BLANK: 1933429 Matrix: Water
Associated Lab Samples: 40208496001, 40208496002, 40208496003, 40208496004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.391 ± 0.380 (0.777) C:71% T:80%	pCi/L	06/18/20 12:49	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

DEFINITIONS

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40208496001	MW-303	EPA 3010	356333	EPA 6020	356385
40208496002	MW-304	EPA 3010	356333	EPA 6020	356385
40208496003	MW-305	EPA 3010	356333	EPA 6020	356385
40208496004	M-4R	EPA 3010	356333	EPA 6020	356385
40208496005	FIELD BLANK-PPOND	EPA 3010	356333	EPA 6020	356385
40208496001	MW-303	EPA 7470	356263	EPA 7470	356290
40208496002	MW-304	EPA 7470	356263	EPA 7470	356290
40208496003	MW-305	EPA 7470	356263	EPA 7470	356290
40208496004	M-4R	EPA 7470	356263	EPA 7470	356290
40208496005	FIELD BLANK-PPOND	EPA 7470	356263	EPA 7470	356290
40208496001	MW-303				
40208496002	MW-304				
40208496003	MW-305				
40208496004	M-4R				
40208496001	MW-303	EPA 903.1	399231		
40208496002	MW-304	EPA 903.1	399231		
40208496003	MW-305	EPA 903.1	399231		
40208496004	M-4R	EPA 903.1	399231		
40208496005	FIELD BLANK-PPOND	EPA 903.1	399236		
40208496001	MW-303	EPA 904.0	399232		
40208496002	MW-304	EPA 904.0	399232		
40208496003	MW-305	EPA 904.0	399232		
40208496004	M-4R	EPA 904.0	399232		
40208496005	FIELD BLANK-PPOND	EPA 904.0	399239		
40208496001	MW-303	Total Radium Calculation	402044		
40208496002	MW-304	Total Radium Calculation	402044		
40208496003	MW-305	Total Radium Calculation	402044		
40208496004	M-4R	Total Radium Calculation	402044		
40208496005	FIELD BLANK-PPOND	Total Radium Calculation	402044		
40208496001	MW-303	SM 2540C	356322		
40208496002	MW-304	SM 2540C	356322		
40208496003	MW-305	SM 2540C	356322		
40208496004	M-4R	SM 2540C	356322		
40208496005	FIELD BLANK-PPOND	SM 2540C	356322		
40208496001	MW-303	EPA 9040	356227		
40208496002	MW-304	EPA 9040	356227		
40208496003	MW-305	EPA 9040	356227		
40208496004	M-4R	EPA 9040	356227		
40208496005	FIELD BLANK-PPOND	EPA 9040	356227		
40208496001	MW-303	EPA 300.0	356728		
40208496002	MW-304	EPA 300.0	356728		
40208496003	MW-305	EPA 300.0	356728		
40208496004	M-4R	EPA 300.0	356728		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 COLUMBIA CCR PRIMARY
Pace Project No.: 40208496

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40208496005	**FIELD BLANK-PPOND**	EPA 300.0	356987		

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

40208496

Page : 1 Of 1

Section A
Required Client Information:

Company:	SCS ENGINEERS
Address:	2830 Dairy Drive
	Madison, WI 53718
Email:	mblodgett@scsengineers.com
Phone:	608-216-7362 Fax
Requested Due Date:	

Section B
Required Project Information:

Report To:	Meghan Blodgett
Copy To:	
Purchase Order #:	
Project Name:	25219067 Columbia CCR Primary Pond
Project #:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	dan.milewsky@pacelabs.com,
Pace Profile #:	x

Regulatory Agency

State / Location

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	Analyses Test Y/N	Radium 226	Radium 228	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	
1																									
2	MW-303	WT		5/27/20	1435	5/27	1435		5	2		3							x	x	x	x	x		001
3	MW-304	WT		5/27/20	1245	5/27	1245		5										x	x	x	x	x		002
4	MW-305	WT		5/27/20	1000	5/27	1000		5										x	x	x	x	x		003
5	M-4R	WT		5/27	1100	5/27	1100		5										x	x	x	x	x		004
6	FIELD BLANK-PPOND	WT		5/27	1100	5/27	1100		5	↓		↓							x	x	x	x	x		005
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Adam Watson/SCS Eng.	5/28	1700				
	CS Logistics	5/29/20	0805	Pace	5/29/20	0805	Rol

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)
	4	4	4

Pace Container Order #648421

4028496

Addresses

Order By :		Ship To :		Return To:	
Company	SCS ENGINEERS	Company	SCS ENGINEERS (Pace Analytical Green	Company	Pace Analytical Green Bay
Contact	Blodgett, Meghan	Contact	Paul Grover	Contact	Milewsky, Dan
Email	mblodgett@scsengineers.com	Email	pgrover@scsengineers.com	Email	dan.milewsky@pacelabs.com
Address	2830 Dairy Drive	Address	2830 Dairy Drive	Address	1241 Bellevue Street
Address 2		Address 2		Address 2	Suite 9
City	Madison	City	Madison	City	Green Bay
State	WI Zip 53718	State	WI Zip 53718	State	WI Zip 54302
Phone	608-216-7362	Phone	608-216-7362	Phone	(920)469-2436

Info

Project Name	25219067 Columbia CCR Primary Pond	**Due Date**	05/19/2020	**Profile**	x	**Quote**	
Project Manager	Milewsky, Dan	**Return Date**		**Carrier**	Most Economical	**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 3 Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
6	WT	Radium 226	1L Plastic HNO3 pres	6	0		
6	WT	Radium 228	1L Plastic HNO3 pres	6	0		
6	WT	Metals	250mL plastic w/HNO3	6	0	M-9-311-06BB	
6	WT	pH	250mL plastic unpres	6	0	M-9-311-06BB	
6	WT	TDS, Cl, F, SO4	250mL plastic unpres	6	0	M-9-311-06BB	

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 :	05/14/2020
Prepared By:	Mai Yer Her
Verified By:	

Sample

Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl
ALL SAMPLES UNFILTERED

CLIENT USE (Optional):

Date Rec'd:	
Received By:	
Verified By:	

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

Sample Preservation Receipt Form

Client Name: SCS Project # 40208496

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

Lab Lot# of pH paper: 10052791 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: KB Date/Time:

	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					✓		2.5 / 5 / 10
002										2		1														2					✓		2.5 / 5 / 10
003										2		1														2					✓		2.5 / 5 / 10
004										2		1														2					✓		2.5 / 5 / 10
005																																	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

qw 5/29/20

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	1 Liter Poly HNO3

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# : 40208496

Client Name: SCS

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 - NA **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: R01 /Corr:

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

Person examining contents: Date: 5/26/20 /Initials: DL

Labeled By Initials: VC

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. project # DL 5/26/20
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		
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

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

June 23, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on May 30, 2020. 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
- Pace Analytical Services - Greensburg

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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40208571001	**MW-301**	Water	05/29/20 13:30	05/30/20 08:00
40208571002	**MW-84A**	Water	05/29/20 12:40	05/30/20 08:00

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Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40208571001	**MW-301**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208571002	**MW-84A**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

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

ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Sample: MW-301 **Lab ID: 40208571001** Collected: 05/29/20 13:30 Received: 05/30/20 08:00 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:30	7440-36-0	
Arsenic	**0.33J**	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 08:30	7440-38-2	
Barium	**9.8**	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 08:30	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 08:30	7440-41-7	
Boron	**21.3**	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 17:29	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:30	7440-43-9	
Calcium	**112000**	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 08:30	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 08:30	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 08:30	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 08:30	7439-92-1	
Lithium	**0.47J**	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 08:30	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 08:30	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 08:30	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 08:30	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.084**	ug/L	0.28	0.084	1	06/10/20 10:40	06/11/20 09:21	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**6.73**	Std. Units			1		05/29/20 13:30		
Field Specific Conductance	**797**	umhos/cm			1		05/29/20 13:30		
Oxygen, Dissolved	**2.00**	mg/L			1		05/29/20 13:30	7782-44-7	
REDOX	**118.7**	mV			1		05/29/20 13:30		
Turbidity	**0.0**	NTU			1		05/29/20 13:30		
Static Water Level	**787.77**	feet			1		05/29/20 13:30		
Temperature, Water (C)	**8.1**	deg C			1		05/29/20 13:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**452**	mg/L	20.0	8.7	1		06/02/20 14:53		
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		06/03/20 09:50		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**2.0J**	mg/L	2.0	0.43	1		06/16/20 01:58	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		06/16/20 01:58	16984-48-8	
Sulfate	**11.5**	mg/L	2.0	0.44	1		06/16/20 01:58	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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Sample: MW-84A **Lab ID: 40208571002** Collected: 05/29/20 12:40 Received: 05/30/20 08:00 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:37	7440-36-0	
Arsenic	**0.34J**	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 08:37	7440-38-2	
Barium	**13.9**	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 08:37	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 08:37	7440-41-7	
Boron	**10.0**	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 17:36	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:37	7440-43-9	
Calcium	**77600**	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 08:37	7440-70-2	
Chromium	**1.7J**	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 08:37	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 08:37	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 08:37	7439-92-1	
Lithium	**0.40J**	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 08:37	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 08:37	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 08:37	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 08:37	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.084**	ug/L	0.28	0.084	1	06/10/20 10:40	06/11/20 09:23	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.34**	Std. Units			1		05/29/20 12:40		
Field Specific Conductance	**613.7**	umhos/cm			1		05/29/20 12:40		
Oxygen, Dissolved	**9.81**	mg/L			1		05/29/20 12:40	7782-44-7	
REDOX	**135.0**	mV			1		05/29/20 12:40		
Turbidity	**2.15**	NTU			1		05/29/20 12:40		
Static Water Level	**787.02**	feet			1		05/29/20 12:40		
Temperature, Water (C)	**10.6**	deg C			1		05/29/20 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**340**	mg/L	20.0	8.7	1		06/02/20 14:53		
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		06/03/20 09:51		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**3.7**	mg/L	2.0	0.43	1		06/16/20 02:11	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		06/16/20 02:11	16984-48-8	
Sulfate	**1.5J**	mg/L	2.0	0.44	1		06/16/20 02:11	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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

QC Batch: 357238
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208571001, 40208571002

METHOD BLANK: 2066129 Matrix: Water
Associated Lab Samples: 40208571001, 40208571002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.084	0.28	06/11/20 08:58	

LABORATORY CONTROL SAMPLE: 2066130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2066131 2066132

Parameter	Units	40208929001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.084	5	5	5.3	4.9	105	98	85-115	7	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

QC Batch: 356333
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208571001, 40208571002

METHOD BLANK: 2060982 Matrix: Water
Associated Lab Samples: 40208571001, 40208571002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	06/11/20 05:17	
Arsenic	ug/L	<0.28	1.0	06/11/20 05:17	
Barium	ug/L	<0.70	2.3	06/11/20 05:17	
Beryllium	ug/L	<0.25	1.0	06/11/20 05:17	
Boron	ug/L	<3.0	10.0	06/11/20 15:11	
Cadmium	ug/L	<0.15	1.0	06/11/20 05:17	
Calcium	ug/L	<76.2	254	06/11/20 05:17	
Chromium	ug/L	<1.0	3.4	06/11/20 05:17	
Cobalt	ug/L	<0.12	1.0	06/11/20 05:17	
Lead	ug/L	<0.24	1.0	06/11/20 05:17	
Lithium	ug/L	<0.22	1.0	06/11/20 05:17	
Molybdenum	ug/L	<0.44	1.5	06/11/20 05:17	
Selenium	ug/L	<0.32	1.1	06/11/20 05:17	
Thallium	ug/L	<0.14	1.0	06/11/20 05:17	

LABORATORY CONTROL SAMPLE: 2060983

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	528	106	80-120	
Arsenic	ug/L	500	494	99	80-120	
Barium	ug/L	500	488	98	80-120	
Beryllium	ug/L	500	448	90	80-120	
Boron	ug/L	500	461	92	80-120	
Cadmium	ug/L	500	513	103	80-120	
Calcium	ug/L	5000	5060	101	80-120	
Chromium	ug/L	500	476	95	80-120	
Cobalt	ug/L	500	471	94	80-120	
Lead	ug/L	500	493	99	80-120	
Lithium	ug/L	500	425	85	80-120	
Molybdenum	ug/L	500	508	102	80-120	
Selenium	ug/L	500	471	94	80-120	
Thallium	ug/L	500	486	97	80-120	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2060984 2060985

Parameter	Units	40208496001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.22J	500	500	552	539	110	108	75-125	2	20	
Arsenic	ug/L	5.9	500	500	521	508	103	100	75-125	3	20	
Barium	ug/L	13.8	500	500	524	514	102	100	75-125	2	20	
Beryllium	ug/L	0.36J	500	500	446	438	89	87	75-125	2	20	
Boron	ug/L	2700	500	500	3180	3090	94	78	75-125	3	20	
Cadmium	ug/L	0.30J	500	500	521	510	104	102	75-125	2	20	
Calcium	ug/L	27400	5000	5000	32700	30400	107	61	75-125	7	20	P6
Chromium	ug/L	42.8	500	500	530	525	98	96	75-125	1	20	
Cobalt	ug/L	0.49J	500	500	484	474	97	95	75-125	2	20	
Lead	ug/L	0.32J	500	500	514	516	103	103	75-125	0	20	
Lithium	ug/L	1.2	500	500	438	432	87	86	75-125	1	20	
Molybdenum	ug/L	67.1	500	500	604	587	107	104	75-125	3	20	
Selenium	ug/L	18.7	500	500	500	495	96	95	75-125	1	20	
Thallium	ug/L	0.28J	500	500	509	513	102	102	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

QC Batch: 356448
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208571001, 40208571002

METHOD BLANK: 2061521 Matrix: Water
Associated Lab Samples: 40208571001, 40208571002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	06/02/20 14:49	

LABORATORY CONTROL SAMPLE: 2061522

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	559	540	97	80-120	

SAMPLE DUPLICATE: 2061523

Parameter	Units	40208499001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	306	304	1	10	

SAMPLE DUPLICATE: 2061524

Parameter	Units	40208542001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	960	988	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

QC Batch: 356504
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208571001, 40208571002

SAMPLE DUPLICATE: 2061791

Parameter	Units	40208541003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.8	3	20	H6,PI

SAMPLE DUPLICATE: 2061792

Parameter	Units	40208560016 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.6	1	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

QC Batch: 356987
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: 40208571001, 40208571002

METHOD BLANK: 2064877 Matrix: Water
Associated Lab Samples: 40208571001, 40208571002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	06/15/20 20:54	
Fluoride	mg/L	<0.095	0.32	06/15/20 20:54	
Sulfate	mg/L	<0.44	2.0	06/15/20 20:54	

LABORATORY CONTROL SAMPLE: 2064878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	19.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064879 2064880

Parameter	Units	40208499001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.76J	20	20	21.1	20.4	102	98	90-110	3	15	
Fluoride	mg/L	<0.095	2	2	2.1	2.0	106	102	90-110	4	15	
Sulfate	mg/L	6.9	20	20	27.6	26.7	103	99	90-110	3	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064881 2064882

Parameter	Units	40208801002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	65.2	100	100	166	164	101	99	90-110	2	15	
Fluoride	mg/L	<0.48	10	10	10.2	10.1	102	101	90-110	1	15	
Sulfate	mg/L	23.1	100	100	122	121	99	98	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Sample: MW-301 **Lab ID: 40208571001** Collected: 05/29/20 13:30 Received: 05/30/20 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.307 (0.495) C:NA T:82%**	pCi/L	06/22/20 15:54	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.193 ± 0.370 (0.813) C:71% T:90%**	pCi/L	06/18/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.193 ± 0.677 (1.31)**	pCi/L	06/23/20 09:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Sample: MW-84A **Lab ID: 40208571002** Collected: 05/29/20 12:40 Received: 05/30/20 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.368 ± 0.419 (0.661) C:NA T:97%**	pCi/L	06/22/20 15:54	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.0273 ± 0.391 (0.895) C:71% T:86%**	pCi/L	06/18/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.395 ± 0.810 (1.56)**	pCi/L	06/23/20 09:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

QC Batch: 399236
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40208571001, 40208571002

METHOD BLANK: 1933438 Matrix: Water
Associated Lab Samples: 40208571001, 40208571002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.176 ± 0.245 (0.622) C:NA T:95%	pCi/L	06/22/20 15:33	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

QC Batch: 399239
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40208571001, 40208571002

METHOD BLANK: 1933446
Matrix: Water
Associated Lab Samples: 40208571001, 40208571002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.173 ± 0.299 (0.652) C:77% T:94%	pCi/L	06/18/20 10:58	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALIFIERS

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

DEFINITIONS

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

H6	Analysis initiated outside of the 15 minute EPA required holding time.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
PI	The precision between the sample and the duplicate sample exceeded laboratory control limits.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40208571

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40208571001	**MW-301**	EPA 3010	356333	EPA 6020	356385
40208571002	**MW-84A**	EPA 3010	356333	EPA 6020	356385
40208571001	**MW-301**	EPA 7470	357238	EPA 7470	357374
40208571002	**MW-84A**	EPA 7470	357238	EPA 7470	357374
40208571001	**MW-301**				
40208571002	**MW-84A**				
40208571001	**MW-301**	EPA 903.1	399236		
40208571002	**MW-84A**	EPA 903.1	399236		
40208571001	**MW-301**	EPA 904.0	399239		
40208571002	**MW-84A**	EPA 904.0	399239		
40208571001	**MW-301**	Total Radium Calculation	402044		
40208571002	**MW-84A**	Total Radium Calculation	402044		
40208571001	**MW-301**	SM 2540C	356448		
40208571002	**MW-84A**	SM 2540C	356448		
40208571001	**MW-301**	EPA 9040	356504		
40208571002	**MW-84A**	EPA 9040	356504		
40208571001	**MW-301**	EPA 300.0	356987		
40208571002	**MW-84A**	EPA 300.0	356987		

Pace Analytical
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CHAIN-OF-CUSTODY / Analytical Request Document

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

402085 71

Page : 1 Of 1

Section A — Required Client Information:

Company:	SCS ENGINEERS
Address:	2830 Dairy Drive
	Madison, WI 53718
Email:	mblodgett@scsengineers.com
Phone:	608-216-7362 Fax
Requested Due Date:	

Section B — Required Project Information:

Report To:	Meghan Blodgett
Copy To:	
Purchase Order #:	
Project Name:	25219067 Columbia CCR Background
Project #:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	dan.milewsky@pacelabs.com,
Pace Profile #:	x

Regulatory Agency

State / Location

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

Requested Analysis Filtered (Y/N)

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	Analyses Test Y/N	Radium 226	Radium 228	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	
1	MW-301	WT				5/29	1330		5	2		3							X	X	X	X	X		001
2	MW-84A	WT				5/29	1240		5	2		3							X	X	X	X	X		002
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Adam Watson / SCS Eng	5/29/20	1615			
	CS Logistics	5/30/20	0800	Erik Weinpfahl	5/30/20	0800

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: .

SIGNATURE of SAMPLER: DATE Signed:

Pace Container Order #648412

Y02085)1

Addresses

Order By :		Ship To :		Return To:	
Company	SCS ENGINEERS	Company	SCS ENGINEERS (Pace Analytical Green	Company	Pace Analytical Green Bay
Contact	Blodgett, Meghan	Contact	Paul Grover	Contact	Milewsky, Dan
Email	mblodgett@scsengineers.com	Email	pgrover@scsengineers.com	Email	dan.milewsky@pacelabs.com
Address	2830 Dairy Drive	Address	2830 Dairy Drive	Address	1241 Bellevue Street
Address 2		Address 2		Address 2	Suite 9
City	Madison	City	Madison	City	Green Bay
State	WI Zip 53718	State	WI Zip 53718	State	WI Zip 54302
Phone	608-216-7362	Phone	608-216-7362	Phone	(920)469-2436

Info

Project Name	25219067 Columbia CCR Background	**Due Date**	05/19/2020	**Profile**	x	**Quote**	
Project Manager	Milewsky, Dan	**Return Date**		**Carrier**	Most Economical	**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

Misc

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

COC Options

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

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
2	WT	Radium 226	1L Plastic HNO3 pres	2	0		
2	WT	Radium 228	1L Plastic HNO3 pres	2	0		
2	WT	Metals	250mL plastic w/HNO3	2	0	M-9-354-03BB	
2	WT	pH	250mL plastic unpres	2	0	M-9-311-06BB	
2	WT	TDS, Cl, F, SO4	250mL plastic unpres	2	0	M-9-311-06BB	

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 :	05/14/2020
Prepared By:	Mai Yer Her
Verified By:	

Sample

Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl
ALL SAMPLES UNFILTERED

CLIENT USE (Optional):

Date Rec'd:	
Received By:	
Verified By:	

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

Sample Preservation Receipt Form

Client Name: SCS

Project # 40208571

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

Lab Lot# of pH paper: 10082741 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: EMW Date/ Time:

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

EMW 5/30/20

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: Red Chem 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	1L poly Nitric Acid

EMW 5/30/20

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# : 40208571**

Client Name: SCS

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

Tracking #: 1578 0528 20

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 - 97 **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 1.0 /Corr: 1.0

Person examining contents: Date 5/30/20 /Initials: SMW

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

Labeled By Initials: NP

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. No pr State, pr #, Invoice, SMW 5/30/20
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		
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

C2 October 2020 Assessment Monitoring

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

November 06, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2020. 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
- Pace Analytical Services - Greensburg

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: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40216312001	**MW-303**	Water	10/07/20 14:40	10/10/20 08:15
40216312002	**MW-304**	Water	10/07/20 13:15	10/10/20 08:15
40216312003	**MW-305**	Water	10/07/20 11:20	10/10/20 08:15
40216312004	**M-4R**	Water	10/07/20 12:40	10/10/20 08:15
40216312005	**FIELD BLANK-PPOND**	Water	10/07/20 14:40	10/10/20 08:15

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40216312001	**MW-303**	EPA 6020	DS1	14	PASI-G
			VGC	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40216312002	**MW-304**	EPA 6020	DS1	14	PASI-G
			VGC	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40216312003	**MW-305**	EPA 6020	DS1	14	PASI-G
			VGC	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40216312004	**M-4R**	EPA 6020	DS1	14	PASI-G
			VGC	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40216312005	**FIELD BLANK-PPOND**	EPA 6020	DS1	14	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G

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

SAMPLE ANALYTE COUNT

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

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

ANALYTICAL RESULTS

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: MW-303 **Lab ID: 40216312001** Collected: 10/07/20 14:40 Received: 10/10/20 08:15 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:25	7440-36-0	
Arsenic	**9.5**	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 23:25	7440-38-2	
Barium	**10.0**	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 23:25	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 23:25	7440-41-7	
Boron	**2520**	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 23:25	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:25	7440-43-9	
Calcium	**19700**	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 23:25	7440-70-2	
Chromium	**46.4**	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 23:25	7440-47-3	
Cobalt	**0.23J**	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 23:25	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 23:25	7439-92-1	
Lithium	**0.69J**	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 23:25	7439-93-2	
Molybdenum	**67.1**	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 23:25	7439-98-7	
Selenium	**17.2**	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 23:25	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 23:25	7440-28-0	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**9.21**	Std. Units			1		10/07/20 14:40		
Field Specific Conductance	**801.0**	umhos/cm			1		10/07/20 14:40		
Oxygen, Dissolved	**7.62**	mg/L			1		10/07/20 14:40	7782-44-7	
REDOX	**183.0**	mV			1		10/07/20 14:40		
Turbidity	**0.00**	NTU			1		10/07/20 14:40		
Static Water Level	**785.16**	feet			1		10/07/20 14:40		
Temperature, Water (C)	**12.6**	deg C			1		10/07/20 14:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**532**	mg/L	20.0	8.7	1		10/12/20 14:17		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.8**	Std. Units	0.10	0.010	1		10/15/20 08:29		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**2.0J**	mg/L	2.0	0.43	1		10/21/20 21:27	16887-00-6	
Fluoride	**0.19J**	mg/L	0.32	0.095	1		10/21/20 21:27	16984-48-8	
Sulfate	**312**	mg/L	20.0	4.4	10		10/22/20 00:05	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: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: MW-304 **Lab ID: 40216312002** Collected: 10/07/20 13:15 Received: 10/10/20 08:15 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:32	7440-36-0	
Arsenic	**2.8**	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 23:32	7440-38-2	
Barium	**37.4**	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 23:32	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 23:32	7440-41-7	
Boron	**784**	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 23:32	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:32	7440-43-9	
Calcium	**75100**	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 23:32	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 23:32	7440-47-3	
Cobalt	**0.65J**	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 23:32	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 23:32	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 23:32	7439-93-2	
Molybdenum	**12.0**	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 23:32	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 23:32	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 23:32	7440-28-0	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.18**	Std. Units			1		10/07/20 13:15		
Field Specific Conductance	**776.0**	umhos/cm			1		10/07/20 13:15		
Oxygen, Dissolved	**0.31**	mg/L			1		10/07/20 13:15	7782-44-7	
REDOX	**-99.7**	mV			1		10/07/20 13:15		
Turbidity	**1.10**	NTU			1		10/07/20 13:15		
Static Water Level	**788.52**	feet			1		10/07/20 13:15		
Temperature, Water (C)	**18.3**	deg C			1		10/07/20 13:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**442**	mg/L	20.0	8.7	1		10/12/20 14:17		
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		10/15/20 08:32		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**43.9**	mg/L	2.0	0.43	1		10/21/20 21:41	16887-00-6	
Fluoride	**0.17J**	mg/L	0.32	0.095	1		10/21/20 21:41	16984-48-8	
Sulfate	**55.9**	mg/L	2.0	0.44	1		10/21/20 21:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: MW-305 **Lab ID: 40216312003** Collected: 10/07/20 11:20 Received: 10/10/20 08:15 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								
Antimony	**0.42J**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:39	7440-36-0	
Arsenic	**0.95J**	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 23:39	7440-38-2	
Barium	**20.2**	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 23:39	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 23:39	7440-41-7	
Boron	**1650**	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 23:39	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:39	7440-43-9	
Calcium	**112000**	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 23:39	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 23:39	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 23:39	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 23:39	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 23:39	7439-93-2	
Molybdenum	**102**	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 23:39	7439-98-7	
Selenium	**7.6**	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 23:39	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 23:39	7440-28-0	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**8.64**	Std. Units			1		10/07/20 11:20		
Field Specific Conductance	**857.0**	umhos/cm			1		10/07/20 11:20		
Oxygen, Dissolved	**1.53**	mg/L			1		10/07/20 11:20	7782-44-7	
REDOX	**215.8**	mV			1		10/07/20 11:20		
Turbidity	**0.00**	NTU			1		10/07/20 11:20		
Static Water Level	**787.96**	feet			1		10/07/20 11:20		
Temperature, Water (C)	**21.9**	deg C			1		10/07/20 11:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**572**	mg/L	20.0	8.7	1		10/12/20 14:18		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.4**	Std. Units	0.10	0.010	1		10/15/20 08:33		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**44.9**	mg/L	2.0	0.43	1		10/21/20 21:56	16887-00-6	
Fluoride	**0.47**	mg/L	0.32	0.095	1		10/21/20 21:56	16984-48-8	
Sulfate	**391**	mg/L	20.0	4.4	10		10/22/20 00:19	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: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: M-4R **Lab ID: 40216312004** Collected: 10/07/20 12:40 Received: 10/10/20 08:15 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:46	7440-36-0	
Arsenic	**0.44J**	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 23:46	7440-38-2	
Barium	**25.3**	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 23:46	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 23:46	7440-41-7	
Boron	**1360**	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 23:46	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 23:46	7440-43-9	
Calcium	**98000**	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 23:46	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 23:46	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 23:46	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 23:46	7439-92-1	
Lithium	**2.2**	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 23:46	7439-93-2	
Molybdenum	**27.6**	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 23:46	7439-98-7	
Selenium	**1.6**	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 23:46	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 23:46	7440-28-0	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.47**	Std. Units			1		10/07/20 12:40		
Field Specific Conductance	**948.0**	umhos/cm			1		10/07/20 12:40		
Oxygen, Dissolved	**0.11**	mg/L			1		10/07/20 12:40	7782-44-7	
REDOX	**217.8**	mV			1		10/07/20 12:40		
Turbidity	**0.00**	NTU			1		10/07/20 12:40		
Static Water Level	**787.74**	feet			1		10/07/20 12:40		
Temperature, Water (C)	**14.3**	deg C			1		10/07/20 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**604**	mg/L	20.0	8.7	1		10/12/20 14:18		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.5**	Std. Units	0.10	0.010	1		10/15/20 08:35		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**53.3**	mg/L	2.0	0.43	1		10/21/20 22:10	16887-00-6	
Fluoride	**0.27J**	mg/L	0.32	0.095	1		10/21/20 22:10	16984-48-8	
Sulfate	**203**	mg/L	20.0	4.4	10		10/22/20 00:34	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: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: FIELD BLANK-PPOND **Lab ID: 40216312005** Collected: 10/07/20 14:40 Received: 10/10/20 08:15 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/16/20 00:06	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/13/20 07:04	10/16/20 00:06	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	10/13/20 07:04	10/16/20 00:06	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/13/20 07:04	10/16/20 00:06	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	10/13/20 07:04	10/16/20 00:06	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/16/20 00:06	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	10/13/20 07:04	10/16/20 00:06	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/13/20 07:04	10/16/20 00:06	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/13/20 07:04	10/16/20 00:06	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/13/20 07:04	10/16/20 00:06	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/13/20 07:04	10/16/20 00:06	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/13/20 07:04	10/16/20 00:06	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/13/20 07:04	10/16/20 00:06	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/13/20 07:04	10/16/20 00:06	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**10.0J**	mg/L	20.0	8.7	1		10/12/20 14:18		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.6**	Std. Units	0.10	0.010	1		10/15/20 08:37		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		10/21/20 22:24	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/21/20 22:24	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		10/21/20 22:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

QC Batch: 368047
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

METHOD BLANK: 2127636 Matrix: Water
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/15/20 21:23	
Arsenic	ug/L	<0.28	1.0	10/15/20 21:23	
Barium	ug/L	<0.70	2.3	10/15/20 21:23	
Beryllium	ug/L	<0.25	1.0	10/15/20 21:23	
Boron	ug/L	<3.0	10.0	10/15/20 21:23	
Cadmium	ug/L	<0.15	1.0	10/15/20 21:23	
Calcium	ug/L	<76.2	254	10/15/20 21:23	
Chromium	ug/L	<1.0	3.4	10/15/20 21:23	
Cobalt	ug/L	<0.12	1.0	10/15/20 21:23	
Lead	ug/L	<0.24	1.0	10/15/20 21:23	
Lithium	ug/L	<0.22	1.0	10/15/20 21:23	
Molybdenum	ug/L	<0.44	1.5	10/15/20 21:23	
Selenium	ug/L	<0.32	1.1	10/15/20 21:23	
Thallium	ug/L	<0.14	1.0	10/15/20 21:23	

LABORATORY CONTROL SAMPLE: 2127637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	516	103	80-120	
Arsenic	ug/L	500	498	100	80-120	
Barium	ug/L	500	476	95	80-120	
Beryllium	ug/L	500	446	89	80-120	
Boron	ug/L	500	433	87	80-120	
Cadmium	ug/L	500	511	102	80-120	
Calcium	ug/L	5000	4980	100	80-120	
Chromium	ug/L	500	462	92	80-120	
Cobalt	ug/L	500	463	93	80-120	
Lead	ug/L	500	442	88	80-120	
Lithium	ug/L	500	426	85	80-120	
Molybdenum	ug/L	500	500	100	80-120	
Selenium	ug/L	500	511	102	80-120	
Thallium	ug/L	500	450	90	80-120	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2127638 2127639

Parameter	Units	40216311001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.33J	500	500	513	524	102	105	75-125	2	20	
Arsenic	ug/L	0.62J	500	500	503	512	100	102	75-125	2	20	
Barium	ug/L	9.4	500	500	486	501	95	98	75-125	3	20	
Beryllium	ug/L	<0.25	500	500	470	479	94	96	75-125	2	20	
Boron	ug/L	28.8	500	500	494	508	93	96	75-125	3	20	
Cadmium	ug/L	0.19J	500	500	506	515	101	103	75-125	2	20	
Calcium	ug/L	93000	5000	5000	98400	103000	107	194	75-125	4	20	P6
Chromium	ug/L	<1.0	500	500	465	478	93	95	75-125	3	20	
Cobalt	ug/L	0.29J	500	500	464	477	93	95	75-125	3	20	
Lead	ug/L	0.25J	500	500	442	458	88	92	75-125	4	20	
Lithium	ug/L	0.46J	500	500	459	473	92	95	75-125	3	20	
Molybdenum	ug/L	<0.44	500	500	509	522	102	104	75-125	2	20	
Selenium	ug/L	<0.32	500	500	509	513	102	102	75-125	1	20	
Thallium	ug/L	0.30J	500	500	459	474	92	95	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

QC Batch: 367994 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

METHOD BLANK: 2127414 Matrix: Water
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/12/20 14:13	

LABORATORY CONTROL SAMPLE: 2127415

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	584	552	95	80-120	

SAMPLE DUPLICATE: 2127416

Parameter	Units	40216194004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	508	500	2	10	

SAMPLE DUPLICATE: 2127417

Parameter	Units	40216312001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	532	524	2	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

QC Batch: 368318
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

SAMPLE DUPLICATE: 2129177

Parameter	Units	40216312001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.8	8.9	0	20	H6

SAMPLE DUPLICATE: 2129178

Parameter	Units	40216413002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	7.9	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
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QUALITY CONTROL DATA

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

QC Batch: 368415 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

METHOD BLANK: 2129758 Matrix: Water
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	10/21/20 18:08	
Fluoride	mg/L	<0.095	0.32	10/21/20 18:08	
Sulfate	mg/L	<0.44	2.0	10/21/20 18:08	

LABORATORY CONTROL SAMPLE: 2129759

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.0	105	90-110	
Fluoride	mg/L	2	2.1	105	90-110	
Sulfate	mg/L	20	21.0	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129760 2129761

Parameter	Units	40216435001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	199	100	100	289	289	90	90	90-110	0	15	
Fluoride	mg/L	<0.48	10	10	11.3	11.5	109	110	90-110	1	15	
Sulfate	mg/L	43.4	100	100	149	150	106	106	90-110	1	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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(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: MW-303 **Lab ID: 40216312001** Collected: 10/07/20 14:40 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0515 ± 0.235 (0.379) C:NA T:92%**	pCi/L	10/29/20 14:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.670 ± 0.339 (0.580) C:83% T:84%**	pCi/L	10/28/20 10:57	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.722 ± 0.574 (0.959)**	pCi/L	11/02/20 13:23	7440-14-4	

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: MW-304 **Lab ID: 40216312002** Collected: 10/07/20 13:15 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.247 (0.503) C:NA T:93%**	pCi/L	10/29/20 15:05	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.435 ± 0.352 (0.704) C:85% T:81%**	pCi/L	10/28/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.435 ± 0.599 (1.21)**	pCi/L	11/02/20 13:23	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: MW-305 **Lab ID: 40216312003** Collected: 10/07/20 11:20 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0596 ± 0.351 (0.716) C:NA T:83%**	pCi/L	10/29/20 14:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.517 ± 0.438 (0.892) C:82% T:81%**	pCi/L	10/28/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.577 ± 0.789 (1.61)**	pCi/L	11/02/20 13:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: M-4R **Lab ID: 40216312004** Collected: 10/07/20 12:40 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.220 (0.354) C:NA T:100%**	pCi/L	10/29/20 15:16	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.485 ± 0.393 (0.780) C:77% T:80%**	pCi/L	10/28/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.485 ± 0.613 (1.13)**	pCi/L	11/02/20 13:23	7440-14-4	

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(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Sample: FIELD BLANK-PPOND **Lab ID: 40216312005** Collected: 10/07/20 14:40 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0547 ± 0.250 (0.403) C:NA T:87%**	pCi/L	10/29/20 15:16	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.166 ± 0.327 (0.720) C:79% T:83%**	pCi/L	10/28/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.221 ± 0.577 (1.12)**	pCi/L	11/02/20 13:23	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

QC Batch: 418548
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

METHOD BLANK: 2023103 Matrix: Water
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.545 ± 0.288 (0.495) C:81% T:94%	pCi/L	10/28/20 10:57	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

QC Batch: 418546 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

METHOD BLANK: 2023102 Matrix: Water
Associated Lab Samples: 40216312001, 40216312002, 40216312003, 40216312004, 40216312005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0400 ± 0.260 (0.524) C:NA T:93%	pCi/L	10/29/20 14:53	

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
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(920)469-2436

QUALIFIERS

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

DEFINITIONS

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

H6	Analysis initiated outside of the 15 minute EPA required holding time.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 COL CCR PRIMARY POND
Pace Project No.: 40216312

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40216312001	**MW-303**	EPA 3010	368047	EPA 6020	368141
40216312002	**MW-304**	EPA 3010	368047	EPA 6020	368141
40216312003	**MW-305**	EPA 3010	368047	EPA 6020	368141
40216312004	**M-4R**	EPA 3010	368047	EPA 6020	368141
40216312005	**FIELD BLANK-PPOND**	EPA 3010	368047	EPA 6020	368141
40216312001	**MW-303**				
40216312002	**MW-304**				
40216312003	**MW-305**				
40216312004	**M-4R**				
40216312001	**MW-303**	EPA 903.1	418546		
40216312002	**MW-304**	EPA 903.1	418546		
40216312003	**MW-305**	EPA 903.1	418546		
40216312004	**M-4R**	EPA 903.1	418546		
40216312005	**FIELD BLANK-PPOND**	EPA 903.1	418546		
40216312001	**MW-303**	EPA 904.0	418548		
40216312002	**MW-304**	EPA 904.0	418548		
40216312003	**MW-305**	EPA 904.0	418548		
40216312004	**M-4R**	EPA 904.0	418548		
40216312005	**FIELD BLANK-PPOND**	EPA 904.0	418548		
40216312001	**MW-303**	Total Radium Calculation	421177		
40216312002	**MW-304**	Total Radium Calculation	421177		
40216312003	**MW-305**	Total Radium Calculation	421177		
40216312004	**M-4R**	Total Radium Calculation	421177		
40216312005	**FIELD BLANK-PPOND**	Total Radium Calculation	421177		
40216312001	**MW-303**	SM 2540C	367994		
40216312002	**MW-304**	SM 2540C	367994		
40216312003	**MW-305**	SM 2540C	367994		
40216312004	**M-4R**	SM 2540C	367994		
40216312005	**FIELD BLANK-PPOND**	SM 2540C	367994		
40216312001	**MW-303**	EPA 9040	368318		
40216312002	**MW-304**	EPA 9040	368318		
40216312003	**MW-305**	EPA 9040	368318		
40216312004	**M-4R**	EPA 9040	368318		
40216312005	**FIELD BLANK-PPOND**	EPA 9040	368318		
40216312001	**MW-303**	EPA 300.0	368415		
40216312002	**MW-304**	EPA 300.0	368415		
40216312003	**MW-305**	EPA 300.0	368415		
40216312004	**M-4R**	EPA 300.0	368415		
40216312005	**FIELD BLANK-PPOND**	EPA 300.0	368415		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
WWW.PACELABS.COM

CHAIN-OF-CUSTODY / Analytical Request Document

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

40216312

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:	25219067 Columbia CCR Primary Pond	Pace Project Manager:	dan.milewsky@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	3946-12

Regulatory Agency

State / Location

Requested Analysis Filtered (Y/N)

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	Radium 226	Radium 228	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	
1		WT																	X	X	X	X	X		
2	MW-303	WT				10/7/20	1440		2			3							X	X	X	X	X		001
3	MW-304	WT				10/7/20	1315		2			3							X	X	X	X	X		002
4	MW-305	WT				10/7/20	1120		2			3							X	X	X	X	X		003
5	M-4R	WT				10/7/20	1240		2			3							X	X	X	X	X		004
6	FIELD BLANK-PPOND	WT				10/7/20	1440		2			3							X	X	X	X	X		005
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl ALL SAMPLES UNFILTERED							1.0			
	C. Sloyer	10/10/20	0815		10/10/20	0815	~~ROI~~ 10/10/20 SRK	4	2	4

SAMPLER NAME AND SIGNATURE			TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Adam Watson					
SIGNATURE of SAMPLER:		DATE Signed: 10/9/2020				

40216310

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CHAIN-OF-CUSTODY / Analytical Request Document

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:	25219067 Columbia CCR Primary Pond	Pace Project Manager:	dan.milewsky@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	3946-12

Regulatory Agency

State / Location

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 (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	Radium 226	Radium 228	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	
1		WT																	x	x	x	x	x		
2	MW-303	WT				10/7/20	1440		2			3							x	x	x	x	x		001
3	MW-304	WT				10/7/20	1315		2			3							x	x	x	x	x		002
4	MW-305	WT				10/7/20	1120		2			3							x	x	x	x	x		003
5	M-4R	WT				10/7/20	1240		2			3							x	x	x	x	x		004
6	FIELD BLANK-PPOND	WT				10/7/20	1440		2			3							x	x	x	x	x		005
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl ALL SAMPLES UNFILTERED										
	C.S logistics	10/10/20	0815		10/10/20	0815	Ice	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Adam Watson

SIGNATURE of SAMPLER:

DATE Signed: 10/8/2020

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

Pace Container Order #703788 4021631Q

Addresses

Order By :

Company SCS ENGINEERS
Contact Blodgett, Meghan
Email mblodgett@scsengineers.com
Address 2830 Dairy Drive
Address 2
City Madison
State WI Zip 53718
Phone 608-216-7362

Ship To :

Company SCS ENGINEERS (Pace Analytical Green
Contact Paul Grover
Email pgrover@scsengineers.com
Address 2830 Dairy Drive
Address 2
City Madison
State WI Zip 53718
Phone 608-216-7362

Return To:

Company Pace Analytical Green Bay
Contact Milewsky, Dan
Email dan.milewsky@pacelabs.com
Address 1241 Bellevue Street
Address 2 Suite 9
City Green Bay
State WI Zip 54302
Phone (920)469-2436

Info

Project Name 25219067 Columbia CCR Primary Pond
Due Date 10/06/2020
Profile 3946-12
Quote
Project Manager Milewsky, Dan
Return Date
Carrier Most Economical
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 3 Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
6	WT	Radium 226	1L Plastic HNO3 pres	6	0		
6	WT	Radium 228	1L Plastic HNO3 pres	6	0		
6	WT	Metals	250mL plastic w/HNO3	6	0	M-0-156-04BB	
6	WT	pH	250mL plastic unpres	6	0	M-0-156-05BB	
6	WT	TDS, Cl, F, SO4	250mL plastic unpres	6	0	M-0-156-05BB	

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 : 10/05/2020
Prepared By: Mai Yer Her
Verified By:

Sample

Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl
ALL SAMPLES UNFILTERED

CLIENT USE (Optional):

Date Rec'd:
Received By:
Verified By:

Sample Preservation Receipt Form

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

Client Name: SCS Engineers Project # 4D216312

All containers needing preservation have been checked and noted below: ~~Yes~~ □No □N/A Initial when completed: MP Date/ Time:

Lab Lot# of pH paper: 10D4194 Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass: AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	Plastic: BP1U	BP3U	BP3B	BP3N	BP3S	Vials: VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	JG9U	WGFU	WPFU	General: 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				✓		2.5 / 5 / 10
002										2		1														2				✓		2.5 / 5 / 10
003										2		1														2				✓		2.5 / 5 / 10
004										2		1														2				✓		2.5 / 5 / 10
005										2		1														2						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																													10/1420			2.5 / 5 / 10
016																													1/1			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)

Project #:

WO#: 40216312

40216312

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 - ~~KM~~ 99 **Type of Ice:** Wet Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 1.0 /Corr: 1.0 10/10/20 SRK

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

Person examining contents:
Date: 10/10/20 /Initials: MP

Labeled By Initials: SRK

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. PW #, invoice info, proj. state 10/10/20 MP 10/10/20 SRK
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		
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

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

November 06, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2020. 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
- Pace Analytical Services - Greensburg

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
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CERTIFICATIONS

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40216311001	**MW-301**	Water	10/08/20 14:45	10/10/20 08:15
40216311002	**MW-84A**	Water	10/08/20 14:35	10/10/20 08:15

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SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40216311001	**MW-301**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			VGC	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40216311002	**MW-84A**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			VGC	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Sample: MW-301 **Lab ID: 40216311001** Collected: 10/08/20 14:45 Received: 10/10/20 08:15 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								
Antimony	**0.33J**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:04	7440-36-0	
Arsenic	**0.62J**	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 22:04	7440-38-2	
Barium	**9.4**	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 22:04	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 22:04	7440-41-7	
Boron	**28.8**	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 22:04	7440-42-8	
Cadmium	**0.19J**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:04	7440-43-9	
Calcium	**93000**	ug/L	2540	762	10	10/13/20 07:04	10/15/20 21:36	7440-70-2	P6
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 22:04	7440-47-3	
Cobalt	**0.29J**	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 22:04	7440-48-4	
Lead	**0.25J**	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 22:04	7439-92-1	
Lithium	**0.46J**	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 22:04	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 22:04	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 22:04	7782-49-2	
Thallium	**0.30J**	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 22:04	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	10/14/20 10:10	10/15/20 10:45	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**6.95**	Std. Units			1		10/08/20 14:45		
Field Specific Conductance	**760.0**	umhos/cm			1		10/08/20 14:45		
Oxygen, Dissolved	**1.22**	mg/L			1		10/08/20 14:45	7782-44-7	
REDOX	**183.9**	mV			1		10/08/20 14:45		
Turbidity	**0.00**	NTU			1		10/08/20 14:45		
Static Water Level	**786.53**	feet			1		10/08/20 14:45		
Temperature, Water (C)	**11.0**	deg C			1		10/08/20 14:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**412**	mg/L	20.0	8.7	1		10/12/20 14:17		
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		10/13/20 10:30		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**3.4**	mg/L	2.0	0.43	1		10/20/20 13:09	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/20/20 13:09	16984-48-8	
Sulfate	**25.1**	mg/L	2.0	0.44	1		10/20/20 13:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Sample: MW-84A **Lab ID: 40216311002** Collected: 10/08/20 14:35 Received: 10/10/20 08:15 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								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:45	7440-36-0	
Arsenic	**0.49J**	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 22:45	7440-38-2	
Barium	**12.6**	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 22:45	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 22:45	7440-41-7	
Boron	**9.7J**	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 22:45	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:45	7440-43-9	
Calcium	**69200**	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 22:45	7440-70-2	
Chromium	**1.6J**	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 22:45	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 22:45	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 22:45	7439-92-1	
Lithium	**0.39J**	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 22:45	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 22:45	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 22:45	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 22:45	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	10/14/20 10:10	10/15/20 10:47	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.49**	Std. Units			1		10/08/20 14:35		
Field Specific Conductance	**610.1**	umhos/cm			1		10/08/20 14:35		
Oxygen, Dissolved	**9.39**	mg/L			1		10/08/20 14:35	7782-44-7	
REDOX	**153.2**	mV			1		10/08/20 14:35		
Turbidity	**0.00**	NTU			1		10/08/20 14:35		
Static Water Level	**786.10**	feet			1		10/08/20 14:35		
Temperature, Water (C)	**11.9**	deg C			1		10/08/20 14:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**320**	mg/L	20.0	8.7	1		10/12/20 14:17		
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		10/13/20 10:33		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**4.3**	mg/L	2.0	0.43	1		10/20/20 13:24	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/20/20 13:24	16984-48-8	
Sulfate	**1.3J**	mg/L	2.0	0.44	1		10/20/20 13:24	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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

QC Batch: 368204
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2128432 Matrix: Water
Associated Lab Samples: 40216311001, 40216311002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	10/15/20 10:08	

LABORATORY CONTROL SAMPLE: 2128433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2128434 2128435

Parameter	Units	40216436001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.1	5.0	101	101	85-115	0	20	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

QC Batch: 368047
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2127636 Matrix: Water
Associated Lab Samples: 40216311001, 40216311002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/15/20 21:23	
Arsenic	ug/L	<0.28	1.0	10/15/20 21:23	
Barium	ug/L	<0.70	2.3	10/15/20 21:23	
Beryllium	ug/L	<0.25	1.0	10/15/20 21:23	
Boron	ug/L	<3.0	10.0	10/15/20 21:23	
Cadmium	ug/L	<0.15	1.0	10/15/20 21:23	
Calcium	ug/L	<76.2	254	10/15/20 21:23	
Chromium	ug/L	<1.0	3.4	10/15/20 21:23	
Cobalt	ug/L	<0.12	1.0	10/15/20 21:23	
Lead	ug/L	<0.24	1.0	10/15/20 21:23	
Lithium	ug/L	<0.22	1.0	10/15/20 21:23	
Molybdenum	ug/L	<0.44	1.5	10/15/20 21:23	
Selenium	ug/L	<0.32	1.1	10/15/20 21:23	
Thallium	ug/L	<0.14	1.0	10/15/20 21:23	

LABORATORY CONTROL SAMPLE: 2127637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	516	103	80-120	
Arsenic	ug/L	500	498	100	80-120	
Barium	ug/L	500	476	95	80-120	
Beryllium	ug/L	500	446	89	80-120	
Boron	ug/L	500	433	87	80-120	
Cadmium	ug/L	500	511	102	80-120	
Calcium	ug/L	5000	4980	100	80-120	
Chromium	ug/L	500	462	92	80-120	
Cobalt	ug/L	500	463	93	80-120	
Lead	ug/L	500	442	88	80-120	
Lithium	ug/L	500	426	85	80-120	
Molybdenum	ug/L	500	500	100	80-120	
Selenium	ug/L	500	511	102	80-120	
Thallium	ug/L	500	450	90	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2127638 2127639

Parameter	Units	40216311001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.33J	500	500	513	524	102	105	75-125	2	20	
Arsenic	ug/L	0.62J	500	500	503	512	100	102	75-125	2	20	
Barium	ug/L	9.4	500	500	486	501	95	98	75-125	3	20	
Beryllium	ug/L	<0.25	500	500	470	479	94	96	75-125	2	20	
Boron	ug/L	28.8	500	500	494	508	93	96	75-125	3	20	
Cadmium	ug/L	0.19J	500	500	506	515	101	103	75-125	2	20	
Calcium	ug/L	93000	5000	5000	98400	103000	107	194	75-125	4	20	P6
Chromium	ug/L	<1.0	500	500	465	478	93	95	75-125	3	20	
Cobalt	ug/L	0.29J	500	500	464	477	93	95	75-125	3	20	
Lead	ug/L	0.25J	500	500	442	458	88	92	75-125	4	20	
Lithium	ug/L	0.46J	500	500	459	473	92	95	75-125	3	20	
Molybdenum	ug/L	<0.44	500	500	509	522	102	104	75-125	2	20	
Selenium	ug/L	<0.32	500	500	509	513	102	102	75-125	1	20	
Thallium	ug/L	0.30J	500	500	459	474	92	95	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

QC Batch: 367994
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2127414 Matrix: Water
Associated Lab Samples: 40216311001, 40216311002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/12/20 14:13	

LABORATORY CONTROL SAMPLE: 2127415

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	584	552	95	80-120	

SAMPLE DUPLICATE: 2127416

Parameter	Units	40216194004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	508	500	2	10	

SAMPLE DUPLICATE: 2127417

Parameter	Units	40216312001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	532	524	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

QC Batch: 368069
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216311001, 40216311002

SAMPLE DUPLICATE: 2127694

Parameter	Units	40216239003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	1	20	H6

SAMPLE DUPLICATE: 2127695

Parameter	Units	40216282001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

QC Batch: 368419
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: 40216311001, 40216311002

METHOD BLANK: 2129786 Matrix: Water
Associated Lab Samples: 40216311001, 40216311002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	10/20/20 09:28	
Fluoride	mg/L	<0.095	0.32	10/20/20 09:28	
Sulfate	mg/L	<0.44	2.0	10/20/20 09:28	

LABORATORY CONTROL SAMPLE: 2129787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.2	96	90-110	
Fluoride	mg/L	2	1.8	91	90-110	
Sulfate	mg/L	20	19.2	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129788 2129789

Parameter	Units	40216308001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.63J	20	20	21.8	21.8	106	106	90-110	0	15	
Fluoride	mg/L	<0.095	2	2	2.2	2.2	109	109	90-110	0	15	
Sulfate	mg/L	8.4	20	20	30.2	30.3	109	109	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129790 2129791

Parameter	Units	40216573006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	35.3	20	20	54.3	54.3	95	95	90-110	0	15	
Fluoride	mg/L	<0.095	2	2	2.3	2.3	113	114	90-110	0	15	M0
Sulfate	mg/L	37.0	20	20	56.6	56.6	98	98	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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Sample: MW-301 **Lab ID: 40216311001** Collected: 10/08/20 14:45 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0511 ± 0.361 (0.720) C:NA T:88%**	pCi/L	10/29/20 15:16	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.329 ± 0.354 (0.740) C:83% T:87%**	pCi/L	10/28/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.380 ± 0.715 (1.46)**	pCi/L	11/02/20 13:23	7440-14-4	

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Sample: MW-84A **Lab ID: 40216311002** Collected: 10/08/20 14:35 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.374 (0.810) C:NA T:85%**	pCi/L	10/29/20 15:16	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.390 ± 0.280 (0.537) C:82% T:92%**	pCi/L	10/28/20 10:58	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.390 ± 0.654 (1.35)**	pCi/L	11/02/20 13:23	7440-14-4	

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

QC Batch: 418548
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2023103 Matrix: Water
Associated Lab Samples: 40216311001, 40216311002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.545 ± 0.288 (0.495) C:81% T:94%	pCi/L	10/28/20 10:57	

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 - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

QC Batch: 418546
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2023102
Matrix: Water
Associated Lab Samples: 40216311001, 40216311002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0400 ± 0.260 (0.524) C:NA T:93%	pCi/L	10/29/20 14:53	

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: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

DEFINITIONS

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40216311

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40216311001	**MW-301**	EPA 3010	368047	EPA 6020	368141
40216311002	**MW-84A**	EPA 3010	368047	EPA 6020	368141
40216311001	**MW-301**	EPA 7470	368204	EPA 7470	368253
40216311002	**MW-84A**	EPA 7470	368204	EPA 7470	368253
40216311001	**MW-301**				
40216311002	**MW-84A**				
40216311001	**MW-301**	EPA 903.1	418546		
40216311002	**MW-84A**	EPA 903.1	418546		
40216311001	**MW-301**	EPA 904.0	418548		
40216311002	**MW-84A**	EPA 904.0	418548		
40216311001	**MW-301**	Total Radium Calculation	421177		
40216311002	**MW-84A**	Total Radium Calculation	421177		
40216311001	**MW-301**	SM 2540C	367994		
40216311002	**MW-84A**	SM 2540C	367994		
40216311001	**MW-301**	EPA 9040	368069		
40216311002	**MW-84A**	EPA 9040	368069		
40216311001	**MW-301**	EPA 300.0	368419		
40216311002	**MW-84A**	EPA 300.0	368419		

Pace Analytical
WWW.PACELABS.COM

CHAIN-OF-CUSTODY / Analytical Request Document

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

40216311

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:	25219067 Columbia CCR Background	Pace Project Manager:	dan.milewsky@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	3946-12

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	Requested Analysis Filtered (Y/N): Radium 226	Radium 228	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	
1	MW-301	WT				10/8	1445		5	2		3							X	X	X	X	X		001
2	MW-84A	WT				10/8	1435		5	2		3							X	X	X	X	X		002
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

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

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	C. S Logistics	10/10/20	0815	[signature]	10/10/20	0815	L.O ~~RG~~ 10/10/20 SRK	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Adam Watson

SIGNATURE of SAMPLER: [signature] DATE Signed: 10/8/2020

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

Pace Container Order #703790

40216311

Addresses

Order By :

Company SCS ENGINEERS
Contact Blodgett, Meghan
Email mblodgett@scsengineers.com
Address 2830 Dairy Drive
Address 2
City Madison
State WI Zip 53718
Phone 608-216-7362

Ship To :

Company SCS ENGINEERS (Pace Analytical Green
Contact Paul Grover
Email pgrover@scsengineers.com
Address 2830 Dairy Drive
Address 2
City Madison
State WI Zip 53718
Phone 608-216-7362

Return To:

Company Pace Analytical Green Bay
Contact Milewsky, Dan
Email dan.milewsky@pacelabs.com
Address 1241 Bellevue Street
Address 2 Suite 9
City Green Bay
State WI Zip 54302
Phone (920)469-2436

Info

Project Name 25219067 Columbia CCR Background
Due Date 10/06/2020
Profile 3946-12
Quote
Project Manager Milewsky, Dan
Return Date
Carrier Most Economical
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
- [ ] DI Water Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
2	WT	Radium 226	1L Plastic HNO3 pres	2	0		
2	WT	Radium 228	1L Plastic HNO3 pres	2	0		
2	WT	Metals	250mL plastic w/HNO3	2	0	M-0-156-04BB	
2	WT	pH	250mL plastic unpres	2	0	M-0-156-05BB	
2	WT	TDS, Cl, F, SO4	250mL plastic unpres	2	0	M-0-156-05BB	

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 : 10/05/2020
Prepared By: Mai Yer Her
Verified By:

Sample

Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl
ALL SAMPLES UNFILTERED

CLIENT USE (Optional):

Date Rec'd:
Received By:
Verified By:

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

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 4021631

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

Lab Lot# of pH paper: 10D4194 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					X		2.5 / 5 / 10
002										2		1														2					X		2.5 / 5 / 10
003																																	2.5 / 5 / 10
004																																	2.5 / 5 / 10
005																																	2.5 / 5 / 10
006																																	2.5 / 5 / 10
007																																	2.5 / 5 / 10
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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

10/16/20

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	1L poly HNO3

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#: 40216311

40216311

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 - ~~NA~~ 99 **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ~~1.0~~ 1.0 /Corr: 1.0 10/10/20 SRK

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

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

Person examining contents:
Date: 10/10/20 /Initials: MP

Labeled By Initials: SRK

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. PM #, invoice info., proj. State 10/10/20 SRK 10/10/20 MP
Chain of Custody Relinquished:	☐Yes ☒No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No	6.
Rush Turn Around Time Requested:	☐Yes ☒No	7.
Sufficient Volume:		8.
For Analysis: ☒Yes ☐No MS/MSD:	☐Yes ☒No ☐N/A	
Correct Containers Used:	☒Yes ☐No	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix:	W	
Trip Blank Present:	☐Yes ☐No ☒N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

C3 December 2020 Resample

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

December 18, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on December 12, 2020. 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: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

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: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40219777001	**MW-305**	Water	12/11/20 11:15	12/12/20 08:45

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40219777001	**MW-305**	EPA 6020	KXS	1
			VGC	7

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: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

Sample: MW-305 **Lab ID: 40219777001** Collected: 12/11/20 11:15 Received: 12/12/20 08:45 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								
Molybdenum	**99.0**	ug/L	14.7	4.4	10	12/15/20 06:34	12/16/20 19:04	7439-98-7	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.43**	Std. Units			1		12/11/20 11:15		
Field Specific Conductance	**834**	umhos/cm			1		12/11/20 11:15		
Oxygen, Dissolved	**1.75**	mg/L			1		12/11/20 11:15	7782-44-7	
REDOX	**112.4**	mV			1		12/11/20 11:15		
Turbidity	**0.00**	NTU			1		12/11/20 11:15		
Static Water Level	**788.19**	feet			1		12/11/20 11:15		
Temperature, Water (C)	**20.8**	deg C			1		12/11/20 11:15		

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

QUALITY CONTROL DATA

Project: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

QC Batch: 373758
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40219777001

METHOD BLANK: 2160114 Matrix: Water
Associated Lab Samples: 40219777001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Molybdenum	ug/L	<0.44	1.5	12/16/20 18:44	

LABORATORY CONTROL SAMPLE: 2160115

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Molybdenum	ug/L	500	501	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2160116 2160117

Parameter	Units	40219777001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Molybdenum	ug/L	99.0	500	500	628	634	106	107	75-125	1	20	

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: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

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.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25220067.00 WPL-COLUMBIA-CCR
Pace Project No.: 40219802

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40219777001	**MW-305**	EPA 3010	373758	EPA 6020	373835
40219777001	**MW-305**				

Quick-Turn Analysis

Pace Analytical
www.pacelabs.com

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

Page 1 of

4021977

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

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison
Project Contact:	Tom Karwoski
Phone:	(608) 9579332
Project Number:	25220067.00
Project Name:	WPL-Columbia Energy Center GW
Project State:	WI
Sampled By (Print):	Ryan Matzuk
Sampled By (Sign):	
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
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, B = Biota, C = Charcoal, O = Oil, S = Soil, SI = Sludge, W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Chloride	TDS	Boron	Molybdenum	Calcium	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
						N	A								
						N	A								
						N	D								
						N	D								
						N	D								
001	MW-305	12/11	1115	GW							X				
002	MW-310		1205	GW		X	X					X			
003	MW-309		1255	GW						X					
004	Field Blank-1		1150	W		X	X								
005	Field Blank-2		1150	W						X	X	X			

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:
	1530 12/11		
C.S Logistics	12/12/20 0845		

PACE Project No.: 4021977
Receipt Temp = 2.0 °C
Sample Receipt pH: OK / Adjusted
Cooler Custody Seal: Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Sample Preservation Receipt Form

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

Client Name: SCS Engineers Project # 40219777

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

Lab Lot# of pH paper: 10D4194 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: LP Date/ Time:

	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												X																		X		2.5 / 5 / 10
002										X		X																		X		2.5 / 5 / 10
003												X																		X		2.5 / 5 / 10
004										X																						2.5 / 5 / 10
005												X																		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																												11/12/20				2.5 / 5 / 10
016																																2.5 / 5 / 10
017																												LP				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)

Project #:

WO#: 40219777

40219777

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

Cooler Temperature Uncorr: 1.01 /Corr:

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

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

Person examining contents:
Date: 12/12/20 Initials: MC
Labeled By Initials: MM

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. Mail, Invoice, Pg # 12/12/20 MC
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No	6.
Rush Turn Around Time Requested:	☒Yes ☐No	7.
Sufficient Volume:		8.
For Analysis: ☒Yes ☐No MS/MSD:	☐Yes ☒No ☐N/A	
Correct Containers Used:	☒Yes ☐No	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix:	W	
Trip Blank Present:	☐Yes ☐No ☒N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

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

Person Contacted: Date/Time:

Comments/ Resolution:

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 - Columbia

Location ID: M-4R
Number of Sampling Dates: 16

Parameter Name	Units	GPS	12/22/2015	4/4/2016	7/7/2016	10/12/2016	1/25/2017	4/11/2017	6/5/2017	8/9/2017	10/24/2017	4/23/2018	8/7/2018	10/24/2018	4/1/2019	10/7/2019	5/27/2020	10/7/2020
Boron	ug/L	--	1000	461	453	793	866	512	464	973	1910	905	704	1140	788	1120	644	1360
Calcium	ug/L	--	105000	79400	68900	94300	103000	84800	90300	91600	67100	86400	99700	84100	106000	82400	106000	98000
Chloride	mg/L	--	45.9	23.8	37.2	33.6	36.5	44	37.1	40.8	49.3	51.6	48.2	26.3	31.4	33.9	50	53.3
Fluoride	mg/L	4	0.22 J	<0.2 U	<0.2 U	0.16 J	0.38	0.18 J	0.2 J	0.23 J	<0.5 U	0.16 J	0.13 J	<0.1 U	0.17 J	0.17 J	0.13 J	0.27 J
Field pH	Std. Units	--	7.41	7.55	7.26	7.67	7.27	7.55	7.07	7.13	7.52	7.44	7.18	7.13	7.24	7.44	7.29	7.47
Sulfate	mg/L	--	112	102	88.5	82.8	144	127	131	139	187	162	151	89.2	149	128	162	203
Total Dissolved Solids	mg/L	--	544	440	410	468	570	484	494	544	474	516	646	424	524	432	594	604
Antimony	ug/L	6	0.13 J	0.14 J	0.13 J	<0.073 U	0.24 J	0.14 J	0.26 J	0.15 J	--	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U
Arsenic	ug/L	10	0.17 J	0.2 J	0.18 J	0.25 J	0.47 J	<0.099 U	0.33 J	<0.28 U	--	0.36 J	<0.28 U	<0.28 U	<0.28 U	0.37 J	0.39 J	0.44 J
Barium	ug/L	2000	25.4	16.3	17.6	27.5	24	22.5	22.3	23.8	--	16.5	23.9	23.7	24.1	21	24.2	25.3
Beryllium	ug/L	4	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	0.3 J	<0.18 U	<0.18 U	<0.18 U	<0.25 U	<0.25 U	<0.25 U
Cadmium	ug/L	5	<0.089 U	<0.089 U	0.21 J	<0.089 U	0.1 J	<0.089 U	0.084 J	<0.081 U	--	<0.081 U	--	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U
Chromium	ug/L	100	0.68 J	1.6	<0.39 U	0.49 J	0.4 J	0.7 J	<1 U	<1 U	--	<1 U	<1 U	1.3 J	<1 U	1.4 J	1.2 J	<1 U
Cobalt	ug/L	6	0.33 J	0.11 J	0.16 J	0.11 J	0.31 J	0.32 J	0.27 J	0.21 J	--	0.16 J	0.12 J	<0.12 U	<0.12 U	<0.12 U	<0.12 U	<0.12 U
Lead	ug/L	15	0.067 J	<0.04 U	0.73 J	<0.04 U	0.094 J	<0.04 U	<0.2 U	<0.2 U	--	<0.2 U	--	<0.24 U	<0.24 U	<0.24 U	<0.24 U	<0.24 U
Lithium	ug/L	40	4.3	1.7	1.5	2.6	6.1	3.2	1.2	3.7	--	4.8	1.9	1.1	1.8	1.8	1.4	2.2
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	<0.084 U	<0.084 U	--	<0.084 U	--
Molybdenum	ug/L	100	14.6	9.9	13.2	11.6	17.6	14.5	11.9	15.8	--	19.1	14.7	15.4	29.4	27.6	25.6	27.6
Selenium	ug/L	50	3	6.4	15.3	7.7	10.5	13.3	9.7	15	--	8.6	5.5	4.1	12.6	1.8	11.7	1.6
Thallium	ug/L	2	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	0.18 J	<0.14 U	--	0.21 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U
Total Radium	pCi/L	5	0.771	0.247	1.74	0.549	1.7	1.21	0.936	0.689	--	0.741	0.48	0.33	0.76	0.244	0.123	0.485
Radium-226	pCi/L	--	0.764	0.16	0.635	0.467	0.984	0.933	0.168	0.439	--	0.217	0.239	0.139	0.211	0.103	0.119	0
Radium-228	pCi/L	--	0.007	0.0865	1.1	0.0824	0.72	0.274	0.768	0.25	--	0.524	0.241	0.191	0.549	0.141	0.0036	0.485
Field Specific Conductance	umhos/cm	--	954	535	662	1332	819	1212	660.4	751	612	790	881	819	888	705	869	948
Oxygen, Dissolved	mg/L	--	0.9	3.63	0.1	0.68	0.11	0.92	1.71	0.1	0.6	1.16	0.28	1.12	1.21	2.65	4	0.11
Field Oxidation Potential	mV	--	106	129.6	52.4	20.9	-0.5	46	82.2	-53.6	170	40.1	118.6	137.3	190.4	177.4	203.6	217.8
Groundwater Elevation	feet	--	801.22	811.83	801.07	801.52	789.64	787.95	787.83	788.54	788	790.43	787.63	788.47	789.44	790.65	787.73	787.74
Temperature	deg C	--	15	11.7	13.9	16.5	14.9	11.7	12.1	15	15.8	10.6	13.9	16.4	11.2	15	11	14.3
Turbidity	NTU	--	--	0	0.05	0.24	0.43	0.23	0.39	0.47	2.71	0.42	0.08	3.54	1.56	1.6	0.16	0
pH at 25 Degrees C	Std. Units	--	7.3	7.6	7.3	7.1	7.2	7.5	7.4	7.6	7.5	7.4	7.3	7.4	7.4	7.4	7.7	7.5

Single Location

Name: WPL - Columbia

Location ID: MW-84A
Number of Sampling Dates: 19

Parameter Name	Units	GPS	12/22/2015	4/5/2016	7/8/2016	7/28/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/24/2017	4/25/2018	8/8/2018	10/24/2018	4/3/2019	10/9/2019	2/3/2020
Boron	ug/L	--	11.9	14	14.7	--	11.1	14.7	16.1	12.9	14.8	22.9	13.8	25	12.8	10.1 J	13.6	12	15.7
Calcium	ug/L	--	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500	72700
Chloride	mg/L	--	4.9	4.7	5.1	--	4.3	4.7	4.6	4.9	5.5	5.5	5.1	4.8	4.9	4.2	3.6	3.9	3.7
Fluoride	mg/L	4	<0.2 U	<0.2 U	<0.2 U	--	<0.1 U	<0.1 U	0.12 J	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	--
Field pH	Std. Units	--	7.6	7.61	7.45	7.34	7.91	7.25	6.99	7.8	7.28	7.23	7.68	7.45	7.38	7.24	7.03	7.23	7.51
Sulfate	mg/L	--	4.9	4.3	3.7 J	--	2.6 J	2.7 J	3	2.8 J	2.7 J	2 J	2.2 J	2.8 J	1.9 J	1.6 J	1.4 J	1.3 J	<2.2 U
Total Dissolved Solids	mg/L	--	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310	316
Antimony	ug/L	6	<0.073 U	0.084 J	0.1 J	--	<0.073 U	<0.073 U	<0.073 U	<0.073 U	<0.15 U	<0.15 U	--	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U	--
Arsenic	ug/L	10	0.15 J	0.29 J	0.14 J	--	0.35 J	0.19 J	0.35 J	<0.099 U	<0.28 U	0.28 J	--	<0.28 U	<0.28 U	0.33 J	<0.28 U	0.46 J	0.38 J
Barium	ug/L	2000	15.3	12.7	12.2	--	14.2	18.4	13.8	14.1	13.4	14	--	14.6	13.7	14.5	14.7	13.2	14
Beryllium	ug/L	4	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	<0.18 U	<0.18 U	<0.18 U	<0.18 U	<0.25 U	--
Cadmium	ug/L	5	<0.089 U	<0.089 U	<0.089 U	--	<0.089 U	<0.089 U	<0.089 U	<0.089 U	<0.081 U	<0.081 U	--	<0.081 U	--	<0.15 U	<0.15 U	<0.15 U	--
Chromium	ug/L	100	2.5	1.9	1.8	--	2	2	1.9	2.4	2 J	1.6 J	--	2.4 J	1.5 J	1.6 J	1.8 J	1.6 J	1.6 J
Cobalt	ug/L	6	0.095 J	<0.036 U	0.053 J	--	<0.036 U	<0.036 U	<0.036 U	<0.036 U	<0.085 U	<0.085 U	--	<0.085 U	<0.085 U	<0.12 U	<0.12 U	<0.12 U	<0.12 U
Lead	ug/L	15	0.16 J	<0.04 U	0.39 J	--	0.049 J	0.11 J	<0.04 U	0.041 J	<0.2 U	<0.2 U	--	<0.2 U	--	<0.24 U	<0.24 U	<0.24 U	--
Lithium	ug/L	40	0.72 J	0.44 J	0.5 J	--	0.56 J	0.56 J	0.56 J	0.55 J	0.46 J	0.58 J	--	0.5 J	0.4 J	0.49 J	0.56 J	0.52 J	0.58 J
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	--	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	<0.084 U	<0.084 U	<0.084 U	--
Molybdenum	ug/L	100	<0.07 U	<0.07 U	0.073 J	--	0.12 J	<0.07 U	<0.07 U	<0.07 U	<0.44 U	<0.44 U	--	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U
Selenium	ug/L	50	<0.21 U	<0.21 U	<0.21 U	--	<0.21 U	<0.21 U	<0.21 U	<0.21 U	<0.32 U	<0.32 U	--	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 U
Thallium	ug/L	2	<0.14 U	<0.14 U	<0.14 U	--	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U
Total Radium	pCi/L	5	0.593	0.0809	--	1.37	0.825	0.404	1.39	0.0929	0.676	0.509	--	0.526	0.529	0.62	0.681	0.247	0.1
Radium-226	pCi/L	--	0.156	-0.088	--	-0.058	0.132	0.168	0.624	0.0768	0.27	0.242	--	0.155	-0.203	0.313	0.199	0.247	0.1
Radium-228	pCi/L	--	0.437	0.0809	--	1.37	0.693	0.236	0.766	0.0161	0.406	0.267	--	0.371	0.529	0.307	0.482	-0.024	-0.153
Field Specific Conductance	umhos/cm	--	599	427	574.8	579.3	1002	578.2	489	948	535.3	557.2	491	581.7	617.1	609	637.2	614.1	618.4
Oxygen, Dissolved	mg/L	--	9.7	9.37	3.78	5.11	9.61	8.94	6.48	9.28	9.46	7.5	9.3	3.94	8.84	10.01	9.49	11.36	8.43
Field Oxidation Potential	mV	--	154	165.1	139.9	138.3	82.7	87	192.9	102	123.6	204.7	210	53.3	142.7	71.5	103.4	181.7	121.5
Groundwater Elevation	feet	--	785.31	786.3	785.89	785.61	787.22	786.63	786.7	787.16	787.63	786.68	785.32	785.88	786.55	788.32	787.35	787.79	786.5
Temperature	deg C	--	10.4	10.2	11.3	11	11.5	10.8	10.9	10.6	11.3	11.2	11.1	10.2	12	11.6	10.2	11.8	10.3
Turbidity	NTU	--	--	0.86	2.75	0.17	0.3	0.25	0.33	0.04	0.56	0.08	2.93	0.81	0.71	3.79	1.9	2.41	1.23
pH at 25 Degrees C	Std. Units	--	7.5	7.4	7.4	--	7.3	7.4	7.3	7.7	7.6	7.4	7.6	7.6	7.4	7.5	7.4	7.5	7.4

Location ID: MW-84A
Number of Sampling Dates: 19

Parameter Name	Units	GPS	5/29/2020	10/8/2020
Boron	ug/L	--	10	9.7 J
Calcium	ug/L	--	77600	69200
Chloride	mg/L	--	3.7	4.3
Fluoride	mg/L	4	<0.095 U	<0.095 U
Field pH	Std. Units	--	7.34	7.49
Sulfate	mg/L	--	1.5 J	1.3 J
Total Dissolved Solids	mg/L	--	340	320
Antimony	ug/L	6	<0.15 U	<0.15 U
Arsenic	ug/L	10	0.34 J	0.49 J
Barium	ug/L	2000	13.9	12.6
Beryllium	ug/L	4	<0.25 U	<0.25 U
Cadmium	ug/L	5	<0.15 U	<0.15 U
Chromium	ug/L	100	1.7 J	1.6 J
Cobalt	ug/L	6	<0.12 U	<0.12 U
Lead	ug/L	15	<0.24 U	<0.24 U
Lithium	ug/L	40	0.4 J	0.39 J
Mercury	ug/L	2	<0.084 U	<0.066 U
Molybdenum	ug/L	100	<0.44 U	<0.44 U
Selenium	ug/L	50	<0.32 U	<0.32 U
Thallium	ug/L	2	<0.14 U	<0.14 U
Total Radium	pCi/L	5	0.395	0.39
Radium-226	pCi/L	--	0.368	0
Radium-228	pCi/L	--	0.0273	0.39
Field Specific Conductance	umhos/cm	--	613.7	610.1
Oxygen, Dissolved	mg/L	--	9.81	9.39
Field Oxidation Potential	mV	--	135	153.2
Groundwater Elevation	feet	--	787.02	786.1
Temperature	deg C	--	10.6	11.9
Turbidity	NTU	--	2.15	0
pH at 25 Degrees C	Std. Units	--	7.6	7.6

Single Location

Name: WPL - Columbia

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

Parameter Name	Units	GPS	12/22/2015	4/5/2016	7/8/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/23/2017	4/25/2018	8/8/2018	10/24/2018	4/2/2019	10/9/2019	2/3/2020	5/29/2020
Boron	ug/L	--	26.5	25.2	23.6	30.6	32.8	32.6	28.8	21.3	30.6	34.3	24.3	22.8	27.8	26.9	35.9	27.9	21.3
Calcium	ug/L	--	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000	112000
Chloride	mg/L	--	3.7 J	4	3.5 J	2.2	2 J	1.5 J	2	3.5	5.5	4	2.3	5.2	3.2	0.79 J	1.7 J	1.3 J	2 J
Fluoride	mg/L	4	<0.2 U	<0.2 U	<0.2 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	--	<0.095 U
Field pH	Std. Units	--	6.85	7.01	6.87	7.28	6.63	7.1	7.11	6.7	6.75	7.37	6.76	6.91	6.79	6.62	6.67	6.89	6.73
Sulfate	mg/L	--	9.3	15.3	15	13.9	12.3 J	6.5	10.3	17.1	31.6	27.5	8.6	21.6	19.2	4.4	8.4	7.2	11.5
Total Dissolved Solids	mg/L	--	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462	452
Antimony	ug/L	6	0.15 J	0.094 J	0.13 J	<0.073 U	0.4 J	<0.073 U	<0.073 U	<0.15 U	<0.15 U	--	<0.15 U	0.36 J	<0.15 U	0.32 J	<0.15 U	--	<0.15 U
Arsenic	ug/L	10	0.26 J	0.26 J	0.19 J	0.24 J	0.4 J	0.13 J	0.18 J	<0.28 U	<0.28 U	--	<0.28 U	0.45 J	<0.28 U	0.4 J	0.42 J	<0.28 U	0.33 J
Barium	ug/L	2000	20.2	11.1	11.6	15.6	15	13.5	13.2	11.3	11.8	--	9.3	10.2	11.5	11.8	10	10.9	9.8
Beryllium	ug/L	4	<0.13 U	<0.13 U	<0.13 U	<0.13 U	0.19 J	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	<0.18 U	0.37 J	<0.18 U	0.28 J	<0.25 U	--	<0.25 U
Cadmium	ug/L	5	<0.089 U	<0.089 U	<0.089 U	<0.089 U	0.32 J	<0.089 U	<0.089 U	<0.081 U	<0.081 U	--	<0.081 U	--	<0.15 U	0.21 J	<0.15 U	--	<0.15 U
Chromium	ug/L	100	2.1	0.58 J	0.59 J	<0.39 U	0.7 J	0.53 J	0.7 J	2.3 J	<1 U	--	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
Cobalt	ug/L	6	1.4	0.25 J	0.22 J	0.041 J	0.38 J	0.071 J	0.064 J	0.13 J	0.12 J	--	<0.085 U	0.28 J	<0.12 U	0.35 J	<0.12 U	0.17 J	<0.12 U
Lead	ug/L	15	0.9 J	0.077 J	0.48 J	<0.04 U	0.34 J	<0.04 U	<0.04 U	<0.2 U	<0.2 U	--	<0.2 U	--	<0.24 U	0.3 J	<0.24 U	--	<0.24 U
Lithium	ug/L	40	1.3	0.58 J	0.69 J	0.6 J	0.87 J	0.67 J	0.68 J	0.62 J	0.6 J	--	0.55 J	0.85 J	0.52 J	0.9 J	0.61 J	0.67 J	0.47 J
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	<0.084 U	<0.084 U	<0.084 U	--	<0.084 U
Molybdenum	ug/L	100	0.35 J	0.15 J	0.14 J	0.12 J	0.38 J	<0.07 U	<0.07 U	<0.44 U	<0.44 U	--	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U
Selenium	ug/L	50	0.3 J	0.21 J	0.39 J	<0.21 U	0.26 J	<0.21 U	<0.21 U	<0.32 U	<0.32 U	--	<0.32 U	0.71 J	<0.32 U	0.49 J	<0.32 U	<0.32 U	<0.32 U
Thallium	ug/L	2	<0.14 U	<0.14 U	<0.14 U	<0.14 U	0.48 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	<0.14 U	0.3 J	<0.14 U	0.48 J	<0.14 U	<0.14 U	<0.14 U
Total Radium	pCi/L	5	1.31	1.11	0.89	0.631	1.01	2.42	1.35	1.3	1.74	--	0.882	0.0351	0.652	0.552	0.701	0.502	0.193
Radium-226	pCi/L	--	0.655	0.294	0.404	-0.067	0.108	1.46	0.513	0.287	1.09	--	0.122	-0.06	0.247	0	0.252	0.136	0
Radium-228	pCi/L	--	0.651	0.82	0.486	0.631	0.905	0.964	0.833	1.01	0.647	--	0.76	0.0351	0.405	0.552	0.449	0.366	0.193
Field Specific Conductance	umhos/cm	--	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868	797
Oxygen, Dissolved	mg/L	--	1.7	2.71	1.47	1.99	1.34	1.24	1.44	1.81	1.43	1.1	2.35	2.14	2.49	2.2	1.67	1.07	2
Field Oxidation Potential	mV	--	135	123.7	133.9	100.8	95.8	226.1	100.9	115.1	187.4	204	74.3	126.5	77.9	152.1	173	132.3	118.7
Groundwater Elevation	feet	--	785.56	768.12	786.31	787.64	787.37	787.27	787.89	788.25	787.34	785.89	785.29	787.06	788.98	787.04	788.47	787.24	787.77
Temperature	deg C	--	9.7	7.7	10	11.2	10.1	8.8	7.7	8.9	10.2	11.1	7.4	10.6	11.1	7.5	11.3	8.5	8.1
Turbidity	NTU	--	--	1.52	3.89	0.59	0.74	0.42	0.1	0.22	0.18	1.52	1.12	0.46	3.3	2.02	2.12	1.41	0
pH at 25 Degrees C	Std. Units	--	7	7	6.8	6.8	6.9	6.9	7.1	7	7	7.3	7	7	7.1	6.8	7	6.8	7

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

Parameter Name	Units	GPS	10/8/2020
Boron	ug/L	--	28.8
Calcium	ug/L	--	93000
Chloride	mg/L	--	3.4
Fluoride	mg/L	4	<0.095 U
Field pH	Std. Units	--	6.95
Sulfate	mg/L	--	25.1
Total Dissolved Solids	mg/L	--	412
Antimony	ug/L	6	0.33 J
Arsenic	ug/L	10	0.62 J
Barium	ug/L	2000	9.4
Beryllium	ug/L	4	<0.25 U
Cadmium	ug/L	5	0.19 J
Chromium	ug/L	100	<1 U
Cobalt	ug/L	6	0.29 J
Lead	ug/L	15	0.25 J
Lithium	ug/L	40	0.46 J
Mercury	ug/L	2	<0.066 U
Molybdenum	ug/L	100	<0.44 U
Selenium	ug/L	50	<0.32 U
Thallium	ug/L	2	0.3 J
Total Radium	pCi/L	5	0.38
Radium-226	pCi/L	--	0.0511
Radium-228	pCi/L	--	0.329
Field Specific Conductance	umhos/cm	--	760
Oxygen, Dissolved	mg/L	--	1.22
Field Oxidation Potential	mV	--	183.9
Groundwater Elevation	feet	--	786.53
Temperature	deg C	--	11
Turbidity	NTU	--	0
pH at 25 Degrees C	Std. Units	--	7.2

Single Location

Name: WPL - Columbia

Location ID: MW-303
Number of Sampling Dates: 19

Parameter Name	Units	GPS	12/21/2015	4/4/2016	7/7/2016	7/28/2016	10/12/2016	1/26/2017	4/10/2017	6/6/2017	8/8/2017	10/23/2017	4/24/2018	8/8/2018	9/21/2018	10/24/2018	4/1/2019	6/19/2019	10/7/2019
Boron	ug/L	--	3000	2130	1680	--	1770	1790	1990	1970	2080	1870	2330	1410	--	2360	2770	--	2560
Calcium	ug/L	--	9830	36000	14200	--	44500	7330	33700	35500	20700	8850	4610	25600	--	28200	9290	--	22300
Chloride	mg/L	--	29.6 J	8	45.9 J	--	<0.5 U	14.2 J	16.7 J	8.1	11.7 J	8.3 J	<10 U	<10 U	--	2.6	3.7 J	--	2.7
Fluoride	mg/L	4	<2 U	0.28 J	<4 U	--	<0.1 U	<1 U	<2 U	0.3 J	<1 U	<0.5 U	<2 U	<2 U	--	0.16 J	0.54 J	--	0.19 J
Field pH	Std. Units	--	9.93	9.43	9.48	9.13	9.75	9.94	9.85	9.1	9	9.2	10.01	9.3	9.15	8.89	9.92	8.98	9.33
Sulfate	mg/L	--	597	311	352	--	438	453	506	445	356	467	527	449	--	327	390	--	299
Total Dissolved Solids	mg/L	--	1230	562	724	--	694	794	778	686	678	806	948	792	--	516	726	--	574
Antimony	ug/L	6	0.92 J	0.23 J	0.32 J	--	0.076 J	0.23 J	0.14 J	<0.15 U	<0.15 U	--	0.28 J	0.15 J	--	<0.15 U	0.29 J	--	0.31 J
Arsenic	ug/L	10	49.2	12.6	27.9	--	13.4	27	12.1	9.1	12	--	39.1	8.7	6	7.8	33.2	5.3	10.2
Barium	ug/L	2000	19.1	13.6	7.5	--	19.6	6.1	16	14.5	10.5	--	5.1	14.3	--	16.6	6.5	--	11.4
Beryllium	ug/L	4	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	<0.18 U	<0.18 U	--	<0.18 U	<0.18 U	--	<0.25 U
Cadmium	ug/L	5	<0.089 U	<0.089 U	<0.089 U	--	<0.089 U	<0.089 U	<0.089 U	<0.081 U	<0.081 U	--	<0.081 U	--	--	<0.15 U	<0.15 U	--	<0.15 U
Chromium	ug/L	100	50.6	60	66.3	--	79.9	73.4	71	65.1	65.3	--	97.1	56.8	--	49.1	71.2	--	62
Cobalt	ug/L	6	1.8	0.46 J	0.6 J	--	0.47 J	0.54 J	0.48 J	0.42 J	0.37 J	--	0.8 J	0.58 J	--	0.4 J	0.54 J	--	0.51 J
Lead	ug/L	15	1.4	0.11 J	0.15 J	--	<0.04 U	<0.04 U	<0.04 U	<0.2 U	<0.2 U	--	<0.2 U	--	--	<0.24 U	<0.24 U	--	<0.24 U
Lithium	ug/L	40	1.6	1	0.77 J	--	1.3	0.59 J	1.2	1.1	0.86 J	--	0.61 J	1.1	--	1.3	0.74 J	--	1
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	--	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	--	<0.084 U	<0.084 U	--	--
Molybdenum	ug/L	100	195	62.6	69.5	--	91.9	91.2	103	87	81.6	--	138	94.8	84.7	85.5	106	64.1	87
Selenium	ug/L	50	126	24	26.6	--	25	32.8	25.9	18.3	19.7	--	52.9	25.1	15.8	15.1	36.5	--	16.4
Thallium	ug/L	2	<0.14 U	<0.14 U	0.15 J	--	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	<0.14 U	<0.14 U	--	<0.14 U	<0.14 U	--	<0.14 U
Total Radium	pCi/L	5	1.65	0.56	--	0.591	0.0851	1.24	0.016	2.41	0.795	--	0.5	0.237	--	0.744	0.677	--	0.422
Radium-226	pCi/L	--	1.25	0.375	--	0.0662	-0.377	-0.776	-0.162	0.145	0.459	--	0.0558	0	--	0.328	0.39	--	0.0995
Radium-228	pCi/L	--	0.404	0.185	--	0.525	0.0851	1.24	0.016	2.26	0.336	--	0.444	0.237	--	0.416	0.287	--	0.322
Field Specific Conductance	umhos/cm	--	2130	641	1076	1154	1946	1134	1826	931	936	1093	1447	1095	856	823	1176	712	865
Oxygen, Dissolved	mg/L	--	1.7	4.95	2.91	3.86	7.24	6.92	6.88	6.9	5.53	5.4	4.53	7.59	8.2	8.93	5.59	7.21	7.93
Field Oxidation Potential	mV	--	43	30.6	-2.3	22.1	26.2	-55.3	3.9	57.5	-22	285	-22.3	126.1	20.4	70.1	19.9	206.4	65.9
Groundwater Elevation	feet	--	784.11	783.58	784.6	784.35	786.18	785.28	786	786.49	785.42	783.92	783.27	785.2	786.5	787.51	786.52	786.81	787.02
Temperature	deg C	--	11.2	10.7	12.2	11.9	12.1	11.6	10.7	11.3	12.5	12.3	10.9	12.7	13.28	12.5	10.8	13	12.4
Turbidity	NTU	--	--	0	4.27	3.38	0.14	1.52	0.74	0.41	2.09	5.67	1.42	3.51	44.4	4.71	2.4	2.24	3.31
pH at 25 Degrees C	Std. Units	--	9.5	8.8	9	--	8.8	9.2	9.1	8.9	9.1	9.3	9.4	8.9	--	8.6	9.1	--	8.8

Location ID: MW-303
Number of Sampling Dates: 19

Parameter Name	Units	GPS	5/27/2020	10/7/2020
Boron	ug/L	--	2700	2520
Calcium	ug/L	--	27400	19700
Chloride	mg/L	--	2.3 J	2 J
Fluoride	mg/L	4	<0.48 U	0.19 J
Field pH	Std. Units	--	8.68	9.21
Sulfate	mg/L	--	326	312
Total Dissolved Solids	mg/L	--	570	532
Antimony	ug/L	6	0.22 J	<0.15 U
Arsenic	ug/L	10	5.9	9.5
Barium	ug/L	2000	13.8	10
Beryllium	ug/L	4	0.36 J	<0.25 U
Cadmium	ug/L	5	0.3 J	<0.15 U
Chromium	ug/L	100	42.8	46.4
Cobalt	ug/L	6	0.49 J	0.23 J
Lead	ug/L	15	0.32 J	<0.24 U
Lithium	ug/L	40	1.2	0.69 J
Mercury	ug/L	2	<0.084 U	--
Molybdenum	ug/L	100	67.1	67.1
Selenium	ug/L	50	18.7	17.2
Thallium	ug/L	2	0.28 J	<0.14 U
Total Radium	pCi/L	5	0.382	0.722
Radium-226	pCi/L	--	0.168	0.0515
Radium-228	pCi/L	--	0.214	0.67
Field Specific Conductance	umhos/cm	--	828	801
Oxygen, Dissolved	mg/L	--	9.15	7.62
Field Oxidation Potential	mV	--	116.1	183
Groundwater Elevation	feet	--	785.56	785.16
Temperature	deg C	--	11.6	12.6
Turbidity	NTU	--	0	0
pH at 25 Degrees C	Std. Units	--	8.2	8.8

Single Location

Name: WPL - Columbia

Location ID: MW-304
Number of Sampling Dates: 16

Parameter Name	Units	GPS	12/21/2015	4/4/2016	7/7/2016	10/13/2016	1/26/2017	4/10/2017	6/5/2017	8/8/2017	10/23/2017	4/24/2018	8/8/2018	10/24/2018	4/2/2019	10/7/2019	5/27/2020	10/7/2020
Boron	ug/L	--	609	420	445	659	614	496	486	570	732	430	632	892	413	613	469	784
Calcium	ug/L	--	78800	77600	72000	77000	65700	79100	75200	79700	78300	77900	84900	72400	88300	82900	84000	75100
Chloride	mg/L	--	34.2	29.3	34.2	31.4	42.8	23.5	42.3	37.5	39.5	30.1	39.1	36.9	30.8	29.4	25.2	43.9
Fluoride	mg/L	4	0.27 J	<0.2 U	0.23 J	<0.5 U	0.26 J	0.1 J	0.19 J	0.12 J	0.13 J	<0.1 U	<1 U	0.14 J	<0.1 U	<0.1 U	<0.095 U	0.17 J
Field pH	Std. Units	--	7.17	7.45	7.25	7.71	7.59	7.64	7.2	7.13	7.78	7.16	7.21	7.11	7.28	7.35	7.09	7.18
Sulfate	mg/L	--	71.9	71.7	66.2	46.8	56.9	63.6	97.1	68.5	57.2	43.5	76	34.1	33.1	40	42.4	55.9
Total Dissolved Solids	mg/L	--	420	434	402	406	388	422	500	454	390	406	530	384	394	428	412	442
Antimony	ug/L	6	0.72 J	<0.073 U	<0.073 U	<0.073 U	<0.073 U	<0.073 U	<0.15 U	<0.15 U	--	<0.15 U	<0.15 U	<0.15 U	<0.15 U	0.29 J	0.25 J	<0.15 U
Arsenic	ug/L	10	2.3	1.1	1.2	1.8	0.99 J	0.98 J	1.1	1	--	0.64 J	0.76 J	1.6	0.63 J	3.2	1.3	2.8
Barium	ug/L	2000	42.9	34.8	28.2	39.5	28.2	30.9	30.9	33.3	--	26.2	35.2	33.6	26.7	34.8	30.8	37.4
Beryllium	ug/L	4	0.34 J	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	<0.18 U	<0.18 U	<0.18 U	<0.18 U	<0.25 U	0.26 J	<0.25 U
Cadmium	ug/L	5	0.64 J	<0.089 U	0.12 J	<0.089 U	<0.089 U	<0.089 U	<0.081 U	<0.081 U	--	<0.081 U	--	<0.15 U	<0.15 U	<0.15 U	0.19 J	<0.15 U
Chromium	ug/L	100	2.1	1.5	<0.39 U	<0.39 U	<0.39 U	0.65 J	1.9 J	<1 U	--	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
Cobalt	ug/L	6	1.9	1.2	0.62 J	0.83 J	0.73 J	0.62 J	0.76 J	0.8 J	--	0.36 J	1.1	0.88 J	0.67 J	0.92 J	0.69 J	0.65 J
Lead	ug/L	15	1.1	0.47 J	0.43 J	<0.04 U	<0.04 U	0.16 J	<0.2 U	<0.2 U	--	<0.2 U	--	<0.24 U	<0.24 U	<0.24 U	0.29 J	<0.24 U
Lithium	ug/L	40	0.93 J	0.51 J	0.17 J	0.14 J	<0.11 U	0.16 J	<0.14 U	<0.14 U	--	<0.14 U	<0.14 U	<0.19 U	<0.19 U	<0.22 U	0.3 J	<0.22 U
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	<0.084 U	<0.084 U	--	<0.084 U	--
Molybdenum	ug/L	100	15.6	9.2	21.9	17.1	14.4	10.1	15.6	11.8	--	3.2	12.3	10.2	3	4.8	3.9	12
Selenium	ug/L	50	1	<0.21 U	<0.21 U	<0.21 U	<0.21 U	<0.21 U	<0.32 U	<0.32 U	--	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 U	0.33 J	<0.32 U
Thallium	ug/L	2	0.68 J	0.15 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	0.15 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	0.33 J	<0.14 U
Total Radium	pCi/L	5	1.03	0.474	2.24	0.885	1.25	0.74	1.88	0.777	--	0.94	0.474	0.678	0.911	0.443	0.302	0.435
Radium-226	pCi/L	--	0.759	0.18	-0.084	0	0.426	0.413	0.437	0.266	--	0.136	-0.061	0.244	0.703	-0.154	0.0533	0
Radium-228	pCi/L	--	0.267	0.294	2.24	0.885	0.819	0.327	1.44	0.511	--	0.804	0.474	0.434	0.208	0.443	0.249	0.435
Field Specific Conductance	umhos/cm	--	770	535	680	1211	624.9	1.105	660	704	628	686.4	785	707	747	729	711	776
Oxygen, Dissolved	mg/L	--	0.8	0.45	0.33	0.59	1.96	0.58	1.37	0.69	0.3	1.45	0.29	1.08	0.3	0.28	0.61	0.31
Field Oxidation Potential	mV	--	96	-65.2	21.2	-68.7	-58.7	-22.2	-15.3	-43.7	94	-18	24.8	-43	14.2	-97	54.2	-99.7
Groundwater Elevation	feet	--	786.13	792.16	787.36	788.18	789.34	788.22	788.58	789.52	788.97	789.69	788.25	789.05	789.72	790.41	789.3	788.52
Temperature	deg C	--	13.7	9.7	16.4	16.3	12.4	10.4	13.4	17.9	17.4	10.6	20.1	16.7	8.3	18.5	16.2	18.3
Turbidity	NTU	--	--	0	2.57	2.19	1.2	5.43	12.84	1.54	6.2	1.22	2.35	5.89	5.27	2.61	4.35	1.1
pH at 25 Degrees C	Std. Units	--	7.3	7.4	7.3	7.3	7.7	7.6	7.4	7.4	7.5	7.4	7.3	7.5	7.3	7.3	7.6	7.4

Single Location

Name: WPL - Columbia

Location ID: MW-305
Number of Sampling Dates: 16

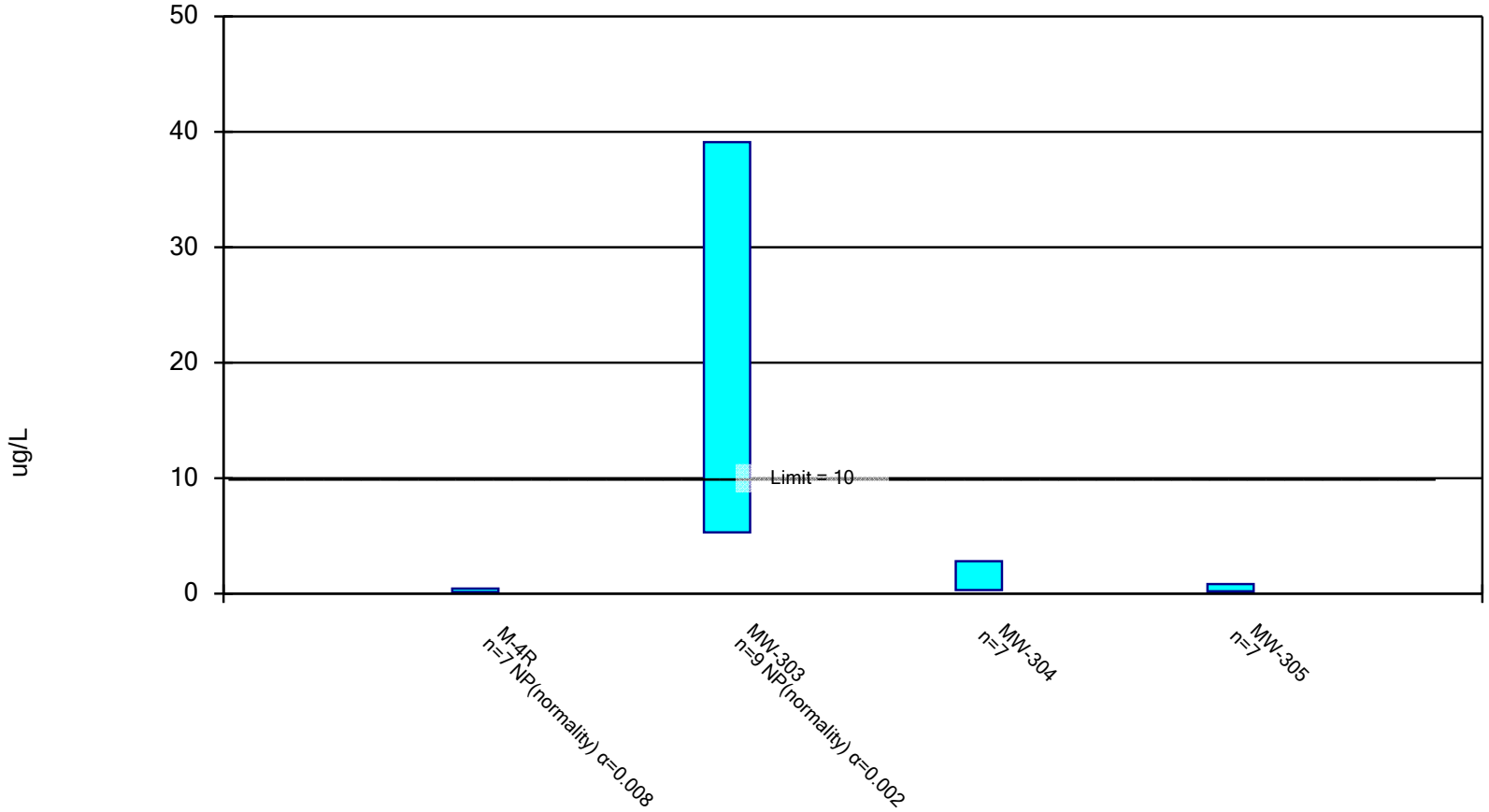
Parameter Name	Units	GPS	12/21/2015	4/4/2016	7/8/2016	10/13/2016	1/25/2017	6/5/2017	8/7/2017	10/24/2017	4/23/2018	8/7/2018	10/24/2018	4/1/2019	10/7/2019	5/27/2020	10/7/2020	12/11/2020
Boron	ug/L	--	1020	525	1110	1270	733	1240	2470	2200	1200	1360	1600	692	1430	1040	1650	--
Calcium	ug/L	--	46400	37500	47300	56700	96500	75500	80200	94100	64800	91200	60200	74700	93000	103000	112000	--
Chloride	mg/L	--	37.1	25.3	32.4	29.4	46.1	37.1	46.9	50.2	50.6	45.7	26.2	35.8	29.3	51.3	44.9	--
Fluoride	mg/L	4	0.76	0.7	0.44	0.65 J	0.53	0.41	0.46	0.64	0.37	0.18 J	0.36	0.33	0.36	0.3 J	0.47	--
Field pH	Std. Units	--	7.93	8.68	8.04	8.25	8.17	7.72	7.82	8.48	9.12	8.01	7.7	8.04	7.75	8.48	8.64	8.43
Sulfate	mg/L	--	105	78.7	99.2	108	274	185	243	252	191	276	123	200	480	305	391	--
Total Dissolved Solids	mg/L	--	258	228	282	298	530	408	490	490	386	614	312	418	496	556	572	--
Antimony	ug/L	6	0.81 J	0.32 J	0.43 J	0.51 J	0.71 J	0.55 J	0.68 J	--	0.26 J	0.42 J	0.58 J	0.16 J	0.46 J	0.3 J	0.42 J	--
Arsenic	ug/L	10	0.56 J	0.34 J	0.26 J	0.27 J	0.78 J	0.37 J	0.43 J	--	0.48 J	0.42 J	0.4 J	<0.28 U	0.49 J	0.75 J	0.95 J	--
Barium	ug/L	2000	9.8	3.9	6.4	9.4	12.7	8.2	12.9	--	6	13.5	11	8.4	15	14.2	20.2	--
Beryllium	ug/L	4	0.19 J	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	<0.18 U	<0.18 U	<0.18 U	<0.18 U	<0.25 U	<0.25 U	<0.25 U	--
Cadmium	ug/L	5	0.31 J	<0.089 U	<0.089 U	<0.089 U	0.34 J	0.18 J	0.13 J	--	<0.081 U	--	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U	--
Chromium	ug/L	100	1.4	1.6	1.1	0.83 J	1.5	1.5 J	<1 U	--	<1 U	<1 U	1.1 J	1.3 J	1.1 J	<1 U	<1 U	--
Cobalt	ug/L	6	0.37 J	0.069 J	0.07 J	<0.036 U	0.44 J	0.26 J	0.2 J	--	<0.085 U	<0.085 U	0.13 J	<0.12 U	<0.12 U	<0.12 U	<0.12 U	--
Lead	ug/L	15	0.38 J	0.056 J	0.27 J	0.2 J	0.38 J	<0.2 U	<0.2 U	--	<0.2 U	--	<0.24 U	<0.24 U	<0.24 U	<0.24 U	<0.24 U	--
Lithium	ug/L	40	0.5 J	0.24 J	<0.11 U	0.34 J	0.21 J	0.17 J	0.15 J	--	<0.14 U	<0.14 U	0.24 J	<0.19 U	<0.22 U	<0.22 U	<0.22 U	--
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	<0.084 U	<0.084 U	--	<0.084 U	--	--
Molybdenum	ug/L	100	33.2	37.3	34.8	40.2	69.1	41.3	68.7	--	54.4	55.7	45.6	47.7	56.2	60.5	102	99
Selenium	ug/L	50	3.7	3	4.8	3.7	6.8	3.9	5.2	--	6.9	4.8	5.4	3.2	7.7	4.2	7.6	--
Thallium	ug/L	2	0.44 J	<0.14 U	<0.14 U	<0.14 U	0.45 J	0.15 J	0.2 J	--	0.16 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--
Total Radium	pCi/L	5	0.253	0.0515	1.43	0.99	0.838	0.839	0.103	--	0.353	0.717	0.924	0.799	0.727	0.71	0.577	--
Radium-226	pCi/L	--	0.253	-0.037	0.112	0.594	0	0.128	-0.121	--	0.189	0.219	0.578	0.39	0.232	0.0976	0.0596	--
Radium-228	pCi/L	--	-0.223	0.0515	1.32	0.396	0.838	0.711	0.103	--	0.164	0.498	0.346	0.409	0.495	0.612	0.517	--
Field Specific Conductance	umhos/cm	--	492	285.6	489.1	861	727	558.4	689	630	579.5	813	565	683	751	814	857	834
Oxygen, Dissolved	mg/L	--	5.5	5.6	1.17	1.38	2.31	3.06	0.55	1.3	0.78	2.04	2.78	5.14	3.53	3.16	1.53	1.75
Field Oxidation Potential	mV	--	234	67.3	96.1	-31.4	-27.6	73.6	99.5	115	-3.3	129.9	102.6	164.8	165.5	211.2	215.8	112.4
Groundwater Elevation	feet	--	788.96	812.15	789.26	789.78	789.36	789.79	789.3	788.14	787.67	788.56	790.04	790.07	790.36	787.78	787.96	788.19
Temperature	deg C	--	24.3	10.9	17	26.1	18.2	12.8	21.8	26.7	12.1	19.6	25.7	11.8	23.4	12.1	21.9	20.8
Turbidity	NTU	--	--	0	0.96	0.59	1.61	0	0.56	2.67	5.98	0.05	3.52	1.34	1.97	0	0	0
pH at 25 Degrees C	Std. Units	--	7.9	7.9	7.9	7.3	8	7.9	7.8	8	8.2	8.1	7.8	7.9	7.7	8.4	8.4	--

Appendix E

Statistical Evaluation

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 12/31/2020 9:47 AM View: COL Primary Pond

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

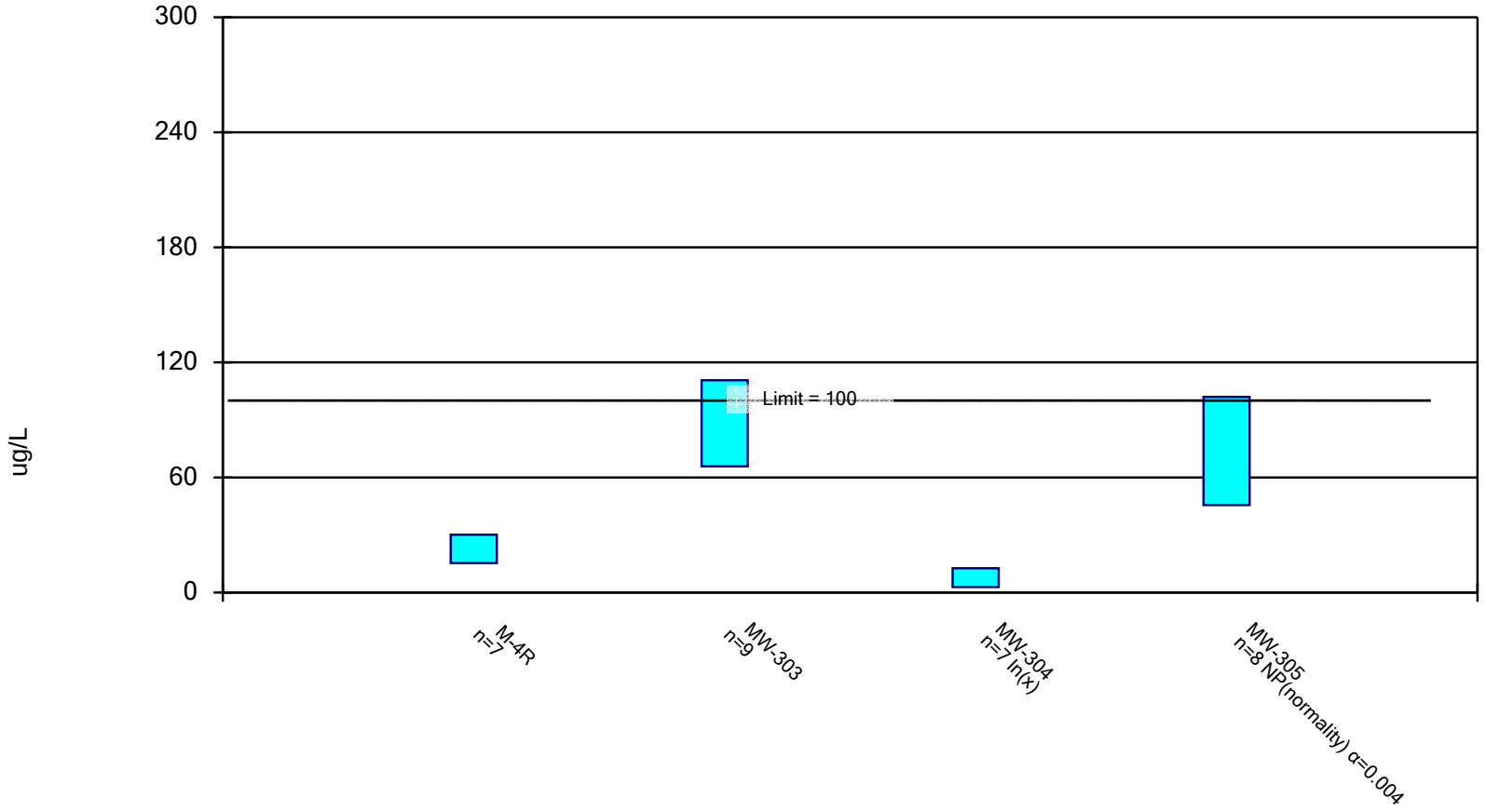
Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 12/31/2020 9:49 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-303	MW-304	MW-305
4/23/2018	0.36 (J)			0.48 (J)
4/24/2018		39.1	0.64 (J)	
8/7/2018	<0.28 (U)			0.42 (J)
8/8/2018		8.7	0.76 (J)	
9/21/2018		6		
10/24/2018	<0.28 (U)	7.8	1.6	0.4 (J)
4/1/2019	<0.28 (U)	33.2		<0.28 (U)
4/2/2019			0.63 (J)	
6/19/2019		5.3		
10/7/2019	0.37 (J)	10.2	3.2	0.49 (J)
5/27/2020	0.39 (J)	5.9	1.3	0.75 (J)
10/7/2020	0.44 (J)	9.5	2.8	0.95 (J)
Mean	0.2829	13.97	1.561	0.5186
Std. Dev.	0.136	12.77	1.053	0.2611
Upper Lim.	0.44	39.1	2.812	0.8287
Lower Lim.	0.14	5.3	0.3111	0.2084

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum Analysis Run 12/31/2020 9:47 AM View: COL Primary Pond

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

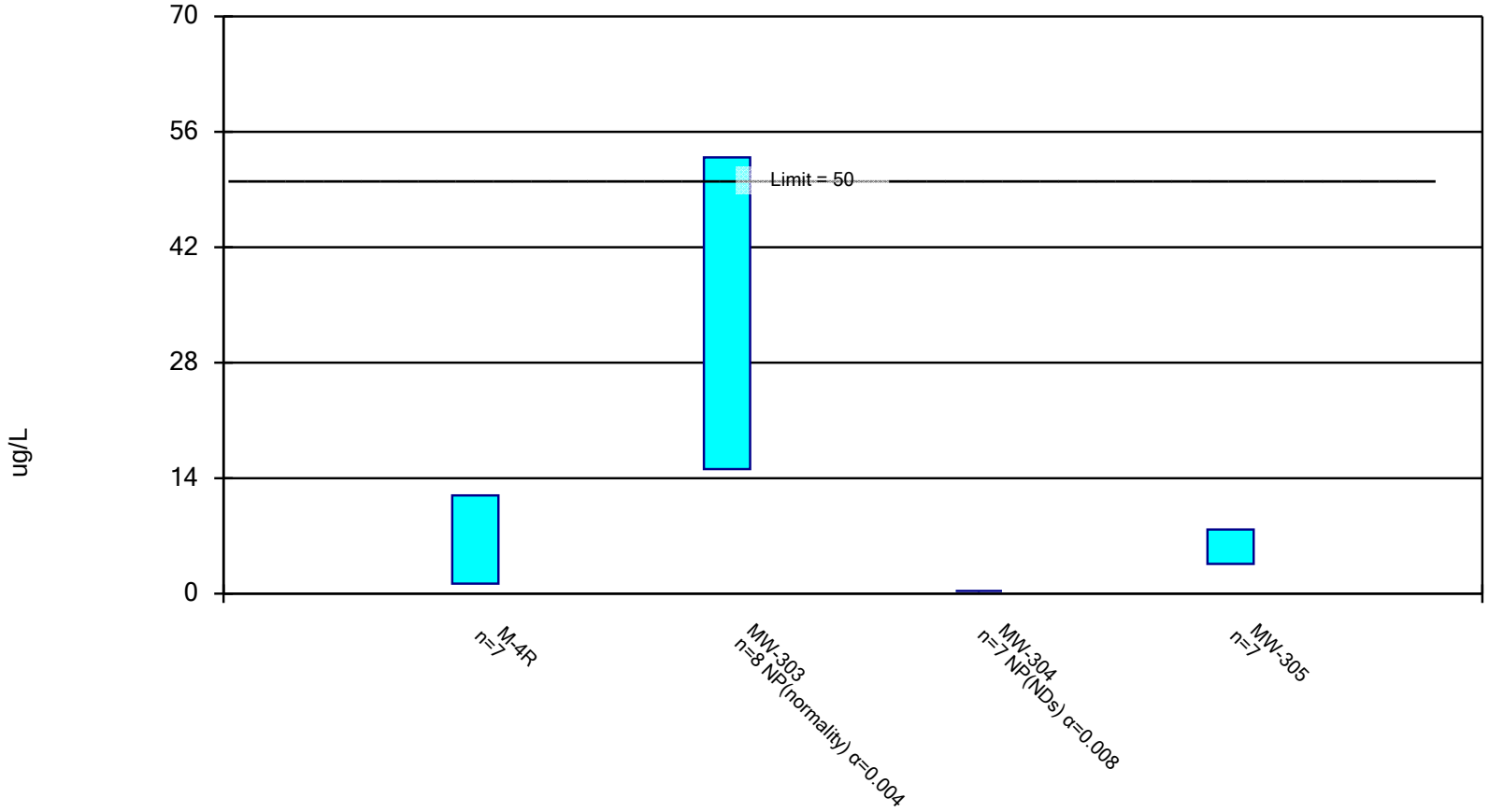
Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 12/31/2020 9:49 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-303	MW-304	MW-305
4/23/2018	19.1			54.4
4/24/2018		138	3.2	
8/7/2018	14.7			55.7
8/8/2018		94.8	12.3	
9/21/2018		84.7		
10/24/2018	15.4	85.5	10.2	45.6
4/1/2019	29.4	106		47.7
4/2/2019			3	
6/19/2019		64.1		
10/7/2019	27.6	87	4.8	56.2
5/27/2020	25.6	67.1	3.9	60.5
10/7/2020	27.6	67.1	12	102
12/11/2020				99
Mean	22.77	88.26	7.057	65.14
Std. Dev.	6.212	23.27	4.247	22.35
Upper Lim.	30.15	110.7	12.63	102
Lower Lim.	15.39	65.79	2.822	45.6

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium Analysis Run 12/31/2020 9:47 AM View: COL Primary Pond

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 12/31/2020 9:49 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-303	MW-304	MW-305
4/23/2018	8.6			6.9
4/24/2018		52.9	<0.32 (U)	
8/7/2018	5.5			4.8
8/8/2018		25.1	<0.32 (U)	
9/21/2018		15.8		
10/24/2018	4.1	15.1	<0.32 (U)	5.4
4/1/2019	12.6	36.5		3.2
4/2/2019			<0.32 (U)	
10/7/2019	1.8	16.4	<0.32 (U)	7.7
5/27/2020	11.7	18.7	0.33 (J)	4.2
10/7/2020	1.6	17.2	<0.32	7.6
Mean	6.557	24.71	0.3214	5.686
Std. Dev.	4.5	13.45	0.00378	1.753
Upper Lim.	11.9	52.9	0.33	7.769
Lower Lim.	1.212	15.1	0.32	3.603

Confidence Interval

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 12/31/2020, 9:49 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.44	0.14	10	No	7	42.86	None	No	0.008	NP (normality)
Arsenic (ug/L)	MW-303	39.1	5.3	10	No	9	0	None	No	0.002	NP (normality)
Arsenic (ug/L)	MW-304	2.812	0.3111	10	No	7	0	None	No	0.01	Param.
Arsenic (ug/L)	MW-305	0.8287	0.2084	10	No	7	14.29	None	No	0.01	Param.
Molybdenum (ug/L)	M-4R	30.15	15.39	100	No	7	0	None	No	0.01	Param.
Molybdenum (ug/L)	MW-303	110.7	65.79	100	No	9	0	None	No	0.01	Param.
Molybdenum (ug/L)	MW-304	12.63	2.822	100	No	7	0	None	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-305	102	45.6	100	No	8	0	None	No	0.004	NP (normality)
Selenium (ug/L)	M-4R	11.9	1.212	50	No	7	0	None	No	0.01	Param.
Selenium (ug/L)	MW-303	52.9	15.1	50	No	8	0	None	No	0.004	NP (normality)
Selenium (ug/L)	MW-304	0.33	0.32	50	No	7	85.71	None	No	0.008	NP (NDs)
Selenium (ug/L)	MW-305	7.769	3.603	50	No	7	0	None	No	0.01	Param.