2021 Annual Groundwater Monitoring and Corrective Action Report

Primary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25221067.00 | January 31, 2022

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

OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Primary Ash Pond
2021 Annual Report

In accordance with §257.90(e)(6), this section at the beginning of the annual report provides an overview of the current status of groundwater monitoring and corrective action programs for the coal combustion residual (CCR) 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 an SSI over background for one or more constituents listed in Appendix III to this part pursuant to §257.94(e):	
	(A) Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and	<u>February 2021</u> Field pH: MW-303, MW-305 <u>April 2021</u> Boron: MW-4R, MW-303, MW-304, MW-305 Chloride: MW-4R, MW-304, MW-305 Field pH: MW-303, MW-305 Sulfate: MW-4R, MW-303, MW-304, MW-305 Total Dissolved Solids: MW-4R, MW-303, MW-305 <u>July 2021</u> Field pH: MW-303, MW-305 <u>October 2021</u> Boron: MW-4R, MW-303, MW-304, MW-305 Chloride: MW-4R, MW-304, MW-305 Field pH: MW-303, MW-305

Category	Rule Requirement	Site Status
		Sulfate: MW-4R, MW-303, MW-304, MW-305 Total Dissolved Solids: MW-4R, MW-303, MW-305
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	July 16, 2018
Statistically Significant Levels (SSL) Above Groundwater Protection Standard (GPS)	(iv) If it was determined that there was an SSL above the GPS for one or more constituents listed in Appendix IV to this part pursuant to §257.95(g) include all of the following:	
	(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;	Not applicable – No SSLs above GPSs
	(B) Provide the date when the assessment of corrective measures (ACM) was initiated for the CCR unit;	Not applicable – No SSLs above GPSs
	(C) Provide the date when the public meeting was held for the ACM for the CCR unit; and	Not applicable – ACM not required
	(D) Provide the date when the ACM 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

Table of Contents

Section Page

Overview of Current Status i
1.0 Introduction 1
2.0 Background 1
2.1 Geologic and Hydrogeologic Setting 1
2.1.1 Regional Information 1
2.1.2 Site Information 2
2.2 CCR Rule Monitoring System 2
3.0 §257.90(e) Annual Report Requirements 2
3.1 §257.90(e)(1) Site Map 2
3.2 §257.90(e)(2) Monitoring System Changes 3
3.3 §257.90(e)(3) Summary of Sampling Events 3
3.4 §257.90(e)(4) Monitoring Transition Narrative 3
3.5 §257.90(e)(5) Other Requirements 4
3.5.1 §257.90(e) General Requirements 4
3.5.2 §257.94(d) Alternative Detection Monitoring Frequency 5
3.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring 5
3.5.4 §257.95(c) Alternative Assessment Monitoring Frequency 6
3.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards 6
3.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring 6
3.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment 6
3.6 §257.90(e)(6) Overview 6
4.0 References 7

Tables

Table 1. Groundwater Monitoring Well Network
Table 2. Groundwater Samples Summary
Table 3. Groundwater Elevation – State Monitoring Program and CCR Well Network
Table 4. Horizontal Gradients and Flow Velocity
Table 5. Groundwater Analytical Results Summary – Assessment Monitoring
Table 6. 2021 Groundwater Field Data Summary

Figures

Figure 1. Site Location Map
Figure 2. Site Plan and Monitoring Well Locations
Figure 3. Water Table Map – April 2021
Figure 4. Water Table Map – October 2021

Appendices

Appendix A Summary of Regional Hydrogeologic Stratigraphy
Appendix B Boring Logs and Well Construction Documentation
Appendix C Laboratory Reports
- C1 February 2021 Assessment Monitoring
- C2 April 2021 Assessment Monitoring
- C3 July 2021 Assessment Monitoring
- C4 October 2021 Assessment Monitoring

Appendix D Historical Monitoring Results
Appendix E Statistical Evaluation
- E1 Lower Confidence Limits
- E2 Prediction Limits for Appendix IV Parameters

I:\25221067.00\Deliverables\2021 Fed Annual Report - COL PP\220131_2021 Annual CCR GW Report COL PP_Final.docx

1.0 INTRODUCTION

This 2021 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the coal combustion residuals (CCR) Rule [40 Code of Federal Regulations (CFR) 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in italics, followed by applicable information relative to the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

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

The groundwater monitoring system 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 water table elevations and groundwater flow directions for the April 2021 monitoring event are shown on **Figure 3**, and the water table elevations and groundwater flow directions for the October 2021 sampling are 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 representative 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 2021.

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

In addition to all the monitoring data obtained under §§257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Four groundwater sampling events were completed for the Primary Ash Pond CCR unit in 2021. Two semiannual sampling events were completed in April 2021 and October 2021, as required by the assessment monitoring program. Additional sampling events for select parameters at monitoring wells MW-303 and MW-305 were completed in February and July 2021. 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 April and October 2021 sampling events were analyzed for both Appendix III and Appendix IV constituents. Groundwater samples collected during the February and July events were analyzed for arsenic at MW-303 and molybdenum at MW-305.

The sampling results for Appendix III and Appendix IV parameters in 2021 are summarized in **Table 5.** Field parameter results for the 2021 sampling events are provided in **Table 6**. The analytical laboratory reports for 2021 are provided in **Appendix C**. Historical results for each monitoring well are summarized in **Appendix D**.

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

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels);

There was no monitoring program transition in 2021.

Assessment monitoring for the Primary Ash Pond was initiated in April 2018 and continued through 2021. The statistical evaluation of the February 2021 results was completed in June 2021. Evaluation of the April 2021 results was completed in July 2021. Evaluation of the July 2021 results was completed in October 2021. Evaluation of the October 2021 results was completed in January 2022.

In accordance with the Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (U.S. EPA, 2009), the comparison of assessment monitoring results to the Groundwater Protection Standards (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, including data collected during all 2021 events, is provided in **Appendix E**.

No Appendix IV parameters were detected at statistically significant levels (SSLs) 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.

The comparison to background was based on a prediction limit approach, comparing the results to interwell upper prediction limits (UPLs) based on background monitoring results from the upgradient wells (MW-84A and MW-301). The interwell UPLs were most recently updated in January 2020 using background data collected through October 2019. The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (USEPA, 2009; Section 5.3.1) recommends periodic updating of background for both intrawell and interwell analyses. For semiannual monitoring, an update interval of 2 to 3 years is recommended; therefore, the next UPL update is planned for 2022 or 2023. The UPL calculations for Appendix IV parameters are included in **Appendix E**. The UPLs for Appendix III parameters are the same as those applied for the Columbia Dry Ash Disposal Facility, Modules 1 through 3, because the background wells are shared. The UPL calculations for Appendix III parameters are included in the COL Mod 1-3 2021 Annual Groundwater Monitoring and Corrective Action Report. The UPLs calculated in January 2020 were applied to the evaluation of the October 2020 and April 2021 monitoring results.

3.5 §257.90(E)(5) OTHER REQUIREMENTS

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

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in italics, followed by applicable information relative to the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR 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 2020 assessment monitoring event and December 2020 resampling event.
- Two semiannual groundwater sampling and analysis events and two additional sampling event (February, April, July, and October 2021).
- Statistical evaluation for the February 2021, April, and July 2021 sampling events.

Description of Any Problems Encountered: No problems were encountered during the groundwater sampling events in 2021.

Discussion of Actions to Resolve the Problems: Not applicable.

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

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the October 2021 monitoring events;
- Two semiannual groundwater sampling and analysis events (April and October 2022);
- Statistical evaluation and determination of any SSLs exceeding the GPS for the April 2022 monitoring event;
- If one or more Appendix IV constituents is detected at an SSL 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).

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 2021 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 2021.

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 (U.S. EPA), 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

1 Groundwater Monitoring Well Network
2 Groundwater Samples Summary
3 Groundwater Elevation – State Monitoring Program and CCR Well Network
4 Horizontal Gradients and Flow Velocity
5 Groundwater Analytical Results Summary – Assessment Monitoring
6 2021 Groundwater Field Data Summary

Table 1. Groundwater Monitoring Well Network
Columbia Energy Center Primary Ash Pond / SCS Engineers Project #25221067.00

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: JAO Date: 12/16/2021
Checked by: RM Date: 12/22/2021

\\Mad-fs01\data\Projects\25221067.00\Deliverables\2021 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 #25221067.00

Sample Dates	Compliance Wells				Background Wells	
	MW-4R	MW-303	MW-304	MW-305	MW-84A	MW-301
2/25/2021	--	A-S	--	A-S	--	--
4/12-14/2021	A	A	A	A	A	A
7/20/2021	--	A-S	--	A-S	--	--
10/11-14/2021	A	A	A	A	A	A
Total Samples	2	4	2	4	2	2

Abbreviations:
A = Required by Assessment Monitoring Program
A-S = Supplemental Sample for the Assessment Monitoring Program

Created by: NDK Date: 1/4/2018
Last revision by: JAO Date: 12/17/2021
Checked by: RM Date: 12/22/2021

I:\25221067.00\Deliverables\2021 Fed Annual Report - COL PP\Tables\[Table 2 - GW Samples Summary.xlsx]GW Summary

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25221067.00

	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
Dry Ash Facility (Facility ID #03025)	**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
	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
	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
	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
	October 7-8, 2020	785.95	aband	787.76	785.91	785.45	785.70	785.68	785.52	785.72	786.10	786.06	786.10	786.55	786.33	786.85	786.38
	February 25, 2021	NM	aband	NM	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 14, 2021	785.11	aband	787.29	784.27	784.05	784.77	784.77	784.46	c	785.84	785.81	785.60	785.86	785.69	786.47	786.06
	June 11, 2021	NM	aband	NM	784.19	NM	784.66	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 11-12, 14, 2021	784.47	adand	786.78	783.73	783.60	784.42	784.41	783.88	783.87	784.96	784.88	784.79	785.14	784.94	785.55	785.11
	October 17, 2021	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Bottom of Well 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

	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
Ash Pond Facility (Facility ID #02325)	**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
	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	--	--	--	--
	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
	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	788.40	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
	October 7-8 &17, 2020	781.42	787.74	784.74	784.64	785.03	784.96	782.83	785.43	785.10	783.06	783.49	788.34	793.32	dry	NM
	April 12, 2021	782.30	786.34	783.66	783.65	784.13	784.08	782.79	784.08	783.97	783.15	783.49	788.03	793.45	below gauge	dry
	October 11-12, 14, 2021	781.03	786.33	782.94	782.85	783.09	783.03	781.94	783.11	783.04	782.15	782.66	788.59	795.13	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 - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25221067.00

	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	NM	NM	NM	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
CCR Rule Wells	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	NM	NM	NM	NM	788.19	NM	NM	NM	NM	NM	NM	NM	785.26	785.26	NM
	February 25, 2021	NM	NM	784.27	NM	788.36	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM
	April 12, 2021	786.50	785.77	784.07	787.99	788.11	786.34	784.27	784.77	785.84	784.32	784.21	785.55	784.29	784.24	784.15
	June 11, 2021	NM	NM	NM	NM	NM	NM	784.19	784.66	NM	NM	NM	NM	784.20	784.05	NM
	July 20, 2021	NM	NM	783.64	NM	788.39	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 11-12, 14, 2021	785.28	785.09	783.09	787.78	787.75	786.33	783.73	784.42	784.96	782.93	782.44	783.76	783.65	783.48	783.48
	December 21, 2021	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.93	NM	NM
	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: JAO Date: 12/22/2021
Checked by: RM Date: 12/22/2021

(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, 2017 sampling event. The level was allowed to return to static and was measured on 10/10/2017.

\\Mad-fs01\data\Projects\25221067.00\Data and Calculations\Tables\[wlstat_Columbia.xls]levels

Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - Primary Pond /
SCS Engineers Project #25221067.00
January - December 2021

	North				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/12-14/2021	788.00	785.00	94.95	0.03	3.7
10/11-14/2021	787.00	783.00	140.21	0.03	3.3

	West				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/12-14/2021	788.11	784.00	190.95	0.02	2.5
10/11-14/2021	787.75	783.00	190.75	0.02	2.9

	South				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/12-14/2021	788.00	785.00	114.95	0.03	3.0
10/11-14/2021	787.00	784.00	106.75	0.03	3.3

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: 1/3/2022
Checked by: MDB Date: 1/4/2022

Table 5. Groundwater Analytical Results Summary - Assessment Monitoring
Columbia Energy Center - Primary Pond / SCS Engineers Project #25221067.00

Parameter Name	UPL Method	UPL		Background Wells				Compliance Wells											
				MW-84A		MW-301		MW-4R		MW-303				MW-304		MW-305			
				4/14/2021	10/14/2021	4/14/2021	10/14/2021	4/13/2021	10/11/2021	2/25/2021	4/12/2021	7/20/2021	10/12/2021	4/12/2021	10/11/2021	2/25/2021	4/12/2021	7/20/2021	10/11/2021
Appendix III																			
Boron, ug/L	P	35.6		14.3	11.1	22.2	31.4	730	2,290	--	2,440	--	2,690	568	1090	--	668	--	1,650
Calcium, ug/L	NP	129,000		69,100	75,300	117,000 P6	67,800 P6	110,000	90,400	--	10,400 P6	--	5,530	78,900	86,600	--	235,000	--	149,000
Chloride, mg/L	P	6.2		4.4	3.5	1.5 J	2.7	49.6	67.8	--	2.5	--	12.4 J, D3	44.7	56.6	--	68.2	--	63.0
Fluoride, mg/L	DQ	DQ		<0.095	<0.095	<0.095	<0.095	0.23 J	0.26 J	--	<0.95 D3, M0	--	<1.9 D3	0.16 J	0.15 J	--	<0.095	--	0.31 J
Field pH, Std. Units	P	7.78		7.34	7.42	6.66	7.01	7.18	7.41	9.16	9.24	9.07	9.31	7.30	7.07	8.68	8.67	8.71	8.95
Sulfate, mg/L	P	30.3		1.4 J	1.3 J	8.5	17.4	193	236	--	345 M0	--	369	85.5	129	--	649	--	446
Total Dissolved Solids, mg/L	NP	514		328	326	472	334	556	628	--	610	--	660	434	522	--	1,020	--	730
Appendix IV		**UPL**	**GPS**																
Antimony, ug/L	NP*	0.4	6	0.55 J	<0.15	<0.15	<0.15	<0.15	0.23 J	--	0.93 J	--	0.55 J	0.86 J	0.44 J	--	0.31 J	--	0.59 J
Arsenic, ug/L	P*	0.53	10	0.91 J	0.41 J	<0.28	0.35 J	<0.28	<0.28	7.7	10.4	13.9	18.6	1.8	1.6	--	0.95 J	--	1.4
Barium, ug/L	P	18.3	2000	13.4	12.9	8.9	7.7	25.1	25.8	--	7.8	--	5.1	32.5	46.4	--	30.0	--	29.3
Beryllium, ug/L	NP*	0.37	4	0.47 J	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	--	<0.25	0.86 J	<0.25	--	<0.25	--	<0.25
Cadmium, ug/L	NP*	0.32	5	0.53 J	<0.15	<0.15	<0.15	<0.15	<0.15	--	0.67 J	--	0.27 J	0.79 J	0.36 J	--	<0.15	--	<0.15
Chromium, ug/L	P*	3.13	100	2.6 J	1.9 J	<1.0	<1.0	<1.0	<1.0	--	44.1	--	50.2	1.1 J	<1.0	--	<1.0	--	1.1 J
Cobalt, ug/L	NP*	0.38	6	0.52 J	0.12 J	<0.12	0.34 J	<0.12	<0.12	--	0.70 J	--	0.74 J	0.84 J	1.2	--	<0.12	--	<0.12
Fluoride, mg/L	DQ	DQ	4	<0.095	<0.095	<0.095	<0.095	0.23 J	0.26 J	--	<0.95 D3, M0	--	<1.9	0.16 J	0.15 J	--	<0.095	--	0.31 J
Lead, ug/L	NP*	0.48	15	0.55 J	<0.24	<0.24	<0.24	<0.24	<0.24	--	0.76 J	--	0.32 J	0.89 J	0.52 J	--	<0.24	--	<0.24
Lithium, ug/L	P*	0.86	40	1.0	0.28 J	0.58 J	0.46 J	1.8	2.5	--	0.93 J	--	0.62 J	1.1	0.45 J	--	<0.22	--	<0.22
Mercury, ug/L	DQ	DQ	2	<0.066	<0.093	<0.066	<0.093	<0.066	<0.066	--	<0.066	--	<0.066	<0.066	<0.066	--	<0.066	--	<0.066
Molybdenum, ug/L	NP*	0.44	100	0.62 J	<0.44	<0.44	<0.44	41.1	60.7	--	67.1	--	78.0	13.0	13.5	107	106	77.0	124
Selenium, ug/L	NP*	0.71	50	0.48 J	<0.32	<0.32	<0.32	3.7	2.3	--	22.4	--	28.1	1.1	0.35 J	--	8.0	--	4.5
Thallium, ug/L	NP*	0.48	2	0.66 J	0.19 J	<0.14	0.17 J	<0.14	<0.14	--	0.89 J	--	0.30 J	1.0 J	0.46 J	--	<0.14	--	<0.14
Radium 226/228 Combined, pCI/L	P	1.93	5	0.285	0.243	1.160	0.172	0.139	0.498	--	0.846	--	0.539	1.22	0.371	--	0.418	--	0.483

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

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

Abbreviations:
UPL = Upper Prediction Limit
mg/L = milligrams per liter
GPS = Groundwater Protection Standard
ug/L = micrograms per liter

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

Notes:
1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant level above the GPS. See the accompanying letter 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-84 and MW-301.

* = UPL is below the LOQ for background sampling. For compliance wells, only results confirmed above the LOQ are evaluated as potential SSIs above background.

Created by: NDK Date: 5/1/2018
Last revision by: MDB Date: 12/9/2021
Checked by: JAO Date: 12/9/2021
Proj Mgr QA/QC: TK Date: 1/9/2022

Table 6. 2021 Groundwater Field Data Summary
Columbia Energy Center - Primary Ash Pond / SCS Engineers Project #25221067.00
January - December 2021

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	4/14/2021	785.84	10.2	7.34	9.80	610.9	95.6	2.45
	10/14/2021	784.96	12.5	7.42	9.25	598.9	89.7	3.41
MW-301	4/14/2021	786.50	7.4	6.66	3.90	857	102.9	2.41
	10/14/2021	785.28	11.1	7.01	0.25	597.2	57.8	3.21
MW-4R	4/13/2021	786.34	10.3	7.18	0.27	845	128.7	0.00
	10/11/2021	786.33	15.6	7.41	NR	955	150.5	0.00
MW-303	2/25/2021	784.27	11.0	9.16	7.45	845	151.0	3.04
	4/12/2021	784.07	11.4	9.24	7.02	927	51.4	1.82
	7/20/2021	783.64	13.1	9.07	6.49	1,058	67.5	0.57
	10/12/2021	783.09	12.1	9.31	NR	1078	110.1	0.00
MW-304	4/12/2021	787.99	10.6	7.30	0.36	751	27.3	3.19
	10/11/2021	787.78	18.3	7.07	NR	847	63.9	0.38
MW-305	2/25/2021	788.36	15.9	8.68	2.33	955	170.0	0.85
	4/12/2021	788.11	13.6	8.67	2.70	1,373	51.5	1.14
	7/20/2021	788.39	18.2	8.71	2.38	1,046	103.3	0.00
	10/11/2021	787.75	24.2	8.95	NR	1,068	151.8	0.00

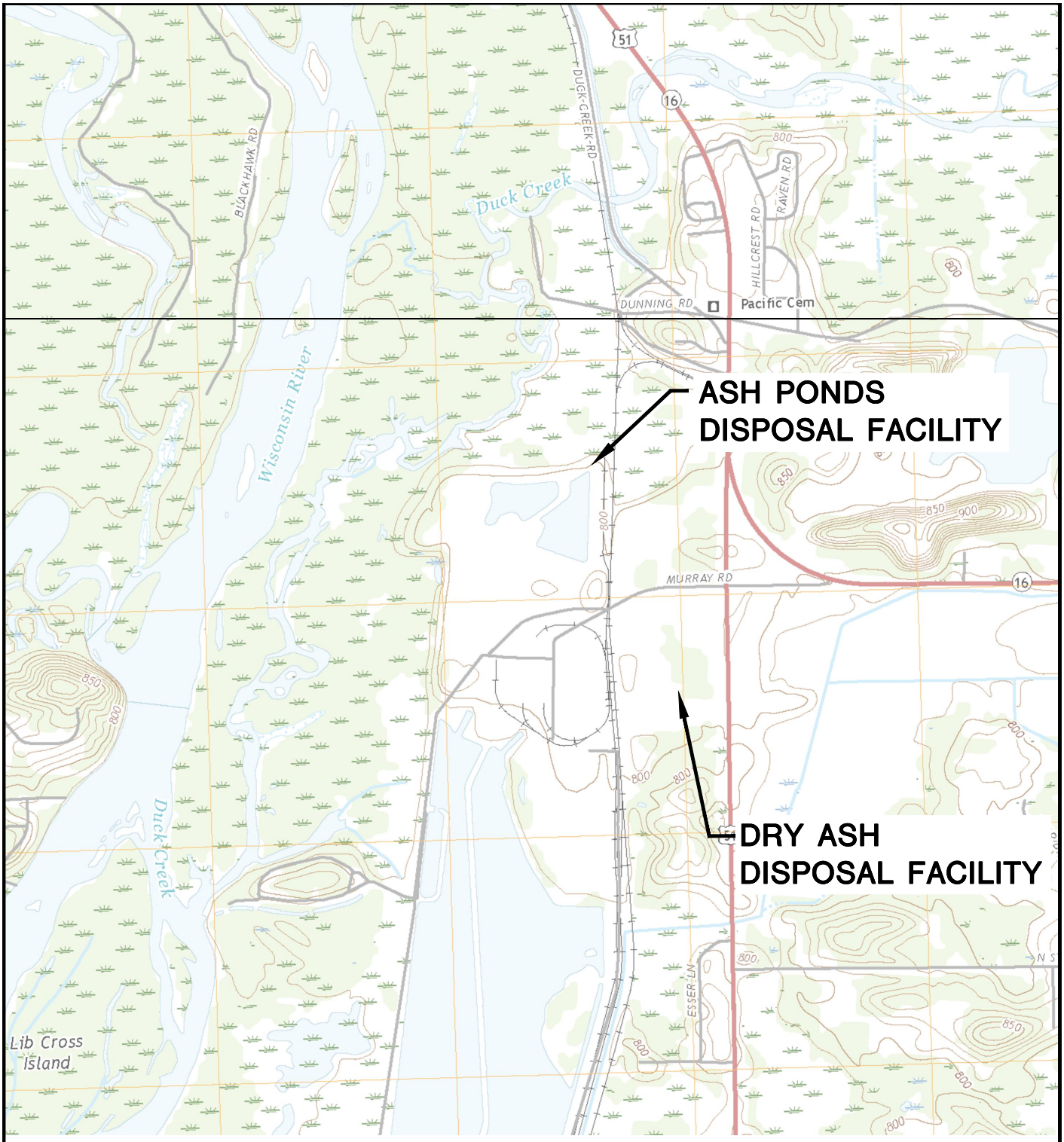
Notes/Abbreviations:
NR = Not Reported

1) October 2021 Dissolved Oxygen results for MW-4R, MW-303, MW-304, and MW-305 not reported due to instrument calibration issues that resulted in rejection of the field-recorded results.

Created by:	RM	Date:	12/22/2020
Last revision by:	JAO	Date:	12/17/2021
Checked by:	RM	Date:	12/22/2021

Figures

1 Site Location Map
2 Site Plan and Monitoring Well Locations
3 Water Table Map – April 2021
4 Water Table Map – October 2021

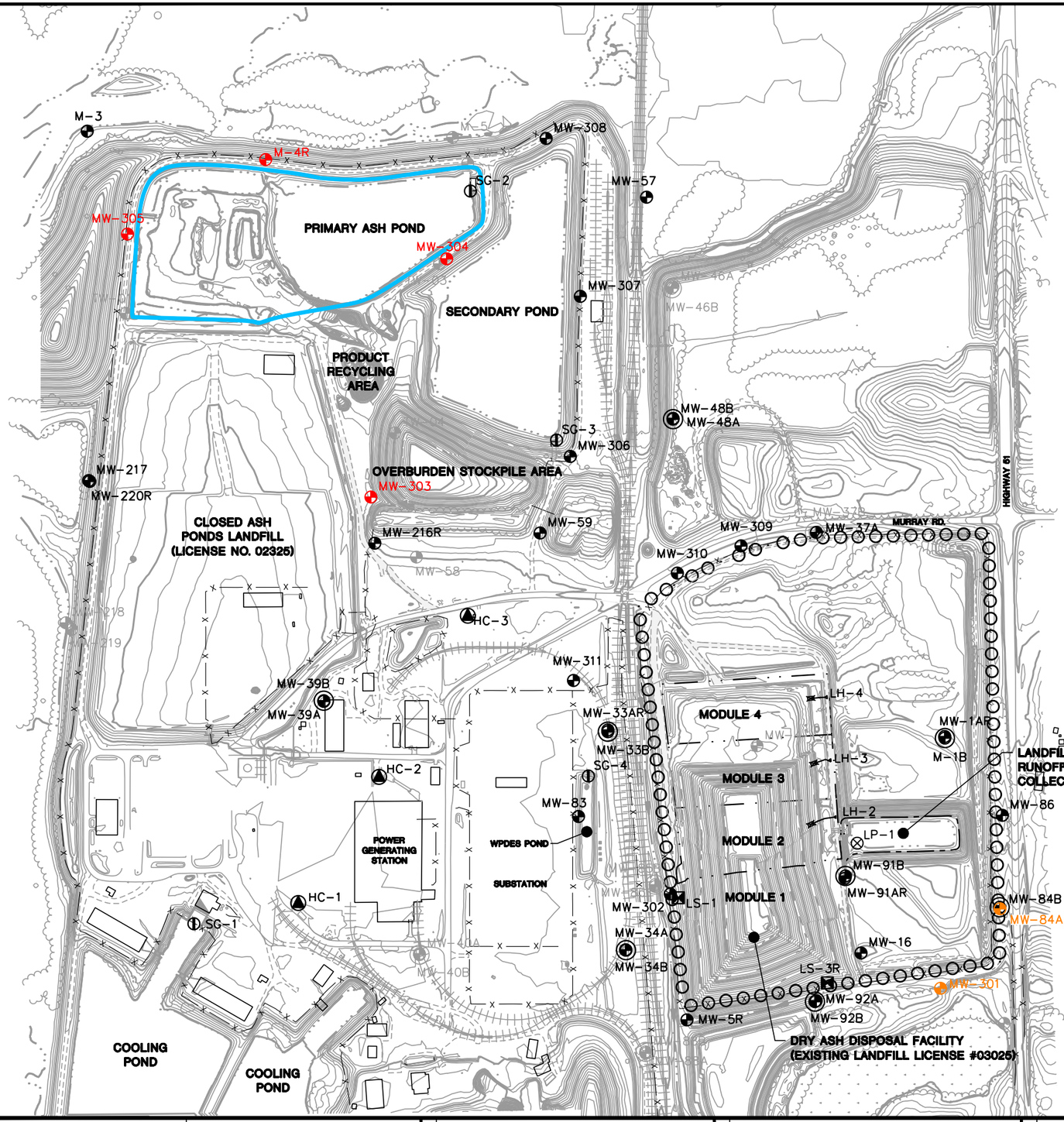


N

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

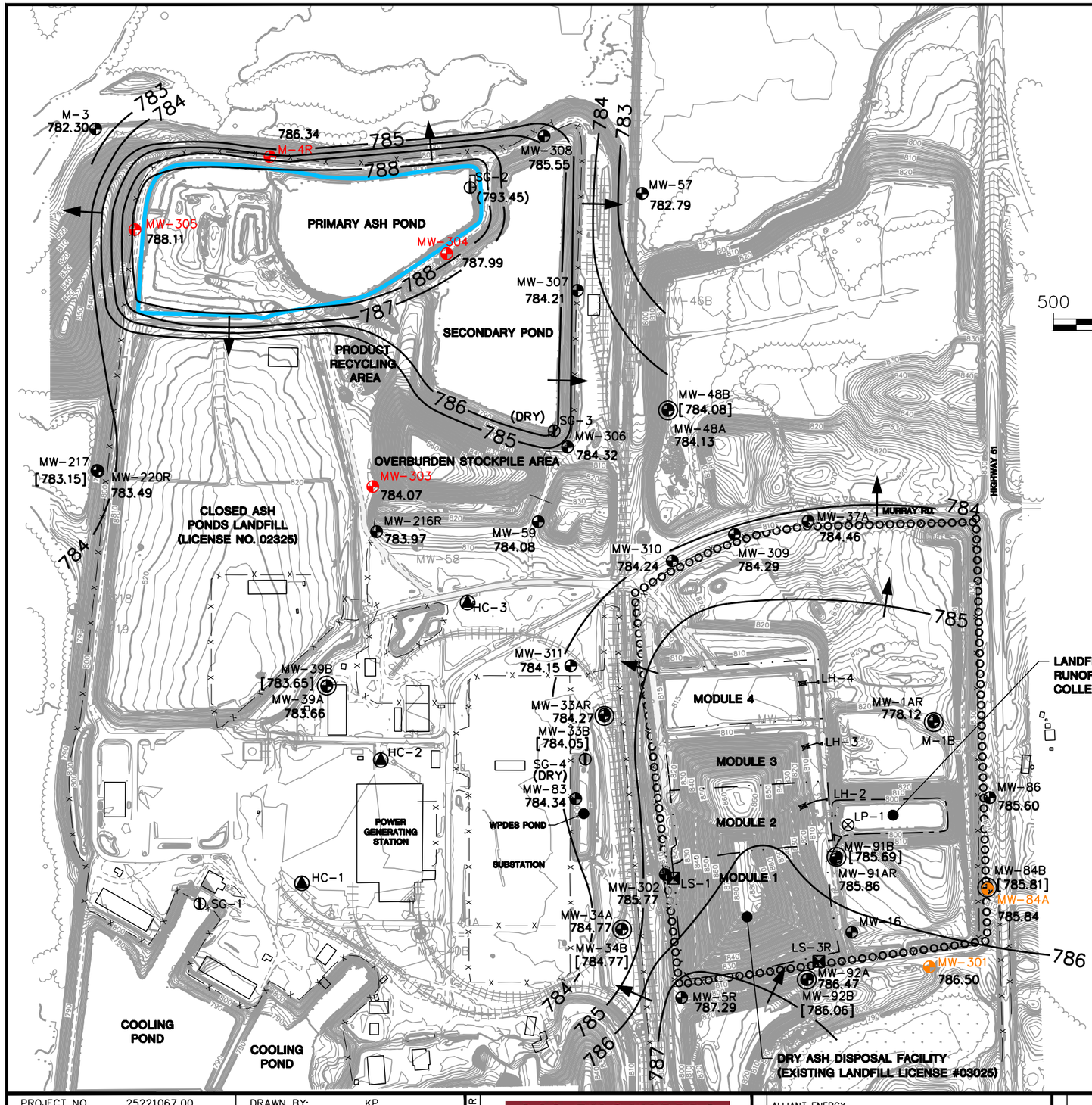
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

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 Well 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
[788.87]	POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
(795.20)	SURFACE WATER ELEVATION (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 AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 12-14, 2021.
8. BACKGROUND MONITORING WELLS FOR THE PRIMARY ASH POND ARE: MW-301 AND MW-84A.

PROJECT NO.	25221067.00	DRAWN BY:	KP
DRAWN:	06/29/2021	CHECKED BY:	NDK
REVISED:	12/27/2021	APPROVED BY:	TK 12/27/2021

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

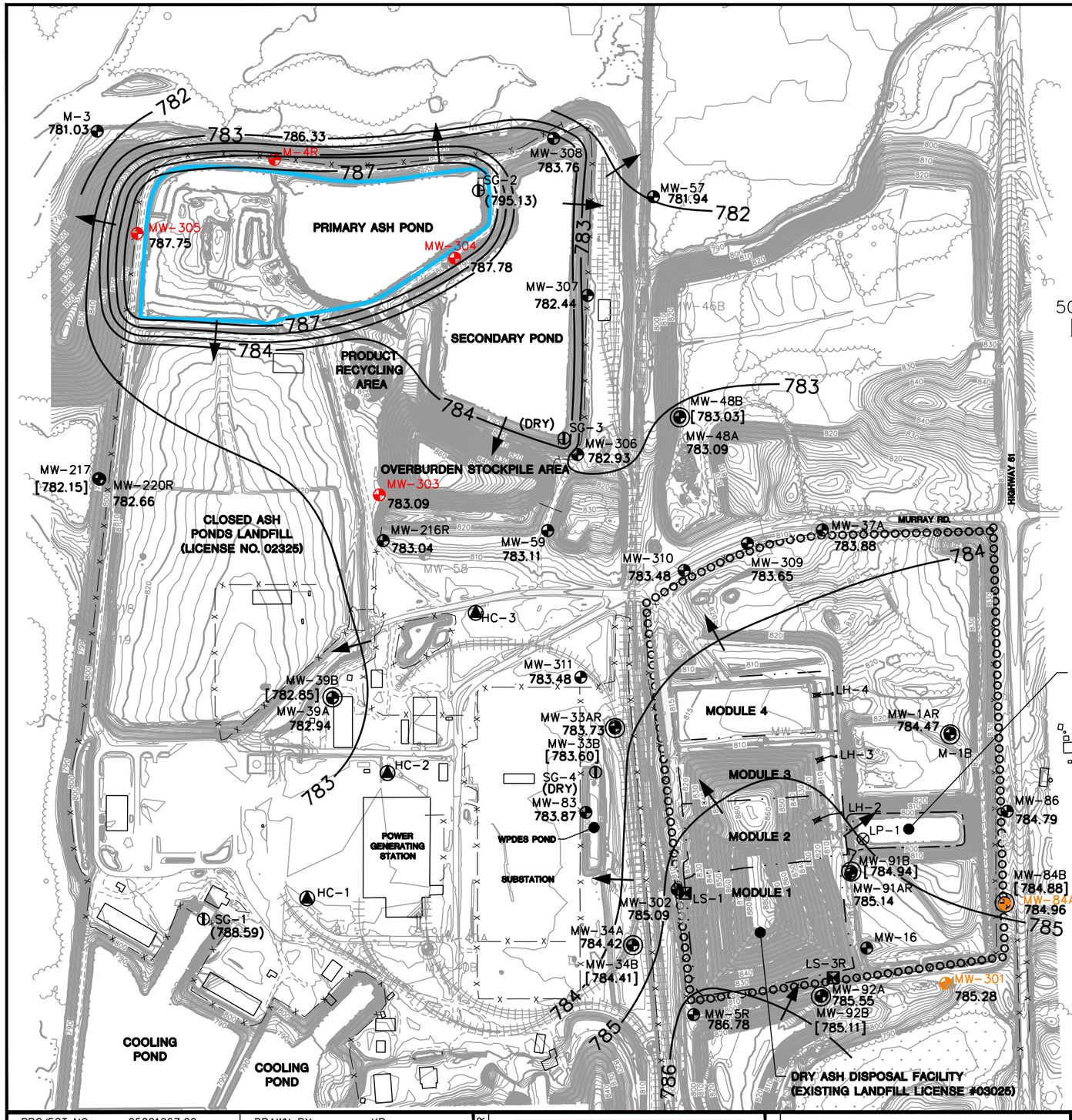
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

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

WATER TABLE MAP
APRIL 2021

FIGURE
3

I:\25221067.00\Drawings\[illegible]ater [illegible]le Map April 2021 Pri[illegible]ar[illegible].dwg, 12/27/2021 11:26:10 AM



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
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (795.20) — SURFACE WATER ELEVATION (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 AND SURFACE WATER ELEVATIONS WERE MEASURED ON OCTOBER 11-14, 2021.
8. BACKGROUND MONITORING WELLS FOR THE PRIMARY ASH POND ARE: MW-301 AND MW-84A.

PROJECT NO.	25221067.00	DRAWN BY:	KP
DRAWN:	10/26/2021	CHECKED BY:	NDK
REVISED:	12/27/2021	APPROVED BY:	TK 12/27/2021

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 2021

FIGURE
4

I:\25221067.00\Drawings\[illegible]ater [illegible]le Map [illegible]ct 2021 Pri[illegible]ar[illegible].dwg, 1/3/2022 9:52:26 AM

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

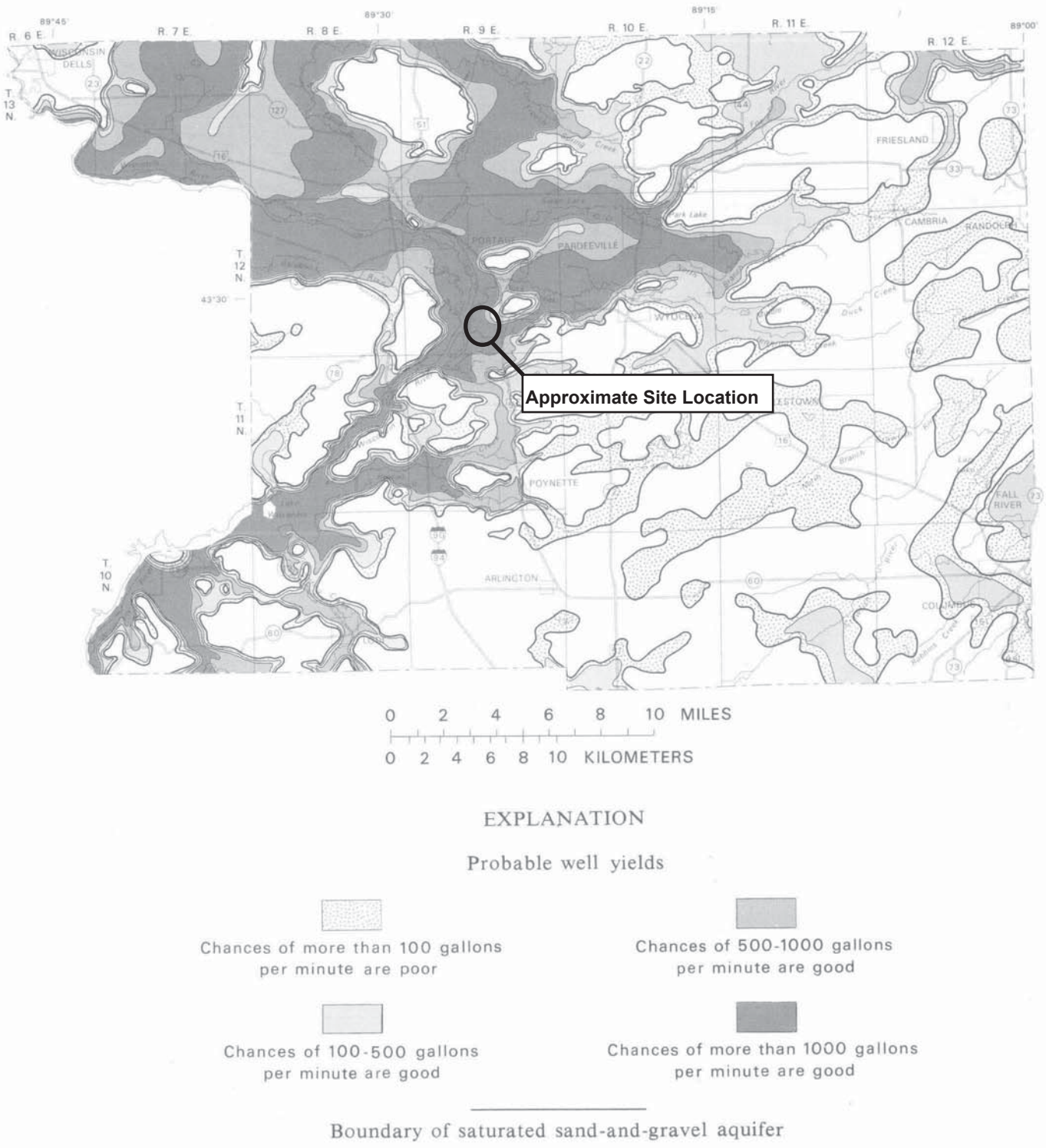
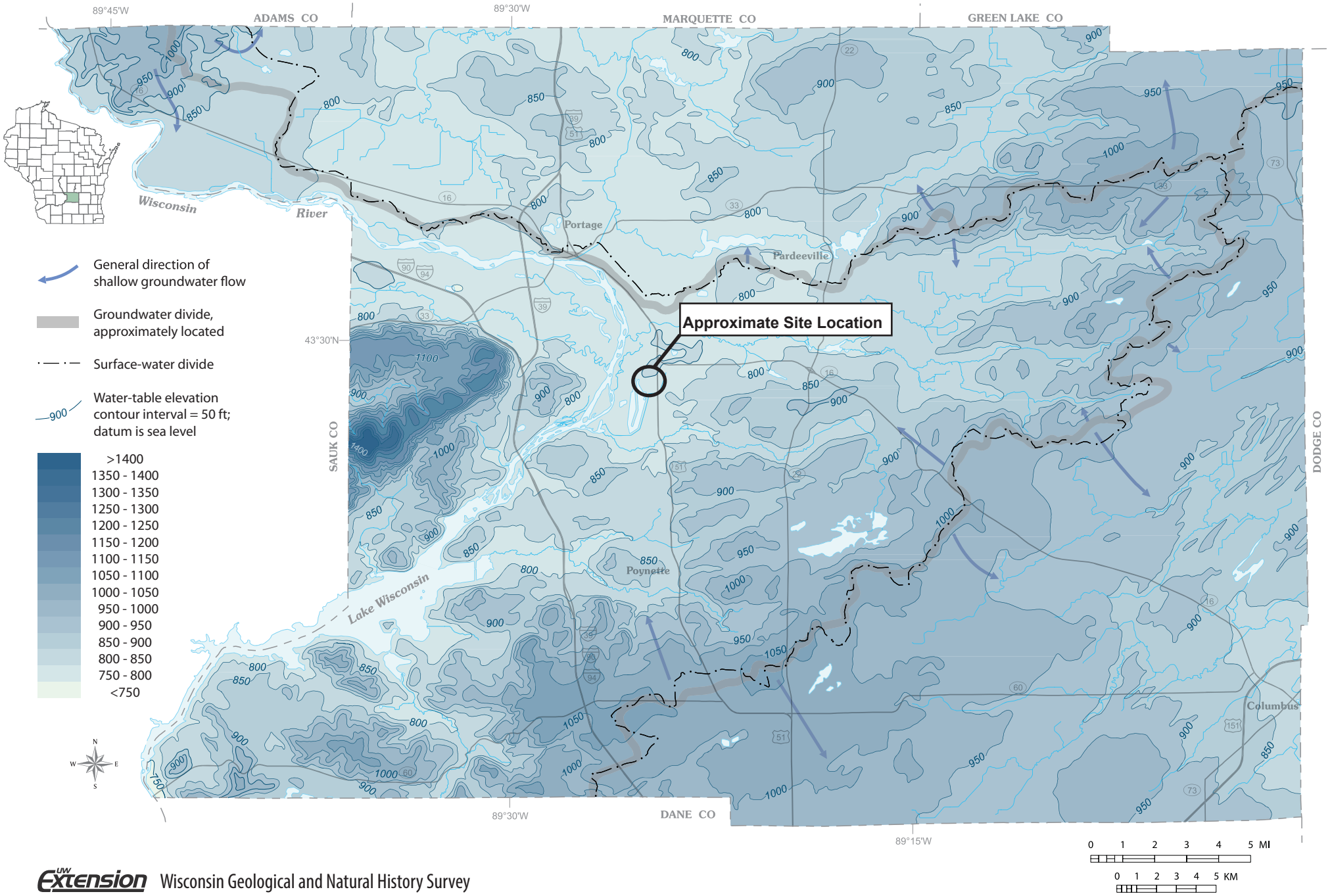


Figure 9. Probably well yields from the sand-and-gravel aquifer.

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



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:

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SILTY SAND, trace gravel, tan color (10YR 5/4), with trace gravel.										
S7	10	50/4	17							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 Feet ☐ S ☐ E 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	Firm	Tel: (608) 224-2830
for Zach Watson	SCS Engineers 2830 Dairy Drive Madison, WI 53711	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-304 Use only as an attachment to Form 4400-122.

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 17 18	SILTY SAND, trace gravel, tan (10YR 5/6), some large dolomite chunks.	SM					W				
				End of boring at 18 ft bgs.										

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

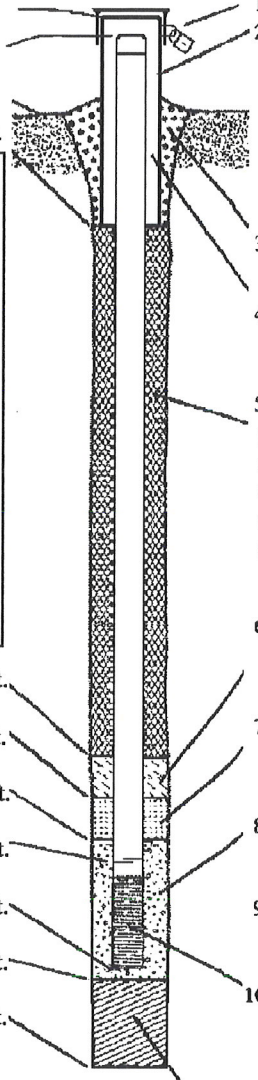
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ____

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 ☐

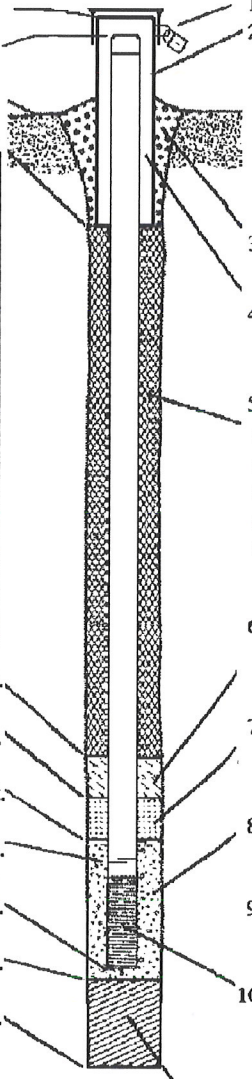
15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

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. ____ 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. 6.7 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 2.5 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-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.

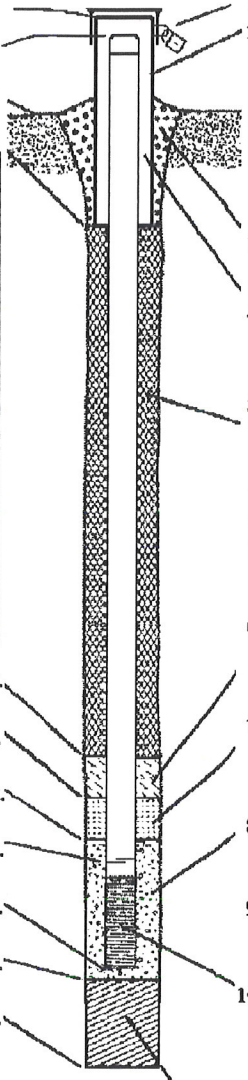
J. Filter pack, bottom 779.50 ft. MSL or 23 ft.

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 Managemen ☐
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

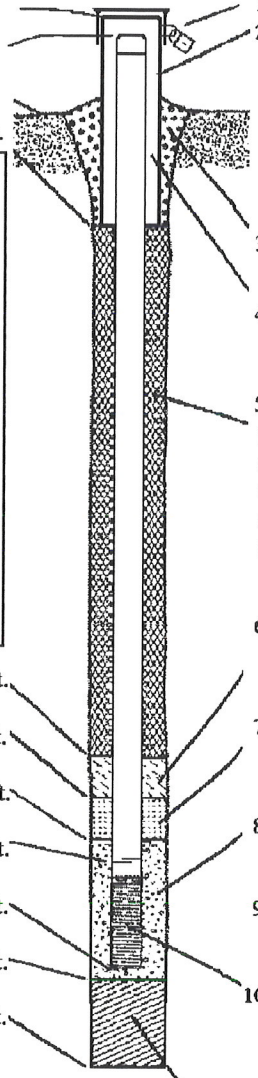
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

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	Firm
for Zach Watson	SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 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: 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: [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: [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.

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

APPENDIX C

WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

BORING NO. MW-84A

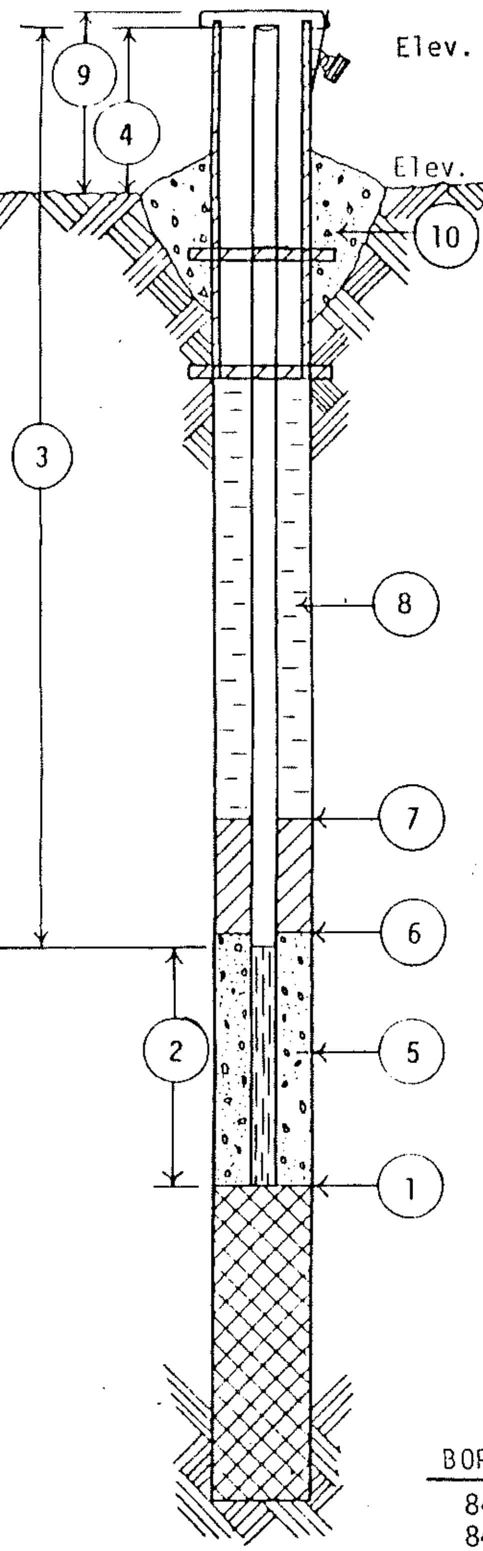
DATE 10/5/83

Elev. 814.57 Steel
Elev. 814.32 PVC

CHIEF JS

LOCATION WP&L-Columbia Generating Station

Elev. 813.4



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

[illegible]

e of Wisconsin
partment of Natural Resources

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

MONITORING 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

Date Well Installed
08 / 22 / 96
M M D D Y Y

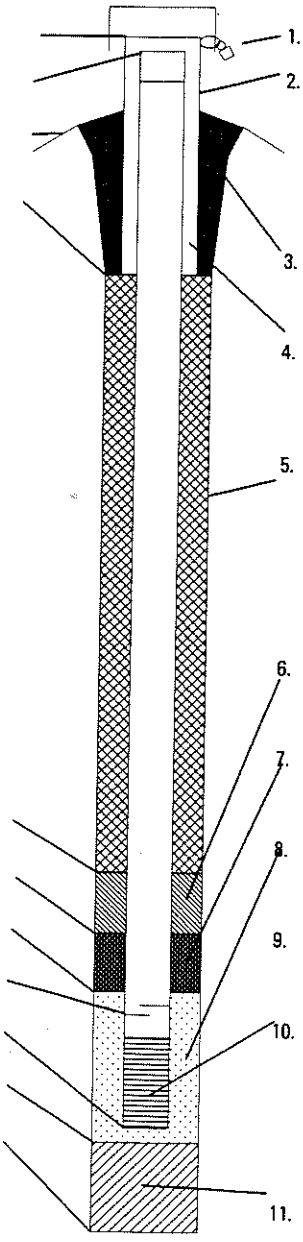
Distance Well is From Waste/Source Boundary
120 ft.

Section Location of Waste/Source
NW¼ of NW¼ of Sec. 27, T 12N, R 9
■ E. ☐ W.

Well Installed By: (Persons' Name and Firm)
Frank Badula
Environmental & Foundation Drilling

s Well A Point of Enforcement Std. Application? ☐ Yes ■ No

Location of Well Relative to Waste/Source
U ☐ Upgradient S ☐ Sidegradient
D ■ Downgradient N ☐ Not Known



. 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.

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):

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.

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

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

7. Fine sand material: Manufacturer, product name, mesh size
a. 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)	25.3 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: [signature]

Print Initials: M L W

Firm: RMT, Inc.

TE: 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

Appendix C1

February 2021 Assessment Monitoring

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

March 09, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on February 26, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay

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

Sincerely,

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

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

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: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40222599001	**MW-303**	Water	02/25/21 12:30	02/26/21 07:30
40222599002	**MW-305**	Water	02/25/21 11:30	02/26/21 07:30
40222599003	**FIELD BLANK**	Water	02/25/21 12:35	02/26/21 07:30

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

SAMPLE ANALYTE COUNT

Project: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40222599001	**MW-303**	EPA 6020	KXS	1
			VGC	7
40222599002	**MW-305**	EPA 6020	KXS	1
			VGC	7
40222599003	**FIELD BLANK**	EPA 6020	KXS	2

PASI-G = Pace Analytical Services - Green Bay

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

ANALYTICAL RESULTS

Project: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

Sample: MW-303 **Lab ID: 40222599001** Collected: 02/25/21 12:30 Received: 02/26/21 07:30 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								
Arsenic	**7.7**	ug/L	1.0	0.28	1	03/01/21 07:05	03/03/21 01:56	7440-38-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**9.16**	Std. Units			1		02/25/21 12:30		
Field Specific Conductance	**845**	umhos/cm			1		02/25/21 12:30		
Oxygen, Dissolved	**7.45**	mg/L			1		02/25/21 12:30	7782-44-7	
REDOX	**151.0**	mV			1		02/25/21 12:30		
Turbidity	**3.04**	NTU			1		02/25/21 12:30		
Static Water Level	**784.27**	feet			1		02/25/21 12:30		
Temperature, Water (C)	**11.0**	deg C			1		02/25/21 12:30		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

Sample: MW-305 **Lab ID: 40222599002** Collected: 02/25/21 11:30 Received: 02/26/21 07:30 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	**107**	ug/L	1.5	0.44	1	03/01/21 07:05	03/03/21 02:03	7439-98-7	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.68**	Std. Units			1		02/25/21 11:30		
Field Specific Conductance	**955**	umhos/cm			1		02/25/21 11:30		
Oxygen, Dissolved	**2.33**	mg/L			1		02/25/21 11:30	7782-44-7	
REDOX	**170.0**	mV			1		02/25/21 11:30		
Turbidity	**0.85**	NTU			1		02/25/21 11:30		
Static Water Level	**788.36**	feet			1		02/25/21 11:30		
Temperature, Water (C)	**15.9**	deg C			1		02/25/21 11:30		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

Sample: FIELD BLANK **Lab ID: 40222599003** Collected: 02/25/21 12:35 Received: 02/26/21 07:30 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								
Arsenic	**<0.28**	ug/L	1.0	0.28	1	03/01/21 07:05	03/02/21 23:34	7440-38-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	03/01/21 07:05	03/02/21 23:34	7439-98-7	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

QC Batch: 378569
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40222599001, 40222599002, 40222599003

METHOD BLANK: 2184199 Matrix: Water
Associated Lab Samples: 40222599001, 40222599002, 40222599003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	ug/L	<0.28	1.0	03/02/21 23:20	
Molybdenum	ug/L	<0.44	1.5	03/02/21 23:20	

LABORATORY CONTROL SAMPLE: 2184200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	500	460	92	80-120	
Molybdenum	ug/L	500	482	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2184201 2184202

Parameter	Units	40222498001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	1.4	500	500	466	485	93	97	75-125	4	20	
Molybdenum	ug/L	3.5	500	500	488	497	97	99	75-125	2	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: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

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: 25221067.00 ALLIANT COLUMBIA
Pace Project No.: 40222599

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40222599001	**MW-303**	EPA 3010	378569	EPA 6020	378634
40222599002	**MW-305**	EPA 3010	378569	EPA 6020	378634
40222599003	**FIELD BLANK**	EPA 3010	378569	EPA 6020	378634
40222599001	**MW-303**				
40222599002	**MW-305**				

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

40222599

Pace Analytical®
www.pacelabs.com

CHAIN OF CUSTODY

(Please Print Clearly)	
Company Name:	SCS
Branch/Location:	Madison
Project Contact:	Mike Blodgett
Phone:	(608) 216-7362
Project Number:	25221067.00
Project Name:	Alliant Columbia
Project State:	WI
Sampled By (Print):	Paul A. Grover
Sampled By (Sign):	Paul A. Grover
PO #:	Regulatory Program:

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

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

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Analyses Requested: Arsenic	Analyses Requested: Molybdenum	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
					N	D					
001	MW-303	2/25/21	12:30	GW			X				
002	MW-305	↓	11:30	GW			X	X			
003	Field Blank	↓	12:35	DI			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:
Paul A. Grover	2/25/21 15:00		
C.S Logistics	2/26/21 0730	Pace	2/26/21 0730

PACE Project No.: 40222599
Receipt Temp = 1.0 °C
Sample Receipt pH OK / Adjusted
Cooler Custody Seal Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

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

Sample Preservation Receipt Form

Client Name: SCS Project # 40222599

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: KY Date/ Time:

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												1																		X		2.5 / 5 / 10
002												1																		X		2.5 / 5 / 10
003												1																		X		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																													2/12/21			2.5 / 5 / 10
016																													TP			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# : 40222599

40222599

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: LOT /Corr:

Person examining contents:
Date: 2/26/21 /Initials: MO

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

Labeled By Initials: MA

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

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. Mail, Invoice, pg # 2/26/21 MO
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

Appendix C2

April 2021 Assessment Monitoring

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

May 11, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 16, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- 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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40225233001	**MW-303**	Water	04/12/21 12:55	04/16/21 07:40
40225233002	**MW-304**	Water	04/12/21 13:50	04/16/21 07:40
40225233003	**MW-305**	Water	04/12/21 16:25	04/16/21 07:40
40225233004	**M-4R**	Water	04/13/21 09:30	04/16/21 07:40
40225233005	**FIELD BLANK-PPOND**	Water	04/13/21 09:30	04/16/21 07:40

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

SAMPLE ANALYTE COUNT

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40225233001	**MW-303**	EPA 6020	DS1, KXS	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	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40225233002	**MW-304**	EPA 6020	DS1, KXS	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	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40225233003	**MW-305**	EPA 6020	DS1, KXS	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	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40225233004	**M-4R**	EPA 6020	DS1, KXS	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	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40225233005	**FIELD BLANK-PPOND**	EPA 6020	DS1, KXS	14	PASI-G

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

SAMPLE ANALYTE COUNT

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

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	RMK	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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: MW-303 **Lab ID: 40225233001** Collected: 04/12/21 12:55 Received: 04/16/21 07:40 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	**0.93J**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 19:19	7440-36-0	
Arsenic	**10.4**	ug/L	1.0	0.28	1	04/20/21 06:41	04/22/21 19:19	7440-38-2	
Barium	**7.8**	ug/L	2.3	0.70	1	04/20/21 06:41	04/22/21 19:19	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/20/21 06:41	04/22/21 19:19	7440-41-7	
Boron	**2440**	ug/L	100	30.3	10	04/20/21 06:41	04/22/21 18:51	7440-42-8	P6
Cadmium	**0.67J**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 19:19	7440-43-9	
Calcium	**10400**	ug/L	254	76.2	1	04/20/21 06:41	04/24/21 02:36	7440-70-2	
Chromium	**44.1**	ug/L	3.4	1.0	1	04/20/21 06:41	04/24/21 02:36	7440-47-3	
Cobalt	**0.70J**	ug/L	1.0	0.12	1	04/20/21 06:41	04/24/21 02:36	7440-48-4	
Lead	**0.76J**	ug/L	1.0	0.24	1	04/20/21 06:41	04/22/21 19:19	7439-92-1	
Lithium	**0.93J**	ug/L	1.0	0.22	1	04/20/21 06:41	04/22/21 19:19	7439-93-2	
Molybdenum	**67.1**	ug/L	1.5	0.44	1	04/20/21 06:41	04/22/21 19:19	7439-98-7	
Selenium	**22.4**	ug/L	1.1	0.32	1	04/20/21 06:41	04/22/21 19:19	7782-49-2	
Thallium	**0.89J**	ug/L	1.0	0.14	1	04/20/21 06:41	04/22/21 19:19	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	04/22/21 11:00	04/23/21 08:37	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**9.24**	Std. Units			1		04/12/21 12:55		
Field Specific Conductance	**927.0**	umhos/cm			1		04/12/21 12:55		
Oxygen, Dissolved	**7.02**	mg/L			1		04/12/21 12:55	7782-44-7	
REDOX	**51.4**	mV			1		04/12/21 12:55		
Turbidity	**1.82**	NTU			1		04/12/21 12:55		
Static Water Level	**784.07**	feet			1		04/12/21 12:55		
Temperature, Water (C)	**11.4**	deg C			1		04/12/21 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**610**	mg/L	20.0	8.7	1		04/16/21 16:52		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**9.0**	Std. Units	0.10	0.010	1		04/19/21 09:30		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**2.5**	mg/L	2.0	0.43	1		04/28/21 17:41	16887-00-6	
Fluoride	**<0.95**	mg/L	3.2	0.95	10		04/29/21 22:53	16984-48-8	D3,M0
Sulfate	**345**	mg/L	20.0	4.4	10		04/29/21 22:53	14808-79-8	M0

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: MW-304 **Lab ID: 40225233002** Collected: 04/12/21 13:50 Received: 04/16/21 07:40 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	**0.86J**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 19:59	7440-36-0	
Arsenic	**1.8**	ug/L	1.0	0.28	1	04/20/21 06:41	04/22/21 19:59	7440-38-2	
Barium	**32.5**	ug/L	2.3	0.70	1	04/20/21 06:41	04/22/21 19:59	7440-39-3	
Beryllium	**0.86J**	ug/L	1.0	0.25	1	04/20/21 06:41	04/22/21 19:59	7440-41-7	
Boron	**568**	ug/L	10.0	3.0	1	04/20/21 06:41	04/22/21 19:59	7440-42-8	
Cadmium	**0.79J**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 19:59	7440-43-9	
Calcium	**78900**	ug/L	254	76.2	1	04/20/21 06:41	04/24/21 03:17	7440-70-2	
Chromium	**1.1J**	ug/L	3.4	1.0	1	04/20/21 06:41	04/24/21 03:17	7440-47-3	
Cobalt	**0.84J**	ug/L	1.0	0.12	1	04/20/21 06:41	04/24/21 03:17	7440-48-4	
Lead	**0.89J**	ug/L	1.0	0.24	1	04/20/21 06:41	04/22/21 19:59	7439-92-1	
Lithium	**1.1**	ug/L	1.0	0.22	1	04/20/21 06:41	04/22/21 19:59	7439-93-2	
Molybdenum	**13.0**	ug/L	1.5	0.44	1	04/20/21 06:41	04/22/21 19:59	7439-98-7	
Selenium	**1.1**	ug/L	1.1	0.32	1	04/20/21 06:41	04/22/21 19:59	7782-49-2	
Thallium	**1.0J**	ug/L	1.0	0.14	1	04/20/21 06:41	04/22/21 19:59	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	04/22/21 11:00	04/23/21 08:43	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.30**	Std. Units			1		04/12/21 13:50		
Field Specific Conductance	**751.0**	umhos/cm			1		04/12/21 13:50		
Oxygen, Dissolved	**0.36**	mg/L			1		04/12/21 13:50	7782-44-7	
REDOX	**27.3**	mV			1		04/12/21 13:50		
Turbidity	**3.19**	NTU			1		04/12/21 13:50		
Static Water Level	**787.99**	feet			1		04/12/21 13:50		
Temperature, Water (C)	**10.6**	deg C			1		04/12/21 13:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**434**	mg/L	20.0	8.7	1		04/16/21 16:52		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/19/21 09:32		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**44.7**	mg/L	2.0	0.43	1		04/28/21 18:54	16887-00-6	
Fluoride	**0.16J**	mg/L	0.32	0.095	1		04/28/21 18:54	16984-48-8	
Sulfate	**85.5**	mg/L	10.0	2.2	5		04/30/21 00:20	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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: MW-305 **Lab ID: 40225233003** Collected: 04/12/21 16:25 Received: 04/16/21 07:40 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	**0.31J**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 20:13	7440-36-0	
Arsenic	**0.95J**	ug/L	1.0	0.28	1	04/20/21 06:41	04/22/21 20:13	7440-38-2	
Barium	**30.0**	ug/L	2.3	0.70	1	04/20/21 06:41	04/22/21 20:13	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/20/21 06:41	04/22/21 20:13	7440-41-7	
Boron	**668**	ug/L	10.0	3.0	1	04/20/21 06:41	04/22/21 20:13	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 20:13	7440-43-9	
Calcium	**235000**	ug/L	254	76.2	1	04/20/21 06:41	04/24/21 03:30	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/20/21 06:41	04/24/21 03:30	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/20/21 06:41	04/24/21 03:30	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/20/21 06:41	04/22/21 20:13	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	04/20/21 06:41	04/22/21 20:13	7439-93-2	
Molybdenum	**106**	ug/L	1.5	0.44	1	04/20/21 06:41	04/22/21 20:13	7439-98-7	
Selenium	**8.0**	ug/L	1.1	0.32	1	04/20/21 06:41	04/22/21 20:13	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/20/21 06:41	04/22/21 20:13	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	04/22/21 11:00	04/23/21 08:46	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**8.67**	Std. Units			1		04/12/21 16:25		
Field Specific Conductance	**1373**	umhos/cm			1		04/12/21 16:25		
Oxygen, Dissolved	**2.70**	mg/L			1		04/12/21 16:25	7782-44-7	
REDOX	**51.5**	mV			1		04/12/21 16:25		
Turbidity	**1.14**	NTU			1		04/12/21 16:25		
Static Water Level	**788.11**	feet			1		04/12/21 16:25		
Temperature, Water (C)	**13.6**	deg C			1		04/12/21 16:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**1020**	mg/L	20.0	8.7	1		04/16/21 16:52		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.3**	Std. Units	0.10	0.010	1		04/19/21 09:34		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**68.2**	mg/L	40.0	8.6	20		04/29/21 02:04	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/28/21 19:51	16984-48-8	
Sulfate	**649**	mg/L	40.0	8.9	20		04/29/21 02:04	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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: M-4R **Lab ID: 40225233004** Collected: 04/13/21 09:30 Received: 04/16/21 07:40 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	04/20/21 06:41	04/22/21 20:20	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/20/21 06:41	04/22/21 20:20	7440-38-2	
Barium	**25.1**	ug/L	2.3	0.70	1	04/20/21 06:41	04/22/21 20:20	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/20/21 06:41	04/22/21 20:20	7440-41-7	
Boron	**730**	ug/L	10.0	3.0	1	04/20/21 06:41	04/22/21 20:20	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 20:20	7440-43-9	
Calcium	**110000**	ug/L	254	76.2	1	04/20/21 06:41	04/24/21 03:37	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/20/21 06:41	04/24/21 03:37	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/20/21 06:41	04/24/21 03:37	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/20/21 06:41	04/22/21 20:20	7439-92-1	
Lithium	**1.8**	ug/L	1.0	0.22	1	04/20/21 06:41	04/22/21 20:20	7439-93-2	
Molybdenum	**41.1**	ug/L	1.5	0.44	1	04/20/21 06:41	04/22/21 20:20	7439-98-7	
Selenium	**3.7**	ug/L	1.1	0.32	1	04/20/21 06:41	04/22/21 20:20	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/20/21 06:41	04/22/21 20:20	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	04/22/21 11:00	04/23/21 08:48	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.18**	Std. Units			1		04/13/21 09:30		
Field Specific Conductance	**845.0**	umhos/cm			1		04/13/21 09:30		
Oxygen, Dissolved	**0.27**	mg/L			1		04/13/21 09:30	7782-44-7	
REDOX	**128.7**	mV			1		04/13/21 09:30		
Turbidity	**0**	NTU			1		04/13/21 09:30		
Static Water Level	**786.34**	feet			1		04/13/21 09:30		
Temperature, Water (C)	**10.3**	deg C			1		04/13/21 09:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**556**	mg/L	20.0	8.7	1		04/16/21 16:53		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.5**	Std. Units	0.10	0.010	1		04/19/21 09:36		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**49.6**	mg/L	2.0	0.43	1		04/28/21 20:05	16887-00-6	
Fluoride	**0.23J**	mg/L	0.32	0.095	1		04/28/21 20:05	16984-48-8	
Sulfate	**193**	mg/L	20.0	4.4	10		04/29/21 02:19	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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: FIELD BLANK-PPOND **Lab ID: 40225233005** Collected: 04/13/21 09:30 Received: 04/16/21 07:40 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	04/20/21 06:41	04/22/21 20:27	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/20/21 06:41	04/22/21 20:27	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	04/20/21 06:41	04/22/21 20:27	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/20/21 06:41	04/22/21 20:27	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	04/20/21 06:41	04/22/21 20:27	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/20/21 06:41	04/22/21 20:27	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	04/20/21 06:41	04/24/21 02:02	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/20/21 06:41	04/24/21 02:02	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/20/21 06:41	04/24/21 02:02	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/20/21 06:41	04/22/21 20:27	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	04/20/21 06:41	04/22/21 20:27	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/20/21 06:41	04/22/21 20:27	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/20/21 06:41	04/22/21 20:27	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/20/21 06:41	04/22/21 20:27	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	04/22/21 11:00	04/23/21 08:55	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**18.0J**	mg/L	20.0	8.7	1		04/16/21 16:53		
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		04/19/21 09:38		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		04/28/21 20:20	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/28/21 20:20	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		04/28/21 20:20	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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

QC Batch: 383173 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

METHOD BLANK: 2210149 Matrix: Water
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	04/23/21 08:32	

LABORATORY CONTROL SAMPLE: 2210150

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2210151 2210152

Parameter	Units	40225233001 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	4.8	4.7	97	94	85-115	3	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

QUALITY CONTROL DATA

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

QC Batch: 382878
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

METHOD BLANK: 2208607 Matrix: Water
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/22/21 18:17	
Arsenic	ug/L	<0.28	1.0	04/22/21 18:17	
Barium	ug/L	<0.70	2.3	04/22/21 18:17	
Beryllium	ug/L	<0.25	1.0	04/22/21 18:17	
Boron	ug/L	<3.0	10.0	04/22/21 18:17	
Cadmium	ug/L	<0.15	1.0	04/22/21 18:17	
Calcium	ug/L	<76.2	254	04/24/21 01:55	
Chromium	ug/L	<1.0	3.4	04/24/21 01:55	
Cobalt	ug/L	<0.12	1.0	04/24/21 01:55	
Lead	ug/L	<0.24	1.0	04/22/21 18:17	
Lithium	ug/L	<0.22	1.0	04/22/21 18:17	
Molybdenum	ug/L	<0.44	1.5	04/22/21 18:17	
Selenium	ug/L	<0.32	1.1	04/22/21 18:17	
Thallium	ug/L	<0.14	1.0	04/22/21 18:17	

LABORATORY CONTROL SAMPLE: 2208608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	498	100	80-120	
Arsenic	ug/L	500	483	97	80-120	
Barium	ug/L	500	500	100	80-120	
Beryllium	ug/L	500	462	92	80-120	
Boron	ug/L	500	460	92	80-120	
Cadmium	ug/L	500	503	101	80-120	
Calcium	ug/L	5000	4890	98	80-120	
Chromium	ug/L	500	505	101	80-120	
Cobalt	ug/L	500	496	99	80-120	
Lead	ug/L	500	492	98	80-120	
Lithium	ug/L	500	474	95	80-120	
Molybdenum	ug/L	500	488	98	80-120	
Selenium	ug/L	500	506	101	80-120	
Thallium	ug/L	500	469	94	80-120	

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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2208609 2208610

Parameter	Units	40225233001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.93J	500	500	498	508	99	101	75-125	2	20	
Arsenic	ug/L	10.4	500	500	488	492	96	96	75-125	1	20	
Barium	ug/L	7.8	500	500	500	504	99	99	75-125	1	20	
Beryllium	ug/L	<0.25	500	500	434	431	87	86	75-125	1	20	
Boron	ug/L	2440	500	500	2810	2960	74	104	75-125	5	20	P6
Cadmium	ug/L	0.67J	500	500	493	505	98	101	75-125	2	20	
Calcium	ug/L	10400	5000	5000	14900	15100	90	93	75-125	1	20	
Chromium	ug/L	44.1	500	500	548	546	101	100	75-125	0	20	
Cobalt	ug/L	0.70J	500	500	506	505	101	101	75-125	0	20	
Lead	ug/L	0.76J	500	500	496	501	99	100	75-125	1	20	
Lithium	ug/L	0.93J	500	500	454	440	91	88	75-125	3	20	
Molybdenum	ug/L	67.1	500	500	565	569	100	100	75-125	1	20	
Selenium	ug/L	22.4	500	500	509	505	97	97	75-125	1	20	
Thallium	ug/L	0.89J	500	500	475	479	95	96	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

QUALITY CONTROL DATA

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

QC Batch: 382705 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

METHOD BLANK: 2207610 Matrix: Water
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/16/21 16:51	

LABORATORY CONTROL SAMPLE: 2207611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	564	542	96	80-120	

SAMPLE DUPLICATE: 2207612

Parameter	Units	40225251002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2940	3000	2	10	

SAMPLE DUPLICATE: 2207613

Parameter	Units	40225251004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2750	2750	0	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

QC Batch: 382734
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

SAMPLE DUPLICATE: 2207891

Parameter	Units	40225153001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.2	0	20	H6

SAMPLE DUPLICATE: 2207905

Parameter	Units	40225178001 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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

QC Batch: 383574
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: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

METHOD BLANK: 2212748 Matrix: Water
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	04/28/21 14:06	
Fluoride	mg/L	<0.095	0.32	04/28/21 14:06	
Sulfate	mg/L	<0.44	2.0	04/28/21 14:06	

LABORATORY CONTROL SAMPLE: 2212749

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.5	107	90-110	
Fluoride	mg/L	2	2.1	103	90-110	
Sulfate	mg/L	20	21.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2212750 2212751

Parameter	Units	40225233001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.5	20	20	24.3	24.4	109	110	90-110	1	15	
Fluoride	mg/L	<0.95	20	20	22.2	19.8	111	99	90-110	11	15	M0
Sulfate	mg/L	345	200	200	545	491	100	73	90-110	11	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2212752 2212753

Parameter	Units	40225269001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.5J	20	20	23.5	23.6	110	110	90-110	0	15	
Fluoride	mg/L	<0.095	2	2	2.2	2.2	107	108	90-110	1	15	
Sulfate	mg/L	4.4	20	20	26.5	26.6	111	111	90-110	0	15	M0

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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: MW-303 **Lab ID: 40225233001** Collected: 04/12/21 12:55 Received: 04/16/21 07:40 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	**0.263 ± 0.448 (0.790) C:NA T:90%**	pCi/L	05/10/21 16:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.583 ± 0.463 (0.923) C:70% T:87%**	pCi/L	05/07/21 15:43	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.846 ± 0.911 (1.71)**	pCi/L	05/11/21 15:49	7440-14-4	

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: MW-304 **Lab ID: 40225233002** Collected: 04/12/21 13:50 Received: 04/16/21 07:40 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	**0.219 ± 0.556 (1.03) C:NA T:85%**	pCi/L	05/10/21 16:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.00 ± 0.599 (1.12) C:66% T:80%**	pCi/L	05/07/21 15:43	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.22 ± 1.16 (2.15)**	pCi/L	05/11/21 15:51	7440-14-4	

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: MW-305 **Lab ID: 40225233003** Collected: 04/12/21 16:25 Received: 04/16/21 07:40 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	**-0.199 ± 0.344 (0.868) C:NA T:83%**	pCi/L	05/10/21 16:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.418 ± 0.463 (0.969) C:63% T:88%**	pCi/L	05/07/21 15:43	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.418 ± 0.807 (1.84)**	pCi/L	05/11/21 15:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: M-4R **Lab ID: 40225233004** Collected: 04/13/21 09:30 Received: 04/16/21 07:40 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	**-0.0735 ± 0.432 (0.963) C:NA T:78%**	pCi/L	05/10/21 16:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.139 ± 0.421 (0.945) C:65% T:89%**	pCi/L	05/07/21 15:44	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.139 ± 0.853 (1.91)**	pCi/L	05/11/21 15:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Sample: FIELD BLANK-PPOND **Lab ID: 40225233005** Collected: 04/13/21 09:30 Received: 04/16/21 07:40 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	**-0.207 ± 0.448 (1.03) C:NA T:90%**	pCi/L	05/10/21 16:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.07 ± 0.644 (1.21) C:68% T:71%**	pCi/L	05/07/21 15:44	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.07 ± 1.09 (2.24)**	pCi/L	05/11/21 15:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

QC Batch: 445314
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: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

METHOD BLANK: 2149682
Matrix: Water
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.621 ± 0.331 (0.589) C:74% T:104%	pCi/L	05/07/21 12:16	

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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

QC Batch: 445313
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: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

METHOD BLANK: 2149681 Matrix: Water
Associated Lab Samples: 40225233001, 40225233002, 40225233003, 40225233004, 40225233005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.301 ± 0.462 (0.795) C:NA T:96%	pCi/L	05/10/21 16:18	

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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

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: 29221067 COLUMBIA CCR P POND
Pace Project No.: 40225233

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40225233001	MW-303	EPA 3010	382878	EPA 6020	382964
40225233002	MW-304	EPA 3010	382878	EPA 6020	382964
40225233003	MW-305	EPA 3010	382878	EPA 6020	382964
40225233004	M-4R	EPA 3010	382878	EPA 6020	382964
40225233005	FIELD BLANK-PPOND	EPA 3010	382878	EPA 6020	382964
40225233001	MW-303	EPA 7470	383173	EPA 7470	383221
40225233002	MW-304	EPA 7470	383173	EPA 7470	383221
40225233003	MW-305	EPA 7470	383173	EPA 7470	383221
40225233004	M-4R	EPA 7470	383173	EPA 7470	383221
40225233005	FIELD BLANK-PPOND	EPA 7470	383173	EPA 7470	383221
40225233001	MW-303				
40225233002	MW-304				
40225233003	MW-305				
40225233004	M-4R				
40225233001	MW-303	EPA 903.1	445313		
40225233002	MW-304	EPA 903.1	445313		
40225233003	MW-305	EPA 903.1	445313		
40225233004	M-4R	EPA 903.1	445313		
40225233005	FIELD BLANK-PPOND	EPA 903.1	445313		
40225233001	MW-303	EPA 904.0	445314		
40225233002	MW-304	EPA 904.0	445314		
40225233003	MW-305	EPA 904.0	445314		
40225233004	M-4R	EPA 904.0	445314		
40225233005	FIELD BLANK-PPOND	EPA 904.0	445314		
40225233001	MW-303	Total Radium Calculation	447511		
40225233002	MW-304	Total Radium Calculation	447513		
40225233003	MW-305	Total Radium Calculation	447513		
40225233004	M-4R	Total Radium Calculation	447513		
40225233005	FIELD BLANK-PPOND	Total Radium Calculation	447513		
40225233001	MW-303	SM 2540C	382705		
40225233002	MW-304	SM 2540C	382705		
40225233003	MW-305	SM 2540C	382705		
40225233004	M-4R	SM 2540C	382705		
40225233005	FIELD BLANK-PPOND	SM 2540C	382705		
40225233001	MW-303	EPA 9040	382734		
40225233002	MW-304	EPA 9040	382734		
40225233003	MW-305	EPA 9040	382734		
40225233004	M-4R	EPA 9040	382734		
40225233005	FIELD BLANK-PPOND	EPA 9040	382734		
40225233001	MW-303	EPA 300.0	383574		
40225233002	MW-304	EPA 300.0	383574		
40225233003	MW-305	EPA 300.0	383574		
40225233004	M-4R	EPA 300.0	383574		
40225233005	FIELD BLANK-PPOND	EPA 300.0	383574		

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.

40225233

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 #:	25221067.00	Pace Profile #:	3946

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)	
	MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS																	Y/N	N	N	N/W	N			
1																									001
2	MW-303	WT		4/12/21		4/12/21	1255		5	2		3							x	x	x	x	x		002
3	MW-304	WT		↓		↓	1350		5	2		3							x	x	x	x	x		003
4	MW-305	WT		↓		↓	1625		5	2		3							x	x	x	x	x		004
5	M-4R	WT		4/13/21		4/13/21	930		5	2		3							x	x	x	x	x		005
6	FIELD BLANK-PPOND	WT		4/13/21		4/13/21	930		5	2		3							x	x	x	x	x		006
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 Engr	4/15/21	1000							
	C Logistics	4/16/21	0740	Susan Killgo Pace	4/16/21	0740	1	Y	N	Y

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:					
SIGNATURE of SAMPLER:	DATE Signed:				

Pace Container Order #800037

40225233

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**	04/09/2021	**Profile**	3946	**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-0-290-03BB	
6	WT	pH	250mL plastic unpres	6	0	M-0-290-04BB	
6	WT	TDS, Cl, F, SO4	250mL plastic unpres	6	0	M-0-290-04BB	

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 :	04/07/2021
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 Engineers Project # 40225233

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

Initial when completed: SKW Date/ Time:

Lab Lot# of pH paper: 10D3601 Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass								Plastic					Vials						Jars				General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN							
001										2		1														2				X		2.5 / 5 / 10
002										2		1														2				X		2.5 / 5 / 10
003										2		1														2				X		2.5 / 5 / 10
004										2		1														2				X		2.5 / 5 / 10
005										2		1														2				X		2.5 / 5 / 10
006										2		1														2				X		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																											4/16/21 SKW						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	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)

Client Name: SCS Engineers Project #:

WO# : 40225233

40225233

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

Cooler Temperature Uncorr: 1 /Corr: 1

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

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

Person examining contents:
Date: 4-16-21 /Initials: SKW

Labeled By Initials: JMB

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

May 11, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40225276

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 16, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- 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.: 40225276

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

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.: 40225276

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40225276001	**MW-301**	Water	04/14/21 14:55	04/16/21 07:40
40225276002	**MW-84A**	Water	04/14/21 13:40	04/16/21 07:40

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 BACKGRND
Pace Project No.: 40225276

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40225276001	**MW-301**	EPA 6020	KXS	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	RMK	1	PASI-PA
		SM 2540C	JXM	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40225276002	**MW-84A**	EPA 6020	KXS	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	RMK	1	PASI-PA
		SM 2540C	JXM	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.: 40225276

Sample: MW-301 **Lab ID: 40225276001** Collected: 04/14/21 14:55 Received: 04/16/21 07:40 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	04/21/21 06:55	04/21/21 21:48	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/21/21 06:55	04/21/21 21:48	7440-38-2	
Barium	**8.9**	ug/L	2.3	0.70	1	04/21/21 06:55	04/21/21 21:48	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/21/21 06:55	04/21/21 21:48	7440-41-7	
Boron	**22.2**	ug/L	10.0	3.0	1	04/21/21 06:55	04/21/21 21:48	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/21/21 06:55	04/21/21 21:48	7440-43-9	
Calcium	**117000**	ug/L	2540	762	10	04/21/21 06:55	04/21/21 19:30	7440-70-2	P6
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/21/21 06:55	04/21/21 21:48	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/21/21 06:55	04/21/21 21:48	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/21/21 06:55	04/21/21 21:48	7439-92-1	
Lithium	**0.58J**	ug/L	1.0	0.22	1	04/21/21 06:55	04/21/21 21:48	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/21/21 06:55	04/21/21 21:48	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/21/21 06:55	04/22/21 10:16	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/21/21 06:55	04/21/21 21:48	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	04/22/21 11:00	04/23/21 09:30	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**6.66**	Std. Units			1		04/14/21 14:55		
Field Specific Conductance	**857.0**	umhos/cm			1		04/14/21 14:55		
Oxygen, Dissolved	**3.90**	mg/L			1		04/14/21 14:55	7782-44-7	
REDOX	**102.9**	mV			1		04/14/21 14:55		
Turbidity	**2.41**	NTU			1		04/14/21 14:55		
Static Water Level	**786.50**	feet			1		04/14/21 14:55		
Temperature, Water (C)	**7.4**	deg C			1		04/14/21 14:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**472**	mg/L	20.0	8.7	1		04/20/21 15:00		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.9**	Std. Units	0.10	0.010	1		04/19/21 10:15		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**1.5J**	mg/L	2.0	0.43	1		04/30/21 16:37	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/30/21 16:37	16984-48-8	
Sulfate	**8.5**	mg/L	2.0	0.44	1		04/30/21 16:37	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.: 40225276

Sample: MW-84A **Lab ID: 40225276002** Collected: 04/14/21 13:40 Received: 04/16/21 07:40 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	**0.55J**	ug/L	1.0	0.15	1	04/21/21 06:55	04/21/21 22:15	7440-36-0	
Arsenic	**0.91J**	ug/L	1.0	0.28	1	04/21/21 06:55	04/21/21 22:15	7440-38-2	
Barium	**13.4**	ug/L	2.3	0.70	1	04/21/21 06:55	04/21/21 22:15	7440-39-3	
Beryllium	**0.47J**	ug/L	1.0	0.25	1	04/21/21 06:55	04/21/21 22:15	7440-41-7	
Boron	**14.3**	ug/L	10.0	3.0	1	04/21/21 06:55	04/21/21 22:15	7440-42-8	
Cadmium	**0.53J**	ug/L	1.0	0.15	1	04/21/21 06:55	04/21/21 22:15	7440-43-9	
Calcium	**69100**	ug/L	254	76.2	1	04/21/21 06:55	04/21/21 22:15	7440-70-2	
Chromium	**2.6J**	ug/L	3.4	1.0	1	04/21/21 06:55	04/21/21 22:15	7440-47-3	
Cobalt	**0.52J**	ug/L	1.0	0.12	1	04/21/21 06:55	04/21/21 22:15	7440-48-4	
Lead	**0.55J**	ug/L	1.0	0.24	1	04/21/21 06:55	04/21/21 22:15	7439-92-1	
Lithium	**1.0**	ug/L	1.0	0.22	1	04/21/21 06:55	04/21/21 22:15	7439-93-2	
Molybdenum	**0.62J**	ug/L	1.5	0.44	1	04/21/21 06:55	04/21/21 22:15	7439-98-7	
Selenium	**0.48J**	ug/L	1.1	0.32	1	04/21/21 06:55	04/22/21 10:44	7782-49-2	
Thallium	**0.66J**	ug/L	1.0	0.14	1	04/21/21 06:55	04/21/21 22:15	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	04/22/21 11:00	04/23/21 09:32	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.34**	Std. Units			1		04/14/21 13:40		
Field Specific Conductance	**610.9**	umhos/cm			1		04/14/21 13:40		
Oxygen, Dissolved	**9.80**	mg/L			1		04/14/21 13:40	7782-44-7	
REDOX	**95.6**	mV			1		04/14/21 13:40		
Turbidity	**2.45**	NTU			1		04/14/21 13:40		
Static Water Level	**785.84**	feet			1		04/14/21 13:40		
Temperature, Water (C)	**10.2**	deg C			1		04/14/21 13:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**328**	mg/L	20.0	8.7	1		04/20/21 15:01		
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		04/19/21 10:17		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**4.4**	mg/L	2.0	0.43	1		04/30/21 16:52	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		04/30/21 16:52	16984-48-8	
Sulfate	**1.4J**	mg/L	2.0	0.44	1		04/30/21 16:52	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.: 40225276

QC Batch: 383173
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225276001, 40225276002

METHOD BLANK: 2210149 Matrix: Water
Associated Lab Samples: 40225276001, 40225276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	04/23/21 08:32	

LABORATORY CONTROL SAMPLE: 2210150

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2210151 2210152

Parameter	Units	40225233001 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	4.8	4.7	97	94	85-115	3	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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40225276

QC Batch: 383007
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225276001, 40225276002

METHOD BLANK: 2209295 Matrix: Water
Associated Lab Samples: 40225276001, 40225276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/21/21 18:28	
Arsenic	ug/L	<0.28	1.0	04/21/21 18:28	
Barium	ug/L	<0.70	2.3	04/21/21 18:28	
Beryllium	ug/L	<0.25	1.0	04/21/21 18:28	
Boron	ug/L	<3.0	10.0	04/21/21 18:28	
Cadmium	ug/L	<0.15	1.0	04/21/21 18:28	
Calcium	ug/L	<76.2	254	04/21/21 18:28	
Chromium	ug/L	<1.0	3.4	04/21/21 18:28	
Cobalt	ug/L	<0.12	1.0	04/21/21 18:28	
Lead	ug/L	<0.24	1.0	04/21/21 18:28	
Lithium	ug/L	<0.22	1.0	04/21/21 18:28	
Molybdenum	ug/L	<0.44	1.5	04/21/21 18:28	
Selenium	ug/L	<0.32	1.1	04/21/21 18:28	
Thallium	ug/L	<0.14	1.0	04/21/21 18:28	

LABORATORY CONTROL SAMPLE: 2209296

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	517	103	80-120	
Arsenic	ug/L	500	492	98	80-120	
Barium	ug/L	500	490	98	80-120	
Beryllium	ug/L	500	477	95	80-120	
Boron	ug/L	500	486	97	80-120	
Cadmium	ug/L	500	509	102	80-120	
Calcium	ug/L	5000	4980	100	80-120	
Chromium	ug/L	500	502	100	80-120	
Cobalt	ug/L	500	486	97	80-120	
Lead	ug/L	500	487	97	80-120	
Lithium	ug/L	500	484	97	80-120	
Molybdenum	ug/L	500	494	99	80-120	
Selenium	ug/L	500	515	103	80-120	
Thallium	ug/L	500	491	98	80-120	

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.: 40225276

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2209297 2209298

Parameter	Units	40225276001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	500	500	531	529	106	106	75-125	0	20	
Arsenic	ug/L	<0.28	500	500	495	490	99	98	75-125	1	20	
Barium	ug/L	8.9	500	500	504	503	99	99	75-125	0	20	
Beryllium	ug/L	<0.25	500	500	475	472	95	94	75-125	1	20	
Boron	ug/L	22.2	500	500	519	512	99	98	75-125	1	20	
Cadmium	ug/L	<0.15	500	500	510	509	102	102	75-125	0	20	
Calcium	ug/L	117000	5000	5000	122000	120000	104	64	75-125	2	20	P6
Chromium	ug/L	<1.0	500	500	511	511	102	102	75-125	0	20	
Cobalt	ug/L	<0.12	500	500	493	494	99	99	75-125	0	20	
Lead	ug/L	<0.24	500	500	512	504	102	101	75-125	2	20	
Lithium	ug/L	0.58J	500	500	487	482	97	96	75-125	1	20	
Molybdenum	ug/L	<0.44	500	500	514	518	103	103	75-125	1	20	
Selenium	ug/L	<0.32	500	500	483	484	97	97	75-125	0	20	
Thallium	ug/L	<0.14	500	500	526	523	105	105	75-125	0	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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40225276

QC Batch: 382972
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225276001, 40225276002

METHOD BLANK: 2209087 Matrix: Water
Associated Lab Samples: 40225276001, 40225276002

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

LABORATORY CONTROL SAMPLE: 2209088

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

SAMPLE DUPLICATE: 2209089

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

SAMPLE DUPLICATE: 2209090

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

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40225276

QC Batch: 382737
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225276001, 40225276002

SAMPLE DUPLICATE: 2207896

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

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40225276

QC Batch: 383702
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: 40225276001, 40225276002

METHOD BLANK: 2213287 Matrix: Water
Associated Lab Samples: 40225276001, 40225276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	04/30/21 01:17	
Fluoride	mg/L	<0.095	0.32	04/30/21 01:17	
Sulfate	mg/L	<0.44	2.0	04/30/21 01:17	

LABORATORY CONTROL SAMPLE: 2213288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.5	108	90-110	
Fluoride	mg/L	2	2.1	107	90-110	
Sulfate	mg/L	20	21.6	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2213289 2213290

Parameter	Units	40225270001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	390	400	400	816	808	107	105	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	1.8	1.9	91	93	90-110	1	15	
Sulfate	mg/L	30.3	20	20	50.5	50.7	101	102	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.: 40225276

Sample: MW-301 **Lab ID: 40225276001** Collected: 04/14/21 14:55 Received: 04/16/21 07:40 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	**0.418 ± 0.563 (0.946) C:NA T:91%**	pCi/L	05/10/21 16:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.739 ± 0.509 (0.983) C:66% T:83%**	pCi/L	05/07/21 15:44	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.16 ± 1.07 (1.93)**	pCi/L	05/11/21 15:49	7440-14-4	

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.: 40225276

Sample: MW-84A **Lab ID: 40225276002** Collected: 04/14/21 13:40 Received: 04/16/21 07:40 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	**-0.289 ± 0.530 (1.20) C:NA T:92%**	pCi/L	05/10/21 17:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.285 ± 0.346 (0.732) C:73% T:95%**	pCi/L	05/11/21 11:28	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.285 ± 0.876 (1.93)**	pCi/L	05/11/21 15:49	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.: 40225276

QC Batch: 445315
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: 40225276002

METHOD BLANK: 2149683 Matrix: Water
Associated Lab Samples: 40225276002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.373 ± 0.381 (0.787) C:76% T:77%	pCi/L	05/11/21 11:27	

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.: 40225276

QC Batch: 445314
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: 40225276001

METHOD BLANK: 2149682 Matrix: Water
Associated Lab Samples: 40225276001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.621 ± 0.331 (0.589) C:74% T:104%	pCi/L	05/07/21 12:16	

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.: 40225276

QC Batch: 445313
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: 40225276001, 40225276002

METHOD BLANK: 2149681 Matrix: Water
Associated Lab Samples: 40225276001, 40225276002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.301 ± 0.462 (0.795) C:NA T:96%	pCi/L	05/10/21 16:18	

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.: 40225276

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 COLUMBIA CCR BACKGRND
Pace Project No.: 40225276

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40225276001	**MW-301**	EPA 3010	383007	EPA 6020	383093
40225276002	**MW-84A**	EPA 3010	383007	EPA 6020	383093
40225276001	**MW-301**	EPA 7470	383173	EPA 7470	383221
40225276002	**MW-84A**	EPA 7470	383173	EPA 7470	383221
40225276001	**MW-301**				
40225276002	**MW-84A**				
40225276001	**MW-301**	EPA 903.1	445313		
40225276002	**MW-84A**	EPA 903.1	445313		
40225276001	**MW-301**	EPA 904.0	445314		
40225276002	**MW-84A**	EPA 904.0	445315		
40225276001	**MW-301**	Total Radium Calculation	447511		
40225276002	**MW-84A**	Total Radium Calculation	447511		
40225276001	**MW-301**	SM 2540C	382972		
40225276002	**MW-84A**	SM 2540C	382972		
40225276001	**MW-301**	EPA 9040	382737		
40225276002	**MW-84A**	EPA 9040	382737		
40225276001	**MW-301**	EPA 300.0	383702		
40225276002	**MW-84A**	EPA 300.0	383702		

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.

40225276

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:	Same
Madison, WI 53718				Address:	
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 #:	25219067.00	Pace Profile #:	x

Regulatory Agency

State / Location

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Radium 226	Radium 228	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)
	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)	N	N	N	N	N	
1	MW-301	WT		4/14/21		4/14/21	1455		5	2		3							X	X	X	X	X	OC1
2	MW-84A	WT		4/14/21		4/14/21	1340		5	2		3							X	X	X	X	X	OC2
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Adam Watson / SCS Engr	4/15/21	1000							
	CS Logistics	4-16-21	0740	Marketing Biotech Inc	4-16-21	0740	4.0	Y	N	Y

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	
SIGNATURE of SAMPLER:	DATE Signed:

Pace Container Order #800030 40225276

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**	04/09/2021	**Profile**	3946	**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-0-290-03BB	
2	WT	pH	250mL plastic unpres	2	0	M-0-290-04BB	
2	WT	TDS, Cl, F, SO4	250mL plastic unpres	2	0	M-0-290-04BB	

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 :	04/07/2021
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:	

Sample Preservation Receipt Form

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

Client Name: SCS Engineers Project # 40225276

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

Lab Lot# of pH paper: 100360\ 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					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
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**

MLR 4-16-21

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: 8021B/8260B MLR 4-16-21 Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☒NA ***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 pres.

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 #:

Client Name: SCS Engineers

WO# : 40225276

40225276

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

Cooler Temperature Uncorr: 1.0 /Corr: 1.0

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

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

Person examining contents:
Date: 4-16-21 /Initials: MR

Labeled By Initials: PT

Chain of Custody Present:	☒Yes ☐No ☐N/A	1. sample MR 4-16-21
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. copy to info, proj. state, ~~sample~~ type MR 4-16-21
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

Page 2 of 2

Appendix C3

July 2021 Assessment Monitoring

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

August 02, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on July 21, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

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

Sincerely,

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

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

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: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40230382001	**MW 303**	Water	07/20/21 13:05	07/21/21 08:00
40230382002	**MW 305**	Water	07/20/21 14:05	07/21/21 08:00
40230382003	**FIELD BLANK**	Water	07/20/21 14:15	07/21/21 08:00

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

SAMPLE ANALYTE COUNT

Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40230382001	**MW 303**	EPA 6020B	DS1	1
			VGC	7
40230382002	**MW 305**	EPA 6020B	DS1	1
			VGC	7
40230382003	**FIELD BLANK**	EPA 6020B	DS1	2

PASI-G = Pace Analytical Services - Green Bay

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

ANALYTICAL RESULTS

Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

Sample: MW 303 **Lab ID: 40230382001** Collected: 07/20/21 13:05 Received: 07/21/21 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Arsenic	**13.9**	ug/L	2.0	0.56	2	07/22/21 05:43	07/29/21 10:18	7440-38-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**9.07**	Std. Units			1		07/20/21 13:05		
Field Specific Conductance	**1058**	umhos/cm			1		07/20/21 13:05		
Oxygen, Dissolved	**6.49**	mg/L			1		07/20/21 13:05	7782-44-7	
REDOX	**67.5**	mV			1		07/20/21 13:05		
Turbidity	**0.57**	NTU			1		07/20/21 13:05		
Static Water Level	**783.64**	feet			1		07/20/21 13:05		
Temperature, Water (C)	**13.1**	deg C			1		07/20/21 13:05		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

Sample: MW 305 **Lab ID: 40230382002** Collected: 07/20/21 14:05 Received: 07/21/21 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Molybdenum	**77.0**	ug/L	2.9	0.88	2	07/22/21 05:43	07/29/21 10:25	7439-98-7	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.71**	Std. Units			1		07/20/21 14:05		
Field Specific Conductance	**1046**	umhos/cm			1		07/20/21 14:05		
Oxygen, Dissolved	**2.38**	mg/L			1		07/20/21 14:05	7782-44-7	
REDOX	**103.3**	mV			1		07/20/21 14:05		
Turbidity	**0.00**	NTU			1		07/20/21 14:05		
Static Water Level	**788.39**	feet			1		07/20/21 14:05		
Temperature, Water (C)	**18.2**	deg C			1		07/20/21 14:05		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

Sample: FIELD BLANK **Lab ID: 40230382003** Collected: 07/20/21 14:15 Received: 07/21/21 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Arsenic	**<0.28**	ug/L	1.0	0.28	1	07/22/21 05:43	07/28/21 04:45	7440-38-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	07/22/21 05:43	07/28/21 04:45	7439-98-7	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

QC Batch: 391037
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40230382001, 40230382002, 40230382003

METHOD BLANK: 2255510 Matrix: Water
Associated Lab Samples: 40230382001, 40230382002, 40230382003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	ug/L	<0.28	1.0	07/28/21 04:16	
Molybdenum	ug/L	<0.44	1.5	07/28/21 04:16	

LABORATORY CONTROL SAMPLE: 2255511

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	250	239	96	80-120	
Molybdenum	ug/L	250	258	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2255512 2255513

Parameter	Units	40230258001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	<10.0	250	250	247	242	98	96	75-125	2	20	
Molybdenum	ug/L	2.2	250	250	262	253	104	100	75-125	4	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: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

DEFINITIONS

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

WORKORDER QUALIFIERS

WO: 40230382

[1] Revised Report: Field measurements are now included.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25221067 ALLIANT-COLUMBIA
Pace Project No.: 40230382

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40230382001	**MW 303**	EPA 3010A	391037	EPA 6020B	391122
40230382002	**MW 305**	EPA 3010A	391037	EPA 6020B	391122
40230382003	**FIELD BLANK**	EPA 3010A	391037	EPA 6020B	391122
40230382001	**MW 303**				
40230382002	**MW 305**				

(Please Print Clearly)

Company Name:	SCS
Branch/Location:	Madison
Project Contact:	Meg Blodgett
Phone:	608-216-7362
Project Number:	25221067
Project Name:	Alliant - Columbia
Project State:	WI
Sampled By (Print):	Paul A. Grover
Sampled By (Sign):	Paul A. Grover
PO #:	
Regulatory Program:	

Pace Analytical®
www.pacelabs.com

CHAIN OF CUSTODY

UPPER MIDWEST REGION

MN: 612-607-1700 WI: 920-469-2436

40230382

*Preservation Codes

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

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
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, Sl = Sludge, W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

					Analyses Requested	Arsenic	Molybdenum							CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
					FILTERED? (YES/NO) Y/N	N	N									
					PRESERVATION (CODE)* Pick Letter	D	D									
PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX												
001	MW 303	7-20-21	13:05	GW		X										
002	MW 305	↓	14:05	GW			X									
003	Field Blank	↓	14:15	DI		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:
Paul A. Grover	7-20-21 16:00		
CS logistics	7/21/21 800	CO Pace	7/21/21 800

PACE Project No. 40230382

Receipt Temp = 1 °C

Sample Receipt pH: OK / Adjusted (OK circled)

Cooler Custody Seal: Present / Not Present (Not Present circled)

Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Pace Container Order #835932 40230382

Addresses

Order By :		Ship To :		Return To:	
Company	SCS ENGINEERS	Company	SCS ENGINEERS	Company	Pace Analytical Green Bay
Contact	Blodgett, Meghan	Contact	Paul Grover	Contact	Milewsky, Dan
Email	mblodgett@scsengineers.com	Email	mblodgett@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 25221067 Alliant Columbia **Due Date** 07/07/2021 **Profile** 3946 **Quote**

Project Manager Milewsky, Dan **Return Date** **Carrier** Most Economical **Location**

Trip Blanks

- [ ] Include Trip Blanks

Bottle Labels

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

Bottles

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

Return Shipping Labels

- [ ] No Shipper
- [ ] With Shipper

COC Options

- [X] Number of Blanks 1
- [ ] Pre-Printed

Misc

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

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
3	WT	Metals	250mL plastic w/HNO3	3	0	M-1-050-02BB	

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 :	07/06/2021
Prepared By:	Mai Yer Her
Verified By:	

Sample

CLIENT USE (Optional):

Date Rec'd:	
Received By:	
Verified By:	

Client Name: SCS

Sample Preservation Receipt Form

Project # 4023038Z

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

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

Lab Lot# of pH paper: 10236O4 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: EL 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		2.5 / 5 / 10
002																															X		2.5 / 5 / 10
003																															X		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																						1/24/21											2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																							EL										2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10

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

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

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

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

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

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

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40230382

40230382

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

Cooler Temperature Uncorr: .5 /Corr: 1

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: 7/21/21 /Initials: EL

Labeled By Initials: SRK

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. mail invoice info, PO# 7/21/21 EL
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: -Includes date/time/ID/Analysis Matrix: W	☐Yes ☑No ☐N/A	12. 002 - No Time 7/21/21 EL
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

Page 2 of 2

Appendix C4

October 2021 Assessment Monitoring

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

November 22, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 14, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- 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: Sherren Clark, SCS Engineers
Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

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 PRIM PON
Pace Project No.: 40235131

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40235131001	**MW-303**	Water	10/12/21 10:00	10/14/21 09:10
40235131002	**MW-304**	Water	10/11/21 15:25	10/14/21 09:10
40235131003	**MW-305**	Water	10/11/21 11:45	10/14/21 09:10
40235131004	**M-4R**	Water	10/11/21 13:10	10/14/21 09:10
40235131005	**FIELD BLANK-PPOND**	Water	10/11/21 15:25	10/14/21 09:10

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

SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40235131001	**MW-303**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40235131002	**MW-304**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40235131003	**MW-305**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40235131004	**M-4R**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40235131005	**FIELD BLANK-PPOND**	EPA 6020B	KXS	14	PASI-G

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 PRIM PON
Pace Project No.: 40235131

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	RMK	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 PRIM PON
Pace Project No.: 40235131

Sample: MW-303 **Lab ID: 40235131001** Collected: 10/12/21 10:00 Received: 10/14/21 09:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.55J**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 12:40	7440-36-0	
Arsenic	**18.6**	ug/L	1.0	0.28	1	10/18/21 06:03	10/28/21 12:40	7440-38-2	
Barium	**5.1**	ug/L	2.3	0.70	1	10/18/21 06:03	10/28/21 12:40	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/18/21 06:03	10/28/21 12:40	7440-41-7	
Boron	**2690**	ug/L	100	30.3	10	10/18/21 06:03	10/28/21 12:10	7440-42-8	
Cadmium	**0.27J**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 12:40	7440-43-9	
Calcium	**5530**	ug/L	254	76.2	1	10/18/21 06:03	10/28/21 12:40	7440-70-2	
Chromium	**50.2**	ug/L	3.4	1.0	1	10/18/21 06:03	10/28/21 12:40	7440-47-3	
Cobalt	**0.74J**	ug/L	1.0	0.12	1	10/18/21 06:03	10/28/21 12:40	7440-48-4	
Lead	**0.32J**	ug/L	1.0	0.24	1	10/18/21 06:03	10/28/21 12:40	7439-92-1	
Lithium	**0.62J**	ug/L	1.0	0.22	1	10/18/21 06:03	10/28/21 12:40	7439-93-2	
Molybdenum	**78.0**	ug/L	1.5	0.44	1	10/18/21 06:03	10/28/21 12:40	7439-98-7	
Selenium	**28.1**	ug/L	1.1	0.32	1	10/18/21 06:03	10/28/21 12:40	7782-49-2	
Thallium	**0.30J**	ug/L	1.0	0.14	1	10/18/21 06:03	10/28/21 12:40	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	11/01/21 11:24	11/02/21 06:10	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**9.31**	Std. Units			1		10/12/21 10:00		
Field Specific Conductance	**1078.0**	umhos/cm			1		10/12/21 10:00		
Oxygen, Dissolved	**0.17**	mg/L			1		10/12/21 10:00	7782-44-7	
REDOX	**110.1**	mV			1		10/12/21 10:00		
Turbidity	**0.00**	NTU			1		10/12/21 10:00		
Static Water Level	**783.09**	feet			1		10/12/21 10:00		
Temperature, Water (C)	**12.1**	deg C			1		10/12/21 10:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**660**	mg/L	20.0	8.7	1		10/15/21 14:03		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**9.2**	Std. Units	0.10	0.010	1		10/22/21 09:55		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**12.4J**	mg/L	40.0	8.6	20		10/29/21 11:22	16887-00-6	D3
Fluoride	**<1.9**	mg/L	6.3	1.9	20		10/29/21 11:22	16984-48-8	D3
Sulfate	**369**	mg/L	40.0	8.9	20		10/29/21 11:22	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 PRIM PON
Pace Project No.: 40235131

Sample: MW-304 **Lab ID: 40235131002** Collected: 10/11/21 15:25 Received: 10/14/21 09:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.44J**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 13:24	7440-36-0	
Arsenic	**1.6**	ug/L	1.0	0.28	1	10/18/21 06:03	10/28/21 13:24	7440-38-2	
Barium	**46.4**	ug/L	2.3	0.70	1	10/18/21 06:03	10/28/21 13:24	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/18/21 06:03	10/28/21 13:24	7440-41-7	
Boron	**1090**	ug/L	100	30.3	10	10/18/21 06:03	10/28/21 14:38	7440-42-8	
Cadmium	**0.36J**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 13:24	7440-43-9	
Calcium	**86600**	ug/L	254	76.2	1	10/18/21 06:03	10/28/21 13:24	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/18/21 06:03	10/28/21 13:24	7440-47-3	
Cobalt	**1.2**	ug/L	1.0	0.12	1	10/18/21 06:03	10/28/21 13:24	7440-48-4	
Lead	**0.52J**	ug/L	1.0	0.24	1	10/18/21 06:03	10/28/21 13:24	7439-92-1	
Lithium	**0.45J**	ug/L	1.0	0.22	1	10/18/21 06:03	10/28/21 13:24	7439-93-2	
Molybdenum	**13.5**	ug/L	1.5	0.44	1	10/18/21 06:03	10/28/21 13:24	7439-98-7	
Selenium	**0.35J**	ug/L	1.1	0.32	1	10/18/21 06:03	10/28/21 13:24	7782-49-2	
Thallium	**0.46J**	ug/L	1.0	0.14	1	10/18/21 06:03	10/28/21 13:24	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	11/01/21 11:24	11/02/21 06:33	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.07**	Std. Units			1		10/11/21 15:25		
Field Specific Conductance	**847.0**	umhos/cm			1		10/11/21 15:25		
Oxygen, Dissolved	**0.55**	mg/L			1		10/11/21 15:25	7782-44-7	
REDOX	**63.9**	mV			1		10/11/21 15:25		
Turbidity	**0.38**	NTU			1		10/11/21 15:25		
Static Water Level	**787.78**	feet			1		10/11/21 15:25		
Temperature, Water (C)	**18.3**	deg C			1		10/11/21 15:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**522**	mg/L	20.0	8.7	1		10/15/21 14:04		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		10/22/21 09:59		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**56.6**	mg/L	2.0	0.43	1		10/27/21 23:10	16887-00-6	
Fluoride	**0.15J**	mg/L	0.32	0.095	1		10/27/21 23:10	16984-48-8	
Sulfate	**129**	mg/L	10.0	2.2	5		10/29/21 11:37	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 PRIM PON
Pace Project No.: 40235131

Sample: MW-305 **Lab ID: 40235131003** Collected: 10/11/21 11:45 Received: 10/14/21 09:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.59J**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 13:39	7440-36-0	
Arsenic	**1.4**	ug/L	1.0	0.28	1	10/18/21 06:03	10/28/21 13:39	7440-38-2	
Barium	**29.3**	ug/L	2.3	0.70	1	10/18/21 06:03	10/28/21 13:39	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/18/21 06:03	10/28/21 13:39	7440-41-7	
Boron	**1650**	ug/L	200	60.6	20	10/18/21 06:03	10/28/21 14:52	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 13:39	7440-43-9	
Calcium	**149000**	ug/L	254	76.2	1	10/18/21 06:03	10/28/21 13:39	7440-70-2	
Chromium	**1.1J**	ug/L	3.4	1.0	1	10/18/21 06:03	10/28/21 13:39	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/18/21 06:03	10/28/21 13:39	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/18/21 06:03	10/28/21 13:39	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/18/21 06:03	10/28/21 13:39	7439-93-2	
Molybdenum	**124**	ug/L	1.5	0.44	1	10/18/21 06:03	10/28/21 13:39	7439-98-7	
Selenium	**4.5**	ug/L	1.1	0.32	1	10/18/21 06:03	10/28/21 13:39	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/18/21 06:03	10/28/21 13:39	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	11/01/21 11:24	11/02/21 06:35	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.95**	Std. Units			1		10/11/21 11:45		
Field Specific Conductance	**1068**	umhos/cm			1		10/11/21 11:45		
Oxygen, Dissolved	**0.26**	mg/L			1		10/11/21 11:45	7782-44-7	
REDOX	**151.8**	mV			1		10/11/21 11:45		
Turbidity	**0.00**	NTU			1		10/11/21 11:45		
Static Water Level	**787.75**	feet			1		10/11/21 11:45		
Temperature, Water (C)	**24.2**	deg C			1		10/11/21 11:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**730**	mg/L	20.0	8.7	1		10/15/21 14:04		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.7**	Std. Units	0.10	0.010	1		10/22/21 10:04		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**63.0**	mg/L	40.0	8.6	20		10/28/21 09:41	16887-00-6	
Fluoride	**0.31J**	mg/L	0.32	0.095	1		10/27/21 23:24	16984-48-8	
Sulfate	**446**	mg/L	40.0	8.9	20		10/28/21 09:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

Sample: M-4R **Lab ID: 40235131004** Collected: 10/11/21 13:10 Received: 10/14/21 09:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.23J**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 13:46	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/18/21 06:03	10/28/21 13:46	7440-38-2	
Barium	**25.8**	ug/L	2.3	0.70	1	10/18/21 06:03	10/28/21 13:46	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/18/21 06:03	10/28/21 13:46	7440-41-7	
Boron	**2290**	ug/L	200	60.6	20	10/18/21 06:03	10/28/21 15:00	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 13:46	7440-43-9	
Calcium	**90400**	ug/L	254	76.2	1	10/18/21 06:03	10/28/21 13:46	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/18/21 06:03	10/28/21 13:46	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/18/21 06:03	10/28/21 13:46	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/18/21 06:03	10/28/21 13:46	7439-92-1	
Lithium	**2.5**	ug/L	1.0	0.22	1	10/18/21 06:03	10/28/21 13:46	7439-93-2	
Molybdenum	**60.7**	ug/L	1.5	0.44	1	10/18/21 06:03	10/28/21 13:46	7439-98-7	
Selenium	**2.3**	ug/L	1.1	0.32	1	10/18/21 06:03	10/28/21 13:46	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/18/21 06:03	10/28/21 13:46	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	11/01/21 11:24	11/02/21 06:37	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.41**	Std. Units			1		10/11/21 13:10		
Field Specific Conductance	**955.0**	umhos/cm			1		10/11/21 13:10		
Oxygen, Dissolved	**0.26**	mg/L			1		10/11/21 13:10	7782-44-7	
REDOX	**150.5**	mV			1		10/11/21 13:10		
Turbidity	**0.00**	NTU			1		10/11/21 13:10		
Static Water Level	**786.33**	feet			1		10/11/21 13:10		
Temperature, Water (C)	**15.6**	deg C			1		10/11/21 13:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**628**	mg/L	20.0	8.7	1		10/15/21 14:05		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		10/22/21 10:08		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**67.8**	mg/L	20.0	4.3	10		10/28/21 09:56	16887-00-6	
Fluoride	**0.26J**	mg/L	0.32	0.095	1		10/27/21 23:38	16984-48-8	
Sulfate	**236**	mg/L	20.0	4.4	10		10/28/21 09:56	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 PRIM PON
Pace Project No.: 40235131

Sample: FIELD BLANK-PPOND **Lab ID: 40235131005** Collected: 10/11/21 15:25 Received: 10/14/21 09:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 11:48	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/18/21 06:03	10/28/21 11:48	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	10/18/21 06:03	10/28/21 11:48	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/18/21 06:03	10/28/21 11:48	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	10/18/21 06:03	10/28/21 11:48	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/18/21 06:03	10/28/21 11:48	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	10/18/21 06:03	10/28/21 11:48	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/18/21 06:03	10/28/21 11:48	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/18/21 06:03	10/28/21 11:48	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/18/21 06:03	10/28/21 11:48	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/18/21 06:03	10/28/21 11:48	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/18/21 06:03	10/28/21 11:48	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/18/21 06:03	10/28/21 11:48	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/18/21 06:03	10/28/21 11:48	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	11/01/21 11:24	11/02/21 06:40	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**16.0J**	mg/L	20.0	8.7	1		10/15/21 14:05		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.7**	Std. Units	0.10	0.010	1		10/22/21 10:09		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		10/27/21 23:52	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/27/21 23:52	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		10/27/21 23:52	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 PRIM PON
Pace Project No.: 40235131

QC Batch: 400243 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

METHOD BLANK: 2311667 Matrix: Water
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	11/02/21 06:05	

LABORATORY CONTROL SAMPLE: 2311668

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2311669 2311670

Parameter	Units	40235131001 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	4.7	4.8	94	97	85-115	3	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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

QC Batch: 398760
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

METHOD BLANK: 2302500 Matrix: Water
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/28/21 11:41	
Arsenic	ug/L	<0.28	1.0	10/28/21 11:41	
Barium	ug/L	<0.70	2.3	10/28/21 11:41	
Beryllium	ug/L	<0.25	1.0	10/28/21 11:41	
Boron	ug/L	<3.0	10.0	10/28/21 11:41	
Cadmium	ug/L	<0.15	1.0	10/28/21 11:41	
Calcium	ug/L	<76.2	254	10/28/21 11:41	
Chromium	ug/L	<1.0	3.4	10/28/21 11:41	
Cobalt	ug/L	<0.12	1.0	10/28/21 11:41	
Lead	ug/L	<0.24	1.0	10/28/21 11:41	
Lithium	ug/L	<0.22	1.0	10/28/21 11:41	
Molybdenum	ug/L	<0.44	1.5	10/28/21 11:41	
Selenium	ug/L	<0.32	1.1	10/28/21 11:41	
Thallium	ug/L	<0.14	1.0	10/28/21 11:41	

LABORATORY CONTROL SAMPLE: 2302501

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	250	100	80-120	
Arsenic	ug/L	250	251	100	80-120	
Barium	ug/L	250	240	96	80-120	
Beryllium	ug/L	250	255	102	80-120	
Boron	ug/L	250	246	98	80-120	
Cadmium	ug/L	250	246	98	80-120	
Calcium	ug/L	10000	9850	99	80-120	
Chromium	ug/L	250	246	98	80-120	
Cobalt	ug/L	250	244	98	80-120	
Lead	ug/L	250	244	98	80-120	
Lithium	ug/L	250	249	99	80-120	
Molybdenum	ug/L	250	247	99	80-120	
Selenium	ug/L	250	257	103	80-120	
Thallium	ug/L	250	247	99	80-120	

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 PRIM PON
Pace Project No.: 40235131

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2302502 2302503

Parameter	Units	40235131001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.55J	250	250	252	247	101	98	75-125	2	20	
Arsenic	ug/L	18.6	250	250	270	265	100	99	75-125	2	20	
Barium	ug/L	5.1	250	250	249	246	98	96	75-125	2	20	
Beryllium	ug/L	<0.25	250	250	255	243	102	97	75-125	5	20	
Boron	ug/L	2690	250	250	2990	2950	120	104	75-125	1	20	
Cadmium	ug/L	0.27J	250	250	245	238	98	95	75-125	3	20	
Calcium	ug/L	5530	10000	10000	15400	15200	98	96	75-125	1	20	
Chromium	ug/L	50.2	250	250	292	287	97	95	75-125	1	20	
Cobalt	ug/L	0.74J	250	250	242	238	97	95	75-125	2	20	
Lead	ug/L	0.32J	250	250	247	257	99	103	75-125	4	20	
Lithium	ug/L	0.62J	250	250	250	241	100	96	75-125	4	20	
Molybdenum	ug/L	78.0	250	250	329	322	100	98	75-125	2	20	
Selenium	ug/L	28.1	250	250	283	280	102	101	75-125	1	20	
Thallium	ug/L	0.30J	250	250	250	256	100	102	75-125	2	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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

QC Batch: 398649 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

METHOD BLANK: 2301509 Matrix: Water
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/15/21 14:01	

LABORATORY CONTROL SAMPLE: 2301510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	575	552	96	80-120	

SAMPLE DUPLICATE: 2301513

Parameter	Units	40235131001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	660	702	6	10	

SAMPLE DUPLICATE: 2301514

Parameter	Units	40235131003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	730	740	1	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

QC Batch: 399343
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

SAMPLE DUPLICATE: 2305673

Parameter	Units	40235127001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.4	1	20	H6

SAMPLE DUPLICATE: 2305674

Parameter	Units	40235131001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	9.2	9.3	1	20	H6

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

QC Batch: 399678
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: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

METHOD BLANK: 2307710 Matrix: Water
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	10/27/21 17:38	
Fluoride	mg/L	<0.095	0.32	10/27/21 17:38	
Sulfate	mg/L	<0.44	2.0	10/27/21 17:38	

LABORATORY CONTROL SAMPLE: 2307711

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	20.5	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2307712 2307713

Parameter	Units	40235074001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1780	2000	2000	3920	4060	107	114	90-110	4	15	M0
Fluoride	mg/L				373	388				4	15	M0
Sulfate	mg/L	63.3	400	400	488	481	106	104	90-110	2	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2308300 2308301

Parameter	Units	40235135003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.6J	100	100	110	110	106	106	90-110	0	15	
Fluoride	mg/L	<0.48	10	10	11.1	11.1	111	111	90-110	0	15	M0
Sulfate	mg/L	<2.2	100	100	107	107	105	105	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 PRIM PON
Pace Project No.: 40235131

Sample: MW-303 **Lab ID: 40235131001** Collected: 10/12/21 10:00 Received: 10/14/21 09:10 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	**-0.355 ± 0.332 (0.845) C:NA T:95%**	pCi/L	11/12/21 15:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.539 ± 0.401 (0.790) C:74% T:89%**	pCi/L	11/04/21 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.539 ± 0.733 (1.64)**	pCi/L	11/22/21 16:30	7440-14-4	

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR PRIM PON
Pace Project No.: 40235131

Sample: MW-304 **Lab ID: 40235131002** Collected: 10/11/21 15:25 Received: 10/14/21 09:10 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	**-0.184 ± 0.312 (0.728) C:NA T:99%**	pCi/L	11/12/21 15:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.371 ± 0.356 (0.733) C:73% T:98%**	pCi/L	11/04/21 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.371 ± 0.668 (1.46)**	pCi/L	11/22/21 16:30	7440-14-4	

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 PRIM PON
Pace Project No.: 40235131

Sample: MW-305 **Lab ID: 40235131003** Collected: 10/11/21 11:45 Received: 10/14/21 09:10 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	**0.0522 ± 0.396 (0.783) C:NA T:98%**	pCi/L	11/12/21 15:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.431 ± 0.415 (0.853) C:76% T:85%**	pCi/L	11/04/21 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.483 ± 0.811 (1.64)**	pCi/L	11/22/21 16:30	7440-14-4	

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 PRIM PON
Pace Project No.: 40235131

Sample: M-4R **Lab ID: 40235131004** Collected: 10/11/21 13:10 Received: 10/14/21 09:10 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	**-0.174 ± 0.320 (0.726) C:NA T:94%**	pCi/L	11/12/21 15:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.498 ± 0.424 (0.861) C:71% T:91%**	pCi/L	11/04/21 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.498 ± 0.744 (1.59)**	pCi/L	11/22/21 16:30	7440-14-4	

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 PRIM PON
Pace Project No.: 40235131

Sample: FIELD BLANK-PPOND **Lab ID: 40235131005** Collected: 10/11/21 15:25 Received: 10/14/21 09:10 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	**-0.0969 ± 0.329 (0.728) C:NA T:98%**	pCi/L	11/12/21 15:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.142 ± 0.330 (0.732) C:78% T:92%**	pCi/L	11/04/21 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.142 ± 0.659 (1.46)**	pCi/L	11/22/21 16:30	7440-14-4	

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 PRIM PON
Pace Project No.: 40235131

QC Batch: 469293
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: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

METHOD BLANK: 2266086 Matrix: Water
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.183 ± 0.191 (0.515) C:NA T:99%	pCi/L	11/12/21 15:34	

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 PRIM PON
Pace Project No.: 40235131

QC Batch: 469295
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: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

METHOD BLANK: 2266087 Matrix: Water
Associated Lab Samples: 40235131001, 40235131002, 40235131003, 40235131004, 40235131005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.201 ± 0.284 (0.706) C:76% T:95%	pCi/L	11/04/21 14:32	

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 PRIM PON
Pace Project No.: 40235131

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.

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 PRIM PON
Pace Project No.: 40235131

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40235131001	**MW-303**	EPA 3010A	398760	EPA 6020B	398850
40235131002	**MW-304**	EPA 3010A	398760	EPA 6020B	398850
40235131003	**MW-305**	EPA 3010A	398760	EPA 6020B	398850
40235131004	**M-4R**	EPA 3010A	398760	EPA 6020B	398850
40235131005	**FIELD BLANK-PPOND**	EPA 3010A	398760	EPA 6020B	398850
40235131001	**MW-303**	EPA 7470	400243	EPA 7470	400251
40235131002	**MW-304**	EPA 7470	400243	EPA 7470	400251
40235131003	**MW-305**	EPA 7470	400243	EPA 7470	400251
40235131004	**M-4R**	EPA 7470	400243	EPA 7470	400251
40235131005	**FIELD BLANK-PPOND**	EPA 7470	400243	EPA 7470	400251
40235131001	**MW-303**				
40235131002	**MW-304**				
40235131003	**MW-305**				
40235131004	**M-4R**				
40235131001	**MW-303**	EPA 903.1	469293		
40235131002	**MW-304**	EPA 903.1	469293		
40235131003	**MW-305**	EPA 903.1	469293		
40235131004	**M-4R**	EPA 903.1	469293		
40235131005	**FIELD BLANK-PPOND**	EPA 903.1	469293		
40235131001	**MW-303**	EPA 904.0	469295		
40235131002	**MW-304**	EPA 904.0	469295		
40235131003	**MW-305**	EPA 904.0	469295		
40235131004	**M-4R**	EPA 904.0	469295		
40235131005	**FIELD BLANK-PPOND**	EPA 904.0	469295		
40235131001	**MW-303**	Total Radium Calculation	473625		
40235131002	**MW-304**	Total Radium Calculation	473625		
40235131003	**MW-305**	Total Radium Calculation	473625		
40235131004	**M-4R**	Total Radium Calculation	473625		
40235131005	**FIELD BLANK-PPOND**	Total Radium Calculation	473625		
40235131001	**MW-303**	SM 2540C	398649		
40235131002	**MW-304**	SM 2540C	398649		
40235131003	**MW-305**	SM 2540C	398649		
40235131004	**M-4R**	SM 2540C	398649		
40235131005	**FIELD BLANK-PPOND**	SM 2540C	398649		
40235131001	**MW-303**	EPA 9040	399343		
40235131002	**MW-304**	EPA 9040	399343		
40235131003	**MW-305**	EPA 9040	399343		
40235131004	**M-4R**	EPA 9040	399343		
40235131005	**FIELD BLANK-PPOND**	EPA 9040	399343		
40235131001	**MW-303**	EPA 300.0	399678		
40235131002	**MW-304**	EPA 300.0	399678		
40235131003	**MW-305**	EPA 300.0	399678		
40235131004	**M-4R**	EPA 300.0	399678		
40235131005	**FIELD BLANK-PPOND**	EPA 300.0	399678		

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.

40235131

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:	Meghan Blodgett
Address:	2830 Dairy Drive	Copy To:		Company Name:	SCS Engineers
	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

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																									
2	MW-303	WT				10/12/21	1000		2			3							X	X	X	X	X		001
3	MW-304	WT		10/11/21		10/11/21	1525		2			3							X	X	X	X	X		002
4	MW-305	WT					1145		2			3							X	X	X	X	X		003
5	M-4R	WT					1310		2			3							X	X	X	X	X		004
6	FIELD BLANK-PPOND	WT					1525		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 Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Adam Watson/SCS	10/12/21	1630							
	CS Logistics	10/14/21	0910	Anthony Blasdell	10/14/21	0910	.5	Y	N	Y

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

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

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 40235131

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

Lab Lot# of pH paper: 0D3604 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: AJW Date/ Time:

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

10/14/21 AJW

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other:_____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No X 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# : 40235131

40235131

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

Cooler Temperature Uncorr: .5 /Corr: .5

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

Person examining contents:
Date: 10/14/21 /Initials: AW

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. no proj. #, 10/14/21 AW proj: State 10/14/21 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: -Includes date/time/ID/Analysis Matrix: WW	☒Yes ☐No ☐N/A	12.
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

Page 2 of 2

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

December 08, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40235317

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- 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: Sherren Clark, SCS Engineers
Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40235317

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.: 40235317

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40235317001	**MW-301**	Water	10/14/21 17:05	10/16/21 08:35
40235317002	**MW-84A**	Water	10/14/21 15:20	10/16/21 08:35

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

SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40235317

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40235317001	**MW-301**	EPA 6020B	KXS	15	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40235317002	**MW-84A**	EPA 6020B	KXS	15	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	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.: 40235317

Sample: MW-301 **Lab ID: 40235317001** Collected: 10/14/21 17:05 Received: 10/16/21 08:35 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Lithium	**0.46J**	ug/L	1.0	0.22	1	10/20/21 06:24	10/26/21 14:44	7439-93-2	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/20/21 06:24	10/26/21 14:44	7440-41-7	
Boron	**31.4**	ug/L	10.0	3.0	1	10/20/21 06:24	10/26/21 14:44	7440-42-8	
Calcium	**67800**	ug/L	254	76.2	1	10/20/21 06:24	10/26/21 14:44	7440-70-2	P6
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/20/21 06:24	10/26/21 14:44	7440-47-3	
Cobalt	**0.34J**	ug/L	1.0	0.12	1	10/20/21 06:24	10/26/21 14:44	7440-48-4	
Arsenic	**0.35J**	ug/L	1.0	0.28	1	10/20/21 06:24	10/26/21 14:44	7440-38-2	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/20/21 06:24	10/26/21 14:44	7782-49-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/20/21 06:24	10/26/21 14:44	7439-98-7	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/20/21 06:24	10/26/21 14:44	7440-43-9	
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/20/21 06:24	10/26/21 14:44	7440-36-0	
Barium	**7.7**	ug/L	2.3	0.70	1	10/20/21 06:24	10/26/21 14:44	7440-39-3	
Mercury	**<0.093**	ug/L	0.31	0.093	1	10/20/21 06:24	10/26/21 14:44	7439-97-6	
Thallium	**0.17J**	ug/L	1.0	0.14	1	10/20/21 06:24	10/26/21 14:44	7440-28-0	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/20/21 06:24	10/26/21 14:44	7439-92-1	
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	11/11/21 10:35	11/12/21 13:03	7439-97-6	H1,M0
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.01**	Std. Units			1		10/14/21 17:05		
Field Specific Conductance	**597.2**	umhos/cm			1		10/14/21 17:05		
Oxygen, Dissolved	**0.25**	mg/L			1		10/14/21 17:05	7782-44-7	
REDOX	**57.8**	mV			1		10/14/21 17:05		
Turbidity	**3.21**	NTU			1		10/14/21 17:05		
Static Water Level	**785.28**	feet			1		10/14/21 17:05		
Temperature, Water (C)	**11.1**	deg C			1		10/14/21 17:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**334**	mg/L	20.0	8.7	1		10/19/21 13:33		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.3**	Std. Units	0.10	0.010	1		10/21/21 11:12		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**2.7**	mg/L	2.0	0.43	1		11/09/21 02:59	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		11/09/21 02:59	16984-48-8	
Sulfate	**17.4**	mg/L	2.0	0.44	1		11/09/21 02:59	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.: 40235317

Sample: MW-84A **Lab ID: 40235317002** Collected: 10/14/21 15:20 Received: 10/16/21 08:35 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/20/21 06:24	10/26/21 15:28	7440-36-0	
Arsenic	**0.41J**	ug/L	1.0	0.28	1	10/20/21 06:24	10/26/21 15:28	7440-38-2	
Barium	**12.9**	ug/L	2.3	0.70	1	10/20/21 06:24	10/26/21 15:28	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/20/21 06:24	10/26/21 15:28	7440-41-7	
Boron	**11.1**	ug/L	10.0	3.0	1	10/20/21 06:24	10/26/21 15:28	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/20/21 06:24	10/26/21 15:28	7440-43-9	
Calcium	**75300**	ug/L	254	76.2	1	10/20/21 06:24	10/26/21 15:28	7440-70-2	
Chromium	**1.9J**	ug/L	3.4	1.0	1	10/20/21 06:24	10/26/21 15:28	7440-47-3	
Cobalt	**0.12J**	ug/L	1.0	0.12	1	10/20/21 06:24	10/26/21 15:28	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/20/21 06:24	10/26/21 15:28	7439-92-1	
Lithium	**0.28J**	ug/L	1.0	0.22	1	10/20/21 06:24	10/26/21 15:28	7439-93-2	
Mercury	**<0.093**	ug/L	0.31	0.093	1	10/20/21 06:24	10/26/21 15:28	7439-97-6	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/20/21 06:24	10/26/21 15:28	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/20/21 06:24	10/26/21 15:28	7782-49-2	
Thallium	**0.19J**	ug/L	1.0	0.14	1	10/20/21 06:24	10/26/21 15:28	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	11/11/21 10:35	11/12/21 13:10	7439-97-6	H1
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.42**	Std. Units			1		10/14/21 15:20		
Field Specific Conductance	**598.9**	umhos/cm			1		10/14/21 15:20		
Oxygen, Dissolved	**9.25**	mg/L			1		10/14/21 15:20	7782-44-7	
REDOX	**89.7**	mV			1		10/14/21 15:20		
Turbidity	**3.41**	NTU			1		10/14/21 15:20		
Static Water Level	**784.96**	feet			1		10/14/21 15:20		
Temperature, Water (C)	**12.5**	deg C			1		10/14/21 15:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**326**	mg/L	20.0	8.7	1		10/19/21 13:33		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		10/21/21 11:15		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**3.5**	mg/L	2.0	0.43	1		11/09/21 03:56	16887-00-6	M0
Fluoride	**<0.095**	mg/L	0.32	0.095	1		11/09/21 03:56	16984-48-8	M0
Sulfate	**1.3J**	mg/L	2.0	0.44	1		11/09/21 03:56	14808-79-8	M0

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.: 40235317

QC Batch: 401437
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235317001, 40235317002

METHOD BLANK: 2317754 Matrix: Water
Associated Lab Samples: 40235317001, 40235317002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	11/12/21 12:58	

LABORATORY CONTROL SAMPLE: 2317755

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.6	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2317756 2317757

Parameter	Units	40235317001 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	6.2	6.2	123	123	85-115	0	20	M0

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.: 40235317

QC Batch: 399050
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235317001, 40235317002

METHOD BLANK: 2304130 Matrix: Water
Associated Lab Samples: 40235317001, 40235317002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/26/21 13:37	
Arsenic	ug/L	<0.28	1.0	10/26/21 13:37	
Barium	ug/L	<0.70	2.3	10/26/21 13:37	
Beryllium	ug/L	<0.25	1.0	10/26/21 13:37	
Boron	ug/L	<3.0	10.0	10/26/21 13:37	
Cadmium	ug/L	<0.15	1.0	10/26/21 13:37	
Calcium	ug/L	<76.2	254	10/26/21 13:37	
Chromium	ug/L	<1.0	3.4	10/26/21 13:37	
Cobalt	ug/L	<0.12	1.0	10/26/21 13:37	
Lead	ug/L	<0.24	1.0	10/26/21 13:37	
Lithium	ug/L	<0.22	1.0	10/26/21 13:37	
Mercury	ug/L	<0.093	0.31	10/26/21 13:37	
Molybdenum	ug/L	<0.44	1.5	10/26/21 13:37	
Selenium	ug/L	<0.32	1.1	10/26/21 13:37	
Thallium	ug/L	<0.14	1.0	10/26/21 13:37	

LABORATORY CONTROL SAMPLE: 2304131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	241	96	80-120	
Arsenic	ug/L	250	239	96	80-120	
Barium	ug/L	250	243	97	80-120	
Beryllium	ug/L	250	240	96	80-120	
Boron	ug/L	250	243	97	80-120	
Cadmium	ug/L	250	244	98	80-120	
Calcium	ug/L	10000	10000	100	80-120	
Chromium	ug/L	250	232	93	80-120	
Cobalt	ug/L	250	242	97	80-120	
Lead	ug/L	250	231	93	80-120	
Lithium	ug/L	250	242	97	80-120	
Mercury	ug/L	5	5.1	102	80-120	
Molybdenum	ug/L	250	240	96	80-120	
Selenium	ug/L	250	246	98	80-120	
Thallium	ug/L	250	237	95	80-120	

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.: 40235317

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2304132 2304133

Parameter	Units	40235317001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	250	250	240	243	96	97	75-125	1	20	
Arsenic	ug/L	0.35J	250	250	240	241	96	96	75-125	1	20	
Barium	ug/L	7.7	250	250	251	254	97	98	75-125	1	20	
Beryllium	ug/L	<0.25	250	250	238	238	95	95	75-125	0	20	
Boron	ug/L	31.4	250	250	273	277	97	98	75-125	1	20	
Cadmium	ug/L	<0.15	250	250	243	244	97	98	75-125	1	20	
Calcium	ug/L	67800	10000	10000	77700	80700	100	129	75-125	4	20	P6
Chromium	ug/L	<1.0	250	250	232	236	93	94	75-125	2	20	
Cobalt	ug/L	0.34J	250	250	241	245	96	98	75-125	2	20	
Lead	ug/L	<0.24	250	250	234	236	93	94	75-125	1	20	
Lithium	ug/L	0.46J	250	250	242	244	97	98	75-125	1	20	
Mercury	ug/L	<0.093	5	5	5.2	5.4	104	107	75-125	3	20	
Molybdenum	ug/L	<0.44	250	250	244	245	97	98	75-125	1	20	
Selenium	ug/L	<0.32	250	250	244	245	98	98	75-125	0	20	
Thallium	ug/L	0.17J	250	250	243	244	97	97	75-125	0	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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40235317

QC Batch: 398939
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235317001, 40235317002

METHOD BLANK: 2303507 Matrix: Water
Associated Lab Samples: 40235317001, 40235317002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/19/21 13:29	

LABORATORY CONTROL SAMPLE: 2303508

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	575	566	98	80-120	

SAMPLE DUPLICATE: 2303509

Parameter	Units	40235220001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	248	272	9	10	

SAMPLE DUPLICATE: 2303510

Parameter	Units	40235316003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	374	390	4	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40235317

QC Batch: 399227
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40235317001, 40235317002

SAMPLE DUPLICATE: 2304971

Parameter	Units	40235095010 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	0	20	H6

SAMPLE DUPLICATE: 2304972

Parameter	Units	40235316004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	1	20	H6

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND
Pace Project No.: 40235317

QC Batch: 400930
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: 40235317001, 40235317002

METHOD BLANK: 2315482 Matrix: Water
Associated Lab Samples: 40235317001, 40235317002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	11/08/21 19:10	
Fluoride	mg/L	<0.095	0.32	11/08/21 19:10	
Sulfate	mg/L	<0.44	2.0	11/08/21 19:10	

LABORATORY CONTROL SAMPLE: 2315483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	18.7	94	90-110	
Fluoride	mg/L	2	1.9	93	90-110	
Sulfate	mg/L	20	18.2	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2315484 2315485

Parameter	Units	40235824001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	7.3	20	20	29.8	30.1	113	114	90-110	1	15	M0
Fluoride	mg/L	<0.095	2	2	2.2	2.2	110	111	90-110	1	15	M0
Sulfate	mg/L	18.5	20	20	41.0	41.1	112	113	90-110	0	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2315486 2315487

Parameter	Units	40235317002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.5	20	20	25.8	27.1	111	118	90-110	5	15	M0
Fluoride	mg/L	<0.095	2	2	2.2	2.3	109	114	90-110	5	15	M0
Sulfate	mg/L	1.3J	20	20	23.2	24.5	109	116	90-110	6	15	M0

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.: 40235317

Sample: MW-301 **Lab ID: 40235317001** Collected: 10/14/21 17:05 Received: 10/16/21 08:35 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	**0.172 ± 0.337 (0.617) C:NA T:96%**	pCi/L	11/17/21 12:14	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**-0.0327 ± 0.419 (0.973) C:61% T:89%**	pCi/L	11/15/21 11:02	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.172 ± 0.756 (1.59)**	pCi/L	11/24/21 15:38	7440-14-4	

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.: 40235317

Sample: MW-84A **Lab ID: 40235317002** Collected: 10/14/21 15:20 Received: 10/16/21 08:35 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 ± 0.242 (0.493) C:NA T:100%**	pCi/L	11/17/21 12:14	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.243 ± 0.576 (1.27) C:60% T:88%**	pCi/L	11/15/21 11:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.243 ± 0.818 (1.76)**	pCi/L	11/24/21 15:38	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.: 40235317

QC Batch: 471019
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: 40235317001, 40235317002

METHOD BLANK: 2273682 Matrix: Water
Associated Lab Samples: 40235317001, 40235317002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0899 ± 0.216 (0.540) C:NA T:95%	pCi/L	11/17/21 12:14	

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.: 40235317

QC Batch: 471020
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: 40235317001, 40235317002

METHOD BLANK: 2273691 Matrix: Water
Associated Lab Samples: 40235317001, 40235317002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.552 ± 0.431 (0.853) C:67% T:79%	pCi/L	11/19/21 11:42	

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.: 40235317

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.

WORKORDER QUALIFIERS

WO: 40235317

[1]	Mercury by Method 7470 was analyzed past hold due to laboratory oversight. Mercury by Method 6020 has been provided as supplemental data.

ANALYTE QUALIFIERS

H1	Analysis conducted outside the recognized method holding time.
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.: 40235317

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40235317001	**MW-301**	EPA 3010A	399050	EPA 6020B	399167
40235317002	**MW-84A**	EPA 3010A	399050	EPA 6020B	399167
40235317001	**MW-301**	EPA 7470	401437	EPA 7470	401479
40235317002	**MW-84A**	EPA 7470	401437	EPA 7470	401479
40235317001	**MW-301**				
40235317002	**MW-84A**				
40235317001	**MW-301**	EPA 903.1	471019		
40235317002	**MW-84A**	EPA 903.1	471019		
40235317001	**MW-301**	EPA 904.0	471020		
40235317002	**MW-84A**	EPA 904.0	471020		
40235317001	**MW-301**	Total Radium Calculation	474011		
40235317002	**MW-84A**	Total Radium Calculation	474011		
40235317001	**MW-301**	SM 2540C	398939		
40235317002	**MW-84A**	SM 2540C	398939		
40235317001	**MW-301**	EPA 9040	399227		
40235317002	**MW-84A**	EPA 9040	399227		
40235317001	**MW-301**	EPA 300.0	400930		
40235317002	**MW-84A**	EPA 300.0	400930		

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

40235317

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:	Meghan Blodgett
Address:	2830 Dairy Drive	Copy To:		Company Name:	SCS Engineers
Madison, WI 53718				Address:	
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 #:	25221067.00	Pace Profile #:	x

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	Y/N	Analyses Test: Radium 226	Radium 228	Metals	pH	TDS, Cl, F, SO4	Residual Chlorine (Y/N)	
1	MW-301	WT				10/14/21	1705			2		3							X	X	X	X	X		001
2	MW-84A	WT				↓	1520			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: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED		10/15/21	1530							
	CS Logistics	10/16/21	0835	[signature]	10/16/21	0835	.5	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed:

Pace Container Order #865037 4023537

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	Adam Watson	Contact	Milewsky, Dan
Email	mblodgett@scsengineers.com	Email	awatson@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 Secondary Pond	**Due Date**	10/08/2021	**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
- [X] Temp. Blanks
- [X] Coolers
- [ ] Syringes
- [ ] Extra Bubble Wrap
- [ ] Short Hold/Rush Stickers
- [X] DI Water 1 Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
4	WT	Metals	250mL plastic w/HNO3	4	0	M-1-106-03BB	
4	WT	pH	250mL plastic unpres	4	0	M-1-203-03BB	
4	WT	TDS, Cl, F, SO4	250mL plastic unpres	4	0	M-1-203-03BB	
4	WT	Radium 226	1L plastic HNO3 preserved	4	0		
4	WT	Radium 228	1L Plastic HNO3 Presered	4	0		

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 :	10/07/2021
Prepared By:	Mai Yer Her
Verified By:	

Sample

Metals=As,Ba,Cr,Co,Li,Mo,Se,Ca,B
ALL SAMPLES UNFILTERED

CLIENT USE (Optional):

Date Rec'd:	
Received By:	
Verified By:	

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 40235517

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

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

Lab Lot# of pH paper: 10036O4 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: AL Date/ Time:

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				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
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

10/16/21 AW

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: Radium 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 plastic HNO3

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO#: 40235317

40235317

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

Cooler Temperature Uncorr: 5 /Corr: 5

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

Person examining contents:
Date: 10/16/21 /Initials: AZ

Labeled By Initials: MP

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. F.H. 10/16/21 AZ
Chain of Custody Relinquished:	☐Yes ☒No ☐N/A	3. does have date/time 10/16/21 AZ
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

Page 2 of 2

Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Columbia

Location ID: M-4R
Number of Sampling Dates: 18

Parameter Name	Units	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	4/13/2021	10/11/2021
Boron	ug/L	1000	461	453	793	866	512	464	973	1910	905	704	1140	788	1120	644	1360	730	2290
Calcium	ug/L	105000	79400	68900	94300	103000	84800	90300	91600	67100	86400	99700	84100	106000	82400	106000	98000	110000	90400
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	49.6	67.8
Fluoride	mg/L	0.22	<0.2	<0.2	0.16	0.38	0.18	0.2	0.23	<0.5	0.16	0.13	<0.1	0.17	0.17	0.13	0.27	0.23	0.26
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	7.18	7.41
Sulfate	mg/L	112	102	88.5	82.8	144	127	131	139	187	162	151	89.2	149	128	162	203	193	236
Total Dissolved Solids	mg/L	544	440	410	468	570	484	494	544	474	516	646	424	524	432	594	604	556	628
Antimony	ug/L	0.13	0.14	0.13	<0.073	0.24	0.14	0.26	0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	0.23
Arsenic	ug/L	0.17	0.2	0.18	0.25	0.47	<0.099	0.33	<0.28	--	0.36	<0.28	<0.28	<0.28	0.37	0.39	0.44	<0.28	<0.28
Barium	ug/L	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	25.1	25.8
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	0.3	<0.18	<0.18	<0.18	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	0.21	<0.089	0.1	<0.089	0.084	<0.081	--	<0.081	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	0.68	1.6	<0.39	0.49	0.4	0.7	<1	<1	--	<1	<1	1.3	<1	1.4	1.2	<1	<1	<1
Cobalt	ug/L	0.33	0.11	0.16	0.11	0.31	0.32	0.27	0.21	--	0.16	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Lead	ug/L	0.067	<0.04	0.73	<0.04	0.094	<0.04	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	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	1.8	2.5
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	--	<0.084	--	<0.066	<0.066
Molybdenum	ug/L	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	41.1	60.7
Selenium	ug/L	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	3.7	2.3
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.18	<0.14	--	0.21	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	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	0.139	0.498
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	-0.073	-0.174
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	0.139	0.498
Field Specific Conductance	umhos/cm	954	535	662	1332	819	1212	660.4	751	612	790	881	819	888	705	869	948	845	955
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	0.27	0.26
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	128.7	150.5
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	786.34	786.33
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	10.3	15.6
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	0	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	7.5	7.8

Single Location

Name: WPL - Columbia

Location ID: MW-84A

Number of Sampling Dates: 21

Parameter Name	Units	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	5/29/2020	10/8/2020	4/14/2021	10/14/2021
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	13.6	12	15.7	10	9.7	14.3	11.1
Calcium	ug/L	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500	72700	77600	69200	69100	75300
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	3.7	4.3	4.4	3.5
Fluoride	mg/L	<0.2	<0.2	<0.2	--	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095
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	7.34	7.49	7.34	7.42
Sulfate	mg/L	4.9	4.3	3.7	--	2.6	2.7	3	2.8	2.7	2	2.2	2.8	1.9	1.6	1.4	1.3	<2.2	1.5	1.3	1.4	1.3
Total Dissolved Solids	mg/L	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310	316	340	320	328	326
Antimony	ug/L	<0.073	0.084	0.1	--	<0.073	<0.073	<0.073	<0.073	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.55	<0.15
Arsenic	ug/L	0.15	0.29	0.14	--	0.35	0.19	0.35	<0.099	<0.28	0.28	--	<0.28	<0.28	0.33	<0.28	0.46	0.38	0.34	0.49	0.91	0.41
Barium	ug/L	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	13.9	12.6	13.4	12.9
Beryllium	ug/L	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.25	--	<0.25	<0.25	0.47	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	--	<0.089	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.53	<0.15
Chromium	ug/L	2.5	1.9	1.8	--	2	2	1.9	2.4	2	1.6	--	2.4	1.5	1.6	1.8	1.6	1.6	1.7	1.6	2.6	1.9
Cobalt	ug/L	0.095	<0.036	0.053	--	<0.036	<0.036	<0.036	<0.036	<0.085	<0.085	--	<0.085	<0.085	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.52	0.12
Lead	ug/L	0.16	<0.04	0.39	--	0.049	0.11	<0.04	0.041	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24	--	<0.24	<0.24	0.55	<0.24
Lithium	ug/L	0.72	0.44	0.5	--	0.56	0.56	0.56	0.55	0.46	0.58	--	0.5	0.4	0.49	0.56	0.52	0.58	0.4	0.39	1	0.28
Mercury	ug/L	<0.1	<0.1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093
Molybdenum	ug/L	<0.07	<0.07	0.073	--	0.12	<0.07	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	0.62	<0.44
Selenium	ug/L	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.32	<0.32	--	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	0.48	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.66	0.19
Total Radium	pCi/L	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	0.395	0.39	0.285	0.243
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	0.368	0	-0.289	0
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	0.0273	0.39	0.285	0.243
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	613.7	610.1	610.9	598.9
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	9.81	9.39	9.8	9.25
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	135	153.2	95.6	89.7
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	787.02	786.1	785.84	784.96
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	10.6	11.9	10.2	12.5
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	2.15	0	2.45	3.41
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	7.6	7.6	7.6	7.8

Single Location

Name: WPL - Columbia

Location ID: MW-301

Number of Sampling Dates: 20

Parameter Name	Units	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	10/8/2020	4/14/2021	10/14/2021
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	28.8	22.2	31.4
Calcium	ug/L	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000	112000	93000	117000	67800
Chloride	mg/L	3.7	4	3.5	2.2	2	1.5	2	3.5	5.5	4	2.3	5.2	3.2	0.79	1.7	1.3	2	3.4	1.5	2.7
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095
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	6.95	6.66	7.01
Sulfate	mg/L	9.3	15.3	15	13.9	12.3	6.5	10.3	17.1	31.6	27.5	8.6	21.6	19.2	4.4	8.4	7.2	11.5	25.1	8.5	17.4
Total Dissolved Solids	mg/L	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462	452	412	472	334
Antimony	ug/L	0.15	0.094	0.13	<0.073	0.4	<0.073	<0.073	<0.15	<0.15	--	<0.15	0.36	<0.15	0.32	<0.15	--	<0.15	0.33	<0.15	<0.15
Arsenic	ug/L	0.26	0.26	0.19	0.24	0.4	0.13	0.18	<0.28	<0.28	--	<0.28	0.45	<0.28	0.4	0.42	<0.28	0.33	0.62	<0.28	0.35
Barium	ug/L	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	9.4	8.9	7.7
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	0.19	<0.13	<0.13	<0.18	<0.18	--	<0.18	0.37	<0.18	0.28	<0.25	--	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	0.32	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	0.21	<0.15	--	<0.15	0.19	<0.15	<0.15
Chromium	ug/L	2.1	0.58	0.59	<0.39	0.7	0.53	0.7	2.3	<1	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	1.4	0.25	0.22	0.041	0.38	0.071	0.064	0.13	0.12	--	<0.085	0.28	<0.12	0.35	<0.12	0.17	<0.12	0.29	<0.12	0.34
Lead	ug/L	0.9	0.077	0.48	<0.04	0.34	<0.04	<0.04	<0.2	<0.2	--	<0.2	--	<0.24	0.3	<0.24	--	<0.24	0.25	<0.24	<0.24
Lithium	ug/L	1.3	0.58	0.69	0.6	0.87	0.67	0.68	0.62	0.6	--	0.55	0.85	0.52	0.9	0.61	0.67	0.47	0.46	0.58	0.46
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093
Molybdenum	ug/L	0.35	0.15	0.14	0.12	0.38	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	0.3	0.21	0.39	<0.21	0.26	<0.21	<0.21	<0.32	<0.32	--	<0.32	0.71	<0.32	0.49	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	0.48	<0.14	<0.14	<0.14	<0.14	--	<0.14	0.3	<0.14	0.48	<0.14	<0.14	<0.14	0.3	<0.14	0.17
Total Radium	pCi/L	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	0.38	1.16	0.172
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	0.0511	0.418	0.172
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	0.329	0.739	-0.0327
Field Specific Conductance	umhos/cm	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868	797	760	857	597.2
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	1.22	3.9	0.25
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	183.9	102.9	57.8
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	786.53	786.5	785.28
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	11	7.4	11.1
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	0	2.41	3.21
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	7.2	6.9	7.3

Single Location

Name: WPL - Columbia

Location ID: MW-303

Number of Sampling Dates: 23

Parameter Name	Units	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	5/27/2020	10/7/2020	2/25/2021	4/12/2021	7/20/2021	10/12/2021
Boron	ug/L	3000	2130	1680	--	1770	1790	1990	1970	2080	1870	2330	1410	--	2360	2770	--	2560	2700	2520	--	2440	--	2690
Calcium	ug/L	9830	36000	14200	--	44500	7330	33700	35500	20700	8850	4610	25600	--	28200	9290	--	22300	27400	19700	--	10400	--	5530
Chloride	mg/L	29.6	8	45.9	--	<0.5	14.2	16.7	8.1	11.7	8.3	<10	<10	--	2.6	3.7	--	2.7	2.3	2	--	2.5	--	12.4
Fluoride	mg/L	<2	0.28	<4	--	<0.1	<1	<2	0.3	<1	<0.5	<2	<2	--	0.16	0.54	--	0.19	<0.48	0.19	--	<0.95	--	<1.9
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	8.68	9.21	9.16	9.24	9.07	9.31
Sulfate	mg/L	597	311	352	--	438	453	506	445	356	467	527	449	--	327	390	--	299	326	312	--	345	--	369
Total Dissolved Solids	mg/L	1230	562	724	--	694	794	778	686	678	806	948	792	--	516	726	--	574	570	532	--	610	--	660
Antimony	ug/L	0.92	0.23	0.32	--	0.076	0.23	0.14	<0.15	<0.15	--	0.28	0.15	--	<0.15	0.29	--	0.31	0.22	<0.15	--	0.93	--	0.55
Arsenic	ug/L	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	5.9	9.5	7.7	10.4	13.9	18.6
Barium	ug/L	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	13.8	10	--	7.8	--	5.1
Beryllium	ug/L	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	--	<0.18	<0.18	--	<0.25	0.36	<0.25	--	<0.25	--	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	--	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	--	<0.15	<0.15	--	<0.15	0.3	<0.15	--	0.67	--	0.27
Chromium	ug/L	50.6	60	66.3	--	79.9	73.4	71	65.1	65.3	--	97.1	56.8	--	49.1	71.2	--	62	42.8	46.4	--	44.1	--	50.2
Cobalt	ug/L	1.8	0.46	0.6	--	0.47	0.54	0.48	0.42	0.37	--	0.8	0.58	--	0.4	0.54	--	0.51	0.49	0.23	--	0.7	--	0.74
Lead	ug/L	1.4	0.11	0.15	--	<0.04	<0.04	<0.04	<0.2	<0.2	--	<0.2	--	--	<0.24	<0.24	--	<0.24	0.32	<0.24	--	0.76	--	0.32
Lithium	ug/L	1.6	1	0.77	--	1.3	0.59	1.2	1.1	0.86	--	0.61	1.1	--	1.3	0.74	--	1	1.2	0.69	--	0.93	--	0.62
Mercury	ug/L	<0.1	<0.1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	<0.084	<0.084	--	--	<0.084	--	--	<0.066	--	<0.066
Molybdenum	ug/L	195	62.6	69.5	--	91.9	91.2	103	87	81.6	--	138	94.8	84.7	85.5	106	64.1	87	67.1	67.1	--	67.1	--	78
Selenium	ug/L	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	18.7	17.2	--	22.4	--	28.1
Thallium	ug/L	<0.14	<0.14	0.15	--	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	--	<0.14	<0.14	--	<0.14	0.28	<0.14	--	0.89	--	0.3
Total Radium	pCi/L	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	0.382	0.722	--	0.846	--	0.539
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	0.168	0.0515	--	0.263	--	-0.355
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	0.214	0.67	--	0.583	--	0.539
Field Specific Conductance	umhos/cm	2130	641	1076	1154	1946	1134	1826	931	936	1093	1447	1095	856	823	1176	712	865	828	801	845	927	1058	1078
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	9.15	7.62	7.45	7.02	6.49	0.17
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	116.1	183	151	51.4	67.5	110.1
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	785.56	785.16	784.27	784.07	783.64	783.09
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	11.6	12.6	11	11.4	13.1	12.1
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	0	0	3.04	1.82	0.57	0
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	8.2	8.8	--	9	--	9.2

Single Location

Name: WPL - Columbia

Location ID: MW-304
Number of Sampling Dates: 18

Parameter Name	Units	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	4/12/2021	10/11/2021
Boron	ug/L	609	420	445	659	614	496	486	570	732	430	632	892	413	613	469	784	568	1090
Calcium	ug/L	78800	77600	72000	77000	65700	79100	75200	79700	78300	77900	84900	72400	88300	82900	84000	75100	78900	86600
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	44.7	56.6
Fluoride	mg/L	0.27	<0.2	0.23	<0.5	0.26	0.1	0.19	0.12	0.13	<0.1	<1	0.14	<0.1	<0.1	<0.095	0.17	0.16	0.15
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	7.3	7.07
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	85.5	129
Total Dissolved Solids	mg/L	420	434	402	406	388	422	500	454	390	406	530	384	394	428	412	442	434	522
Antimony	ug/L	0.72	<0.073	<0.073	<0.073	<0.073	<0.073	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	0.29	0.25	<0.15	0.86	0.44
Arsenic	ug/L	2.3	1.1	1.2	1.8	0.99	0.98	1.1	1	--	0.64	0.76	1.6	0.63	3.2	1.3	2.8	1.8	1.6
Barium	ug/L	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	32.5	46.4
Beryllium	ug/L	0.34	<0.13	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.25	0.26	<0.25	0.86	<0.25
Cadmium	ug/L	0.64	<0.089	0.12	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	<0.15	<0.15	0.19	<0.15	0.79	0.36
Chromium	ug/L	2.1	1.5	<0.39	<0.39	<0.39	0.65	1.9	<1	--	<1	<1	<1	<1	<1	<1	<1	1.1	<1
Cobalt	ug/L	1.9	1.2	0.62	0.83	0.73	0.62	0.76	0.8	--	0.36	1.1	0.88	0.67	0.92	0.69	0.65	0.84	1.2
Lead	ug/L	1.1	0.47	0.43	<0.04	<0.04	0.16	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24	0.29	<0.24	0.89	0.52
Lithium	ug/L	0.93	0.51	0.17	0.14	<0.11	0.16	<0.14	<0.14	--	<0.14	<0.14	<0.19	<0.19	<0.22	0.3	<0.22	1.1	0.45
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	--	<0.084	--	<0.066	<0.066
Molybdenum	ug/L	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	13	13.5
Selenium	ug/L	1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.32	<0.32	--	<0.32	<0.32	<0.32	<0.32	<0.32	0.33	<0.32	1.1	0.35
Thallium	ug/L	0.68	0.15	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	0.15	<0.14	<0.14	<0.14	<0.14	0.33	<0.14	1	0.46
Total Radium	pCi/L	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	1.22	0.371
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	0.219	-0.184
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	1	0.371
Field Specific Conductance	umhos/cm	770	535	680	1211	624.9	1.105	660	704	628	686.4	785	707	747	729	711	776	751	847
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	0.36	0.55
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	27.3	63.9
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	787.99	787.78
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	10.6	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	3.19	0.38
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	7.4	7.7

Single Location

Name: WPL - Columbia

Location ID: MW-305
Number of Sampling Dates: 20

Parameter Name	Units	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	2/25/2021	4/12/2021	7/20/2021	10/11/2021
Boron	ug/L	1020	525	1110	1270	733	1240	2470	2200	1200	1360	1600	692	1430	1040	1650	--	--	668	--	1650
Calcium	ug/L	46400	37500	47300	56700	96500	75500	80200	94100	64800	91200	60200	74700	93000	103000	112000	--	--	235000	--	149000
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	--	--	68.2	--	63
Fluoride	mg/L	0.76	0.7	0.44	0.65	0.53	0.41	0.46	0.64	0.37	0.18	0.36	0.33	0.36	0.3	0.47	--	--	<0.095	--	0.31
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	8.68	8.67	8.71	8.95
Sulfate	mg/L	105	78.7	99.2	108	274	185	243	252	191	276	123	200	480	305	391	--	--	649	--	446
Total Dissolved Solids	mg/L	258	228	282	298	530	408	490	490	386	614	312	418	496	556	572	--	--	1020	--	730
Antimony	ug/L	0.81	0.32	0.43	0.51	0.71	0.55	0.68	--	0.26	0.42	0.58	0.16	0.46	0.3	0.42	--	--	0.31	--	0.59
Arsenic	ug/L	0.56	0.34	0.26	0.27	0.78	0.37	0.43	--	0.48	0.42	0.4	<0.28	0.49	0.75	0.95	--	--	0.95	--	1.4
Barium	ug/L	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	--	--	30	--	29.3
Beryllium	ug/L	0.19	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.25	<0.25	<0.25	--	--	<0.25	--	<0.25
Cadmium	ug/L	0.31	<0.089	<0.089	<0.089	0.34	0.18	0.13	--	<0.081	--	<0.15	<0.15	<0.15	<0.15	<0.15	--	--	<0.15	--	<0.15
Chromium	ug/L	1.4	1.6	1.1	0.83	1.5	1.5	<1	--	<1	<1	1.1	1.3	1.1	<1	<1	--	--	<1	--	1.1
Cobalt	ug/L	0.37	0.069	0.07	<0.036	0.44	0.26	0.2	--	<0.085	<0.085	0.13	<0.12	<0.12	<0.12	<0.12	--	--	<0.12	--	<0.12
Lead	ug/L	0.38	0.056	0.27	0.2	0.38	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24	<0.24	<0.24	--	--	<0.24	--	<0.24
Lithium	ug/L	0.5	0.24	<0.11	0.34	0.21	0.17	0.15	--	<0.14	<0.14	0.24	<0.19	<0.22	<0.22	<0.22	--	--	<0.22	--	<0.22
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	--	<0.084	--	--	--	<0.066	--	<0.066
Molybdenum	ug/L	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	107	106	77	124
Selenium	ug/L	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	--	--	8	--	4.5
Thallium	ug/L	0.44	<0.14	<0.14	<0.14	0.45	0.15	0.2	--	0.16	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	--	<0.14	--	<0.14
Total Radium	pCi/L	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	--	--	0.418	--	0.483
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	--	--	-0.199	--	0.0522
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	--	--	0.418	--	0.431
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	955	1373	1046	1068
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	2.33	2.7	2.38	0.26
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	170	51.5	103.3	151.8
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	788.36	788.11	788.39	787.75
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	15.9	13.6	18.2	24.2
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	0.85	1.14	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	--	--	8.3	--	8.7

Appendix E

Statistical Evaluation

Appendix E1

Lower Confidence Limits

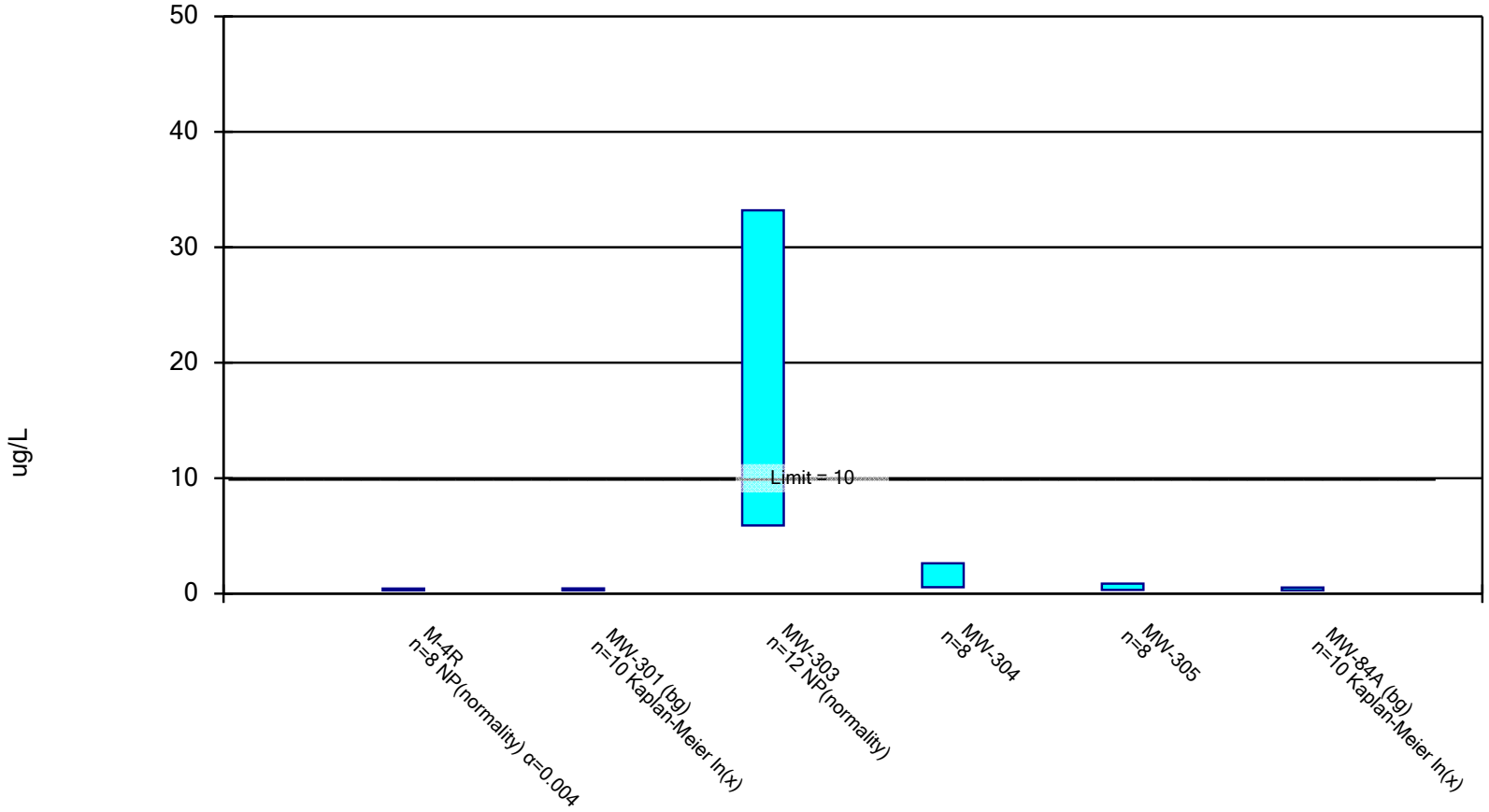
Confidence Interval

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 12/17/2021, 12:39 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.44	0.28	10	No	8	50	None	No	0.004	NP (normality)
Arsenic (ug/L)	MW-301 (bg)	0.447	0.2846	10	No	10	40	Kapla...	ln(x)	0.01	Param.
Arsenic (ug/L)	MW-303	33.2	5.9	10	No	12	0	None	No	0.01	NP (normality)
Arsenic (ug/L)	MW-304	2.628	0.5545	10	No	8	0	None	No	0.01	Param.
Arsenic (ug/L)	MW-305	0.8641	0.3159	10	No	8	12.5	None	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.5278	0.2862	10	No	10	30	Kapla...	ln(x)	0.01	Param.
Molybdenum (ug/L)	M-4R	34.25	15.88	100	No	8	0	None	No	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.44	100	No	10	100	None	No	0.011	NP (NDs)
Molybdenum (ug/L)	MW-303	106.6	65.67	100	No	10	0	None	No	0.01	Param.
Molybdenum (ug/L)	MW-304	13	3	100	No	8	0	None	No	0.004	NP (normality)
Molybdenum (ug/L)	MW-305	92.73	52.84	100	No	11	0	None	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.44	0.44	100	No	10	90	None	No	0.011	NP (NDs)
Selenium (ug/L)	M-4R	10.74	1.656	50	No	8	0	None	No	0.01	Param.
Selenium (ug/L)	MW-301 (bg)	0.49	0.32	50	No	10	80	None	No	0.011	NP (NDs)
Selenium (ug/L)	MW-303	52.9	15.1	50	No	9	0	None	No	0.002	NP (normality)
Selenium (ug/L)	MW-304	1.1	0.32	50	No	8	75	None	No	0.004	NP (normality)
Selenium (ug/L)	MW-305	7.902	4.048	50	No	8	0	None	No	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.32	0.32	50	No	10	90	None	No	0.011	NP (NDs)

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 12/17/2021 12:38 PM View: COL Primary Pond

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

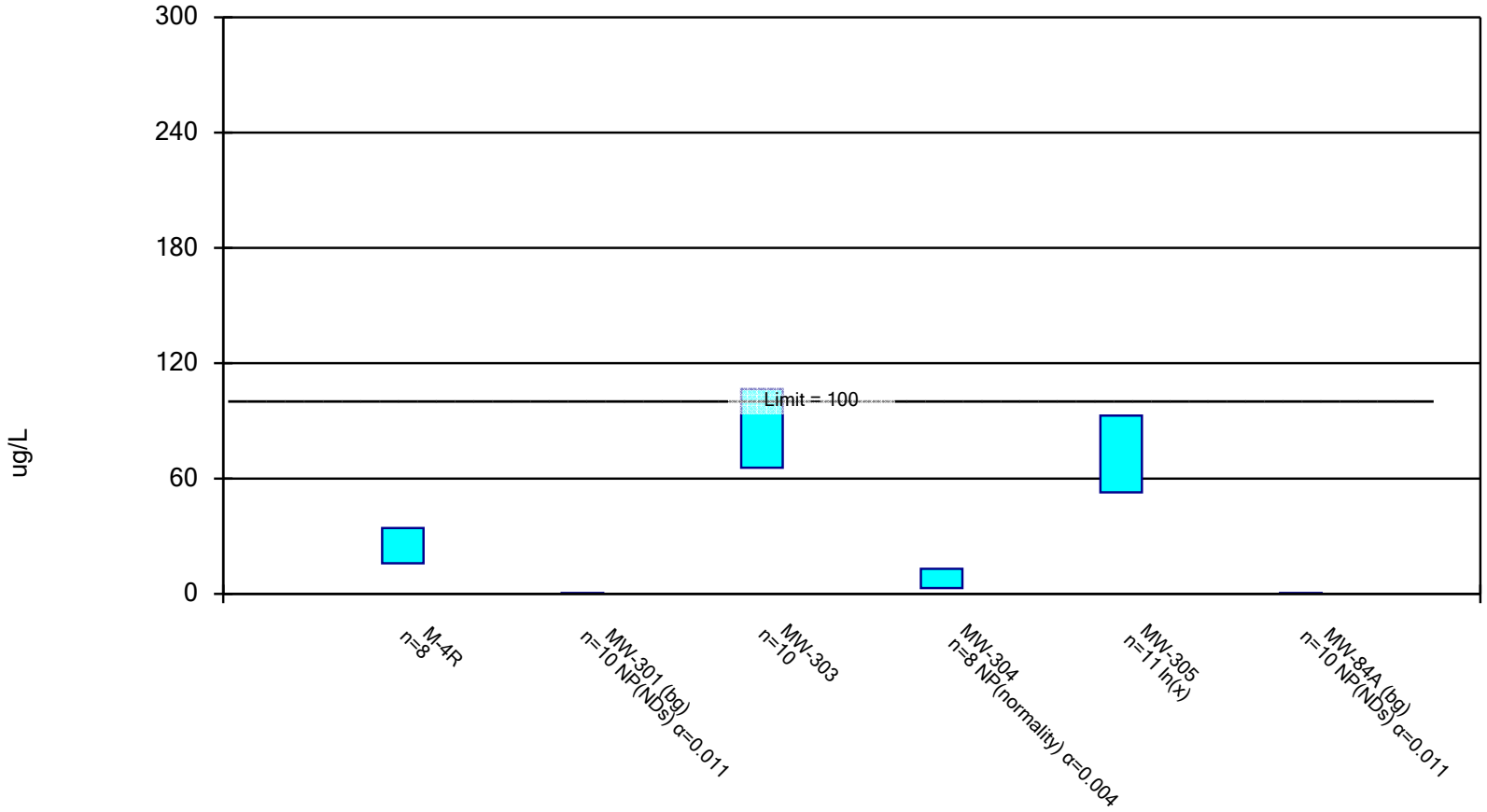
Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 12/17/2021 12:39 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	0.36 (J)				0.48 (J)	
4/24/2018			39.1	0.64 (J)		
4/25/2018		<0.28 (U)				<0.28 (U)
8/7/2018	<0.28 (U)				0.42 (J)	
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)
9/21/2018			6			
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)
4/1/2019	<0.28 (U)		33.2		<0.28 (U)	
4/2/2019		0.4 (J)		0.63 (J)		
4/3/2019						<0.28 (U)
6/19/2019			5.3			
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)	
10/9/2019		0.42 (J)				0.46 (J)
2/3/2020		<0.28 (U)				0.38 (J)
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
2/25/2021			7.7			
4/12/2021			10.4	1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/14/2021		0.35 (J)				0.41 (J)
Mean	0.335	0.369	13.14	1.591	0.59	0.416
Std. Dev.	0.06325	0.1089	11.07	0.9782	0.2586	0.189
Upper Lim.	0.44	0.447	33.2	2.628	0.8641	0.5278
Lower Lim.	0.28	0.2846	5.9	0.5545	0.3159	0.2862

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 12/17/2021 12:38 PM View: COL Primary Pond

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

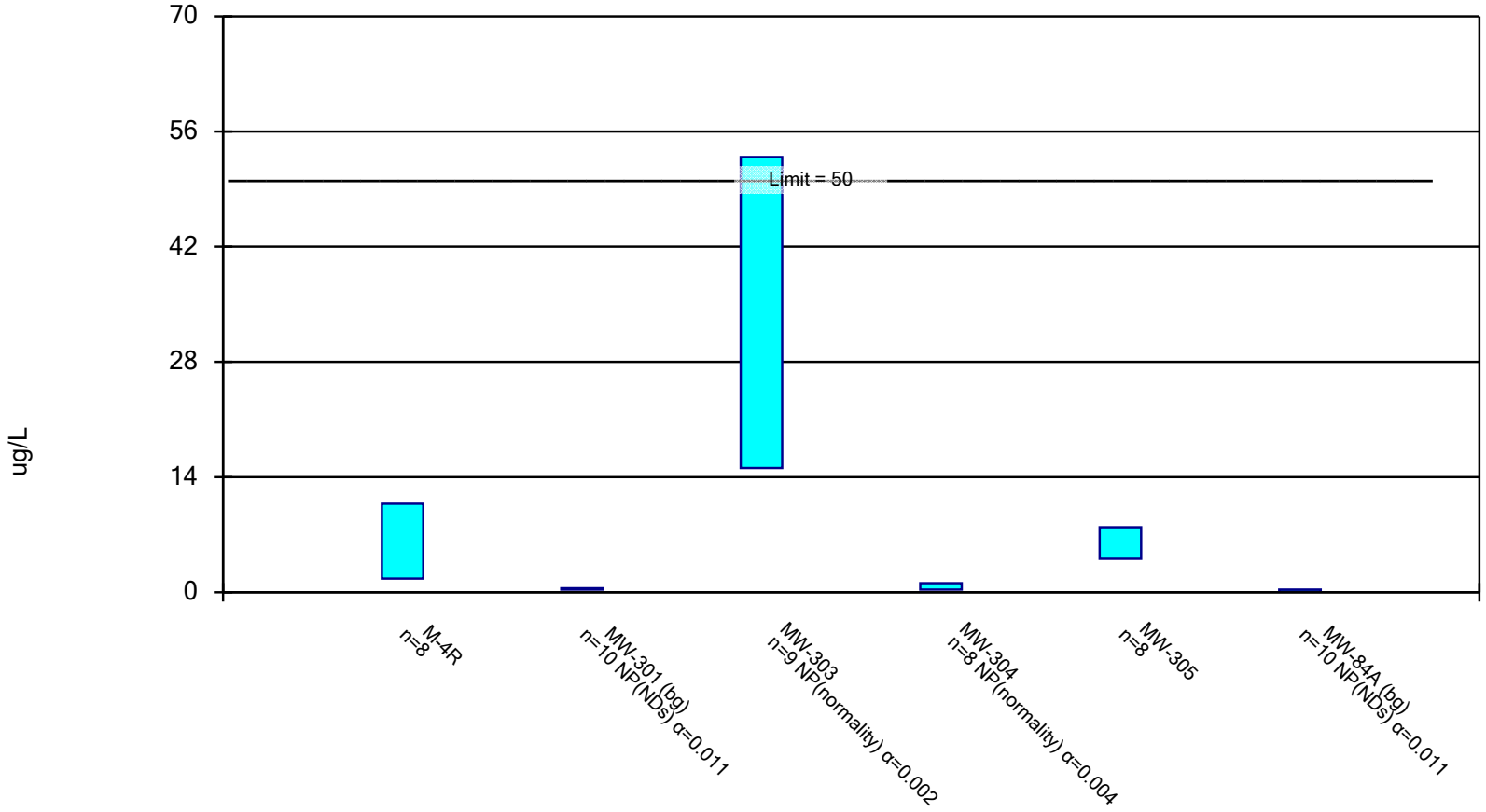
Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 12/17/2021 12:39 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	19.1				54.4	
4/24/2018			138	3.2		
4/25/2018		<0.44 (U)				<0.44 (U)
8/7/2018	14.7				55.7	
8/8/2018		<0.44 (U)	94.8	12.3		<0.44 (U)
9/21/2018			84.7			
10/24/2018	15.4	<0.44 (U)	85.5	10.2	45.6	<0.44 (U)
4/1/2019	29.4		106		47.7	
4/2/2019		<0.44 (U)		3		
4/3/2019						<0.44 (U)
6/19/2019			64.1			
10/7/2019	27.6		87	4.8	56.2	
10/9/2019		<0.44 (U)				<0.44 (U)
2/3/2020		<0.44 (U)				<0.44 (U)
5/27/2020	25.6		67.1	3.9	60.5	
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12	102	
10/8/2020		<0.44 (U)				<0.44 (U)
12/11/2020					99	
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/14/2021		<0.44 (U)				<0.44 (U)
Mean	25.06	0.44	86.14	7.8	73.74	0.458
Std. Dev.	8.664	0	22.94	4.458	24.99	0.05692
Upper Lim.	34.25	0.44	106.6	13	92.73	0.44
Lower Lim.	15.88	0.44	65.67	3	52.84	0.44

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 12/17/2021 12:38 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 12/17/2021 12:39 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	8.6				6.9	
4/24/2018			52.9	<0.32 (U)		
4/25/2018		<0.32 (U)				<0.32 (U)
8/7/2018	5.5				4.8	
8/8/2018		0.71 (J)	25.1	<0.32 (U)		<0.32 (U)
9/21/2018			15.8			
10/24/2018	4.1	<0.32 (U)	15.1	<0.32 (U)	5.4	<0.32 (U)
4/1/2019	12.6		36.5		3.2	
4/2/2019		0.49 (J)		<0.32 (U)		
4/3/2019						<0.32 (U)
10/7/2019	1.8		16.4	<0.32 (U)	7.7	
10/9/2019		<0.32 (U)				<0.32 (U)
2/3/2020		<0.32 (U)				<0.32 (U)
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/14/2021		<0.32 (U)				<0.32 (U)
Mean	6.2	0.376	24.46	0.4187	5.975	0.336
Std. Dev.	4.287	0.1289	12.61	0.2753	1.818	0.0506
Upper Lim.	10.74	0.49	52.9	1.1	7.902	0.32
Lower Lim.	1.656	0.32	15.1	0.32	4.048	0.32

Appendix E2

Prediction Limits for Appendix IV Parameters

January 25, 2020 (Revised January 17, 2022)
File No. 25219067.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results
COL Primary Pond, October 2019 Sampling Event UPL Update

PREPARED BY: Sherren Clark

CHECKED BY: Nicole Kron

Note: Revisions on January 17, 2022, were limited to the text of the memorandum describing the process. The statistical analysis and attached Sanitas output were not changed.

STATISTICAL METHOD

The statistical analysis uses a prediction interval approach for comparison to background and a confidence interval approach for comparison to Groundwater Protection Standard (GPS) values, as recommended in the March 2009 United States Environmental Protection Agency (USEPA) Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities.

For the prediction interval evaluation, interwell testing was selected based on the considerations outlined in Chapter 6 of the Unified Guidance. The statistical program used to calculate the interwell prediction interval is Sanitas™.

Under the interwell approach for comparison to background, monitoring results are compared to upper prediction limits (UPLs) calculated based on background monitoring results from the two background wells: MW-84A and MW-301. Compliance wells for the Primary Pond include MW-303, MW-304, MW-305, and MW-4R.

Nine rounds of background monitoring were performed prior to the initiation of compliance monitoring, from December 2015 through August 2017. Since then, 6 additional rounds of monitoring for Appendix III parameters and 5 additional rounds of monitoring for Appendix IV parameters have been performed at the background wells. As part of the evaluation of the October 2019 detection monitoring results, the background data set for the UPL calculations is being updated to include data from the background wells collected through October 2019. The update for the Appendix III parameters was addressed in the statistical evaluation for the Modules 1-3 of the Dry Ash Disposal Facility, and the same UPLs will be used for the Primary Pond. This memo addresses updated UPLs for the Appendix IV parameters.

The statistical approach uses an interwell UPL with 1-of-2 retesting, calculated using Sanitas software. For a UPL calculated with 1-of-2 retesting, only 1 of 2 samples collected for the event (original and retest) must meet the UPL to demonstrate compliance.

The October 2019 monitoring event includes the following sample dates:

- October 8-9, 2019: All wells, all assessment monitoring parameters except mercury (not detected in April 2019 event)

TIME SERIES PLOTS

Time series plots were prepared for the required detection and assessment monitoring parameters to show the concentration variations over time, and are included in Attachment A. The time series plots include the four compliance wells and two background wells for the primary pond.

BACKGROUND UPDATE

The background data pool for Appendix IV parameters was updated in accordance with the Unified Guidance, which recommends updating background every 2 to 3 years for semiannual sampling. Prior to expanding the data pool, the original background data set (12/15 through 8/17) and the data to be added (10/17 through 10/19) were compared. The Unified Guidance states that recently collected measurements from the background wells can be added to the existing pool if a Student's t-test or Wilcoxon rank-sum test (finds no significant difference between the two groups at the 1% level of significance. In the background well samples, most of the Appendix IV parameters were either not detected or detected at a level below the limit of quantitation. The statistical comparison between the two background data sets was performed for parameters with a least one result above the limit of quantitation, which included barium, chromium, lithium, and radium. Data summaries indicating the number of ND or Trace (less than LOQ) results for each parameter in the background wells are provided in Attachment B.

The Wilcoxon rank-sum analysis for the COL background data sets, included in Attachment C, indicated no signficant difference at the 1% level; therefore, the more recent data can be added to the background pool.

OUTLIER ANALYSIS

For the interwell evaluation, an outlier analysis was performed for the pooled background monitoring results for the two background wells. A statistical outlier is a value that is extremely different from the other values in the data set. The Sanitas outlier tests identify data points that do not appear to fit the distribution of the rest of the data set and determine if they differ significantly from the rest of the data. The outlier analysis performed in Sanitas includes the following steps:

1) Run normality test (Shapiro Wilk)
   a) If not normal, transform to natural log and test for lognormal distribution

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

b) If number of background samples is more than 25, run Rosner's test for suspected outliers.

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

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

The Sanitas output for the outlier analysis is provided in **Attachment C**. The background outlier analysis included the complete pooled data set, including sample dates from December 2015 through October 2019.

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

The following background values were identified as potential outliers and handled as described:

- **Lead (MW-301)**: One high lead result from the December 2015 sampling was flagged by Sanitas as a statistical outlier. This result was removed from the dataset because it occurred in the first sampling event after the well was installed and appeared likely to have been related to well installation effects.

- **Lithium (MW-301)**: One high lithium result from the December 2015 sampling was flagged by Sanitas as a statistical outlier. This result was removed from the dataset because it occurred in the first sampling event after the well was installed and appeared likely to have been related to well installation effects.

- **Radium (MW-301)**: One high radium result from the January 2017 sampling was flagged by Sanitas as a statistical outlier. This result was kept in the dataset because there was no known explanation for the varying results. The result (2.4 pCi/l) appears to fall within a possible range for this parameter, and is less than 3 times the mean and median for this parameter in the background wells.

INTERWELL PREDICTION LIMITS

Interwell upper prediction limits (UPLs) were calculated using data from the background wells for each monitored Appendix IV constituent, with outliers handled as noted above. The prediction limit analysis performed in Sanitas includes the following steps:

1) If more than 50 percent of results are non-detect, apply a non-parametric UPL. For small background sample sizes, the non-parametric UPL is the highest background value. For a parameter with 100 percent non-detects in the background values, the Double Quanitification rule applies, which says that an statistically significant increase (SSI) occurs when two results exceeding the quantification limit are reported for a compliance well.

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

3) If normal or transformed normal, calculate parametric UPL.

4) If not normal or transformed normal, calculate non-parametric UPL.

Consistent with the Unified Guidance, parametric prediction limits were calculated based on a 1-of-2 retesting protocol and a target 10 percent annual site-wide false positive rate. Sanitas establishes the per-test significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For the update through October 2019, the following values were used:

Parameter	Value	Comments
Evaluations per year	2	April and October events
Constituents analyzed	13	Total of 14 constituents analyzed for assessment monitoring. Mercury not counted because all background results were non-detect. Double Quantification rule will apply.
Compliance wells	4	MW-303, MW-304, MW-305, MW-4R

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

For results with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule means that a SSI has not occurred for a compliance well unless two sample results from the well exceed the laboratory's reporting limit or quanitification limit. For evaluation of parameters with less than 100 percent non-detects in the background sampling, the non-detects were replaced with a value of one-half the detection limit. For all parameters, only results at or above the laboratory's reporting limit or quanitification limit are compared to the UPL for SSI determination.

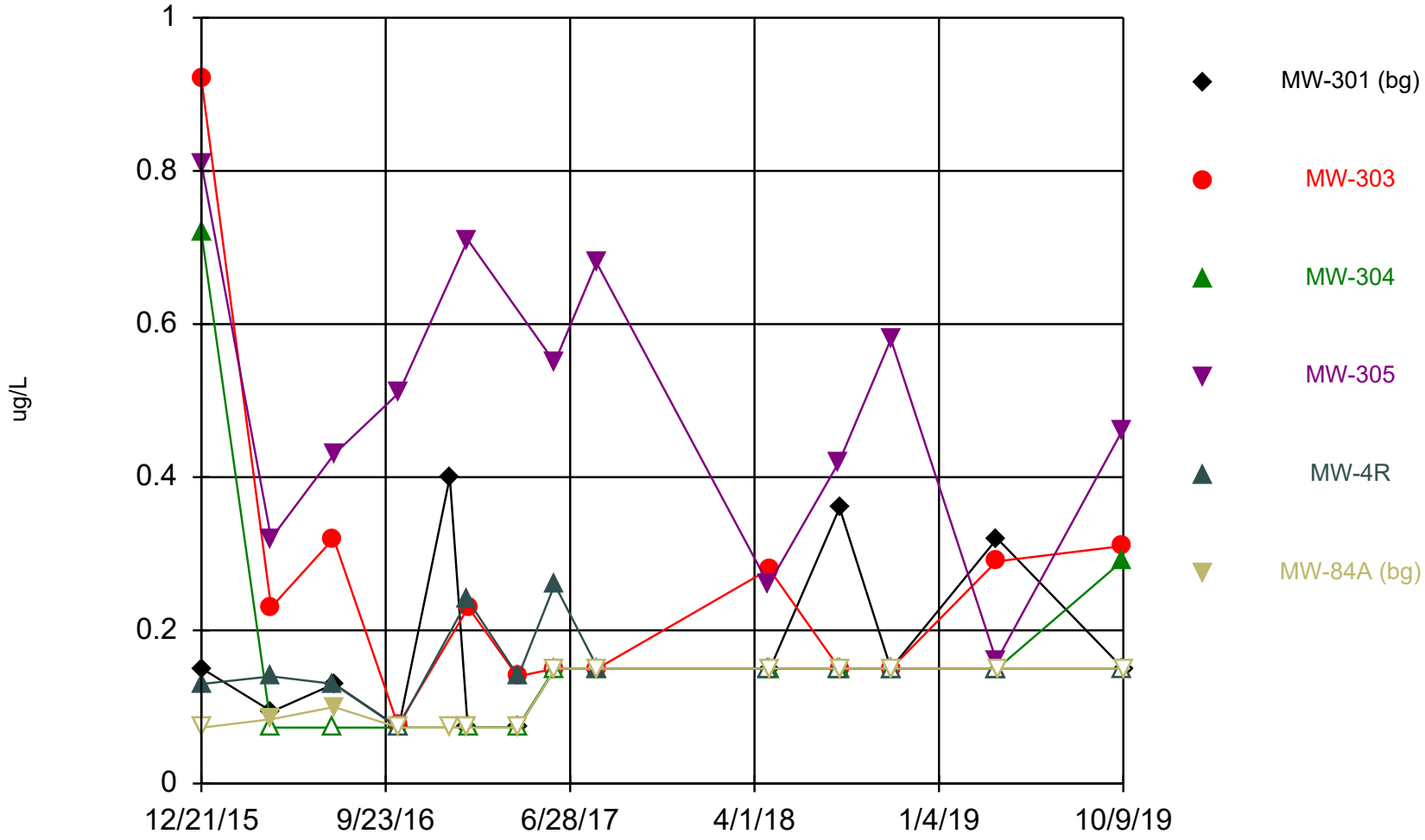
Updated interwell prediction limits for the Appendix IV parameters are included in **Attachment D**.

Attachment A

Times Series Plots

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Antimony Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

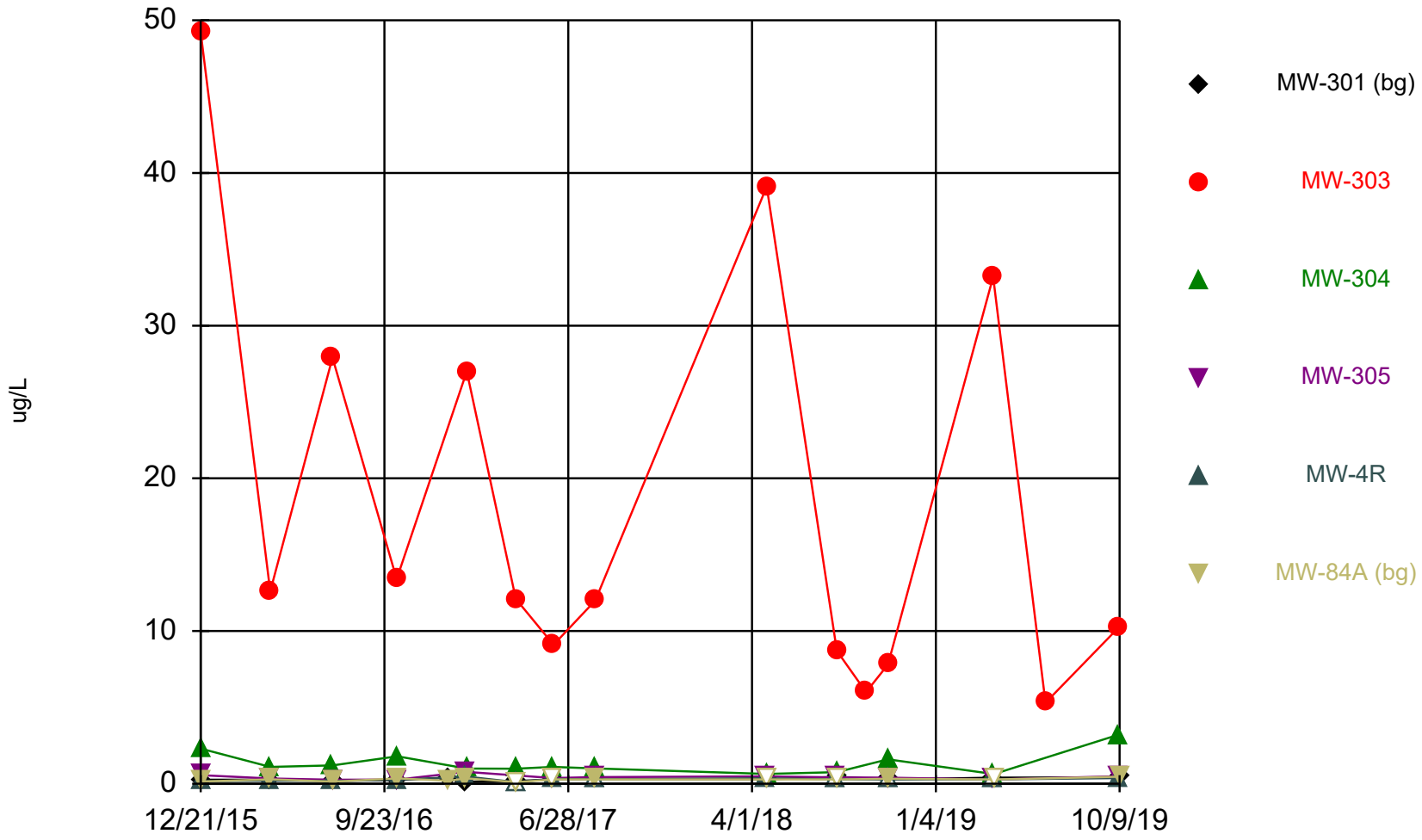
Constituent: Antimony (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		0.92 (J)	0.72 (J)	0.81 (J)		
12/22/2015	0.15 (J)				0.13 (J)	<0.073
4/4/2016		0.23 (J)	<0.073	0.32 (J)	0.14 (J)	
4/5/2016	0.094 (J)					0.084 (J)
7/7/2016		0.32 (J)	<0.073		0.13 (J)	
7/8/2016	0.13 (J)			0.43 (J)		0.1 (J)
10/12/2016		0.076 (J)			<0.073	
10/13/2016	<0.073		<0.073	0.51 (J)		<0.073
12/29/2016	0.4 (J)					<0.073
1/25/2017	<0.073			0.71 (J)	0.24 (J)	<0.073
1/26/2017		0.23 (J)	<0.073			
4/10/2017		0.14 (J)	<0.073			
4/11/2017	<0.073				0.14 (J)	<0.073
6/5/2017			<0.15	0.55 (J)	0.26 (J)	
6/6/2017	<0.15	<0.15				<0.15
8/7/2017				0.68 (J)		
8/8/2017	<0.15	<0.15	<0.15			<0.15
8/9/2017					0.15 (J)	
4/23/2018				0.26 (J)	<0.15	
4/24/2018		0.28 (J)	<0.15			
4/25/2018	<0.15					<0.15
8/7/2018				0.42 (J)	<0.15	
8/8/2018	0.36 (J)	0.15 (J)	<0.15			<0.15
10/24/2018	<0.15	<0.15	<0.15	0.58 (J)	<0.15	<0.15
4/1/2019		0.29 (J)		0.16 (J)	<0.15	
4/2/2019	0.32 (J)		<0.15			
4/3/2019						<0.15
10/7/2019		0.31 (J)	0.29 (J)	0.46 (J)	<0.15	
10/9/2019	<0.15					<0.15

Hollow symbols indicate censored values.

Time Series



Constituent: Arsenic Analysis Run 1/16/2020 9:32 AM View: PP

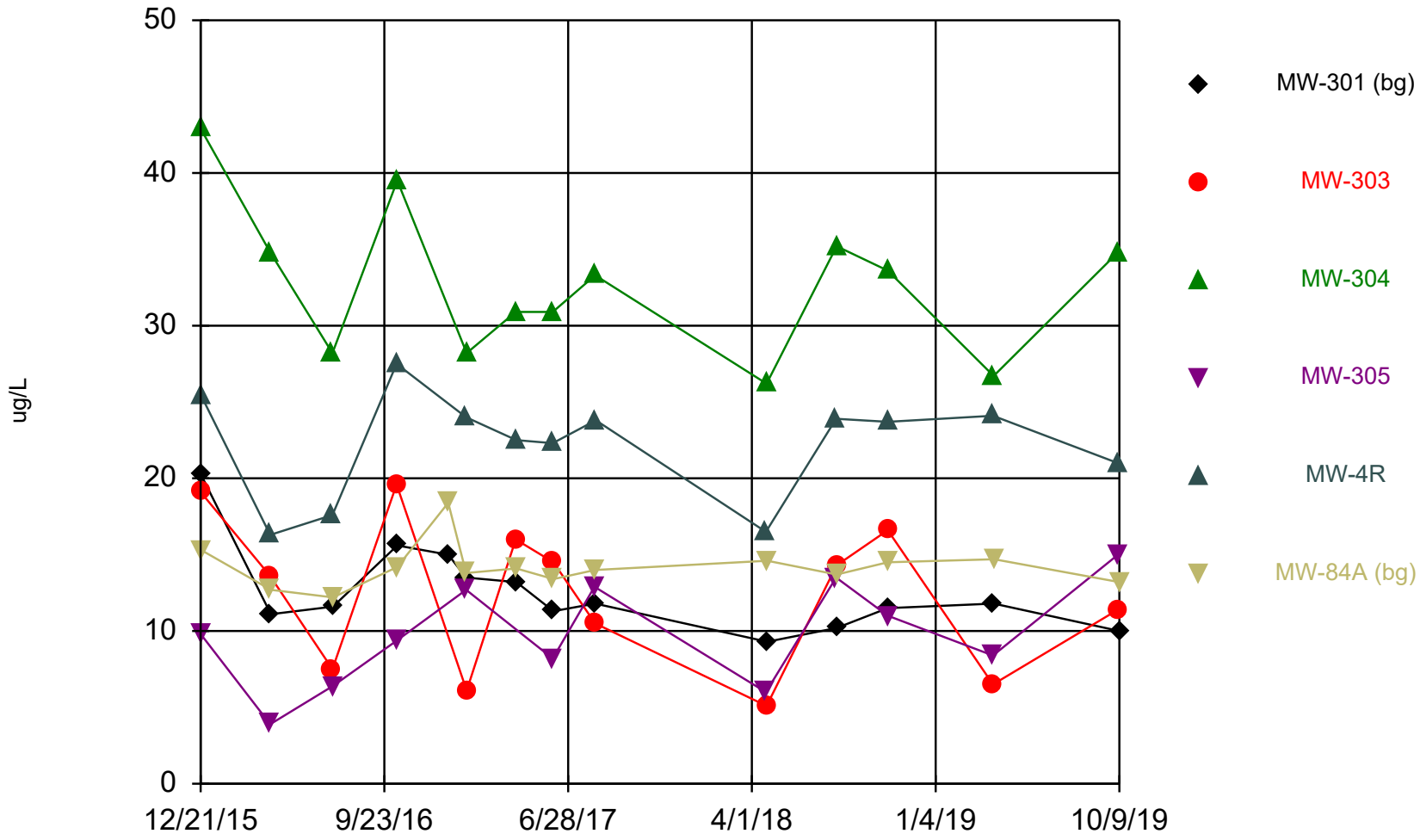
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

Constituent: Arsenic (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		49.2	2.3	0.56 (J)		
12/22/2015	0.26 (J)				0.17 (J)	0.15 (J)
4/4/2016		12.6	1.1	0.34 (J)	0.2 (J)	
4/5/2016	0.26 (J)					0.29 (J)
7/7/2016		27.9	1.2		0.18 (J)	
7/8/2016	0.19 (J)			0.26 (J)		0.14 (J)
10/12/2016		13.4			0.25 (J)	
10/13/2016	0.24 (J)		1.8	0.27 (J)		0.35 (J)
12/29/2016	0.4 (J)					0.19 (J)
1/25/2017	0.13 (J)			0.78 (J)	0.47 (J)	0.35 (J)
1/26/2017		27	0.99 (J)			
4/10/2017		12.1	0.98 (J)			
4/11/2017	0.18 (J)				<0.099	<0.099
6/5/2017			1.1	0.37 (J)	0.33 (J)	
6/6/2017	<0.28	9.1				<0.28
8/7/2017				0.43 (J)		
8/8/2017	<0.28	12	1			0.28 (J)
8/9/2017					<0.28	
4/23/2018				0.48 (J)	0.36 (J)	
4/24/2018		39.1	0.64 (J)			
4/25/2018	<0.28					<0.28
8/7/2018				0.42 (J)	<0.28	
8/8/2018	0.45 (J)	8.7	0.76 (J)			<0.28
9/21/2018		6				
10/24/2018	<0.28	7.8	1.6	0.4 (J)	<0.28	0.33 (J)
4/1/2019		33.2		<0.28	<0.28	
4/2/2019	0.4 (J)		0.63 (J)			
4/3/2019						<0.28
6/19/2019		5.3 (D)				
10/7/2019		10.2	3.2	0.49 (J)	0.37 (J)	
10/9/2019	0.42 (J)					0.46 (J)

Time Series



Constituent: Barium Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

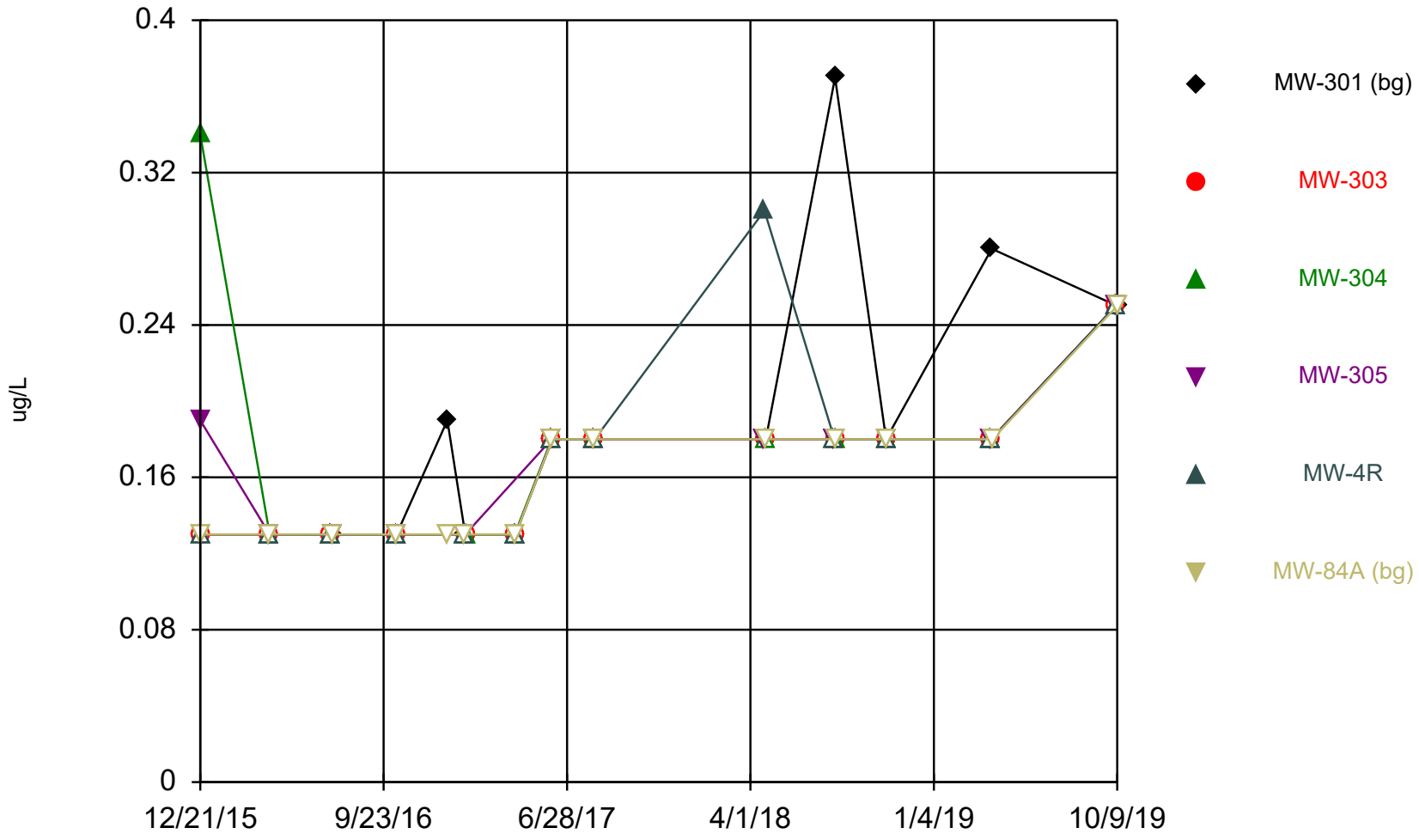
Time Series

Constituent: Barium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		19.1	42.9	9.8		
12/22/2015	20.2				25.4	15.3
4/4/2016		13.6	34.8	3.9	16.3	
4/5/2016	11.1					12.7
7/7/2016		7.5	28.2		17.6	
7/8/2016	11.6			6.4		12.2
10/12/2016		19.6			27.5	
10/13/2016	15.6		39.5	9.4		14.2
12/29/2016	15					18.4
1/25/2017	13.5			12.7	24	13.8
1/26/2017		6.1	28.2			
4/10/2017		16	30.9			
4/11/2017	13.2				22.5	14.1
6/5/2017			30.9	8.2	22.3	
6/6/2017	11.3	14.5				13.4
8/7/2017				12.9		
8/8/2017	11.8	10.5	33.3			14
8/9/2017					23.8	
4/23/2018				6	16.5	
4/24/2018		5.1	26.2			
4/25/2018	9.3					14.6
8/7/2018				13.5	23.9	
8/8/2018	10.2	14.3	35.2			13.7
10/24/2018	11.5	16.6	33.6	11	23.7	14.5
4/1/2019		6.5		8.4	24.1	
4/2/2019	11.8		26.7			
4/3/2019						14.7
10/7/2019		11.4	34.8	15	21	
10/9/2019	10					13.2

Hollow symbols indicate censored values.

Time Series



Constituent: Beryllium Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

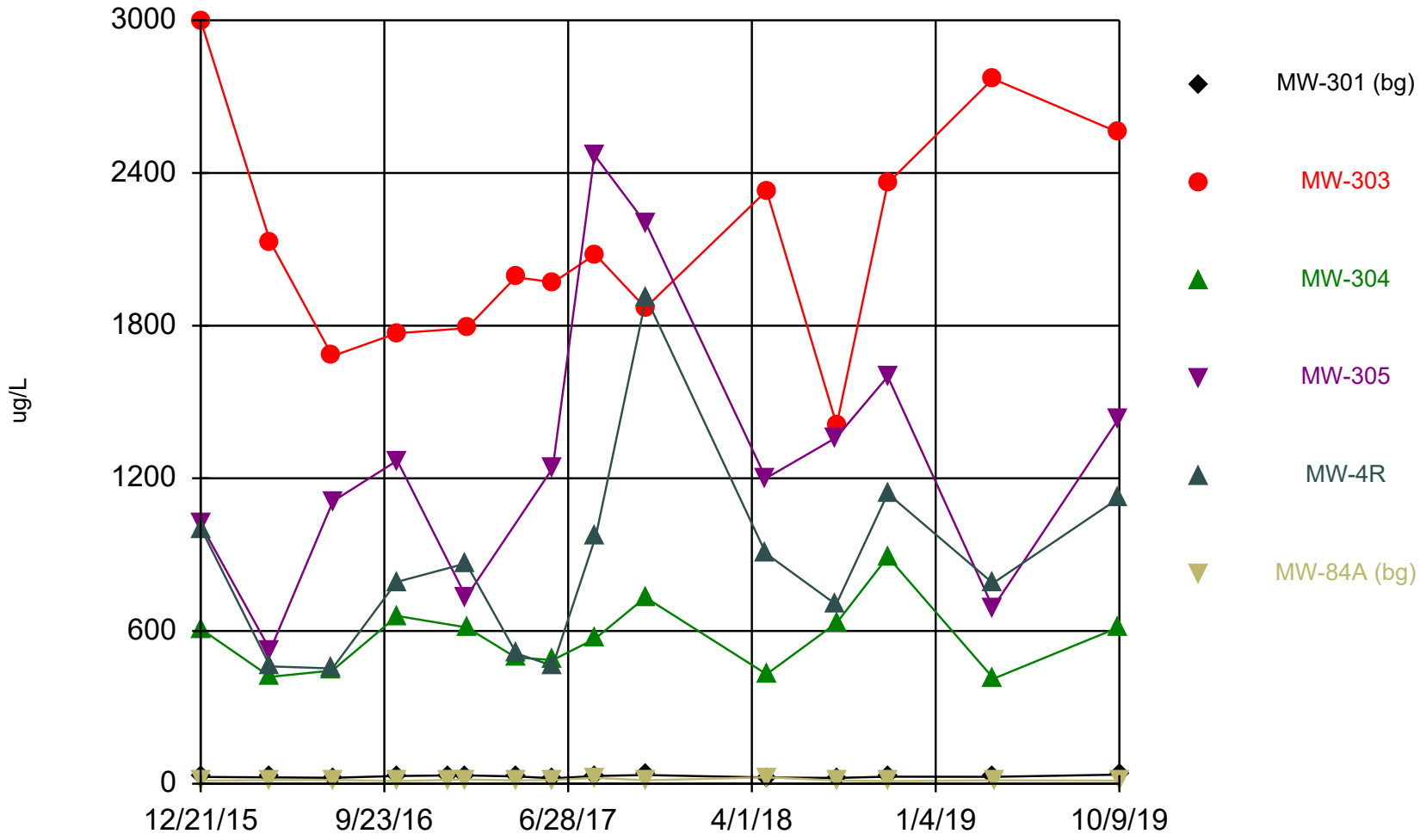
Time Series

Constituent: Beryllium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		<0.13	0.34 (J)	0.19 (J)		
12/22/2015	<0.13				<0.13	<0.13
4/4/2016		<0.13	<0.13	<0.13	<0.13	
4/5/2016	<0.13					<0.13
7/7/2016		<0.13	<0.13		<0.13	
7/8/2016	<0.13			<0.13		<0.13
10/12/2016		<0.13			<0.13	
10/13/2016	<0.13		<0.13	<0.13		<0.13
12/29/2016	0.19 (J)					<0.13
1/25/2017	<0.13			<0.13	<0.13	<0.13
1/26/2017		<0.13	<0.13			
4/10/2017		<0.13	<0.13			
4/11/2017	<0.13				<0.13	<0.13
6/5/2017			<0.18	<0.18	<0.18	
6/6/2017	<0.18	<0.18				<0.18
8/7/2017				<0.18		
8/8/2017	<0.18	<0.18	<0.18			<0.18
8/9/2017					<0.18	
4/23/2018				<0.18	0.3 (J)	
4/24/2018		<0.18	<0.18			
4/25/2018	<0.18					<0.18
8/7/2018				<0.18	<0.18	
8/8/2018	0.37 (J)	<0.18	<0.18			<0.18
10/24/2018	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
4/1/2019		<0.18		<0.18	<0.18	
4/2/2019	0.28 (J)		<0.18			
4/3/2019						<0.18
10/7/2019		<0.25	<0.25	<0.25	<0.25	
10/9/2019	<0.25					<0.25

Time Series



Constituent: Boron Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

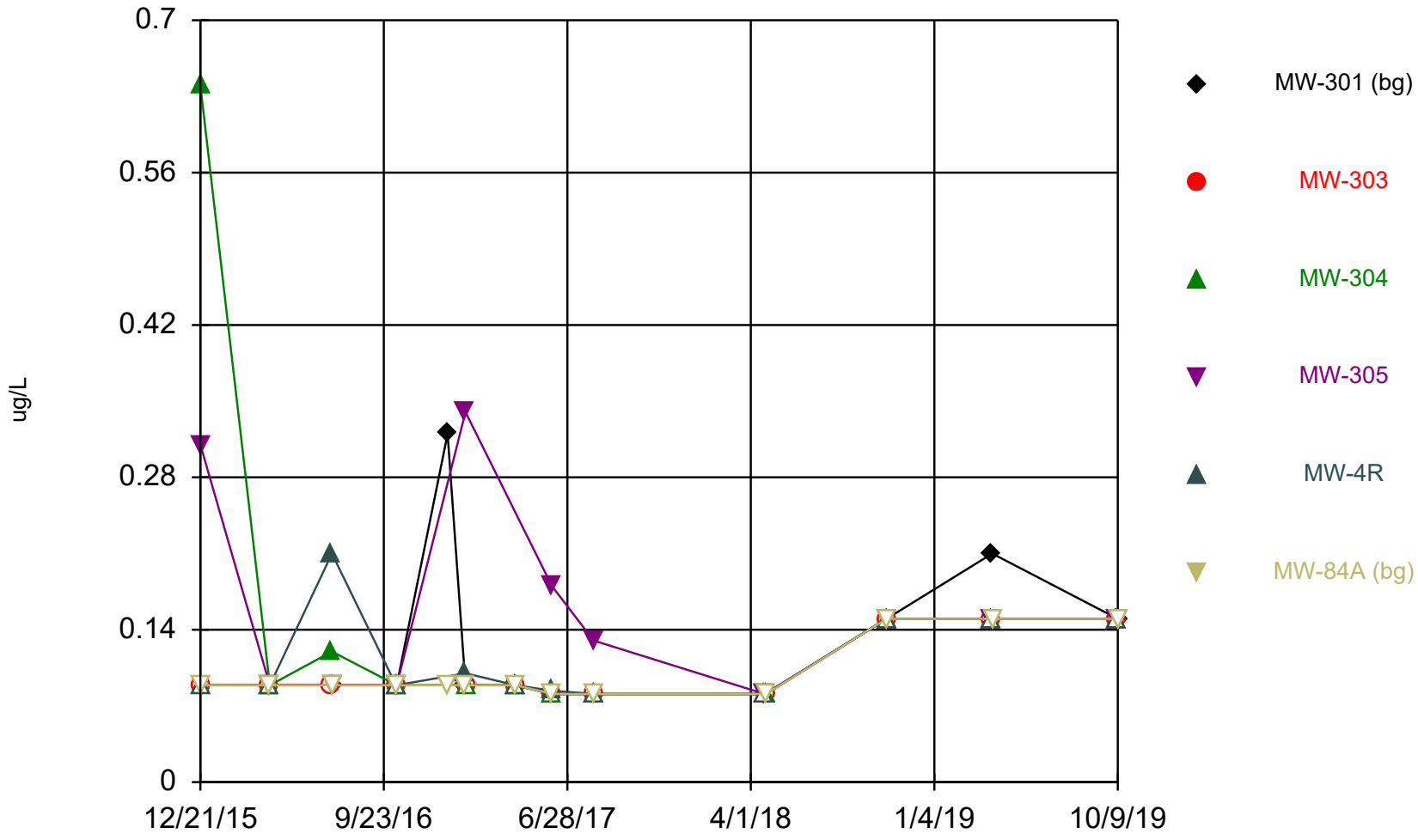
Time Series

Constituent: Boron (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		3000	609	1020		
12/22/2015	26.5				1000	11.9
4/4/2016		2130	420	525	461	
4/5/2016	25.2					14
7/7/2016		1680	445		453	
7/8/2016	23.6			1110		14.7
10/12/2016		1770			793	
10/13/2016	30.6		659	1270		11.1
12/29/2016	32.8					14.7
1/25/2017	32.6			733	866	16.1
1/26/2017		1790	614			
4/10/2017		1990	496			
4/11/2017	28.8				512	12.9
6/5/2017			486	1240	464	
6/6/2017	21.3	1970				14.8
8/7/2017				2470		
8/8/2017	30.6	2080	570			22.9
8/9/2017					973	
10/23/2017	34.3	1870	732			
10/24/2017				2200	1910	13.8
4/23/2018				1200	905	
4/24/2018		2330	430			
4/25/2018	24.3					25
8/7/2018				1360	704	
8/8/2018	22.8	1410	632			12.8
10/24/2018	27.8	2360	892	1600	1140	10.1 (J)
4/1/2019		2770		692	788	
4/2/2019	26.9		413			
4/3/2019						13.6
10/7/2019		2560	613	1430	1120	
10/9/2019	35.9					12

Hollow symbols indicate censored values.

Time Series



Constituent: Cadmium Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

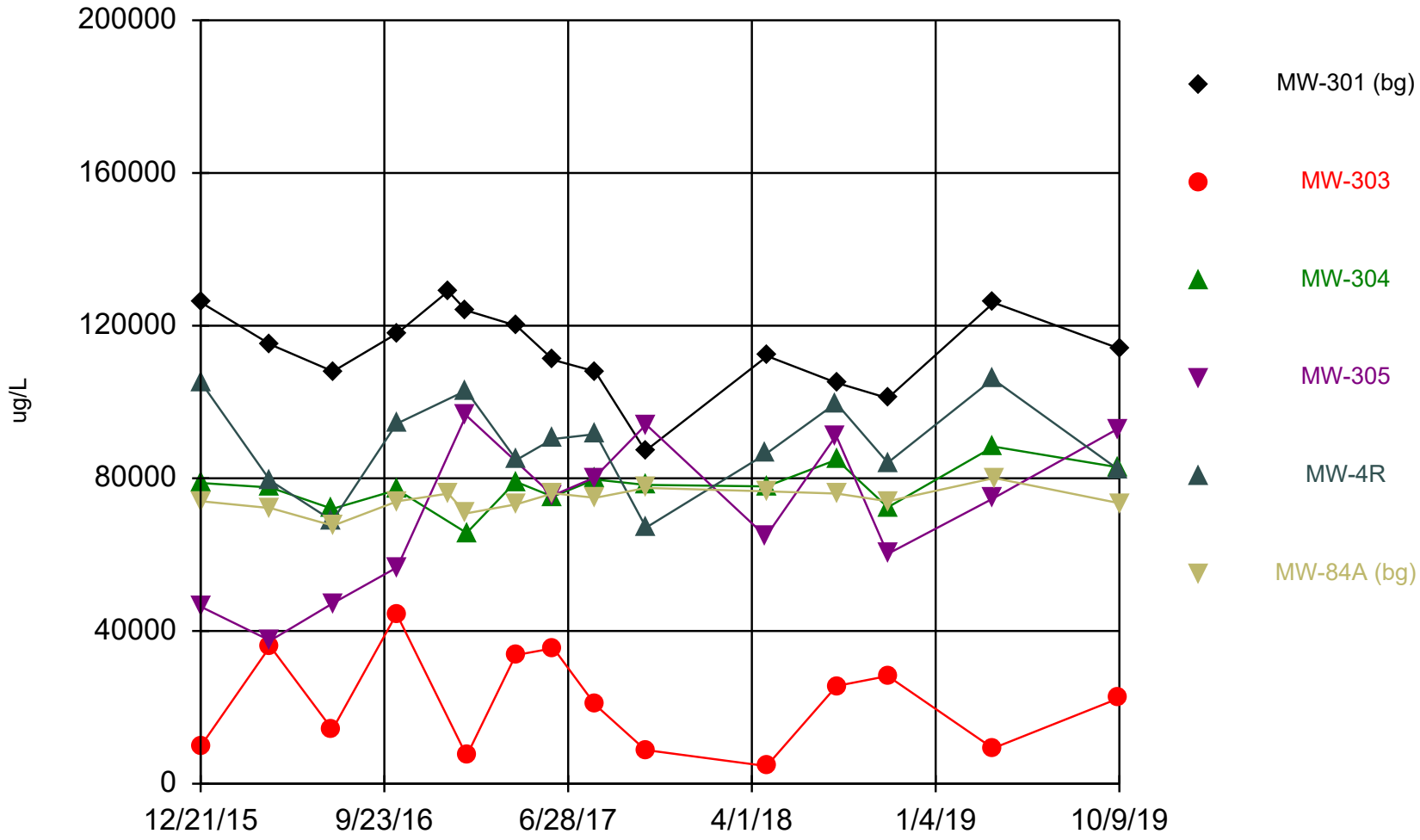
Time Series

Constituent: Cadmium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		<0.089	0.64 (J)	0.31 (J)		
12/22/2015	<0.089				<0.089	<0.089
4/4/2016		<0.089	<0.089	<0.089	<0.089	
4/5/2016	<0.089					<0.089
7/7/2016		<0.089	0.12 (J)		0.21 (J)	
7/8/2016	<0.089			<0.089		<0.089
10/12/2016		<0.089			<0.089	
10/13/2016	<0.089		<0.089	<0.089		<0.089
12/29/2016	0.32 (J)					<0.089
1/25/2017	<0.089			0.34 (J)	0.1 (J)	<0.089
1/26/2017		<0.089	<0.089			
4/10/2017		<0.089	<0.089			
4/11/2017	<0.089				<0.089	<0.089
6/5/2017			<0.081	0.18 (J)	0.084 (J)	
6/6/2017	<0.081	<0.081				<0.081
8/7/2017				0.13 (J)		
8/8/2017	<0.081	<0.081	<0.081			<0.081
8/9/2017					<0.081	
4/23/2018				<0.081	<0.081	
4/24/2018		<0.081	<0.081			
4/25/2018	<0.081					<0.081
10/24/2018	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
4/1/2019		<0.15		<0.15	<0.15	
4/2/2019	0.21 (J)		<0.15			
4/3/2019						<0.15
10/7/2019		<0.15	<0.15	<0.15	<0.15	
10/9/2019	<0.15					<0.15

Time Series



Constituent: Calcium Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

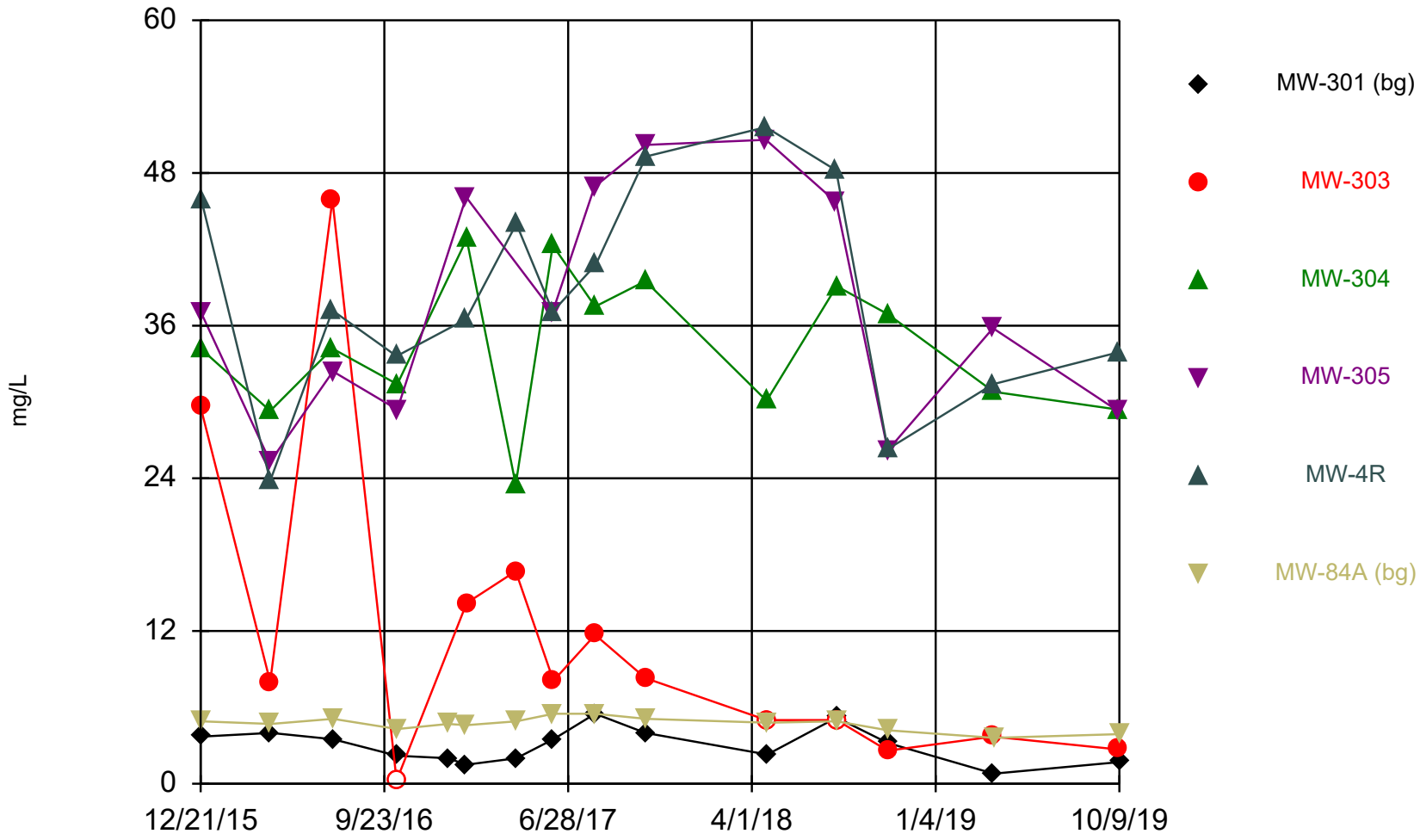
Constituent: Calcium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		9830	78800	46400		
12/22/2015	126000				105000	74000
4/4/2016		36000	77600	37500	79400	
4/5/2016	115000					72200
7/7/2016		14200	72000		68900	
7/8/2016	108000			47300		67600
10/12/2016		44500			94300	
10/13/2016	118000		77000	56700		74000
12/29/2016	129000					76000
1/25/2017	124000			96500	103000	70800
1/26/2017		7330	65700			
4/10/2017		33700	79100			
4/11/2017	120000				84800	73200
6/5/2017			75200	75500	90300	
6/6/2017	111000	35500				76100
8/7/2017				80200		
8/8/2017	108000	20700	79700			74900
8/9/2017					91600	
10/23/2017	87200	8850	78300			
10/24/2017				94100	67100	77500
4/23/2018				64800	86400	
4/24/2018		4610	77900			
4/25/2018	112000					76600
8/7/2018				91200	99700	
8/8/2018	105000	25600	84900			76000
10/24/2018	101000	28200	72400	60200	84100	74000
4/1/2019		9290		74700	106000	
4/2/2019	126000		88300			
4/3/2019						80100
10/7/2019		22300	82900	93000	82400	
10/9/2019	114000					73500

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Chloride Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

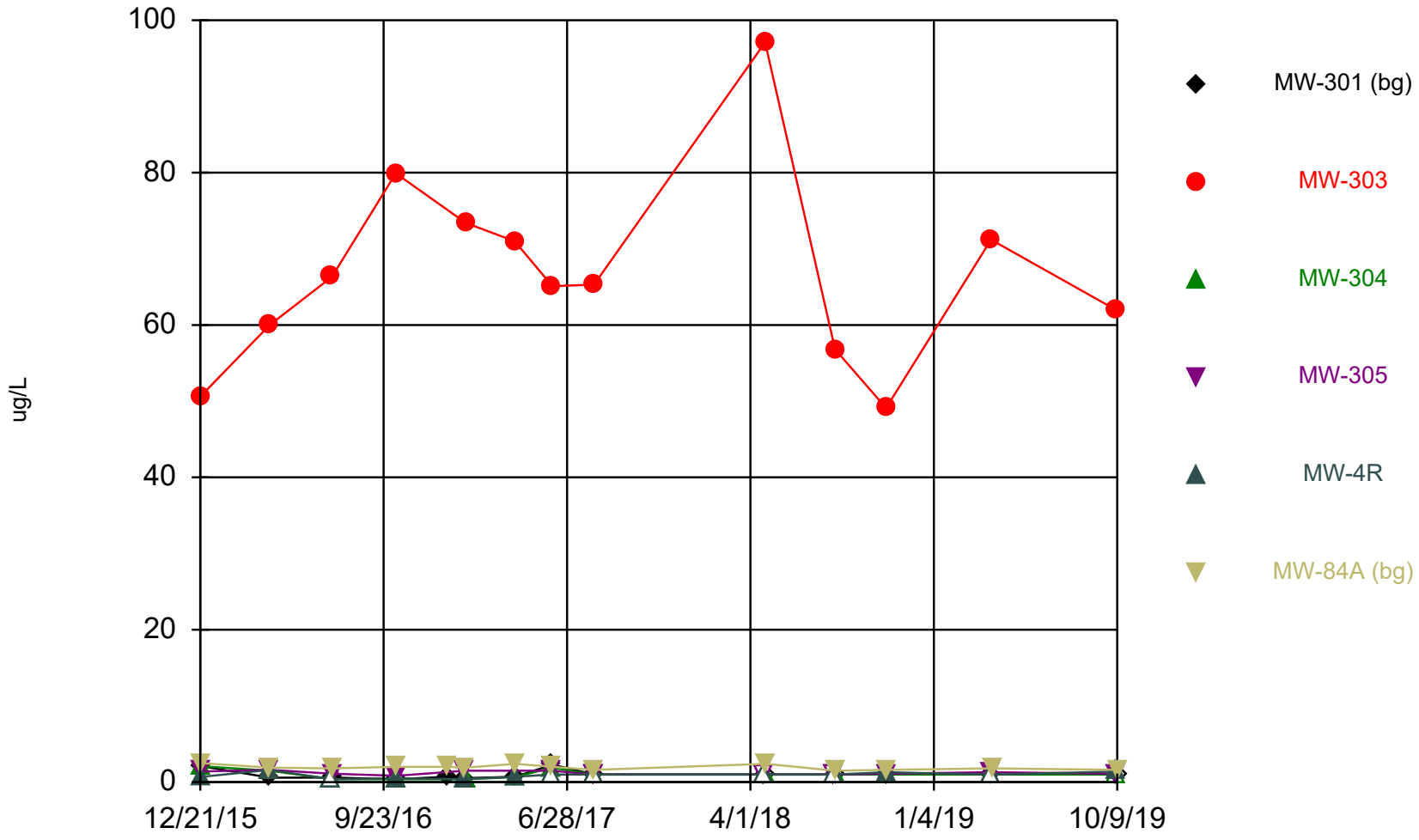
Constituent: Chloride (mg/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		29.6 (J)	34.2	37.1		
12/22/2015	3.7 (J)				45.9	4.9
4/4/2016		8	29.3	25.3	23.8	
4/5/2016	4					4.7
7/7/2016		45.9 (J)	34.2		37.2	
7/8/2016	3.5 (J)			32.4		5.1
10/12/2016		<0.5			33.6	
10/13/2016	2.2		31.4	29.4		4.3
12/29/2016	2 (J)					4.7
1/25/2017	1.5 (J)			46.1	36.5	4.6
1/26/2017		14.2 (J)	42.8			
4/10/2017		16.7 (J)	23.5			
4/11/2017	2				44	4.9
6/5/2017			42.3	37.1	37.1	
6/6/2017	3.5	8.1				5.5
8/7/2017				46.9		
8/8/2017	5.5	11.7 (J)	37.5			5.5
8/9/2017					40.8	
10/23/2017	4	8.3 (J)	39.5			
10/24/2017				50.2	49.3	5.1
4/23/2018				50.6	51.6	
4/24/2018		<10	30.1			
4/25/2018	2.3					4.8
8/7/2018				45.7	48.2	
8/8/2018	5.2	<10	39.1			4.9
10/24/2018	3.2	2.6	36.9	26.2	26.3	4.2
4/1/2019		3.7 (J)		35.8	31.4	
4/2/2019	0.79 (J)		30.8			
4/3/2019						3.6
10/7/2019		2.7	29.4	29.3	33.9	
10/9/2019	1.7 (J)					3.9

Hollow symbols indicate censored values.

Time Series



Constituent: Chromium Analysis Run 1/16/2020 9:32 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

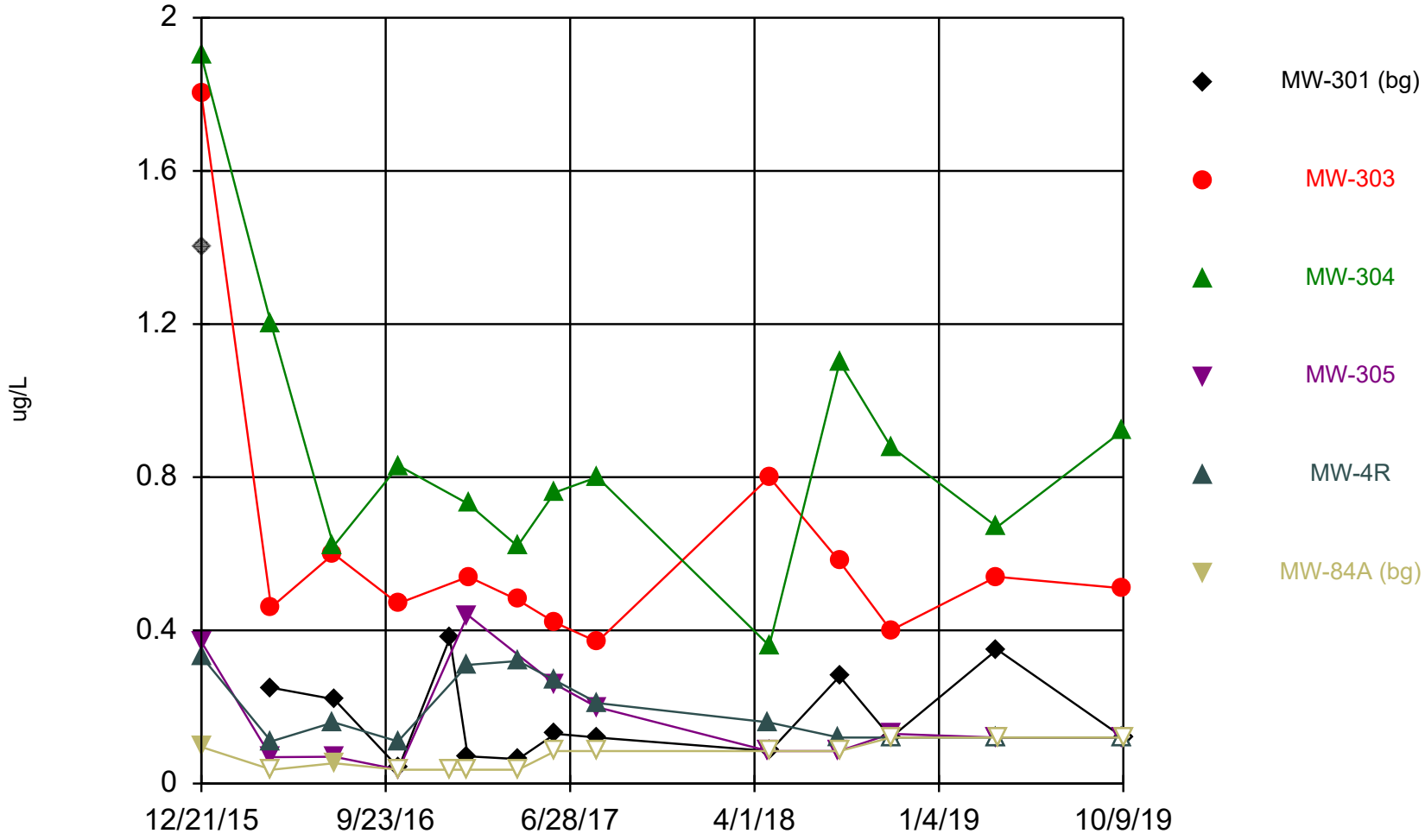
Constituent: Chromium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		50.6	2.1	1.4		
12/22/2015	2.1				0.68 (J)	2.5
4/4/2016		60	1.5	1.6	1.6	
4/5/2016	0.58 (J)					1.9
7/7/2016		66.3	<0.39		<0.39	
7/8/2016	0.59 (J)			1.1		1.8
10/12/2016		79.9			0.49 (J)	
10/13/2016	<0.39		<0.39	0.83 (J)		2
12/29/2016	0.7 (J)					2
1/25/2017	0.53 (J)			1.5	0.4 (J)	1.9
1/26/2017		73.4	<0.39			
4/10/2017		71	0.65 (J)			
4/11/2017	0.7 (J)				0.7 (J)	2.4
6/5/2017			1.9 (J)	1.5 (J)	<1	
6/6/2017	2.3 (J)	65.1				2 (J)
8/7/2017				<1		
8/8/2017	<1	65.3	<1			1.6 (J)
8/9/2017					<1	
4/23/2018				<1	<1	
4/24/2018		97.1	<1			
4/25/2018	<1					2.4 (J)
8/7/2018				<1	<1	
8/8/2018	<1	56.8	<1			1.5 (J)
10/24/2018	<1	49.1	<1	1.1 (J)	1.3 (J)	1.6 (J)
4/1/2019		71.2		1.3 (J)	<1	
4/2/2019	<1		<1			
4/3/2019						1.8 (J)
10/7/2019		62	<1	1.1 (J)	1.4 (J)	
10/9/2019	<1					1.6 (J)

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Cobalt Analysis Run 1/16/2020 9:32 AM View: PP

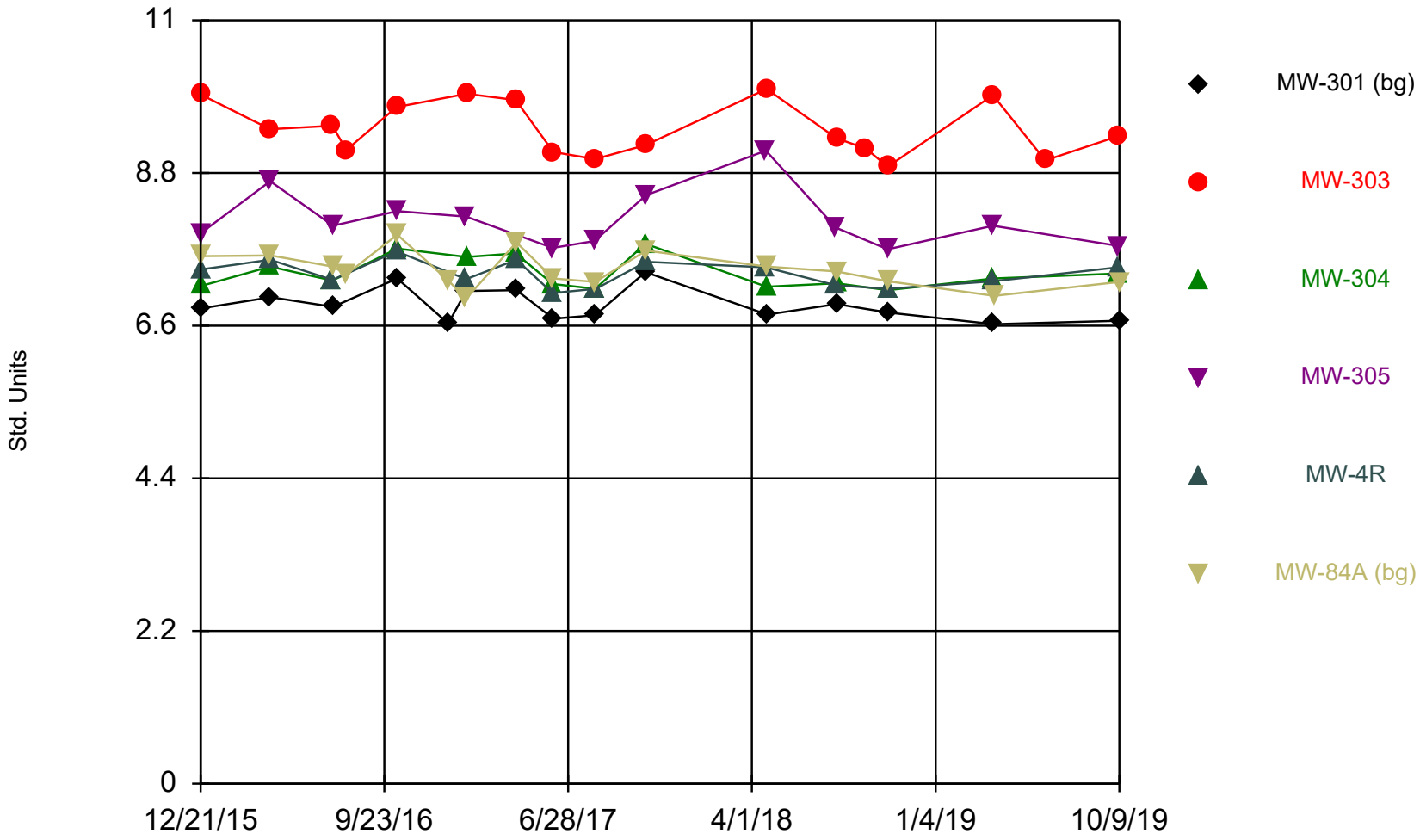
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

Constituent: Cobalt (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		1.8	1.9	0.37 (J)		
12/22/2015	1.4 (R)				0.33 (J)	0.095 (J)
4/4/2016		0.46 (J)	1.2	0.069 (J)	0.11 (J)	
4/5/2016	0.25 (J)					<0.036
7/7/2016		0.6 (J)	0.62 (J)		0.16 (J)	
7/8/2016	0.22 (J)			0.07 (J)		0.053 (J)
10/12/2016		0.47 (J)			0.11 (J)	
10/13/2016	0.041 (J)		0.83 (J)	<0.036		<0.036
12/29/2016	0.38 (J)					<0.036
1/25/2017	0.071 (J)			0.44 (J)	0.31 (J)	<0.036
1/26/2017		0.54 (J)	0.73 (J)			
4/10/2017		0.48 (J)	0.62 (J)			
4/11/2017	0.064 (J)				0.32 (J)	<0.036
6/5/2017			0.76 (J)	0.26 (J)	0.27 (J)	
6/6/2017	0.13 (J)	0.42 (J)				<0.085
8/7/2017				0.2 (J)		
8/8/2017	0.12 (J)	0.37 (J)	0.8 (J)			<0.085
8/9/2017					0.21 (J)	
4/23/2018				<0.085	0.16 (J)	
4/24/2018		0.8 (J)	0.36 (J)			
4/25/2018	<0.085					<0.085
8/7/2018				<0.085	0.12 (J)	
8/8/2018	0.28 (J)	0.58 (J)	1.1			<0.085
10/24/2018	<0.12	0.4 (J)	0.88 (J)	0.13 (J)	<0.12	<0.12
4/1/2019		0.54 (J)		<0.12	<0.12	
4/2/2019	0.35 (J)		0.67 (J)			
4/3/2019						<0.12
10/7/2019		0.51 (J)	0.92 (J)	<0.12	<0.12	
10/9/2019	<0.12					<0.12

Time Series



Constituent: Field pH Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

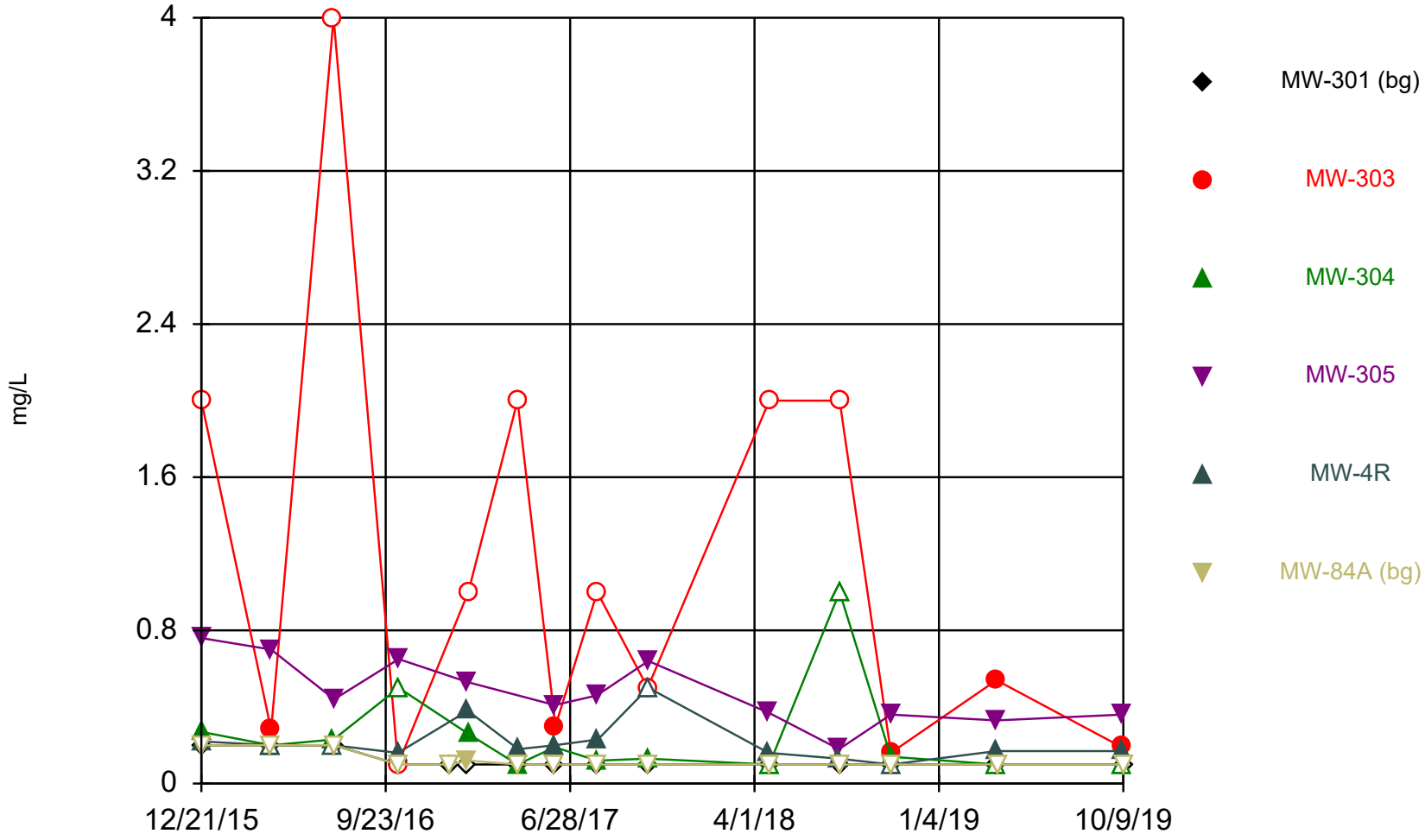
Constituent: Field pH (Std. Units) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		9.93	7.17	7.93		
12/22/2015	6.85				7.41	7.6
4/4/2016		9.43	7.45	8.68	7.55	
4/5/2016	7.01					7.61
7/7/2016		9.48	7.25		7.26	
7/8/2016	6.87			8.04		7.45
7/28/2016		9.13				7.34
10/12/2016		9.75			7.67	
10/13/2016	7.28		7.71	8.25		7.91
12/29/2016	6.63					7.25
1/25/2017	7.1			8.17	7.27	6.99
1/26/2017		9.94	7.59			
4/10/2017		9.85	7.64			
4/11/2017	7.11				7.55	7.8
6/5/2017			7.2	7.72	7.07	
6/6/2017	6.7	9.1				7.28
8/7/2017				7.82		
8/8/2017	6.75	9	7.13			7.23
8/9/2017					7.13	
10/23/2017	7.37	9.2	7.78			
10/24/2017				8.48	7.52	7.68
4/23/2018				9.12	7.44	
4/24/2018		10.01	7.16			
4/25/2018	6.76					7.45
8/7/2018				8.01	7.18	
8/8/2018	6.91	9.3	7.21			7.38
9/21/2018		9.15				
10/24/2018	6.79	8.89	7.11	7.7	7.13	7.24
4/1/2019		9.92		8.04	7.24	
4/2/2019	6.62		7.28			
4/3/2019						7.03
6/19/2019		8.98 (D)				
10/7/2019		9.33	7.35	7.75	7.44	
10/9/2019	6.67					7.23

Hollow symbols indicate censored values.

Time Series



Constituent: Fluoride Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

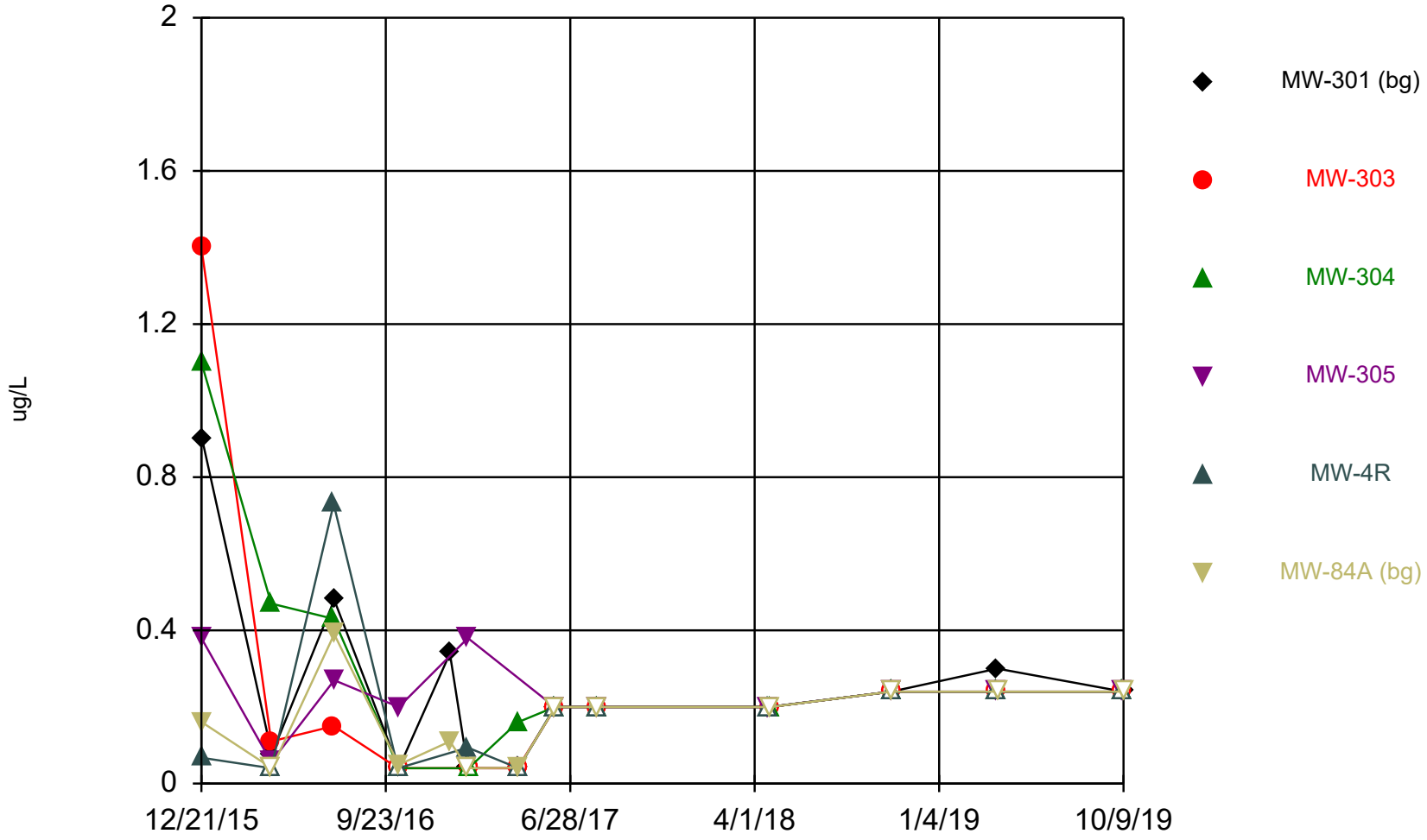
Constituent: Fluoride (mg/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		<2	0.27 (J)	0.76		
12/22/2015	<0.2				0.22 (J)	<0.2
4/4/2016		0.28 (J)	<0.2	0.7	<0.2	
4/5/2016	<0.2					<0.2
7/7/2016		<4	0.23 (J)		<0.2	
7/8/2016	<0.2			0.44		<0.2
10/12/2016		<0.1			0.16 (J)	
10/13/2016	<0.1		<0.5	0.65 (J)		<0.1
12/29/2016	<0.1					<0.1
1/25/2017	<0.1			0.53	0.38	0.12 (J)
1/26/2017		<1	0.26 (J)			
4/10/2017		<2	0.1 (J)			
4/11/2017	<0.1				0.18 (J)	<0.1
6/5/2017			0.19 (J)	0.41	0.2 (J)	
6/6/2017	<0.1	0.3 (J)				<0.1
8/7/2017				0.46		
8/8/2017	<0.1	<1	0.12 (J)			<0.1
8/9/2017					0.23 (J)	
10/23/2017	<0.1	<0.5	0.13 (J)			
10/24/2017				0.64	<0.5	<0.1
4/23/2018				0.37	0.16 (J)	
4/24/2018		<2	<0.1			
4/25/2018	<0.1					<0.1
8/7/2018				0.18 (J)	0.13 (J)	
8/8/2018	<0.1	<2	<1			<0.1
10/24/2018	<0.1	0.16 (J)	0.14 (J)	0.36	<0.1	<0.1
4/1/2019		0.54 (J)		0.33	0.17 (J)	
4/2/2019	<0.1		<0.1			
4/3/2019						<0.1
10/7/2019		0.19 (J)	<0.1	0.36	0.17 (J)	
10/9/2019	<0.1					<0.1

Hollow symbols indicate censored values.

Time Series



Constituent: Lead Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

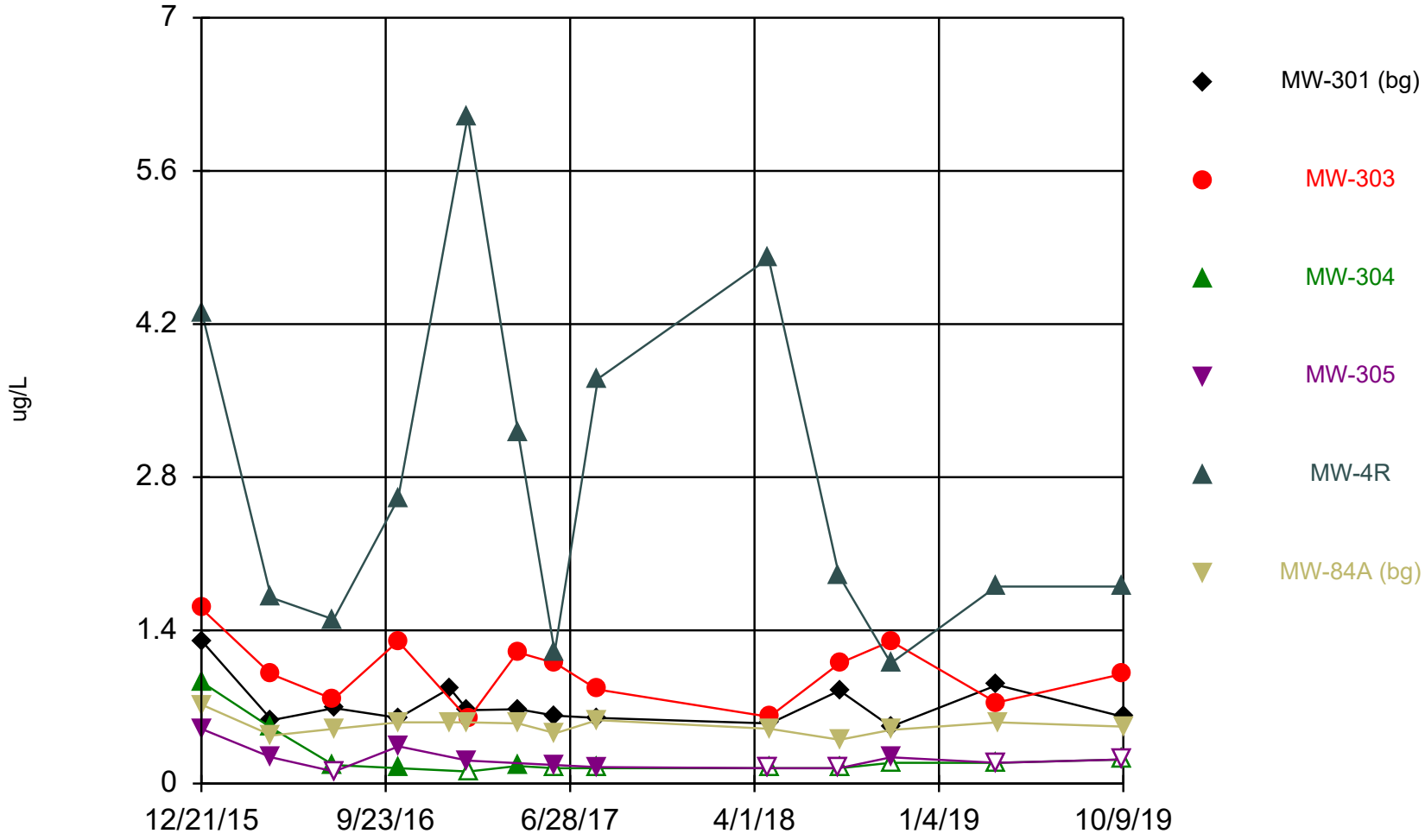
Time Series

Constituent: Lead (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		1.4	1.1	0.38 (J)		
12/22/2015	0.9 (J)				0.067 (J)	0.16 (J)
4/4/2016		0.11 (J)	0.47 (J)	0.056 (J)	<0.04	
4/5/2016	0.077 (J)					<0.04
7/7/2016		0.15 (J)	0.43 (J)		0.73 (J)	
7/8/2016	0.48 (J)			0.27 (J)		0.39 (J)
10/12/2016		<0.04			<0.04	
10/13/2016	<0.04		<0.04	0.2 (J)		0.049 (J)
12/29/2016	0.34 (J)					0.11 (J)
1/25/2017	<0.04			0.38 (J)	0.094 (J)	<0.04
1/26/2017		<0.04	<0.04			
4/10/2017		<0.04	0.16 (J)			
4/11/2017	<0.04				<0.04	0.041 (J)
6/5/2017			<0.2	<0.2	<0.2	
6/6/2017	<0.2	<0.2				<0.2
8/7/2017				<0.2		
8/8/2017	<0.2	<0.2	<0.2			<0.2
8/9/2017					<0.2	
4/23/2018				<0.2	<0.2	
4/24/2018		<0.2	<0.2			
4/25/2018	<0.2					<0.2
10/24/2018	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
4/1/2019		<0.24		<0.24	<0.24	
4/2/2019	0.3 (J)		<0.24			
4/3/2019						<0.24
10/7/2019		<0.24	<0.24	<0.24	<0.24	
10/9/2019	<0.24					<0.24

Hollow symbols indicate censored values.

Time Series



Constituent: Lithium Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

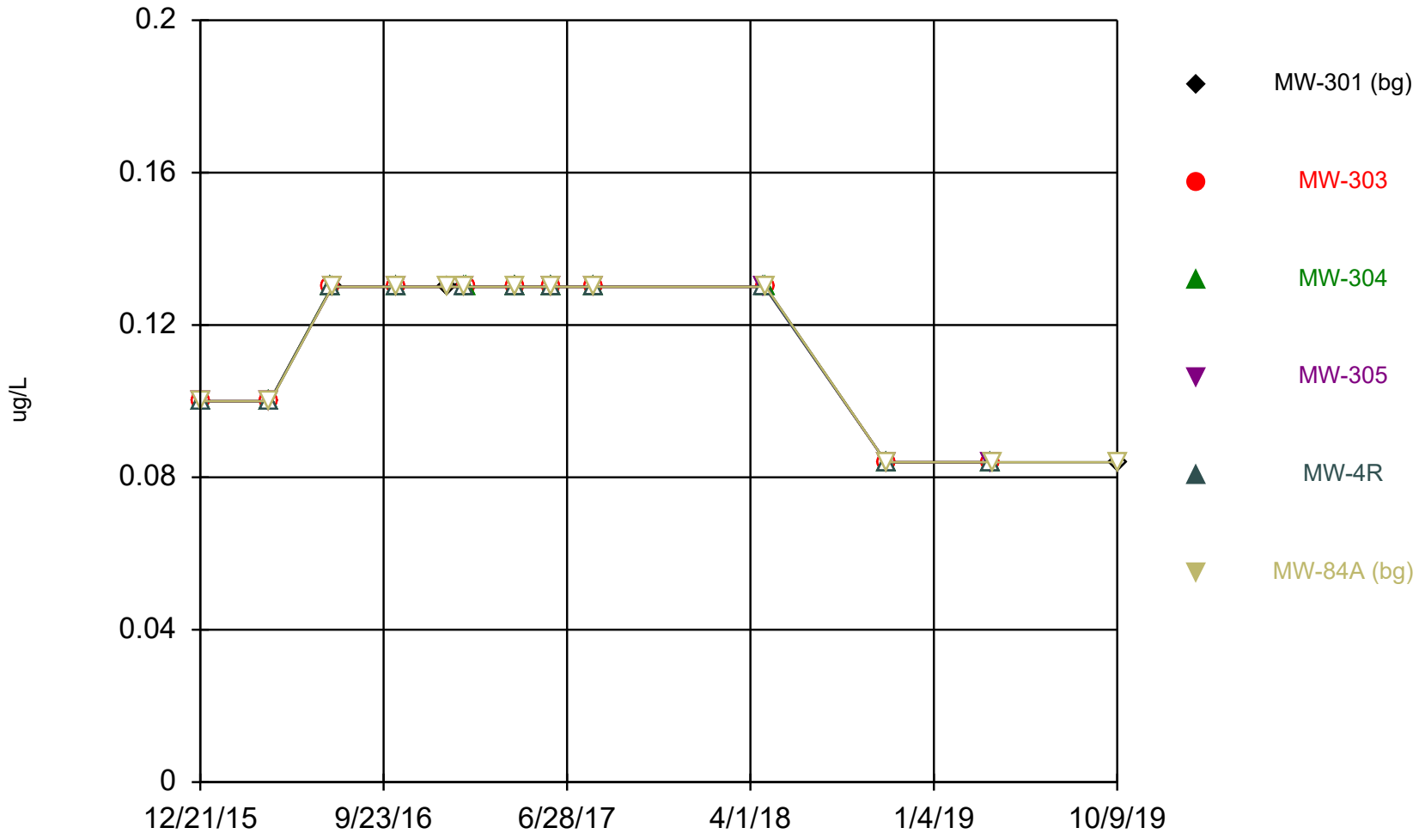
Time Series

Constituent: Lithium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		1.6	0.93 (J)	0.5 (J)		
12/22/2015	1.3				4.3	0.72 (J)
4/4/2016		1	0.51 (J)	0.24 (J)	1.7	
4/5/2016	0.58 (J)					0.44 (J)
7/7/2016		0.77 (J)	0.17 (J)		1.5	
7/8/2016	0.69 (J)			<0.11		0.5 (J)
10/12/2016		1.3			2.6	
10/13/2016	0.6 (J)		0.14 (J)	0.34 (J)		0.56 (J)
12/29/2016	0.87 (J)					0.56 (J)
1/25/2017	0.67 (J)			0.21 (J)	6.1	0.56 (J)
1/26/2017		0.59 (J)	<0.11			
4/10/2017		1.2	0.16 (J)			
4/11/2017	0.68 (J)				3.2	0.55 (J)
6/5/2017			<0.14	0.17 (J)	1.2	
6/6/2017	0.62 (J)	1.1				0.46 (J)
8/7/2017				0.15 (J)		
8/8/2017	0.6 (J)	0.86 (J)	<0.14			0.58 (J)
8/9/2017					3.7	
4/23/2018				<0.14	4.8	
4/24/2018		0.61 (J)	<0.14			
4/25/2018	0.55 (J)					0.5 (J)
8/7/2018				<0.14	1.9	
8/8/2018	0.85 (J)	1.1	<0.14			0.4 (J)
10/24/2018	0.52 (J)	1.3	<0.19	0.24 (J)	1.1	0.49 (J)
4/1/2019		0.74 (J)		<0.19	1.8	
4/2/2019	0.9 (J)		<0.19			
4/3/2019						0.56 (J)
10/7/2019		1	<0.22	<0.22	1.8	
10/9/2019	0.61 (J)					0.52 (J)

Hollow symbols indicate censored values.

Time Series



Constituent: Mercury Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

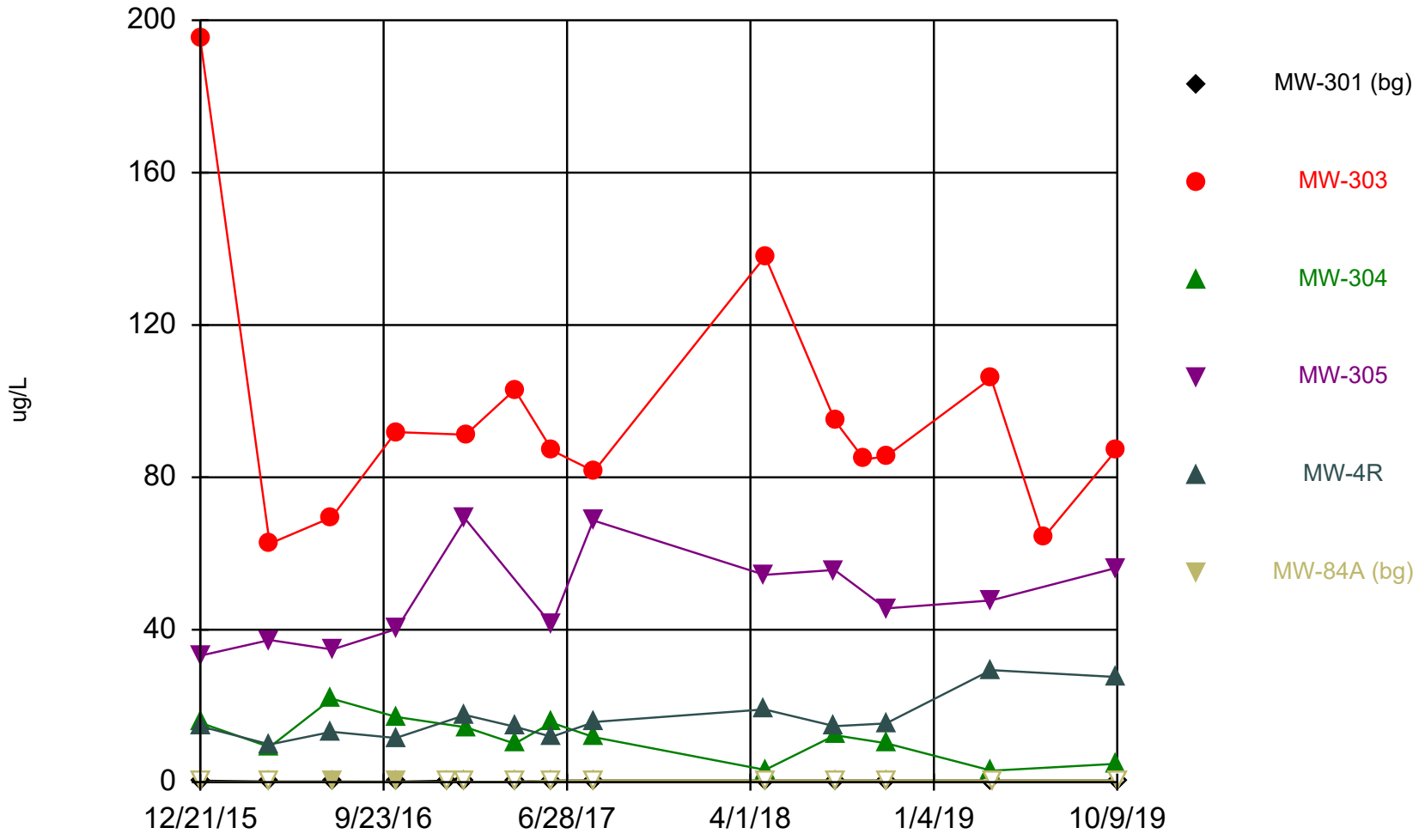
Constituent: Mercury (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		<0.1	<0.1	<0.1		
12/22/2015	<0.1				<0.1	<0.1
4/4/2016		<0.1	<0.1	<0.1	<0.1	
4/5/2016	<0.1					<0.1
7/7/2016		<0.13	<0.13		<0.13	
7/8/2016	<0.13			<0.13		<0.13
10/12/2016		<0.13			<0.13	
10/13/2016	<0.13		<0.13	<0.13		<0.13
12/29/2016	<0.13					<0.13
1/25/2017	<0.13			<0.13	<0.13	<0.13
1/26/2017		<0.13	<0.13			
4/10/2017		<0.13	<0.13			
4/11/2017	<0.13				<0.13	<0.13
6/5/2017			<0.13	<0.13	<0.13	
6/6/2017	<0.13	<0.13				<0.13
8/7/2017				<0.13		
8/8/2017	<0.13	<0.13	<0.13			<0.13
8/9/2017					<0.13	
4/23/2018				<0.13	<0.13	
4/24/2018		<0.13	<0.13			
4/25/2018	<0.13					<0.13
10/24/2018	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084
4/1/2019		<0.084		<0.084	<0.084	
4/2/2019	<0.084		<0.084			
4/3/2019						<0.084
10/9/2019	<0.084					<0.084

Hollow symbols indicate censored values.

Time Series



Constituent: Molybdenum Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

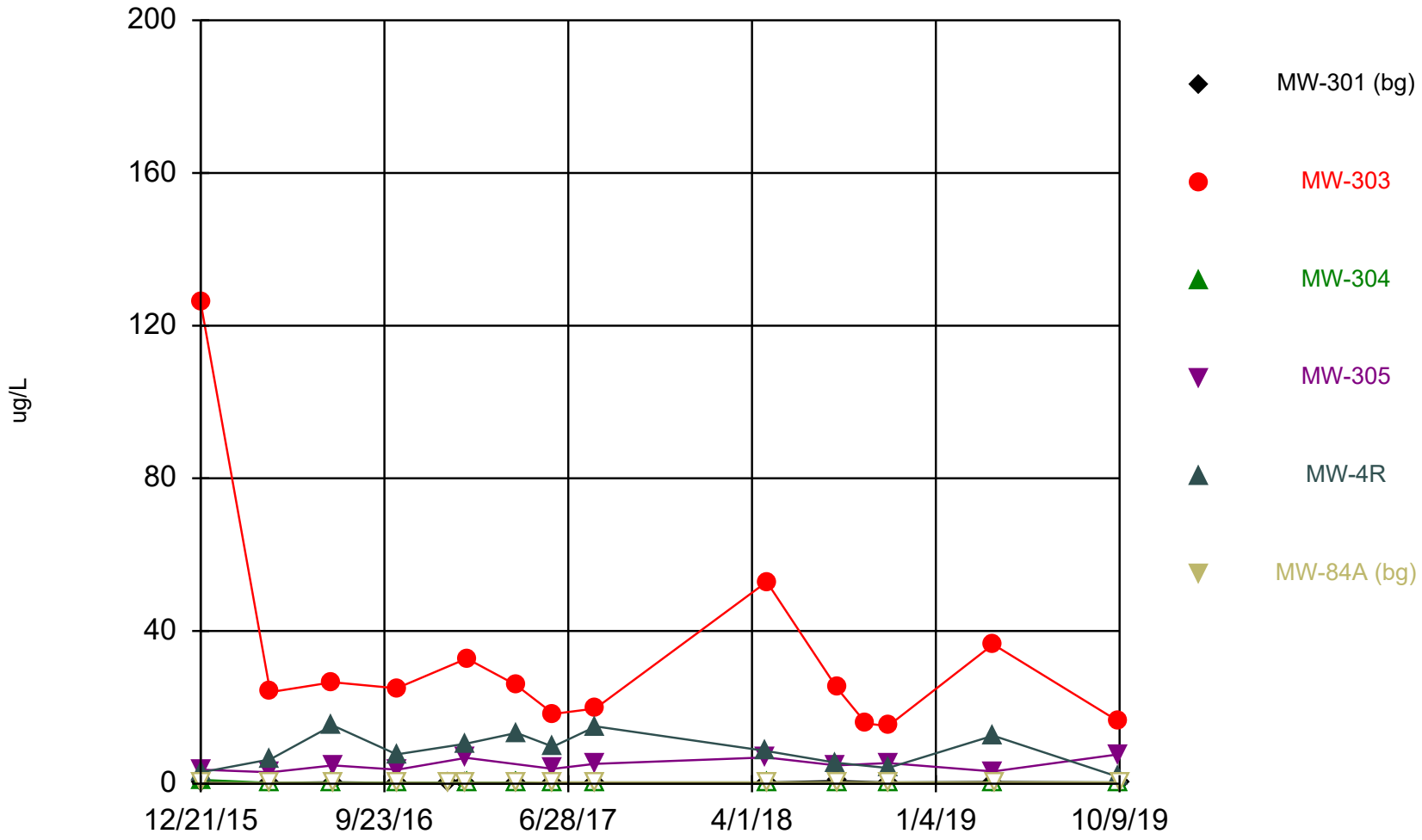
Constituent: Molybdenum (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		195	15.6	33.2		
12/22/2015	0.35 (J)				14.6	<0.07
4/4/2016		62.6	9.2	37.3	9.9	
4/5/2016	0.15 (J)					<0.07
7/7/2016		69.5	21.9		13.2	
7/8/2016	0.14 (J)			34.8		0.073 (J)
10/12/2016		91.9			11.6	
10/13/2016	0.12 (J)		17.1	40.2		0.12 (J)
12/29/2016	0.38 (J)					<0.07
1/25/2017	<0.07			69.1	17.6	<0.07
1/26/2017		91.2	14.4			
4/10/2017		103	10.1			
4/11/2017	<0.07				14.5	<0.07
6/5/2017			15.6	41.3	11.9	
6/6/2017	<0.44	87				<0.44
8/7/2017				68.7		
8/8/2017	<0.44	81.6	11.8			<0.44
8/9/2017					15.8	
4/23/2018				54.4	19.1	
4/24/2018		138	3.2			
4/25/2018	<0.44					<0.44
8/7/2018				55.7	14.7	
8/8/2018	<0.44	94.8	12.3			<0.44
9/21/2018		84.7				
10/24/2018	<0.44	85.5	10.2	45.6	15.4	<0.44
4/1/2019		106		47.7	29.4	
4/2/2019	<0.44		3			
4/3/2019						<0.44
6/19/2019		64.1 (D)				
10/7/2019		87	4.8	56.2	27.6	
10/9/2019	<0.44					<0.44

Hollow symbols indicate censored values.

Time Series



Constituent: Selenium Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

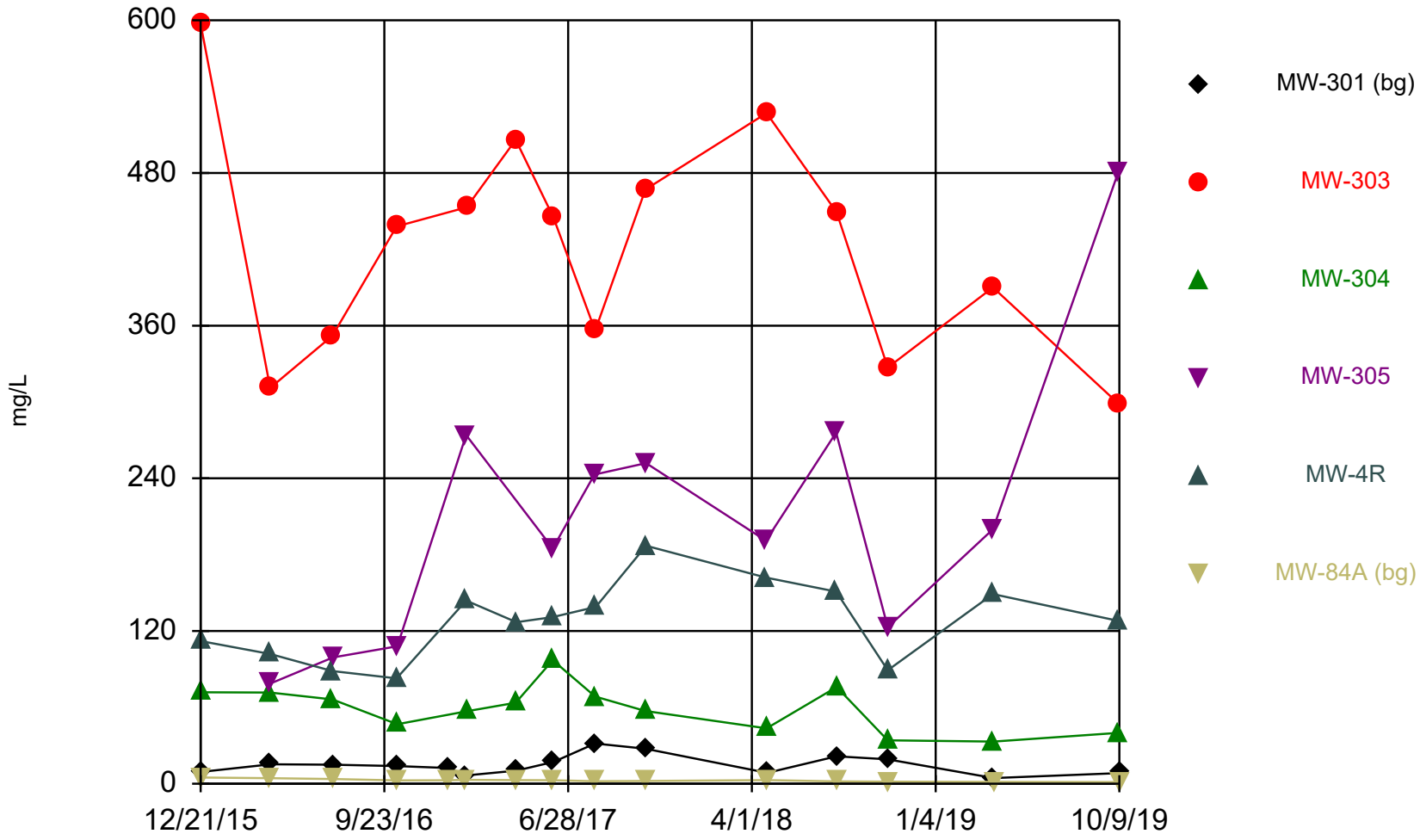
Time Series

Constituent: Selenium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		126	1	3.7		
12/22/2015	0.3 (J)				3	<0.21
4/4/2016		24	<0.21	3	6.4	
4/5/2016	0.21 (J)					<0.21
7/7/2016		26.6	<0.21		15.3	
7/8/2016	0.39 (J)			4.8		<0.21
10/12/2016		25			7.7	
10/13/2016	<0.21		<0.21	3.7		<0.21
12/29/2016	0.26 (J)					<0.21
1/25/2017	<0.21			6.8	10.5	<0.21
1/26/2017		32.8	<0.21			
4/10/2017		25.9	<0.21			
4/11/2017	<0.21				13.3	<0.21
6/5/2017			<0.32	3.9	9.7	
6/6/2017	<0.32	18.3				<0.32
8/7/2017				5.2		
8/8/2017	<0.32	19.7	<0.32			<0.32
8/9/2017					15	
4/23/2018				6.9	8.6	
4/24/2018		52.9	<0.32			
4/25/2018	<0.32					<0.32
8/7/2018				4.8	5.5	
8/8/2018	0.71 (J)	25.1	<0.32			<0.32
9/21/2018		15.8				
10/24/2018	<0.32	15.1	<0.32	5.4	4.1	<0.32
4/1/2019		36.5		3.2	12.6	
4/2/2019	0.49 (J)		<0.32			
4/3/2019						<0.32
10/7/2019		16.4	<0.32	7.7	1.8	
10/9/2019	<0.32					<0.32

Time Series



Constituent: Sulfate Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

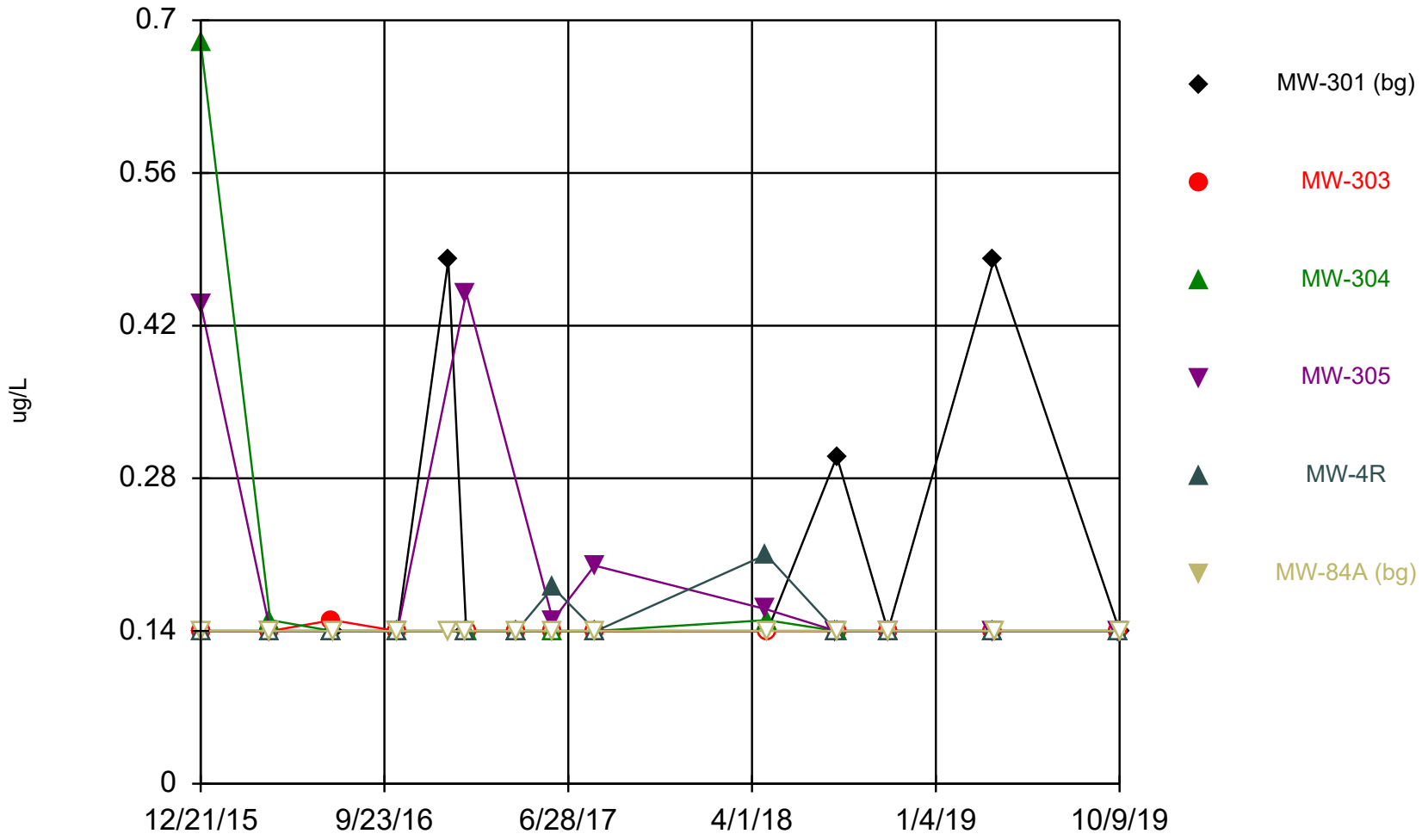
Constituent: Sulfate (mg/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		597	71.9			
12/22/2015	9.3				112	4.9
4/4/2016		311	71.7	78.7	102	
4/5/2016	15.3					4.3
7/7/2016		352	66.2		88.5	
7/8/2016	15			99.2		3.7 (J)
10/12/2016		438			82.8	
10/13/2016	13.9		46.8	108		2.6 (J)
12/29/2016	12.3 (J)					2.7 (J)
1/25/2017	6.5			274	144	3
1/26/2017		453	56.9			
4/10/2017		506	63.6			
4/11/2017	10.3				127	2.8 (J)
6/5/2017			97.1	185	131	
6/6/2017	17.1	445				2.7 (J)
8/7/2017				243		
8/8/2017	31.6	356	68.5			2 (J)
8/9/2017					139	
10/23/2017	27.5	467	57.2			
10/24/2017				252	187	2.2 (J)
4/23/2018				191	162	
4/24/2018		527	43.5			
4/25/2018	8.6					2.8 (J)
8/7/2018				276	151	
8/8/2018	21.6	449	76			1.9 (J)
10/24/2018	19.2	327	34.1	123	89.2	1.6 (J)
4/1/2019		390		200	149	
4/2/2019	4.4		33.1			
4/3/2019						1.4 (J)
10/7/2019		299	40	480	128	
10/9/2019	8.4					1.3 (J)

Hollow symbols indicate censored values.

Time Series



Constituent: Thallium Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

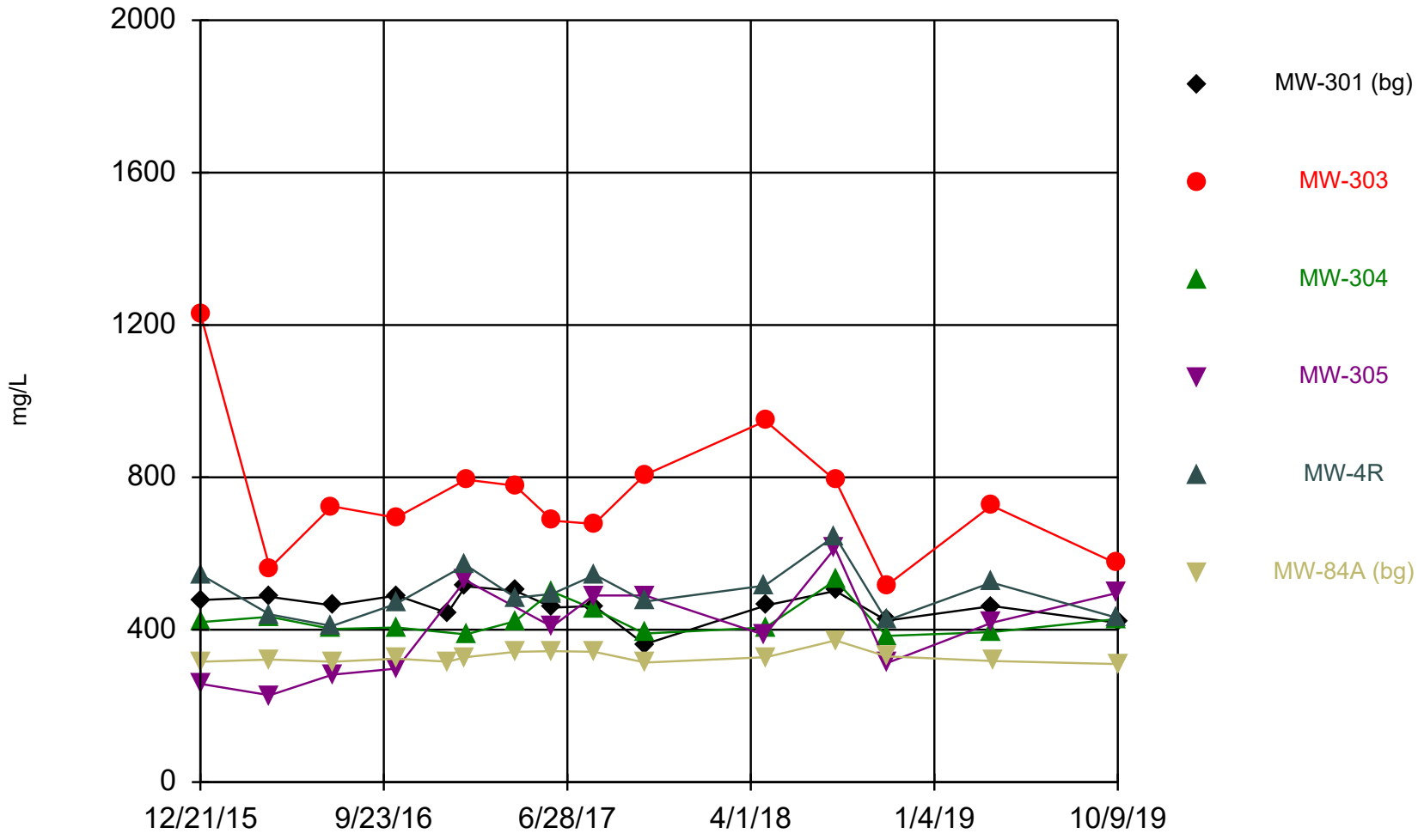
Time Series

Constituent: Thallium (ug/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		<0.14	0.68 (J)	0.44 (J)		
12/22/2015	<0.14				<0.14	<0.14
4/4/2016		<0.14	0.15 (J)	<0.14	<0.14	
4/5/2016	<0.14					<0.14
7/7/2016		0.15 (J)	<0.14		<0.14	
7/8/2016	<0.14			<0.14		<0.14
10/12/2016		<0.14			<0.14	
10/13/2016	<0.14		<0.14	<0.14		<0.14
12/29/2016	0.48 (J)					<0.14
1/25/2017	<0.14			0.45 (J)	<0.14	<0.14
1/26/2017		<0.14	<0.14			
4/10/2017		<0.14	<0.14			
4/11/2017	<0.14				<0.14	<0.14
6/5/2017			<0.14	0.15 (J)	0.18 (J)	
6/6/2017	<0.14	<0.14				<0.14
8/7/2017				0.2 (J)		
8/8/2017	<0.14	<0.14	<0.14			<0.14
8/9/2017					<0.14	
4/23/2018				0.16 (J)	0.21 (J)	
4/24/2018		<0.14	0.15 (J)			
4/25/2018	<0.14					<0.14
8/7/2018				<0.14	<0.14	
8/8/2018	0.3 (J)	<0.14	<0.14			<0.14
10/24/2018	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
4/1/2019		<0.14		<0.14	<0.14	
4/2/2019	0.48 (J)		<0.14			
4/3/2019						<0.14
10/7/2019		<0.14	<0.14	<0.14	<0.14	
10/9/2019	<0.14					<0.14

Time Series



Constituent: Total Dissolved Solids Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

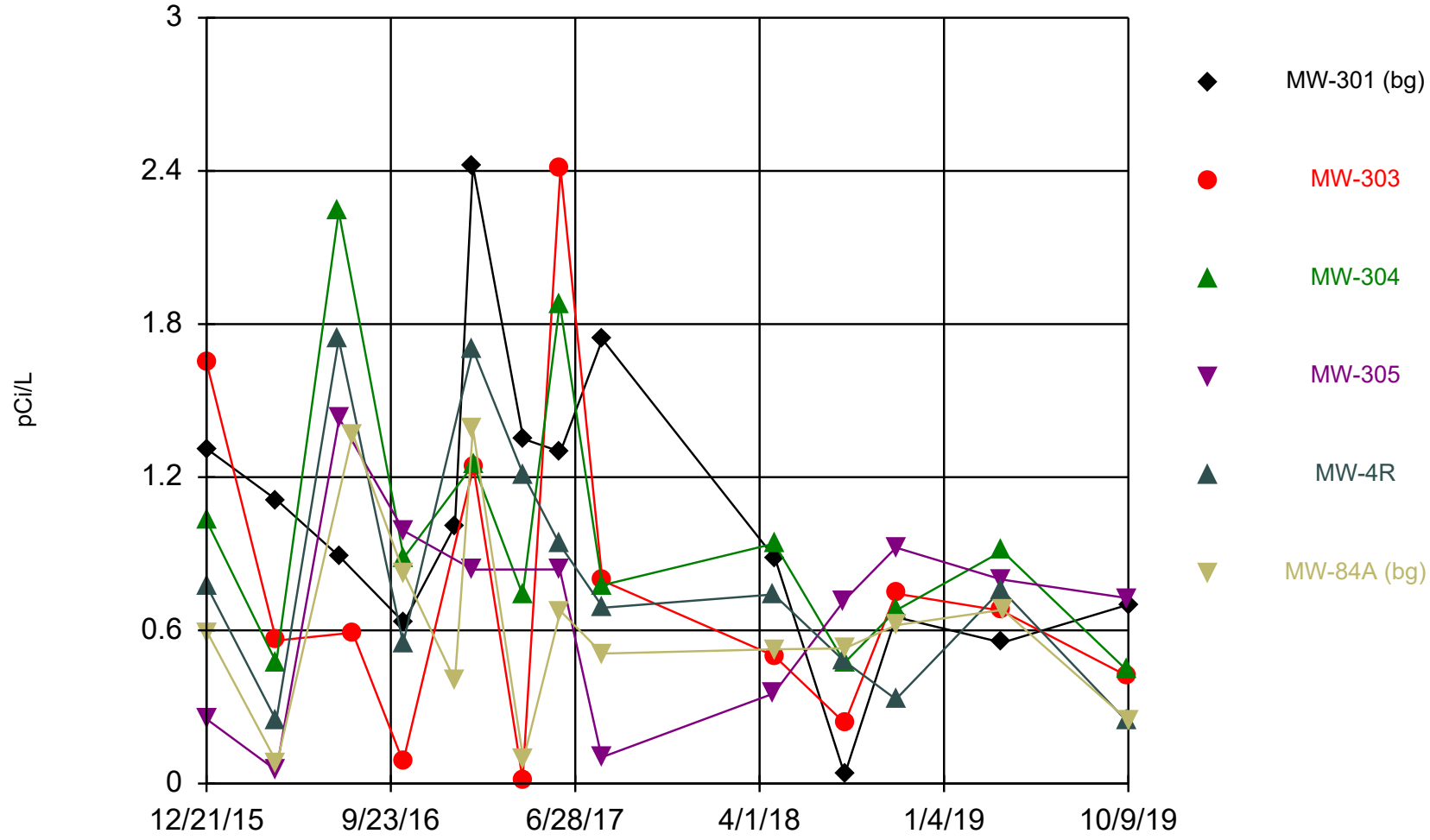
Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		1230	420	258		
12/22/2015	478				544	316
4/4/2016		562	434	228	440	
4/5/2016	486					322
7/7/2016		724	402		410	
7/8/2016	464			282		316
10/12/2016		694			468	
10/13/2016	490		406	298		324
12/29/2016	444					316
1/25/2017	514			530	570	328
1/26/2017		794	388			
4/10/2017		778	422			
4/11/2017	502				484	342
6/5/2017			500	408	494	
6/6/2017	458	686				344
8/7/2017				490		
8/8/2017	462	678	454			342
8/9/2017					544	
10/23/2017	362	806	390			
10/24/2017				490	474	314
4/23/2018				386	516	
4/24/2018		948	406			
4/25/2018	464					328
8/7/2018				614	646	
8/8/2018	502	792	530			372
10/24/2018	424	516	384	312	424	330
4/1/2019		726		418	524	
4/2/2019	462		394			
4/3/2019						318
10/7/2019		574	428	496	432	
10/9/2019	418					310

Time Series



Constituent: Total Radium Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Time Series

Constituent: Total Radium (pCi/L) Analysis Run 1/16/2020 9:33 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

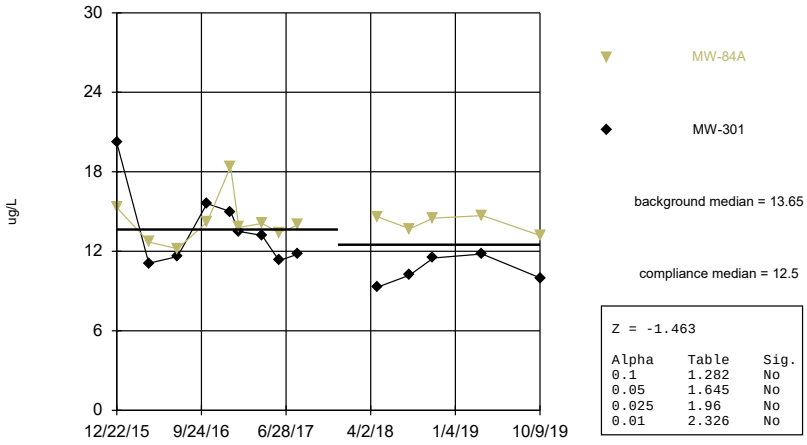
	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		1.65	1.03	0.253		
12/22/2015	1.31				0.771	0.593
4/4/2016		0.56	0.474	0.0515	0.247	
4/5/2016	1.11					0.0809
7/7/2016			2.24		1.74	
7/8/2016	0.89			1.43		
7/28/2016		0.591				1.37
10/12/2016		0.0851			0.549	
10/13/2016	0.631		0.885	0.99		0.825
12/29/2016	1.01					0.404
1/25/2017	2.42			0.838	1.7	1.39
1/26/2017		1.24	1.25			
4/10/2017		0.016	0.74			
4/11/2017	1.35				1.21	0.0929
6/5/2017			1.88	0.839	0.936	
6/6/2017	1.3	2.41				0.676
8/7/2017				0.103		
8/8/2017	1.74	0.795	0.777			0.509
8/9/2017					0.689	
4/23/2018				0.353	0.741	
4/24/2018		0.5	0.94			
4/25/2018	0.882					0.526
8/7/2018				0.717	0.48	
8/8/2018	0.0351	0.237	0.474			0.529
10/24/2018	0.652	0.744	0.678	0.924	0.33	0.62
4/1/2019		0.677		0.799	0.76	
4/2/2019	0.552		0.911			
4/3/2019						0.681
10/7/2019		0.422	0.443	0.727	0.244	
10/9/2019	0.701					0.247

Attachment B

Comparison of Background Data Sets

Barium

Combined Background Wells

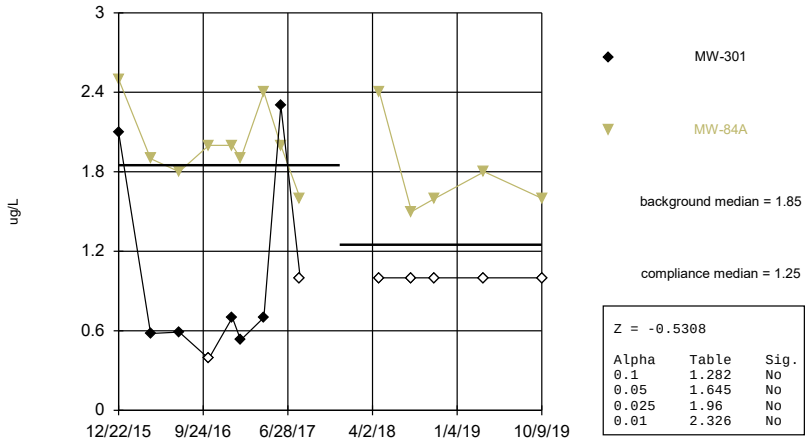


Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 1/22/2020 3:04 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Hollow symbols indicate censored values.

Chromium

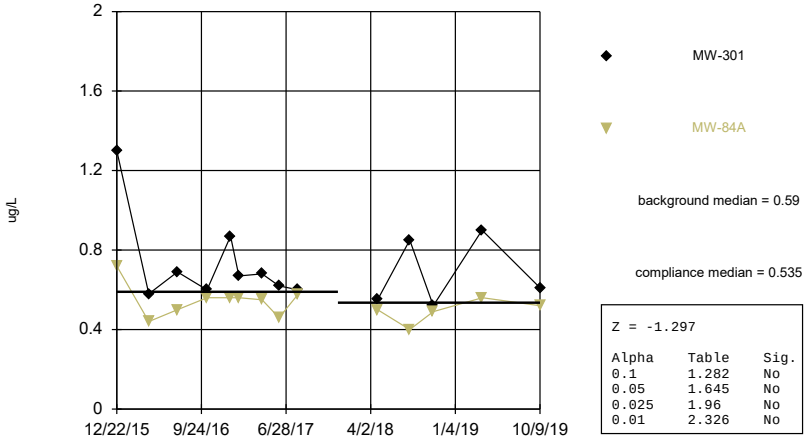
Combined Background Wells



Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 1/22/2020 3:04 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Lithium

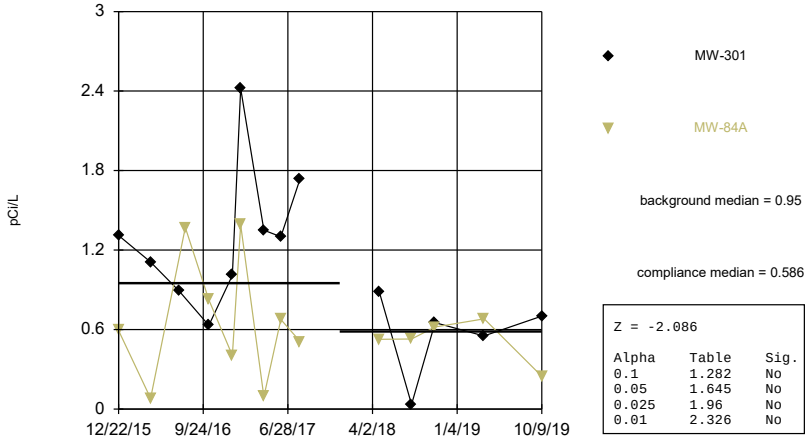
Combined Background Wells



Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 1/22/2020 3:04 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Total Radium

Combined Background Wells



Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 1/22/2020 3:04 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Barium (ug/L) Analysis Run 1/22/2020 3:05 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)	MW-84A	MW-301
12/22/2015	20.2	15.3		
4/5/2016	11.1	12.7		
7/8/2016	11.6	12.2		
10/13/2016	15.6	14.2		
12/29/2016	15	18.4		
1/25/2017	13.5	13.8		
4/11/2017	13.2	14.1		
6/6/2017	11.3	13.4		
8/8/2017	11.8	14		
4/25/2018			14.6	9.3
8/8/2018			13.7	10.2
10/24/2018			14.5	11.5
4/2/2019				11.8
4/3/2019			14.7	
10/9/2019			13.2	10

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Chromium (ug/L) Analysis Run 1/22/2020 3:05 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-84A (bg)	MW-301 (bg)	MW-301	MW-84A
12/22/2015	2.5	2.1		
4/5/2016	1.9	0.58 (J)		
7/8/2016	1.8	0.59 (J)		
10/13/2016	2	<0.39		
12/29/2016	2	0.7 (J)		
1/25/2017	1.9	0.53 (J)		
4/11/2017	2.4	0.7 (J)		
6/6/2017	2 (J)	2.3 (J)		
8/8/2017	1.6 (J)	<1		
4/25/2018			<1	2.4 (J)
8/8/2018			<1	1.5 (J)
10/24/2018			<1	1.6 (J)
4/2/2019			<1	
4/3/2019				1.8 (J)
10/9/2019			<1	1.6 (J)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Lithium (ug/L) Analysis Run 1/22/2020 3:05 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)	MW-301	MW-84A
12/22/2015	1.3	0.72 (J)		
4/5/2016	0.58 (J)	0.44 (J)		
7/8/2016	0.69 (J)	0.5 (J)		
10/13/2016	0.6 (J)	0.56 (J)		
12/29/2016	0.87 (J)	0.56 (J)		
1/25/2017	0.67 (J)	0.56 (J)		
4/11/2017	0.68 (J)	0.55 (J)		
6/6/2017	0.62 (J)	0.46 (J)		
8/8/2017	0.6 (J)	0.58 (J)		
4/25/2018			0.55 (J)	0.5 (J)
8/8/2018			0.85 (J)	0.4 (J)
10/24/2018			0.52 (J)	0.49 (J)
4/2/2019			0.9 (J)	
4/3/2019				0.56 (J)
10/9/2019			0.61 (J)	0.52 (J)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Total Radium (pCi/L) Analysis Run 1/22/2020 3:05 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)	MW-301	MW-84A
12/22/2015	1.31	0.593		
4/5/2016	1.11	0.0809		
7/8/2016	0.89			
7/28/2016		1.37		
10/13/2016	0.631	0.825		
12/29/2016	1.01	0.404		
1/25/2017	2.42	1.39		
4/11/2017	1.35	0.0929		
6/6/2017	1.3	0.676		
8/8/2017	1.74	0.509		
4/25/2018			0.882	0.526
8/8/2018			0.0351	0.529
10/24/2018			0.652	0.62
4/2/2019			0.552	
4/3/2019				0.681
10/9/2019			0.701	0.247

Welch's t-test/Mann-Whitney

Columbia Energy Center Client: SCS Engineers Data: Input -191203 Printed 1/22/2020, 3:05 PM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Alpha	Sig.	Bg. Wells	Method
Barium (ug/L)	Combined	-1.463	No	No	No	No	0.01	No	MW-301,MW-84A	Mann-W
Chromium (ug/L)	Combined	-0....	No	No	No	No	0.01	No	MW-301,MW-84A	Mann-W
Lithium (ug/L)	Combined	-1.297	No	No	No	No	0.01	No	MW-301,MW-84A	Mann-W
Total Radium (pCi/L)	Combined	-2.086	No	No	No	No	0.01	No	MW-301,MW-84A	Mann-W

Summary Report

Constituent: Antimony Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 28
Wells = 2
Minimum Value = 0.073
Maximum Value = 0.4
Mean Value = 0.1436
Median Value = 0.15
Standard Deviation = 0.08437
Coefficient of Variation = 0.5874
Skewness = 1.835

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	8	0.073	0.4	0.1731	0.15	0.1072	0.6193	1.149
MW-84A (bg)	14	12	0.073	0.15	0.1142	0.125	0.0378	0.3309	-0.08825

Summary Report

Constituent: Arsenic Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 28
Wells = 2
Minimum Value = 0.099
Maximum Value = 0.46
Mean Value = 0.2789
Median Value = 0.28
Standard Deviation = 0.09476
Coefficient of Variation = 0.3398
Skewness = 0.07884

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	4	0.13	0.45	0.2893	0.28	0.09571	0.3309	0.2367
MW-84A (bg)	14	5	0.099	0.46	0.2685	0.28	0.0962	0.3583	-0.07028

Summary Report

Constituent: Barium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 0
Wells = 2
Minimum Value = 9.3
Maximum Value = 20.2
Mean Value = 13.39
Median Value = 13.45
Standard Deviation = 2.362
Coefficient of Variation = 0.1764
Skewness = 0.8212

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	0	9.3	20.2	12.58	11.7	2.836	0.2254	1.44
MW-84A (bg)	14	0	12.2	18.4	14.2	14.05	1.46	0.1028	1.605

Summary Report

Constituent: Beryllium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 28
Wells = 2
Minimum Value = 0.13
Maximum Value = 0.37
Mean Value = 0.1725
Median Value = 0.18
Standard Deviation = 0.05674
Coefficient of Variation = 0.3289
Skewness = 1.835

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	11	0.13	0.37	0.185	0.18	0.07112	0.3844	1.435
MW-84A (bg)	14	14	0.13	0.25	0.16	0.155	0.03595	0.2247	1.01

Summary Report

Constituent: Cadmium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 26
ND/Trace = 26
Wells = 2
Minimum Value = 0.081
Maximum Value = 0.32
Mean Value = 0.1124
Median Value = 0.089
Standard Deviation = 0.05394
Coefficient of Variation = 0.4798
Skewness = 2.544

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	13	11	0.081	0.32	0.1236	0.089	0.07075	0.5723	1.904
MW-84A (bg)	13	13	0.081	0.15	0.1012	0.089	0.028	0.2766	1.226

Summary Report

Constituent: Chromium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 20
Wells = 2
Minimum Value = 0.39
Maximum Value = 2.5
Mean Value = 1.46
Median Value = 1.6
Standard Deviation = 0.6522
Coefficient of Variation = 0.4466
Skewness = -0.06433

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	7	0.39	2.3	0.9921	1	0.5559	0.5603	1.439
MW-84A (bg)	14	0	1.5	2.5	1.929	1.9	0.3197	0.1658	0.5077

Summary Report

Constituent: Cobalt Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 27
ND/Trace = 27
Wells = 2
Minimum Value = 0.036
Maximum Value = 0.38
Mean Value = 0.1207
Median Value = 0.085
Standard Deviation = 0.09434
Coefficient of Variation = 0.7816
Skewness = 1.506

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	13	3	0.041	0.38	0.1716	0.12	0.1123	0.6547	0.6707
MW-84A (bg)	14	12	0.036	0.12	0.07343	0.085	0.03389	0.4615	0.09962

Summary Report

Constituent: Lead Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 26
ND/Trace = 26
Wells = 2
Minimum Value = 0.04
Maximum Value = 0.9
Mean Value = 0.2095
Median Value = 0.2
Standard Deviation = 0.1834
Coefficient of Variation = 0.8753
Skewness = 2.125

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	13	8	0.04	0.9	0.2536	0.2	0.2338	0.9217	1.678
MW-84A (bg)	13	8	0.04	0.39	0.1654	0.2	0.1058	0.6397	0.3728

Summary Report

Constituent: Lithium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 27
Wells = 2
Minimum Value = 0.4
Maximum Value = 1.3
Mean Value = 0.6229
Median Value = 0.57
Standard Deviation = 0.1803
Coefficient of Variation = 0.2894
Skewness = 2.115

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	0	0.52	1.3	0.7171	0.645	0.2062	0.2875	1.727
MW-84A (bg)	14	0	0.4	0.72	0.5286	0.535	0.07645	0.1446	0.7215

Summary Report

Constituent: Mercury Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 26
ND/Trace = 26
Wells = 2
Minimum Value = 0.084
Maximum Value = 0.13
Mean Value = 0.1148
Median Value = 0.13
Standard Deviation = 0.02026
Coefficient of Variation = 0.1766
Skewness = -0.643

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	13	13	0.084	0.13	0.1148	0.13	0.02068	0.1802	-0.643
MW-84A (bg)	13	13	0.084	0.13	0.1148	0.13	0.02068	0.1802	-0.643

Summary Report

Constituent: Molybdenum Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 28
Wells = 2
Minimum Value = 0.07
Maximum Value = 0.44
Mean Value = 0.2851
Median Value = 0.41
Standard Deviation = 0.1734
Coefficient of Variation = 0.6082
Skewness = -0.2936

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	9	0.07	0.44	0.3114	0.41	0.1595	0.512	-0.5738
MW-84A (bg)	14	12	0.07	0.44	0.2588	0.28	0.1885	0.7283	-0.01278

Summary Report

Constituent: Selenium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 28
Wells = 2
Minimum Value = 0.21
Maximum Value = 0.71
Mean Value = 0.2964
Median Value = 0.32
Standard Deviation = 0.1067
Coefficient of Variation = 0.36
Skewness = 2.229

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	8	0.21	0.71	0.3279	0.32	0.1351	0.4122	1.728
MW-84A (bg)	14	14	0.21	0.32	0.265	0.265	0.05708	0.2154	2.3e-17

Summary Report

Constituent: Thallium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 28
Wells = 2
Minimum Value = 0.14
Maximum Value = 0.48
Mean Value = 0.17
Median Value = 0.14
Standard Deviation = 0.09262
Coefficient of Variation = 0.5448
Skewness = 2.901

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	11	0.14	0.48	0.2	0.14	0.126	0.63	1.697
MW-84A (bg)	14	14	0.14	0.14	0.14	0.14	0	0	NaN

Summary Report

Constituent: Total Radium Analysis Run 1/16/2020 9:40 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

For observations made between 12/22/2015 and 10/9/2019, a summary of the selected data set:

Observations = 28
ND/Trace = 0
Wells = 2
Minimum Value = 0.0351
Maximum Value = 2.42
Mean Value = 0.826
Median Value = 0.6785
Standard Deviation = 0.5325
Coefficient of Variation = 0.6447
Skewness = 0.9565

Well	#Obs.	ND/Trace	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
MW-301 (bg)	14	0	0.0351	2.42	1.042	0.95	0.5795	0.5563	0.7027
MW-84A (bg)	14	0	0.0809	1.39	0.6103	0.561	0.391	0.6407	0.7711

Attachment C

Outlier Analysis

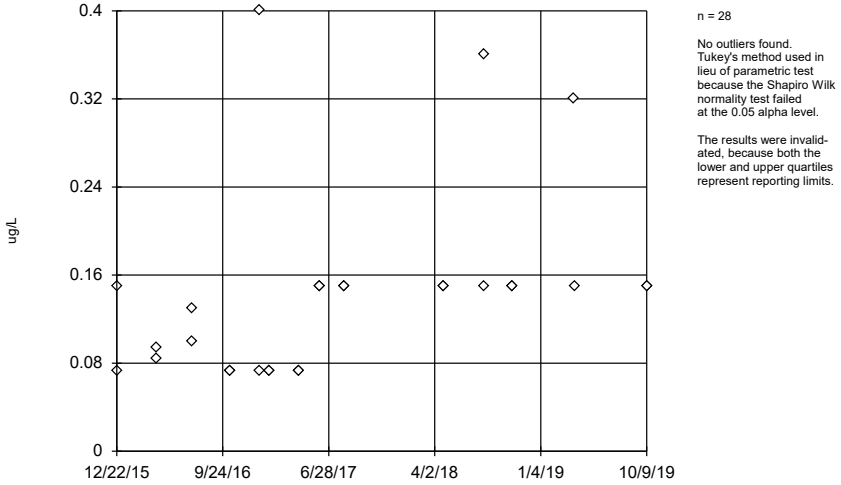
Outlier Analysis

Columbia Energy Center Client: SCS Engineers Data: Input -191203 Printed 1/22/2020, 3:11 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (ug/L)	MW-301,MW-84A	n/a	n/a	n/a w/com...	NP (nrm)	NaN	28	0.1436	0.08437	unknown	ShapiroWilk
Arsenic (ug/L)	MW-84A,MW-301	No	n/a	n/a w/com...	EPA 1989	0.05	28	0.2789	0.09476	normal	ShapiroWilk
Barium (ug/L)	MW-301,MW-84A	No	n/a	n/a w/com...	EPA 1989	0.05	28	13.39	2.362	normal	ShapiroWilk
Beryllium (ug/L)	MW-301,MW-84A	n/a	n/a	n/a w/com...	NP (nrm)	NaN	28	0.1725	0.05674	unknown	ShapiroWilk
Cadmium (ug/L)	MW-301,MW-84A	No	n/a	n/a w/com...	NP (nrm)	NaN	26	0.1124	0.05394	unknown	ShapiroWilk
Chromium (ug/L)	MW-301,MW-84A	No	n/a	n/a w/com...	EPA 1989	0.05	28	1.46	0.6522	normal	ShapiroWilk
Cobalt (ug/L)	MW-84A,MW-301	No	n/a	n/a w/com...	EPA 1989	0.05	27	0.1207	0.09434	ln(x)	ShapiroWilk
Lead (ug/L)	**MW-301,MW-84A**	**Yes**	**0.9**	**n/a w/com...**	**NP (nrm)**	**NaN**	**26**	**0.2095**	**0.1834**	**unknown**	**ShapiroWilk**
Lithium (ug/L)	**MW-84A,MW-301**	**Yes**	**1.3**	**n/a w/com...**	**Rosner`s**	**0.01**	**28**	**0.6229**	**0.1803**	**ln(x)**	**ShapiroWilk**
Mercury (ug/L)	MW-301,MW-84A	No	n/a	n/a w/com...	NP (nrm)	NaN	26	0.1148	0.02026	unknown	ShapiroWilk
Molybdenum (ug/L)	MW-301,MW-84A	No	n/a	n/a w/com...	NP (nrm)	NaN	28	0.2851	0.1734	unknown	ShapiroWilk
Selenium (ug/L)	MW-301,MW-84A	n/a	n/a	n/a w/com...	NP (nrm)	NaN	28	0.2964	0.1067	unknown	ShapiroWilk
Thallium (ug/L)	MW-301,MW-84A	n/a	n/a	n/a w/com...	NP (nrm)	NaN	28	0.17	0.09262	unknown	ShapiroWilk
Total Radium (pCi/L)	**MW-301,MW-84A**	**Yes**	**2.42**	**n/a w/com...**	**Rosner`s**	**0.01**	**28**	**0.826**	**0.5325**	**ln(x)**	**ShapiroWilk**

Antimony

MW-301,MW-84A



n = 28

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

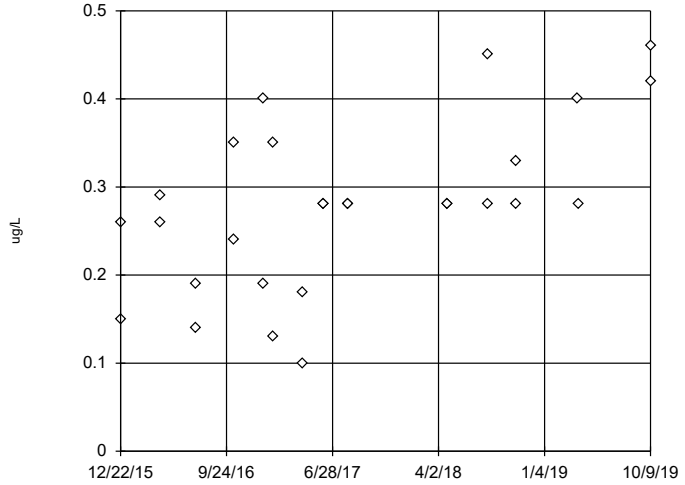
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG

Arsenic

MW-84A,MW-301



n = 28

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.2789, std. dev. 0.09476, critical Tn 2.714

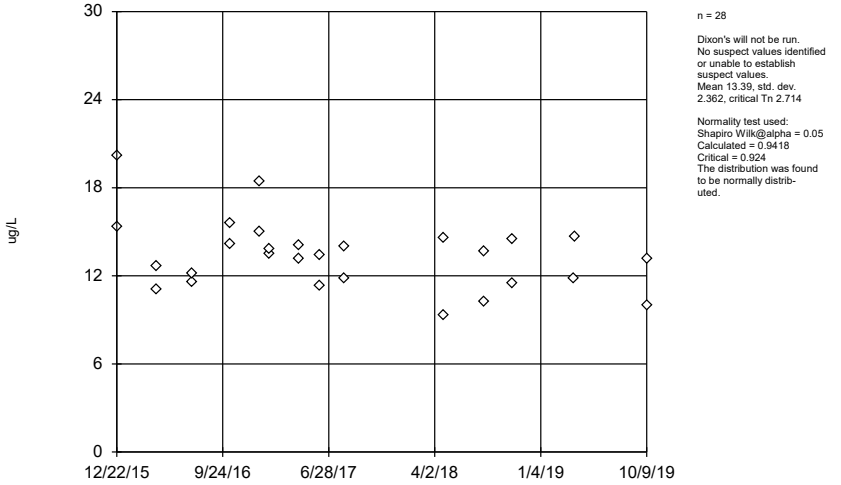
Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9479
Critical = 0.924
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG

Barium

MW-301,MW-84A



n = 28

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 13.39, std. dev. 2.362, critical Tn 2.714

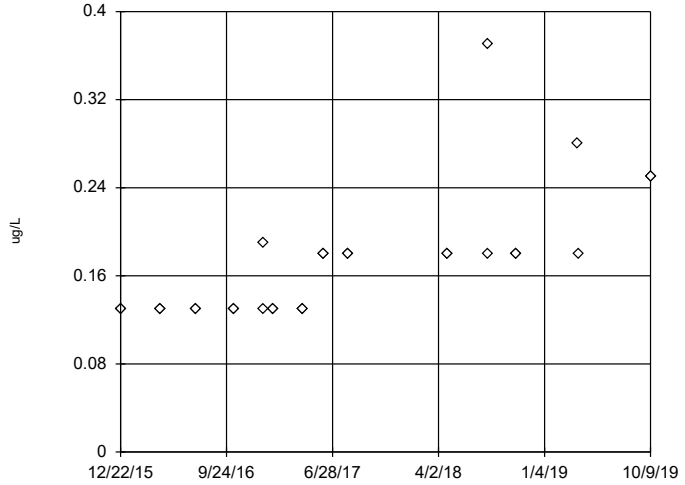
Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9418
Critical = 0.924
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG

Beryllium

MW-301,MW-84A



n = 28

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Tukey's Outlier Screening, Pooled Background

Constituent: Antimony (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	0.15 (J)	<0.073
4/5/2016	0.094 (J)	0.084 (J)
7/8/2016	0.13 (J)	0.1 (J)
10/13/2016	<0.073	<0.073
12/29/2016	0.4 (J)	<0.073
1/25/2017	<0.073	<0.073
4/11/2017	<0.073	<0.073
6/6/2017	<0.15	<0.15
8/8/2017	<0.15	<0.15
4/25/2018	<0.15	<0.15
8/8/2018	0.36 (J)	<0.15
10/24/2018	<0.15	<0.15
4/2/2019	0.32 (J)	
4/3/2019		<0.15
10/9/2019	<0.15	<0.15

EPA 1989 Outlier Screening, Pooled Background

Constituent: Arsenic (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-84A (bg)	MW-301 (bg)
12/22/2015	0.15 (J)	0.26 (J)
4/5/2016	0.29 (J)	0.26 (J)
7/8/2016	0.14 (J)	0.19 (J)
10/13/2016	0.35 (J)	0.24 (J)
12/29/2016	0.19 (J)	0.4 (J)
1/25/2017	0.35 (J)	0.13 (J)
4/11/2017	<0.099	0.18 (J)
6/6/2017	<0.28	<0.28
8/8/2017	0.28 (J)	<0.28
4/25/2018	<0.28	<0.28
8/8/2018	<0.28	0.45 (J)
10/24/2018	0.33 (J)	<0.28
4/2/2019		0.4 (J)
4/3/2019	<0.28	
10/9/2019	0.46 (J)	0.42 (J)

EPA 1989 Outlier Screening, Pooled Background

Constituent: Barium (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	20.2	15.3
4/5/2016	11.1	12.7
7/8/2016	11.6	12.2
10/13/2016	15.6	14.2
12/29/2016	15	18.4
1/25/2017	13.5	13.8
4/11/2017	13.2	14.1
6/6/2017	11.3	13.4
8/8/2017	11.8	14
4/25/2018	9.3	14.6
8/8/2018	10.2	13.7
10/24/2018	11.5	14.5
4/2/2019	11.8	
4/3/2019		14.7
10/9/2019	10	13.2

Tukey's Outlier Screening, Pooled Background

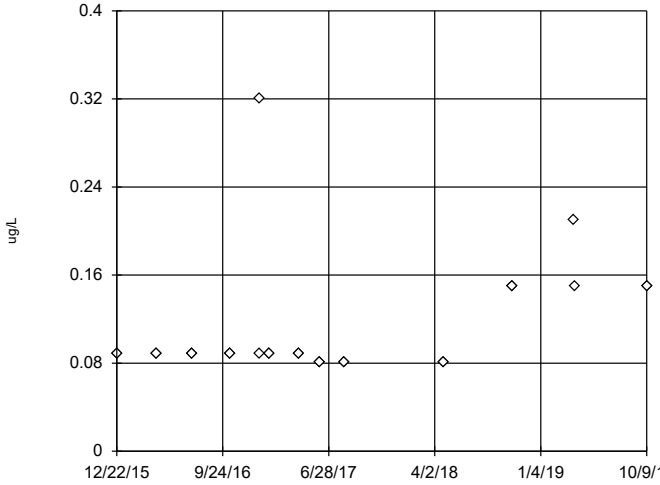
Constituent: Beryllium (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	<0.13	<0.13
4/5/2016	<0.13	<0.13
7/8/2016	<0.13	<0.13
10/13/2016	<0.13	<0.13
12/29/2016	0.19 (J)	<0.13
1/25/2017	<0.13	<0.13
4/11/2017	<0.13	<0.13
6/6/2017	<0.18	<0.18
8/8/2017	<0.18	<0.18
4/25/2018	<0.18	<0.18
8/8/2018	0.37 (J)	<0.18
10/24/2018	<0.18	<0.18
4/2/2019	0.28 (J)	
4/3/2019		<0.18
10/9/2019	<0.25	<0.25

Cadmium

MW-301,MW-84A



n = 26

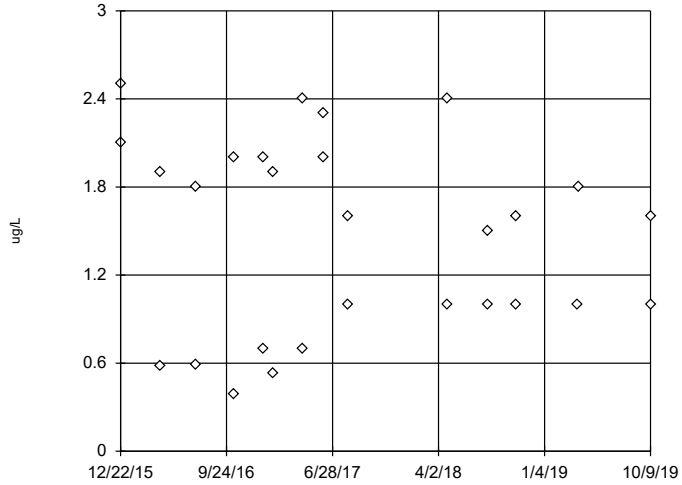
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

High cutoff = 0.345, low cutoff = -0.11, based on IQR multiplier of 3.

Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Chromium

MW-301,MW-84A



n = 28

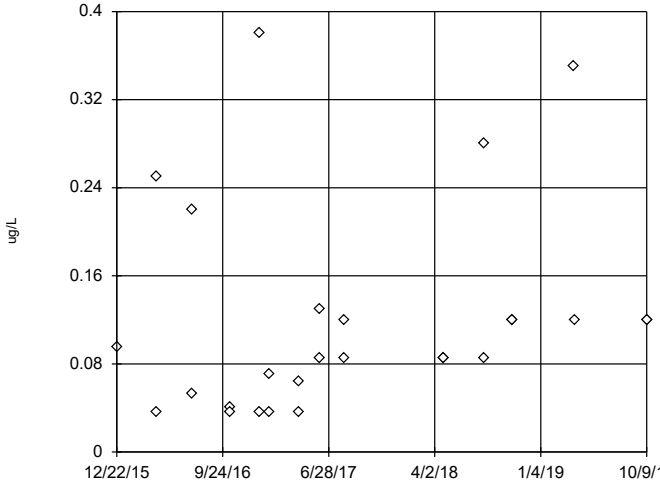
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1.46, std. dev. 0.6522, critical Tn 2.714

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9255
Critical = 0.924
The distribution was found to be normally distrib-uted.

EPA 1989 Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Cobalt

MW-84A,MW-301



n = 27

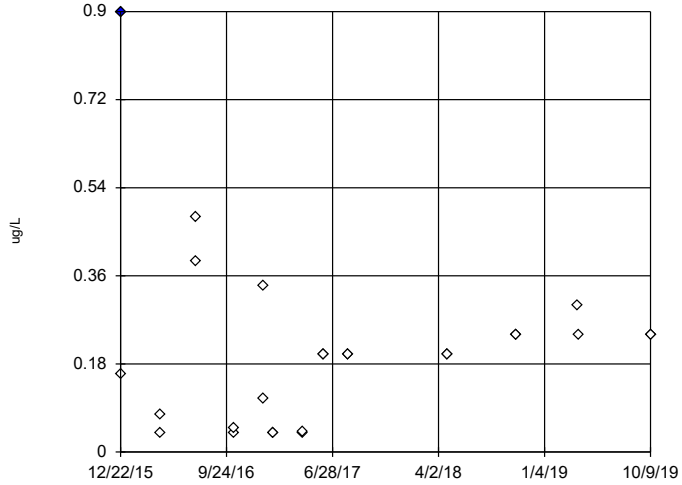
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.1207, std. dev. 0.09434, critical Tn 2.698

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9241
Critical = 0.923 (after natural log transforma-tion)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Lead

MW-301,MW-84A



n = 26

Outlier is drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

High cutoff = 0.825, low cutoff = -0.54, based on IQR multiplier of 3.

Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Tukey's Outlier Screening, Pooled Background

Constituent: Cadmium (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	<0.089	<0.089
4/5/2016	<0.089	<0.089
7/8/2016	<0.089	<0.089
10/13/2016	<0.089	<0.089
12/29/2016	0.32 (J)	<0.089
1/25/2017	<0.089	<0.089
4/11/2017	<0.089	<0.089
6/6/2017	<0.081	<0.081
8/8/2017	<0.081	<0.081
4/25/2018	<0.081	<0.081
10/24/2018	<0.15	<0.15
4/2/2019	0.21 (J)	
4/3/2019		<0.15
10/9/2019	<0.15	<0.15

EPA 1989 Outlier Screening, Pooled Background

Constituent: Chromium (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	2.1	2.5
4/5/2016	0.58 (J)	1.9
7/8/2016	0.59 (J)	1.8
10/13/2016	<0.39	2
12/29/2016	0.7 (J)	2
1/25/2017	0.53 (J)	1.9
4/11/2017	0.7 (J)	2.4
6/6/2017	2.3 (J)	2 (J)
8/8/2017	<1	1.6 (J)
4/25/2018	<1	2.4 (J)
8/8/2018	<1	1.5 (J)
10/24/2018	<1	1.6 (J)
4/2/2019	<1	
4/3/2019		1.8 (J)
10/9/2019	<1	1.6 (J)

EPA 1989 Outlier Screening, Pooled Background

Constituent: Cobalt (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-84A (bg)	MW-301 (bg)
12/22/2015	0.095 (J)	
4/5/2016	<0.036	0.25 (J)
7/8/2016	0.053 (J)	0.22 (J)
10/13/2016	<0.036	0.041 (J)
12/29/2016	<0.036	0.38 (J)
1/25/2017	<0.036	0.071 (J)
4/11/2017	<0.036	0.064 (J)
6/6/2017	<0.085	0.13 (J)
8/8/2017	<0.085	0.12 (J)
4/25/2018	<0.085	<0.085
8/8/2018	<0.085	0.28 (J)
10/24/2018	<0.12	<0.12
4/2/2019		0.35 (J)
4/3/2019	<0.12	
10/9/2019	<0.12	<0.12

Tukey's Outlier Screening, Pooled Background

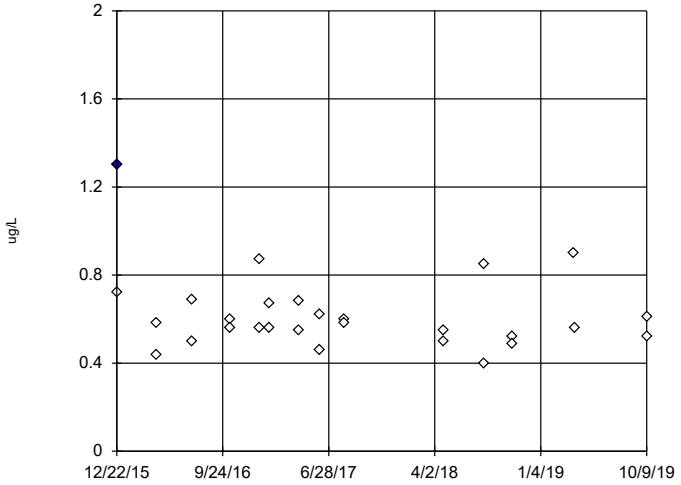
Constituent: Lead (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	0.9 (JO)	0.16 (J)
4/5/2016	0.077 (J)	<0.04
7/8/2016	0.48 (J)	0.39 (J)
10/13/2016	<0.04	0.049 (J)
12/29/2016	0.34 (J)	0.11 (J)
1/25/2017	<0.04	<0.04
4/11/2017	<0.04	0.041 (J)
6/6/2017	<0.2	<0.2
8/8/2017	<0.2	<0.2
4/25/2018	<0.2	<0.2
10/24/2018	<0.24	<0.24
4/2/2019	0.3 (J)	
4/3/2019		<0.24
10/9/2019	<0.24	<0.24

Lithium

MW-84A,MW-301



n = 28

Statistical outlier is drawn as solid.

k = 1
r = 3.135
Tabulated value = 2.888
Alpha = 0.01

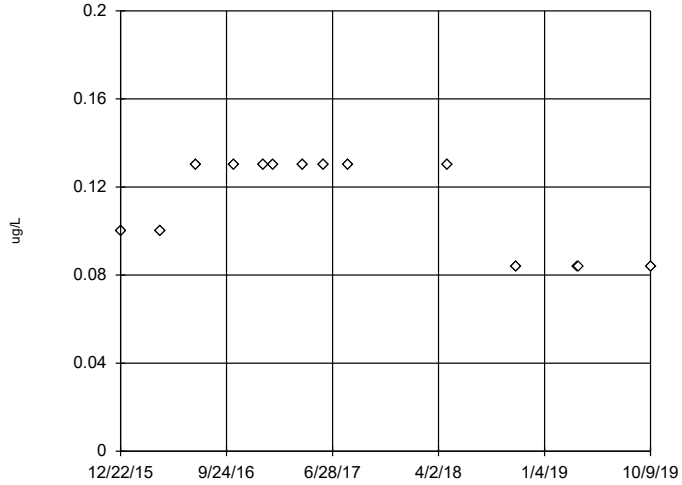
Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9554
Critical = 0.923 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Rosner's Outlier Test, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG

Mercury

MW-301,MW-84A



n = 26

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

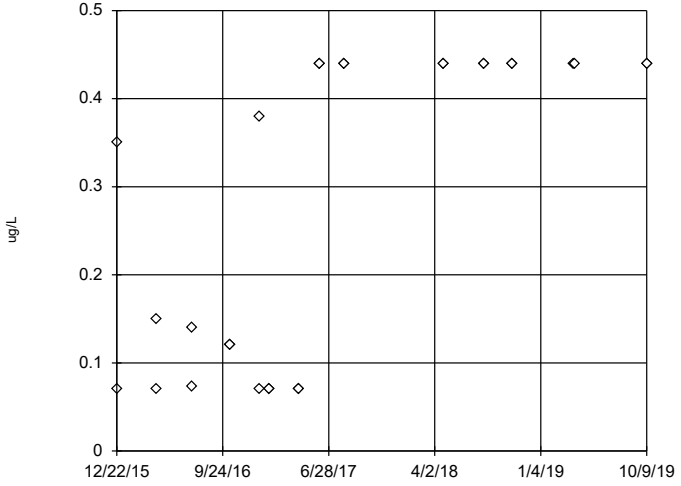
High cutoff = 0.244, low cutoff = -0.022, based on IQR multiplier of 3.

Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG

Molybdenum

MW-301,MW-84A



n = 28

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

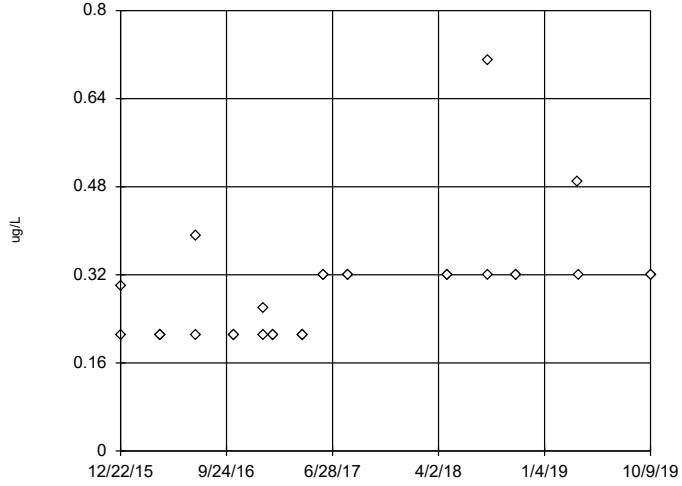
High cutoff = 1.545, low cutoff = -1.034, based on IQR multiplier of 3.

Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG

Selenium

MW-301,MW-84A



n = 28

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Rosner's Outlier Test, Pooled Background

Constituent: Lithium (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-84A (bg)	MW-301 (bg)
12/22/2015	0.72 (J)	1.3 (O)
4/5/2016	0.44 (J)	0.58 (J)
7/8/2016	0.5 (J)	0.69 (J)
10/13/2016	0.56 (J)	0.6 (J)
12/29/2016	0.56 (J)	0.87 (J)
1/25/2017	0.56 (J)	0.67 (J)
4/11/2017	0.55 (J)	0.68 (J)
6/6/2017	0.46 (J)	0.62 (J)
8/8/2017	0.58 (J)	0.6 (J)
4/25/2018	0.5 (J)	0.55 (J)
8/8/2018	0.4 (J)	0.85 (J)
10/24/2018	0.49 (J)	0.52 (J)
4/2/2019		0.9 (J)
4/3/2019	0.56 (J)	
10/9/2019	0.52 (J)	0.61 (J)

Tukey's Outlier Screening, Pooled Background

Constituent: Mercury (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	<0.1	<0.1
4/5/2016	<0.1	<0.1
7/8/2016	<0.13	<0.13
10/13/2016	<0.13	<0.13
12/29/2016	<0.13	<0.13
1/25/2017	<0.13	<0.13
4/11/2017	<0.13	<0.13
6/6/2017	<0.13	<0.13
8/8/2017	<0.13	<0.13
4/25/2018	<0.13	<0.13
10/24/2018	<0.084	<0.084
4/2/2019	<0.084	
4/3/2019		<0.084
10/9/2019	<0.084	<0.084

Tukey's Outlier Screening, Pooled Background

Constituent: Molybdenum (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	0.35 (J)	<0.07
4/5/2016	0.15 (J)	<0.07
7/8/2016	0.14 (J)	0.073 (J)
10/13/2016	0.12 (J)	0.12 (J)
12/29/2016	0.38 (J)	<0.07
1/25/2017	<0.07	<0.07
4/11/2017	<0.07	<0.07
6/6/2017	<0.44	<0.44
8/8/2017	<0.44	<0.44
4/25/2018	<0.44	<0.44
8/8/2018	<0.44	<0.44
10/24/2018	<0.44	<0.44
4/2/2019	<0.44	
4/3/2019		<0.44
10/9/2019	<0.44	<0.44

Tukey's Outlier Screening, Pooled Background

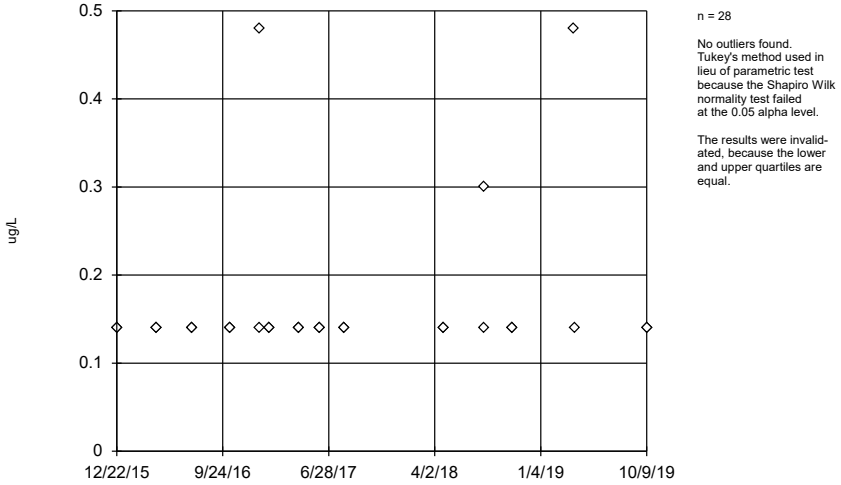
Constituent: Selenium (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	0.3 (J)	<0.21
4/5/2016	0.21 (J)	<0.21
7/8/2016	0.39 (J)	<0.21
10/13/2016	<0.21	<0.21
12/29/2016	0.26 (J)	<0.21
1/25/2017	<0.21	<0.21
4/11/2017	<0.21	<0.21
6/6/2017	<0.32	<0.32
8/8/2017	<0.32	<0.32
4/25/2018	<0.32	<0.32
8/8/2018	0.71 (J)	<0.32
10/24/2018	<0.32	<0.32
4/2/2019	0.49 (J)	
4/3/2019		<0.32
10/9/2019	<0.32	<0.32

Thallium

MW-301,MW-84A



n = 28

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

The results were invalidated, because the lower and upper quartiles are equal.

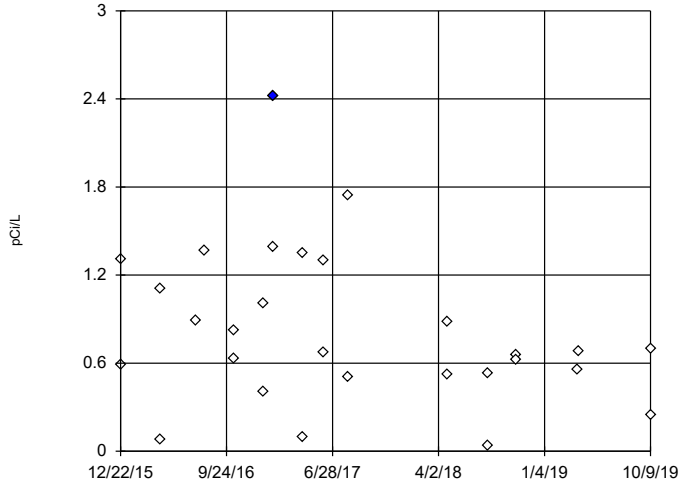
Tukey's Outlier Screening, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.24 Software licensed to SCS Engineers. UG

Total Radium

MW-301,MW-84A



n = 28

Statistical outlier is drawn as solid.

k = 3
r = 2.994
Tabulated value = 2.736
Alpha = 0.01

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9561
Critical = 0.923 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Rosner's Outlier Test, Pooled Background Analysis Run 1/22/2020 3:07 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Tukey's Outlier Screening, Pooled Background

Constituent: Thallium (ug/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	<0.14	<0.14
4/5/2016	<0.14	<0.14
7/8/2016	<0.14	<0.14
10/13/2016	<0.14	<0.14
12/29/2016	0.48 (J)	<0.14
1/25/2017	<0.14	<0.14
4/11/2017	<0.14	<0.14
6/6/2017	<0.14	<0.14
8/8/2017	<0.14	<0.14
4/25/2018	<0.14	<0.14
8/8/2018	0.3 (J)	<0.14
10/24/2018	<0.14	<0.14
4/2/2019	0.48 (J)	
4/3/2019		<0.14
10/9/2019	<0.14	<0.14

Rosner's Outlier Test, Pooled Background

Constituent: Total Radium (pCi/L) Analysis Run 1/22/2020 3:11 PM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-84A (bg)
12/22/2015	1.31	0.593
4/5/2016	1.11	0.0809
7/8/2016	0.89	
7/28/2016		1.37
10/13/2016	0.631	0.825
12/29/2016	1.01	0.404
1/25/2017	2.42 (O)	1.39
4/11/2017	1.35	0.0929
6/6/2017	1.3	0.676
8/8/2017	1.74	0.509
4/25/2018	0.882	0.526
8/8/2018	0.0351	0.529
10/24/2018	0.652	0.62
4/2/2019	0.552	
4/3/2019		0.681
10/9/2019	0.701	0.247

Attachment D

Interwell Prediction Limit Analysis

Prediction Limit

Columbia Energy Center Client: SCS Engineers Data: Input -191203 Printed 1/24/2020, 11:19 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (ug/L)	MW-303	0.400	n/a	10/7/2019	0.31	No	28	MW-84A,MW-301	n/a	n/a	71.43	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Antimony (ug/L)	MW-304	0.400	n/a	10/7/2019	0.29	No	28	MW-84A,MW-301	n/a	n/a	71.43	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Antimony (ug/L)	MW-305	0.400	n/a	10/7/2019	0.46	No	28	MW-84A,MW-301	n/a	n/a	71.43	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Antimony (ug/L)	MW-4R	0.400	n/a	10/7/2019	0.15ND	No	28	MW-84A,MW-301	n/a	n/a	71.43	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Arsenic (ug/L)	**MW-303**	**0.533**	**n/a**	**10/7/2019**	**10.2**	**Yes**	**28**	**MW-301,MW-84A**	**0.1954**	**0.1627**	**32.14**	**Aitch...**	**No**	**0.001013**	**Param Inter 1 of 2**
Arsenic (ug/L)	**MW-304**	**0.533**	**n/a**	**10/7/2019**	**3.2**	**Yes**	**28**	**MW-301,MW-84A**	**0.1954**	**0.1627**	**32.14**	**Aitch...**	**No**	**0.001013**	**Param Inter 1 of 2**
Arsenic (ug/L)	MW-305	0.533	n/a	10/7/2019	0.49	No	28	MW-301,MW-84A	0.1954	0.1627	32.14	Aitch...	No	0.001013	Param Inter 1 of 2
Arsenic (ug/L)	MW-4R	0.533	n/a	10/7/2019	0.37	No	28	MW-301,MW-84A	0.1954	0.1627	32.14	Aitch...	No	0.001013	Param Inter 1 of 2
Barium (ug/L)	MW-303	18.3	n/a	10/7/2019	11.4	No	28	MW-301,MW-84A	13.39	2.362	0	None	No	0.001013	Param Inter 1 of 2
Barium (ug/L)	**MW-304**	**18.3**	**n/a**	**10/7/2019**	**34.8**	**Yes**	**28**	**MW-301,MW-84A**	**13.39**	**2.362**	**0**	**None**	**No**	**0.001013**	**Param Inter 1 of 2**
Barium (ug/L)	MW-305	18.3	n/a	10/7/2019	15	No	28	MW-301,MW-84A	13.39	2.362	0	None	No	0.001013	Param Inter 1 of 2
Barium (ug/L)	**MW-4R**	**18.3**	**n/a**	**10/7/2019**	**21**	**Yes**	**28**	**MW-301,MW-84A**	**13.39**	**2.362**	**0**	**None**	**No**	**0.001013**	**Param Inter 1 of 2**
Beryllium (ug/L)	MW-303	0.370	n/a	10/7/2019	0.25ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-304	0.370	n/a	10/7/2019	0.25ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-305	0.370	n/a	10/7/2019	0.25ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Beryllium (ug/L)	MW-4R	0.370	n/a	10/7/2019	0.25ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Cadmium (ug/L)	MW-303	0.320	n/a	10/7/2019	0.15ND	No	26	MW-301,MW-84A	n/a	n/a	92.31	n/a	n/a	0.00258	NP Inter (NDs) 1 of 2
Cadmium (ug/L)	MW-304	0.320	n/a	10/7/2019	0.15ND	No	26	MW-301,MW-84A	n/a	n/a	92.31	n/a	n/a	0.00258	NP Inter (NDs) 1 of 2
Cadmium (ug/L)	MW-305	0.320	n/a	10/7/2019	0.15ND	No	26	MW-301,MW-84A	n/a	n/a	92.31	n/a	n/a	0.00258	NP Inter (NDs) 1 of 2
Cadmium (ug/L)	MW-4R	0.320	n/a	10/7/2019	0.15ND	No	26	MW-301,MW-84A	n/a	n/a	92.31	n/a	n/a	0.00258	NP Inter (NDs) 1 of 2
Chromium (ug/L)	**MW-303**	**3.13**	**n/a**	**10/7/2019**	**62**	**Yes**	**28**	**MW-301,MW-84A**	**1.232**	**0.9136**	**25**	**Aitch...**	**No**	**0.001013**	**Param Inter 1 of 2**
Chromium (ug/L)	MW-304	3.13	n/a	10/7/2019	1ND	No	28	MW-301,MW-84A	1.232	0.9136	25	Aitch...	No	0.001013	Param Inter 1 of 2
Chromium (ug/L)	MW-305	3.13	n/a	10/7/2019	1.1	No	28	MW-301,MW-84A	1.232	0.9136	25	Aitch...	No	0.001013	Param Inter 1 of 2
Chromium (ug/L)	MW-4R	3.13	n/a	10/7/2019	1.4	No	28	MW-301,MW-84A	1.232	0.9136	25	Aitch...	No	0.001013	Param Inter 1 of 2
Cobalt (ug/L)	MW-303	0.380	n/a	10/7/2019	0.51	No	27	MW-84A,MW-301	n/a	n/a	55.56	n/a	n/a	0.002424	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-304	0.380	n/a	10/7/2019	0.92	No	27	MW-84A,MW-301	n/a	n/a	55.56	n/a	n/a	0.002424	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-305	0.380	n/a	10/7/2019	0.12ND	No	27	MW-84A,MW-301	n/a	n/a	55.56	n/a	n/a	0.002424	NP Inter (NDs) 1 of 2
Cobalt (ug/L)	MW-4R	0.380	n/a	10/7/2019	0.12ND	No	27	MW-84A,MW-301	n/a	n/a	55.56	n/a	n/a	0.002424	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-303	0.480	n/a	10/7/2019	0.24ND	No	25	MW-301,MW-84A	n/a	n/a	64	n/a	n/a	0.002736	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-304	0.480	n/a	10/7/2019	0.24ND	No	25	MW-301,MW-84A	n/a	n/a	64	n/a	n/a	0.002736	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-305	0.480	n/a	10/7/2019	0.24ND	No	25	MW-301,MW-84A	n/a	n/a	64	n/a	n/a	0.002736	NP Inter (NDs) 1 of 2
Lead (ug/L)	MW-4R	0.480	n/a	10/7/2019	0.24ND	No	25	MW-301,MW-84A	n/a	n/a	64	n/a	n/a	0.002736	NP Inter (NDs) 1 of 2
Lithium (ug/L)	**MW-303**	**0.857**	**n/a**	**10/7/2019**	**1**	**Yes**	**27**	**MW-301,MW-84A**	**0.5978**	**0.1243**	**0**	**None**	**No**	**0.001013**	**Param Inter 1 of 2**
Lithium (ug/L)	MW-304	0.857	n/a	10/7/2019	0.22ND	No	27	MW-301,MW-84A	0.5978	0.1243	0	None	No	0.001013	Param Inter 1 of 2
Lithium (ug/L)	MW-305	0.857	n/a	10/7/2019	0.22ND	No	27	MW-301,MW-84A	0.5978	0.1243	0	None	No	0.001013	Param Inter 1 of 2
Lithium (ug/L)	**MW-4R**	**0.857**	**n/a**	**10/7/2019**	**1.8**	**Yes**	**27**	**MW-301,MW-84A**	**0.5978**	**0.1243**	**0**	**None**	**No**	**0.001013**	**Param Inter 1 of 2**
Molybdenum (ug/L)	**MW-303**	**0.440**	**n/a**	**10/7/2019**	**87**	**Yes**	**28**	**MW-84A,MW-301**	**n/a**	**n/a**	**75**	**n/a**	**n/a**	**0.002268**	**NP Inter (NDs) 1 of 2**
Molybdenum (ug/L)	**MW-304**	**0.440**	**n/a**	**10/7/2019**	**4.8**	**Yes**	**28**	**MW-84A,MW-301**	**n/a**	**n/a**	**75**	**n/a**	**n/a**	**0.002268**	**NP Inter (NDs) 1 of 2**
Molybdenum (ug/L)	**MW-305**	**0.440**	**n/a**	**10/7/2019**	**56.2**	**Yes**	**28**	**MW-84A,MW-301**	**n/a**	**n/a**	**75**	**n/a**	**n/a**	**0.002268**	**NP Inter (NDs) 1 of 2**
Molybdenum (ug/L)	**MW-4R**	**0.440**	**n/a**	**10/7/2019**	**27.6**	**Yes**	**28**	**MW-84A,MW-301**	**n/a**	**n/a**	**75**	**n/a**	**n/a**	**0.002268**	**NP Inter (NDs) 1 of 2**
Selenium (ug/L)	**MW-303**	**0.710**	**n/a**	**10/7/2019**	**16.4**	**Yes**	**28**	**MW-84A,MW-301**	**n/a**	**n/a**	**78.57**	**n/a**	**n/a**	**0.002268**	**NP Inter (NDs) 1 of 2**
Selenium (ug/L)	MW-304	0.710	n/a	10/7/2019	0.32ND	No	28	MW-84A,MW-301	n/a	n/a	78.57	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Selenium (ug/L)	**MW-305**	**0.710**	**n/a**	**10/7/2019**	**7.7**	**Yes**	**28**	**MW-84A,MW-301**	**n/a**	**n/a**	**78.57**	**n/a**	**n/a**	**0.002268**	**NP Inter (NDs) 1 of 2**
Selenium (ug/L)	**MW-4R**	**0.710**	**n/a**	**10/7/2019**	**1.8**	**Yes**	**28**	**MW-84A,MW-301**	**n/a**	**n/a**	**78.57**	**n/a**	**n/a**	**0.002268**	**NP Inter (NDs) 1 of 2**
Thallium (ug/L)	MW-303	0.480	n/a	10/7/2019	0.14ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Thallium (ug/L)	MW-304	0.480	n/a	10/7/2019	0.14ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Thallium (ug/L)	MW-305	0.480	n/a	10/7/2019	0.14ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Thallium (ug/L)	MW-4R	0.480	n/a	10/7/2019	0.14ND	No	28	MW-301,MW-84A	n/a	n/a	89.29	n/a	n/a	0.002268	NP Inter (NDs) 1 of 2
Total Radium (pCi/L)	MW-303	1.93	n/a	10/7/2019	0.422	No	28	MW-301,MW-84A	0.826	0.5325	0	None	No	0.001013	Param Inter 1 of 2
Total Radium (pCi/L)	MW-304	1.93	n/a	10/7/2019	0.443	No	28	MW-301,MW-84A	0.826	0.5325	0	None	No	0.001013	Param Inter 1 of 2

Prediction Limit

Columbia Energy Center Client: SCS Engineers Data: Input -191203 Printed 1/24/2020, 11:19 AM

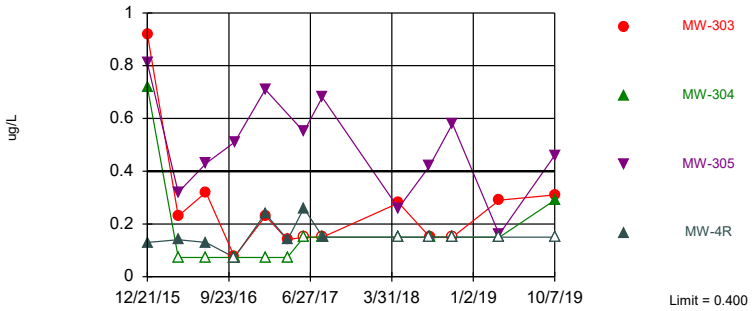
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Total Radium (pCi/L)	MW-305	1.93	n/a	10/7/2019	0.727	No	28	MW-301,MW-84A	0.826	0.5325	0	None	No	0.001013	Param Inter 1 of 2
Total Radium (pCi/L)	MW-4R	1.93	n/a	10/7/2019	0.244	No	28	MW-301,MW-84A	0.826	0.5325	0	None	No	0.001013	Param Inter 1 of 2

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Antimony

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 28 background values. 71.43% NDs. Annual per-constituent alpha = 0.018. Individual comparison alpha = 0.002268 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

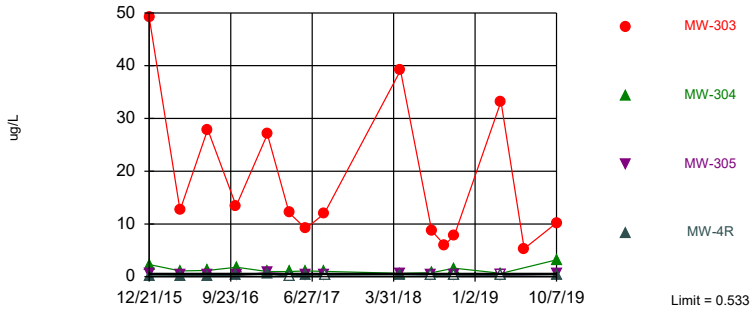
Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-303, MW-304

Arsenic

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=0.1954, Std. Dev.=0.1627, n=28, 32.14% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9479, critical = 0.896. Kappa = 2.075 (c=13, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.001013. Comparing 4 points to limit.

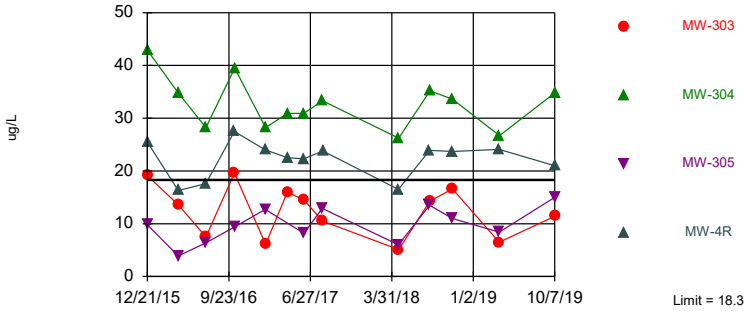
Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG

Exceeds Limit: MW-304, MW-4R

Barium

Interwell Parametric



Background Data Summary: Mean=13.39, Std. Dev.=2.362, n=28. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9418, critical = 0.896. Kappa = 2.075 (c=13, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.001013. Comparing 4 points to limit.

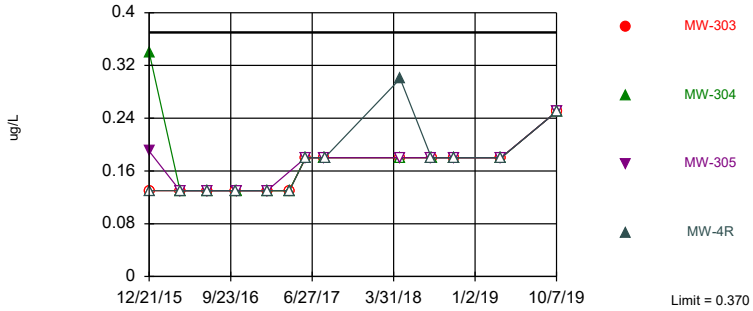
Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Beryllium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 28 background values. 89.29% NDs. Annual per-constituent alpha = 0.018. Individual comparison alpha = 0.002268 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Prediction Limit

Constituent: Antimony (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-305	MW-304	MW-303	MW-4R	MW-84A (bg)	MW-301 (bg)
12/21/2015	0.81 (J)	0.72 (J)	0.92 (J)			
12/22/2015				0.13 (J)	<0.073	0.15 (J)
4/4/2016	0.32 (J)	<0.073	0.23 (J)	0.14 (J)		
4/5/2016					0.084 (J)	0.094 (J)
7/7/2016		<0.073	0.32 (J)	0.13 (J)		
7/8/2016	0.43 (J)				0.1 (J)	0.13 (J)
10/12/2016			0.076 (J)	<0.073		
10/13/2016	0.51 (J)	<0.073			<0.073	<0.073
12/29/2016					<0.073	0.4 (J)
1/25/2017	0.71 (J)			0.24 (J)	<0.073	<0.073
1/26/2017		<0.073	0.23 (J)			
4/10/2017		<0.073	0.14 (J)			
4/11/2017				0.14 (J)	<0.073	<0.073
6/5/2017	0.55 (J)	<0.15		0.26 (J)		
6/6/2017			<0.15		<0.15	<0.15
8/7/2017	0.68 (J)					
8/8/2017		<0.15	<0.15		<0.15	<0.15
8/9/2017				0.15 (J)		
4/23/2018	0.26 (J)			<0.15		
4/24/2018		<0.15	0.28 (J)			
4/25/2018					<0.15	<0.15
8/7/2018	0.42 (J)			<0.15		
8/8/2018		<0.15	0.15 (J)		<0.15	0.36 (J)
10/24/2018	0.58 (J)	<0.15	<0.15	<0.15	<0.15	<0.15
4/1/2019	0.16 (J)		0.29 (J)	<0.15		
4/2/2019		<0.15				0.32 (J)
4/3/2019					<0.15	
10/7/2019	0.46 (J)	0.29 (J)	0.31 (J)	<0.15		
10/9/2019					<0.15	<0.15

Prediction Limit

Constituent: Arsenic (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		49.2	2.3	0.56 (J)		
12/22/2015	0.26 (J)				0.17 (J)	0.15 (J)
4/4/2016		12.6	1.1	0.34 (J)	0.2 (J)	
4/5/2016	0.26 (J)					0.29 (J)
7/7/2016		27.9	1.2		0.18 (J)	
7/8/2016	0.19 (J)			0.26 (J)		0.14 (J)
10/12/2016		13.4			0.25 (J)	
10/13/2016	0.24 (J)		1.8	0.27 (J)		0.35 (J)
12/29/2016	0.4 (J)					0.19 (J)
1/25/2017	0.13 (J)			0.78 (J)	0.47 (J)	0.35 (J)
1/26/2017		27	0.99 (J)			
4/10/2017		12.1	0.98 (J)			
4/11/2017	0.18 (J)				<0.099	<0.099
6/5/2017			1.1	0.37 (J)	0.33 (J)	
6/6/2017	<0.28	9.1				<0.28
8/7/2017				0.43 (J)		
8/8/2017	<0.28	12	1			0.28 (J)
8/9/2017					<0.28	
4/23/2018				0.48 (J)	0.36 (J)	
4/24/2018		39.1	0.64 (J)			
4/25/2018	<0.28					<0.28
8/7/2018				0.42 (J)	<0.28	
8/8/2018	0.45 (J)	8.7	0.76 (J)			<0.28
9/21/2018		6				
10/24/2018	<0.28	7.8	1.6	0.4 (J)	<0.28	0.33 (J)
4/1/2019		33.2		<0.28	<0.28	
4/2/2019	0.4 (J)		0.63 (J)			
4/3/2019						<0.28
6/19/2019		5.3 (D)				
10/7/2019		10.2	3.2	0.49 (J)	0.37 (J)	
10/9/2019	0.42 (J)					0.46 (J)

Prediction Limit

Constituent: Barium (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		19.1	42.9	9.8		
12/22/2015	20.2				25.4	15.3
4/4/2016		13.6	34.8	3.9	16.3	
4/5/2016	11.1					12.7
7/7/2016		7.5	28.2		17.6	
7/8/2016	11.6			6.4		12.2
10/12/2016		19.6			27.5	
10/13/2016	15.6		39.5	9.4		14.2
12/29/2016	15					18.4
1/25/2017	13.5			12.7	24	13.8
1/26/2017		6.1	28.2			
4/10/2017		16	30.9			
4/11/2017	13.2				22.5	14.1
6/5/2017			30.9	8.2	22.3	
6/6/2017	11.3	14.5				13.4
8/7/2017				12.9		
8/8/2017	11.8	10.5	33.3			14
8/9/2017					23.8	
4/23/2018				6	16.5	
4/24/2018		5.1	26.2			
4/25/2018	9.3					14.6
8/7/2018				13.5	23.9	
8/8/2018	10.2	14.3	35.2			13.7
10/24/2018	11.5	16.6	33.6	11	23.7	14.5
4/1/2019		6.5		8.4	24.1	
4/2/2019	11.8		26.7			
4/3/2019						14.7
10/7/2019		11.4	34.8	15	21	
10/9/2019	10					13.2

Prediction Limit

Constituent: Beryllium (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

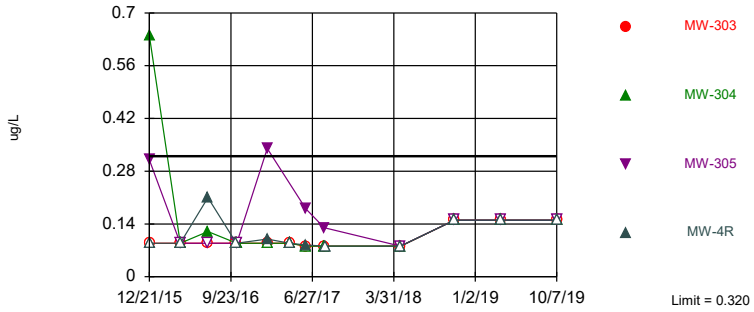
	MW-305	MW-304	MW-303	MW-4R	MW-84A (bg)	MW-301 (bg)
12/21/2015	0.19 (J)	0.34 (J)	<0.13			
12/22/2015				<0.13	<0.13	<0.13
4/4/2016	<0.13	<0.13	<0.13	<0.13		
4/5/2016					<0.13	<0.13
7/7/2016		<0.13	<0.13	<0.13		
7/8/2016	<0.13				<0.13	<0.13
10/12/2016			<0.13	<0.13		
10/13/2016	<0.13	<0.13			<0.13	<0.13
12/29/2016					<0.13	0.19 (J)
1/25/2017	<0.13			<0.13	<0.13	<0.13
1/26/2017		<0.13	<0.13			
4/10/2017		<0.13	<0.13			
4/11/2017				<0.13	<0.13	<0.13
6/5/2017	<0.18	<0.18		<0.18		
6/6/2017			<0.18		<0.18	<0.18
8/7/2017	<0.18					
8/8/2017		<0.18	<0.18		<0.18	<0.18
8/9/2017				<0.18		
4/23/2018	<0.18			0.3 (J)		
4/24/2018		<0.18	<0.18			
4/25/2018					<0.18	<0.18
8/7/2018	<0.18			<0.18		
8/8/2018		<0.18	<0.18		<0.18	0.37 (J)
10/24/2018	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
4/1/2019	<0.18		<0.18	<0.18		
4/2/2019		<0.18				0.28 (J)
4/3/2019					<0.18	
10/7/2019	<0.25	<0.25	<0.25	<0.25		
10/9/2019					<0.25	<0.25

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Cadmium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 26 background values. 92.31% NDs. Annual per-constituent alpha = 0.02045. Individual comparison alpha = 0.00258 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

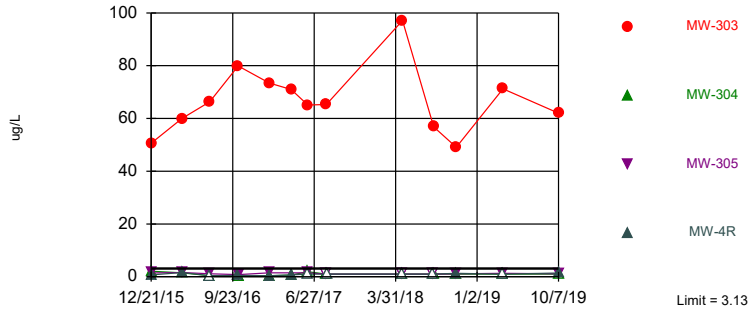
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-303

Chromium

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=1.232, Std. Dev.=0.9136, n=28, 25% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9255, critical = 0.896. Kappa = 2.075 (c=13, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.001013. Comparing 4 points to limit.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

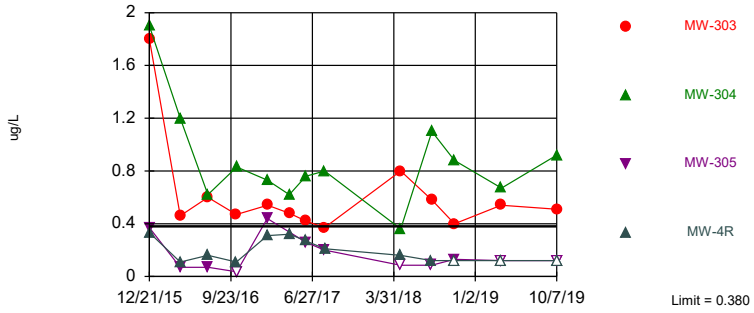
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Cobalt

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 27 background values. 55.56% NDs. Annual per-constituent alpha = 0.01923. Individual comparison alpha = 0.002424 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

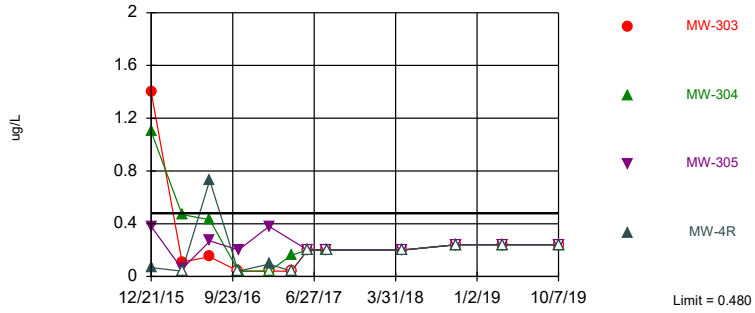
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Lead

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 25 background values. 64% NDs. Annual per-constituent alpha = 0.02168. Individual comparison alpha = 0.002736 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Prediction Limit

Constituent: Cadmium (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-305	MW-304	MW-303	MW-4R	MW-84A (bg)	MW-301 (bg)
12/21/2015	0.31 (J)	0.64 (J)	<0.089			
12/22/2015				<0.089	<0.089	<0.089
4/4/2016	<0.089	<0.089	<0.089	<0.089		
4/5/2016					<0.089	<0.089
7/7/2016		0.12 (J)	<0.089	0.21 (J)		
7/8/2016	<0.089				<0.089	<0.089
10/12/2016			<0.089	<0.089		
10/13/2016	<0.089	<0.089			<0.089	<0.089
12/29/2016					<0.089	0.32 (J)
1/25/2017	0.34 (J)			0.1 (J)	<0.089	<0.089
1/26/2017		<0.089	<0.089			
4/10/2017		<0.089	<0.089			
4/11/2017				<0.089	<0.089	<0.089
6/5/2017	0.18 (J)	<0.081		0.084 (J)		
6/6/2017			<0.081		<0.081	<0.081
8/7/2017	0.13 (J)					
8/8/2017		<0.081	<0.081		<0.081	<0.081
8/9/2017				<0.081		
4/23/2018	<0.081			<0.081		
4/24/2018		<0.081	<0.081			
4/25/2018					<0.081	<0.081
10/24/2018	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
4/1/2019	<0.15		<0.15	<0.15		
4/2/2019		<0.15				0.21 (J)
4/3/2019					<0.15	
10/7/2019	<0.15	<0.15	<0.15	<0.15		
10/9/2019					<0.15	<0.15

Prediction Limit

Constituent: Chromium (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		50.6	2.1	1.4		
12/22/2015	2.1				0.68 (J)	2.5
4/4/2016		60	1.5	1.6	1.6	
4/5/2016	0.58 (J)					1.9
7/7/2016		66.3	<0.39		<0.39	
7/8/2016	0.59 (J)			1.1		1.8
10/12/2016		79.9			0.49 (J)	
10/13/2016	<0.39		<0.39	0.83 (J)		2
12/29/2016	0.7 (J)					2
1/25/2017	0.53 (J)			1.5	0.4 (J)	1.9
1/26/2017		73.4	<0.39			
4/10/2017		71	0.65 (J)			
4/11/2017	0.7 (J)				0.7 (J)	2.4
6/5/2017			1.9 (J)	1.5 (J)	<1	
6/6/2017	2.3 (J)	65.1				2 (J)
8/7/2017				<1		
8/8/2017	<1	65.3	<1			1.6 (J)
8/9/2017					<1	
4/23/2018				<1	<1	
4/24/2018		97.1	<1			
4/25/2018	<1					2.4 (J)
8/7/2018				<1	<1	
8/8/2018	<1	56.8	<1			1.5 (J)
10/24/2018	<1	49.1	<1	1.1 (J)	1.3 (J)	1.6 (J)
4/1/2019		71.2		1.3 (J)	<1	
4/2/2019	<1		<1			
4/3/2019						1.8 (J)
10/7/2019		62	<1	1.1 (J)	1.4 (J)	
10/9/2019	<1					1.6 (J)

Prediction Limit

Constituent: Cobalt (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-305	MW-304	MW-303	MW-4R	MW-84A (bg)	MW-301 (bg)
12/21/2015	0.37 (J)	1.9	1.8			
12/22/2015				0.33 (J)	0.095 (J)	1.4 (R)
4/4/2016	0.069 (J)	1.2	0.46 (J)	0.11 (J)		
4/5/2016					<0.036	0.25 (J)
7/7/2016		0.62 (J)	0.6 (J)	0.16 (J)		
7/8/2016	0.07 (J)				0.053 (J)	0.22 (J)
10/12/2016			0.47 (J)	0.11 (J)		
10/13/2016	<0.036	0.83 (J)			<0.036	0.041 (J)
12/29/2016					<0.036	0.38 (J)
1/25/2017	0.44 (J)			0.31 (J)	<0.036	0.071 (J)
1/26/2017		0.73 (J)	0.54 (J)			
4/10/2017		0.62 (J)	0.48 (J)			
4/11/2017				0.32 (J)	<0.036	0.064 (J)
6/5/2017	0.26 (J)	0.76 (J)		0.27 (J)		
6/6/2017			0.42 (J)		<0.085	0.13 (J)
8/7/2017	0.2 (J)					
8/8/2017		0.8 (J)	0.37 (J)		<0.085	0.12 (J)
8/9/2017				0.21 (J)		
4/23/2018	<0.085			0.16 (J)		
4/24/2018		0.36 (J)	0.8 (J)			
4/25/2018					<0.085	<0.085
8/7/2018	<0.085			0.12 (J)		
8/8/2018		1.1	0.58 (J)		<0.085	0.28 (J)
10/24/2018	0.13 (J)	0.88 (J)	0.4 (J)	<0.12	<0.12	<0.12
4/1/2019	<0.12		0.54 (J)	<0.12		
4/2/2019		0.67 (J)				0.35 (J)
4/3/2019					<0.12	
10/7/2019	<0.12	0.92 (J)	0.51 (J)	<0.12		
10/9/2019					<0.12	<0.12

Prediction Limit

Constituent: Lead (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP
Columbia Energy Center Client: SCS Engineers Data: Input -191203

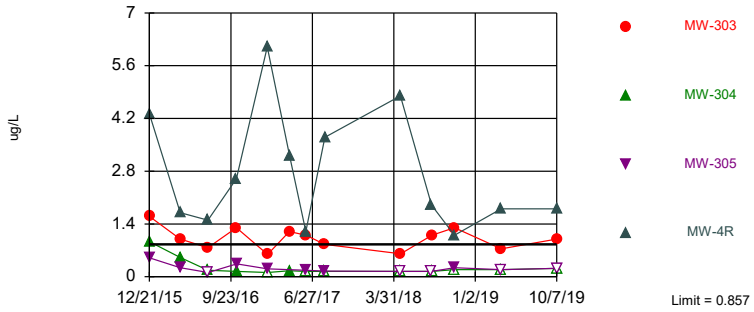
	MW-305	MW-304	MW-303	MW-4R	MW-84A (bg)	MW-301 (bg)
12/21/2015	0.38 (J)	1.1	1.4			
12/22/2015				0.067 (J)	0.16 (J)	0.9 (JR)
4/4/2016	0.056 (J)	0.47 (J)	0.11 (J)	<0.04		
4/5/2016					<0.04	0.077 (J)
7/7/2016		0.43 (J)	0.15 (J)	0.73 (J)		
7/8/2016	0.27 (J)				0.39 (J)	0.48 (J)
10/12/2016			<0.04	<0.04		
10/13/2016	0.2 (J)	<0.04			0.049 (J)	<0.04
12/29/2016					0.11 (J)	0.34 (J)
1/25/2017	0.38 (J)			0.094 (J)	<0.04	<0.04
1/26/2017		<0.04	<0.04			
4/10/2017		0.16 (J)	<0.04			
4/11/2017				<0.04	0.041 (J)	<0.04
6/5/2017	<0.2	<0.2		<0.2		
6/6/2017			<0.2		<0.2	<0.2
8/7/2017	<0.2					
8/8/2017		<0.2	<0.2		<0.2	<0.2
8/9/2017				<0.2		
4/23/2018	<0.2			<0.2		
4/24/2018		<0.2	<0.2			
4/25/2018					<0.2	<0.2
10/24/2018	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
4/1/2019	<0.24		<0.24	<0.24		
4/2/2019		<0.24				0.3 (J)
4/3/2019					<0.24	
10/7/2019	<0.24	<0.24	<0.24	<0.24		
10/9/2019					<0.24	<0.24

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-303, MW-4R

Lithium

Interwell Parametric



Background Data Summary: Mean=0.5978, Std. Dev.=0.1243, n=27. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9061, critical = 0.894. Kappa = 2.085 (c=13, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.001013. Comparing 4 points to limit.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

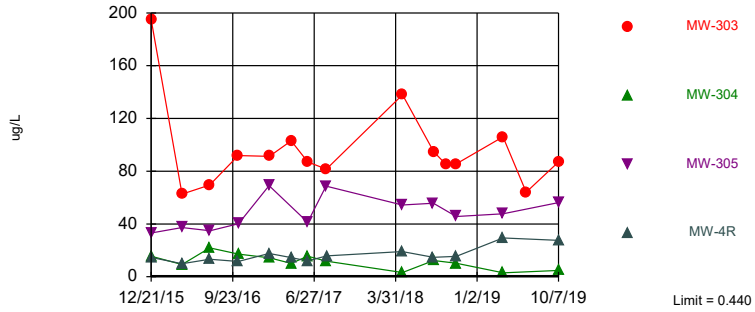
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG

Exceeds Limit: MW-303, MW-304, MW-305, MW-4R

Molybdenum

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 28 background values. 75% NDs. Annual per-constituent alpha = 0.018. Individual comparison alpha = 0.002268 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

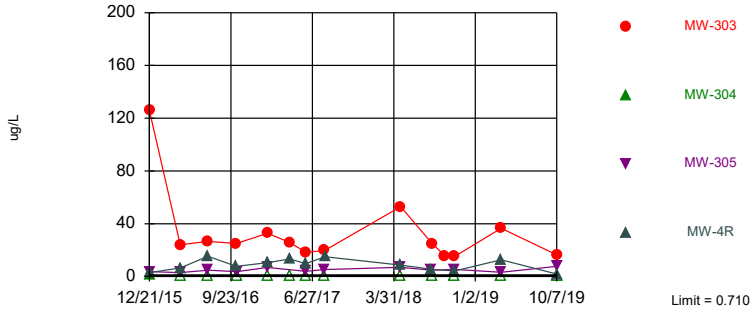
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-303, MW-305, MW-4R

Selenium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 28 background values. 78.57% NDs. Annual per-constituent alpha = 0.018. Individual comparison alpha = 0.002268 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

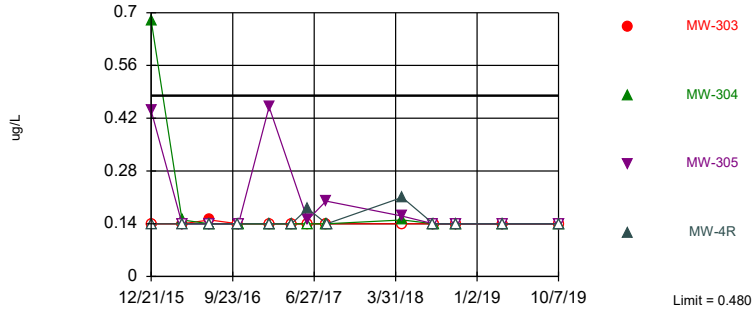
Columbia Energy Center Client: SCS Engineers Data: Input -191203

Sanitas™ v.9.6.25 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Thallium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 28 background values. 89.29% NDs. Annual per-constituent alpha = 0.018. Individual comparison alpha = 0.002268 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Prediction Limit

Constituent: Lithium (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		1.6	0.93 (J)	0.5 (J)		
12/22/2015	1.3 (R)				4.3	0.72 (J)
4/4/2016		1	0.51 (J)	0.24 (J)	1.7	
4/5/2016	0.58 (J)					0.44 (J)
7/7/2016		0.77 (J)	0.17 (J)		1.5	
7/8/2016	0.69 (J)			<0.11		0.5 (J)
10/12/2016		1.3			2.6	
10/13/2016	0.6 (J)		0.14 (J)	0.34 (J)		0.56 (J)
12/29/2016	0.87 (J)					0.56 (J)
1/25/2017	0.67 (J)			0.21 (J)	6.1	0.56 (J)
1/26/2017		0.59 (J)	<0.11			
4/10/2017		1.2	0.16 (J)			
4/11/2017	0.68 (J)				3.2	0.55 (J)
6/5/2017			<0.14	0.17 (J)	1.2	
6/6/2017	0.62 (J)	1.1				0.46 (J)
8/7/2017				0.15 (J)		
8/8/2017	0.6 (J)	0.86 (J)	<0.14			0.58 (J)
8/9/2017					3.7	
4/23/2018				<0.14	4.8	
4/24/2018		0.61 (J)	<0.14			
4/25/2018	0.55 (J)					0.5 (J)
8/7/2018				<0.14	1.9	
8/8/2018	0.85 (J)	1.1	<0.14			0.4 (J)
10/24/2018	0.52 (J)	1.3	<0.19	0.24 (J)	1.1	0.49 (J)
4/1/2019		0.74 (J)		<0.19	1.8	
4/2/2019	0.9 (J)		<0.19			
4/3/2019						0.56 (J)
10/7/2019		1	<0.22	<0.22	1.8	
10/9/2019	0.61 (J)					0.52 (J)

Prediction Limit

Constituent: Molybdenum (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-304	MW-303	MW-305	MW-4R	MW-301 (bg)	MW-84A (bg)
12/21/2015	15.6	195	33.2			
12/22/2015				14.6	0.35 (J)	<0.07
4/4/2016	9.2	62.6	37.3	9.9		
4/5/2016					0.15 (J)	<0.07
7/7/2016	21.9	69.5		13.2		
7/8/2016			34.8		0.14 (J)	0.073 (J)
10/12/2016		91.9		11.6		
10/13/2016	17.1		40.2		0.12 (J)	0.12 (J)
12/29/2016					0.38 (J)	<0.07
1/25/2017			69.1	17.6	<0.07	<0.07
1/26/2017	14.4	91.2				
4/10/2017	10.1	103				
4/11/2017				14.5	<0.07	<0.07
6/5/2017	15.6		41.3	11.9		
6/6/2017		87			<0.44	<0.44
8/7/2017			68.7			
8/8/2017	11.8	81.6			<0.44	<0.44
8/9/2017				15.8		
4/23/2018			54.4	19.1		
4/24/2018	3.2	138				
4/25/2018					<0.44	<0.44
8/7/2018			55.7	14.7		
8/8/2018	12.3	94.8			<0.44	<0.44
9/21/2018		84.7				
10/24/2018	10.2	85.5	45.6	15.4	<0.44	<0.44
4/1/2019		106	47.7	29.4		
4/2/2019	3				<0.44	
4/3/2019						<0.44
6/19/2019		64.1 (D)				
10/7/2019	4.8	87	56.2	27.6		
10/9/2019					<0.44	<0.44

Prediction Limit

Constituent: Selenium (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-304	MW-305	MW-303	MW-4R	MW-84A (bg)	MW-301 (bg)
12/21/2015	1	3.7	126			
12/22/2015				3	<0.21	0.3 (J)
4/4/2016	<0.21	3	24	6.4		
4/5/2016					<0.21	0.21 (J)
7/7/2016	<0.21		26.6	15.3		
7/8/2016		4.8			<0.21	0.39 (J)
10/12/2016			25	7.7		
10/13/2016	<0.21	3.7			<0.21	<0.21
12/29/2016					<0.21	0.26 (J)
1/25/2017		6.8		10.5	<0.21	<0.21
1/26/2017	<0.21		32.8			
4/10/2017	<0.21		25.9			
4/11/2017				13.3	<0.21	<0.21
6/5/2017	<0.32	3.9		9.7		
6/6/2017			18.3		<0.32	<0.32
8/7/2017		5.2				
8/8/2017	<0.32		19.7		<0.32	<0.32
8/9/2017				15		
4/23/2018		6.9		8.6		
4/24/2018	<0.32		52.9			
4/25/2018					<0.32	<0.32
8/7/2018		4.8		5.5		
8/8/2018	<0.32		25.1		<0.32	0.71 (J)
9/21/2018			15.8			
10/24/2018	<0.32	5.4	15.1	4.1	<0.32	<0.32
4/1/2019		3.2	36.5	12.6		
4/2/2019	<0.32					0.49 (J)
4/3/2019					<0.32	
10/7/2019	<0.32	7.7	16.4	1.8		
10/9/2019					<0.32	<0.32

Prediction Limit

Constituent: Thallium (ug/L) Analysis Run 1/24/2020 11:19 AM View: PP

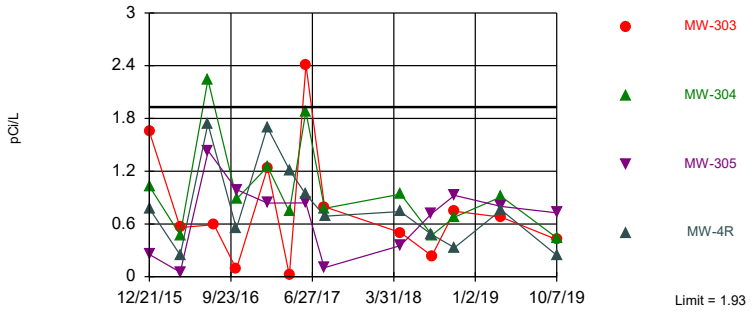
Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-305	MW-304	MW-303	MW-4R	MW-84A (bg)	MW-301 (bg)
12/21/2015	0.44 (J)	0.68 (J)	<0.14			
12/22/2015				<0.14	<0.14	<0.14
4/4/2016	<0.14	0.15 (J)	<0.14	<0.14		
4/5/2016					<0.14	<0.14
7/7/2016		<0.14	0.15 (J)	<0.14		
7/8/2016	<0.14				<0.14	<0.14
10/12/2016			<0.14	<0.14		
10/13/2016	<0.14	<0.14			<0.14	<0.14
12/29/2016					<0.14	0.48 (J)
1/25/2017	0.45 (J)			<0.14	<0.14	<0.14
1/26/2017		<0.14	<0.14			
4/10/2017		<0.14	<0.14			
4/11/2017				<0.14	<0.14	<0.14
6/5/2017	0.15 (J)	<0.14		0.18 (J)		
6/6/2017			<0.14		<0.14	<0.14
8/7/2017	0.2 (J)					
8/8/2017		<0.14	<0.14		<0.14	<0.14
8/9/2017				<0.14		
4/23/2018	0.16 (J)			0.21 (J)		
4/24/2018		0.15 (J)	<0.14			
4/25/2018					<0.14	<0.14
8/7/2018	<0.14			<0.14		
8/8/2018		<0.14	<0.14		<0.14	0.3 (J)
10/24/2018	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
4/1/2019	<0.14		<0.14	<0.14		
4/2/2019		<0.14				0.48 (J)
4/3/2019					<0.14	
10/7/2019	<0.14	<0.14	<0.14	<0.14		
10/9/2019					<0.14	<0.14

Within Limit

Total Radium

Interwell Parametric



Background Data Summary: Mean=0.826, Std. Dev.=0.5325, n=28. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9284, critical = 0.896. Kappa = 2.075 (c=13, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.001013. Comparing 4 points to limit.

Prediction Limit Analysis Run 1/24/2020 10:58 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

Prediction Limit

Constituent: Total Radium (pCi/L) Analysis Run 1/24/2020 11:19 AM View: PP

Columbia Energy Center Client: SCS Engineers Data: Input -191203

	MW-301 (bg)	MW-303	MW-304	MW-305	MW-4R	MW-84A (bg)
12/21/2015		1.65	1.03	0.253		
12/22/2015	1.31				0.771	0.593
4/4/2016		0.56	0.474	0.0515	0.247	
4/5/2016	1.11					0.0809
7/7/2016			2.24		1.74	
7/8/2016	0.89			1.43		
7/28/2016		0.591				1.37
10/12/2016		0.0851			0.549	
10/13/2016	0.631		0.885	0.99		0.825
12/29/2016	1.01					0.404
1/25/2017	2.42			0.838	1.7	1.39
1/26/2017		1.24	1.25			
4/10/2017		0.016	0.74			
4/11/2017	1.35				1.21	0.0929
6/5/2017			1.88	0.839	0.936	
6/6/2017	1.3	2.41				0.676
8/7/2017				0.103		
8/8/2017	1.74	0.795	0.777			0.509
8/9/2017					0.689	
4/23/2018				0.353	0.741	
4/24/2018		0.5	0.94			
4/25/2018	0.882					0.526
8/7/2018				0.717	0.48	
8/8/2018	0.0351	0.237	0.474			0.529
10/24/2018	0.652	0.744	0.678	0.924	0.33	0.62
4/1/2019		0.677		0.799	0.76	
4/2/2019	0.552		0.911			
4/3/2019						0.681
10/7/2019		0.422	0.443	0.727	0.244	
10/9/2019	0.701					0.247

Data | Output | Trend Test | Control Cht | **Prediction Lim** | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

☑ Test for Normality using Shapiro-Wilk/Francia at Alpha = 0.01

☑ Use Non-Parametric Test when Non-Detects Percent > 50

Use Aitchison's Adjustment when Non-Detects Percent > 15

☐ Optional Further Refinement: Use _____ when NDs % > 50

☐ Use Poisson Prediction Limit when Non-Detects Percent > 0

Transformation

- ○ Use Ladder of Powers
- ◉ Natural Log or No Transformation
- ○ Never Transform
- ○ Use Specific Transformation: Natural Log

☐ Use Best W Statistic

☐ Plot Transformed Values

Deseasonalize (Intra- and InterWell)

- ◉ If Seasonality Is Detected
- ○ If Seasonality Is Detected Or Insufficient to Test
- ○ Always (When Sufficient Data)
- ○ Never

☐ Always Use Non-Parametric

Facility α

Statistical Evaluations per Year: 2

Constituents Analyzed: 13

Downgradient (Compliance) Wells: 4

Sampling Plan

Comparing Individual Observations

- ○ 1 of 1
- ◉ 1 of 2
- ○ 1 of 3
- ○ 1 of 4
- ○ 2 of 4 ("Modified California")

IntraWell Other

☐ Stop if Background Trend Detected at Alpha = 0.05

☑ Plot Background Data

Override Standard Deviation: _____

Override DF: _____ Override Kappa: _____

☐ Automatically Remove Background Outliers

☐ 2-Tailed Test Mode...

☐ Show Deselected Data Lighter

Non-Parametric Limit = Highest Background Value

Non-Parametric Limit when 100% Non-Detects:

- ○ Highest/Second Highest Background Value
- ◉ Most Recent PQL if available, or MDL
- ○ Most Recent Background Value (subst. method)