

2020 Annual Groundwater Monitoring and Corrective Action Report

Secondary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:



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SCS ENGINEERS

25221067.00 | June 22, 2021

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OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Secondary Ash Pond 2020 Annual Report

In accordance with §257.90(e)(6), this section at the beginning of the annual report provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR units. Supporting information is provided in the text of the annual report.

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Monitoring Status – End of Year	(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Statistically Significant Increases (SSIs)	(iii) If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to §257.94(e):	
	(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and	<u>February 2020</u> Boron: MW-306, MW-307, MW-308 Chloride: MW-307 <u>May 2020</u> Same as February <u>October 2020</u> Same as February and May
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	January 13, 2020

Category	Rule Requirement	Site Status
Statistically Significant Levels (SSL) Above Groundwater Protection Standard	(iv) If it was determined that there was a statistically significant level above the groundwater protection standard (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;	None
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Not applicable – No SSLs above GPSs
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	Not applicable – ACM not required
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Not applicable – ACM not required
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not applicable – Selection of remedy not required
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable – Selection of remedy not required

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1.0 INTRODUCTION

This 2020 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.100 and 40 CFR 257.90(e) for inactive CCR surface impoundments. The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR unit.

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

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

- COL Secondary Ash Pond (inactive surface impoundment)

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

Other CCR units at the COL facility include the COL Primary Ash Pond and Dry Ash Disposal Facility (Modules 1-4). Annual groundwater monitoring and corrective action reports for these existing CCR units are submitted separately on January 31 of each year in accordance with 40 CFR 257.90(e).

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 Secondary 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-306, MW-307, and MW-308, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously-installed monitoring well MW-84A show silty sand and sand as the primary unconsolidated materials at these locations. The boring logs for the Secondary Ash Pond CCR monitoring wells are provided in **Appendix C**. All CCR monitoring wells are screened within the unconsolidated sand unit. The groundwater monitoring network and sample summary are provided in **Tables 1** and **Table 2**, respectfully.

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

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 three downgradient monitoring Wells. The background wells include MW-84A and MW-301. The background wells are shared with other CCR units at COL. The downgradient wells include MW-306, MW-307, and MW-308. The CCR Rule wells are installed in the surficial sand aquifer. Well depths range from approximately 26.4 to 37 feet, measured from the top of the well casing.

3.0 §257.100(E)(5) GROUNDWATER MONITORING AND CORRECTIVE ACTION FOR INACTIVE CCR SURFACE IMPOUNDMENTS

The owner or operator of the inactive CCR surface impoundment must: (i) No later than April 17, 2020, comply with groundwater monitoring requirements set forth in §§ 257.90(b) and 257.94(b); and (ii) No later than August 1, 2020, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

This report is submitted to fulfill the report requirement.

4.0 §257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. 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, and 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:

4.1 §257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A map of the location of the site is provided as **Figure 1**. A map showing the inactive COL Secondary Ash Pond 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**.

4.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

No new monitoring wells were installed, and no wells were decommissioned as part of the groundwater monitoring program for the CCR unit in 2020.

4.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

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

Three groundwater sampling events were completed for the inactive COL Secondary Ash Pond in 2020. The second assessment monitoring round was completed in February 2020 and the established semiannual sampling for the site was followed and sampling occurred in May 2020 and October 2020. As described in **Section 4.4**, the site transitioned to an assessment monitoring program in 2019. The first round of assessment monitoring sampling was completed in December 2019.

The sampling results for Appendix III and Appendix IV parameters in 2020 are summarized in **Table 5**. Field parameter results for the 2020 sampling events are provided in **Table 6**. The analytical laboratory reports for 2020 are provided in **Appendix C**. Historical results for each monitoring well are summarized in **Appendix D**.

4.4 §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);

Assessment monitoring for the COL Secondary Ash Pond was initiated in January 2020 in response to statistically significant increases (SSIs) in detection monitoring constituents identified at downgradient wells. SSIs were identified for boron, chloride, and sulfate at one or more wells based on the April 2019 detection monitoring event. Wisconsin Power and Light Company (WPL) collected

the first round of assessment monitoring samples in December 2019 and established an assessment monitoring program on January 13, 2020, in accordance with §257.95(b).

The initial evaluation of assessment groundwater monitoring performed at COL Secondary Ash Pond included the December 2019, February 2020, and April 2020 results and was completed in July 2020. Evaluation of the October 2020 results was completed in January 2021.

No Appendix IV parameters were detected at statistically significant levels (SSLs) above the groundwater protection standards (GPSs) in 2020. None of the individual results in 2020 exceeded the GPS values; therefore, statistical evaluation of the significance of levels above the GPS was not required. Based on the results of the assessment monitoring conducted in 2020, WPL will continue assessment monitoring in accordance with 40 CFR 257.95(f).

For comparison of the assessment monitoring results to background concentrations, upper prediction limits (UPLs) for detection and assessment monitoring parameters were calculated based on a 1-of-2 resampling approach. In January 2021, the UPLs for Appendix III and Appendix IV parameters were updated to include background monitoring well data collected through October 2020. The UPL update analysis is provided in **Attachment E**. Concentrations of several Appendix IV parameters continue to exceed background concentrations, therefore the CCR unit must remain in assessment monitoring.

4.5 §257.90(E)(5) OTHER REQUIREMENTS

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

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in *italics*, followed by applicable information relative to the 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR unit.

4.5.1 §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 after transitioning from detection monitoring in January 2020.

Summary of Key Actions Completed.

- Establishment of the assessment monitoring program (January 13, 2020)
- Completion of the second assessment monitoring event (February 2020)
- Transmittal of the results for the February 2020 assessment monitoring event (April 28, 2020)

- Initial statistical evaluation of assessment groundwater monitoring for the sampling events in December 2019, February 2020, and April 2020 (July 15, 2020)
- Two semiannual groundwater sampling and analysis events (April and October 2020)

Description of Any Problems Encountered. No problems were encountered in 2020.

Discussion of Actions to Resolve the Problems. Not applicable.

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

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the October 2020 monitoring events (by January 15, 2021)
- Two Semiannual Groundwater Sampling and Analysis Events (April and October 2021)
- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the April 2021 monitoring events (by July 15, 2021)

4.5.2 §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 COL Secondary Ash Pond is no longer in detection monitoring.

4.5.3 §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 COL Secondary Ash Pond is no longer in detection monitoring.

4.5.4 §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, and no alternative assessment monitoring frequency has been proposed at this time.

4.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards

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

The 2020 assessment monitoring results, background UPLs, and GPSs established for the site are provided in **Tables 5A** and **5B**. The laboratory reports are provided in **Appendix C**. Historical monitoring results are summarized in **Appendix D**.

4.5.6 §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 for assessment monitoring was completed in 2020.

4.5.7 §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.

4.6 §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.

5.0 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.

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 CCR Rule Groundwater Samples Summary
- 3 Groundwater Elevation
- 4 Horizontal Gradients and Flow Velocity
- 5A 2020 Groundwater Analytical Results Summary
- 5B Groundwater Analytical Results Summary –
Assessment Monitoring
- 6 2020 Groundwater Field Data Summary

**Table 1. Groundwater Monitoring Well Network
Columbia Energy Center Secondary 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-306	Downgradient	Compliance
MW-307	Downgradient	Compliance
MW-308	Downgradient	Compliance

Created by: RM
 Last revision by: RM
 Checked by: NDK

Date: 12/14/2020
 Date: 1/31/2021
 Date: 2/8/2021

07/01/2021 - Classification: Internal - ECRM12626135

**Table 2. CCR Rule Groundwater Samples Summary
Columbia Energy Center Secondary Pond / SCS Engineers Project #25221067.00**

Sample Dates	Compliance Wells			Background Wells	
	MW-306	MW-307	MW-308	MW-84A	MW-301
02/03/20	A	A	A	A	A
5/27-28/20	A	A	A	A	A
10/7-8/20	A	A	A	A	A
Total Samples	3	3	3	3	3

Abbreviations:

A = Assessment Monitoring Program

Created by:	<u>ACW</u>	Date:	<u>11/18/2019</u>
Last revision by:	<u>RM</u>	Date:	<u>1/31/2021</u>
Checked by:	<u>NDK</u>	Date:	<u>2/8/2021</u>

Table 3. Groundwater Elevation
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
	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
Screen Length (ft)																
Total Depth (ft from top of casing)	44.40	39.58	25.97	31.08	57.50	35.43	56.95	31.80	25.42	40.21	52.02	45.43	32.90	52.38	28.94	51.75
Top of Well Screen Elevation (ft)	778.15	780.16	779.47	777.21	750.89	770.52	749.10	781.24	782.54	774.07	762.24	779.36	776.13	756.07	779.53	756.66
Measurement Date																
October 2, 2012	783.41	783.70	784.96	782.38	782.23	783.03	782.99	782.66	dry	783.84	783.94	783.81	784.09	783.90	784.49	784.06
April 15, 2013	785.44	784.02	786.09	784.16	784.14	784.74	784.79	783.87	784.49	785.83	785.76	785.22	785.14	785.01	785.75	785.34
October 8, 2013													785.66	785.42	785.97	785.52
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 ⁽⁴⁾	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
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
Top of Casing Elevation (feet amsl)	788.23	806.10	809.62	809.50	828.86	828.84	786.29	815.48	814.21	791.55	792.90	792.06	795.25	808.60	805.36
Screen Length (ft)															
Total Depth (ft from top of casing)	16.90	25.55	34.80	76.07	51.88	75.80	14.40	38.50	37.85	37.37	18.96	--	--	--	--
Top of Well Screen Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94	--	--	--	--
Measurement Date															
October 2, 2012	780.13	786.76	781.49	781.34	782.03	781.93	780.58	779.88	781.91	780.95	780.55	789.14	793.85	dry	dry
April 15, 2013	785.16	788.39	783.97	784.00	783.77	783.78	784.69	783.66	784.09	784.75	785.02	789.5 ⁽¹⁾	NM	dry	dry
October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36	789.5 ⁽¹⁾	791.33	dry	dry
October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	NM	NM	NM	NM	NM	NM	NM
April 14, 2014	786.04	788.96	783.57	783.68	783.56	783.57	785.51	783.41	783.73	785.25	785.87	788.90	dry	dry	dry
October 1-3, 2014	781.16	787.55	783.42	783.32	784.05	783.94	782.32	783.55	783.79	782.63	783.03	NM	dry	dry	dry
April 13-14, 2015	783.08	786.83	782.77	782.68	782.80	782.82	782.81	782.83	782.93	783.34	783.42	789.3	791.70	dry	dry
October 6-7, 2015	780.66	786.12	782.97	782.81	783.10	783.01	781.82	783.25	783.18	781.95	782.26	788.48	791.58	dry	dry
April 4-6, 2016	784.21	789.09	785.27	785.27	784.79	784.76	783.21	784.97	785.68	785.02	784.36	NM	793.40	dry	dry
October 11-13, 2016	781.88	787.88	785.75	785.52	785.73	785.61	783.12	786.51	786.16	783.75	784.09	788.32	792.52	dry	dry
April 10-13, 2017	782.94	787.95	785.44	785.20	785.82	785.69	782.77	786.09	785.95	784.29	784.09	788.31	793.85	dry	dry
October 3-5, 2017	780.93	787.04	783.35	783.18	784.30	784.19	782.37	784.23	783.89	782.48	782.61	788.3	793.45	dry	dry
April 23-25, 2018	782.89	790.43	782.86	782.87	783.14	783.09	783.04	783.02	783.23	783.26	783.45	788.38	>795.25	dry	dry
October 23-25, 2018	782.95	788.47	787.12	786.88	787.12	786.99	783.48	787.73	787.49	784.90	784.52	787.76	793.25	dry	dry
April 1-4, 2019	785.68	789.44	786.28	786.31	786.56	786.45	785.27	787.39	786.53	786.33	785.46	--	794.60	dry	dry
October 7-9, 2019	785.33	790.65	787.10	787.02	786.68	786.65	785.29	786.68	787.07	786.01	785.42	748.48	795.20	dry	dry
May 27-29, 2020	781.80	787.73	785.12	784.92	785.74	785.59	783.11	785.89	785.60	783.41	783.89	748.48	>795.25	dry	dry
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
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	--	--	--	--

07/01/2021 - Classification: Internal - ECRM12626135

Table 3. Groundwater Elevation
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	--	--	--	--	--	--
April 4-5, 2016	786.78	785.81	785.48	788.08	789.61	789.09	785.29	785.63	786.37	--	--	--	--	--	--
July 7-8, 2016	786.31	786.28	784.60	787.36	789.26	787.43	785.19	785.05	785.89	--	--	--	--	--	--
July 28, 2016	NM	NM	784.35	NM	NM	NM	NM	784.86	785.61	--	--	--	--	--	--
October 11-13, 2016	787.64	787.76	786.18	788.18	789.78	787.88	787.36	786.45	787.22	--	--	--	--	--	--
December 29, 2016	787.37	787.05	NM	NM	NM	NM	785.66	785.72	786.63	--	--	--	--	--	--
January 25-26, 2017	787.27	786.89	785.28	789.34	789.36	789.64	785.88	785.98	786.70	785.50	785.36	785.73	--	--	--
April 10 & 11, 2017	787.89	787.55	786.00	788.22	789.57	787.95	786.39	786.30	787.16	786.22	785.64	786.51	--	--	--
June 6, 2017	788.25	788.37	786.49	788.58	789.79	787.83	787.27	786.66	787.63	786.85	786.07	786.46	--	--	--
August 7-9, 2017	787.34	787.55	785.42	789.52	789.30	788.54	786.11	785.81	786.68	785.69	785.19	785.37	--	--	--
October 23-24, 2017	785.89	785.94	783.92	788.97	788.14	788.00	784.13	784.50	785.32	783.97	784.79	784.17	--	--	--
February 21, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02
March 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00
April 23-25, 2018	785.29	784.37	783.27	789.69	787.67	790.43	783.09	781.77	785.88	783.24	783.65	782.65	783.07	782.97	781.83
May 24, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97
June 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47
July 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55
August 7, 2018	787.06	NM	785.20	788.25	788.56	787.63	NM	NM	786.55	NM	NM	NM	NM	NM	NM
August 22, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46
September 21, 2018	NM	788.37	786.50	NM	NM	NM	787.90	787.01	NM	NM	NM	NM	787.08	787.24	787.66
October 22-24, 2018	788.98	789.16	787.51	789.05	790.04	788.47	788.77	787.88	788.32	787.66	786.57	787.81	787.99	788.18	788.64
April 1-4, 2019	787.04	787.56	786.52	789.72	790.07	789.44	786.63	786.82	787.35	786.72	786.71	787.53	786.30	786.38	786.38
June 12, 2019	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.25	NM
June 19, 2019	NM	NM	786.81	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
October 7-9, 2019	788.47	788.31	787.02	790.41	790.36	790.65	NM	NM	NM	787.47	786.99	787.18	787.26	787.94	787.64
December 13, 2019	--	--	--	--	--	--	--	--	--	787.03	785.68	786.43	--	--	--
December 23, 2019	--	--	--	--	--	--	--	--	--	--	--	--	--	775.22	--
January 17, 2020	--	--	785.58	--	--	--	--	--	--	--	--	--	--	--	--
February 3, 2020	787.24	NM	NM	NM	NM	NM	NM	NM	786.50	785.77	785.57	786.48	NM	NM	NM
May 27-29, 2020	787.77	787.29	785.56	789.30	787.78	787.73	786.01	785.98	787.02	785.77	785.35	786.28	785.98	785.81	785.85
June 30, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM
August 6, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM
October 7-8, 2020	786.53	786.74	785.16	788.52	787.96	787.74	785.91	785.70	786.10	785.39	784.71	785.68	785.47	785.56	785.83
December 11, 2020	--	--	--	--	788.19	--	--	--	--	--	--	--	785.26	785.26	--
Bottom of Well Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	780.63	780.39	778.90	775.60	775.21	773.55

Notes:
 NM = not measured

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

- (1) The elevation for SG-1 is read off of the staff gauge (rather than measured from the top of the gauge).
- (2) SG-2 could not be located during the April 2013 event.
- (3) SG-3 could not be located during the October 2013 event. SG-1 could not be safely accessed during the October 2013 event.
- (4) 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.

07/01/2021 - Classification: Internal - ECRM12626135

**Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - Secondary Pond /
SCS Engineers Project #25221067.00**

East					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
5/27-29/2020	787.00	783.11	335.55	0.012	0.14
10/7-8/2020	787.00	782.83	346.69	0.012	0.15

Southwest					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
5/27-29/2020	787.00	785.56	488.60	0.003	0.04
10/7-8/2020	787.00	785.16	526.50	0.003	0.04

Wells	K Values (cm/sec)	K Values (ft/d)	Assumed Porosity, n
MW-306	4.36E-03	12	
MW-307	1.74E-03	4.9	
MW-308	7.03E-04	2.0	
Geometric Mean	1.75E-03	5.0	0.40

Groundwater flow velocity equation: $V = [K*(\Delta h/\Delta l)] / n$

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:	<u>RM</u>	Date:	<u>12/29/2020</u>
Last revision by:	<u>RM</u>	Date:	<u>2/8/2021</u>
Checked by:	<u>NDK</u>	Date:	<u>2/8/2021</u>

**Table 5A. 2020 Groundwater Analytical Results Summary
Columbia Secondary Pond January - September 2020 / SCS Engineers Project #25221067.00**

Parameter Name	UPL Method	UPL	GPS	Background Wells				Compliance Wells					
				MW-84A		MW-301		MW-306		MW-307		MW-308	
				2/3/2020	5/29/2020	2/3/2020	5/29/2020	2/3/2020	5/28/2020	2/3/2020	5/27/2020	2/3/2020	5/27/2020
Appendix III													
Boron, µg/L	P	37.4		15.7	10.0	27.9	21.3	120	108	246	231	606	476
Calcium, µg/L	NP	138,400		72,700	77,600	113,000	112,000	81900	84,600	72600	77,800	124000	132,000
Chloride, mg/L	P	6.52		3.7	3.7	1.3 J	2.0 J	0.88 J	0.76 J	13.8	12.9	1.5 J	1.2 J
Fluoride, mg/L	NP*	0.3		--	<0.095	--	<0.095	--	<0.095	--	<0.095	--	<0.095
Field pH, Std. Units	P	7.93		7.51	7.34	6.89	6.73	7.08	6.97	7.19	7.07	7.29	7.1
Sulfate, mg/L	P	37.1		<2.2	1.5 J	7.2	11.5	7.2	6.9	15.3	13.2	<2.2	2.8
Total Dissolved Solids, mg/L	NP	514		316	340	462	452	310	306	340	356	468	510
Appendix IV													
		UPL	GPS										
Antimony, ug/L	NP*	0.4	6	--	<0.15	--	<0.15	--	<0.15	--	<0.15	--	<0.15
Arsenic, ug/L	NP*	0.44	10	0.38 J	0.34 J	<0.28	0.33 J	<0.28	<0.28	1.7	0.76 J	3.6	3.1
Barium, ug/L	P	17.9	2000	14.0	13.9	10.9	9.8	10.2	9.7	13.5	13.7	55.6	59.1
Beryllium, ug/L	NP*	0.19	4	--	<0.25	--	<0.25	--	<0.25	--	<0.25	--	<0.25
Cadmium, ug/L	NP*	0.32	5	--	<0.15	--	<0.15	--	<0.15	--	<0.15	--	<0.15
Chromium, ug/L	NP	2.5	100	1.6 J	1.7 J	<1.0	<1.0	2.1 J	2.1 J	<1.0	<1.0	<1.0	<1.0
Cobalt, ug/L	NP*	0.40	6	<0.12	<0.12	0.17 J	<0.12	<0.12	<0.12	1.0	0.55 J	<0.12	<0.12
Fluoride, mg/L	NP*	0.3	4	--	<0.095	--	<0.095	--	<0.095	--	<0.095	--	<0.095
Lead, ug/L	NP*	0.48	15	--	<0.24	--	<0.24	--	<0.24	--	<0.24	--	<0.24
Lithium, ug/L	P*	0.88	40	0.58 J	0.4 J	0.67 J	0.47 J	3.1	2.7	0.53 J	<0.22	0.35 J	<0.22
Mercury, ug/L	DQ	DQ	2	--	<0.084	--	<0.084	--	<0.084	--	<0.084	--	<0.084
Molybdenum, ug/L	NP*	0.38	100	<0.44	<0.44	<0.44	<0.44	6.1	6.5	1.2 J	0.7 J	1.2 J	0.9 J
Selenium, ug/L	NP*	0.39	50	<0.32	<0.32	<0.32	<0.32	0.81 J	0.85 J	0.78 J	<0.32	<0.32	<0.32
Thallium, ug/L	NP*	0.48	2	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.65 J	<0.14	<0.14	<0.14
Radium 226/228 Combined, pCi/L	P	2.35	5	0.1000	0.395	0.502	0.193	0.759	0.49	0.706	0.309	0.257	0.569

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

 Yellow shaded cell indicates the compliance well result exceed the GPS.

Abbreviations:

UPL = Upper Prediction Limit
mg/L = milligrams per liter

GPS = Groundwater Protection Standard
µg/L = micrograms per liter

LOD = Limit of Detection SSI = Statistically Significant Increase
LOQ = Limit of Quantitation

P = Parametric UPL with 1-of-2 retesting

NP = Nonparametric UPL (highest background value) with 1-of-2- retesting

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

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

DQ = Double Quantification Rule (not detected in background)

Table 5A. 2020 Groundwater Analytical Results Summary
Columbia Secondary Pond January - September 2020 / SCS Engineers Project #25221067.00

Notes:



1. An individual result above the UPL or GPS does not constitute an 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.

Created by: <u>NDK</u>	Date: <u>5/16/2019</u>
Last revision by: <u>NDK</u>	Date: <u>5/28/2021</u>
Checked by: <u>RM</u>	Date: <u>5/28/2021</u>
Proj Mgr QA/QC: <u>TK</u>	Date: <u>6/1/2021</u>

I:\25220067.00\Deliverables\2020 Fed Annual Report - COL Sec Pond\Tables\[Table 5A - COL SP CCR GW Screening Summary_2020.xlsx]Table 5 - 2020 Analytical

**Table 5B. Groundwater Analytical Results Summary - Assessment Monitoring
Columbia Secondary Pond - October 2020 / SCS Engineers Project #25220067.00**

Parameter Name	UPL Method	UPL		Background Wells		Compliance Wells		
				MW-84A	MW-301	MW-306	MW-307	MW-308
				10/8/2020	10/8/2020	10/7/2020	10/8/2020	10/7/2020
Appendix III								
Boron, µg/L	P	35		9.7 J	28.8	108	307	563
Calcium, µg/L	NP	129,000		69,200	93,000	77,900	67,800	123,000
Chloride, mg/L	P	6.02		4.3	3.4 J	0.63 J	12.1	1.1 J
Fluoride, mg/L	DQ	DQ		<0.095	<0.095	<0.095	<0.48	0.12 J
Field pH, Std. Units	P	7.76		7.49	6.95	7.25	7.28	7.09
Sulfate, mg/L	P	30.8		1.3 J	25.1	8.4	10.3	0.52 J
Total Dissolved Solids, mg/L	NP	514		320	412	322	334	490
Appendix IV								
		UPL	GPS					
Antimony, µg/L	NP*	0.4	6	<0.15	0.33 J	--	--	--
Arsenic, µg/L	P*	0.507	10	0.49 J	0.62 J	<0.28	2.7	3.7
Barium, µg/L	P	16.9	2000	12.6	9.4	10.5	13.8	61.5
Beryllium, µg/L	NP*	0.37	4	<0.25	<0.25	--	--	--
Cadmium, µg/L	NP*	0.32	5	<0.15	0.19 J	--	--	--
Chromium, µg/L	P*	2.36	100	1.6 J	<1.0	2.0 J	<1.0	<1.0
Cobalt, µg/L	NP*	0.38	6	<0.12	0.29 J	<0.12	0.61 J	<0.12
Fluoride, mg/L	DQ	DQ	4	<0.095	<0.095	<0.095	<0.48	0.12 J
Lead, µg/L	NP*	0.90	15	<0.24	0.25 J	--	--	--
Lithium, µg/L	P*	0.827	40	0.39 J	0.46 J	4.4	<0.22	<0.22
Mercury, µg/L	DQ	DQ	2	<0.066	<0.066	--	--	--
Molybdenum, µg/L	NP*	0.44	100	<0.44	<0.44	7.1	0.64 J	1.1 J
Selenium, µg/L	NP*	0.71	50	<0.32	<0.32	0.69 J	<0.32	<0.32
Thallium, µg/L	NP*	0.48	2	<0.14	0.30 J	--	--	--
Radium 226/228 Combined, pCi/L	P	1.76	5	0.390	0.380	0.721	0.636	1.03

 Blue shaded cell indicates the compliance well result exceeds the UPL and the LOQ.
 Yellow shaded cell indicates the compliance well result exceed the GPS.

Abbreviations:

UPL = Upper Prediction Limit
mg/L = milligrams per liter

GPS = Groundwater Protection Standard
µg/L = micrograms per liter

-- = Not Analyzed

P = Parametric UPL with 1-of-2 retesting

NP = Nonparametric UPL (highest background value) with 1-of-2- retesting

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

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

DQ = Double Quantification Rule (not detected in background)

Notes:

1. An individual result above the UPL or GPS does not constitute an 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.
4. Interwell UPLs were updated in January 2021 with background well results from December 2015 through October 2020.

Created by: NDK	Date: 5/16/2019
Last revision by: NDK	Date: 5/28/2021
Checked by: RM	Date: 5/28/2021
Proj Mgr QA/QC: TK	Date: 6/1/2021

I:\25220067.00\Deliverables\2020 Fed Annual Report - COL Sec Pond\Tables\[Table 5B -COL SP CCR Screening Summary - October 2020.xlsx]Current Event Table

Table 6. 2020 Groundwater Field Data Summary
Columbia Energy Center - Secondary Ash Pond / SCS Engineers Project #25221067.00

Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-84A	2/3/2020	786.50	10.3	7.51	8.43	618	121.5	1.23
	5/29/2020	787.02	10.6	7.34	9.81	614	135.0	2.15
	10/8/2020	786.10	11.9	7.49	9.39	610	153.2	0.00
MW-301	2/3/2020	787.24	8.5	6.89	1.07	868	132.3	1.41
	5/29/2020	787.77	8.1	6.73	2.00	797	118.7	0.00
	10/8/2020	786.53	11.0	6.95	1.22	760	183.9	0.00
MW-306	2/3/2020	785.77	9.9	7.08	8.26	588	226.5	0.65
	5/28/2020	785.77	10.2	6.97	9.08	572	227.7	0.32
	10/7/2020	785.39	13.1	7.25	7.71	565	103.8	1.29
MW-307	2/3/2020	785.57	10.0	7.19	0.07	638	-80.50	1.32
	5/27/2020	785.35	10.8	7.07	0.13	615	-26.30	0.74
	10/8/2020	784.71	14.0	7.28	0.03	644	-141.8	0.00
MW-308	2/3/2020	786.48	10.4	7.29	0.08	909	-151.7	1.52
	5/27/2020	786.28	12.1	7.10	0.21	897	-91.50	4.44
	10/7/2020	785.68	15.5	7.09	0.45	916	-123.5	0.00

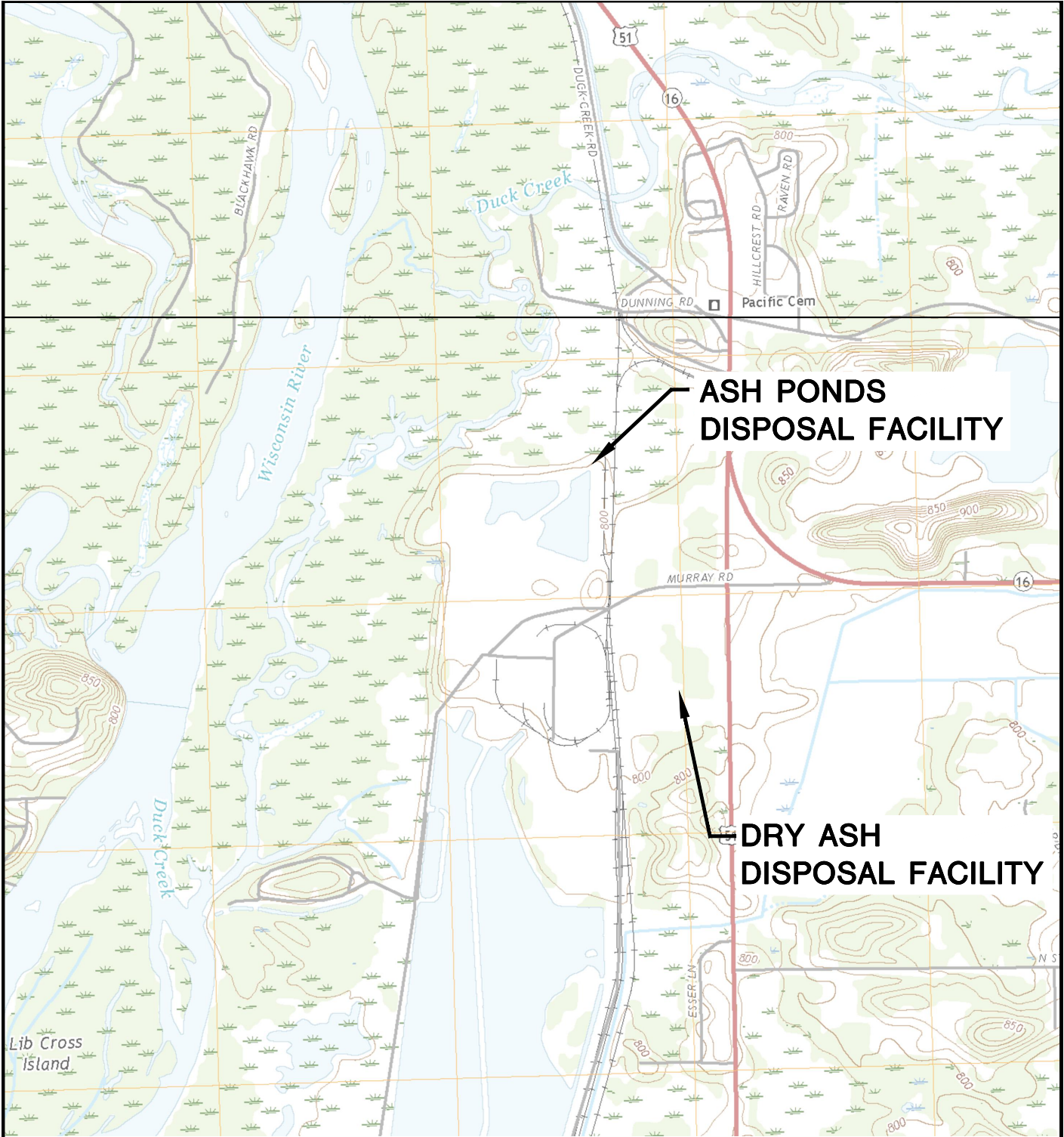
Created by: RM
 Last revision by: RM
 Checked by: NDK

Date: 12/22/2020
 Date: 2/1/2021
 Date: 2/8/2021

07/01/2021 - Classification: Internal - ECRM12626135

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map May 2020
- 4 Water Table Map October 2020

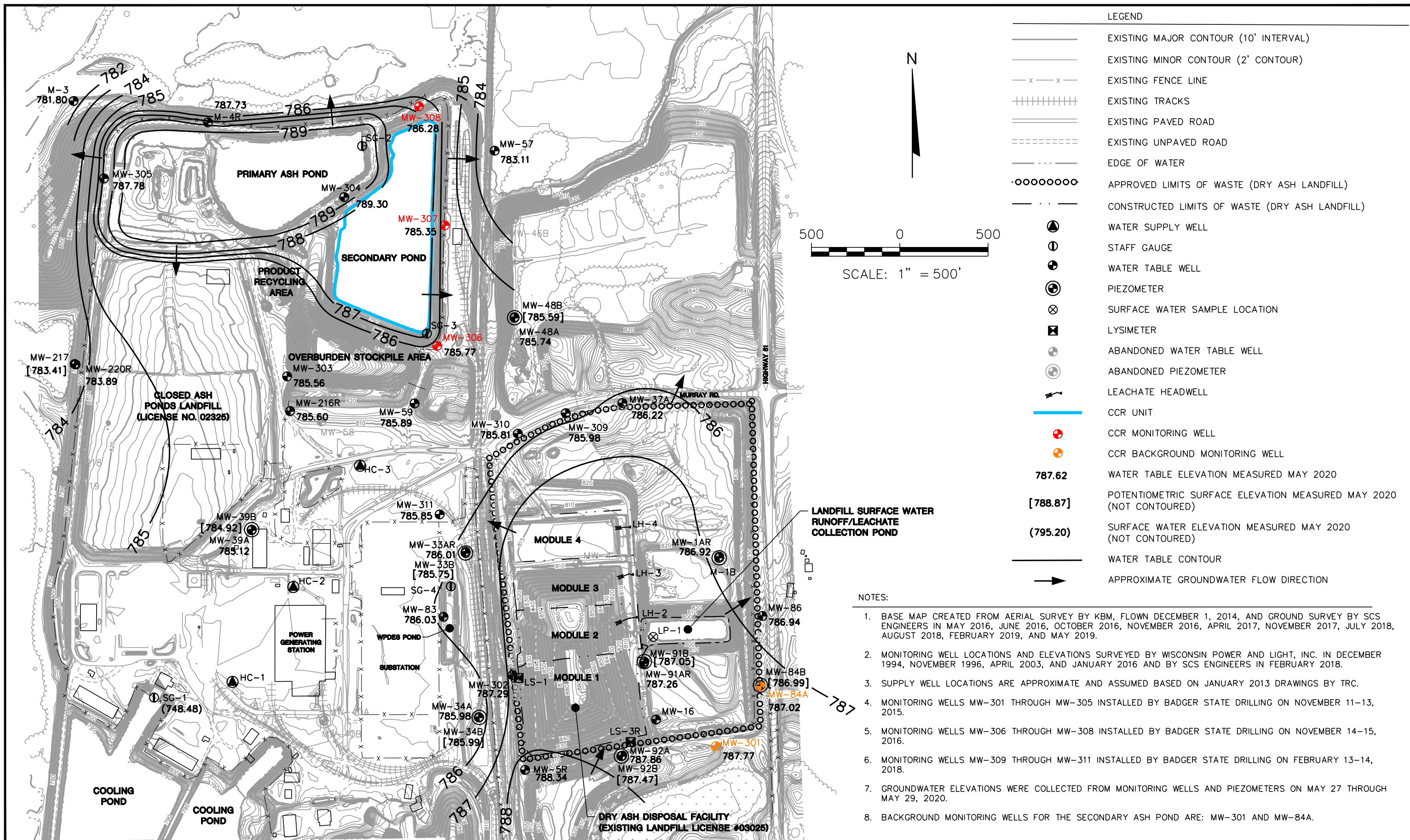


POYNETTE QUADRANGLE
 WISCONSIN-COLUMBIA CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



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

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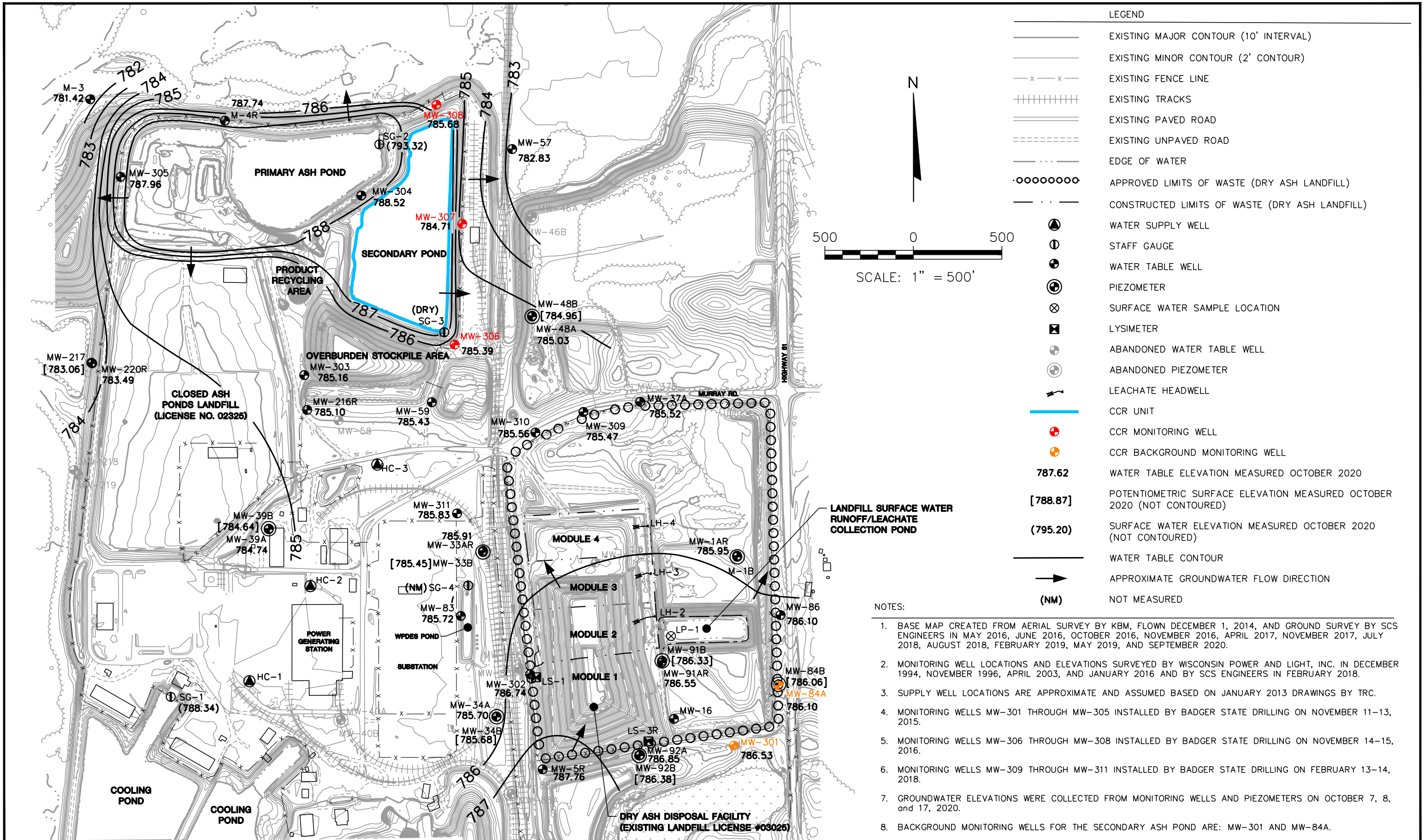


- LEGEND**
- EXISTING MAJOR CONTOUR (10' INTERVAL)
 - EXISTING MINOR CONTOUR (2' CONTOUR)
 - x - x - EXISTING FENCE LINE
 - ||||| EXISTING TRACKS
 - ==== EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - - - - - EDGE OF WATER
 - APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
 - · · · — CONSTRUCTED LIMITS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

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

PROJECT NO. 25220067.00	DRAWN BY: BSS	<p>2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830</p>	CLIENT ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954	SITE ALLIANT ENERGY COLUMBIA ENERGY CENTER SECONDARY ASH DISPOSAL FACILITY PARDEEVILLE, WI	WATER TABLE MAP MAY 2020	FIGURE
DRAWN: 08/26/2020	CHECKED BY: NDK					3
REVISED: 08/26/2020	APPROVED BY: SCC 09/25/2020					


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- LEGEND
- EXISTING MAJOR CONTOUR (10' INTERVAL)
 - EXISTING MINOR CONTOUR (2' CONTOUR)
 - EXISTING FENCE LINE
 - EXISTING TRACKS
 - EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - EDGE OF WATER
 - APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
 - CONSTRUCTED LIMITS OF WASTE (DRY ASH LANDFILL)
 - WATER SUPPLY WELL
 - STAFF GAUGE
 - WATER TABLE WELL
 - PIEZOMETER
 - SURFACE WATER SAMPLE LOCATION
 - LYSIMETER
 - ABANDONED WATER TABLE WELL
 - ABANDONED PIEZOMETER
 - LEACHATE HEADWELL
 - CCR UNIT
 - CCR MONITORING WELL
 - CCR BACKGROUND MONITORING WELL
 - 787.62 WATER TABLE ELEVATION MEASURED OCTOBER 2020
 - [788.87] POTENTIOMETRIC SURFACE ELEVATION MEASURED OCTOBER 2020 (NOT CONTOURED)
 - (795.20) SURFACE WATER ELEVATION MEASURED OCTOBER 2020 (NOT CONTOURED)
 - WATER TABLE CONTOUR
 - APPROXIMATE GROUNDWATER FLOW DIRECTION
 - (NM) NOT MEASURED
- NOTES:
1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, MAY 2019, AND SEPTEMBER 2020.
 2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND JANUARY 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
 3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
 4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11-13, 2015.
 5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14-15, 2016.
 6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
 7. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS AND PIEZOMETERS ON OCTOBER 7, 8, and 17, 2020.
 8. BACKGROUND MONITORING WELLS FOR THE SECONDARY ASH POND ARE: MW-301 AND MW-84A.

PROJECT NO. 25220067.00	DRAWN BY: KP/ZTW	<p>2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830</p>	<p>CLIENT ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954</p>	<p>SITE ALLIANT ENERGY COLUMBIA ENERGY CENTER SECONDARY ASH DISPOSAL FACILITY PARDEEVILLE, WI</p>	<p>FIGURE 4</p>
DRAWN: 08/07/2020	CHECKED BY: TK				
REVISED: 01/05/2021	APPROVED BY: TK 01/28/2021				

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Appendix A
Summary of Regional Hydrogeologic Stratigraphy

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

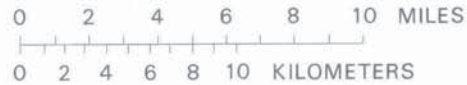
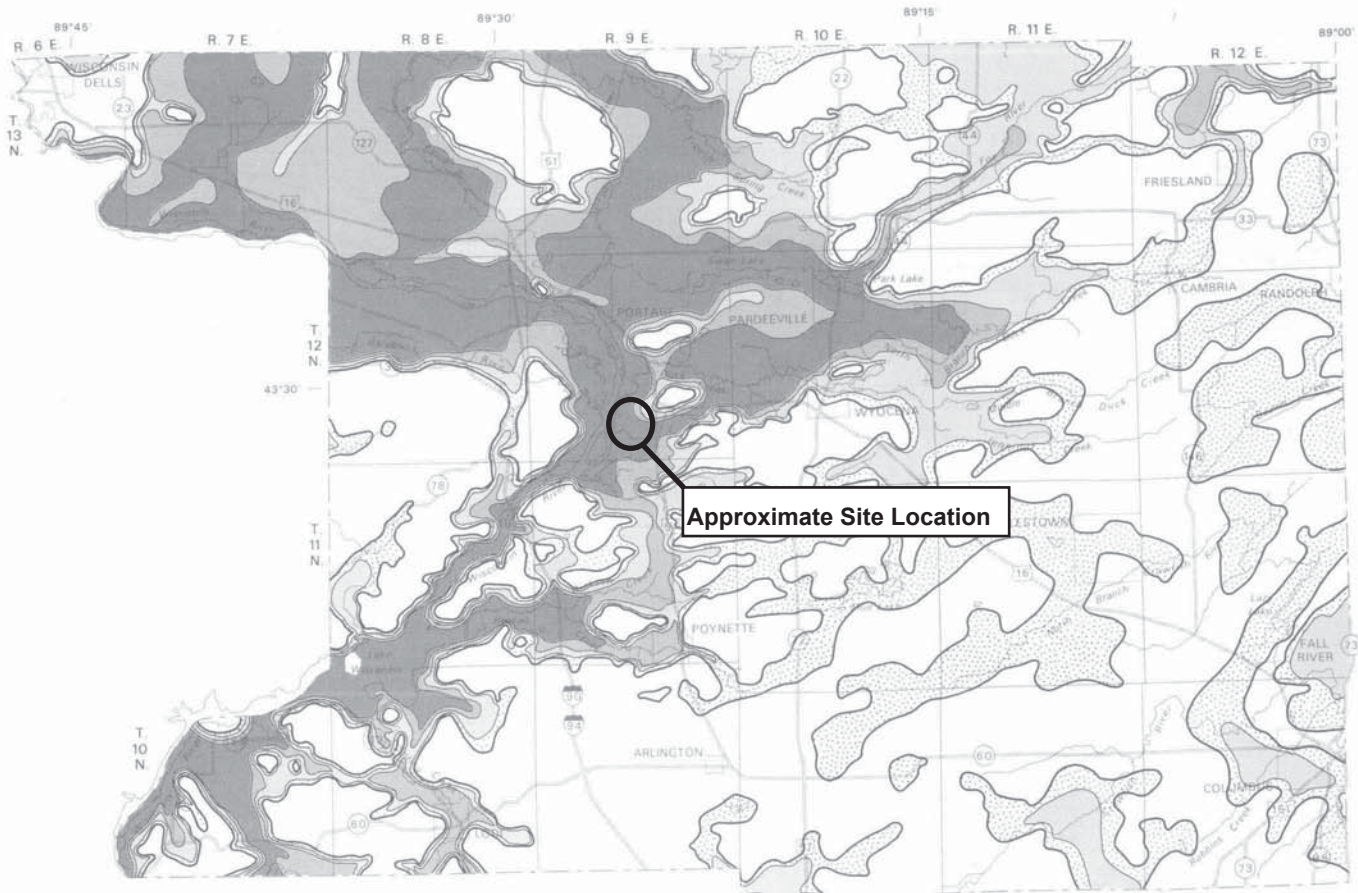
Approximate Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary (0-1 million years old)	Surficial Aquifer	0 to 300+	Holocene & Pleistocene Deposits	<ul style="list-style-type: none"> • Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic matter
Ordovician (460 to 490 million years old)	Sandstone Aquifer	0 to 800+	Galena Decorah Platteville St. Peter Prairie du Chien	<ul style="list-style-type: none"> • Dolomite and shaley dolomite • Sandstone
Cambrian (490 to 500 million years old)			Trempeleau Franconia Galesville Eau Claire Mt. Simon	<ul style="list-style-type: none"> • Sandstone
Precambrian (more than 1 billion years old)	Used for domestic supply in some areas	--	Precambrian	<ul style="list-style-type: none"> • 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.

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EXPLANATION

Probable well yields

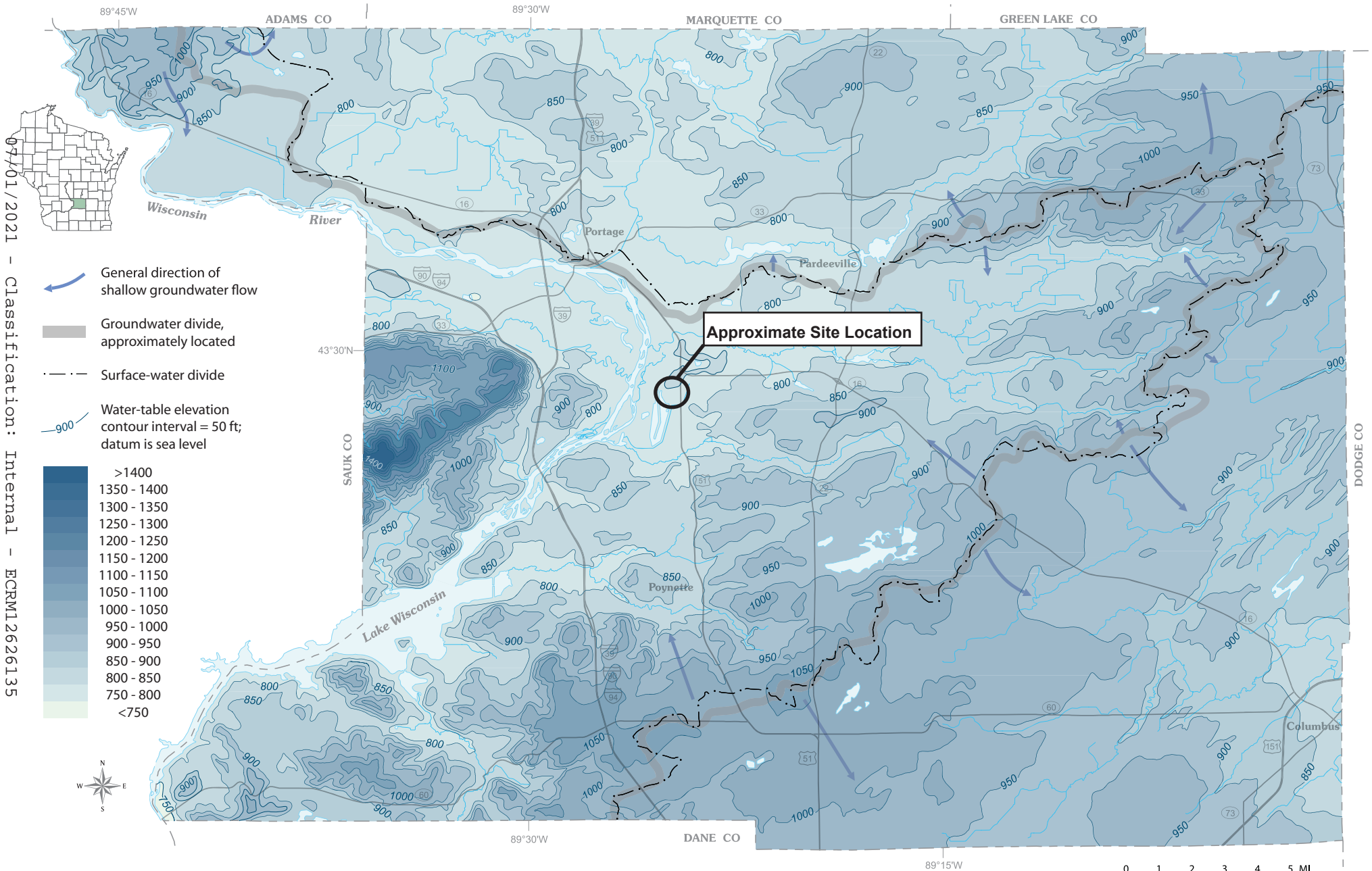
-  Chances of more than 100 gallons per minute are poor
-  Chances of 100-500 gallons per minute are good
-  Chances of 500-1000 gallons per minute are good
-  Chances of more than 1000 gallons per minute are good

Boundary of saturated sand-and-gravel aquifer


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 Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.
 07/01/2021 - Classification: Internal - ECRM12626135

Generalized water-table elevation in Columbia County, Wisconsin



07/01/2021 - Classification: Internal - ECRM12626135



Appendix B
Boring Logs and Well Construction Documentation

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				
No.	Type	Recovery		Moisture			q _c	W	LL	PL	D
		↓	↓	N	Depth						
						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

10/5/83 10/5/83

Start _____ Complete _____

Crew Chief JVS Rig B-40

Drilling Method ED 0-37'

WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

BORING NO. MW-84A

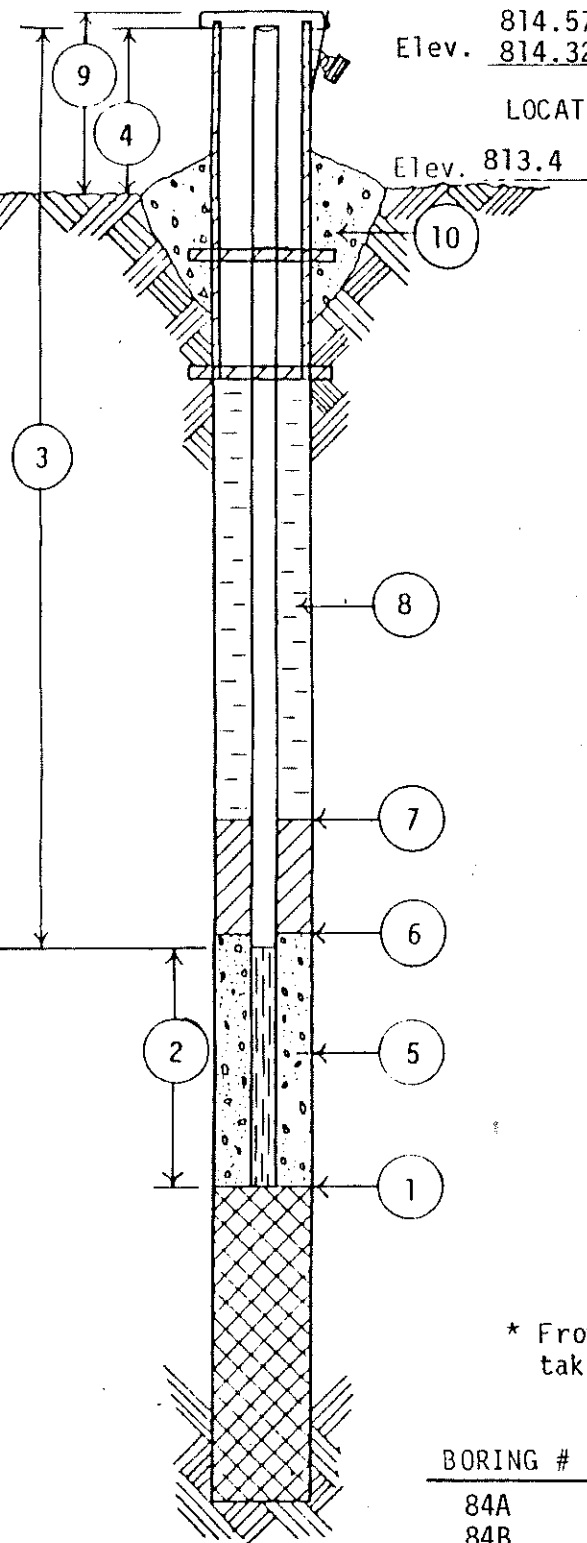
DATE 10/5/83

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"	



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. _____ ft. _____ ft. _____ ft.	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 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Kevin Duerst Badger State Drilling
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	

A. Protective pipe, top elevation	807.16 ft. MSL	1. Cap and lock?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
B. Well casing, top elevation	806.89 ft. MSL	2. Protective cover pipe:	
C. Land surface elevation	803.69 ft. MSL	a. Inside diameter:	6 in.
D. Surface seal, bottom	791.69 ft. MSL or 12 ft.	b. Length:	5 ft.
		c. Material:	Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
12. USCS classification of soil near screen:		d. Additional protection?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: bumper posts
GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>		3. Surface seal:	Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
13. Sieve analysis performed?	<input type="checkbox"/> Yes <input type="checkbox"/> No	4. Material between well casing and protective pipe:	Bentonite <input checked="" type="checkbox"/> 30 Bentonite to grade, sand above Other <input type="checkbox"/>
14. Drilling method used:	Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	5. Annular space seal:	a. Granular/Chipped Bentonite <input type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft ³ volume added for any of the above
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99		f. How installed:	Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input type="checkbox"/> 08
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		6. Bentonite seal:	a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 32 c. 4 ft ³ Other <input type="checkbox"/>
17. Source of water (attach analysis, if required):		7. Fine sand material: Manufacturer, product name & mesh size	a. RW Sidley Inc. #7 <input type="checkbox"/> b. Volume added 0.5 ft ³
E. Bentonite seal, top	803.69 ft. MSL or 0 ft.	8. Filter pack material: Manufacturer, product name & mesh size	a. RW Sidley #5 <input type="checkbox"/> b. Volume added 2 ft ³
F. Fine sand, top	791.69 ft. MSL or 12 ft.	9. Well casing:	Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
G. Filter pack, top	789.69 ft. MSL or 14 ft.	10. Screen material:	PVC
H. Screen joint, top	787.69 ft. MSL or 16 ft.	a. Screen type:	Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
I. Well bottom	777.69 ft. MSL or 26 ft.	b. Manufacturer	Johnson
J. Filter pack, bottom	776.69 ft. MSL or 27 ft.	c. Slot size:	0.01 in.
K. Borehole, bottom	775.69 ft. MSL or 28 ft.	d. Slotted length:	10 ft.
L. Borehole, diameter	8.5 in.	11. Backfill material (below filter pack):	None <input type="checkbox"/> 14 Native <input checked="" type="checkbox"/>
M. O.D. well casing	2.4 in.		
N. I.D. well casing	2.0 in.		

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

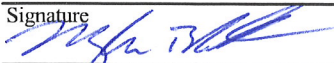
Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, 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.

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

Facility/Project Name WPL-Columbia		SCS#: 25215135.00		License/Permit/Monitoring Number		Boring Number MW-301	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State Drilling				Date Drilling Started 11/11/2015		Date Drilling Completed 11/11/2015	
WI Unique Well No. VY701		DNR Well ID No.		Common Well Name		Final Static Water Level Feet	
						Surface Elevation 803.69 Feet	
						Borehole Diameter 8.5 in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>				Local Grid Location			
State Plane 541562.2 N, 2025001.0 E S/C/N				Lat _____ ' _____ "			
1/4 of _____ 1/4 of Section 27 , T 12 N, R 9 E				Long _____ ' _____ "			
Facility ID		County Columbia		County Code 11		Civil Town/City/ or Village 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					RQD/ Comments		
									Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200			
S1	21	7 6 9 10	1 2	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.												
S2	20	6 7 9 10	3 4	Same as above except, 10YR 5/4 (top section), 10YR 3/6 (bottom section), trace gravel.												
S3	22	7 6 9 6	5 6 7	Same as above except, 10YR 3/4 (bottom), 10YR 5/4 (top), trace little roots and sticks, trace gravel.	SM											
S4	21	4 5 6 5	8 9	Same as above except, 10YR (top), 10YR 4/6 (bottom), trace clay at bottom.												
S5	18	2 2 4 5	10 11 12	Same as above except, fine to coarse grained sand, little gravel, trace clay in top half, 10YR 3/6.												
S6	20	2 3 3 3	13 14 15	Same as above except, 10YR 6/8.												

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

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

Boring Number **MW-301**

Use only as an attachment to Form 4400-122.

Page **2** of **2**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S7	20	5 4 4 3	16 17	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.	SM							M		
S8	20	2 4 4 5	18 19 20										W	
S9	23	4 4 3 6	21 22										W	
S10	21	3 2 4 10	23 24 25			Same as above except, 10YR 6/4.							W	
			26 27 28	End of boring at 28 ft bgs.										

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

Facility/Project Name Alliant-Columbia	County Name Columbia	Well Name MW-301	
Facility License, Permit or Monitoring Number	County Code 11	Wis. Unique Well Number VY701	DNR Well ID Number

1. Can this well be purged dry? Yes No
2. Well development method
- surged with bailer and bailed 4 1
 - surged with bailer and pumped 6 1
 - surged with block and bailed 4 2
 - surged with block and pumped 6 2
 - surged with block, bailed and pumped 7 0
 - compressed air 2 0
 - bailed only 1 0
 - pumped only 5 1
 - pumped slowly 5 0
 - Other
3. Time spent developing well _____ 120 min.
4. Depth of well (from top of well casing) _____ 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? Yes No
(If yes, attach results)

	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	_____ 12 / _____ 02 / _____ 2015
Time	c. _____ 08 : 30 <input checked="" type="checkbox"/> a.m. _____ p.m.	_____ 10 : 30 <input checked="" type="checkbox"/> a.m. _____ p.m.
12. Sediment in well bottom	_____ 0 . inches	_____ 0 . inches
13. Water clarity	Clear <input type="checkbox"/> 1 0 Turbid <input checked="" type="checkbox"/> 1 5 (Describe)	Clear <input checked="" type="checkbox"/> 2 0 Turbid <input type="checkbox"/> 2 5 (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: Pardeville, WI 53954

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

Signature: *[Handwritten 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.

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

Facility/Project Name WPL- Columbia		License/Permit/Monitoring Number SCS#: 25216146.00		Boring Number MW-306	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Duerst Badger State Drilling			Date Drilling Started 11/14/2016	Date Drilling Completed 11/14/2016	Drilling Method hollow stem auger
WI Unique Well No. VY812	DNR Well ID No.	Common Well Name MW-306	Final Static Water Level Feet	Surface Elevation 805.30 Feet	Borehole Diameter 8.5 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Plane 543,829 N, 2,123,424 E S/C/N SE 1/4 of NW 1/4 of Section 27, T 12 N, R 9 E			Local Grid Location Lat _____ " _____ " Long _____ " _____ " Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Columbia	County Code 11	Civil Town/City/ or Village 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					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
				TOPSOIL.											
			1	SILTY SAND, yellowish brown (10YR 5/4), medium grained.											
S1	23	8 13 11 11	4								M				
S2	16	7 5 5 5	6		SM						M				
S3	16	2 4 8 14	9								M				
S4	16	7 10 7 10	11								M				
S5	23	9 22 31 39	14	POORLY GRADED SAND, light yellowish brown (10YR 6/4), medium grained, dense.	SP						M				

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

Signature 	Firm SCS Engineers 2830 Dairy Drive Madison, WI 53711	Tel: (608) 224-2830 Fax:
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This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-306**

Use only as an attachment to Form 4400-122.

Page 2 of 2

Sample		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	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
S6	22	17 29 40 42	16 17	SILTY SAND, yellowish brown (10YR 5/4), fine to medium grained.	SP										
S7	24	26 41 47 44	18 19												
S8	20	11 25 37 46	20 21 22												
S9	24	8 19 31 44	23 24 25 26 27 28		SM										
				End of boring at 28 ft bgs.											

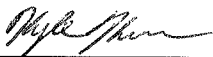
wi= 20 ft bgs.

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

Facility/Project Name WPL- Columbia SCS#: 25216146.00		License/Permit/Monitoring Number		Boring Number MW-307	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Duerst Badger State Drilling		Date Drilling Started 11/14/2016		Date Drilling Completed 11/15/2016	
WI Unique Well No. VY813		DNR Well ID No.		Common Well Name MW-307	
Final Static Water Level Feet		Surface Elevation 804.53 Feet		Borehole Diameter 8.5 in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>		State Plane 544,511 N, 2,123,467 E S/C/N		Local Grid Location	
SE 1/4 of NW 1/4 of Section 27, T 12 N, R 9 E		Lat _____ ' _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> S	
Facility ID		County Columbia		County Code 11	
				Civil Town/City/ or Village 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						RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
				TOPSOIL.											
			1	SILTY SAND, yellowish brown (10YR 5/4), medium grained.											
S1	23	55 714	4								M				
S2	22	1122 2438	7	Same as above except, pale brown (10YR 6/3).	SM						M				
S3	22	725 3340	9								M				rock in spoon.
S4	22	1418 2226	12								M				
S5	24	1218 1922	14								M				

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

Signature 	Firm SCS Engineers 2830 Dairy Drive Madison, WI 53711	Tel. (608) 224-2830 Fax:
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Boring Number **MW-307**

Use only as an attachment to Form 4400-122.

Page 2 of 2

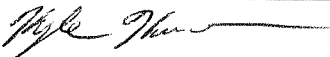
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S6	23	12 16 16 19	16 17	Same as above except, brown (10YR 4/3). Same as above except, brown (10YR 5/3). End of boring at 27.5 ft bgs.	SM				M					wl=19.5 ft bgs.
S7	24	6 8 8 6	18 19						M					
S8	20	3 4 4 4	20 21 22						W					
S9	24	2 2 6 8	23 24 25						W					
S10	24	2 3 3 7	26 27						W					

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

Facility/Project Name WPL- Columbia		SCS#: 25216146.00		License/Permit/Monitoring Number		Boring Number MW-308	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Duerst Badger State Drilling				Date Drilling Started 11/15/2016		Date Drilling Completed 11/15/2016	
WI Unique Well No. VY814		DNR Well ID No.		Common Well Name MW-308		Final Static Water Level Feet	
				Surface Elevation 804.54 Feet		Borehole Diameter 8.5 in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>				Lat _____"		Local Grid Location	
State Plane 545,184 N, 2,123,321 E S/C/N				Feet <input type="checkbox"/> N		Feet <input type="checkbox"/> E	
NE 1/4 of NW 1/4 of Section 27, T 12 N, R 9 E				Long _____"		<input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Columbia		County Code 11		Civil Town/City/ or Village 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					RQD/ Comments
										Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
				1	POORLY GRADED GRAVEL.	GP									
				2	SILTY SAND, brown (10YR 5/3), medium grained.										
	S1	23	5 17 23 25	4							M				
	S2	23	10 21 17 19	6							M				
	S3	24	10 15 18 26	9		SM					M				
	S4	24	11 23 19 23	11							M				
	S5	19	9 12 16 16	14	Same as above except, brown (10YR 4/3).						M				

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

Signature 	Firm SCS Engineers 2830 Dairy Drive Madison, WI 53711	Tel: (608) 224-2830 Fax:
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This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Facility/Project Name WPL- Columbia	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> E. <input type="checkbox"/> S. <input type="checkbox"/> W.	Well Name MW-306
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input checked="" type="checkbox"/> Lat. " Long. " or "	Wis. Unique Well No. VY812 DNR Well ID No.
Facility ID	St. Plane 543828.99 ft. N. 2123423.65 ft. E. S/C/N	Date Well Installed 11 / 14 / 2016 m m d d y y v v 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 <input checked="" type="checkbox"/> E <input checked="" type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Kevin Duerst
Distance from Waste/Source _____ ft.	Enf. Stds. Apply <input checked="" type="checkbox"/> Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number _____ Badger State Drilling

A. Protective pipe, top elevation --- 807.88 ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation --- 807.66 ft. MSL	2. Protective cover pipe: a. Inside diameter: --- 6 in. b. Length: --- 5 ft. c. Material: Steel <input checked="" type="checkbox"/> 0 4 Other <input type="checkbox"/>
C. Land surface elevation --- 805.30 ft. MSL	d. Additional protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: bumper posts
D. Surface seal, bottom --- 804.8 ft. MSL or --- 0.5 ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 3 0 Concrete <input type="checkbox"/> 0 1 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input checked="" type="checkbox"/> 3 0 Bentonite to grade, sand above Other <input type="checkbox"/>
13. Sieve analysis performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 3 3 b. ___ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 3 5 c. ___ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 3 1 d. ___ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 5 0 e. ___ Ft ³ volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 5 0 Hollow Stem Auger <input checked="" type="checkbox"/> 4 1 Other <input type="checkbox"/>	f. How installed: Tremie <input type="checkbox"/> 0 1 Tremie pumped <input type="checkbox"/> 0 2 Gravity <input checked="" type="checkbox"/> 0 8
15. Drilling fluid used: Water <input type="checkbox"/> 0 2 Air <input type="checkbox"/> 0 1 Drilling Mud <input type="checkbox"/> 0 3 None <input checked="" type="checkbox"/> 9 9	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 3 3 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 3 2 c. Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____	7. Fine sand material: Manufacturer, product name & mesh size a. RW Sidley Inc. #7 <input type="checkbox"/> b. Volume added 0.5 ft ³ <input type="checkbox"/>
17. Source of water (attach analysis, if required): _____	8. Filter pack material: Manufacturer, product name & mesh size a. RW Sidley #5 <input type="checkbox"/> b. Volume added 3 ft ³ <input type="checkbox"/>
E. Bentonite seal, top --- 804.8 ft. MSL or --- 0.5 ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 2 3 Flush threaded PVC schedule 80 <input type="checkbox"/> 2 4 Other <input type="checkbox"/>
F. Fine sand, top --- 791.3 ft. MSL or --- 14 ft.	10. Screen material: PVC a. Screen type: Factory cut <input checked="" type="checkbox"/> 1 1 Continuous slot <input type="checkbox"/> 0 1 Other <input type="checkbox"/>
G. Filter pack, top --- 790.3 ft. MSL or --- 15 ft.	b. Manufacturer Johnson c. Slot size: 0.01 in. d. Slotted length: --- 10 ft.
H. Screen joint, top --- 788.3 ft. MSL or --- 17 ft.	11. Backfill material (below filter pack): None <input type="checkbox"/> 1 4 Other <input checked="" type="checkbox"/>
I. Well bottom --- 778.3 ft. MSL or --- 27 ft.	
J. Filter pack, bottom --- 778.3 ft. MSL or --- 27 ft.	
K. Borehole, bottom --- 777.3 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.	

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

Signature *Myke M...* Firm SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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.

Facility/Project Name WPL- Columbia	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> E. <input type="checkbox"/> S. <input type="checkbox"/> W.	Well Name MW-307
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input checked="" type="checkbox"/> Lat. " Long. " or " "	Wis. Unique Well No. VY813 DNR Well ID No.
Facility ID	St. Plane 544510.95 ft. N, 2123466.6 ft. E. S/C/N	Date Well Installed 11 / 15 / 2016 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
Distance from Waste/Source _____ ft.	Enf. Stds. Apply <input checked="" type="checkbox"/> Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number Badger State Drilling

A. Protective pipe, top elevation --- 807.16 ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation --- 806.96 ft. MSL	2. Protective cover pipe: a. Inside diameter: --- 6 in. b. Length: --- 5 ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/> d. Additional protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: bumper posts
C. Land surface elevation --- 804.53 ft. MSL	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
D. Surface seal, bottom --- 804.03 ft. MSL or --- 0.5 ft.	4. Material between well casing and protective pipe: Bentonite <input checked="" type="checkbox"/> 30 Bentonite to grade, sand above Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 33 b. ___ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. ___ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. ___ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. ___ Ft ³ volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
13. Sieve analysis performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 32 c. Other <input type="checkbox"/>
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	7. Fine sand material: Manufacturer, product name & mesh size a. RW Sidley Inc. #7 <input type="checkbox"/> b. Volume added 0.5 ft ³
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	8. Filter pack material: Manufacturer, product name & mesh size a. RW Sidley #5 <input type="checkbox"/> b. Volume added 3.5 ft ³
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
17. Source of water (attach analysis, if required): _____	10. Screen material: PVC a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/> b. Manufacturer Johnson c. Slot size: 0.01 in. d. Slotted length: 10 ft.
E. Bentonite seal, top --- 804.03 ft. MSL or --- 0.5 ft.	11. Backfill material (below filter pack): None <input type="checkbox"/> 14 Other <input checked="" type="checkbox"/>
F. Fine sand, top --- 791.03 ft. MSL or --- 13.5 ft.	
G. Filter pack, top --- 790.03 ft. MSL or --- 14.5 ft.	
H. Screen joint, top --- 788.03 ft. MSL or --- 16.5 ft.	
I. Well bottom --- 778.03 ft. MSL or --- 26.5 ft.	
J. Filter pack, bottom --- 777.03 ft. MSL or --- 27.5 ft.	
K. Borehole, bottom --- 777.03 ft. MSL or --- 27.5 ft.	
L. Borehole, diameter --- 8.5 in.	
M. O.D. well casing --- 2.4 in.	
N. I.D. well casing --- 2.0 in.	

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

Signature *Wyle Thur* Firm SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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Facility/Project Name WPL- Columbia	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> E. ft. <input type="checkbox"/> S. <input type="checkbox"/> W.	Well Name MW-308
Facility License, Permit or Monitoring No.	Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input checked="" type="checkbox"/> Lat. " Long. " or " "	Wis. Unique Well No. <u>VY814</u> DNR Well ID No.
Facility ID	St. Plane <u>545183.88</u> ft. N. <u>2123320.76</u> ft. E. S/C/N	Date Well Installed <u>11</u> / <u>15</u> / <u>2016</u> m m d d y y v v y
Type of Well Well Code <u>11</u> / MW	Section Location of Waste/Source <u>NE 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 E</u>	Well Installed By: Name (first, last) and Firm <u>Kevin Duerst</u>
Distance from Waste/Source <u> </u> ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number <u> </u> Badger State Drilling
Enf. Stds. Apply <input checked="" type="checkbox"/>		

A. Protective pipe, top elevation <u>807.10</u> ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <u>806.92</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>6</u> in. b. Length: <u>5</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 0 4 Other <input type="checkbox"/> d. Additional protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: <u>bumper posts</u>
C. Land surface elevation <u>804.54</u> ft. MSL	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 3 0 Concrete <input type="checkbox"/> 0 1 Other <input type="checkbox"/>
D. Surface seal, bottom <u>804.04</u> ft. MSL or <u>0.5</u> ft.	4. Material between well casing and protective pipe: Bentonite to grade, sand above Bentonite <input checked="" type="checkbox"/> 3 0 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input checked="" type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 3 3 b. <u> </u> Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 3 5 c. <u> </u> Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 3 1 d. <u> </u> % Bentonite Bentonite-cement grout <input type="checkbox"/> 5 0 e. <u> </u> Ft ³ volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 0 1 Tremie pumped <input type="checkbox"/> 0 2 Gravity <input checked="" type="checkbox"/> 0 8
13. Sieve analysis performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 3 3 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 3 2 c. <u> </u> Other <input type="checkbox"/>
14. Drilling method used: Rotary <input type="checkbox"/> 5 0 Hollow Stem Auger <input checked="" type="checkbox"/> 4 1 Other <input type="checkbox"/>	7. Fine sand material: Manufacturer, product name & mesh size a. <u>RW Sidley Inc. #7</u> <input type="checkbox"/> b. Volume added <u>0.5</u> ft ³
15. Drilling fluid used: Water <input type="checkbox"/> 0 2 Air <input type="checkbox"/> 0 1 Drilling Mud <input type="checkbox"/> 0 3 None <input checked="" type="checkbox"/> 9 9	8. Filter pack material: Manufacturer, product name & mesh size a. <u>RW Sidley #5</u> <input type="checkbox"/> b. Volume added <u>3</u> ft ³
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <u> </u>	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 2 3 Flush threaded PVC schedule 80 <input type="checkbox"/> 2 4 Other <input type="checkbox"/>
17. Source of water (attach analysis, if required): <u> </u>	10. Screen material: <u>PVC</u> a. Screen type: Factory cut <input checked="" type="checkbox"/> 1 1 Continuous slot <input type="checkbox"/> 0 1 Other <input type="checkbox"/> b. Manufacturer <u>Johnson</u> c. Slot size: <u>0.01</u> in. d. Slotted length: <u>10</u> ft.
E. Bentonite seal, top <u>804.04</u> ft. MSL or <u>0.5</u> ft.	11. Backfill material (below filter pack): None <input type="checkbox"/> 1 4 Other <input checked="" type="checkbox"/>
F. Fine sand, top <u>789.54</u> ft. MSL or <u>15.0</u> ft.	
G. Filter pack, top <u>788.54</u> ft. MSL or <u>16.0</u> ft.	
H. Screen joint, top <u>786.54</u> ft. MSL or <u>18.0</u> ft.	
I. Well bottom <u>776.54</u> ft. MSL or <u>28.0</u> ft.	
J. Filter pack, bottom <u>775.54</u> ft. MSL or <u>29.0</u> ft.	
K. Borehole, bottom <u>775.54</u> ft. MSL or <u>29.0</u> ft.	
L. Borehole, diameter <u>8.5</u> in.	
M. O.D. well casing <u>2.4</u> in.	
N. I.D. well casing <u>2.0</u> in.	

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

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.



Appendix C
Laboratory Reports

C1 February 2020 Assessment Monitoring

April 27, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on February 05, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

Revised Report: A field data entry error has been corrected for 40202911004.

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

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

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SAMPLE SUMMARY

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40202911001	MW-306	Water	02/03/20 10:00	02/05/20 09:10
40202911002	MW-307	Water	02/03/20 12:25	02/05/20 09:10
40202911003	MW-308	Water	02/03/20 13:30	02/05/20 09:10
40202911004	MW-84A	Water	02/03/20 15:05	02/05/20 09:10
40202911005	MW-301	Water	02/03/20 16:10	02/05/20 09:10
40202911006	FIELD BLANK SC POND	Water	02/03/20 13:50	02/05/20 09:10

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
40202911001	MW-306	EPA 6020	KXS	10	PASI-G		
			HMG	7	PASI-G		
		EPA 903.1	MK1	1	PASI-PA		
			EPA 904.0	VAL	1	PASI-PA	
		Total Radium Calculation	CMC	1	PASI-PA		
		SM 2540C	TMK	1	PASI-G		
		EPA 9040	ALY	1	PASI-G		
		EPA 300.0	HMB	2	PASI-G		
		40202911002	MW-307	EPA 6020	KXS	10	PASI-G
					HMG	7	PASI-G
EPA 903.1	MK1			1	PASI-PA		
	EPA 904.0			VAL	1	PASI-PA	
Total Radium Calculation	CMC			1	PASI-PA		
SM 2540C	TMK			1	PASI-G		
EPA 9040	ALY			1	PASI-G		
EPA 300.0	HMB			2	PASI-G		
40202911003	MW-308			EPA 6020	KXS	10	PASI-G
					HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA		
			EPA 904.0	VAL	1	PASI-PA	
		Total Radium Calculation	CMC	1	PASI-PA		
		SM 2540C	TMK	1	PASI-G		
		EPA 9040	ALY	1	PASI-G		
		EPA 300.0	HMB	2	PASI-G		
		40202911004	MW-84A	EPA 6020	KXS	10	PASI-G
					HMG	7	PASI-G
EPA 903.1	MK1			1	PASI-PA		
	EPA 904.0			VAL	1	PASI-PA	
Total Radium Calculation	CMC			1	PASI-PA		
SM 2540C	TMK			1	PASI-G		
EPA 9040	ALY			1	PASI-G		
EPA 300.0	HMB			2	PASI-G		
40202911005	MW-301			EPA 6020	KXS	10	PASI-G
					HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA		
			EPA 904.0	VAL	1	PASI-PA	
		Total Radium Calculation	CMC	1	PASI-PA		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40202911006	FIELD BLANK SC POND	SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	2	PASI-G
		EPA 6020	KXS	10	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	2	PASI-G

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Sample: MW-306 **Lab ID: 40202911001** Collected: 02/03/20 10:00 Received: 02/05/20 09:10 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	02/06/20 05:22	02/06/20 15:53	7440-38-2	
Barium	10.2	ug/L	2.3	0.70	1	02/06/20 05:22	02/06/20 15:53	7440-39-3	
Boron	120	ug/L	10.0	3.0	1	02/06/20 05:22	02/06/20 15:53	7440-42-8	
Calcium	81900	ug/L	2540	762	10	02/06/20 05:22	02/06/20 15:13	7440-70-2	P6
Chromium	2.1J	ug/L	3.4	1.0	1	02/06/20 05:22	02/06/20 15:53	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	02/06/20 05:22	02/06/20 15:53	7440-48-4	
Lithium	3.1	ug/L	1.0	0.22	1	02/06/20 05:22	02/06/20 15:53	7439-93-2	
Molybdenum	6.1	ug/L	1.5	0.44	1	02/06/20 05:22	02/06/20 15:53	7439-98-7	
Selenium	0.81J	ug/L	1.1	0.32	1	02/06/20 05:22	02/06/20 15:53	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/06/20 05:22	02/06/20 15:53	7440-28-0	

Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.08	Std. Units			1		02/03/20 10:00		
Field Specific Conductance	588.0	umhos/cm			1		02/03/20 10:00		
Oxygen, Dissolved	8.26	mg/L			1		02/03/20 10:00	7782-44-7	
REDOX	226.5	mV			1		02/03/20 10:00		
Turbidity	0.65	NTU			1		02/03/20 10:00		
Static Water Level	785.77	feet			1		02/03/20 10:00		
Temperature, Water (C)	9.9	deg C			1		02/03/20 10:00		

2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	310	mg/L	20.0	8.7	1		02/07/20 16:30		

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		02/10/20 10:56		H6

300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	0.88J	mg/L	2.0	0.43	1		02/06/20 17:33	16887-00-6	
Sulfate	7.2	mg/L	2.0	0.44	1		02/06/20 17:33	14808-79-8	

Sample: MW-307 **Lab ID: 40202911002** Collected: 02/03/20 12:25 Received: 02/05/20 09:10 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	1.7	ug/L	1.0	0.28	1	02/06/20 05:22	02/06/20 16:21	7440-38-2	
Barium	13.5	ug/L	2.3	0.70	1	02/06/20 05:22	02/06/20 16:21	7440-39-3	
Boron	246	ug/L	10.0	3.0	1	02/06/20 05:22	02/06/20 16:21	7440-42-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Sample: MW-307 **Lab ID: 40202911002** Collected: 02/03/20 12:25 Received: 02/05/20 09:10 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							
Calcium	72600	ug/L	254	76.2	1	02/06/20 05:22	02/06/20 16:21	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	02/06/20 05:22	02/06/20 16:21	7440-47-3	
Cobalt	1.0	ug/L	1.0	0.12	1	02/06/20 05:22	02/06/20 16:21	7440-48-4	
Lithium	0.53J	ug/L	1.0	0.22	1	02/06/20 05:22	02/06/20 16:21	7439-93-2	
Molybdenum	1.2J	ug/L	1.5	0.44	1	02/06/20 05:22	02/06/20 16:21	7439-98-7	
Selenium	0.78J	ug/L	1.1	0.32	1	02/06/20 05:22	02/06/20 16:21	7782-49-2	
Thallium	0.65J	ug/L	1.0	0.14	1	02/06/20 05:22	02/06/20 16:21	7440-28-0	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.19	Std. Units			1		02/03/20 12:25		
Field Specific Conductance	638.3	umhos/cm			1		02/03/20 12:25		
Oxygen, Dissolved	0.07	mg/L			1		02/03/20 12:25	7782-44-7	
REDOX	-80.5	mV			1		02/03/20 12:25		
Turbidity	1.32	NTU			1		02/03/20 12:25		
Static Water Level	785.57	feet			1		02/03/20 12:25		
Temperature, Water (C)	10.0	deg C			1		02/03/20 12:25		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	340	mg/L	20.0	8.7	1		02/07/20 16:30		
9040 pH		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	7.2	Std. Units	0.10	0.010	1		02/10/20 10:57		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	13.8	mg/L	2.0	0.43	1		02/06/20 17:46	16887-00-6	
Sulfate	15.3	mg/L	2.0	0.44	1		02/06/20 17:46	14808-79-8	

Sample: MW-308 **Lab ID: 40202911003** Collected: 02/03/20 13:30 Received: 02/05/20 09:10 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	3.6	ug/L	1.0	0.28	1	02/06/20 05:22	02/06/20 16:34	7440-38-2	
Barium	55.6	ug/L	2.3	0.70	1	02/06/20 05:22	02/06/20 16:34	7440-39-3	
Boron	606	ug/L	10.0	3.0	1	02/06/20 05:22	02/06/20 16:34	7440-42-8	
Calcium	124000	ug/L	254	76.2	1	02/06/20 05:22	02/06/20 16:34	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	02/06/20 05:22	02/06/20 16:34	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	02/06/20 05:22	02/06/20 16:34	7440-48-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Sample: MW-308 **Lab ID: 40202911003** Collected: 02/03/20 13:30 Received: 02/05/20 09:10 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									
Lithium	0.35J	ug/L	1.0	0.22	1	02/06/20 05:22	02/06/20 16:34	7439-93-2	
Molybdenum	1.2J	ug/L	1.5	0.44	1	02/06/20 05:22	02/06/20 16:34	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	02/06/20 05:22	02/06/20 16:34	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/06/20 05:22	02/06/20 16:34	7440-28-0	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.29	Std. Units			1		02/03/20 13:30		
Field Specific Conductance	909	umhos/cm			1		02/03/20 13:30		
Oxygen, Dissolved	0.08	mg/L			1		02/03/20 13:30	7782-44-7	
REDOX	-151.7	mV			1		02/03/20 13:30		
Turbidity	1.52	NTU			1		02/03/20 13:30		
Static Water Level	786.48	feet			1		02/03/20 13:30		
Temperature, Water (C)	10.4	deg C			1		02/03/20 13:30		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	468	mg/L	20.0	8.7	1		02/07/20 16:30		
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		02/10/20 10:59		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		02/06/20 17:59	16887-00-6	
Sulfate	<2.2	mg/L	10.0	2.2	5		02/07/20 12:19	14808-79-8	D3

Sample: MW-84A **Lab ID: 40202911004** Collected: 02/03/20 15:05 Received: 02/05/20 09:10 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	0.38J	ug/L	1.0	0.28	1	02/06/20 05:22	02/06/20 16:41	7440-38-2	
Barium	14.0	ug/L	2.3	0.70	1	02/06/20 05:22	02/06/20 16:41	7440-39-3	
Boron	15.7	ug/L	10.0	3.0	1	02/06/20 05:22	02/06/20 16:41	7440-42-8	
Calcium	72700	ug/L	254	76.2	1	02/06/20 05:22	02/06/20 16:41	7440-70-2	
Chromium	1.6J	ug/L	3.4	1.0	1	02/06/20 05:22	02/06/20 16:41	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	02/06/20 05:22	02/06/20 16:41	7440-48-4	
Lithium	0.58J	ug/L	1.0	0.22	1	02/06/20 05:22	02/06/20 16:41	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	02/06/20 05:22	02/06/20 16:41	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	02/06/20 05:22	02/06/20 16:41	7782-49-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Sample: MW-84A **Lab ID: 40202911004** Collected: 02/03/20 15:05 Received: 02/05/20 09:10 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									
Thallium	<0.14	ug/L	1.0	0.14	1	02/06/20 05:22	02/06/20 16:41	7440-28-0	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.51	Std. Units			1		02/03/20 15:05		
Field Specific Conductance	618.4	umhos/cm			1		02/03/20 15:05		
Oxygen, Dissolved	8.43	mg/L			1		02/03/20 15:05	7782-44-7	
REDOX	121.5	mV			1		02/03/20 15:05		
Turbidity	1.23	NTU			1		02/03/20 15:05		
Static Water Level	786.50	feet			1		02/03/20 15:05		
Temperature, Water (C)	10.3	deg C			1		02/03/20 15:05		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	316	mg/L	20.0	8.7	1		02/07/20 16:30		
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		02/10/20 11:01		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	3.7	mg/L	2.0	0.43	1		02/06/20 18:12	16887-00-6	
Sulfate	<2.2	mg/L	10.0	2.2	5		02/07/20 12:32	14808-79-8	D3

Sample: MW-301 **Lab ID: 40202911005** Collected: 02/03/20 16:10 Received: 02/05/20 09:10 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	02/06/20 05:22	02/06/20 16:48	7440-38-2	
Barium	10.9	ug/L	2.3	0.70	1	02/06/20 05:22	02/06/20 16:48	7440-39-3	
Boron	27.9	ug/L	10.0	3.0	1	02/06/20 05:22	02/06/20 16:48	7440-42-8	
Calcium	113000	ug/L	254	76.2	1	02/06/20 05:22	02/06/20 16:48	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	02/06/20 05:22	02/06/20 16:48	7440-47-3	
Cobalt	0.17J	ug/L	1.0	0.12	1	02/06/20 05:22	02/06/20 16:48	7440-48-4	
Lithium	0.67J	ug/L	1.0	0.22	1	02/06/20 05:22	02/06/20 16:48	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	02/06/20 05:22	02/06/20 16:48	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	02/06/20 05:22	02/06/20 16:48	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/06/20 05:22	02/06/20 16:48	7440-28-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

Sample: MW-301 **Lab ID: 40202911005** Collected: 02/03/20 16:10 Received: 02/05/20 09:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	6.89	Std. Units			1		02/03/20 16:10		
Field Specific Conductance	868	umhos/cm			1		02/03/20 16:10		
Oxygen, Dissolved	1.07	mg/L			1		02/03/20 16:10	7782-44-7	
REDOX	132.3	mV			1		02/03/20 16:10		
Turbidity	1.41	NTU			1		02/03/20 16:10		
Static Water Level	787.24	feet			1		02/03/20 16:10		
Temperature, Water (C)	8.5	deg C			1		02/03/20 16:10		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	462	mg/L	20.0	8.7	1		02/07/20 16:30		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.8	Std. Units	0.10	0.010	1		02/10/20 11:03		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	1.3J	mg/L	2.0	0.43	1		02/06/20 18:26	16887-00-6	
Sulfate	7.2	mg/L	2.0	0.44	1		02/06/20 18:26	14808-79-8	

Sample: FIELD BLANK SC POND **Lab ID: 40202911006** Collected: 02/03/20 13:50 Received: 02/05/20 09:10 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	02/06/20 05:22	02/06/20 14:59	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	02/06/20 05:22	02/06/20 14:59	7440-39-3	
Boron	<3.0	ug/L	10.0	3.0	1	02/06/20 05:22	02/06/20 14:59	7440-42-8	
Calcium	<76.2	ug/L	254	76.2	1	02/06/20 05:22	02/06/20 14:59	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	02/06/20 05:22	02/06/20 14:59	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	02/06/20 05:22	02/06/20 14:59	7440-48-4	
Lithium	<0.22	ug/L	1.0	0.22	1	02/06/20 05:22	02/06/20 14:59	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	02/06/20 05:22	02/06/20 14:59	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	02/06/20 05:22	02/06/20 14:59	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/06/20 05:22	02/06/20 14:59	7440-28-0	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		02/07/20 16:31		

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

Sample: FIELD BLANK SC POND **Lab ID: 40202911006** Collected: 02/03/20 13:50 Received: 02/05/20 09:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.0	Std. Units	0.10	0.010	1		02/10/20 11:07		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		02/07/20 18:34	16887-00-6	
Sulfate	<0.44	mg/L	2.0	0.44	1		02/07/20 18:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

QC Batch: 347099 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40202911001, 40202911002, 40202911003, 40202911004, 40202911005, 40202911006

METHOD BLANK: 2013331 Matrix: Water
Associated Lab Samples: 40202911001, 40202911002, 40202911003, 40202911004, 40202911005, 40202911006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	ug/L	<0.28	1.0	02/08/20 00:35	
Barium	ug/L	<0.70	2.3	02/08/20 00:35	
Boron	ug/L	<3.0	10.0	02/08/20 00:35	
Calcium	ug/L	<76.2	254	02/08/20 00:35	
Chromium	ug/L	<1.0	3.4	02/08/20 00:35	
Cobalt	ug/L	<0.12	1.0	02/08/20 00:35	
Lithium	ug/L	<0.22	1.0	02/08/20 00:35	
Molybdenum	ug/L	<0.44	1.5	02/08/20 00:35	
Selenium	ug/L	<0.32	1.1	02/08/20 00:35	
Thallium	ug/L	<0.14	1.0	02/08/20 00:35	

LABORATORY CONTROL SAMPLE: 2013332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	500	496	99	80-120	
Barium	ug/L	500	476	95	80-120	
Boron	ug/L	500	463	93	80-120	
Calcium	ug/L	5000	4900	98	80-120	
Chromium	ug/L	500	466	93	80-120	
Cobalt	ug/L	500	464	93	80-120	
Lithium	ug/L	500	447	89	80-120	
Molybdenum	ug/L	500	479	96	80-120	
Selenium	ug/L	500	512	102	80-120	
Thallium	ug/L	500	457	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013333 2013334

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40202911001 Result	Spike Conc.	Spike Conc.	Conc.								
Arsenic	ug/L	<0.28	500	500	502	508	100	102	75-125	1	20		
Barium	ug/L	10.2	500	500	486	499	95	98	75-125	3	20		
Boron	ug/L	120	500	500	601	615	96	99	75-125	2	20		
Calcium	ug/L	81900	5000	5000	85800	93600	78	234	75-125	9	20	P6	
Chromium	ug/L	2.1J	500	500	478	488	95	97	75-125	2	20		
Cobalt	ug/L	<0.12	500	500	468	478	94	96	75-125	2	20		
Lithium	ug/L	3.1	500	500	453	470	90	93	75-125	4	20		
Molybdenum	ug/L	6.1	500	500	490	509	97	101	75-125	4	20		

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

Parameter	Units	2013333		2013334		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40202911001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Selenium	ug/L	0.81J	500	500	514	517	103	103	75-125	1	20		
Thallium	ug/L	<0.14	500	500	465	482	93	96	75-125	4	20		

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

QC Batch: 347297 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40202911001, 40202911002, 40202911003, 40202911004, 40202911005, 40202911006

METHOD BLANK: 2014243 Matrix: Water
Associated Lab Samples: 40202911001, 40202911002, 40202911003, 40202911004, 40202911005, 40202911006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	02/07/20 16:29	

LABORATORY CONTROL SAMPLE: 2014244

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	547	562	103	80-120	

SAMPLE DUPLICATE: 2014245

Parameter	Units	40202911001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	310	316	2	10	

SAMPLE DUPLICATE: 2014246

Parameter	Units	40203005001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1110	1070	4	10	

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

QC Batch: 347349

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40202911001, 40202911002, 40202911003, 40202911004, 40202911005, 40202911006

SAMPLE DUPLICATE: 2014700

Parameter	Units	40202843001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	4.9	4.9	0	20	H6

SAMPLE DUPLICATE: 2014701

Parameter	Units	40202909001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.4	1	20	H6

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

QC Batch:	347153	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40202911001, 40202911002, 40202911003, 40202911004, 40202911005

METHOD BLANK: 2013500 Matrix: Water
Associated Lab Samples: 40202911001, 40202911002, 40202911003, 40202911004, 40202911005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	02/06/20 14:54	
Sulfate	mg/L	<0.44	2.0	02/06/20 14:54	

LABORATORY CONTROL SAMPLE: 2013501

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.7	98	90-110	
Sulfate	mg/L	20	19.7	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013502 2013503

Parameter	Units	40202944001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	92.8	200	200	303	304	105	106	90-110	0	15	
Sulfate	mg/L	109	200	200	320	320	105	105	90-110	0	15	

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

QC Batch: 347278	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40202911006

METHOD BLANK: 2014027 Matrix: Water

Associated Lab Samples: 40202911006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	02/07/20 15:27	
Sulfate	mg/L	<0.44	2.0	02/07/20 15:27	

LABORATORY CONTROL SAMPLE: 2014028

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2014029 2014030

Parameter	Units	2014029		2014030		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40203010001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	69.4	100	100	184	184	115	90-110	0	15	M0
Sulfate	mg/L	63.2	100	100	176	177	113	90-110	0	15	M0

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Sample: MW-306		Lab ID: 40202911001	Collected: 02/03/20 10:00	Received: 02/05/20 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	-0.0492 ± 0.255 (0.591) C:NA T:92%	pCi/L	02/21/20 14:50	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.759 ± 0.499 (0.970) C:74% T:86%	pCi/L	02/21/20 14:29	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.759 ± 0.754 (1.56)	pCi/L	02/25/20 10:32	7440-14-4	

Sample: MW-307		Lab ID: 40202911002	Collected: 02/03/20 12:25	Received: 02/05/20 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	-0.228 ± 0.354 (0.856) C:NA T:83%	pCi/L	02/21/20 14:50	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.706 ± 0.434 (0.814) C:72% T:87%	pCi/L	02/21/20 14:29	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.706 ± 0.788 (1.67)	pCi/L	02/25/20 10:32	7440-14-4	

Sample: MW-308		Lab ID: 40202911003	Collected: 02/03/20 13:30	Received: 02/05/20 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	-0.0539 ± 0.435 (0.898) C:NA T:93%	pCi/L	02/21/20 14:50	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.257 ± 0.510 (1.12) C:58% T:76%	pCi/L	02/21/20 14:29	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.257 ± 0.945 (2.02)	pCi/L	02/25/20 10:32	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA WPL CCR
Pace Project No.: 40202911

Sample: MW-84A		Lab ID: 40202911004	Collected: 02/03/20 15:05	Received: 02/05/20 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	0.100 ± 0.311 (0.601) C:NA T:83%	pCi/L	02/21/20 14:50	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	-0.153 ± 0.376 (0.896) C:72% T:91%	pCi/L	02/21/20 14:29	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.1000 ± 0.687 (1.50)	pCi/L	02/25/20 10:32	7440-14-4	

Sample: MW-301		Lab ID: 40202911005	Collected: 02/03/20 16:10	Received: 02/05/20 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	0.136 ± 0.208 (0.334) C:NA T:98%	pCi/L	02/21/20 15:03	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.366 ± 0.445 (0.944) C:70% T:83%	pCi/L	02/21/20 14:29	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.502 ± 0.653 (1.28)	pCi/L	02/25/20 10:32	7440-14-4	

Sample: FIELD BLANK SC POND		Lab ID: 40202911006	Collected: 02/03/20 13:50	Received: 02/05/20 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	0.454 ± 0.389 (0.527) C:NA T:85%	pCi/L	02/21/20 15:03	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.00309 ± 0.366 (0.851) C:71% T:84%	pCi/L	02/21/20 14:30	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.457 ± 0.755 (1.38)	pCi/L	02/25/20 10:32	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40202911001	MW-306	EPA 3010	347099	EPA 6020	347183
40202911002	MW-307	EPA 3010	347099	EPA 6020	347183
40202911003	MW-308	EPA 3010	347099	EPA 6020	347183
40202911004	MW-84A	EPA 3010	347099	EPA 6020	347183
40202911005	MW-301	EPA 3010	347099	EPA 6020	347183
40202911006	FIELD BLANK SC POND	EPA 3010	347099	EPA 6020	347183
40202911001	MW-306				
40202911002	MW-307				
40202911003	MW-308				
40202911004	MW-84A				
40202911005	MW-301				
40202911001	MW-306	EPA 903.1	382932		
40202911002	MW-307	EPA 903.1	382932		
40202911003	MW-308	EPA 903.1	382932		
40202911004	MW-84A	EPA 903.1	382932		
40202911005	MW-301	EPA 903.1	382932		
40202911006	FIELD BLANK SC POND	EPA 903.1	382932		
40202911001	MW-306	EPA 904.0	382934		
40202911002	MW-307	EPA 904.0	382934		
40202911003	MW-308	EPA 904.0	382934		
40202911004	MW-84A	EPA 904.0	382934		
40202911005	MW-301	EPA 904.0	382934		
40202911006	FIELD BLANK SC POND	EPA 904.0	382934		
40202911001	MW-306	Total Radium Calculation	384977		
40202911002	MW-307	Total Radium Calculation	384977		
40202911003	MW-308	Total Radium Calculation	384977		
40202911004	MW-84A	Total Radium Calculation	384977		
40202911005	MW-301	Total Radium Calculation	384977		
40202911006	FIELD BLANK SC POND	Total Radium Calculation	384977		
40202911001	MW-306	SM 2540C	347297		
40202911002	MW-307	SM 2540C	347297		
40202911003	MW-308	SM 2540C	347297		
40202911004	MW-84A	SM 2540C	347297		
40202911005	MW-301	SM 2540C	347297		
40202911006	FIELD BLANK SC POND	SM 2540C	347297		
40202911001	MW-306	EPA 9040	347349		
40202911002	MW-307	EPA 9040	347349		
40202911003	MW-308	EPA 9040	347349		
40202911004	MW-84A	EPA 9040	347349		
40202911005	MW-301	EPA 9040	347349		
40202911006	FIELD BLANK SC POND	EPA 9040	347349		
40202911001	MW-306	EPA 300.0	347153		
40202911002	MW-307	EPA 300.0	347153		
40202911003	MW-308	EPA 300.0	347153		
40202911004	MW-84A	EPA 300.0	347153		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067.00 COLUMBIA WPL CCR

Pace Project No.: 40202911

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40202911005	MW-301	EPA 300.0	347153		
40202911006	FIELD BLANK SC POND	EPA 300.0	347278		

REPORT OF LABORATORY ANALYSIS

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(Please Print Clearly)



CHAIN OF CUSTODY

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

UPPER MIDWEST REGION

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

40202911

Company Name: **SCS Engineers**
 Branch/Location: **Madison WI**
 Project Contact: **Meghan Blodgett**
 Phone: **608-213-7562**
 Project Number: **25219067.00**
 Project Name: **Columbia**
 Project State: **Wisconsin**
 Sampled By (Print): **Adam Lytson**
 Sampled By (Sign): *[Signature]*
 PO #:

FILTERED? (YES/NO)
 PRESERVATION (CODE)
 Regulatory Program:

Data Package Options (billable)
 EPA Level III
 EPA Level IV
MS/MSD (billable)
 On your sample
 NOT needed on your sample

Matrix Codes	W = Water	DW = Drinking Water	C = Charcoal	O = Oil	S = Soil	SI = Sludge	WV = Waste Water	WFP = Wipe
Analysis Requested								
Radium 226	X							
Radium 228	X							
Metals: B, Cu, As, Pb, Cr, Co, Li, Mo, Se, Tl	X							
PH	X							
TDS, Cl, SO4	X							

PAGE LAB #	CLIENT FIELD ID	COLLECTION		MATRIX	Analysis Requested													
		DATE	TIME		Y/N	Pick Letter	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N						
MLD-306		2/3/2020	1000	U	X		X											
MLD-307			1225		X		X											
MLD-308			1330		X		X											
MLD-84A			1505		X		X											
MLD-301			1610		X		X											
Field Blank SC Road			1350		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:

Relinquished By: **Adam Lytson** Date/Time: **2/14/2020 1100**
 Relinquished By: **CS Stephens** Date/Time: **2/5/2020 0910**
 Relinquished By: Date/Time:
 Relinquished By: Date/Time:

Received By: **Quentin White** Date/Time: **2/5/2020 0910**
 Received By: **Jack** Date/Time:
 Received By: Date/Time:
 Received By: Date/Time:

PAGE Project No. **10202911**
 Receipt Temp = **102°C**
 Sample Receipt pH **OK/ Adjusted**
 Cooler Custody Seal **Present/ Not Present**
 Intact / Not Intact

Sample Preservation Receipt Form

Client Name: SCS Project # 40202911

All containers needing preservation have been checked and noted below: Yes No N/A
 Lab Lot# of pH paper: 1052791 Lab Sid #ID of preservation (if pH adjusted):

Initial whoe completed: SKL Date/Time:

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

Pace Lab #	Glass	Plastic	Vials	Jars	General		VOA Vials (>6mm) *	H2SO4 pH \leq 2	NaOH+Zn Act pH \geq 9	NaOH pH \geq 12	HNO3 pH \leq 2	pH after adjusted	Volume (mL)
					SP5T	ZPLC							
001													2.5/5/10
002													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

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	BP1U	1 liter plastic unpres	DG3A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH		
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3				
AG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4	VG9D	40 mL clear vial DI	SP5T	120 mL plastic Na Thiosulfate
						ZPLC	ziploc bag
						GN:	1 liter poly HNO3



Document Name: Sample Condition Upon Receipt (SCUR)
Document No.: F-GB-C-031-Rev.07

Document Revised: 25Apr2018
Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS Eng
Courier: S Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Project #: _____
WO# : 40202911

40202911

Tracking #: 1600020420
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 - N/A Type of Ice: Wet Blue Dry None
Cooler Temperature Uncorr: ROT / Corr: _____

Temp Blank Present: yes no Biological Tissue is Frozen: yes no
Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 2-5-20
Initials: [Signature]

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

Project Manager Review: [Signature] Date: 2/5/2020

C2 May 2020 Assessment Monitoring

June 23, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

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

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on May 30, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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07/01/2021 - Classification: Internal - ECRM12626135

CERTIFICATIONS

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

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

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

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

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Antimony	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:30	7440-36-0	
Arsenic	0.33J	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 08:30	7440-38-2	
Barium	9.8	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 08:30	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 08:30	7440-41-7	
Boron	21.3	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 17:29	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:30	7440-43-9	
Calcium	112000	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 08:30	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 08:30	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 08:30	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 08:30	7439-92-1	
Lithium	0.47J	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 08:30	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 08:30	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 08:30	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 08:30	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.084	ug/L	0.28	0.084	1	06/10/20 10:40	06/11/20 09:21	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	6.73	Std. Units			1		05/29/20 13:30		
Field Specific Conductance	797	umhos/cm			1		05/29/20 13:30		
Oxygen, Dissolved	2.00	mg/L			1		05/29/20 13:30	7782-44-7	
REDOX	118.7	mV			1		05/29/20 13:30		
Turbidity	0.0	NTU			1		05/29/20 13:30		
Static Water Level	787.77	feet			1		05/29/20 13:30		
Temperature, Water (C)	8.1	deg C			1		05/29/20 13:30		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	452	mg/L	20.0	8.7	1		06/02/20 14:53		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.0	Std. Units	0.10	0.010	1		06/03/20 09:50		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	2.0J	mg/L	2.0	0.43	1		06/16/20 01:58	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/16/20 01:58	16984-48-8	
Sulfate	11.5	mg/L	2.0	0.44	1		06/16/20 01:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

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

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

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Antimony	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:37	7440-36-0	
Arsenic	0.34J	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 08:37	7440-38-2	
Barium	13.9	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 08:37	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 08:37	7440-41-7	
Boron	10.0	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 17:36	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 08:37	7440-43-9	
Calcium	77600	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 08:37	7440-70-2	
Chromium	1.7J	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 08:37	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 08:37	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 08:37	7439-92-1	
Lithium	0.40J	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 08:37	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 08:37	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 08:37	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 08:37	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.084	ug/L	0.28	0.084	1	06/10/20 10:40	06/11/20 09:23	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.34	Std. Units			1		05/29/20 12:40		
Field Specific Conductance	613.7	umhos/cm			1		05/29/20 12:40		
Oxygen, Dissolved	9.81	mg/L			1		05/29/20 12:40	7782-44-7	
REDOX	135.0	mV			1		05/29/20 12:40		
Turbidity	2.15	NTU			1		05/29/20 12:40		
Static Water Level	787.02	feet			1		05/29/20 12:40		
Temperature, Water (C)	10.6	deg C			1		05/29/20 12:40		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	340	mg/L	20.0	8.7	1		06/02/20 14:53		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		06/03/20 09:51		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	3.7	mg/L	2.0	0.43	1		06/16/20 02:11	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/16/20 02:11	16984-48-8	
Sulfate	1.5J	mg/L	2.0	0.44	1		06/16/20 02:11	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 2066130

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2066131 2066132

Parameter	Units	2066131		2066132		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		40208929001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Mercury	ug/L	<0.084	5	5	5.3	4.9	105	98	85-115	7	20	

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QUALITY CONTROL DATA

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

QC Batch: 356333 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40208571001, 40208571002

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

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

LABORATORY CONTROL SAMPLE: 2060983

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

Parameter	Units	2060984		2060985		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40208496001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	0.22J	500	500	552	539	110	108	75-125	2	20		
Arsenic	ug/L	5.9	500	500	521	508	103	100	75-125	3	20		
Barium	ug/L	13.8	500	500	524	514	102	100	75-125	2	20		
Beryllium	ug/L	0.36J	500	500	446	438	89	87	75-125	2	20		
Boron	ug/L	2700	500	500	3180	3090	94	78	75-125	3	20		
Cadmium	ug/L	0.30J	500	500	521	510	104	102	75-125	2	20		
Calcium	ug/L	27400	5000	5000	32700	30400	107	61	75-125	7	20	P6	
Chromium	ug/L	42.8	500	500	530	525	98	96	75-125	1	20		
Cobalt	ug/L	0.49J	500	500	484	474	97	95	75-125	2	20		
Lead	ug/L	0.32J	500	500	514	516	103	103	75-125	0	20		
Lithium	ug/L	1.2	500	500	438	432	87	86	75-125	1	20		
Molybdenum	ug/L	67.1	500	500	604	587	107	104	75-125	3	20		
Selenium	ug/L	18.7	500	500	500	495	96	95	75-125	1	20		
Thallium	ug/L	0.28J	500	500	509	513	102	102	75-125	1	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 2061522

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

SAMPLE DUPLICATE: 2061523

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

SAMPLE DUPLICATE: 2061524

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

QC Batch: 356504

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40208571001, 40208571002

SAMPLE DUPLICATE: 2061791

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

SAMPLE DUPLICATE: 2061792

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

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QUALITY CONTROL DATA

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

QC Batch: 356987 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208571001, 40208571002

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

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

LABORATORY CONTROL SAMPLE: 2064878

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064879 2064880

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064881 2064882

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

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

QC Batch: 399236

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 40208571001, 40208571002

METHOD BLANK: 1933438

Matrix: Water

Associated Lab Samples: 40208571001, 40208571002

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

QC Batch: 399239

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 40208571001, 40208571002

METHOD BLANK: 1933446

Matrix: Water

Associated Lab Samples: 40208571001, 40208571002

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

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QUALIFIERS

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40208571

DEFINITIONS

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

PI The precision between the sample and the duplicate sample exceeded laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

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

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

REPORT OF LABORATORY ANALYSIS

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Pace Container Order #648412

40208571

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

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

Trip Blanks <input type="checkbox"/> Include Trip Blanks	Bottle Labels <input type="checkbox"/> Blank <input type="checkbox"/> Pre-Printed No Sample IDs <input checked="" type="checkbox"/> Pre-Printed With Sample IDs	Bottles <input type="checkbox"/> Boxed Cases <input type="checkbox"/> Individually Wrapped <input checked="" type="checkbox"/> Grouped By Sample ID/Matrix
Return Shipping Labels <input type="checkbox"/> No Shipper <input type="checkbox"/> With Shipper	Misc <input type="checkbox"/> Sampling Instructions <input type="checkbox"/> Custody Seal <input type="checkbox"/> Temp. Blanks <input checked="" type="checkbox"/> Coolers <input type="checkbox"/> Syringes	
COC Options <input type="checkbox"/> Number of Blanks <input checked="" type="checkbox"/> Pre-Printed	<input type="checkbox"/> Extra Bubble Wrap <input type="checkbox"/> Short Hold/Rush Stickers <input type="checkbox"/> DI Water <input type="text" value="Liter(s)"/> <input type="checkbox"/> 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-9-354-03BB	
2	WT	pH	250mL plastic unpres	2	0	M-9-311-06BB	
2	WT	TDS, Cl, F, SO4	250mL plastic unpres	2	0	M-9-311-06BB	

Hazard Shipping Placard In Place : NA

- *Sample receiving hours are typically 8am-5pm, but may differ by location. Please check with your Pace Project Manager.
- *Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.
- *Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage/disposal.
- *Payment term are net 30 days.
- *Please include the proposal number on the chain of custody to insure proper billing.

LAB USE:


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

Sample

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

CLIENT USE (Optional):

Date Rec'd:	
Received By:	
Verified By:	


 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

Courier: CS Logistics Fed Ex Speedee UPS Walto
 Client Pace Other: _____

Project #: **WO# : 40208571**



40208571

Tracking #: 1578 052820

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

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

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 97 Type of Ice: Wet Blue Dry None

Cooler Temperature Uncorr: 1.0 / Corr: 1.0 Samples on ice, cooling process has begun

Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Person examining contents:
Date 5/30/20 / Initials: SMW
Labeled By Initials: WP

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

Client Notification/ Resolution: _____
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

If checked, see attached form for additional comments

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

June 23, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on May 29, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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07/01/2021 - Classification: Internal - ECRM12626135

CERTIFICATIONS

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

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

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SAMPLE SUMMARY

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40208499001	MW-306	Water	05/28/20 10:15	05/29/20 08:05
40208499002	MW-307	Water	05/27/20 18:00	05/29/20 08:05
40208499003	MW-308	Water	05/27/20 15:40	05/29/20 08:05
40208499004	FIELD BLANK-SCPOND	Water	05/27/20 15:40	05/29/20 08:05

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SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40208499001	MW-306	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40208499002	MW-307	EPA 6020	DS1
EPA 7470	AJT			1	PASI-G
	HMG			7	PASI-G
EPA 903.1	MK1			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	ALY			1	PASI-G
EPA 300.0	HMB			3	PASI-G
40208499003	MW-308			EPA 6020	DS1
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40208499004	FIELD BLANK-SCPOND	EPA 6020	DS1
EPA 7470	AJT			1	PASI-G
	HMG			7	PASI-G
EPA 903.1	MK1			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	ALY			1	PASI-G
EPA 300.0	HMB			3	PASI-G

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

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

Sample: MW-306 **Lab ID: 40208499001** Collected: 05/28/20 10:15 Received: 05/29/20 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Antimony	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:28	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 07:28	7440-38-2	
Barium	9.7	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 07:28	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 07:28	7440-41-7	
Boron	108	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 16:54	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:28	7440-43-9	
Calcium	84600	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 07:28	7440-70-2	
Chromium	2.1J	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 07:28	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 07:28	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 07:28	7439-92-1	
Lithium	2.7	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 07:28	7439-93-2	
Molybdenum	6.5	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 07:28	7439-98-7	
Selenium	0.85J	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 07:28	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 07:28	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.084	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:35	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	6.97	Std. Units			1		05/28/20 10:15		
Field Specific Conductance	572.1	umhos/cm			1		05/28/20 10:15		
Oxygen, Dissolved	9.08	mg/L			1		05/28/20 10:15	7782-44-7	
REDOX	227.7	mV			1		05/28/20 10:15		
Turbidity	0.32	NTU			1		05/28/20 10:15		
Static Water Level	785.77	feet			1		05/28/20 10:15		
Temperature, Water (C)	10.2	deg C			1		05/28/20 10:15		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	306	mg/L	20.0	8.7	1		06/02/20 14:50		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		06/01/20 09:29		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	0.76J	mg/L	2.0	0.43	1		06/15/20 21:21	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 21:21	16984-48-8	
Sulfate	6.9	mg/L	2.0	0.44	1		06/15/20 21:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

Sample: MW-307 **Lab ID: 40208499002** Collected: 05/27/20 18:00 Received: 05/29/20 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Antimony	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:35	7440-36-0	
Arsenic	0.76J	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 07:35	7440-38-2	
Barium	13.7	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 07:35	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 07:35	7440-41-7	
Boron	231	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 17:01	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:35	7440-43-9	
Calcium	77800	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 07:35	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 07:35	7440-47-3	
Cobalt	0.55J	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 07:35	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 07:35	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 07:35	7439-93-2	
Molybdenum	0.70J	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 07:35	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 07:35	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 07:35	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.084	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:37	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.07	Std. Units			1		05/27/20 18:00		
Field Specific Conductance	615.2	umhos/cm			1		05/27/20 18:00		
Oxygen, Dissolved	0.13	mg/L			1		05/27/20 18:00	7782-44-7	
REDOX	-26.3	mV			1		05/27/20 18:00		
Turbidity	0.74	NTU			1		05/27/20 18:00		
Static Water Level	785.35	feet			1		05/27/20 18:00		
Temperature, Water (C)	10.8	deg C			1		05/27/20 18:00		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	356	mg/L	20.0	8.7	1		06/01/20 16:21		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		06/01/20 09:31		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	12.9	mg/L	2.0	0.43	1		06/15/20 22:40	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 22:40	16984-48-8	
Sulfate	13.2	mg/L	2.0	0.44	1		06/15/20 22:40	14808-79-8	

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

Sample: MW-308 **Lab ID: 40208499003** Collected: 05/27/20 15:40 Received: 05/29/20 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Antimony	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:42	7440-36-0	
Arsenic	3.1	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 07:42	7440-38-2	
Barium	59.1	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 07:42	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 07:42	7440-41-7	
Boron	476	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 17:08	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 07:42	7440-43-9	
Calcium	132000	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 07:42	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 07:42	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 07:42	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 07:42	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 07:42	7439-93-2	
Molybdenum	0.90J	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 07:42	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 07:42	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 07:42	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.084	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:39	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.10	Std. Units			1		05/27/20 15:40		
Field Specific Conductance	897	umhos/cm			1		05/27/20 15:40		
Oxygen, Dissolved	0.21	mg/L			1		05/27/20 15:40	7782-44-7	
REDOX	-91.5	mV			1		05/27/20 15:40		
Turbidity	4.44	NTU			1		05/27/20 15:40		
Static Water Level	786.28	feet			1		05/27/20 15:40		
Temperature, Water (C)	12.1	deg C			1		05/27/20 15:40		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	510	mg/L	20.0	8.7	1		06/01/20 16:21		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.3	Std. Units	0.10	0.010	1		06/01/20 09:32		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	1.2J	mg/L	2.0	0.43	1		06/15/20 22:53	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 22:53	16984-48-8	
Sulfate	2.8	mg/L	2.0	0.44	1		06/15/20 22:53	14808-79-8	

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

Sample: FIELD BLANK-SCPOND **Lab ID: 40208499004** Collected: 05/27/20 15:40 Received: 05/29/20 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Antimony	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 05:38	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	06/01/20 18:15	06/11/20 05:38	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	06/01/20 18:15	06/11/20 05:38	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/01/20 18:15	06/11/20 05:38	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	06/01/20 18:15	06/11/20 15:31	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/01/20 18:15	06/11/20 05:38	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	06/01/20 18:15	06/11/20 05:38	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	06/01/20 18:15	06/11/20 05:38	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/01/20 18:15	06/11/20 05:38	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/01/20 18:15	06/11/20 05:38	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	06/01/20 18:15	06/11/20 05:38	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	06/01/20 18:15	06/11/20 05:38	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	06/01/20 18:15	06/11/20 05:38	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/01/20 18:15	06/11/20 05:38	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.084	ug/L	0.28	0.084	1	06/01/20 10:05	06/02/20 09:41	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	20.0	mg/L	20.0	8.7	1		06/01/20 16:21		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.6	Std. Units	0.10	0.010	1		06/01/20 09:33		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		06/15/20 23:06	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 23:06	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		06/15/20 23:06	14808-79-8	

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

QC Batch: 356263 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

METHOD BLANK: 2060745 Matrix: Water
Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

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

LABORATORY CONTROL SAMPLE: 2060746

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2060747 2060748

Parameter	Units	2060747		2060748		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40208305001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	ug/L	<0.28	5	5	5.1	5.0	102	100	85-115	2	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

QC Batch: 356333 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

METHOD BLANK: 2060982 Matrix: Water
Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

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

LABORATORY CONTROL SAMPLE: 2060983

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

Parameter	Units	2060984		2060985		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40208496001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	0.22J	500	500	552	539	110	108	75-125	2	20		
Arsenic	ug/L	5.9	500	500	521	508	103	100	75-125	3	20		
Barium	ug/L	13.8	500	500	524	514	102	100	75-125	2	20		
Beryllium	ug/L	0.36J	500	500	446	438	89	87	75-125	2	20		
Boron	ug/L	2700	500	500	3180	3090	94	78	75-125	3	20		
Cadmium	ug/L	0.30J	500	500	521	510	104	102	75-125	2	20		
Calcium	ug/L	27400	5000	5000	32700	30400	107	61	75-125	7	20	P6	
Chromium	ug/L	42.8	500	500	530	525	98	96	75-125	1	20		
Cobalt	ug/L	0.49J	500	500	484	474	97	95	75-125	2	20		
Lead	ug/L	0.32J	500	500	514	516	103	103	75-125	0	20		
Lithium	ug/L	1.2	500	500	438	432	87	86	75-125	1	20		
Molybdenum	ug/L	67.1	500	500	604	587	107	104	75-125	3	20		
Selenium	ug/L	18.7	500	500	500	495	96	95	75-125	1	20		
Thallium	ug/L	0.28J	500	500	509	513	102	102	75-125	1	20		

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

QC Batch: 356322 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208499002, 40208499003, 40208499004

METHOD BLANK: 2060951 Matrix: Water
Associated Lab Samples: 40208499002, 40208499003, 40208499004

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

LABORATORY CONTROL SAMPLE: 2060952

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

SAMPLE DUPLICATE: 2060953

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

SAMPLE DUPLICATE: 2060954

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

QC Batch: 356448 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208499001

METHOD BLANK: 2061521 Matrix: Water
Associated Lab Samples: 40208499001

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

LABORATORY CONTROL SAMPLE: 2061522

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

SAMPLE DUPLICATE: 2061523

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

SAMPLE DUPLICATE: 2061524

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

QC Batch: 356227

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

SAMPLE DUPLICATE: 2060671

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR 2ND POND
Pace Project No.: 40208499

QC Batch: 356987 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

METHOD BLANK: 2064877 Matrix: Water
Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

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

LABORATORY CONTROL SAMPLE: 2064878

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064879 2064880

Parameter	Units	40208499001		40208499002		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.								
Chloride	mg/L	0.76J	20	20	20	21.1	20.4	102	98	90-110	3	15	
Fluoride	mg/L	<0.095	2	2	2	2.1	2.0	106	102	90-110	4	15	
Sulfate	mg/L	6.9	20	20	20	27.6	26.7	103	99	90-110	3	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064881 2064882

Parameter	Units	40208801002		40208801003		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.								
Chloride	mg/L	65.2	100	100	100	166	164	101	99	90-110	2	15	
Fluoride	mg/L	<0.48	10	10	10	10.2	10.1	102	101	90-110	1	15	
Sulfate	mg/L	23.1	100	100	100	122	121	99	98	90-110	1	15	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

Sample: MW-306 **Lab ID: 40208499001** Collected: 05/28/20 10:15 Received: 05/29/20 08:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.182 ± 0.316 (0.564) C:NA T:99%	pCi/L	06/22/20 15:33	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.308 ± 0.380 (0.803) C:73% T:83%	pCi/L	06/18/20 10:58	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.490 ± 0.696 (1.37)	pCi/L	06/23/20 09:27	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

Sample: MW-307 **Lab ID: 40208499002** Collected: 05/27/20 18:00 Received: 05/29/20 08:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.203 ± 0.398 (0.728) C:NA T:83%	pCi/L	06/22/20 15:33	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.106 ± 0.307 (0.689) C:73% T:96%	pCi/L	06/18/20 10:58	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.309 ± 0.705 (1.42)	pCi/L	06/23/20 09:27	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

Sample: MW-308 **Lab ID: 40208499003** Collected: 05/27/20 15:40 Received: 05/29/20 08:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.249 ± 0.301 (0.459) C:NA T:92%	pCi/L	06/22/20 15:54	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.320 ± 0.358 (0.749) C:74% T:87%	pCi/L	06/18/20 10:58	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.569 ± 0.659 (1.21)	pCi/L	06/23/20 09:27	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

Sample: FIELD BLANK-SCPOND **Lab ID: 40208499004** Collected: 05/27/20 15:40 Received: 05/29/20 08:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	-0.133 ± 0.319 (0.797) C:NA T:87%	pCi/L	06/22/20 15:54	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.1000 ± 0.396 (0.894) C:73% T:81%	pCi/L	06/18/20 10:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.1000 ± 0.715 (1.69)	pCi/L	06/23/20 09:27	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

QC Batch: 399236

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

METHOD BLANK: 1933438

Matrix: Water

Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

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

Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

METHOD BLANK: 1933446 Matrix: Water

Associated Lab Samples: 40208499001, 40208499002, 40208499003, 40208499004

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

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QUALIFIERS

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 COLUMBIA CCR 2ND POND

Pace Project No.: 40208499

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40208499001	MW-306	EPA 3010	356333	EPA 6020	356385
40208499002	MW-307	EPA 3010	356333	EPA 6020	356385
40208499003	MW-308	EPA 3010	356333	EPA 6020	356385
40208499004	FIELD BLANK-SCPOND	EPA 3010	356333	EPA 6020	356385
40208499001	MW-306	EPA 7470	356263	EPA 7470	356290
40208499002	MW-307	EPA 7470	356263	EPA 7470	356290
40208499003	MW-308	EPA 7470	356263	EPA 7470	356290
40208499004	FIELD BLANK-SCPOND	EPA 7470	356263	EPA 7470	356290
40208499001	MW-306				
40208499002	MW-307				
40208499003	MW-308				
40208499001	MW-306	EPA 903.1	399236		
40208499002	MW-307	EPA 903.1	399236		
40208499003	MW-308	EPA 903.1	399236		
40208499004	FIELD BLANK-SCPOND	EPA 903.1	399236		
40208499001	MW-306	EPA 904.0	399239		
40208499002	MW-307	EPA 904.0	399239		
40208499003	MW-308	EPA 904.0	399239		
40208499004	FIELD BLANK-SCPOND	EPA 904.0	399239		
40208499001	MW-306	Total Radium Calculation	402044		
40208499002	MW-307	Total Radium Calculation	402044		
40208499003	MW-308	Total Radium Calculation	402044		
40208499004	FIELD BLANK-SCPOND	Total Radium Calculation	402044		
40208499001	MW-306	SM 2540C	356448		
40208499002	MW-307	SM 2540C	356322		
40208499003	MW-308	SM 2540C	356322		
40208499004	FIELD BLANK-SCPOND	SM 2540C	356322		
40208499001	MW-306	EPA 9040	356227		
40208499002	MW-307	EPA 9040	356227		
40208499003	MW-308	EPA 9040	356227		
40208499004	FIELD BLANK-SCPOND	EPA 9040	356227		
40208499001	MW-306	EPA 300.0	356987		
40208499002	MW-307	EPA 300.0	356987		
40208499003	MW-308	EPA 300.0	356987		
40208499004	FIELD BLANK-SCPOND	EPA 300.0	356987		

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Pace Container Order #648424

40208499

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

Info			
Project Name <u>25219067 Columbia CCR Secondary Pond</u>	Due Date <u>05/19/2020</u>	Profile <u>x</u>	Quote _____
Project Manager <u>Milewsky, Dan</u>	Return Date _____	Carrier <u>Most Economical</u>	Location _____

Trip Blanks

Include Trip Blanks

Bottle Labels

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

Misc

Sampling Instructions

Custody Seal

Temp. Blanks

Coolers _____

Syringes _____

Extra Bubble Wrap

Short Hold/Rush Stickers

DI Water 3 Liter(s)

USDA Regulated Soils

COC Options

Number of Blanks _____

Pre-Printed _____

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
4	WT	Metals	250mL plastic w/HNO3	4	0	M-9-354-03BB	
4	WT	pH	250mL plastic unpres	4	0	M-9-311-06BB	
4	WT	TDS, Cl, F, SO4	250mL plastic unpres	4	0	M-9-311-06BB	
4	WT	Radium 226	1L Plastic HNO3 pres	4	0		
4	WT	Radium 228	1L Plastic HNO3 pres	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 : 05/14/2020

Prepared By: Mai Yer Her

Verified By: _____

Sample

ALL SAMPLES UNFILTERED


Metals=Sb,As,Ba,Be,B,Ca,Cd,Cr,Co,Pb,Li,Hg,Mo,Se,Tl

CLIENT USE (Optional):

Date Rec'd: _____

Received By: _____

Verified By: _____


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

Project #: _____

WO#: 40208499



40208499

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: RO1 /Corr: _____
Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no

Person examining contents:

Date: Shabo /Initials: CS

Labeled By Initials: VC

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

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

C3 October 2020 Assessment Monitoring

November 06, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

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

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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07/01/2021 - Classification: Internal - ECRM12626135

CERTIFICATIONS

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

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

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

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

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

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Pace Analytical Services - Green Bay									
Antimony	0.33J	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:04	7440-36-0	
Arsenic	0.62J	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 22:04	7440-38-2	
Barium	9.4	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 22:04	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 22:04	7440-41-7	
Boron	28.8	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 22:04	7440-42-8	
Cadmium	0.19J	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:04	7440-43-9	
Calcium	93000	ug/L	2540	762	10	10/13/20 07:04	10/15/20 21:36	7440-70-2	P6
Chromium	<1.0	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 22:04	7440-47-3	
Cobalt	0.29J	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 22:04	7440-48-4	
Lead	0.25J	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 22:04	7439-92-1	
Lithium	0.46J	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 22:04	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 22:04	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 22:04	7782-49-2	
Thallium	0.30J	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 22:04	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	10/14/20 10:10	10/15/20 10:45	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	6.95	Std. Units			1		10/08/20 14:45		
Field Specific Conductance	760.0	umhos/cm			1		10/08/20 14:45		
Oxygen, Dissolved	1.22	mg/L			1		10/08/20 14:45	7782-44-7	
REDOX	183.9	mV			1		10/08/20 14:45		
Turbidity	0.00	NTU			1		10/08/20 14:45		
Static Water Level	786.53	feet			1		10/08/20 14:45		
Temperature, Water (C)	11.0	deg C			1		10/08/20 14:45		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	412	mg/L	20.0	8.7	1		10/12/20 14:17		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.2	Std. Units	0.10	0.010	1		10/13/20 10:30		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	3.4	mg/L	2.0	0.43	1		10/20/20 13:09	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		10/20/20 13:09	16984-48-8	
Sulfate	25.1	mg/L	2.0	0.44	1		10/20/20 13:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

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

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Pace Analytical Services - Green Bay									
Antimony	<0.15	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:45	7440-36-0	
Arsenic	0.49J	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 22:45	7440-38-2	
Barium	12.6	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 22:45	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	10/13/20 07:04	10/15/20 22:45	7440-41-7	
Boron	9.7J	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 22:45	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	10/13/20 07:04	10/15/20 22:45	7440-43-9	
Calcium	69200	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 22:45	7440-70-2	
Chromium	1.6J	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 22:45	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 22:45	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	10/13/20 07:04	10/15/20 22:45	7439-92-1	
Lithium	0.39J	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 22:45	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 22:45	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 22:45	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	10/13/20 07:04	10/15/20 22:45	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	10/14/20 10:10	10/15/20 10:47	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.49	Std. Units			1		10/08/20 14:35		
Field Specific Conductance	610.1	umhos/cm			1		10/08/20 14:35		
Oxygen, Dissolved	9.39	mg/L			1		10/08/20 14:35	7782-44-7	
REDOX	153.2	mV			1		10/08/20 14:35		
Turbidity	0.00	NTU			1		10/08/20 14:35		
Static Water Level	786.10	feet			1		10/08/20 14:35		
Temperature, Water (C)	11.9	deg C			1		10/08/20 14:35		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	320	mg/L	20.0	8.7	1		10/12/20 14:17		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		10/13/20 10:33		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	4.3	mg/L	2.0	0.43	1		10/20/20 13:24	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		10/20/20 13:24	16984-48-8	
Sulfate	1.3J	mg/L	2.0	0.44	1		10/20/20 13:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

QC Batch: 368204 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2128432 Matrix: Water

Associated Lab Samples: 40216311001, 40216311002

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

LABORATORY CONTROL SAMPLE: 2128433

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2128434 2128435

Parameter	Units	2128434		2128435		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		40216436001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Mercury	ug/L	<0.066	5	5	5.1	5.0	101	101	85-115	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

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QUALITY CONTROL DATA

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

QC Batch: 368047 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2127636 Matrix: Water

Associated Lab Samples: 40216311001, 40216311002

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

LABORATORY CONTROL SAMPLE: 2127637

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

Parameter	Units	2127638		2127639		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40216311001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	0.33J	500	500	513	524	102	105	75-125	2	20		
Arsenic	ug/L	0.62J	500	500	503	512	100	102	75-125	2	20		
Barium	ug/L	9.4	500	500	486	501	95	98	75-125	3	20		
Beryllium	ug/L	<0.25	500	500	470	479	94	96	75-125	2	20		
Boron	ug/L	28.8	500	500	494	508	93	96	75-125	3	20		
Cadmium	ug/L	0.19J	500	500	506	515	101	103	75-125	2	20		
Calcium	ug/L	93000	5000	5000	98400	103000	107	194	75-125	4	20	P6	
Chromium	ug/L	<1.0	500	500	465	478	93	95	75-125	3	20		
Cobalt	ug/L	0.29J	500	500	464	477	93	95	75-125	3	20		
Lead	ug/L	0.25J	500	500	442	458	88	92	75-125	4	20		
Lithium	ug/L	0.46J	500	500	459	473	92	95	75-125	3	20		
Molybdenum	ug/L	<0.44	500	500	509	522	102	104	75-125	2	20		
Selenium	ug/L	<0.32	500	500	509	513	102	102	75-125	1	20		
Thallium	ug/L	0.30J	500	500	459	474	92	95	75-125	3	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 2127415

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

SAMPLE DUPLICATE: 2127416

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

SAMPLE DUPLICATE: 2127417

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

QC Batch: 368069	Analysis Method: EPA 9040
QC Batch Method: EPA 9040	Analysis Description: 9040 pH
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40216311001, 40216311002

SAMPLE DUPLICATE: 2127694

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

SAMPLE DUPLICATE: 2127695

Parameter	Units	40216282001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

QC Batch: 368419 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40216311001, 40216311002

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

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

LABORATORY CONTROL SAMPLE: 2129787

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129788 2129789

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129790 2129791

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

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

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

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

QC Batch: 418548

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2023103

Matrix: Water

Associated Lab Samples: 40216311001, 40216311002

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

QC Batch: 418546

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 40216311001, 40216311002

METHOD BLANK: 2023102

Matrix: Water

Associated Lab Samples: 40216311001, 40216311002

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

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25219067 COLUMBIA CCR BACKGRND

Pace Project No.: 40216311

DEFINITIONS

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

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

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

REPORT OF LABORATORY ANALYSIS

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Pace Container Order #703790

40216311

Addresses

Order By :

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

Ship To :

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

Return To:

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

Info

Project Name 25219067 Columbia CCR Background **Due Date** 10/06/2020 **Profile** 3946-12 **Quote** _____
Project Manager Milewsky, Dan **Return Date** _____ **Carrier** Most Economical **Location** _____

Trip Blanks

Include Trip Blanks

Bottle Labels

Blank
 Pre-Printed No Sample IDs
 Pre-Printed With Sample IDs

Bottles

Boxed Cases
 Individually Wrapped
 Grouped By Sample ID/Matrix

Return Shipping Labels

No Shipper
 With Shipper

Misc

Sampling Instructions
 Custody Seal
 Temp. Blanks
 Coolers _____
 Syringes _____
 Extra Bubble Wrap
 Short Hold/Rush Stickers
 DI Water
 USDA Regulated Soils

COC Options

Number of Blanks
 Pre-Printed

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

Hazard Shipping Placard In Place : NA

LAB USE:

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

Ship Date :
Prepared By:
Verified By:

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.

Sample

CLIENT USE (Optional):

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

Date Rec'd:
Received By:
Verified By:

Sample Preservation Receipt Form

1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Client Name: SCS Engineers

Project # 40216311

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

Lab Lot# of pH paper: 1004194

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

Initial when completed: VP Date/Time:

Page #	ab #	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)
001	AG1U												2.5/5/10
002	BG1U												2.5/5/10
003	AG1H												2.5/5/10
004	AG4S												2.5/5/10
005	AG4U												2.5/5/10
006	AG5U												2.5/5/10
007	AG2S												2.5/5/10
008	BG3U												2.5/5/10
009	BP1U												2.5/5/10
010	BP3U												2.5/5/10
011	BP3B												2.5/5/10
012	BP3N												2.5/5/10
013	BP3S												2.5/5/10
014	VG9A												2.5/5/10
015	DG9T												2.5/5/10
016	VG9U												2.5/5/10
017	VG9H												2.5/5/10
018	VG9M												2.5/5/10
019	VG9D												2.5/5/10
020	JGFU												2.5/5/10
	JG9U												2.5/5/10
	WGFU												2.5/5/10
	WPFU												2.5/5/10
	SP5T												2.5/5/10
	ZPLC												2.5/5/10
	GN												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	1L Poly HNO3

November 06, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40216308001	MW-306	Water	10/07/20 15:50	10/10/20 08:15
40216308002	MW-307	Water	10/08/20 10:00	10/10/20 08:15
40216308003	MW-308	Water	10/07/20 14:40	10/10/20 08:15
40216308004	FIELD BLANK SCPOND	Water	10/08/20 10:00	10/10/20 08:15

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SAMPLE ANALYTE COUNT

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40216308001	MW-306	EPA 6020	DS1	9	PASI-G
			VGC	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
			VAL	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
			Total Radium Calculation	CMC	1
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40216308002	MW-307	EPA 6020	DS1
VGC	7				PASI-G
EPA 903.1	MK1			1	PASI-PA
	VAL			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
	Total Radium Calculation			CMC	1
SM 2540C	HNT			1	PASI-G
EPA 9040	ALY			1	PASI-G
EPA 300.0	HMB			3	PASI-G
40216308003	MW-308			EPA 6020	DS1
		VGC	7		PASI-G
		EPA 903.1	MK1	1	PASI-PA
			VAL	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
			Total Radium Calculation	CMC	1
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40216308004	FIELD BLANK SCPOND	EPA 6020	DS1
VGC	7				PASI-G
EPA 903.1	MK1			1	PASI-PA
	VAL			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
	Total Radium Calculation			CMC	1
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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Sample: MW-306 **Lab ID: 40216308001** Collected: 10/07/20 15:50 Received: 10/10/20 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Arsenic	<0.28	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 22:58	7440-38-2	
Barium	10.5	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 22:58	7440-39-3	
Boron	108	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 22:58	7440-42-8	
Calcium	77900	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 22:58	7440-70-2	
Chromium	2.0J	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 22:58	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 22:58	7440-48-4	
Lithium	4.4	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 22:58	7439-93-2	
Molybdenum	7.1	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 22:58	7439-98-7	
Selenium	0.69J	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 22:58	7782-49-2	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.25	Std. Units			1		10/07/20 15:50		
Field Specific Conductance	565.4	umhos/cm			1		10/07/20 15:50		
Oxygen, Dissolved	7.71	mg/L			1		10/07/20 15:50	7782-44-7	
REDOX	103.8	mV			1		10/07/20 15:50		
Turbidity	1.29	NTU			1		10/07/20 15:50		
Static Water Level	785.39	feet			1		10/07/20 15:50		
Temperature, Water (C)	13.1	deg C			1		10/07/20 15:50		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	322	mg/L	20.0	8.7	1		10/12/20 14:16		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		10/13/20 10:10		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	0.63J	mg/L	2.0	0.43	1		10/20/20 09:57	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		10/20/20 09:57	16984-48-8	
Sulfate	8.4	mg/L	2.0	0.44	1		10/20/20 09:57	14808-79-8	

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Sample: MW-307 **Lab ID: 40216308002** Collected: 10/08/20 10:00 Received: 10/10/20 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Pace Analytical Services - Green Bay									
Arsenic	2.7	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 23:05	7440-38-2	
Barium	13.8	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 23:05	7440-39-3	
Boron	307	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 23:05	7440-42-8	
Calcium	67800	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 23:05	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 23:05	7440-47-3	
Cobalt	0.61J	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 23:05	7440-48-4	
Lithium	<0.22	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 23:05	7439-93-2	
Molybdenum	0.64J	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 23:05	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 23:05	7782-49-2	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.28	Std. Units			1		10/08/20 10:00		
Field Specific Conductance	644.0	umhos/cm			1		10/08/20 10:00		
Oxygen, Dissolved	0.03	mg/L			1		10/08/20 10:00	7782-44-7	
REDOX	-141.8	mV			1		10/08/20 10:00		
Turbidity	0.00	NTU			1		10/08/20 10:00		
Static Water Level	784.71	feet			1		10/08/20 10:00		
Temperature, Water (C)	14.0	deg C			1		10/08/20 10:00		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	334	mg/L	20.0	8.7	1		10/12/20 14:16		
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		10/13/20 10:12		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	12.1	mg/L	10.0	2.2	5		10/20/20 10:46	16887-00-6	
Fluoride	<0.48	mg/L	1.6	0.48	5		10/20/20 10:46	16984-48-8	D3
Sulfate	10.3	mg/L	10.0	2.2	5		10/20/20 10:46	14808-79-8	

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Sample: MW-308 **Lab ID: 40216308003** Collected: 10/07/20 14:40 Received: 10/10/20 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Arsenic	3.7	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 23:12	7440-38-2	
Barium	61.5	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 23:12	7440-39-3	
Boron	563	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 23:12	7440-42-8	
Calcium	123000	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 23:12	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 23:12	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 23:12	7440-48-4	
Lithium	<0.22	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 23:12	7439-93-2	
Molybdenum	1.1J	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 23:12	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 23:12	7782-49-2	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.09	Std. Units			1		10/07/20 14:40		
Field Specific Conductance	916.0	umhos/cm			1		10/07/20 14:40		
Oxygen, Dissolved	0.45	mg/L			1		10/07/20 14:40	7782-44-7	
REDOX	-123.5	mV			1		10/07/20 14:40		
Turbidity	0.00	NTU			1		10/07/20 14:40		
Static Water Level	785.68	feet			1		10/07/20 14:40		
Temperature, Water (C)	15.5	deg C			1		10/07/20 14:40		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	490	mg/L	20.0	8.7	1		10/12/20 14:16		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.4	Std. Units	0.10	0.010	1		10/13/20 10:13		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	1.1J	mg/L	2.0	0.43	1		10/20/20 11:00	16887-00-6	
Fluoride	0.12J	mg/L	0.32	0.095	1		10/20/20 11:00	16984-48-8	
Sulfate	0.52J	mg/L	2.0	0.44	1		10/20/20 11:00	14808-79-8	

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ANALYTICAL RESULTS

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Sample: FIELD BLANK SCPOND **Lab ID: 40216308004** Collected: 10/08/20 10:00 Received: 10/10/20 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Arsenic	<0.28	ug/L	1.0	0.28	1	10/13/20 07:04	10/15/20 23:19	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	10/13/20 07:04	10/15/20 23:19	7440-39-3	
Boron	3.5J	ug/L	10.0	3.0	1	10/13/20 07:04	10/15/20 23:19	7440-42-8	
Calcium	142J	ug/L	254	76.2	1	10/13/20 07:04	10/15/20 23:19	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	10/13/20 07:04	10/15/20 23:19	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	10/13/20 07:04	10/15/20 23:19	7440-48-4	
Lithium	<0.22	ug/L	1.0	0.22	1	10/13/20 07:04	10/15/20 23:19	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	10/13/20 07:04	10/15/20 23:19	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	10/13/20 07:04	10/15/20 23:19	7782-49-2	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	10.0J	mg/L	20.0	8.7	1		10/12/20 14:16		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.7	Std. Units	0.10	0.010	1		10/13/20 10:15		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		10/20/20 11:14	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		10/20/20 11:14	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		10/20/20 11:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

QC Batch: 368047 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

METHOD BLANK: 2127636 Matrix: Water
Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

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

LABORATORY CONTROL SAMPLE: 2127637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	500	498	100	80-120	
Barium	ug/L	500	476	95	80-120	
Boron	ug/L	500	433	87	80-120	
Calcium	ug/L	5000	4980	100	80-120	
Chromium	ug/L	500	462	92	80-120	
Cobalt	ug/L	500	463	93	80-120	
Lithium	ug/L	500	426	85	80-120	
Molybdenum	ug/L	500	500	100	80-120	
Selenium	ug/L	500	511	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2127638 2127639

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40216311001	Spike Conc.	Spike Conc.	Result								
Arsenic	ug/L	0.62J	500	500	503	512	100	102	75-125	2	20		
Barium	ug/L	9.4	500	500	486	501	95	98	75-125	3	20		
Boron	ug/L	28.8	500	500	494	508	93	96	75-125	3	20		
Calcium	ug/L	93000	5000	5000	98400	103000	107	194	75-125	4	20	P6	
Chromium	ug/L	<1.0	500	500	465	478	93	95	75-125	3	20		
Cobalt	ug/L	0.29J	500	500	464	477	93	95	75-125	3	20		
Lithium	ug/L	0.46J	500	500	459	473	92	95	75-125	3	20		
Molybdenum	ug/L	<0.44	500	500	509	522	102	104	75-125	2	20		
Selenium	ug/L	<0.32	500	500	509	513	102	102	75-125	1	20		

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

QC Batch: 367994 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

METHOD BLANK: 2127414 Matrix: Water
Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

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

LABORATORY CONTROL SAMPLE: 2127415

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

SAMPLE DUPLICATE: 2127416

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

SAMPLE DUPLICATE: 2127417

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

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

QC Batch: 368069	Analysis Method: EPA 9040
QC Batch Method: EPA 9040	Analysis Description: 9040 pH
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

SAMPLE DUPLICATE: 2127694

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

SAMPLE DUPLICATE: 2127695

Parameter	Units	40216282001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	20	H6

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QUALITY CONTROL DATA

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

QC Batch: 368419 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

METHOD BLANK: 2129786 Matrix: Water
Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

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

LABORATORY CONTROL SAMPLE: 2129787

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129788 2129789

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129790 2129791

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

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

Sample: MW-306 **Lab ID: 40216308001** Collected: 10/07/20 15:50 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	0.304 ± 0.316 (0.471) C:NA T:93%	pCi/L	10/29/20 14:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.417 ± 0.309 (0.598) C:79% T:88%	pCi/L	10/28/20 10:57	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.721 ± 0.625 (1.07)	pCi/L	11/01/20 12:49	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

Sample: MW-307 **Lab ID: 40216308002** Collected: 10/08/20 10:00 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	0.108 ± 0.259 (0.501) C:NA T:92%	pCi/L	10/29/20 14:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.528 ± 0.330 (0.616) C:82% T:87%	pCi/L	10/28/20 10:57	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.636 ± 0.589 (1.12)	pCi/L	11/01/20 12:49	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

Sample: MW-308 **Lab ID: 40216308003** Collected: 10/07/20 14:40 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	0.210 ± 0.292 (0.487) C:NA T:90%	pCi/L	10/29/20 14:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.815 ± 0.399 (0.698) C:82% T:87%	pCi/L	10/28/20 10:57	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	1.03 ± 0.691 (1.19)	pCi/L	11/01/20 12:49	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

Sample: FIELD BLANK SCPOND **Lab ID: 40216308004** Collected: 10/08/20 10:00 Received: 10/10/20 08:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	0.0513 ± 0.234 (0.477) C:NA T:92%	pCi/L	10/29/20 14:53	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.628 ± 0.357 (0.648) C:86% T:80%	pCi/L	10/28/20 10:57	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.679 ± 0.591 (1.13)	pCi/L	11/01/20 12:49	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

QC Batch:	418548	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

METHOD BLANK: 2023103 Matrix: Water

Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

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

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

QC Batch:	418546	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

METHOD BLANK: 2023102 Matrix: Water

Associated Lab Samples: 40216308001, 40216308002, 40216308003, 40216308004

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

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

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QUALIFIERS

Project: 25219067 COLUMBIA CCR SEC POND

Pace Project No.: 40216308

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 COLUMBIA CCR SEC POND
Pace Project No.: 40216308

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40216308001	MW-306	EPA 3010	368047	EPA 6020	368141
40216308002	MW-307	EPA 3010	368047	EPA 6020	368141
40216308003	MW-308	EPA 3010	368047	EPA 6020	368141
40216308004	FIELD BLANK SCPOND	EPA 3010	368047	EPA 6020	368141
40216308001	MW-306				
40216308002	MW-307				
40216308003	MW-308				
40216308001	MW-306	EPA 903.1	418546		
40216308002	MW-307	EPA 903.1	418546		
40216308003	MW-308	EPA 903.1	418546		
40216308004	FIELD BLANK SCPOND	EPA 903.1	418546		
40216308001	MW-306	EPA 904.0	418548		
40216308002	MW-307	EPA 904.0	418548		
40216308003	MW-308	EPA 904.0	418548		
40216308004	FIELD BLANK SCPOND	EPA 904.0	418548		
40216308001	MW-306	Total Radium Calculation	421105		
40216308002	MW-307	Total Radium Calculation	421105		
40216308003	MW-308	Total Radium Calculation	421105		
40216308004	FIELD BLANK SCPOND	Total Radium Calculation	421105		
40216308001	MW-306	SM 2540C	367994		
40216308002	MW-307	SM 2540C	367994		
40216308003	MW-308	SM 2540C	367994		
40216308004	FIELD BLANK SCPOND	SM 2540C	367994		
40216308001	MW-306	EPA 9040	368069		
40216308002	MW-307	EPA 9040	368069		
40216308003	MW-308	EPA 9040	368069		
40216308004	FIELD BLANK SCPOND	EPA 9040	368069		
40216308001	MW-306	EPA 300.0	368419		
40216308002	MW-307	EPA 300.0	368419		
40216308003	MW-308	EPA 300.0	368419		
40216308004	FIELD BLANK SCPOND	EPA 300.0	368419		

REPORT OF LABORATORY ANALYSIS

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Pace Container Order #703794

40216308

Addresses

Order By :

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

Ship To :

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

Return To:

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

Info

Project Name 25219067 Columbia CCR Secondary Pond **Due Date** 10/06/2020 **Profile** 3946-12 **Quote** _____
Project Manager Milewsky, Dan **Return Date** _____ **Carrier** Most Economical **Location** _____

Trip Blanks

Include Trip Blanks

Bottle Labels

Blank
 Pre-Printed No Sample IDs
 Pre-Printed With Sample IDs

Bottles

Boxed Cases
 Individually Wrapped
 Grouped By Sample ID/Matrix

Return Shipping Labels

No Shipper
 With Shipper

Misc

Sampling Instructions
 Custody Seal
 Temp. Blanks
 Coolers _____
 Syringes _____

Extra Bubble Wrap
 Short Hold/Rush Stickers
 DI Water 1 Liter(s)
 USDA Regulated Soils

COC Options

Number of Blanks _____
 Pre-Printed _____

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
4	WT	Metals	250mL plastic w/HNO3	4	0	M-0-156-04BB	
4	WT	pH	250mL plastic unpres	4	0	M-0-156-05BB	
4	WT	TDS, Cl, F, SO4	250mL plastic unpres	4	0	M-0-156-05BB	
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

LAB USE:

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

Ship Date : 10/05/2020
Prepared By: Mai Yer Her
Verified By: _____

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.

Sample

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

CLIENT USE (Optional):


Date Rec'd: _____
Received By: _____
Verified By: _____

 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 #:

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

WO#: 40216308

 40216308

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 0.5/0.5 / Corr 0.5/0.5
Temp Blank Present: yes no
 Biological Tissue is Frozen: yes no

Person examining contents:
 Date: 10-10-20 Initials: MLR
 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: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1. <u>+ copy</u> <u>MLR 10-10-20</u>
Chain of Custody Filled Out: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	2. <u>copy to info, proj #, invoice info, proj</u>
Chain of Custody Relinquished: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	3. <u>state, sample type</u> <u>MLR 10-10-20</u>
Sampler Name & Signature on COC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt <input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>150 MLR 10-10-20</u>
Sufficient Volume:	8. <u>004 (1) BP3U received w/ ~130 mL</u> <u>MLR 10-10-20</u>
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. <u>Lab received containers per Ra 226+228 but not indicated on COC. 001-002 would be under vol. for these tests.</u> <u>MLR</u>
-Pace Containers Used: <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used: <u>MLR 10-10-20</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. <u>10-10-20</u>
Filtered volume received for Dissolved tests <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>W</u>	
Trip Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: _____



Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Columbia

Location ID: MW-84A		Number of Sampling Dates: 19																		
Parameter Name	Units	GPS	12/22/2015	4/5/2016	7/8/2016	7/28/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/24/2017	4/25/2018	8/8/2018	10/24/2018	4/3/2019	10/9/2019	2/3/2020	
Boron	ug/L	--	11.9	14	14.7	--	11.1	14.7	16.1	12.9	14.8	22.9	13.8	25	12.8	10.1 J	13.6	12	15.7	
Calcium	ug/L	--	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500	72700	
Chloride	mg/L	--	4.9	4.7	5.1	--	4.3	4.7	4.6	4.9	5.5	5.5	5.1	4.8	4.9	4.2	3.6	3.9	3.7	
Fluoride	mg/L	4	<0.2 U	<0.2 U	<0.2 U	--	<0.1 U	<0.1 U	0.12 J	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	--	
Field pH	Std. Units	--	7.6	7.61	7.45	7.34	7.91	7.25	6.99	7.8	7.28	7.23	7.68	7.45	7.38	7.24	7.03	7.23	7.51	
Sulfate	mg/L	--	4.9	4.3	3.7 J	--	2.6 J	2.7 J	3	2.8 J	2.7 J	2 J	2.2 J	2.8 J	1.9 J	1.6 J	1.4 J	1.3 J	<2.2 U	
Total Dissolved Solids	mg/L	--	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310	316	
Antimony	ug/L	6	<0.073 U	0.084 J	0.1 J	--	<0.073 U	<0.073 U	<0.073 U	<0.073 U	<0.15 U	<0.15 U	--	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U	--	
Arsenic	ug/L	10	0.15 J	0.29 J	0.14 J	--	0.35 J	0.19 J	0.35 J	<0.099 U	<0.28 U	0.28 J	--	<0.28 U	<0.28 U	0.33 J	<0.28 U	0.46 J	0.38 J	
Barium	ug/L	2000	15.3	12.7	12.2	--	14.2	18.4	13.8	14.1	13.4	14	--	14.6	13.7	14.5	14.7	13.2	14	
Beryllium	ug/L	4	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	<0.18 U	<0.18 U	<0.18 U	<0.18 U	<0.25 U	--	
Cadmium	ug/L	5	<0.089 U	<0.089 U	<0.089 U	--	<0.089 U	<0.089 U	<0.089 U	<0.089 U	<0.081 U	<0.081 U	--	<0.081 U	--	<0.15 U	<0.15 U	<0.15 U	--	
Chromium	ug/L	100	2.5	1.9	1.8	--	2	2	1.9	2.4	2 J	1.6 J	--	2.4 J	1.5 J	1.6 J	1.8 J	1.6 J	1.6 J	
Cobalt	ug/L	6	0.095 J	<0.036 U	0.053 J	--	<0.036 U	<0.036 U	<0.036 U	<0.036 U	<0.085 U	<0.085 U	--	<0.085 U	<0.085 U	<0.12 U	<0.12 U	<0.12 U	<0.12 U	
Lead	ug/L	15	0.16 J	<0.04 U	0.39 J	--	0.049 J	0.11 J	<0.04 U	0.041 J	<0.2 U	<0.2 U	--	<0.2 U	--	<0.24 U	<0.24 U	<0.24 U	--	
Lithium	ug/L	40	0.72 J	0.44 J	0.5 J	--	0.56 J	0.56 J	0.56 J	0.55 J	0.46 J	0.58 J	--	0.5 J	0.4 J	0.49 J	0.56 J	0.52 J	0.58 J	
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	--	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	<0.084 U	<0.084 U	<0.084 U	--	
Molybdenum	ug/L	100	<0.07 U	<0.07 U	0.073 J	--	0.12 J	<0.07 U	<0.07 U	<0.07 U	<0.44 U	<0.44 U	--	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U	
Selenium	ug/L	50	<0.21 U	<0.21 U	<0.21 U	--	<0.21 U	<0.21 U	<0.21 U	<0.21 U	<0.32 U	<0.32 U	--	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 U	
Thallium	ug/L	2	<0.14 U	<0.14 U	<0.14 U	--	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	
Total Radium	pCi/L	5	0.593	0.0809	--	1.37	0.825	0.404	1.39	0.0929	0.676	0.509	--	0.526	0.529	0.62	0.681	0.247	0.1	
Radium-226	pCi/L	--	0.156	-0.088	--	-0.058	0.132	0.168	0.624	0.0768	0.27	0.242	--	0.155	-0.203	0.313	0.199	0.247	0.1	
Radium-228	pCi/L	--	0.437	0.0809	--	1.37	0.693	0.236	0.766	0.0161	0.406	0.267	--	0.371	0.529	0.307	0.482	-0.024	-0.153	
Field Specific Conductance	umhos/cm	--	599	427	574.8	579.3	1002	578.2	489	948	535.3	557.2	491	581.7	617.1	609	637.2	614.1	618.4	
Oxygen, Dissolved	mg/L	--	9.7	9.37	3.78	5.11	9.61	8.94	6.48	9.28	9.46	7.5	9.3	3.94	8.84	10.01	9.49	11.36	8.43	
Field Oxidation Potential	mV	--	154	165.1	139.9	138.3	82.7	87	192.9	102	123.6	204.7	210	53.3	142.7	71.5	103.4	181.7	121.5	
Groundwater Elevation	feet	--	785.31	786.3	785.89	785.61	787.22	786.63	786.7	787.16	787.63	786.68	785.32	785.88	786.55	788.32	787.35	787.79	786.5	
Temperature	deg C	--	10.4	10.2	11.3	11	11.5	10.8	10.9	10.6	11.3	11.2	11.1	10.2	12	11.6	10.2	11.8	10.3	
Turbidity	NTU	--	--	0.86	2.75	0.17	0.3	0.25	0.33	0.04	0.56	0.08	2.93	0.81	0.71	3.79	1.9	2.41	1.23	
pH at 25 Degrees C	Std. Units	--	7.5	7.4	7.4	--	7.3	7.4	7.3	7.7	7.6	7.4	7.6	7.6	7.4	7.5	7.4	7.5	7.4	

07/01/2021 - Classification: Internal - ECRM12626135

Location ID: MW-84A

Number of Sampling Dates: 19

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

07/01/2021 - Classification: Internal - ECRM12626135

Single Location

Name: WPL - Columbia

Location ID: MW-301		Number of Sampling Dates: 18																	
Parameter Name	Units	GPS	12/22/2015	4/5/2016	7/8/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/23/2017	4/25/2018	8/8/2018	10/24/2018	4/2/2019	10/9/2019	2/3/2020	5/29/2020
Boron	ug/L	--	26.5	25.2	23.6	30.6	32.8	32.6	28.8	21.3	30.6	34.3	24.3	22.8	27.8	26.9	35.9	27.9	21.3
Calcium	ug/L	--	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000	112000
Chloride	mg/L	--	3.7 J	4	3.5 J	2.2	2 J	1.5 J	2	3.5	5.5	4	2.3	5.2	3.2	0.79 J	1.7 J	1.3 J	2 J
Fluoride	mg/L	4	<0.2 U	<0.2 U	<0.2 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	--	<0.095 U
Field pH	Std. Units	--	6.85	7.01	6.87	7.28	6.63	7.1	7.11	6.7	6.75	7.37	6.76	6.91	6.79	6.62	6.67	6.89	6.73
Sulfate	mg/L	--	9.3	15.3	15	13.9	12.3 J	6.5	10.3	17.1	31.6	27.5	8.6	21.6	19.2	4.4	8.4	7.2	11.5
Total Dissolved Solids	mg/L	--	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462	452
Antimony	ug/L	6	0.15 J	0.094 J	0.13 J	<0.073 U	0.4 J	<0.073 U	<0.073 U	<0.15 U	<0.15 U	--	<0.15 U	0.36 J	<0.15 U	0.32 J	<0.15 U	--	<0.15 U
Arsenic	ug/L	10	0.26 J	0.26 J	0.19 J	0.24 J	0.4 J	0.13 J	0.18 J	<0.28 U	<0.28 U	--	<0.28 U	0.45 J	<0.28 U	0.4 J	0.42 J	<0.28 U	0.33 J
Barium	ug/L	2000	20.2	11.1	11.6	15.6	15	13.5	13.2	11.3	11.8	--	9.3	10.2	11.5	11.8	10	10.9	9.8
Beryllium	ug/L	4	<0.13 U	<0.13 U	<0.13 U	<0.13 U	0.19 J	<0.13 U	<0.13 U	<0.18 U	<0.18 U	--	<0.18 U	0.37 J	<0.18 U	0.28 J	<0.25 U	--	<0.25 U
Cadmium	ug/L	5	<0.089 U	<0.089 U	<0.089 U	<0.089 U	0.32 J	<0.089 U	<0.089 U	<0.081 U	<0.081 U	--	<0.081 U	--	<0.15 U	0.21 J	<0.15 U	--	<0.15 U
Chromium	ug/L	100	2.1	0.58 J	0.59 J	<0.39 U	0.7 J	0.53 J	0.7 J	2.3 J	<1 U	--	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
Cobalt	ug/L	6	1.4	0.25 J	0.22 J	0.041 J	0.38 J	0.071 J	0.064 J	0.13 J	0.12 J	--	<0.085 U	0.28 J	<0.12 U	0.35 J	<0.12 U	0.17 J	<0.12 U
Lead	ug/L	15	0.9 J	0.077 J	0.48 J	<0.04 U	0.34 J	<0.04 U	<0.04 U	<0.2 U	<0.2 U	--	<0.2 U	--	<0.24 U	0.3 J	<0.24 U	--	<0.24 U
Lithium	ug/L	40	1.3	0.58 J	0.69 J	0.6 J	0.87 J	0.67 J	0.68 J	0.62 J	0.6 J	--	0.55 J	0.85 J	0.52 J	0.9 J	0.61 J	0.67 J	0.47 J
Mercury	ug/L	2	<0.1 U	<0.1 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	--	<0.13 U	--	<0.084 U	<0.084 U	<0.084 U	--	<0.084 U
Molybdenum	ug/L	100	0.35 J	0.15 J	0.14 J	0.12 J	0.38 J	<0.07 U	<0.07 U	<0.44 U	<0.44 U	--	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U	<0.44 U
Selenium	ug/L	50	0.3 J	0.21 J	0.39 J	<0.21 U	0.26 J	<0.21 U	<0.21 U	<0.32 U	<0.32 U	--	<0.32 U	0.71 J	<0.32 U	0.49 J	<0.32 U	<0.32 U	<0.32 U
Thallium	ug/L	2	<0.14 U	<0.14 U	<0.14 U	<0.14 U	0.48 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	<0.14 U	0.3 J	<0.14 U	0.48 J	<0.14 U	<0.14 U	<0.14 U
Total Radium	pCi/L	5	1.31	1.11	0.89	0.631	1.01	2.42	1.35	1.3	1.74	--	0.882	0.0351	0.652	0.552	0.701	0.502	0.193
Radium-226	pCi/L	--	0.655	0.294	0.404	-0.067	0.108	1.46	0.513	0.287	1.09	--	0.122	-0.06	0.247	0	0.252	0.136	0
Radium-228	pCi/L	--	0.651	0.82	0.486	0.631	0.905	0.964	0.833	1.01	0.647	--	0.76	0.0351	0.405	0.552	0.449	0.366	0.193
Field Specific Conductance	umhos/cm	--	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868	797
Oxygen, Dissolved	mg/L	--	1.7	2.71	1.47	1.99	1.34	1.24	1.44	1.81	1.43	1.1	2.35	2.14	2.49	2.2	1.67	1.07	2
Field Oxidation Potential	mV	--	135	123.7	133.9	100.8	95.8	226.1	100.9	115.1	187.4	204	74.3	126.5	77.9	152.1	173	132.3	118.7
Groundwater Elevation	feet	--	785.56	768.12	786.31	787.64	787.37	787.27	787.89	788.25	787.34	785.89	785.29	787.06	788.98	787.04	788.47	787.24	787.77
Temperature	deg C	--	9.7	7.7	10	11.2	10.1	8.8	7.7	8.9	10.2	11.1	7.4	10.6	11.1	7.5	11.3	8.5	8.1
Turbidity	NTU	--	--	1.52	3.89	0.59	0.74	0.42	0.1	0.22	0.18	1.52	1.12	0.46	3.3	2.02	2.12	1.41	0
pH at 25 Degrees C	Std. Units	--	7	7	6.8	6.8	6.9	6.9	7.1	7	7	7.3	7	7	7.1	6.8	7	6.8	7

07/01/2021 - Classification: Internal - ECRM12626135

Location ID: MW-301

Number of Sampling Dates: 18

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

07/01/2021 - Classification: Internal - ECRM12626135

Single Location

Name: WPL - Columbia

Location ID: MW-306		Number of Sampling Dates: 13													
Parameter Name	Units	GPS	1/26/2017	4/10/2017	6/5/2017	8/8/2017	10/23/2017	5/24/2018	10/24/2018	4/1/2019	10/8/2019	12/13/2019	2/3/2020	5/28/2020	10/7/2020
Boron	ug/L	--	138	128	129	136	145	92	166	119	134	121	120	108	108
Calcium	ug/L	--	81200	83500	85200	84800	90700	78400	86700	87300	92800	83800	81900	84600	77900
Chloride	mg/L	--	1.7 J	1.1 J	2.3	1.7 J	1 J	1.8 J	1.3 J	1.7 J	0.64 J	0.76 J	0.88 J	0.76 J	0.63 J
Fluoride	mg/L	4	0.15 J	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.095 U	--	<0.095 U	<0.095 U
Field pH	Std. Units	--	8.98	7.56	7.22	6.96	7.7	7.25	7.09	7.31	7.28	7.29	7.08	6.97	7.25
Sulfate	mg/L	--	8.2	6.8	10.1	7.3	8.7	6.3	14.4	9.2	7.8	7.6	7.2	6.9	8.4
Total Dissolved Solids	mg/L	--	310	326	324	338	310	314	322	310	328	326	310	306	322
Antimony	ug/L	6	0.074 J	0.21 J	<0.15 U	<0.15 U	0.17 J	<0.15 U	<0.15 U	--	--	<0.15 U	--	<0.15 U	--
Arsenic	ug/L	10	0.14 J	0.25 J	<0.28 U	<0.28 U	0.29 J	<0.28 U	<0.28 U	--	--	<0.28 U	<0.28 U	<0.28 U	<0.28 U
Barium	ug/L	2000	19.2	14.9	8.2	11.8	16.1	11.3	8.5	--	--	9	10.2	9.7	10.5
Beryllium	ug/L	4	<0.13 U	0.14 J	<0.18 U	<0.18 U	<0.18 U	<0.18 U	<0.18 U	--	--	<0.25 U	--	<0.25 U	--
Cadmium	ug/L	5	<0.089 U	0.11 J	<0.081 U	<0.081 U	<0.081 U	<0.081 U	<0.15 U	--	--	<0.15 U	--	<0.15 U	--
Chromium	ug/L	100	1.6	2.2	1.8 J	2 J	2.9 J	2.2 J	1.7 J	--	--	4.1	2.1 J	2.1 J	2 J
Cobalt	ug/L	6	0.054 J	0.15 J	<0.085 U	<0.085 U	0.2 J	<0.085 U	<0.12 U	--	--	<0.12 U	<0.12 U	<0.12 U	<0.12 U
Lead	ug/L	15	<0.04 U	0.15 J	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.26 J	--	--	<0.24 U	--	<0.24 U	--
Lithium	ug/L	40	13.9	6.8	1.6	5.7	8.6	3.8	0.51 J	--	--	2.2	3.1	2.7	4.4
Mercury	ug/L	2	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.084 U	--	--	<0.084 U	--	<0.084 U	--
Molybdenum	ug/L	100	11.4	8.4	5	6.7	9.6	7.2	4	--	--	5.8	6.1	6.5	7.1
Selenium	ug/L	50	0.52 J	0.77 J	0.48 J	0.58 J	0.84 J	0.58 J	0.59 J	--	--	0.54 J	0.81 J	0.85 J	0.69 J
Thallium	ug/L	2	<0.14 U	0.28 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	--	0.17 J	<0.14 U	<0.14 U	--
Total Radium	pCi/L	5	0.653	0.886	1.4	0.435	0.502	0.5	0.291	--	--	0.323	0.759	0.49	0.721
Radium-226	pCi/L	--	-0.148	0.567	0.329	0.0606	0.271	0.31	0.291	--	--	0	-0.0492	0.182	0.304
Radium-228	pCi/L	--	0.653	0.319	1.07	0.374	0.231	0.19	-0.378	--	--	0.323	0.759	0.308	0.417
Field Specific Conductance	umhos/cm	--	531.8	899	495.7	524.4	477	583	598	592.3	583	662	588	572.1	565.4
Oxygen, Dissolved	mg/L	--	5.91	7.81	9.6	6.27	5	8.91	8.02	8.46	9.8	8.34	8.26	9.08	7.71
Field Oxidation Potential	mV	--	-16.1	97.6	84.3	196.2	234	92.8	40.3	150	109.1	56	226.5	227.7	103.8

07/01/2021 - Classification: Internal - ECRM12626135

Location ID: MW-306															
Number of Sampling Dates: 13															
Parameter Name	Units	GPS	1/26/2017	4/10/2017	6/5/2017	8/8/2017	10/23/2017	5/24/2018	10/24/2018	4/1/2019	10/8/2019	12/13/2019	2/3/2020	5/28/2020	10/7/2020
Groundwater Elevation	feet	--	785.5	786.22	786.85	785.69	783.97	785.79	787.66	786.72	787.47	787.03	785.77	785.77	785.39
Temperature	deg C	--	10.1	9.8	10	12.1	13.4	9.6	13.5	9.1	13.1	11.6	9.9	10.2	13.1
Turbidity	NTU	--	0.41	0.34	0.55	0.34	32.64	3.96	4.89	1.61	1.27	0	0.65	0.32	1.29
pH at 25 Degrees C	Std. Units	--	7.5	7.4	7.4	7.3	7.4	7.4	7.5	7.4	7.3	7.3	7.4	7.6	7.6

07/01/2021 - Classification: Internal - ECRM12626135

Single Location

Name: WPL - Columbia

Location ID: MW-307		Number of Sampling Dates: 13													
Parameter Name	Units	GPS	1/26/2017	4/10/2017	6/5/2017	8/8/2017	10/23/2017	5/24/2018	10/24/2018	4/1/2019	10/7/2019	12/13/2019	2/3/2020	5/27/2020	10/8/2020
Boron	ug/L	--	319	175	178	373	434	313	338	154	242	281	246	231	307
Calcium	ug/L	--	70300	68300	70600	72500	83700	107000	17400	76500	75800	78700	72600	77800	67800
Chloride	mg/L	--	8.7 J	4.1	5.4	8.3	12.9	52.8	19.3	13.8	9.3	16	13.8	12.9	12.1
Fluoride	mg/L	4	<0.5 U	<0.1 U	<0.1 U	<0.1 U	<0.5 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.48 U	--	<0.095 U	<0.48 U
Field pH	Std. Units	--	6.89	7.52	7.26	6.9	7.75	6.83	6.94	7.14	7.24	7.18	7.19	7.07	7.28
Sulfate	mg/L	--	14.2 J	33.1	32.6	6.7	10.7 J	115	47.7	38.2	27.8	15.5	15.3	13.2	10.3
Total Dissolved Solids	mg/L	--	318	324	324	350	362	576	398	350	336	354	340	356	334
Antimony	ug/L	6	<0.073 U	0.29 J	<0.15 U	<0.15 U	<0.15 U	0.39 J	<0.15 U	--	--	<0.15 U	--	<0.15 U	--
Arsenic	ug/L	10	2	0.73 J	0.42 J	1.5	3	0.7 J	<0.28 U	--	--	1.1	1.7	0.76 J	2.7
Barium	ug/L	2000	10.7	9.3	7.8	13.7	15.1	13.6	4.8 J	--	--	15.9	13.5	13.7	13.8
Beryllium	ug/L	4	<0.13 U	<0.13 U	<0.18 U	<0.18 U	<0.18 U	<0.18 U	<0.18 U	--	--	<0.25 U	--	<0.25 U	--
Cadmium	ug/L	5	<0.089 U	0.27 J	<0.081 U	<0.081 U	<0.081 U	<0.081 U	0.21 J	--	--	<0.15 U	--	<0.15 U	--
Chromium	ug/L	100	<0.39 U	1.6	<1 U	<1 U	<1 U	<1 U	<1 U	--	--	<1 U	<1 U	<1 U	<1 U
Cobalt	ug/L	6	0.33 J	0.58 J	0.19 J	0.6 J	0.43 J	2.7	0.45 J	--	--	0.46 J	1	0.55 J	0.61 J
Lead	ug/L	15	<0.04 U	0.41 J	<0.2 U	0.21 J	<0.2 U	<0.2 U	0.33 J	--	--	<0.24 U	--	<0.24 U	--
Lithium	ug/L	40	<0.11 U	0.3 J	<0.14 U	0.21 J	<0.14 U	0.2 J	0.5 J	--	--	0.24 J	0.53 J	<0.22 U	<0.22 U
Mercury	ug/L	2	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.084 U	--	--	<0.084 U	--	<0.084 U	--
Molybdenum	ug/L	100	1	0.8 J	0.44 J	0.74 J	1.5 J	0.94 J	<0.44 U	--	--	0.72 J	1.2 J	0.7 J	0.64 J
Selenium	ug/L	50	<0.21 U	0.4 J	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 U	--	--	<0.32 U	0.78 J	<0.32 U	<0.32 U
Thallium	ug/L	2	<0.14 U	0.37 J	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	--	0.21 J	0.65 J	<0.14 U	--
Total Radium	pCi/L	5	0.864	1.39	2.26	0.676	0.742	0.505	0.416	--	--	0.188	0.706	0.309	0.636
Radium-226	pCi/L	--	-0.523	0.233	0.914	0.309	0.511	0.309	0.251	--	--	-0.0613	-0.228	0.203	0.108
Radium-228	pCi/L	--	0.864	1.16	1.35	0.367	0.231	0.196	0.165	--	--	0.188	0.706	0.106	0.528
Field Specific Conductance	umhos/cm	--	570.2	898	503.9	589.9	591	915	731	662.5	618.2	752	638.3	615.2	644
Oxygen, Dissolved	mg/L	--	0.23	0.28	0.19	0.14	0.3	0.2	0.07	0.12	0.11	0.33	0.07	0.13	0.03
Field Oxidation Potential	mV	--	-119.6	-19.6	-12.9	-51.1	101	-34	-68.2	-0.8	-98.7	-102.7	-80.5	-26.3	-141.8

07/01/2021 - Classification: Internal - ECRM12626135

Location ID: MW-307		Number of Sampling Dates: 13													
Parameter Name	Units	GPS	1/26/2017	4/10/2017	6/5/2017	8/8/2017	10/23/2017	5/24/2018	10/24/2018	4/1/2019	10/7/2019	12/13/2019	2/3/2020	5/27/2020	10/8/2020
Groundwater Elevation	feet	--	785.36	785.64	786.07	785.19	784.79	785.09	786.57	786.71	786.99	785.68	785.57	785.35	784.71
Temperature	deg C	--	10.1	9.2	10.5	15	14.5	9.5	14.6	8.2	14.3	12	10	10.8	14
Turbidity	NTU	--	1.9	1.28	1.85	1.78	3.87	6.64	6.07	2.27	1.83	0	1.32	0.74	0
pH at 25 Degrees C	Std. Units	--	7.5	7.6	7.4	7.3	7.4	7	7.4	7.3	7.5	7.2	7.2	7.5	7.3

07/01/2021 - Classification: Internal - ECRM12626135

Single Location

Name: WPL - Columbia

Location ID: MW-308		Number of Sampling Dates: 13													
Parameter Name	Units	GPS	1/26/2017	4/10/2017	6/5/2017	8/9/2017	10/23/2017	4/24/2018	10/24/2018	4/1/2019	10/7/2019	12/13/2019	2/3/2020	5/27/2020	10/7/2020
Boron	ug/L	--	740	614	565	644	707	584	430	587	694	647	606	476	563
Calcium	ug/L	--	132000	129000	140000	131000	134000	126000	144000	132000	131000	130000	124000	132000	123000
Chloride	mg/L	--	7.5 J	5.8 J	5.8 J	3.7	5.6 J	3.7 J	<2.5 U	1.8 J	1.6 J	2.3 J	1.5 J	1.2 J	1.1 J
Fluoride	mg/L	4	<0.5 U	<0.5 U	<0.5 U	0.11 J	<0.5 U	<0.5 U	<0.5 U	<0.1 U	<0.1 U	<0.48 U	--	<0.095 U	0.12 J
Field pH	Std. Units	--	7.38	7.56	7.09	7.25	7.51	7.1	6.78	7.39	7.48	7.25	7.29	7.1	7.09
Sulfate	mg/L	--	6.1 J	5.5 J	14.8 J	1.7 J	<5 U	<5 U	70.7	1.1 J	<1 U	<2.2 U	<2.2 U	2.8	0.52 J
Total Dissolved Solids	mg/L	--	544	526	508	546	486	512	566	484	470	504	468	510	490
Antimony	ug/L	6	<0.073 U	0.12 J	<0.15 U	<0.15 U	<0.15 U	<0.15 U	<0.15 U	--	--	<0.15 U	--	<0.15 U	--
Arsenic	ug/L	10	3.4	3.5	2.3	2.6	5.1	4.9	6.8	--	--	3.5	3.6	3.1	3.7
Barium	ug/L	2000	70.8	95.1	66.7	75	86.6	85.4	84.8	--	--	62.4	55.6	59.1	61.5
Beryllium	ug/L	4	<0.13 U	0.17 J	<0.18 U	<0.18 U	<0.18 U	<0.18 U	<0.18 U	--	--	<0.25 U	--	<0.25 U	--
Cadmium	ug/L	5	<0.089 U	<0.089 U	<0.081 U	<0.081 U	<0.081 U	<0.081 U	<0.15 U	--	--	<0.15 U	--	<0.15 U	--
Chromium	ug/L	100	0.97 J	9.3	<1 U	1.1 J	4	7.9	<1 U	--	--	<1 U	<1 U	<1 U	<1 U
Cobalt	ug/L	6	0.28 J	1.6	0.21 J	0.26 J	0.85 J	1.7	1	--	--	<0.12 U	<0.12 U	<0.12 U	<0.12 U
Lead	ug/L	15	0.28 J	2.5	<0.2 U	0.37 J	1.2	2.5	<0.24 U	--	--	<0.24 U	--	<0.24 U	--
Lithium	ug/L	40	0.28 J	2.2	0.18 J	0.26 J	0.96 J	2.1	<0.19 U	--	--	<0.22 U	0.35 J	<0.22 U	<0.22 U
Mercury	ug/L	2	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.13 U	<0.084 U	--	--	<0.084 U	--	<0.084 U	--
Molybdenum	ug/L	100	1.2	1.4	2.2	0.91 J	1.2 J	0.54 J	3.2	--	--	3	1.2 J	0.9 J	1.1 J
Selenium	ug/L	50	<0.21 U	0.72 J	<0.32 U	<0.32 U	0.35 J	0.45 J	<0.32 U	--	--	<0.32 U	<0.32 U	<0.32 U	<0.32 U
Thallium	ug/L	2	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	<0.14 U	--	--	<0.14 U	<0.14 U	<0.14 U	--
Total Radium	pCi/L	5	1.67	0.78	1.44	1.18	0.318	0.581	0.274	--	--	0.733	0.257	0.569	1.03
Radium-226	pCi/L	--	0	0.295	0	0.454	-0.077	0.411	0.274	--	--	0.0522	-0.053	0.249	0.21
Radium-228	pCi/L	--	1.67	0.485	1.44	0.722	0.318	0.17	-0.042	--	--	0.681	0.257	0.32	0.815
Field Specific Conductance	umhos/cm	--	920	1457	819	864	810	902	987	924	896	1051	909	897	916
Oxygen, Dissolved	mg/L	--	1.15	0.19	0.16	0.08	0.2	0.11	0.08	0.15	0.07	0.4	0.08	0.21	0.45
Field Oxidation Potential	mV	--	-105.4	-106.4	-76.1	-71.4	100	-184	-147.8	-137.7	-170	-154.9	-151.7	-91.5	-123.5


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Location ID: MW-308

Number of Sampling Dates: 13

Parameter Name	Units	GPS	1/26/2017	4/10/2017	6/5/2017	8/9/2017	10/23/2017	4/24/2018	10/24/2018	4/1/2019	10/7/2019	12/13/2019	2/3/2020	5/27/2020	10/7/2020
Groundwater Elevation	feet	--	785.73	786.51	786.46	785.37	784.17	782.65	787.81	787.53	787.18	786.43	786.48	786.28	785.68
Temperature	deg C	--	11.5	9	10.6	14.9	14.6	10.5	15.1	8.9	15	12	10.4	12.1	15.5
Turbidity	NTU	--	14.9	113.1	9.85	16.81	38.62	133.7	9.3	3.44	6.75	0	1.52	4.44	0
pH at 25 Degrees C	Std. Units	--	7.4	7.4	7.2	7.3	7.3	7.2	7.3	7.4	7.4	7.2	7.3	7.3	7.4

07/01/2021 - Classification: Internal - ECRM12626135



Appendix E

Statistical Evaluation

January 4, 2021
File No. 25220067.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results – Prediction Limit Update
Columbia Energy Center - Secondary Ash Pond

PREPARED BY: Nicole Kron

CHECKED BY: Sherren Clark

STATISTICAL METHOD FOR PREDICTION LIMITS

Groundwater monitoring data for the Columbia Energy Center (COL) Secondary Ash Pond, is evaluated in accordance with 40 CFR 257.93(f)(3), using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit (UPL).

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

The COL Secondary Ash Pond, monitoring data includes two background monitoring wells, MW-301 and MW-84A, as well three compliance monitoring wells, MW-306, MW-307, and MW-308. The background wells are shared with other CCR units at COL.

The initial UPLs were calculated based on nine rounds of background monitoring were performed prior to the initiation of compliance monitoring for the existing CCR units at COL, from December 2015 through August 2017. Since then, additional rounds of monitoring for Appendix III parameters and Appendix IV parameters have been performed at the background wells. As part of the evaluation of the October 2020 monitoring results, the background data set for the UPL calculations is being updated to include data from the background wells collected through October 2020. This memo addresses updated UPLs for both Appendix III and Appendix IV parameters.

TIME SERIES PLOTS

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

OUTLIER ANALYSIS - INTERWELL

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



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

- 1) Run normality test (Shapiro Wilk/Francia).
- 2) If normally distributed, run USEPA's 1989 Outlier Test to identify suspected outliers.
 - a) If number of background samples is less than or equal to 25, run Dixon's test for suspected outliers.
 - b) If number of background samples is more than 25, run Rosner's test for suspected outliers.
- 3) If not normally distributed, run Tukey's test for outliers.
- 4) Review data flagged as possible outliers to evaluate whether they should be removed from the background data set. Also review time series plots for possible outliers that were not picked up in the statistical evaluation (e.g., outlier test may not identify outliers when two values are similar to each other, but very different from all other data).

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

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

- **Barium (MW-301).** One high result from the December 2015 event was flagged as a statistical outlier. This result was removed from the dataset because this was the first sample collected following the well installation, which may have impacted groundwater conditions.
- **Barium (MW-84A).** One high result from the December 2016 event was flagged as a statistical outlier. This result was not removed from the dataset because there was no known explanation for the higher result and it appeared to be within the range of potential natural variation relative to the other observed barium concentrations.
- **Cobalt (MW-301).** One high result from the December 2015 event was flagged as a statistical outlier. This result was removed from the dataset because this was the first sample collected following the well installation, which may have impacted groundwater conditions.
- **Lithium (MW-301).** One high result from the December 2015 event was flagged as a statistical outlier. This result was removed from the dataset because this was the first sample collected following the well installation, which may have impacted groundwater conditions.
- Outlier analysis of results are included in **Attachment 2.**

INTERWELL PREDICTION LIMITS

Interwell prediction limits are calculated using background data from the upgradient monitoring wells (MW-301 and MW-84A) for each monitored constituent, with outliers removed as noted above. During this evaluation of compliance monitoring groundwater results from October 2017 through October 2020 were included to calculate the interwell prediction limits. The prediction limit analysis performed in Sanitas includes the following steps:

- 1) If 100% of the background values are non-detect, the Double Quantification rule applies and no prediction limit is calculated.
- 2) If 50% or more of results are non-detect, then a non-parametric prediction limit is calculated.
- 3) If fewer than 50% of the results are non-detect, run normality test (Shapiro Wilk/Francia) to assess whether the data fit a normal distribution or can be transformed to fit a normal distribution (e.g., lognormal).
- 4) If normal or transformed normal, calculate parametric prediction limit.
- 5) If not normal or transformed normal, calculate non-parametric prediction limit.

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

Parameter	Value	Comments
Evaluations per year	2	Spring and Fall events
Appendix III Constituents analyzed	6	Total of 7 constituents analyzed, fluoride not counted because all background results were non-detect
Appendix IV Constituents analyzed	13	Total of 15 constituents analyzed, fluoride and mercury not counted because double quantification rule will be used
Compliance wells	3	MW-306, MW-307, MW-308

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

For results with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule means that a statistically significant increase (SSI) has not occurred for a compliance well unless two sample results from the well exceed the laboratory's reporting limit or quantification limit. Mercury had 100 percent non-detects in the background data. Fluoride had only one J-flagged detection in the pooled background data, at an estimated concentration below the

TECHNICAL MEMORANDUM

January 4, 2020

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detection limits for some other results; therefore, the double quantification rule will also be used for fluoride.

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

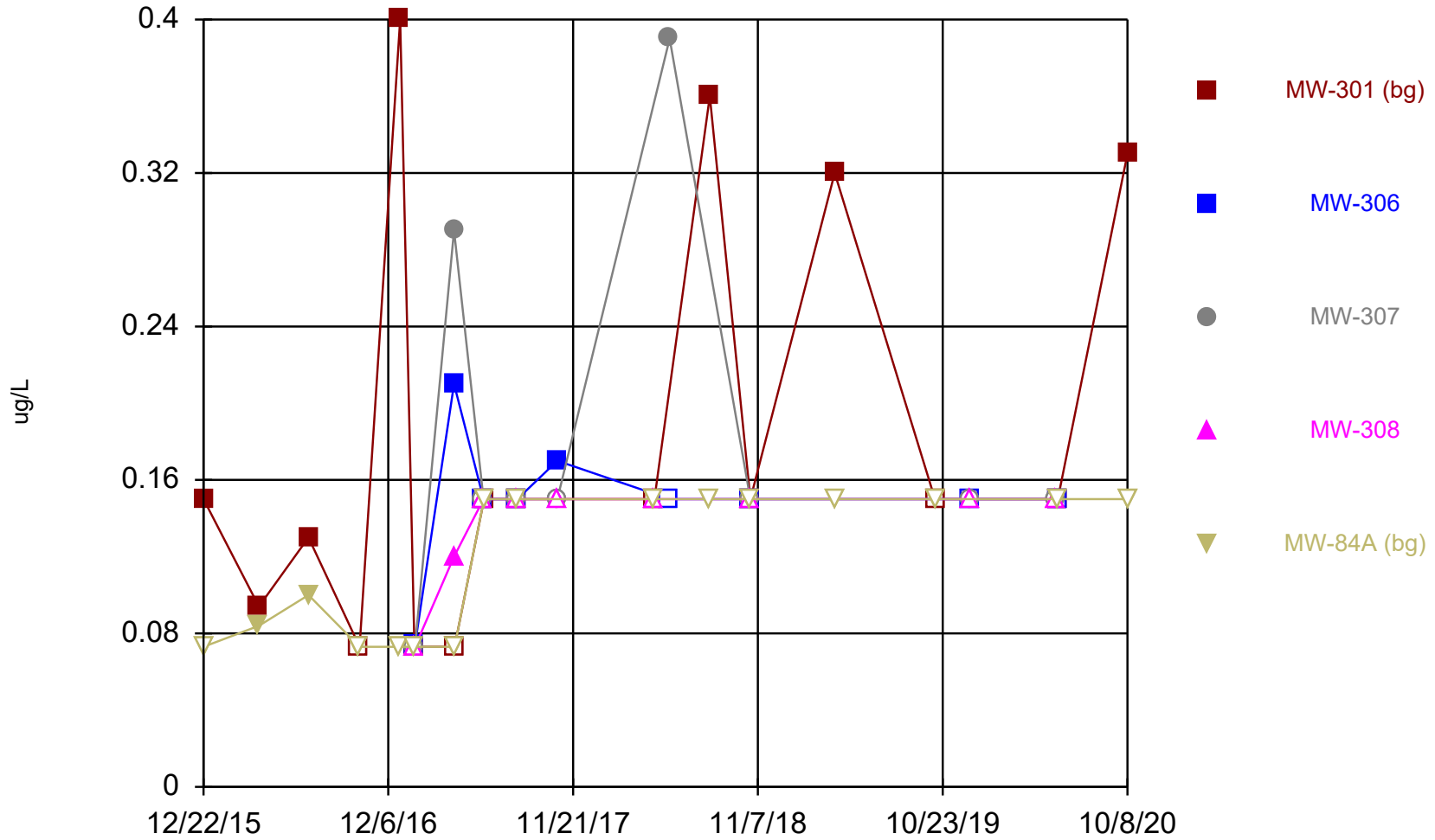
Interwell prediction limit analysis results for Appendix III constituents are included in **Attachment 3** and **Attachment 4** for Appendix IV constituents. UPLs were updated for all parameters. For Appendix IV parameters that were not analyzed in October 2020 because they were not detected in the compliance wells in May 2020, Sanitas shows the May 2020 results in the summary table.

NDK/SCC

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Attachment 1
Times Series Graphs

Antimony



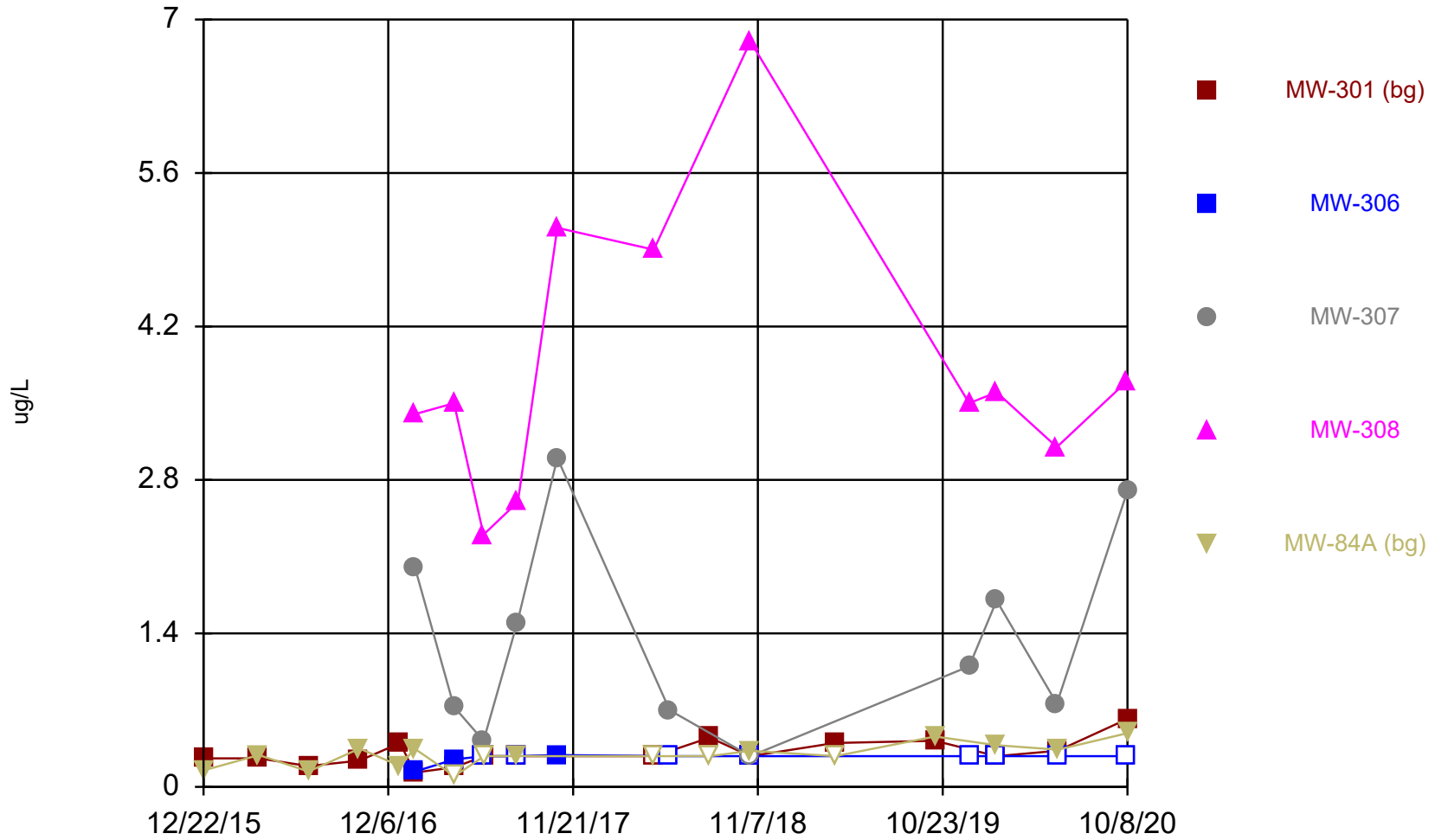
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Time Series

Constituent: Antimony (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	0.15 (J)				<0.073 (U)
4/5/2016	0.094 (J)				0.084 (J)
7/8/2016	0.13 (J)				0.1 (J)
10/13/2016	<0.073 (U)				<0.073 (U)
12/29/2016	0.4 (J)				<0.073 (U)
1/25/2017	<0.073 (U)				<0.073 (U)
1/26/2017		0.074 (J)	<0.073 (U)	<0.073 (U)	
4/10/2017		0.21 (J)	0.29 (J)	0.12 (J)	
4/11/2017	<0.073 (U)				<0.073 (U)
6/5/2017		<0.15 (U)	<0.15 (U)	<0.15 (U)	
6/6/2017	<0.15 (U)				<0.15 (U)
8/8/2017	<0.15 (U)	<0.15 (U)	<0.15 (U)		<0.15 (U)
8/9/2017				<0.15 (U)	
10/23/2017		0.17 (J)	<0.15 (U)	<0.15 (U)	
4/24/2018				<0.15 (U)	
4/25/2018	<0.15 (U)				<0.15 (U)
5/24/2018		<0.15 (U)	0.39 (J)		
8/8/2018	0.36 (J)				<0.15 (U)
10/24/2018	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)
4/2/2019	0.32 (J)				
4/3/2019					<0.15 (U)
10/9/2019	<0.15 (U)				<0.15 (U)
12/13/2019		<0.15 (U)	<0.15 (U)	<0.15 (U)	
5/27/2020			<0.15 (U)	<0.15 (U)	
5/28/2020		<0.15 (U)			
5/29/2020	<0.15 (U)				<0.15 (U)
10/8/2020	0.33 (J)				<0.15 (U)

Arsenic



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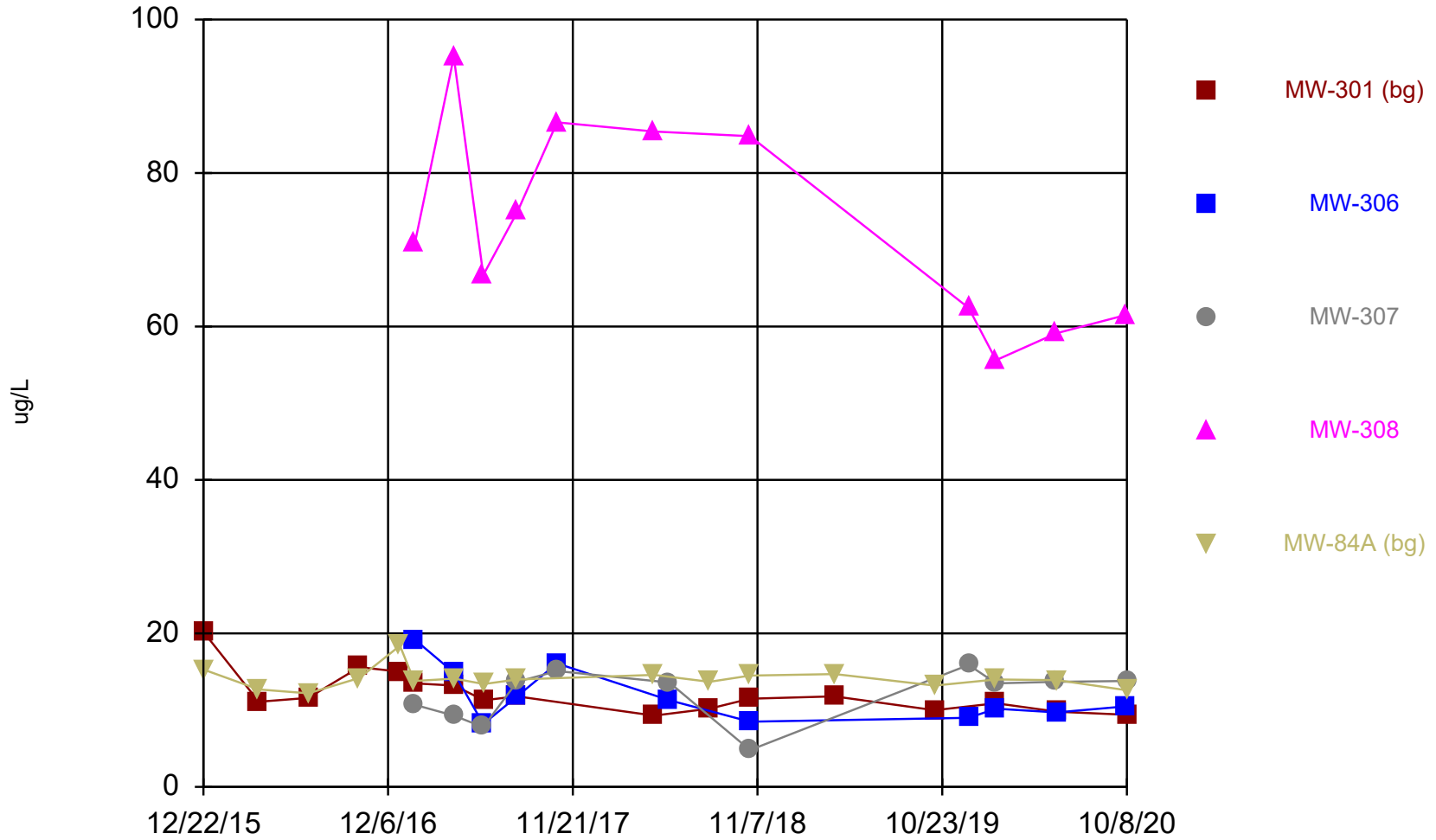
Time Series Analysis Run 12/23/2020 3:36 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Arsenic (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	0.26 (J)				0.15 (J)
4/5/2016	0.26 (J)				0.29 (J)
7/8/2016	0.19 (J)				0.14 (J)
10/13/2016	0.24 (J)				0.35 (J)
12/29/2016	0.4 (J)				0.19 (J)
1/25/2017	0.13 (J)				0.35 (J)
1/26/2017		0.14 (J)	2	3.4	
4/10/2017		0.25 (J)	0.73 (J)	3.5	
4/11/2017	0.18 (J)				<0.099 (U)
6/5/2017		<0.28 (U)	0.42 (J)	2.3	
6/6/2017	<0.28 (U)				<0.28 (U)
8/8/2017	<0.28 (U)	<0.28 (U)	1.5		0.28 (J)
8/9/2017				2.6	
10/23/2017		0.29 (J)	3	5.1	
4/24/2018				4.9	
4/25/2018	<0.28 (U)				<0.28 (U)
5/24/2018		<0.28 (U)	0.7 (J)		
8/8/2018	0.45 (J)				<0.28 (U)
10/24/2018	<0.28 (U)	<0.28 (U)	<0.28 (U)	6.8	0.33 (J)
4/2/2019	0.4 (J)				
4/3/2019					<0.28 (U)
10/9/2019	0.42 (J)				0.46 (J)
12/13/2019		<0.28 (U)	1.1	3.5	
2/3/2020	<0.28 (U)	<0.28 (U)	1.7	3.6	0.38 (J)
5/27/2020			0.76 (J)	3.1	
5/28/2020		<0.28 (U)			
5/29/2020	0.33 (J)				0.34 (J)
10/7/2020		<0.28 (U)		3.7	
10/8/2020	0.62 (J)		2.7		0.49 (J)

Barium



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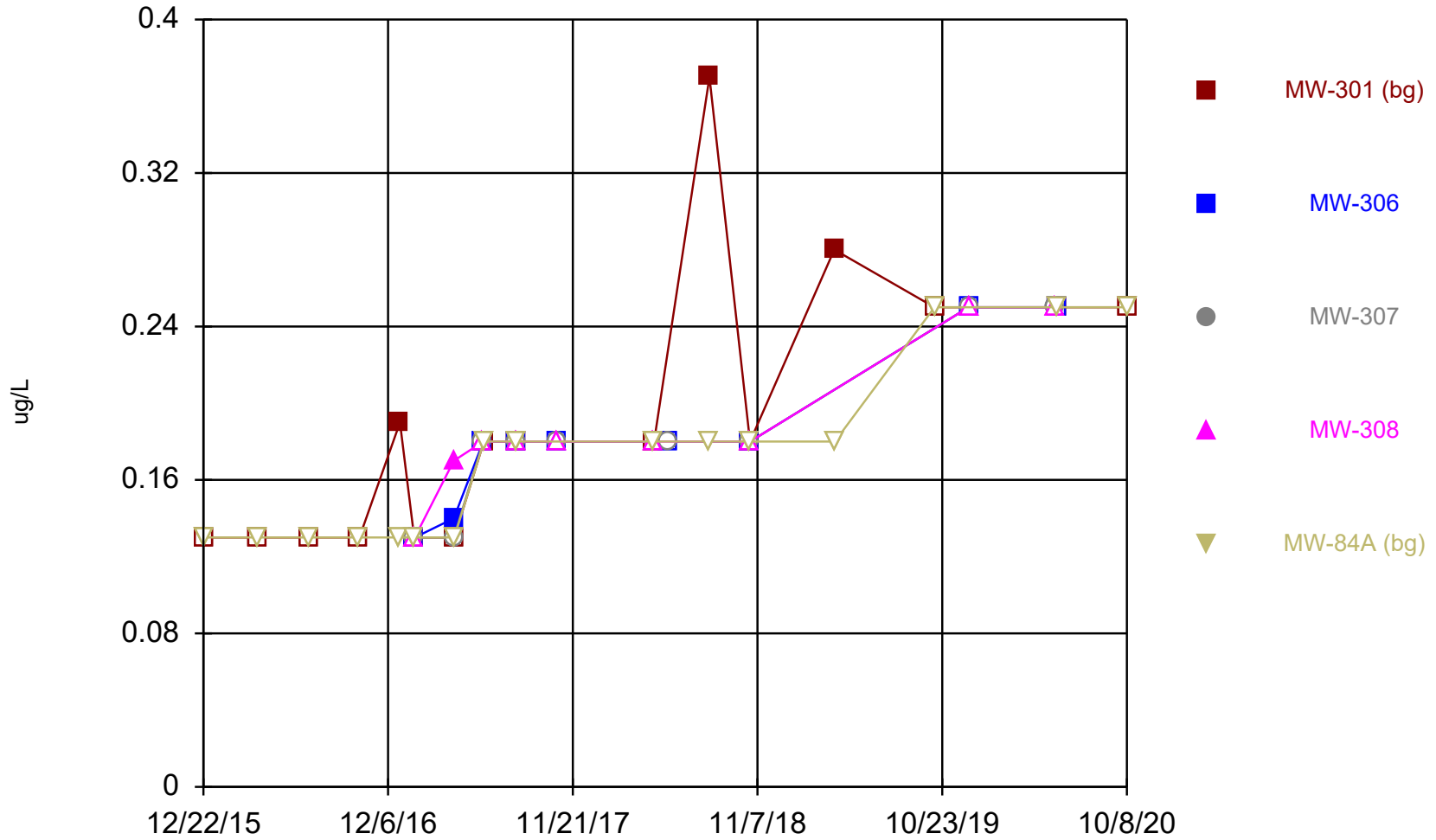
Time Series Analysis Run 12/23/2020 3:36 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Barium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	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
1/26/2017		19.2	10.7	70.8	
4/10/2017		14.9	9.3	95.1	
4/11/2017	13.2				14.1
6/5/2017		8.2	7.8	66.7	
6/6/2017	11.3				13.4
8/8/2017	11.8	11.8	13.7		14
8/9/2017				75	
10/23/2017		16.1	15.1	86.6	
4/24/2018				85.4	
4/25/2018	9.3				14.6
5/24/2018		11.3	13.6		
8/8/2018	10.2				13.7
10/24/2018	11.5	8.5	4.8 (J)	84.8	14.5
4/2/2019	11.8				
4/3/2019					14.7
10/9/2019	10				13.2
12/13/2019		9	15.9	62.4	
2/3/2020	10.9	10.2	13.5	55.6	14
5/27/2020			13.7	59.1	
5/28/2020		9.7			
5/29/2020	9.8				13.9
10/7/2020		10.5		61.5	
10/8/2020	9.4		13.8		12.6

Beryllium



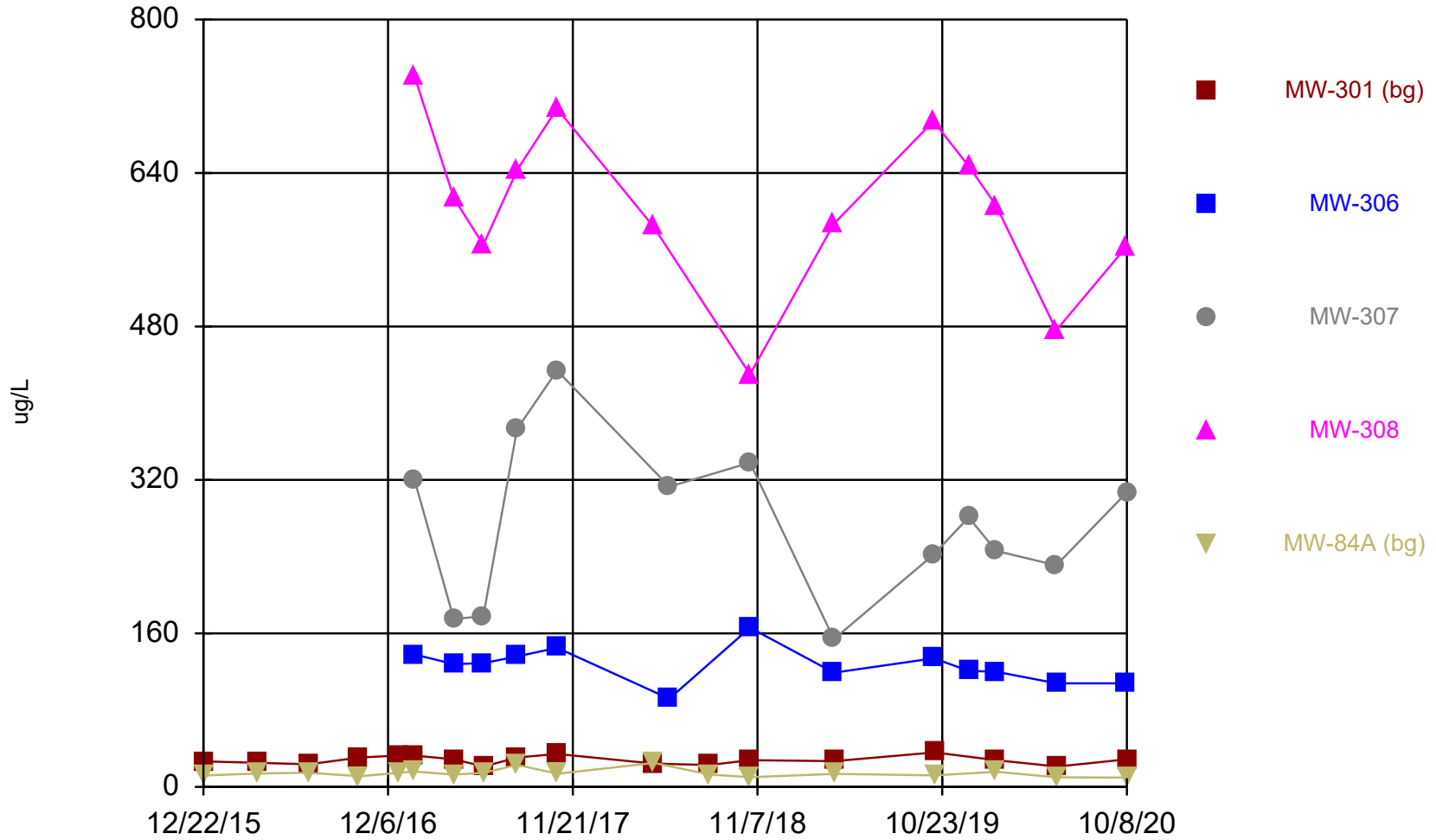
Time Series Analysis Run 12/23/2020 3:36 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Beryllium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	<0.13 (U)				<0.13 (U)
4/5/2016	<0.13 (U)				<0.13 (U)
7/8/2016	<0.13 (U)				<0.13 (U)
10/13/2016	<0.13 (U)				<0.13 (U)
12/29/2016	0.19 (J)				<0.13 (U)
1/25/2017	<0.13 (U)				<0.13 (U)
1/26/2017		<0.13 (U)	<0.13 (U)	<0.13 (U)	
4/10/2017		0.14 (J)	<0.13 (U)	0.17 (J)	
4/11/2017	<0.13 (U)				<0.13 (U)
6/5/2017		<0.18 (U)	<0.18 (U)	<0.18 (U)	
6/6/2017	<0.18 (U)				<0.18 (U)
8/8/2017	<0.18 (U)	<0.18 (U)	<0.18 (U)		<0.18 (U)
8/9/2017				<0.18 (U)	
10/23/2017		<0.18 (U)	<0.18 (U)	<0.18 (U)	
4/24/2018				<0.18 (U)	
4/25/2018	<0.18 (U)				<0.18 (U)
5/24/2018		<0.18 (U)	<0.18 (U)		
8/8/2018	0.37 (J)				<0.18 (U)
10/24/2018	<0.18 (U)	<0.18 (U)	<0.18 (U)	<0.18 (U)	<0.18 (U)
4/2/2019	0.28 (J)				
4/3/2019					<0.18 (U)
10/9/2019	<0.25 (U)				<0.25 (U)
12/13/2019		<0.25 (U)	<0.25 (U)	<0.25 (U)	
5/27/2020			<0.25 (U)	<0.25 (U)	
5/28/2020		<0.25 (U)			
5/29/2020	<0.25 (U)				<0.25 (U)
10/8/2020	<0.25 (U)				<0.25 (U)

Boron



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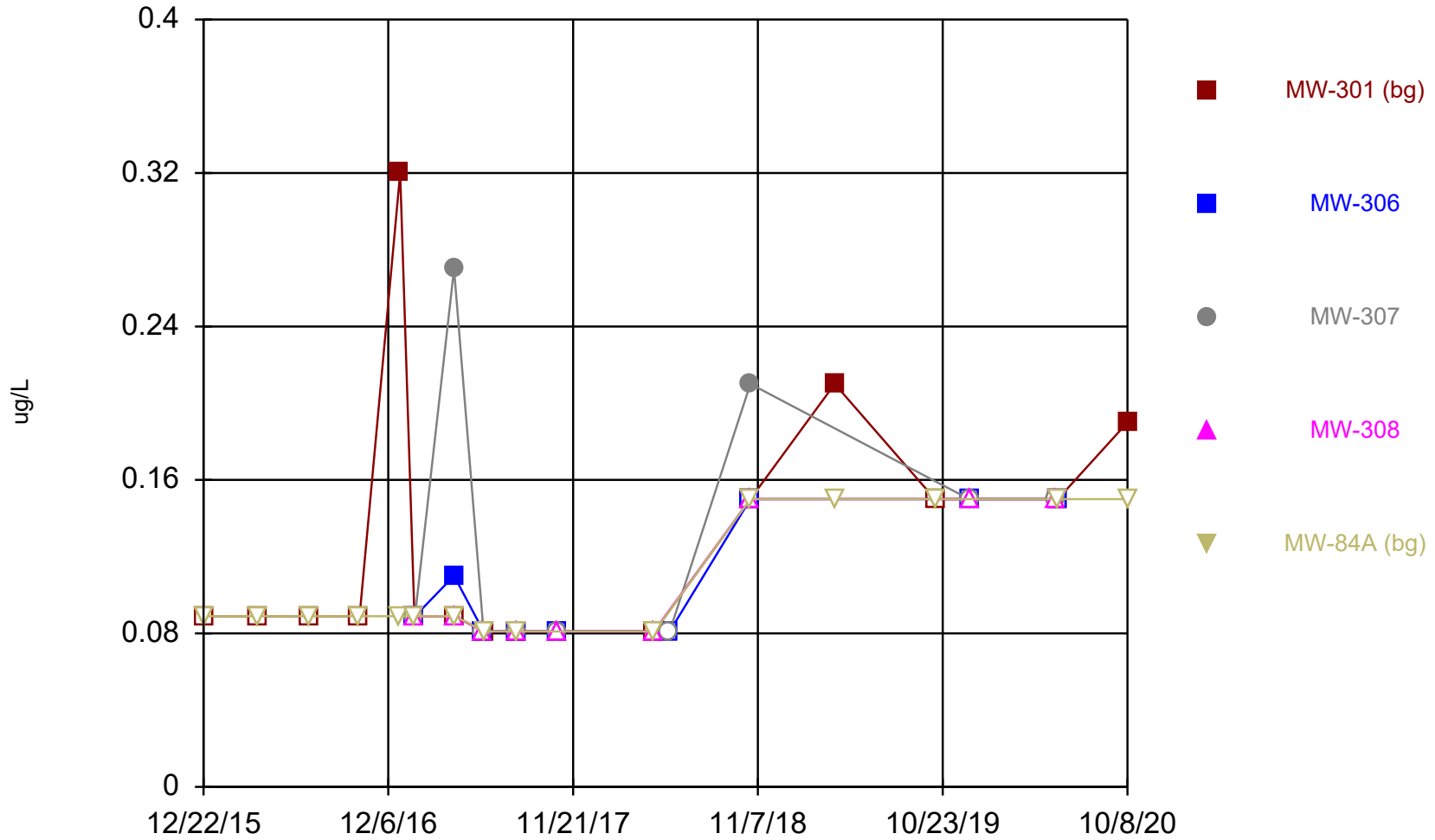
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Boron (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	26.5				11.9
4/5/2016	25.2				14
7/8/2016	23.6				14.7
10/13/2016	30.6				11.1
12/29/2016	32.8				14.7
1/25/2017	32.6				16.1
1/26/2017		138	319	740	
4/10/2017		128	175	614	
4/11/2017	28.8				12.9
6/5/2017		129	178	565	
6/6/2017	21.3				14.8
8/8/2017	30.6	136	373		22.9
8/9/2017				644	
10/23/2017	34.3	145	434	707	
10/24/2017					13.8
4/24/2018				584	
4/25/2018	24.3				25
5/24/2018		92	313		
8/8/2018	22.8				12.8
10/24/2018	27.8	166	338	430	10.1 (J)
4/1/2019		119	154	587	
4/2/2019	26.9				
4/3/2019					13.6
10/7/2019			242	694	
10/8/2019		134			
10/9/2019	35.9				12
12/13/2019		121	281	647	
2/3/2020	27.9	120	246	606	15.7
5/27/2020			231	476	
5/28/2020		108			
5/29/2020	21.3				10
10/7/2020		108		563	
10/8/2020	28.8		307		9.7 (J)

Cadmium



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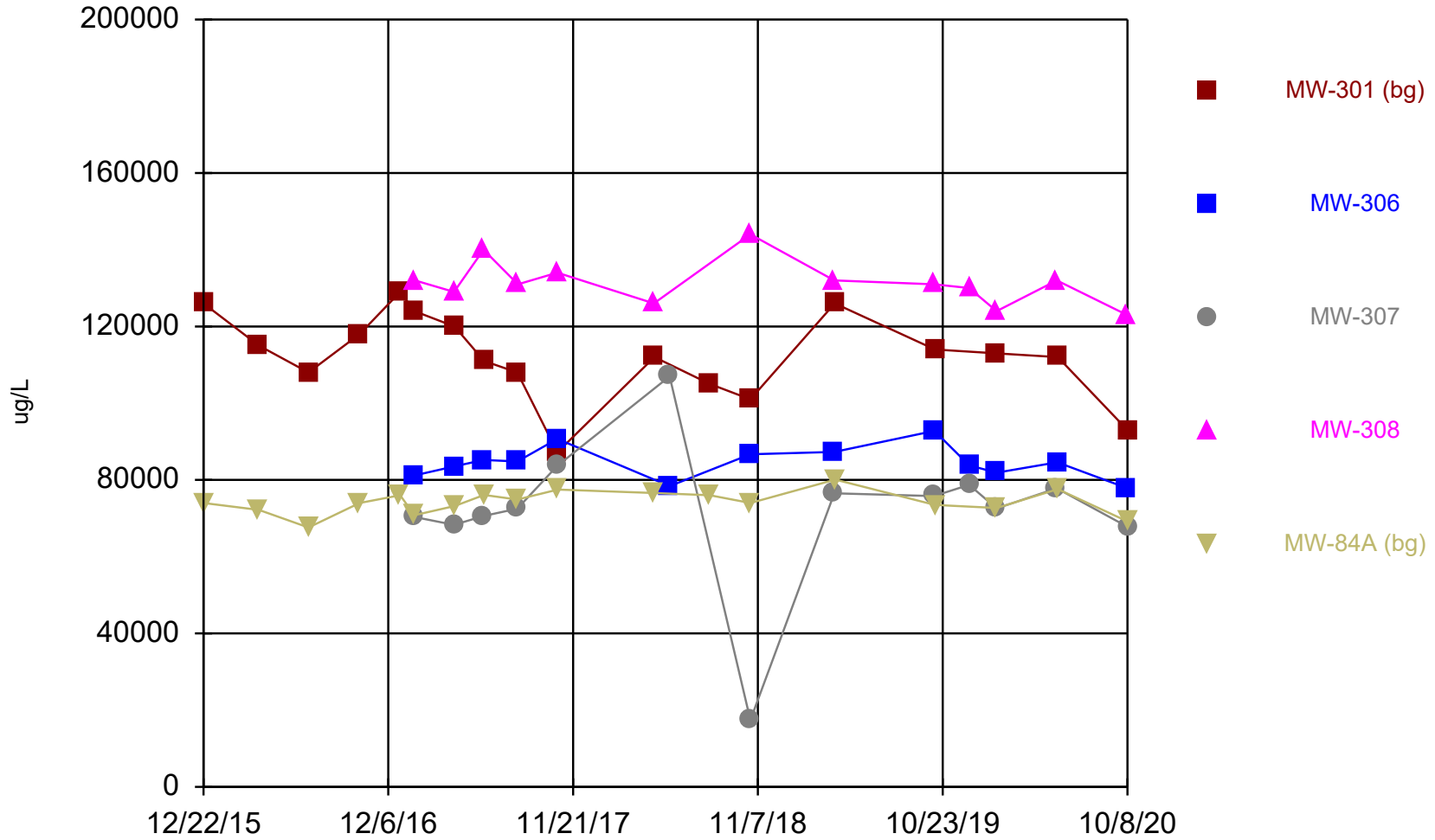
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Cadmium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	<0.089 (U)				<0.089 (U)
4/5/2016	<0.089 (U)				<0.089 (U)
7/8/2016	<0.089 (U)				<0.089 (U)
10/13/2016	<0.089 (U)				<0.089 (U)
12/29/2016	0.32 (J)				<0.089 (U)
1/25/2017	<0.089 (U)				<0.089 (U)
1/26/2017		<0.089 (U)	<0.089 (U)	<0.089 (U)	
4/10/2017		0.11 (J)	0.27 (J)	<0.089 (U)	
4/11/2017	<0.089 (U)				<0.089 (U)
6/5/2017		<0.081 (U)	<0.081 (U)	<0.081 (U)	
6/6/2017	<0.081 (U)				<0.081 (U)
8/8/2017	<0.081 (U)	<0.081 (U)	<0.081 (U)		<0.081 (U)
8/9/2017				<0.081 (U)	
10/23/2017		<0.081 (U)	<0.081 (U)	<0.081 (U)	
4/24/2018				<0.081 (U)	
4/25/2018	<0.081 (U)				<0.081 (U)
5/24/2018		<0.081 (U)	<0.081 (U)		
10/24/2018	<0.15 (U)	<0.15 (U)	0.21 (J)	<0.15 (U)	<0.15 (U)
4/2/2019	0.21 (J)				
4/3/2019					<0.15 (U)
10/9/2019	<0.15 (U)				<0.15 (U)
12/13/2019		<0.15 (U)	<0.15 (U)	<0.15 (U)	
5/27/2020			<0.15 (U)	<0.15 (U)	
5/28/2020		<0.15 (U)			
5/29/2020	<0.15 (U)				<0.15 (U)
10/8/2020	0.19 (J)				<0.15 (U)

Calcium



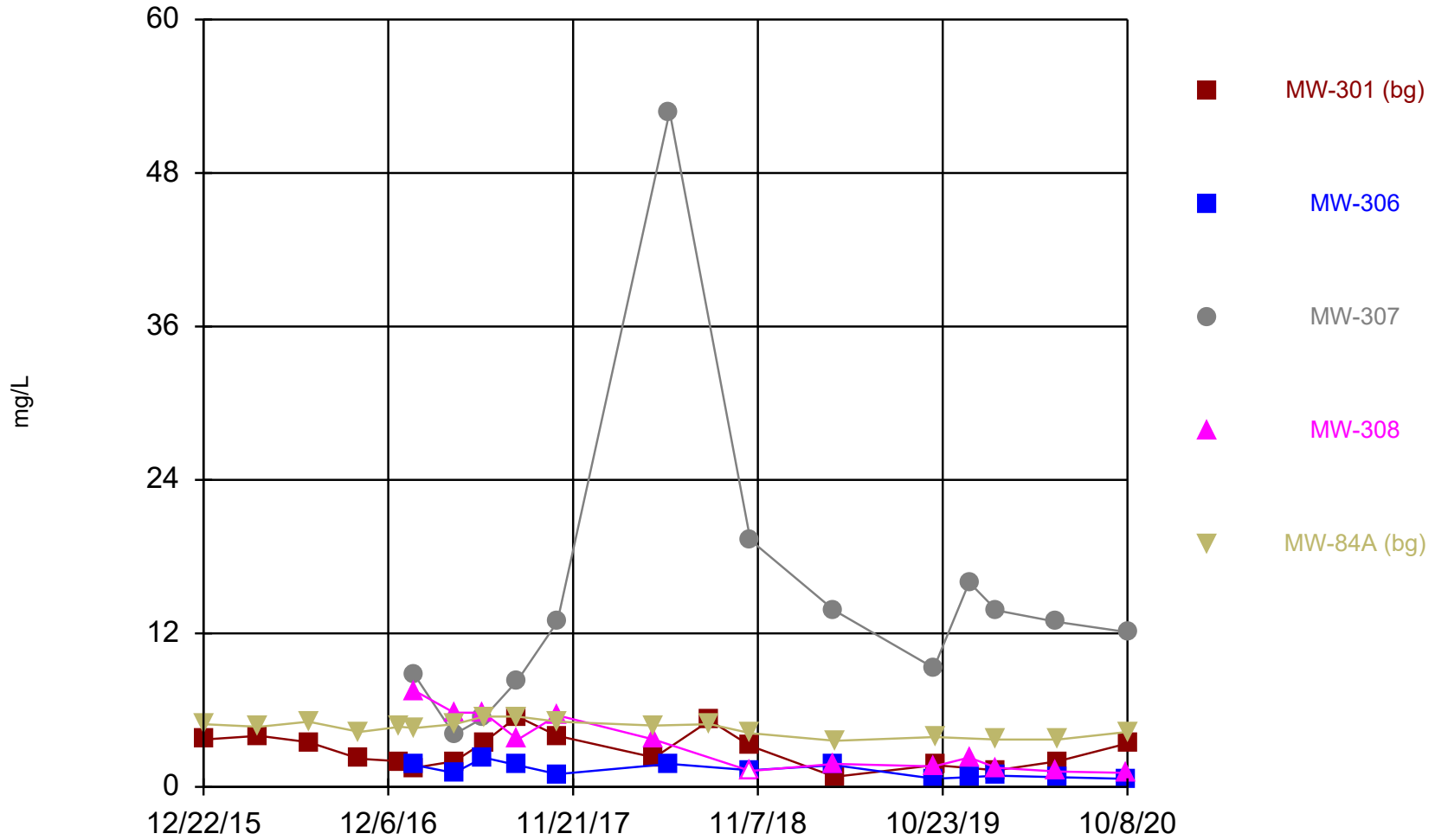
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Calcium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	126000				74000
4/5/2016	115000				72200
7/8/2016	108000				67600
10/13/2016	118000				74000
12/29/2016	129000				76000
1/25/2017	124000				70800
1/26/2017		81200	70300	132000	
4/10/2017		83500	68300	129000	
4/11/2017	120000				73200
6/5/2017		85200	70600	140000	
6/6/2017	111000				76100
8/8/2017	108000	84800	72500		74900
8/9/2017				131000	
10/23/2017	87200	90700	83700	134000	
10/24/2017					77500
4/24/2018				126000	
4/25/2018	112000				76600
5/24/2018		78400	107000		
8/8/2018	105000				76000
10/24/2018	101000	86700	17400	144000	74000
4/1/2019		87300	76500	132000	
4/2/2019	126000				
4/3/2019					80100
10/7/2019			75800	131000	
10/8/2019		92800			
10/9/2019	114000				73500
12/13/2019		83800	78700	130000	
2/3/2020	113000	81900	72600	124000	72700
5/27/2020			77800	132000	
5/28/2020		84600			
5/29/2020	112000				77600
10/7/2020		77900		123000	
10/8/2020	93000		67800		69200

Chloride



07/01/2021 - Classification: Internal - ECRM12626135

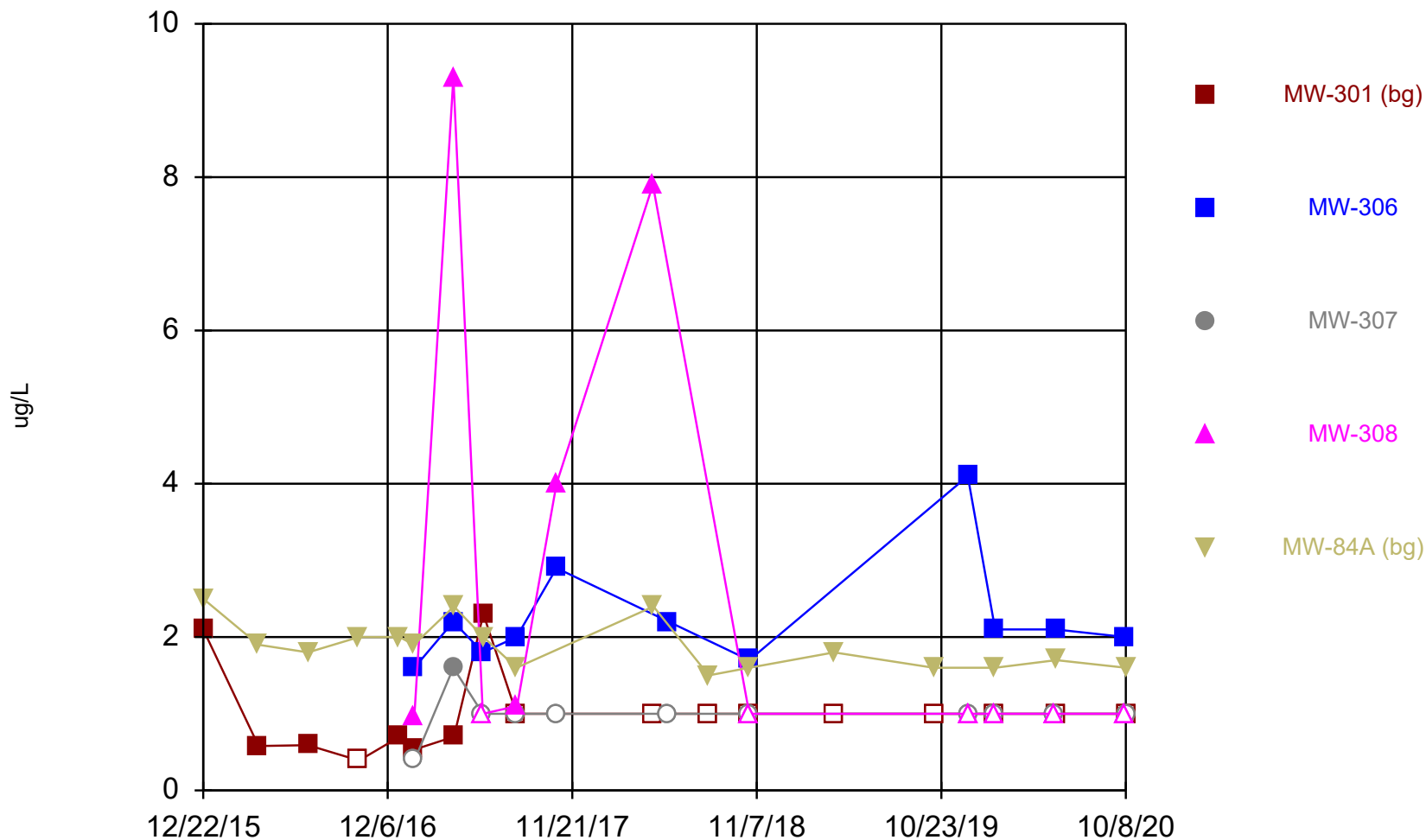
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Chloride (mg/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	3.7 (J)				4.9
4/5/2016	4				4.7
7/8/2016	3.5 (J)				5.1
10/13/2016	2.2				4.3
12/29/2016	2 (J)				4.7
1/25/2017	1.5 (J)				4.6
1/26/2017		1.7 (J)	8.7 (J)	7.5 (J)	
4/10/2017		1.1 (J)	4.1	5.8 (J)	
4/11/2017	2				4.9
6/5/2017		2.3	5.4	5.8 (J)	
6/6/2017	3.5				5.5
8/8/2017	5.5	1.7 (J)	8.3		5.5
8/9/2017				3.7	
10/23/2017	4	1 (J)	12.9	5.6 (J)	
10/24/2017					5.1
4/24/2018				3.7 (J)	
4/25/2018	2.3				4.8
5/24/2018		1.8 (J)	52.8		
8/8/2018	5.2				4.9
10/24/2018	3.2	1.3 (J)	19.3	<2.5 (U)	4.2
4/1/2019		1.7 (J)	13.8	1.8 (J)	
4/2/2019	0.79 (J)				
4/3/2019					3.6
10/7/2019			9.3	1.6 (J)	
10/8/2019		0.64 (J)			
10/9/2019	1.7 (J)				3.9
12/13/2019		0.76 (J)	16	2.3 (J)	
2/3/2020	1.3 (J)	0.88 (J)	13.8	1.5 (J)	3.7
5/27/2020			12.9	1.2 (J)	
5/28/2020		0.76 (J)			
5/29/2020	2 (J)				3.7
10/7/2020		0.63 (J)		1.1 (J)	
10/8/2020	3.4		12.1		4.3

Chromium



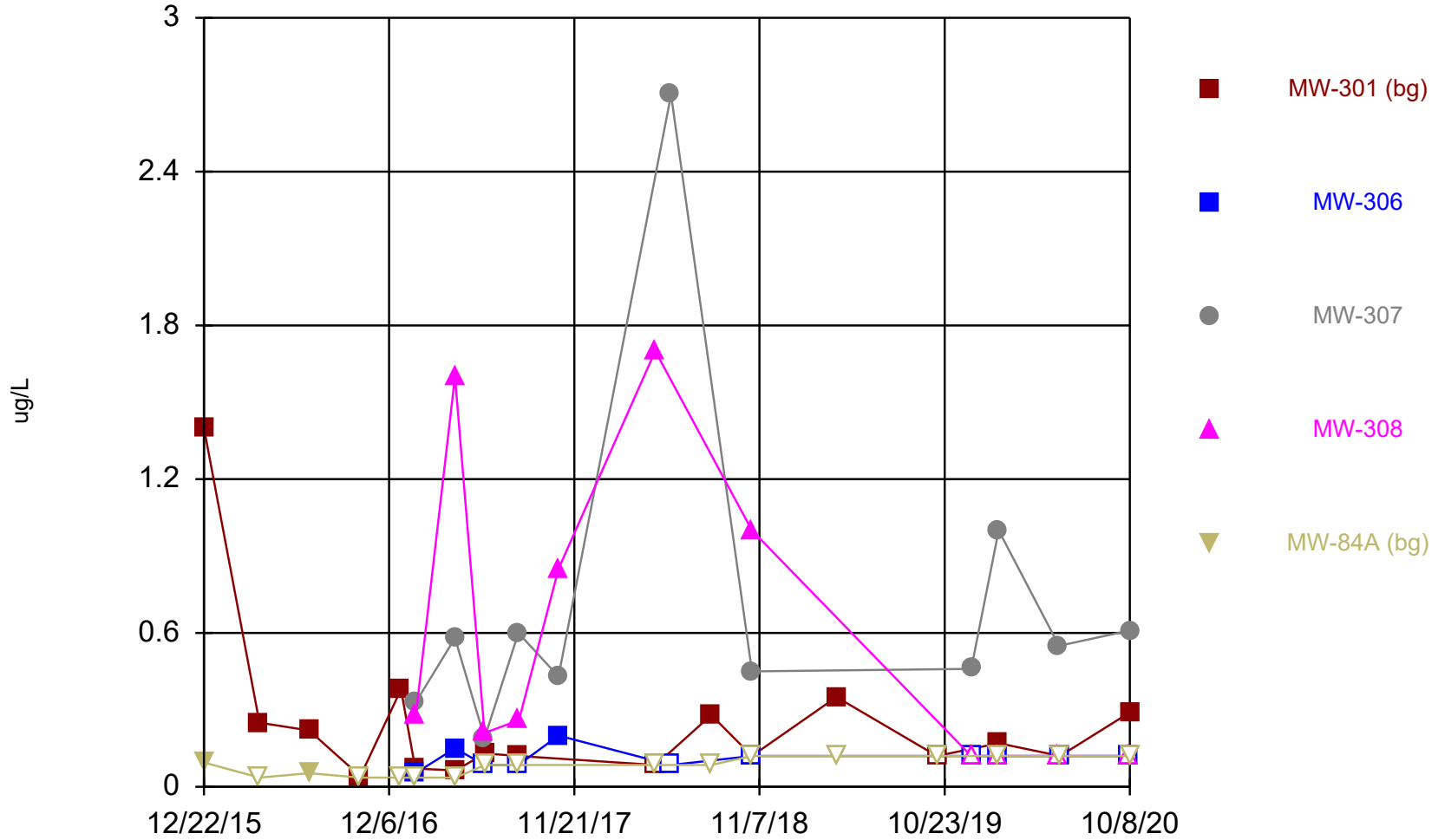
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Chromium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	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 (U)				2
12/29/2016	0.7 (J)				2
1/25/2017	0.53 (J)				1.9
1/26/2017		1.6	<0.39 (U)	0.97 (J)	
4/10/2017		2.2	1.6	9.3	
4/11/2017	0.7 (J)				2.4
6/5/2017		1.8 (J)	<1 (U)	<1 (U)	
6/6/2017	2.3 (J)				2 (J)
8/8/2017	<1 (U)	2 (J)	<1 (U)		1.6 (J)
8/9/2017				1.1 (J)	
10/23/2017		2.9 (J)	<1 (U)	4	
4/24/2018				7.9	
4/25/2018	<1 (U)				2.4 (J)
5/24/2018		2.2 (J)	<1 (U)		
8/8/2018	<1 (U)				1.5 (J)
10/24/2018	<1 (U)	1.7 (J)	<1 (U)	<1 (U)	1.6 (J)
4/2/2019	<1 (U)				
4/3/2019					1.8 (J)
10/9/2019	<1 (U)				1.6 (J)
12/13/2019		4.1	<1 (U)	<1 (U)	
2/3/2020	<1 (U)	2.1 (J)	<1 (U)	<1 (U)	1.6 (J)
5/27/2020			<1 (U)	<1 (U)	
5/28/2020		2.1 (J)			
5/29/2020	<1 (U)				1.7 (J)
10/7/2020		2 (J)		<1 (U)	
10/8/2020	<1 (U)		<1 (U)		1.6 (J)

Cobalt



Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond

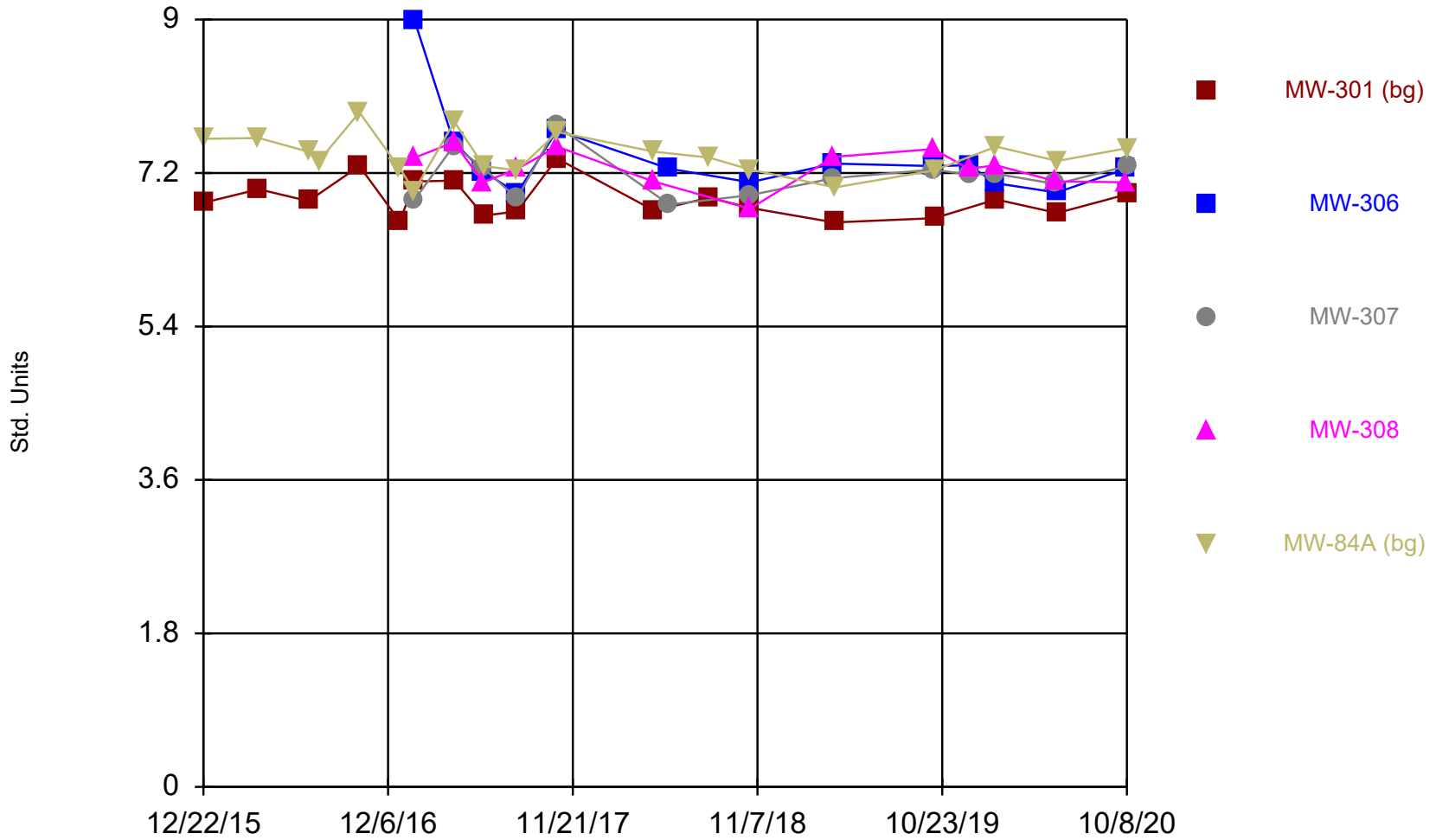
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Cobalt (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	1.4				0.095 (J)
4/5/2016	0.25 (J)				<0.036 (U)
7/8/2016	0.22 (J)				0.053 (J)
10/13/2016	0.041 (J)				<0.036 (U)
12/29/2016	0.38 (J)				<0.036 (U)
1/25/2017	0.071 (J)				<0.036 (U)
1/26/2017		0.054 (J)	0.33 (J)	0.28 (J)	
4/10/2017		0.15 (J)	0.58 (J)	1.6	
4/11/2017	0.064 (J)				<0.036 (U)
6/5/2017		<0.085 (U)	0.19 (J)	0.21 (J)	
6/6/2017	0.13 (J)				<0.085 (U)
8/8/2017	0.12 (J)	<0.085 (U)	0.6 (J)		<0.085 (U)
8/9/2017				0.26 (J)	
10/23/2017		0.2 (J)	0.43 (J)	0.85 (J)	
4/24/2018				1.7	
4/25/2018	<0.085 (U)				<0.085 (U)
5/24/2018		<0.085 (U)	2.7		
8/8/2018	0.28 (J)				<0.085 (U)
10/24/2018	<0.12 (U)	<0.12 (U)	0.45 (J)	1	<0.12 (U)
4/2/2019	0.35 (J)				
4/3/2019					<0.12 (U)
10/9/2019	<0.12 (U)				<0.12 (U)
12/13/2019		<0.12 (U)	0.46 (J)	<0.12 (U)	
2/3/2020	0.17 (J)	<0.12 (U)	1	<0.12 (U)	<0.12 (U)
5/27/2020			0.55 (J)	<0.12 (U)	
5/28/2020		<0.12 (U)			
5/29/2020	<0.12 (U)				<0.12 (U)
10/7/2020		<0.12 (U)		<0.12 (U)	
10/8/2020	0.29 (J)		0.61 (J)		<0.12 (U)

Field pH



07/01/2021 - Classification: Internal - ECRM12626135

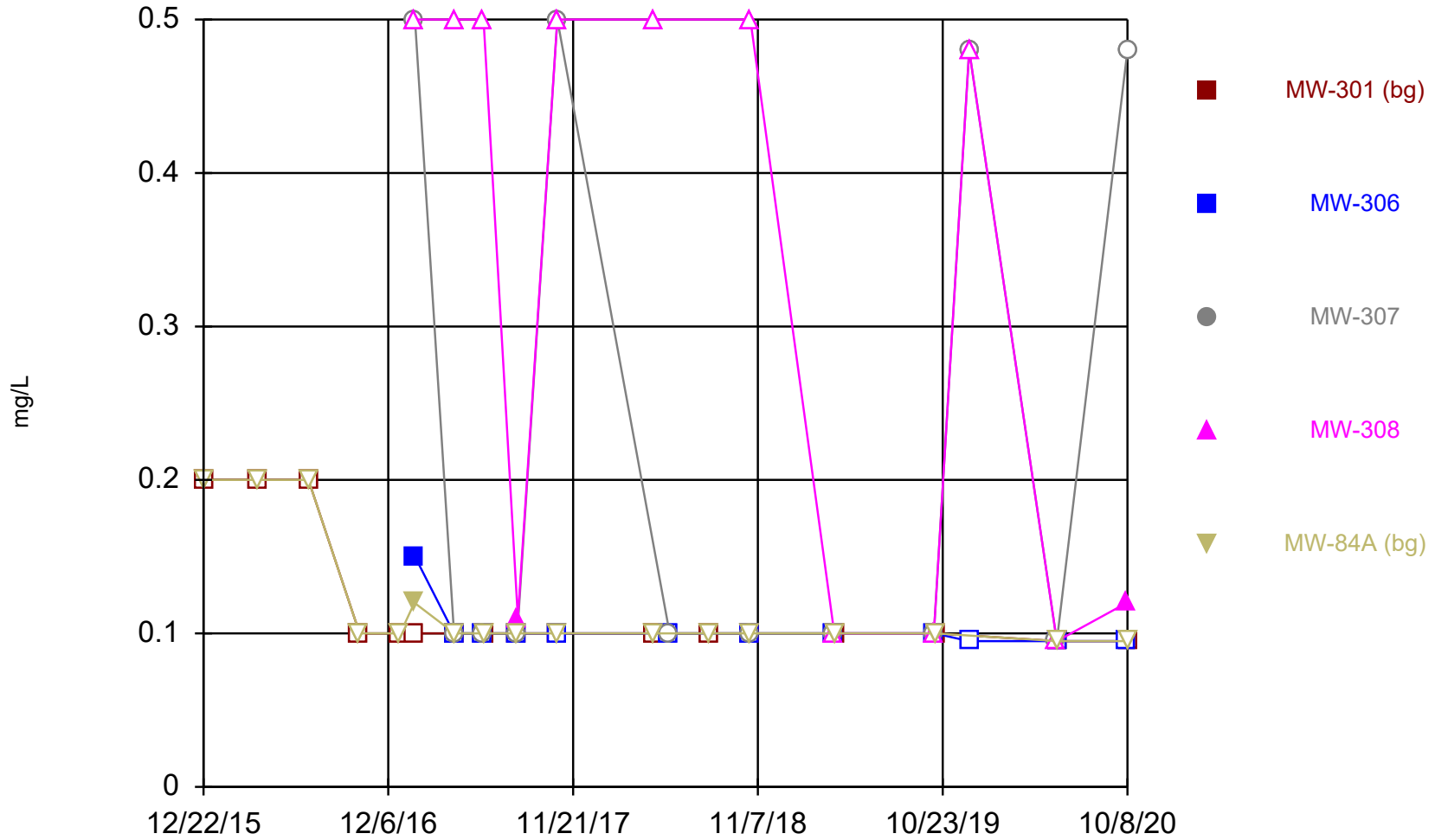
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Field pH (Std. Units) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	6.85				7.6
4/5/2016	7.01				7.61
7/8/2016	6.87				7.45
7/28/2016					7.34
10/13/2016	7.28				7.91
12/29/2016	6.63				7.25
1/25/2017	7.1				6.99
1/26/2017		8.98	6.89	7.38	
4/10/2017		7.56	7.52	7.56	
4/11/2017	7.11				7.8
6/5/2017		7.22	7.26	7.09	
6/6/2017	6.7				7.28
8/8/2017	6.75	6.96	6.9		7.23
8/9/2017				7.25	
10/23/2017	7.37	7.7	7.75	7.51	
10/24/2017					7.68
4/24/2018				7.1	
4/25/2018	6.76				7.45
5/24/2018		7.25	6.83		
8/8/2018	6.91				7.38
10/24/2018	6.79	7.09	6.94	6.78	7.24
4/1/2019		7.31	7.14	7.39	
4/2/2019	6.62				
4/3/2019					7.03
10/7/2019			7.24	7.48	
10/8/2019		7.28			
10/9/2019	6.67				7.23
12/13/2019		7.29	7.18	7.25	
2/3/2020	6.89	7.08	7.19	7.29	7.51
5/27/2020			7.07	7.1	
5/28/2020		6.97			
5/29/2020	6.73				7.34
10/7/2020		7.25		7.09	
10/8/2020	6.95		7.28		7.49

Fluoride



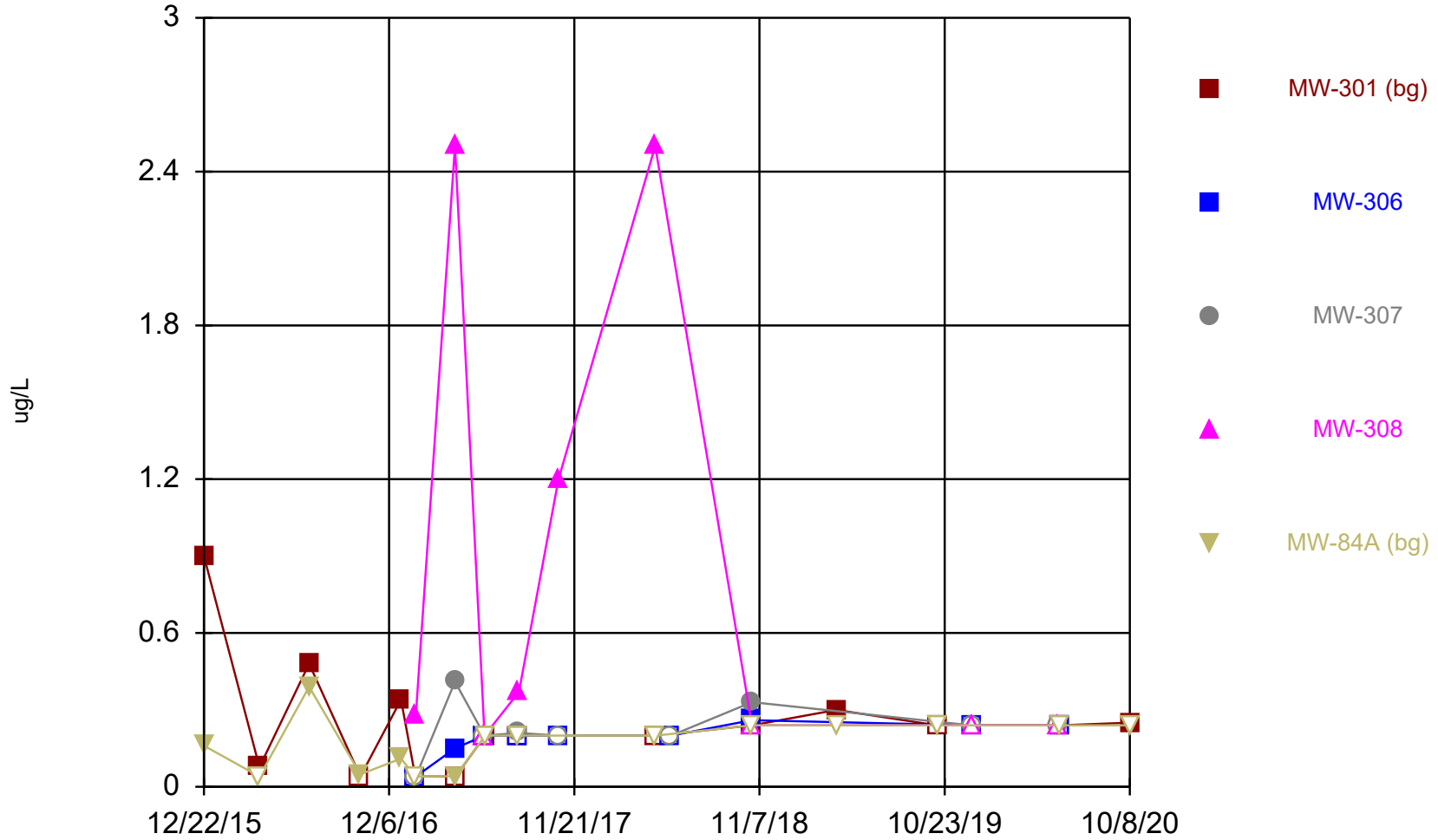
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Fluoride (mg/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	<0.2 (U)				<0.2 (U)
4/5/2016	<0.2 (U)				<0.2 (U)
7/8/2016	<0.2 (U)				<0.2 (U)
10/13/2016	<0.1 (U)				<0.1 (U)
12/29/2016	<0.1 (U)				<0.1 (U)
1/25/2017	<0.1 (U)				0.12 (J)
1/26/2017		0.15 (J)	<0.5 (U)	<0.5 (U)	
4/10/2017		<0.1 (U)	<0.1 (U)	<0.5 (U)	
4/11/2017	<0.1 (U)				<0.1 (U)
6/5/2017		<0.1 (U)	<0.1 (U)	<0.5 (U)	
6/6/2017	<0.1 (U)				<0.1 (U)
8/8/2017	<0.1 (U)	<0.1 (U)	<0.1 (U)		<0.1 (U)
8/9/2017				0.11 (J)	
10/23/2017	<0.1 (U)	<0.1 (U)	<0.5 (U)	<0.5 (U)	
10/24/2017					<0.1 (U)
4/24/2018				<0.5 (U)	
4/25/2018	<0.1 (U)				<0.1 (U)
5/24/2018		<0.1 (U)	<0.1 (U)		
8/8/2018	<0.1 (U)				<0.1 (U)
10/24/2018	<0.1 (U)	<0.1 (U)	<0.1 (U)	<0.5 (U)	<0.1 (U)
4/1/2019		<0.1 (U)	<0.1 (U)	<0.1 (U)	
4/2/2019	<0.1 (U)				
4/3/2019					<0.1 (U)
10/7/2019			<0.1 (U)	<0.1 (U)	
10/8/2019		<0.1 (U)			
10/9/2019	<0.1 (U)				<0.1 (U)
12/13/2019		<0.095 (U)	<0.48 (U)	<0.48 (U)	
5/27/2020			<0.095 (U)	<0.095 (U)	
5/28/2020		<0.095 (U)			
5/29/2020	<0.095 (U)				<0.095 (U)
10/7/2020		<0.095 (U)		0.12 (J)	
10/8/2020	<0.095 (U)		<0.48 (U)		<0.095 (U)

Lead



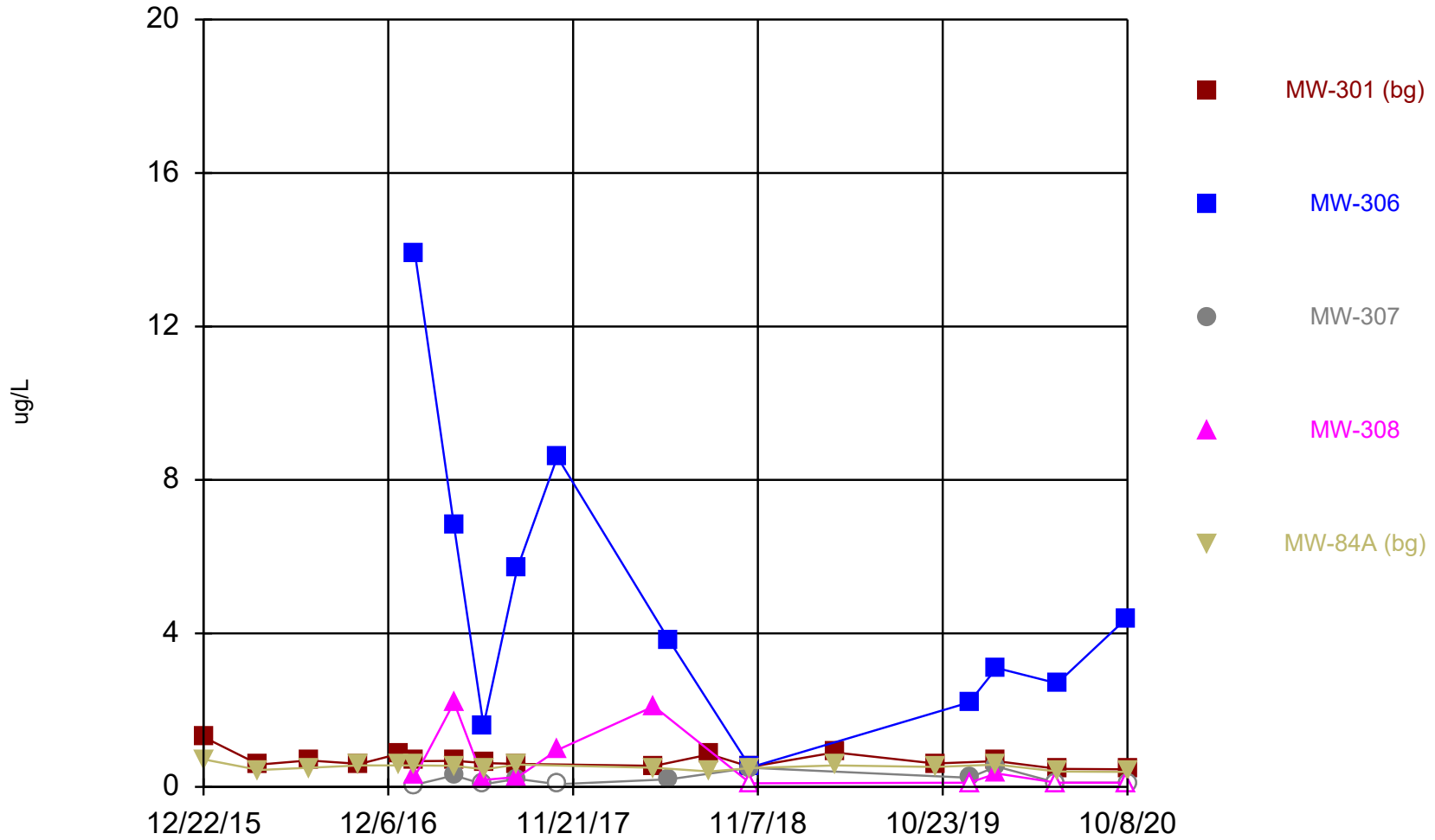
07/01/2021 - Classification: Internal - ECRM12626135

Time Series

Constituent: Lead (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	0.9 (J)				0.16 (J)
4/5/2016	0.077 (J)				<0.04 (U)
7/8/2016	0.48 (J)				0.39 (J)
10/13/2016	<0.04 (U)				0.049 (J)
12/29/2016	0.34 (J)				0.11 (J)
1/25/2017	<0.04 (U)				<0.04 (U)
1/26/2017		<0.04 (U)	<0.04 (U)	0.28 (J)	
4/10/2017		0.15 (J)	0.41 (J)	2.5	
4/11/2017	<0.04 (U)				0.041 (J)
6/5/2017		<0.2 (U)	<0.2 (U)	<0.2 (U)	
6/6/2017	<0.2 (U)				<0.2 (U)
8/8/2017	<0.2 (U)	<0.2 (U)	0.21 (J)		<0.2 (U)
8/9/2017				0.37 (J)	
10/23/2017		<0.2 (U)	<0.2 (U)	1.2	
4/24/2018				2.5	
4/25/2018	<0.2 (U)				<0.2 (U)
5/24/2018		<0.2 (U)	<0.2 (U)		
10/24/2018	<0.24 (U)	0.26 (J)	0.33 (J)	<0.24 (U)	<0.24 (U)
4/2/2019	0.3 (J)				
4/3/2019					<0.24 (U)
10/9/2019	<0.24 (U)				<0.24 (U)
12/13/2019		<0.24 (U)	<0.24 (U)	<0.24 (U)	
5/27/2020			<0.24 (U)	<0.24 (U)	
5/28/2020		<0.24 (U)			
5/29/2020	<0.24 (U)				<0.24 (U)
10/8/2020	0.25 (J)				<0.24 (U)

Lithium



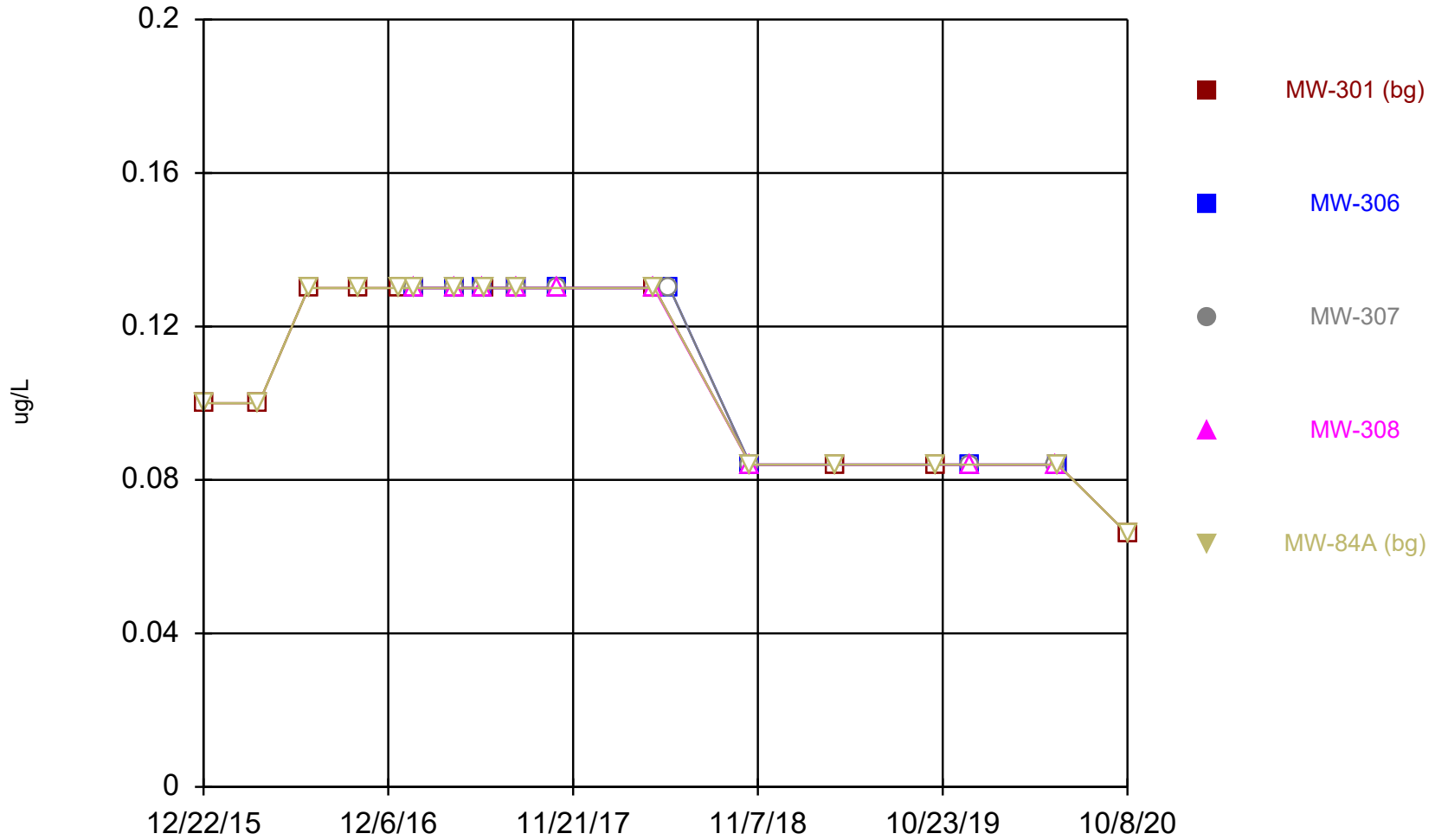
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Lithium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
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)
1/26/2017		13.9	<0.11 (U)	0.28 (J)	
4/10/2017		6.8	0.3 (J)	2.2	
4/11/2017	0.68 (J)				0.55 (J)
6/5/2017		1.6	<0.14 (U)	0.18 (J)	
6/6/2017	0.62 (J)				0.46 (J)
8/8/2017	0.6 (J)	5.7	0.21 (J)		0.58 (J)
8/9/2017				0.26 (J)	
10/23/2017		8.6	<0.14 (U)	0.96 (J)	
4/24/2018				2.1	
4/25/2018	0.55 (J)				0.5 (J)
5/24/2018		3.8	0.2 (J)		
8/8/2018	0.85 (J)				0.4 (J)
10/24/2018	0.52 (J)	0.51 (J)	0.5 (J)	<0.19 (U)	0.49 (J)
4/2/2019	0.9 (J)				
4/3/2019					0.56 (J)
10/9/2019	0.61 (J)				0.52 (J)
12/13/2019		2.2	0.24 (J)	<0.22 (U)	
2/3/2020	0.67 (J)	3.1	0.53 (J)	0.35 (J)	0.58 (J)
5/27/2020			<0.22 (U)	<0.22 (U)	
5/28/2020		2.7			
5/29/2020	0.47 (J)				0.4 (J)
10/7/2020		4.4		<0.22 (U)	
10/8/2020	0.46 (J)		<0.22 (U)		0.39 (J)

Mercury



07/01/2021 - Classification: Internal - ECRM12626135

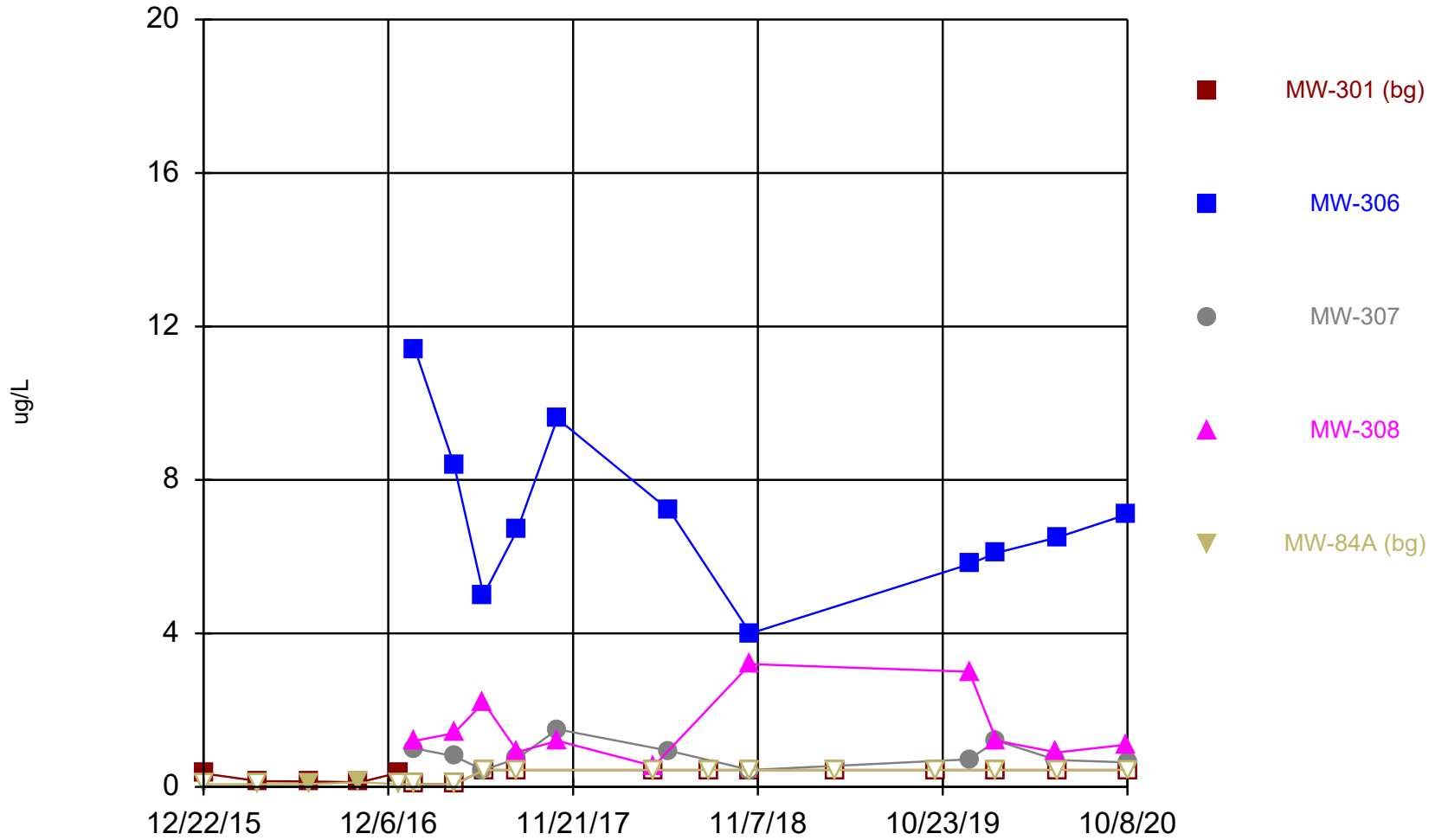
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Mercury (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	<0.1 (U)				<0.1 (U)
4/5/2016	<0.1 (U)				<0.1 (U)
7/8/2016	<0.13 (U)				<0.13 (U)
10/13/2016	<0.13 (U)				<0.13 (U)
12/29/2016	<0.13 (U)				<0.13 (U)
1/25/2017	<0.13 (U)				<0.13 (U)
1/26/2017		<0.13 (U)	<0.13 (U)	<0.13 (U)	
4/10/2017		<0.13 (U)	<0.13 (U)	<0.13 (U)	
4/11/2017	<0.13 (U)				<0.13 (U)
6/5/2017		<0.13 (U)	<0.13 (U)	<0.13 (U)	
6/6/2017	<0.13 (U)				<0.13 (U)
8/8/2017	<0.13 (U)	<0.13 (U)	<0.13 (U)		<0.13 (U)
8/9/2017				<0.13 (U)	
10/23/2017		<0.13 (U)	<0.13 (U)	<0.13 (U)	
4/24/2018				<0.13 (U)	
4/25/2018	<0.13 (U)				<0.13 (U)
5/24/2018		<0.13 (U)	<0.13 (U)		
10/24/2018	<0.084 (U)	<0.084 (U)	<0.084 (U)	<0.084 (U)	<0.084 (U)
4/2/2019	<0.084 (U)				
4/3/2019					<0.084 (U)
10/9/2019	<0.084 (U)				<0.084 (U)
12/13/2019		<0.084 (U)	<0.084 (U)	<0.084 (U)	
5/27/2020			<0.084 (U)	<0.084 (U)	
5/28/2020		<0.084 (U)			
5/29/2020	<0.084 (U)				<0.084 (U)
10/8/2020	<0.066 (U)				<0.066 (U)

Molybdenum



07/01/2021 - Classification: Internal - ECRM12626135

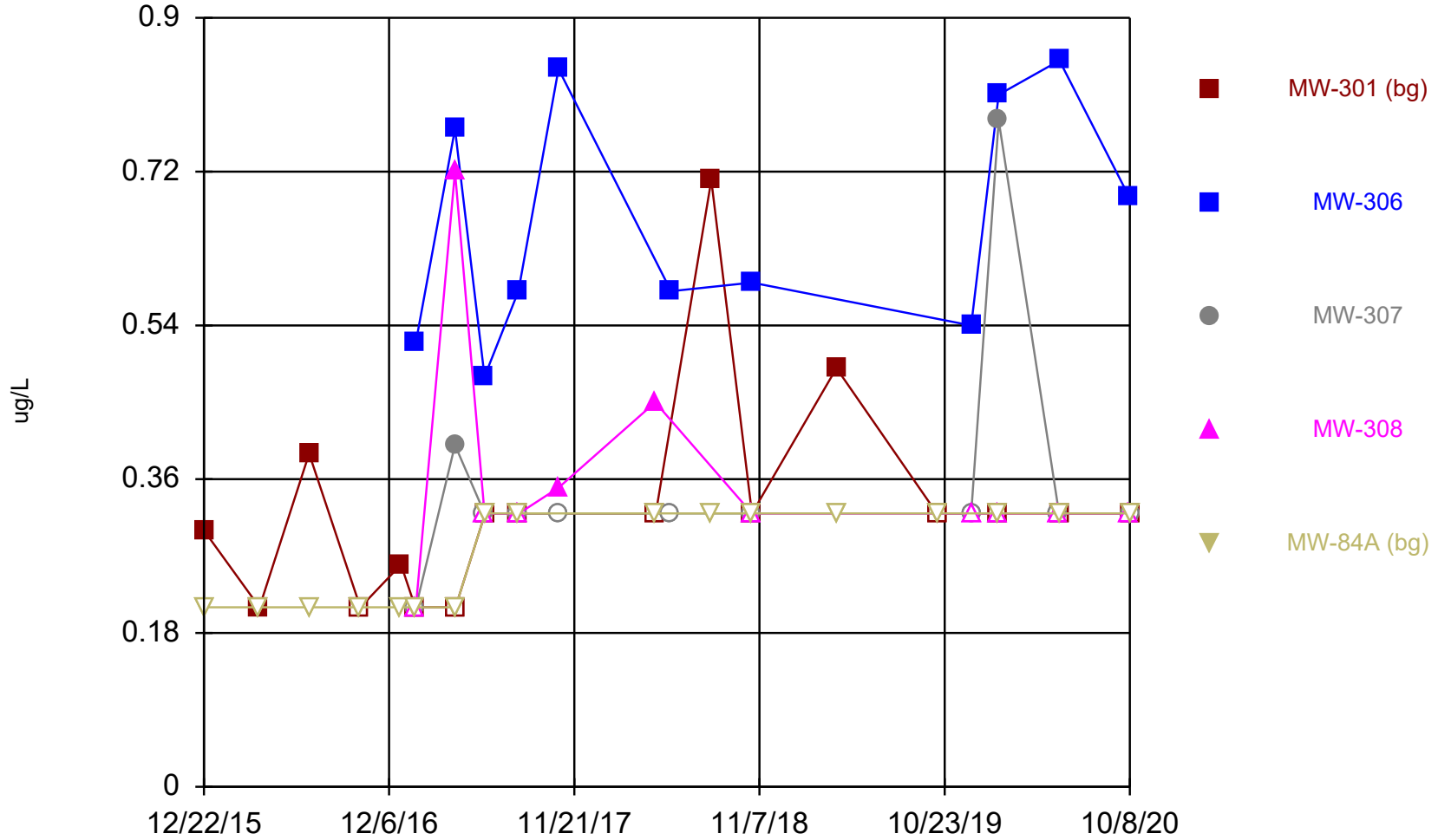
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Molybdenum (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	0.35 (J)				<0.07 (U)
4/5/2016	0.15 (J)				<0.07 (U)
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 (U)
1/25/2017	<0.07 (U)				<0.07 (U)
1/26/2017		11.4	1	1.2	
4/10/2017		8.4	0.8 (J)	1.4	
4/11/2017	<0.07 (U)				<0.07 (U)
6/5/2017		5	0.44 (J)	2.2	
6/6/2017	<0.44 (U)				<0.44 (U)
8/8/2017	<0.44 (U)	6.7	0.74 (J)		<0.44 (U)
8/9/2017				0.91 (J)	
10/23/2017		9.6	1.5 (J)	1.2 (J)	
4/24/2018				0.54 (J)	
4/25/2018	<0.44 (U)				<0.44 (U)
5/24/2018		7.2	0.94 (J)		
8/8/2018	<0.44 (U)				<0.44 (U)
10/24/2018	<0.44 (U)	4	<0.44 (U)	3.2	<0.44 (U)
4/2/2019	<0.44 (U)				
4/3/2019					<0.44 (U)
10/9/2019	<0.44 (U)				<0.44 (U)
12/13/2019		5.8	0.72 (J)	3	
2/3/2020	<0.44 (U)	6.1	1.2 (J)	1.2 (J)	<0.44 (U)
5/27/2020			0.7 (J)	0.9 (J)	
5/28/2020		6.5			
5/29/2020	<0.44 (U)				<0.44 (U)
10/7/2020		7.1		1.1 (J)	
10/8/2020	<0.44 (U)		0.64 (J)		<0.44 (U)

Selenium



Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

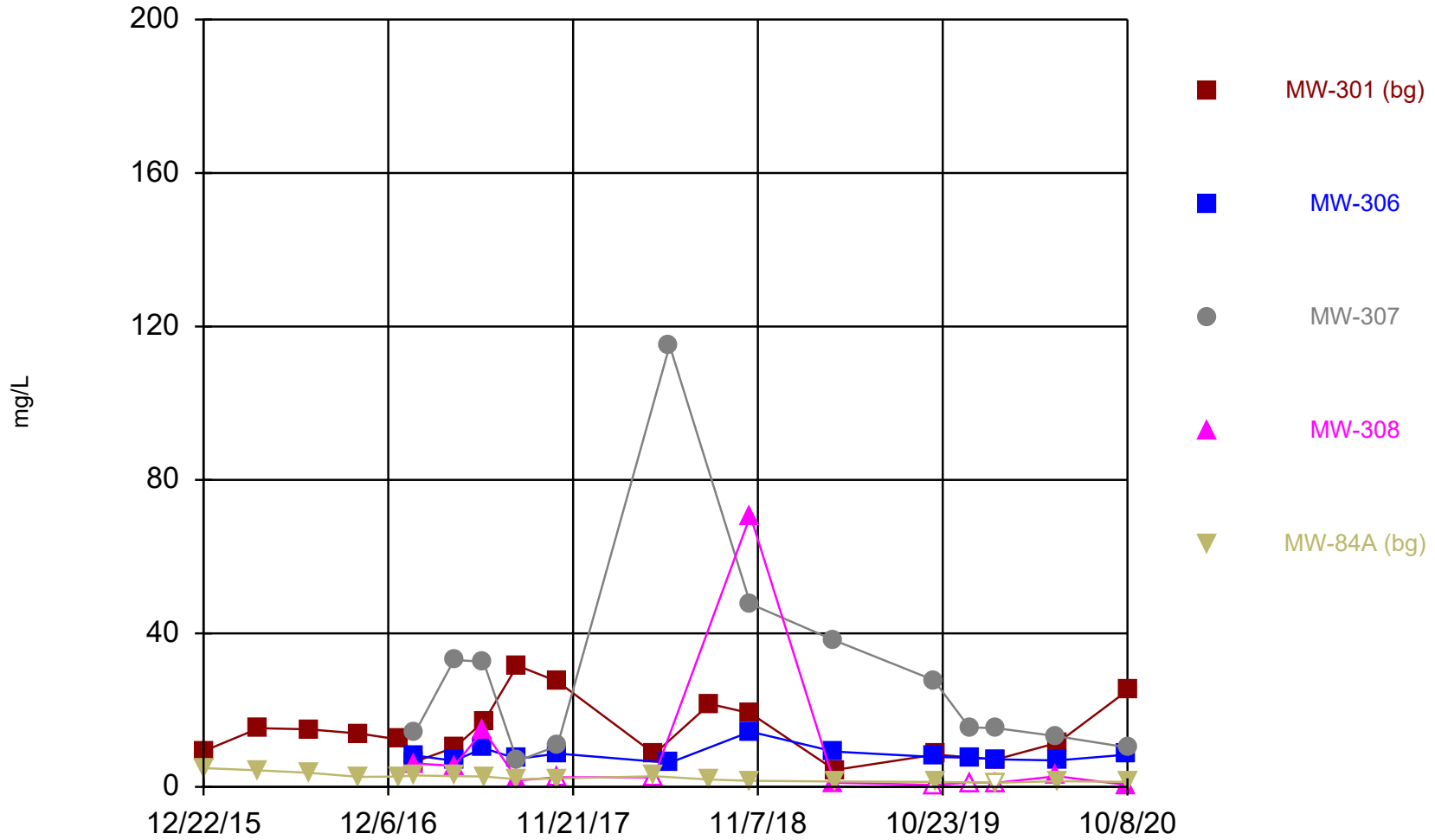
07/01/2021 - Classification: Internal - ECRM12626135

Time Series

Constituent: Selenium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	0.3 (J)				<0.21 (U)
4/5/2016	0.21 (J)				<0.21 (U)
7/8/2016	0.39 (J)				<0.21 (U)
10/13/2016	<0.21 (U)				<0.21 (U)
12/29/2016	0.26 (J)				<0.21 (U)
1/25/2017	<0.21 (U)				<0.21 (U)
1/26/2017		0.52 (J)	<0.21 (U)	<0.21 (U)	
4/10/2017		0.77 (J)	0.4 (J)	0.72 (J)	
4/11/2017	<0.21 (U)				<0.21 (U)
6/5/2017		0.48 (J)	<0.32 (U)	<0.32 (U)	
6/6/2017	<0.32 (U)				<0.32 (U)
8/8/2017	<0.32 (U)	0.58 (J)	<0.32 (U)		<0.32 (U)
8/9/2017				<0.32 (U)	
10/23/2017		0.84 (J)	<0.32 (U)	0.35 (J)	
4/24/2018				0.45 (J)	
4/25/2018	<0.32 (U)				<0.32 (U)
5/24/2018		0.58 (J)	<0.32 (U)		
8/8/2018	0.71 (J)				<0.32 (U)
10/24/2018	<0.32 (U)	0.59 (J)	<0.32 (U)	<0.32 (U)	<0.32 (U)
4/2/2019	0.49 (J)				
4/3/2019					<0.32 (U)
10/9/2019	<0.32 (U)				<0.32 (U)
12/13/2019		0.54 (J)	<0.32 (U)	<0.32 (U)	
2/3/2020	<0.32 (U)	0.81 (J)	0.78 (J)	<0.32 (U)	<0.32 (U)
5/27/2020			<0.32 (U)	<0.32 (U)	
5/28/2020		0.85 (J)			
5/29/2020	<0.32 (U)				<0.32 (U)
10/7/2020		0.69 (J)		<0.32 (U)	
10/8/2020	<0.32 (U)		<0.32 (U)		<0.32 (U)

Sulfate



07/01/2021 - Classification: Internal - ECRM12626135

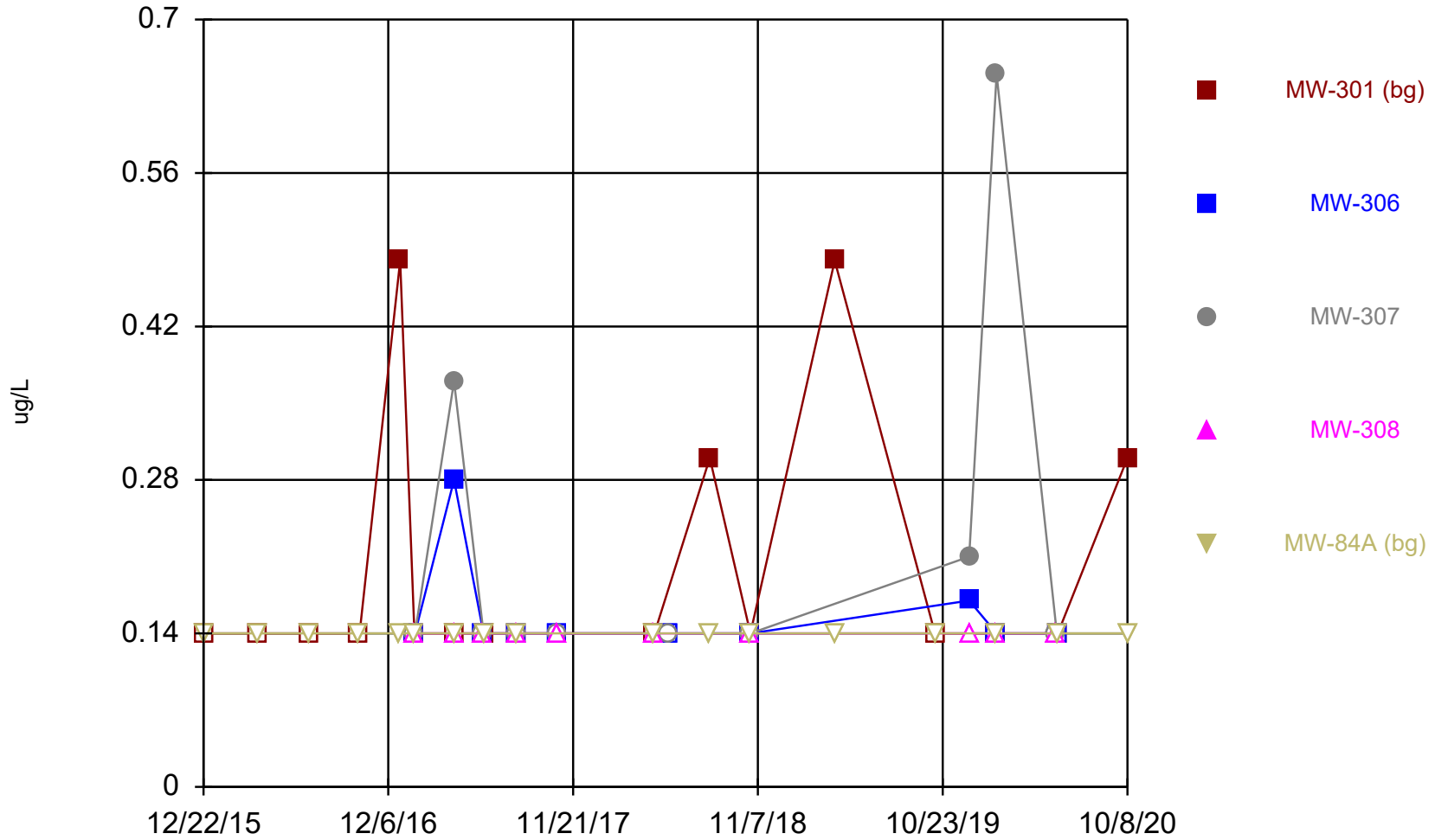
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	9.3				4.9
4/5/2016	15.3				4.3
7/8/2016	15				3.7 (J)
10/13/2016	13.9				2.6 (J)
12/29/2016	12.3 (J)				2.7 (J)
1/25/2017	6.5				3
1/26/2017		8.2	14.2 (J)	6.1 (J)	
4/10/2017		6.8	33.1	5.5 (J)	
4/11/2017	10.3				2.8 (J)
6/5/2017		10.1	32.6	14.8 (J)	
6/6/2017	17.1				2.7 (J)
8/8/2017	31.6	7.3	6.7		2 (J)
8/9/2017				1.7 (J)	
10/23/2017	27.5	8.7	10.7 (J)	<5 (U)	
10/24/2017					2.2 (J)
4/24/2018				<5 (U)	
4/25/2018	8.6				2.8 (J)
5/24/2018		6.3	115		
8/8/2018	21.6				1.9 (J)
10/24/2018	19.2	14.4	47.7	70.7	1.6 (J)
4/1/2019		9.2	38.2	1.1 (J)	
4/2/2019	4.4				
4/3/2019					1.4 (J)
10/7/2019			27.8	<1 (U)	
10/8/2019		7.8			
10/9/2019	8.4				1.3 (J)
12/13/2019		7.6	15.5	<2.2 (U)	
2/3/2020	7.2	7.2	15.3	<2.2 (U)	<2.2 (U)
5/27/2020			13.2	2.8	
5/28/2020		6.9			
5/29/2020	11.5				1.5 (J)
10/7/2020		8.4		0.52 (J)	
10/8/2020	25.1		10.3		1.3 (J)

Thallium



07/01/2021 - Classification: Internal - ECRM12626135

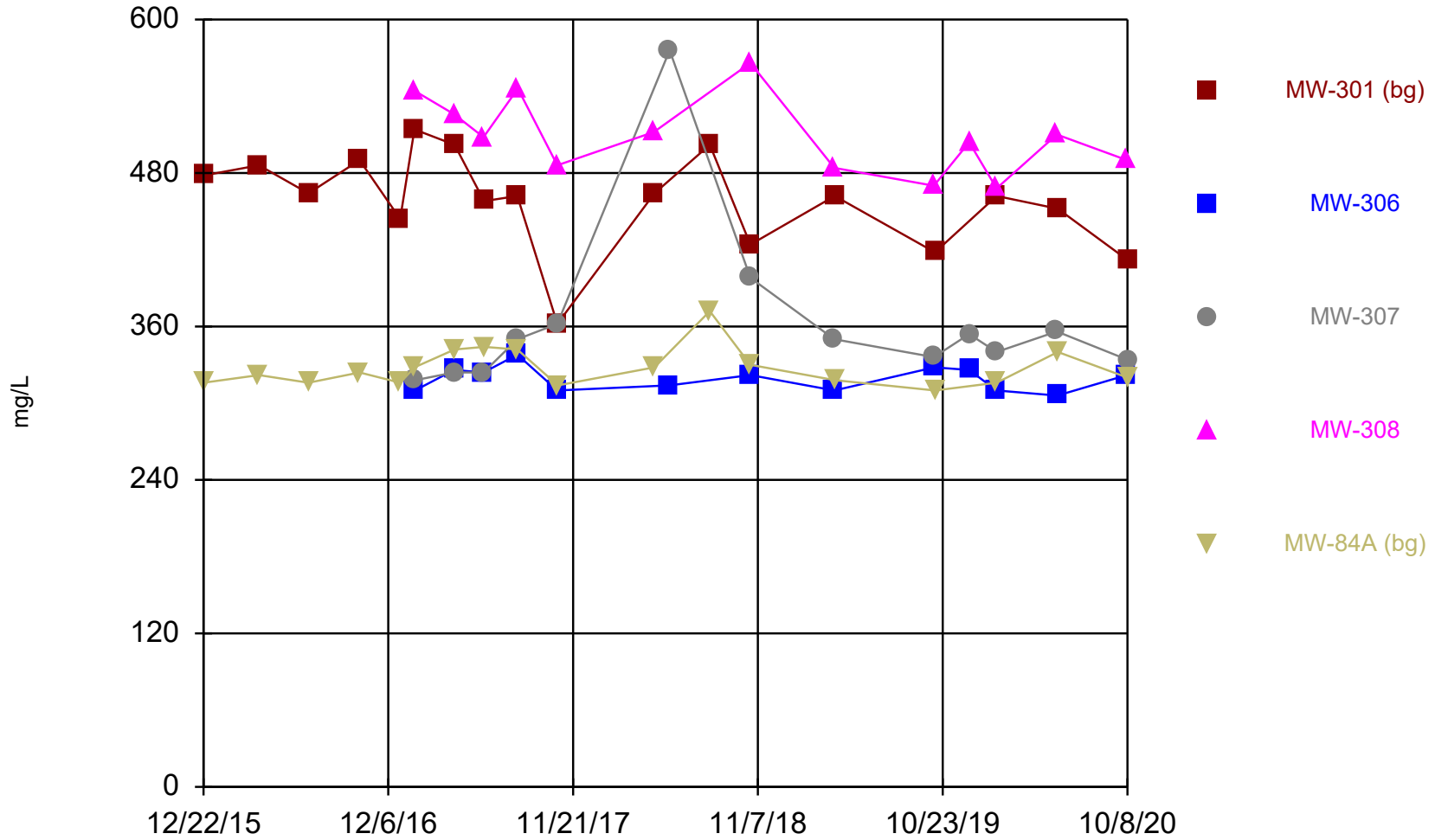
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Thallium (ug/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	<0.14 (U)				<0.14 (U)
4/5/2016	<0.14 (U)				<0.14 (U)
7/8/2016	<0.14 (U)				<0.14 (U)
10/13/2016	<0.14 (U)				<0.14 (U)
12/29/2016	0.48 (J)				<0.14 (U)
1/25/2017	<0.14 (U)				<0.14 (U)
1/26/2017		<0.14 (U)	<0.14 (U)	<0.14 (U)	
4/10/2017		0.28 (J)	0.37 (J)	<0.14 (U)	
4/11/2017	<0.14 (U)				<0.14 (U)
6/5/2017		<0.14 (U)	<0.14 (U)	<0.14 (U)	
6/6/2017	<0.14 (U)				<0.14 (U)
8/8/2017	<0.14 (U)	<0.14 (U)	<0.14 (U)		<0.14 (U)
8/9/2017				<0.14 (U)	
10/23/2017		<0.14 (U)	<0.14 (U)	<0.14 (U)	
4/24/2018				<0.14 (U)	
4/25/2018	<0.14 (U)				<0.14 (U)
5/24/2018		<0.14 (U)	<0.14 (U)		
8/8/2018	0.3 (J)				<0.14 (U)
10/24/2018	<0.14 (U)	<0.14 (U)	<0.14 (U)	<0.14 (U)	<0.14 (U)
4/2/2019	0.48 (J)				
4/3/2019					<0.14 (U)
10/9/2019	<0.14 (U)				<0.14 (U)
12/13/2019		0.17 (J)	0.21 (J)	<0.14 (U)	
2/3/2020	<0.14 (U)	<0.14 (U)	0.65 (J)	<0.14 (U)	<0.14 (U)
5/27/2020			<0.14 (U)	<0.14 (U)	
5/28/2020		<0.14 (U)			
5/29/2020	<0.14 (U)				<0.14 (U)
10/8/2020	0.3 (J)				<0.14 (U)

Total Dissolved Solids



07/01/2021 - Classification: Internal - ECRM12626135

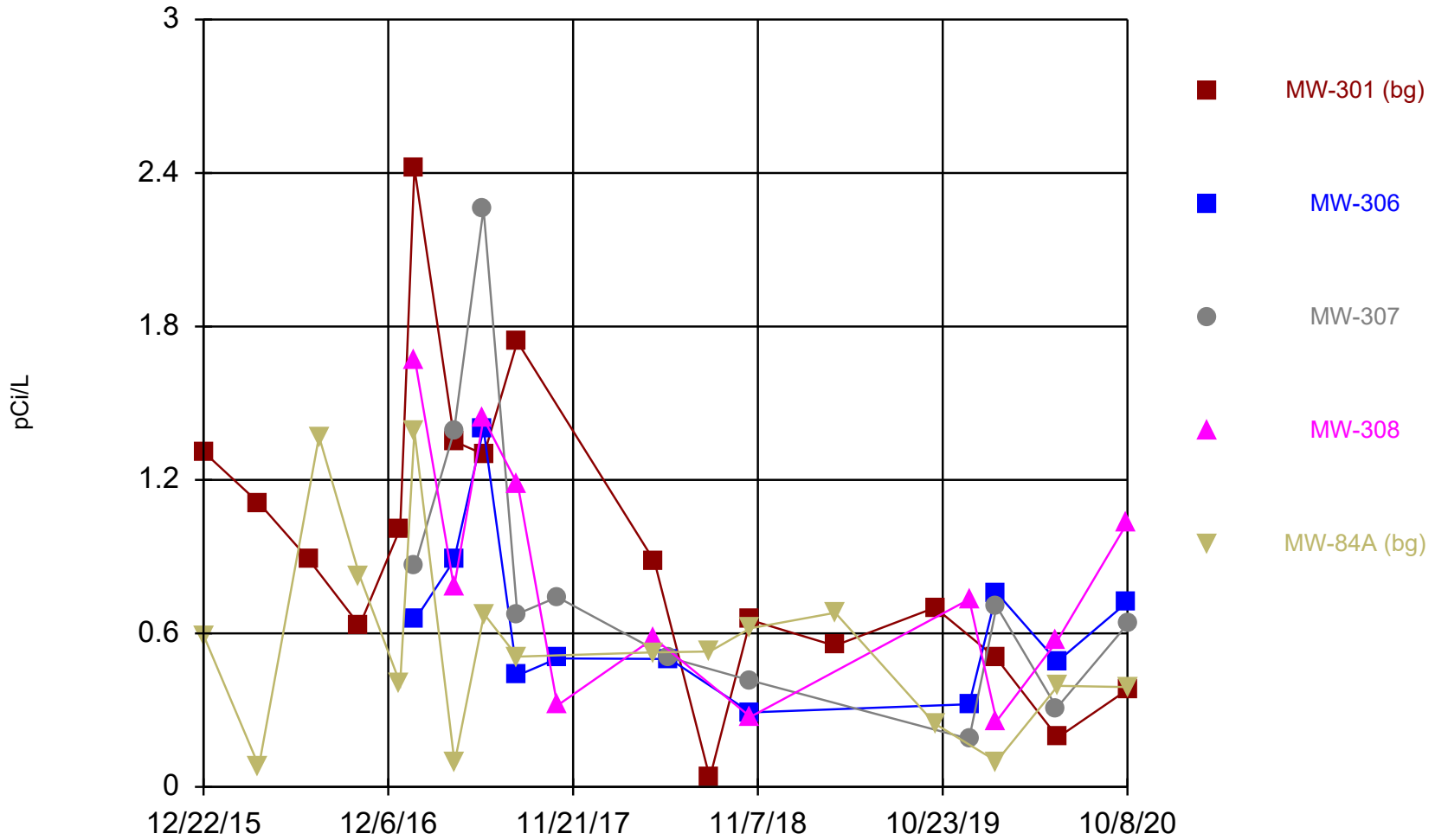
Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	478				316
4/5/2016	486				322
7/8/2016	464				316
10/13/2016	490				324
12/29/2016	444				316
1/25/2017	514				328
1/26/2017		310	318	544	
4/10/2017		326	324	526	
4/11/2017	502				342
6/5/2017		324	324	508	
6/6/2017	458				344
8/8/2017	462	338	350		342
8/9/2017				546	
10/23/2017	362	310	362	486	
10/24/2017					314
4/24/2018				512	
4/25/2018	464				328
5/24/2018		314	576		
8/8/2018	502				372
10/24/2018	424	322	398	566	330
4/1/2019		310	350	484	
4/2/2019	462				
4/3/2019					318
10/7/2019			336	470	
10/8/2019		328			
10/9/2019	418				310
12/13/2019		326	354	504	
2/3/2020	462	310	340	468	316
5/27/2020			356	510	
5/28/2020		306			
5/29/2020	452				340
10/7/2020		322		490	
10/8/2020	412		334		320

Total Radium



07/01/2021 - Classification: Internal - ECRM12626135

Time Series Analysis Run 12/23/2020 3:37 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Total Radium (pCi/L) Analysis Run 12/23/2020 3:38 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	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				1.39
1/26/2017		0.653	0.864	1.67	
4/10/2017		0.886	1.39	0.78	
4/11/2017	1.35				0.0929
6/5/2017		1.4	2.26	1.44	
6/6/2017	1.3				0.676
8/8/2017	1.74	0.435	0.676		0.509
8/9/2017				1.18	
10/23/2017		0.502	0.742	0.318	
4/24/2018				0.581	
4/25/2018	0.882				0.526
5/24/2018		0.5	0.505		
8/8/2018	0.0351				0.529
10/24/2018	0.652	0.291	0.416	0.274	0.62
4/2/2019	0.552				
4/3/2019					0.681
10/9/2019	0.701				0.247
12/13/2019		0.323	0.188	0.733	
2/3/2020	0.502	0.759	0.706	0.257	0.1
5/27/2020			0.309	0.569	
5/28/2020		0.49			
5/29/2020	0.193				0.395
10/7/2020		0.721		1.03	
10/8/2020	0.38		0.636		0.39

Attachment 2

Outliers Analysis Results – Background Wells

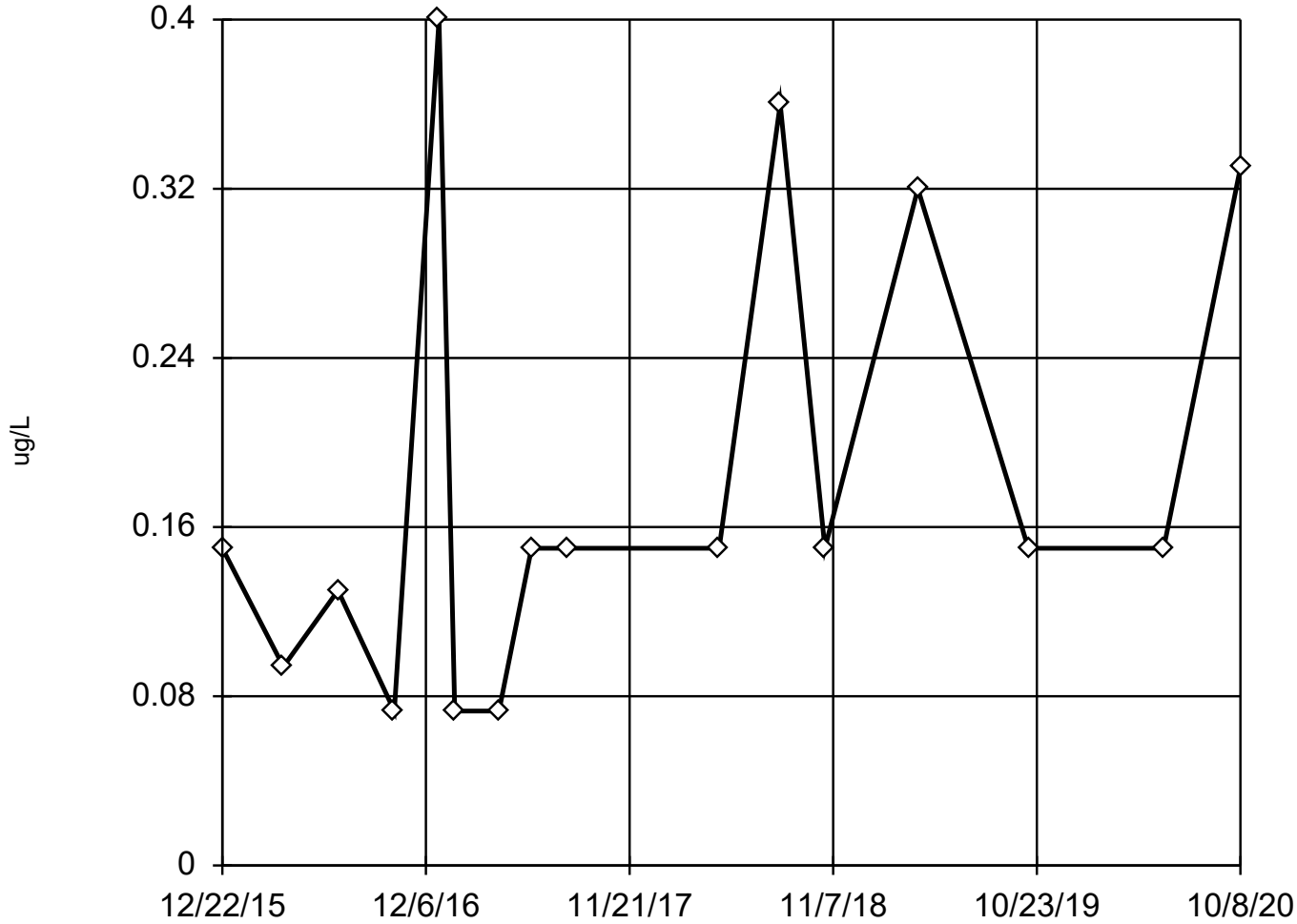
Outlier Analysis

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 12/28/2020, 5:12 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	16	0.1814	0.1075	unknown	ShapiroWilk
Antimony (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	16	0.1187	0.03725	unknown	ShapiroWilk
Arsenic (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	17	0.3106	0.1179	normal	ShapiroWilk
Arsenic (ug/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	17	0.2923	0.1053	normal	ShapiroWilk
Barium (ug/L)	MW-301 (bg)	Yes	20.2	12/22/2015	Dixon`s	0.05	17	12.13	2.758	normal	ShapiroWilk
Barium (ug/L)	MW-84A (bg)	Yes	18.4	12/29/2016	Dixon`s	0.05	17	14.08	1.372	normal	ShapiroWilk
Beryllium (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	16	0.1931	0.06983	unknown	ShapiroWilk
Beryllium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	16	0.1713	0.04544	unknown	ShapiroWilk
Boron (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	18	27.89	4.353	normal	ShapiroWilk
Boron (ug/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	18	14.21	4.042	unknown	ShapiroWilk
Cadmium (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	15	0.1298	0.06792	unknown	ShapiroWilk
Cadmium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	15	0.1077	0.03109	unknown	ShapiroWilk
Calcium (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	18	112344	11156	normal	ShapiroWilk
Calcium (ug/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	18	74222	3083	normal	ShapiroWilk
Chloride (mg/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	18	2.877	1.325	normal	ShapiroWilk
Chloride (mg/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	18	4.578	0.5887	normal	ShapiroWilk
Chromium (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	17	0.9935	0.501	unknown	ShapiroWilk
Chromium (ug/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	17	1.876	0.3113	unknown	ShapiroWilk
Cobalt (ug/L)	MW-301 (bg)	Yes	1.4	12/22/2015	Dixon`s	0.05	17	0.2477	0.3141	normal	ShapiroWilk
Cobalt (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	17	0.08165	0.03561	unknown	ShapiroWilk
Field pH (Std. Units)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	18	6.888	0.2159	normal	ShapiroWilk
Field pH (Std. Units)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	19	7.411	0.2402	normal	ShapiroWilk
Lead (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	15	0.2525	0.2165	unknown	ShapiroWilk
Lead (ug/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	15	0.1753	0.1014	unknown	ShapiroWilk
Lithium (ug/L)	MW-301 (bg)	Yes	1.3	12/22/2015	Dixon`s	0.05	17	0.6847	0.2037	normal	ShapiroWilk
Lithium (ug/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	17	0.5159	0.08352	normal	ShapiroWilk
Molybdenum (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	17	0.3341	0.1524	unknown	ShapiroWilk
Molybdenum (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	17	0.2908	0.1842	unknown	ShapiroWilk
Selenium (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	17	0.3265	0.1219	unknown	ShapiroWilk
Selenium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	17	0.2747	0.0558	unknown	ShapiroWilk
Sulfate (mg/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	18	14.71	7.682	normal	ShapiroWilk
Sulfate (mg/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	18	2.433	1.069	normal	ShapiroWilk
Thallium (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	17	0.1988	0.1182	unknown	ShapiroWilk
Thallium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	17	0.14	0	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-301 (bg)	No	n/a	n/a	Dixon`s	0.05	18	458.7	37.3	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	18	327.7	15.42	unknown	ShapiroWilk
Total Radium (pCi/L)	MW-301 (bg)	No	n/a	n/a	Dixon`s	0.05	17	0.9211	0.5899	normal	ShapiroWilk
Total Radium (pCi/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	17	0.5546	0.3783	unknown	ShapiroWilk

Tukey's Outlier Screening

MW-301 (bg)



n = 16

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1.706, low cutoff = 0.0142, based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

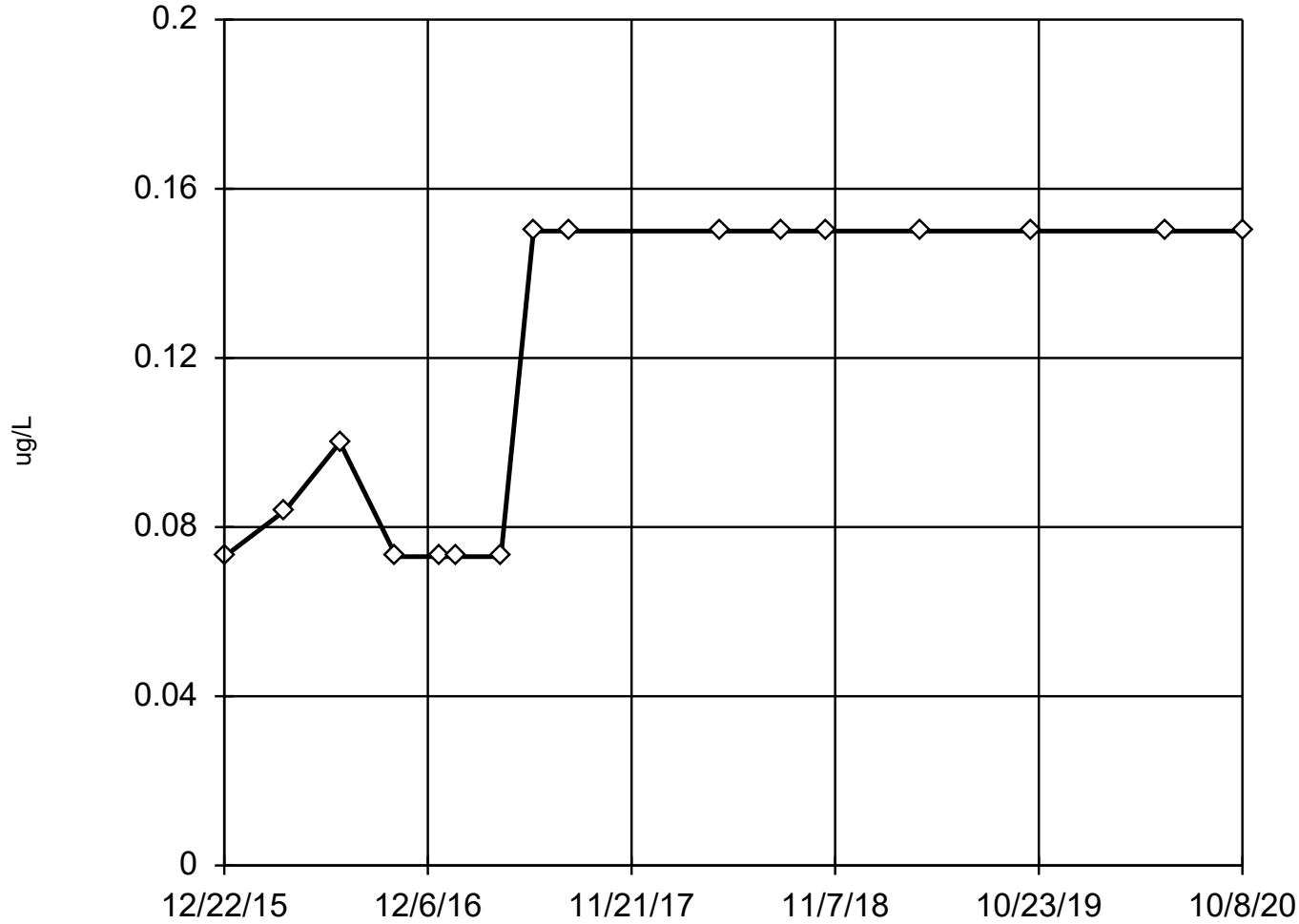
Tukey's Outlier Screening

Constituent: Antimony (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	0.15 (J)
4/5/2016	0.094 (J)
7/8/2016	0.13 (J)
10/13/2016	<0.073 (U)
12/29/2016	0.4 (J)
1/25/2017	<0.073 (U)
4/11/2017	<0.073 (U)
6/6/2017	<0.15 (U)
8/8/2017	<0.15 (U)
4/25/2018	<0.15 (U)
8/8/2018	0.36 (J)
10/24/2018	<0.15 (U)
4/2/2019	0.32 (J)
10/9/2019	<0.15 (U)
5/29/2020	<0.15 (U)
10/8/2020	0.33 (J)

Tukey's Outlier Screening

MW-84A (bg)



n = 16

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

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

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Antimony Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

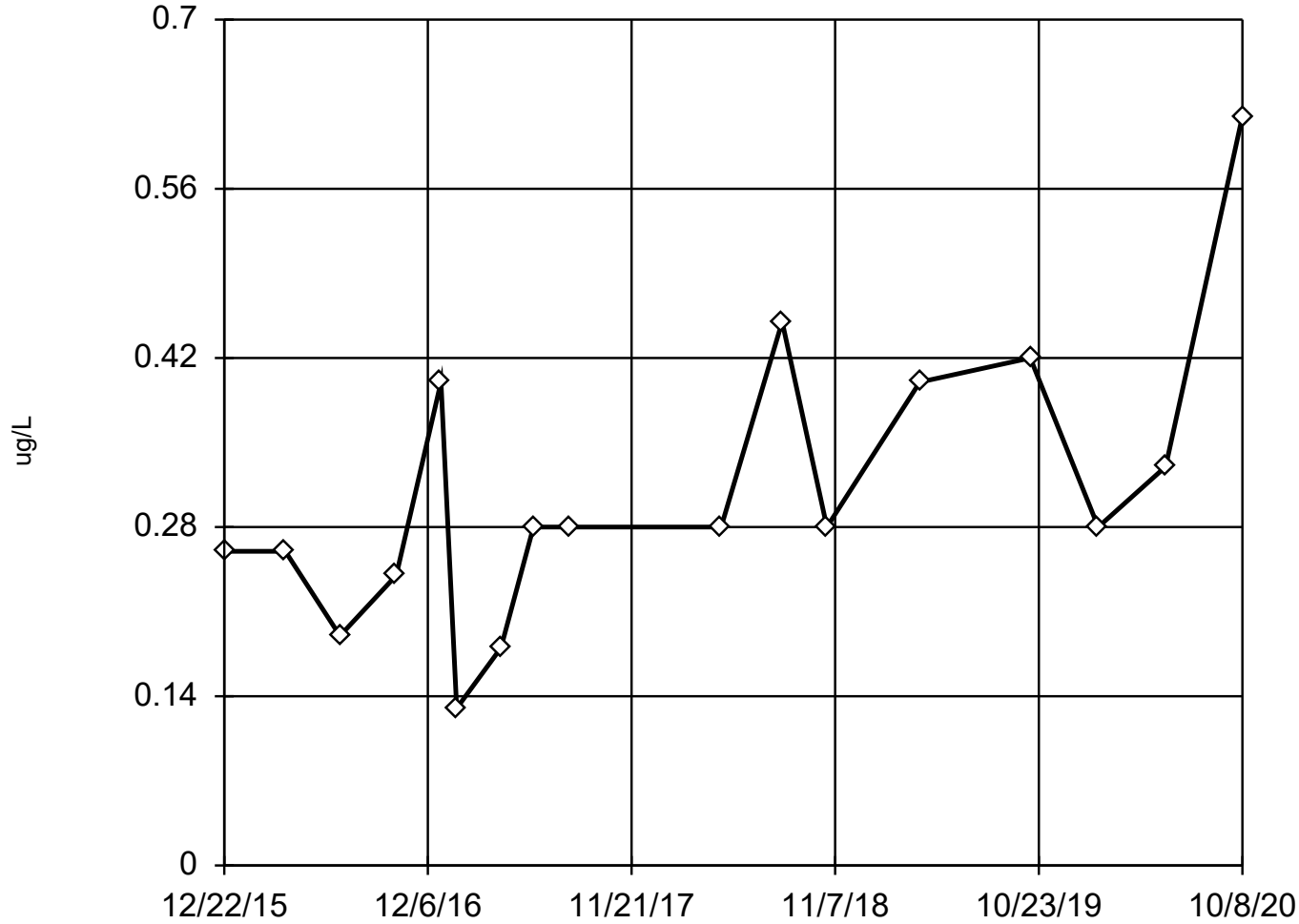
Tukey's Outlier Screening

Constituent: Antimony (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	<0.073 (U)
4/5/2016	0.084 (J)
7/8/2016	0.1 (J)
10/13/2016	<0.073 (U)
12/29/2016	<0.073 (U)
1/25/2017	<0.073 (U)
4/11/2017	<0.073 (U)
6/6/2017	<0.15 (U)
8/8/2017	<0.15 (U)
4/25/2018	<0.15 (U)
8/8/2018	<0.15 (U)
10/24/2018	<0.15 (U)
4/3/2019	<0.15 (U)
10/9/2019	<0.15 (U)
5/29/2020	<0.15 (U)
10/8/2020	<0.15 (U)

EPA Screening (suspected outliers for Dixon's Test)

MW-301 (bg)



n = 17

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.3106, std. dev. 0.1179, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9147
Critical = 0.91
The distribution was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Arsenic Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

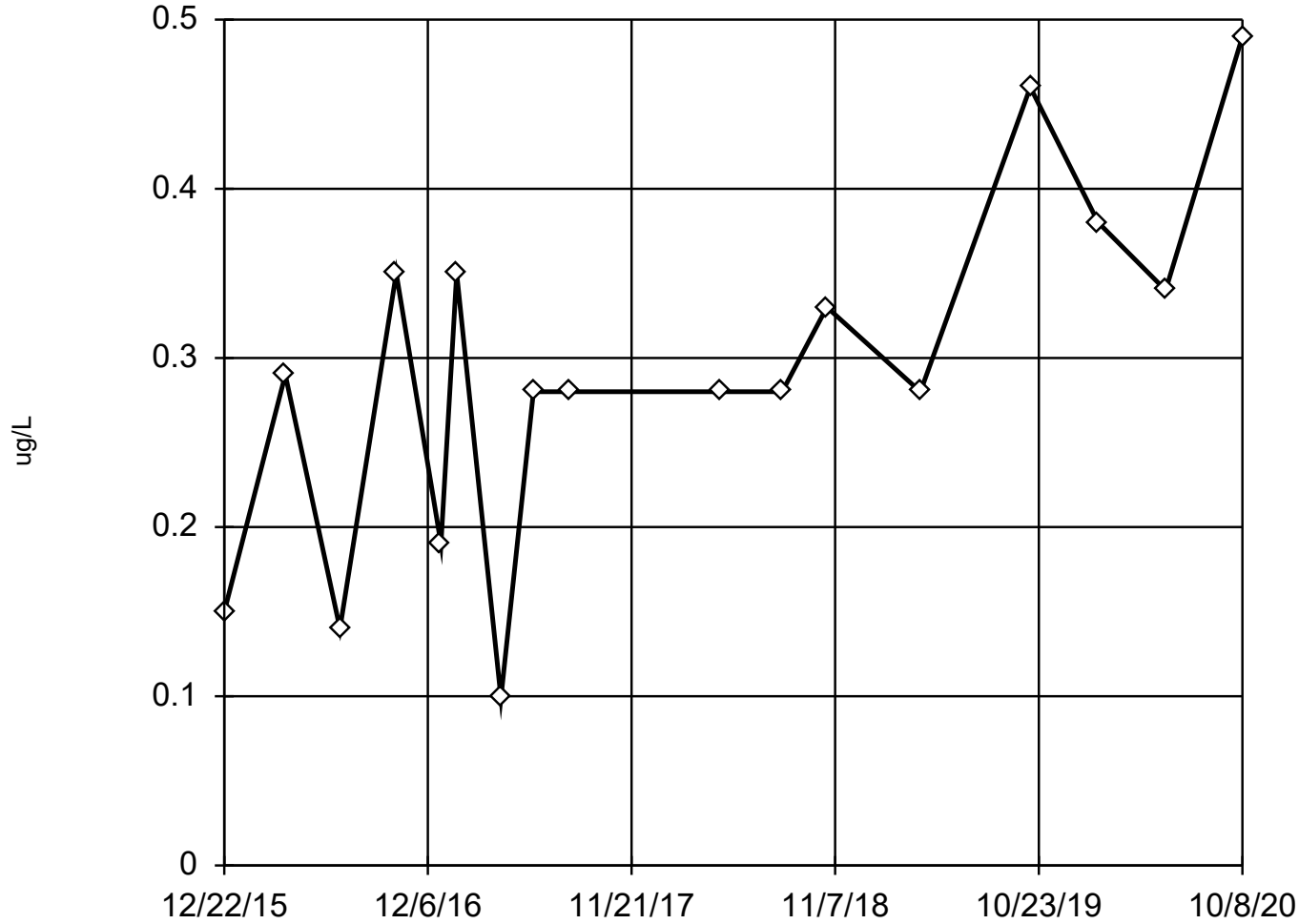
EPA 1989 Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	0.26 (J)
4/5/2016	0.26 (J)
7/8/2016	0.19 (J)
10/13/2016	0.24 (J)
12/29/2016	0.4 (J)
1/25/2017	0.13 (J)
4/11/2017	0.18 (J)
6/6/2017	<0.28 (U)
8/8/2017	<0.28 (U)
4/25/2018	<0.28 (U)
8/8/2018	0.45 (J)
10/24/2018	<0.28 (U)
4/2/2019	0.4 (J)
10/9/2019	0.42 (J)
2/3/2020	<0.28 (U)
5/29/2020	0.33 (J)
10/8/2020	0.62 (J)

EPA Screening (suspected outliers for Dixon's Test)

MW-84A (bg)



n = 17

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 0.2923, std. dev.
0.1053, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9506
Critical = 0.91
The distribution was found
to be normally distrib-
uted.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Arsenic Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

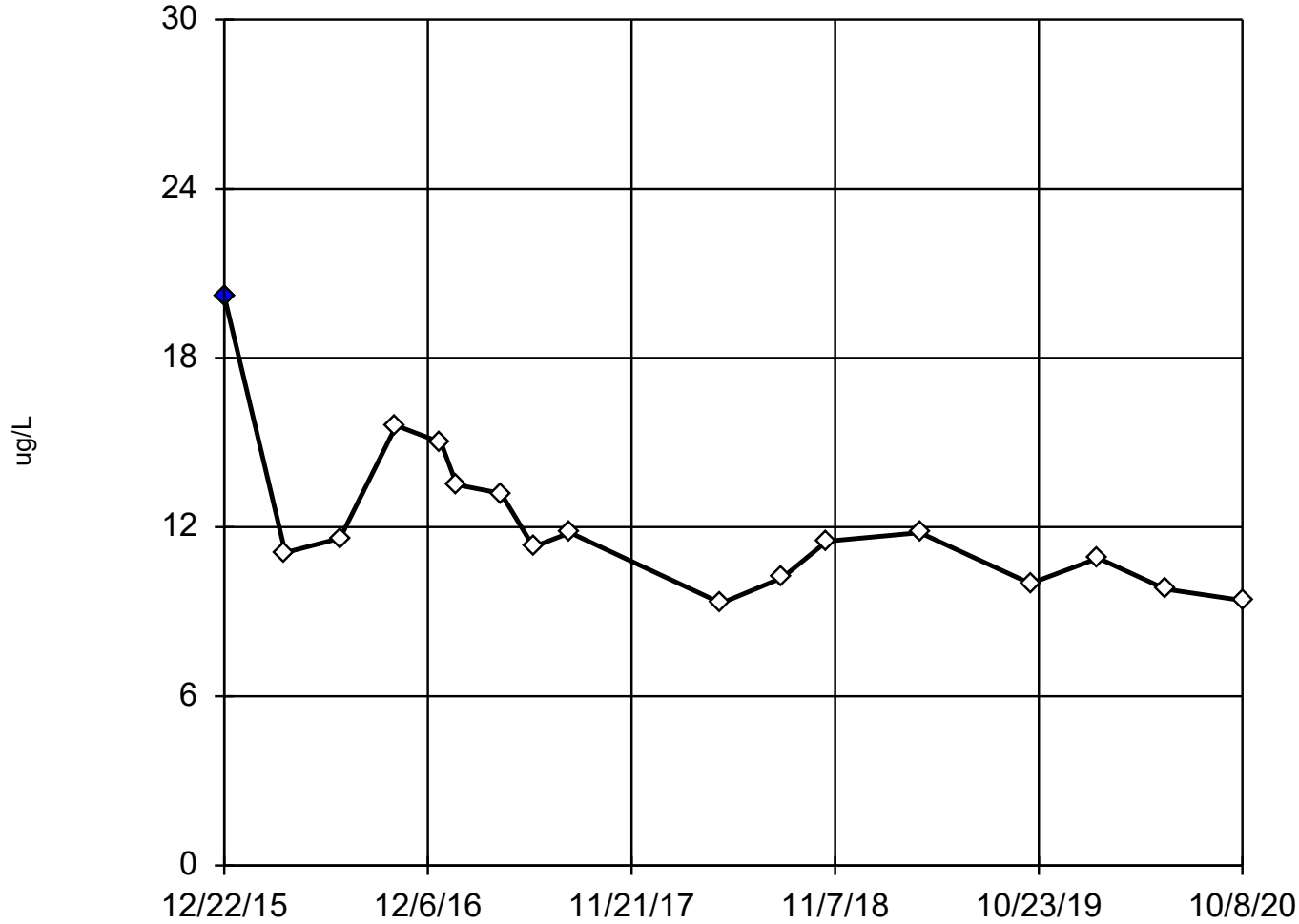
EPA 1989 Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	0.15 (J)
4/5/2016	0.29 (J)
7/8/2016	0.14 (J)
10/13/2016	0.35 (J)
12/29/2016	0.19 (J)
1/25/2017	0.35 (J)
4/11/2017	<0.099 (U)
6/6/2017	<0.28 (U)
8/8/2017	0.28 (J)
4/25/2018	<0.28 (U)
8/8/2018	<0.28 (U)
10/24/2018	0.33 (J)
4/3/2019	<0.28 (U)
10/9/2019	0.46 (J)
2/3/2020	0.38 (J)
5/29/2020	0.34 (J)
10/8/2020	0.49 (J)

Dixon's Outlier Test

MW-301 (bg)



n = 17

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 12.13.
Std. Dev. = 2.758.
20.2: c = 0.5
tab1 = 0.49.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9159
Critical = 0.906
The distribution, after removal of suspect value, was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Barium Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

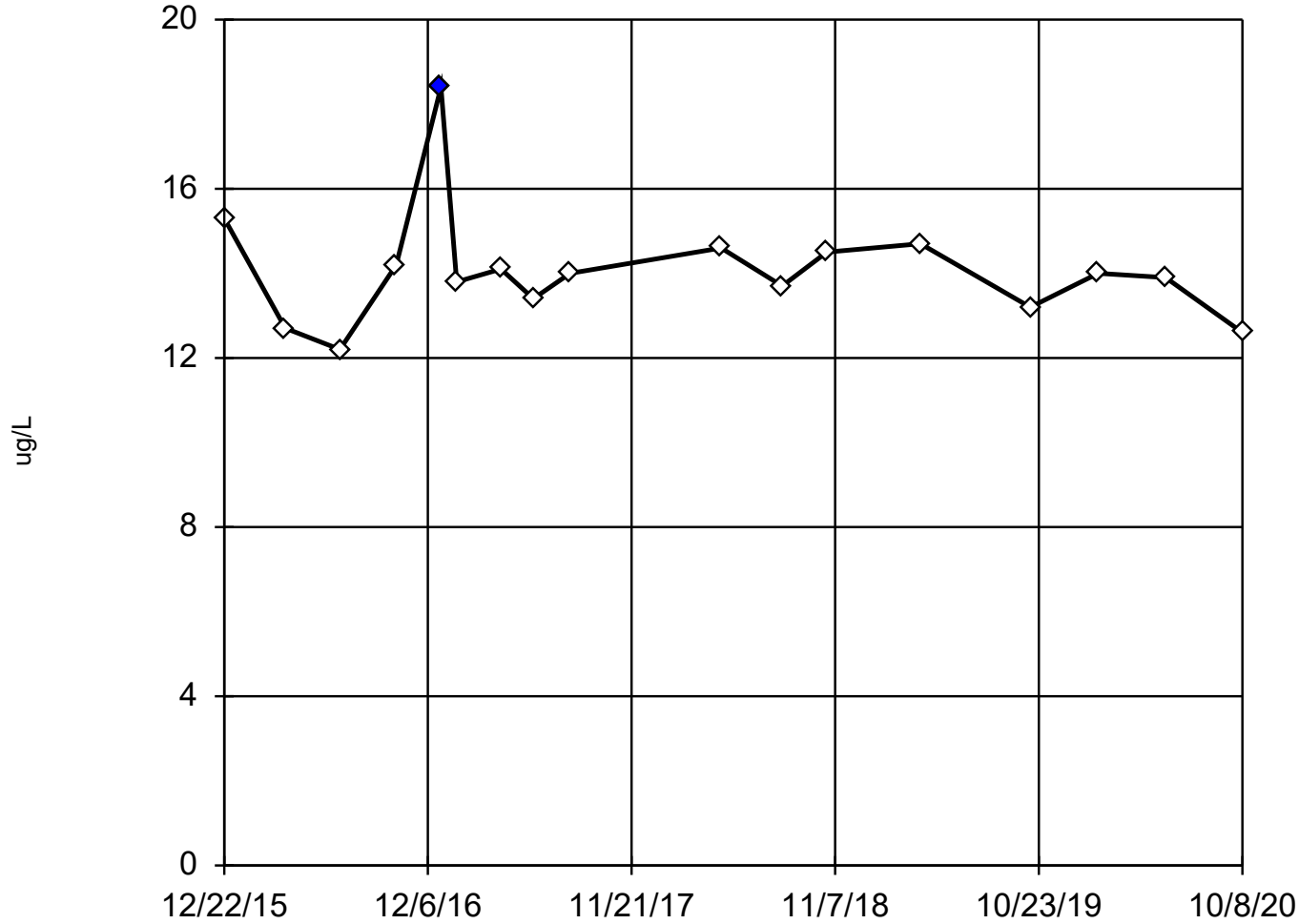
Dixon's Outlier Test

Constituent: Barium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	20.2 (O)
4/5/2016	11.1
7/8/2016	11.6
10/13/2016	15.6
12/29/2016	15
1/25/2017	13.5
4/11/2017	13.2
6/6/2017	11.3
8/8/2017	11.8
4/25/2018	9.3
8/8/2018	10.2
10/24/2018	11.5
4/2/2019	11.8
10/9/2019	10
2/3/2020	10.9
5/29/2020	9.8
10/8/2020	9.4

Dixon's Outlier Test

MW-84A (bg)



n = 17

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 14.08.
Std. Dev. = 1.372.
18.4: c = 0.6491
tab1 = 0.49.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9718
Critical = 0.906
The distribution, after removal of suspect value, was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Barium Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

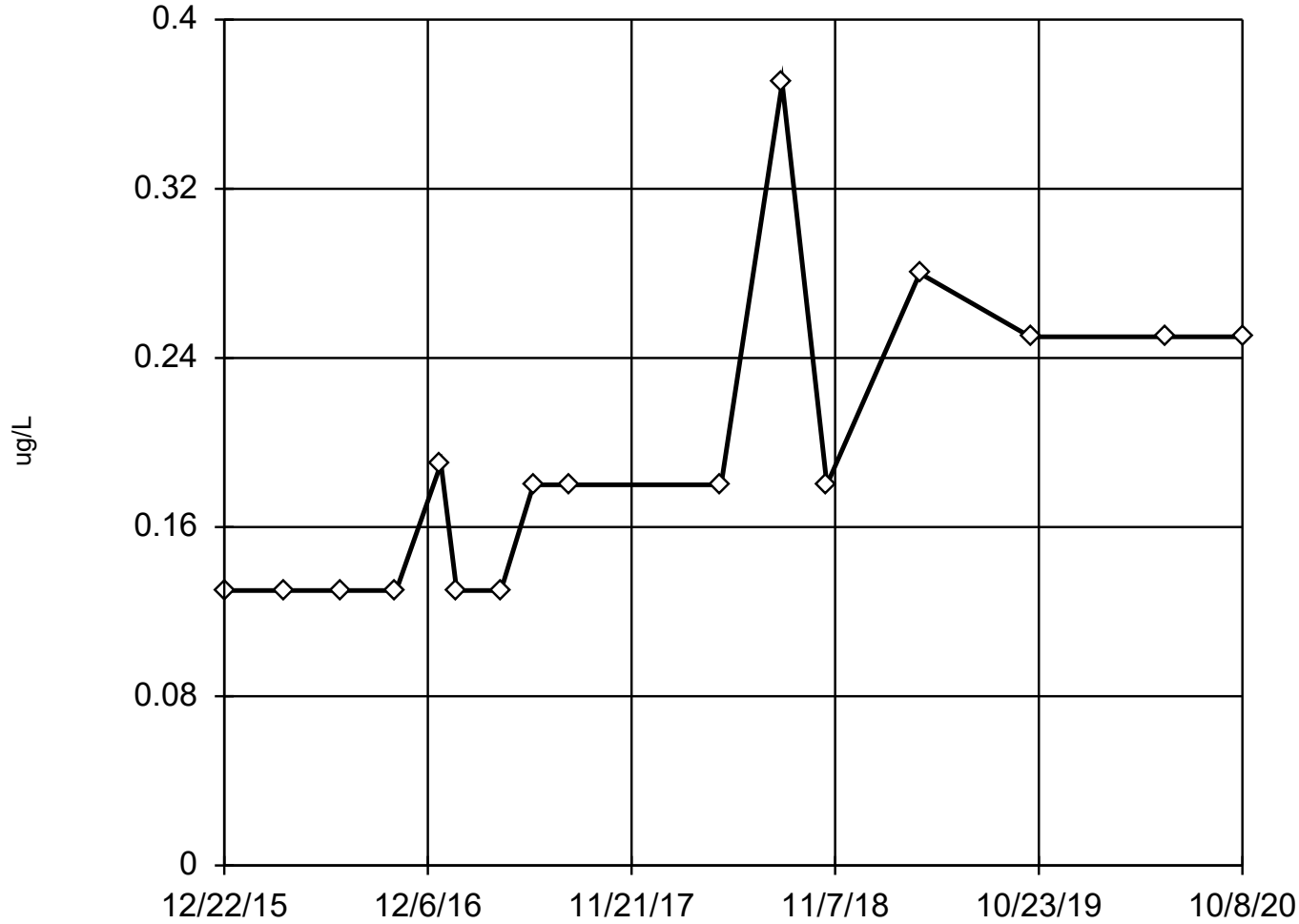
Dixon's Outlier Test

Constituent: Barium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	15.3
4/5/2016	12.7
7/8/2016	12.2
10/13/2016	14.2
12/29/2016	18.4 (O)
1/25/2017	13.8
4/11/2017	14.1
6/6/2017	13.4
8/8/2017	14
4/25/2018	14.6
8/8/2018	13.7
10/24/2018	14.5
4/3/2019	14.7
10/9/2019	13.2
2/3/2020	14
5/29/2020	13.9
10/8/2020	12.6

Tukey's Outlier Screening

MW-301 (bg)



n = 16

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

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

07/01/2021 - Classification: Internal - ECRM12626135

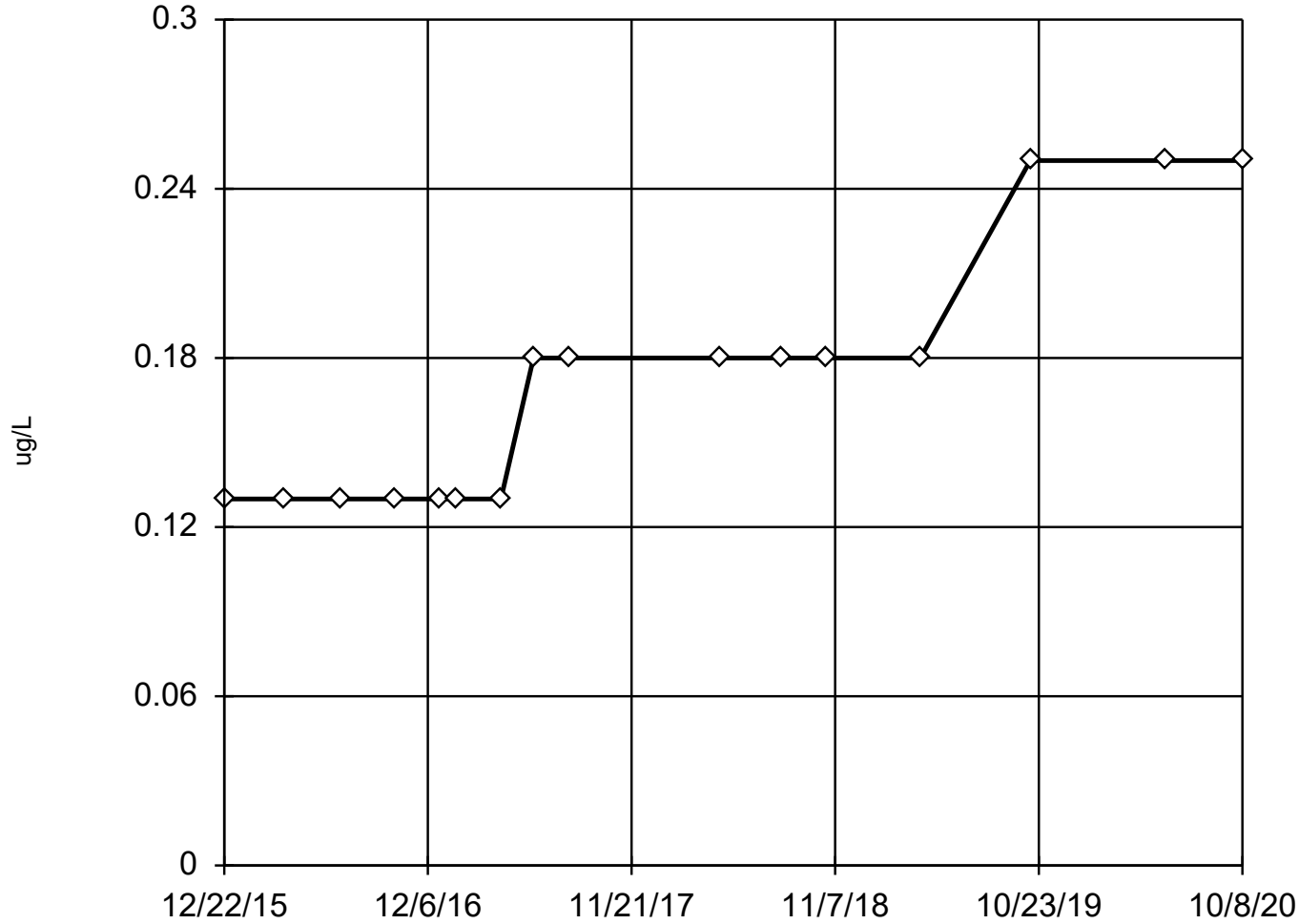
Constituent: Beryllium Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Beryllium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	<0.13 (U)
4/5/2016	<0.13 (U)
7/8/2016	<0.13 (U)
10/13/2016	<0.13 (U)
12/29/2016	0.19 (J)
1/25/2017	<0.13 (U)
4/11/2017	<0.13 (U)
6/6/2017	<0.18 (U)
8/8/2017	<0.18 (U)
4/25/2018	<0.18 (U)
8/8/2018	0.37 (J)
10/24/2018	<0.18 (U)
4/2/2019	0.28 (J)
10/9/2019	<0.25 (U)
5/29/2020	<0.25 (U)
10/8/2020	<0.25 (U)

Tukey's Outlier Screening MW-84A (bg)



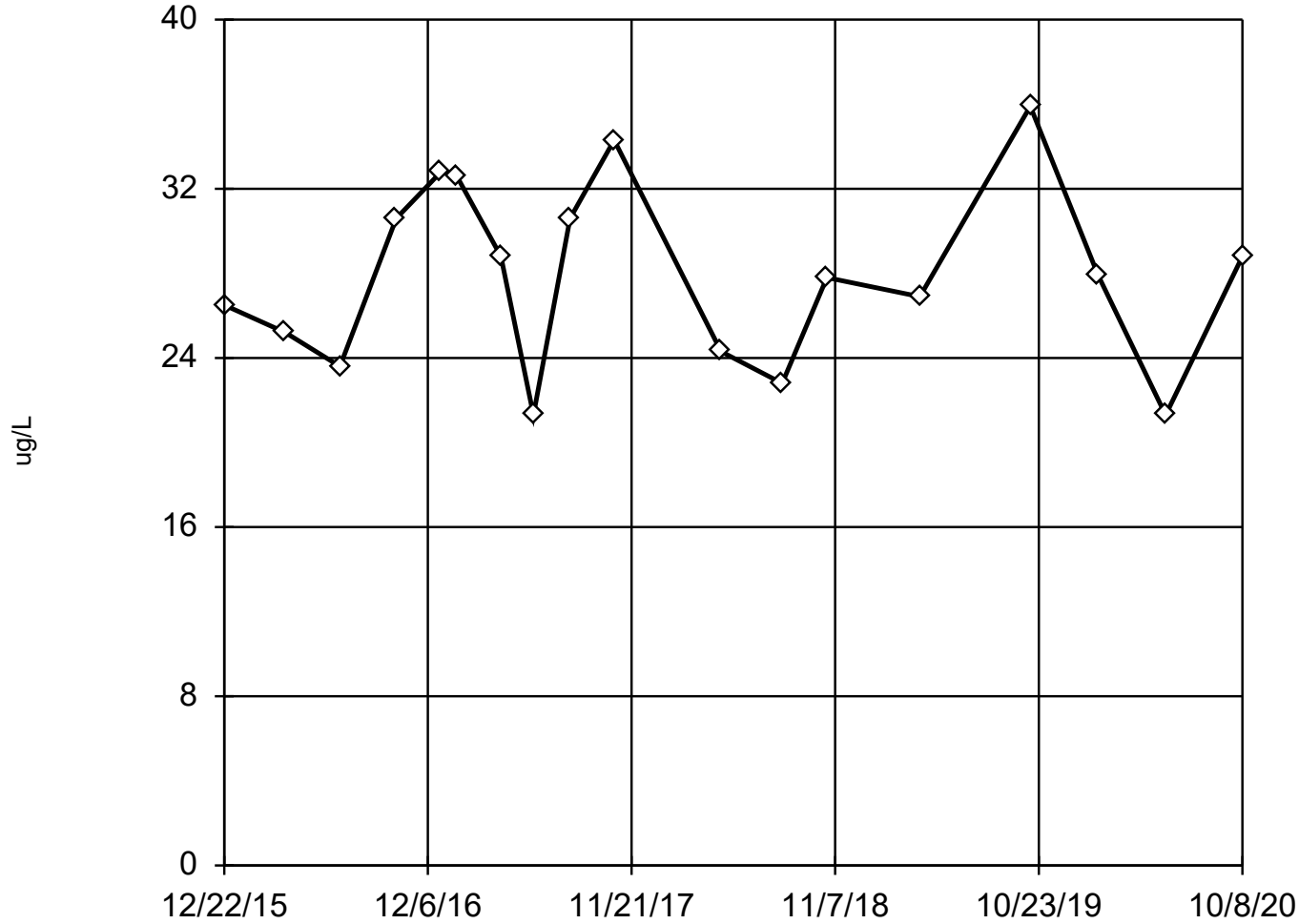
Tukey's Outlier Screening

Constituent: Beryllium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	<0.13 (U)
4/5/2016	<0.13 (U)
7/8/2016	<0.13 (U)
10/13/2016	<0.13 (U)
12/29/2016	<0.13 (U)
1/25/2017	<0.13 (U)
4/11/2017	<0.13 (U)
6/6/2017	<0.18 (U)
8/8/2017	<0.18 (U)
4/25/2018	<0.18 (U)
8/8/2018	<0.18 (U)
10/24/2018	<0.18 (U)
4/3/2019	<0.18 (U)
10/9/2019	<0.25 (U)
5/29/2020	<0.25 (U)
10/8/2020	<0.25 (U)

EPA Screening (suspected outliers for Dixon's Test)

MW-301 (bg)



n = 18

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 27.89, std. dev.
4.353, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9698
Critical = 0.914
The distribution was found
to be normally distrib-
uted.

Constituent: Boron Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

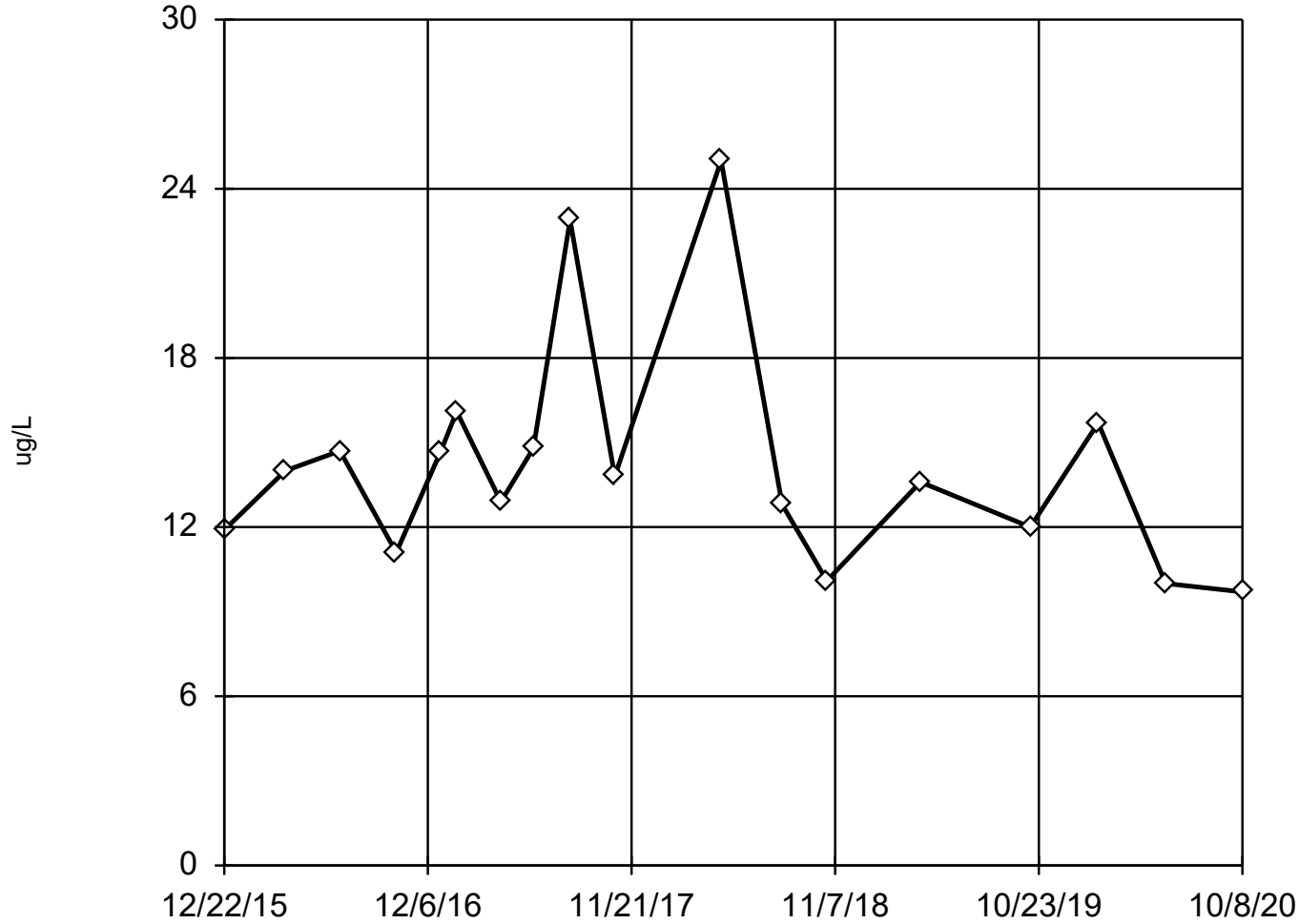
EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	26.5
4/5/2016	25.2
7/8/2016	23.6
10/13/2016	30.6
12/29/2016	32.8
1/25/2017	32.6
4/11/2017	28.8
6/6/2017	21.3
8/8/2017	30.6
10/23/2017	34.3
4/25/2018	24.3
8/8/2018	22.8
10/24/2018	27.8
4/2/2019	26.9
10/9/2019	35.9
2/3/2020	27.9
5/29/2020	21.3
10/8/2020	28.8

Tukey's Outlier Screening

MW-84A (bg)



n = 18

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 35.56, low cutoff = 4.926, based on IQR multiplier of 3.

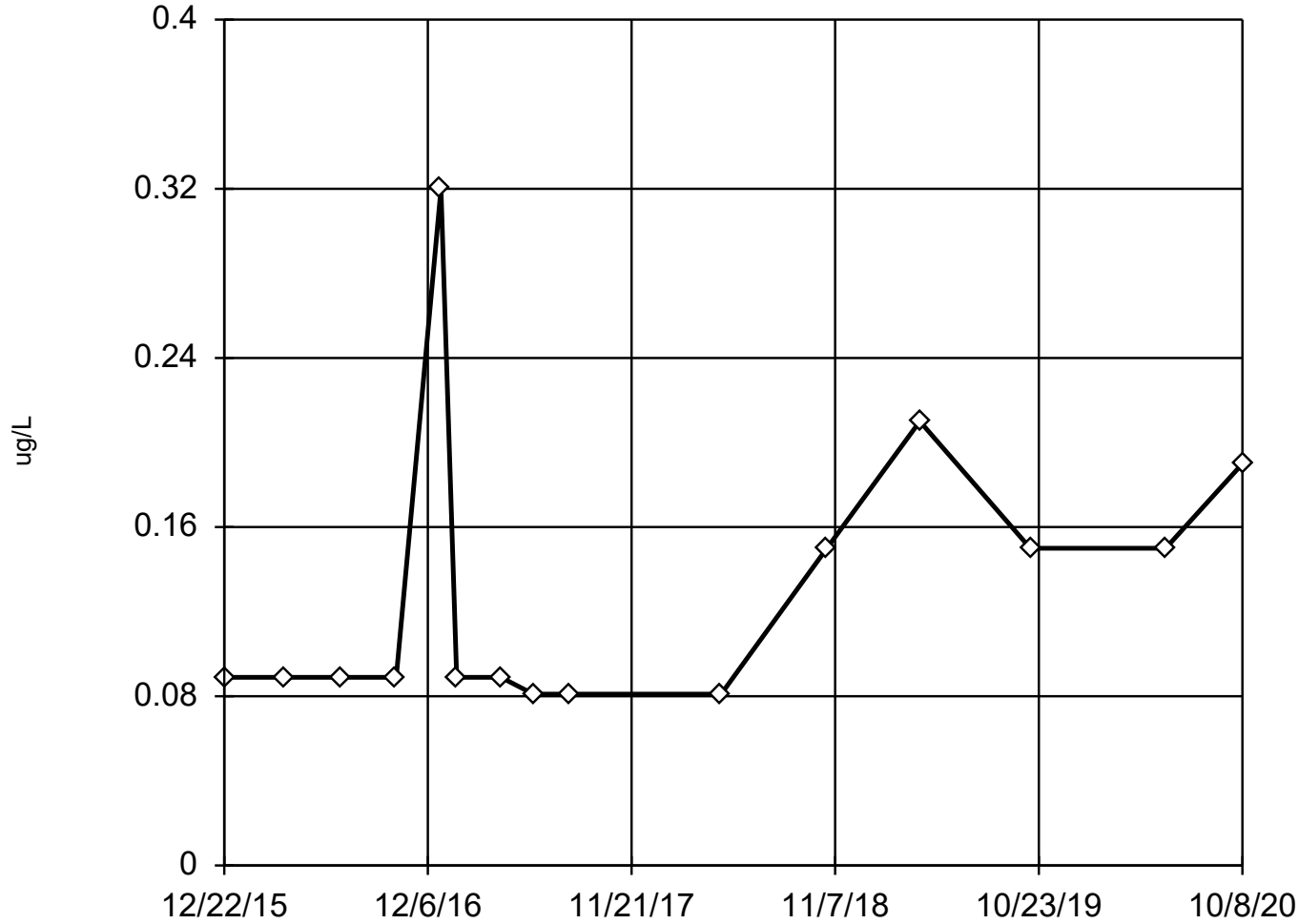
Constituent: Boron Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Boron (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	11.9
4/5/2016	14
7/8/2016	14.7
10/13/2016	11.1
12/29/2016	14.7
1/25/2017	16.1
4/11/2017	12.9
6/6/2017	14.8
8/8/2017	22.9
10/24/2017	13.8
4/25/2018	25
8/8/2018	12.8
10/24/2018	10.1 (J)
4/3/2019	13.6
10/9/2019	12
2/3/2020	15.7
5/29/2020	10
10/8/2020	9.7 (J)

Tukey's Outlier Screening MW-301 (bg)



n = 15

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

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

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Cadmium Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

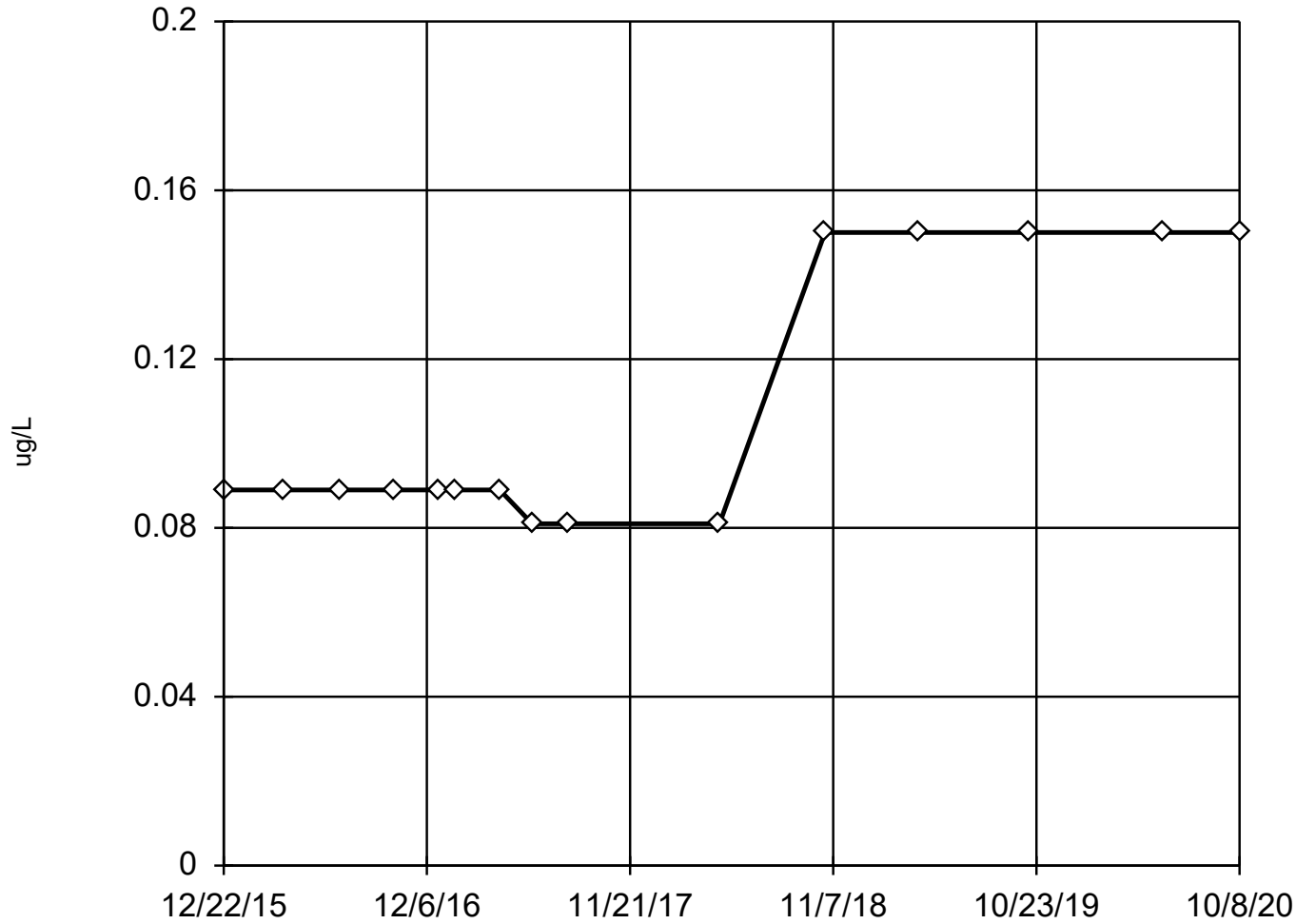
Tukey's Outlier Screening

Constituent: Cadmium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	<0.089 (U)
4/5/2016	<0.089 (U)
7/8/2016	<0.089 (U)
10/13/2016	<0.089 (U)
12/29/2016	0.32 (J)
1/25/2017	<0.089 (U)
4/11/2017	<0.089 (U)
6/6/2017	<0.081 (U)
8/8/2017	<0.081 (U)
4/25/2018	<0.081 (U)
10/24/2018	<0.15 (U)
4/2/2019	0.21 (J)
10/9/2019	<0.15 (U)
5/29/2020	<0.15 (U)
10/8/2020	0.19 (J)

Tukey's Outlier Screening

MW-84A (bg)



n = 15

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

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

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Cadmium Analysis Run 12/28/2020 5:09 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

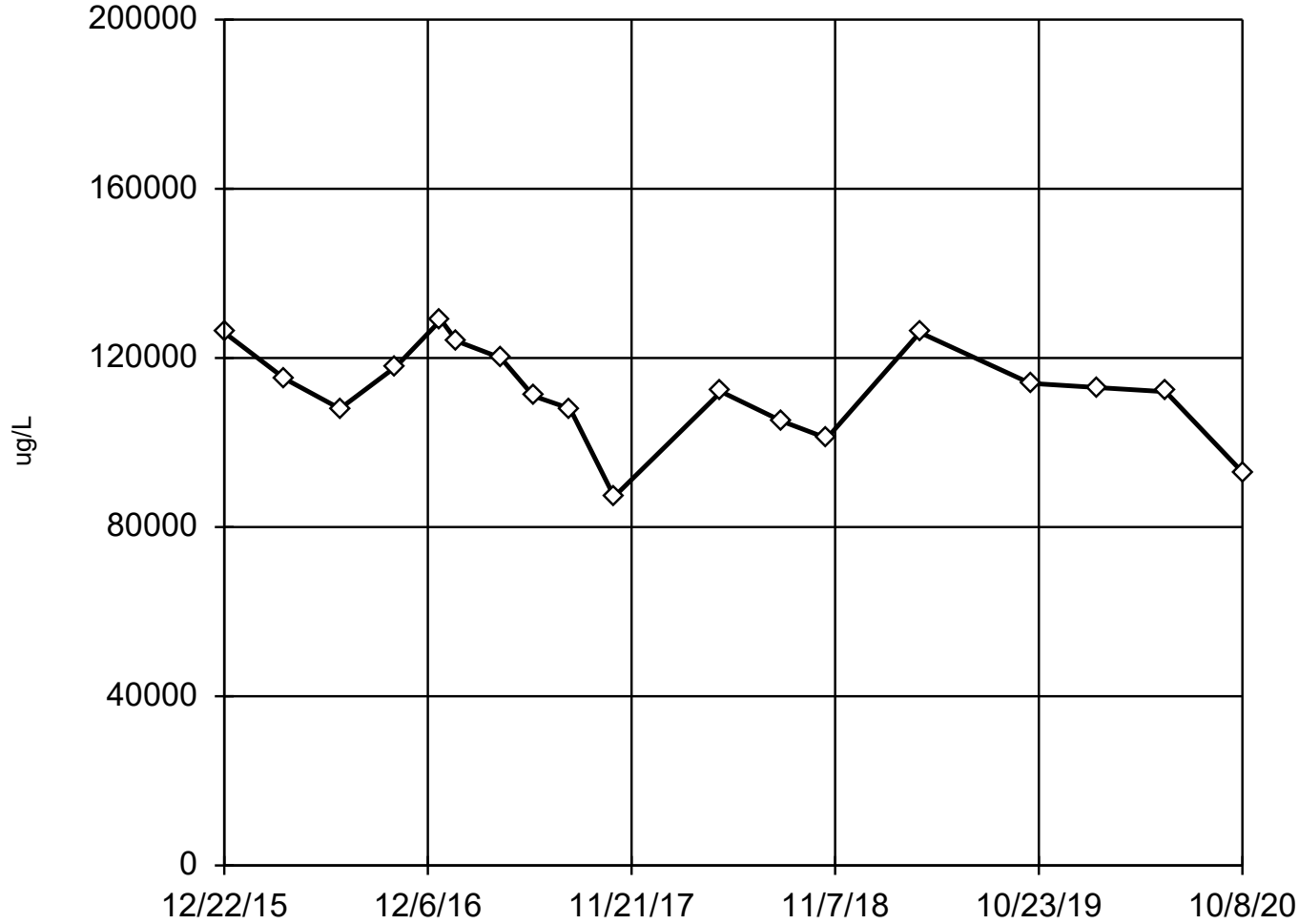
Tukey's Outlier Screening

Constituent: Cadmium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	<0.089 (U)
4/5/2016	<0.089 (U)
7/8/2016	<0.089 (U)
10/13/2016	<0.089 (U)
12/29/2016	<0.089 (U)
1/25/2017	<0.089 (U)
4/11/2017	<0.089 (U)
6/6/2017	<0.081 (U)
8/8/2017	<0.081 (U)
4/25/2018	<0.081 (U)
10/24/2018	<0.15 (U)
4/3/2019	<0.15 (U)
10/9/2019	<0.15 (U)
5/29/2020	<0.15 (U)
10/8/2020	<0.15 (U)

EPA Screening (suspected outliers for Dixon's Test)

MW-301 (bg)



n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 112344, std. dev. 11156, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9547
Critical = 0.914
The distribution was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Calcium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

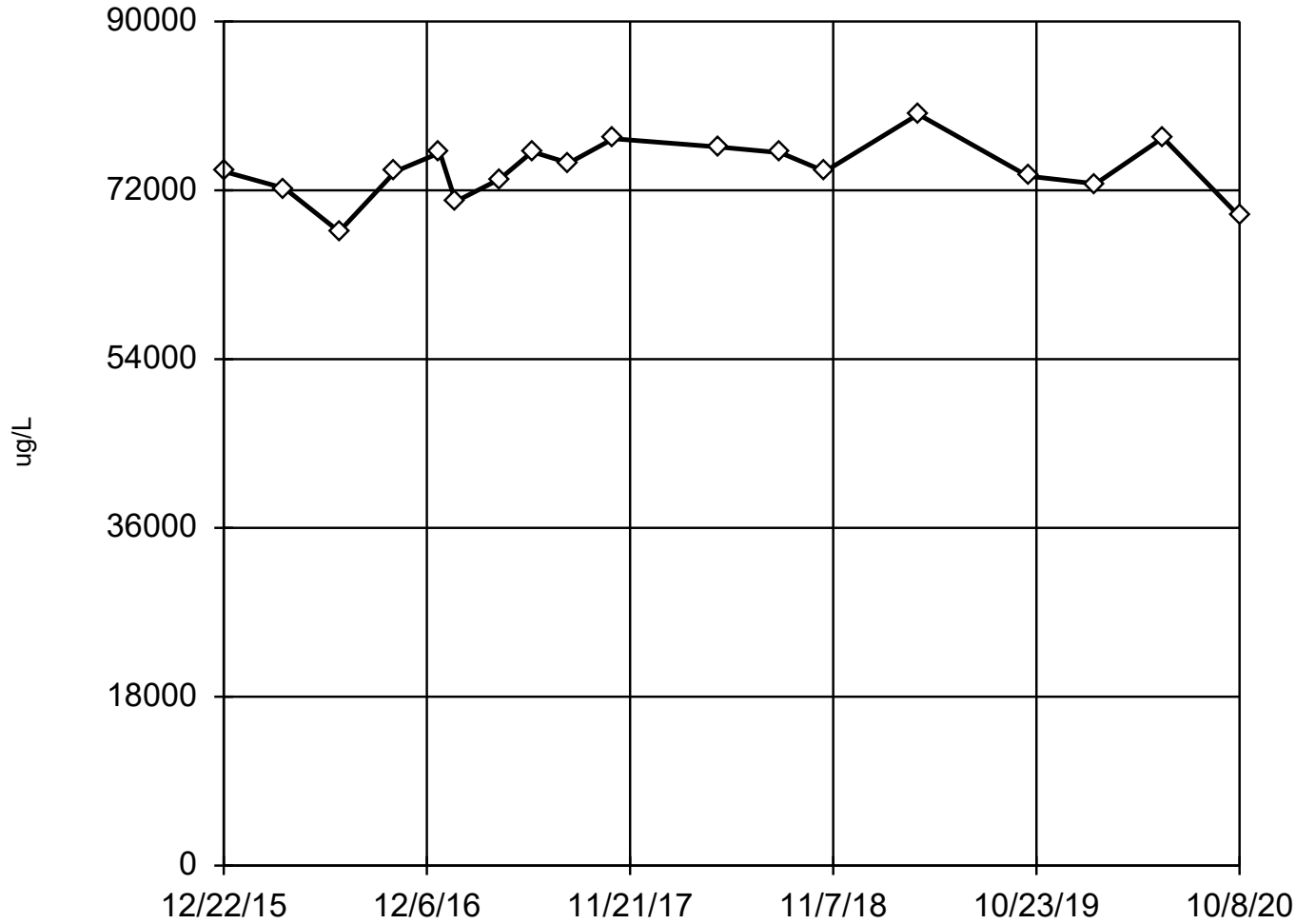
EPA 1989 Outlier Screening

Constituent: Calcium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	126000
4/5/2016	115000
7/8/2016	108000
10/13/2016	118000
12/29/2016	129000
1/25/2017	124000
4/11/2017	120000
6/6/2017	111000
8/8/2017	108000
10/23/2017	87200
4/25/2018	112000
8/8/2018	105000
10/24/2018	101000
4/2/2019	126000
10/9/2019	114000
2/3/2020	113000
5/29/2020	112000
10/8/2020	93000

EPA Screening (suspected outliers for Dixon's Test)

MW-84A (bg)



n = 18
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 74222, std. dev. 3083, critical Tn 2.504
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9781
Critical = 0.914
The distribution was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Calcium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

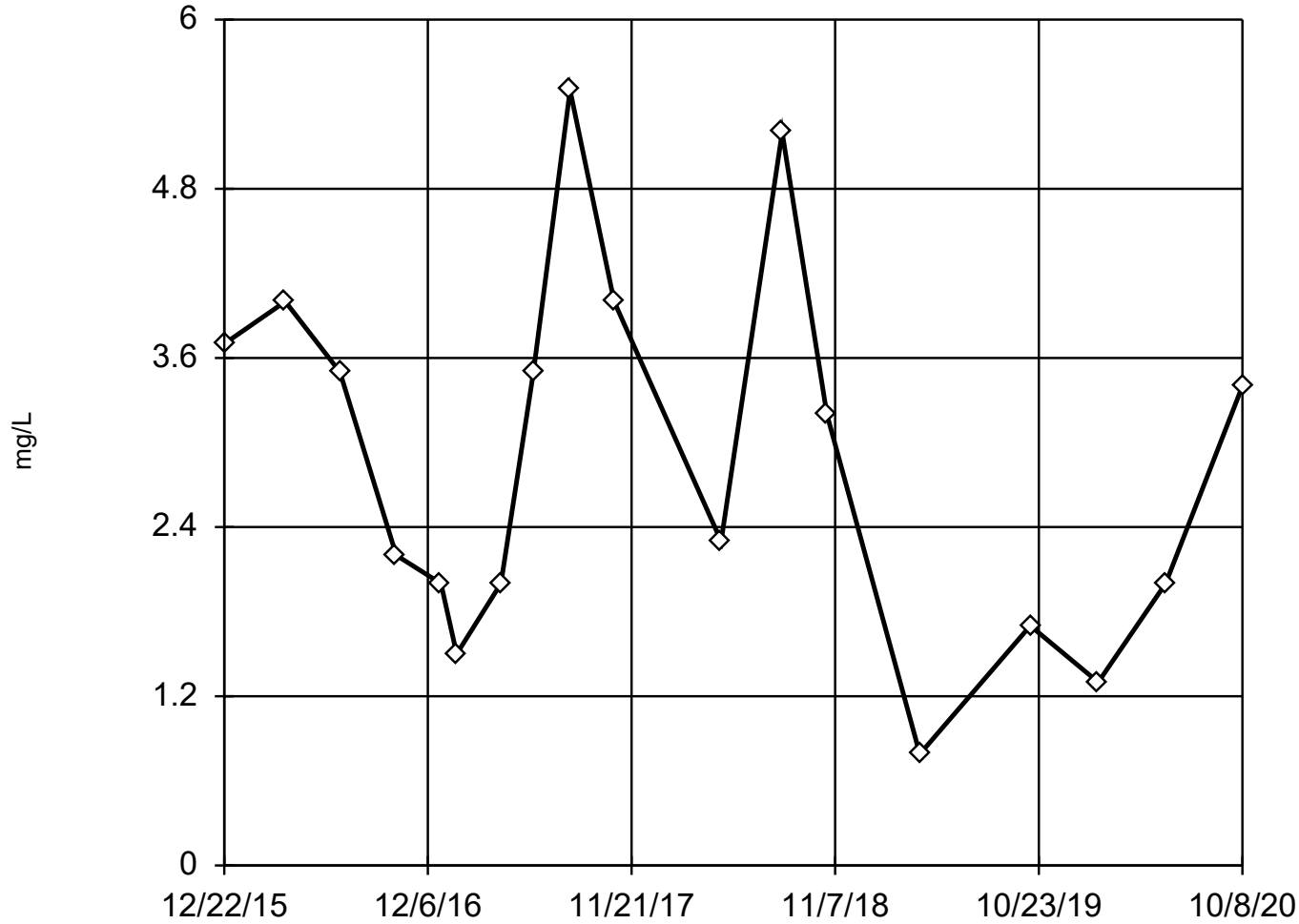
EPA 1989 Outlier Screening

Constituent: Calcium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	74000
4/5/2016	72200
7/8/2016	67600
10/13/2016	74000
12/29/2016	76000
1/25/2017	70800
4/11/2017	73200
6/6/2017	76100
8/8/2017	74900
10/24/2017	77500
4/25/2018	76600
8/8/2018	76000
10/24/2018	74000
4/3/2019	80100
10/9/2019	73500
2/3/2020	72700
5/29/2020	77600
10/8/2020	69200

EPA Screening (suspected outliers for Dixon's Test)

MW-301 (bg)



n = 18

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 2.877, std. dev.
1.325, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9493
Critical = 0.914
The distribution was found
to be normally distrib-
uted.

Constituent: Chloride Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

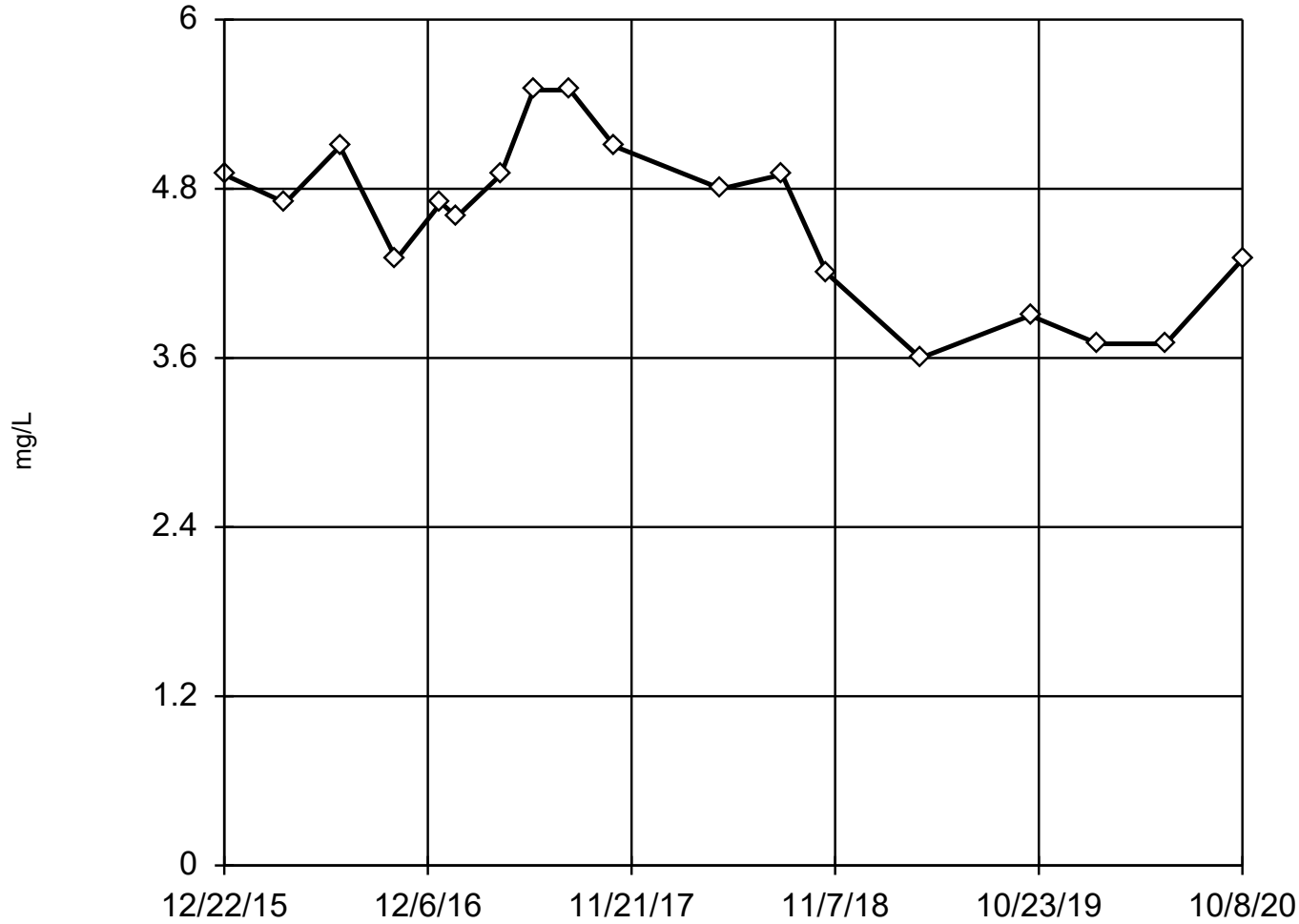
EPA 1989 Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	3.7 (J)
4/5/2016	4
7/8/2016	3.5 (J)
10/13/2016	2.2
12/29/2016	2 (J)
1/25/2017	1.5 (J)
4/11/2017	2
6/6/2017	3.5
8/8/2017	5.5
10/23/2017	4
4/25/2018	2.3
8/8/2018	5.2
10/24/2018	3.2
4/2/2019	0.79 (J)
10/9/2019	1.7 (J)
2/3/2020	1.3 (J)
5/29/2020	2 (J)
10/8/2020	3.4

EPA Screening (suspected outliers for Dixon's Test)

MW-84A (bg)



n = 18

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 4.578, std. dev.
0.5887, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9435
Critical = 0.914
The distribution was found
to be normally distrib-
uted.

Constituent: Chloride Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

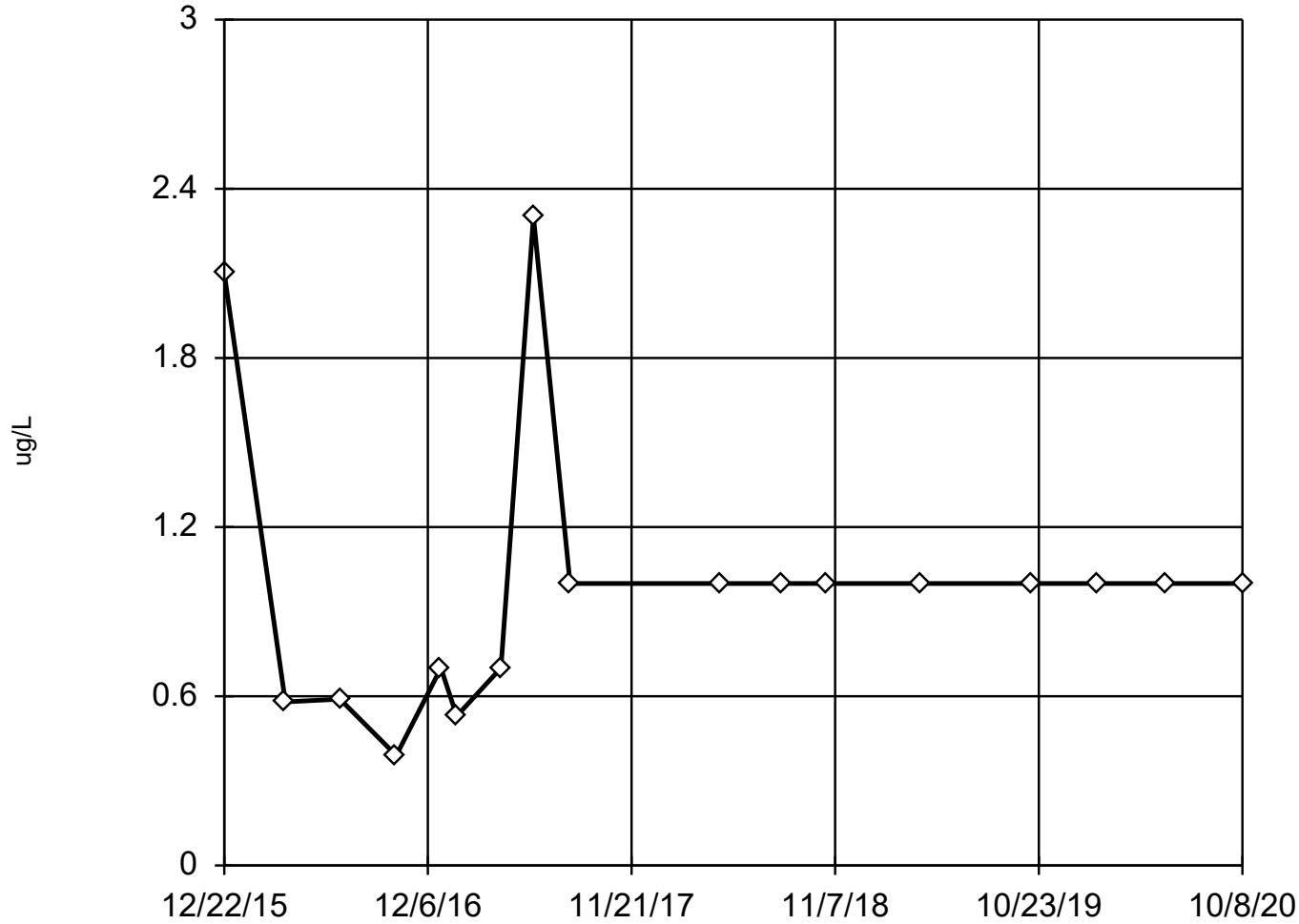
EPA 1989 Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	4.9
4/5/2016	4.7
7/8/2016	5.1
10/13/2016	4.3
12/29/2016	4.7
1/25/2017	4.6
4/11/2017	4.9
6/6/2017	5.5
8/8/2017	5.5
10/24/2017	5.1
4/25/2018	4.8
8/8/2018	4.9
10/24/2018	4.2
4/3/2019	3.6
10/9/2019	3.9
2/3/2020	3.7
5/29/2020	3.7
10/8/2020	4.3

Tukey's Outlier Screening

MW-301 (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 3.768, low cutoff = 0.1706, based on IQR multiplier of 3.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Chromium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

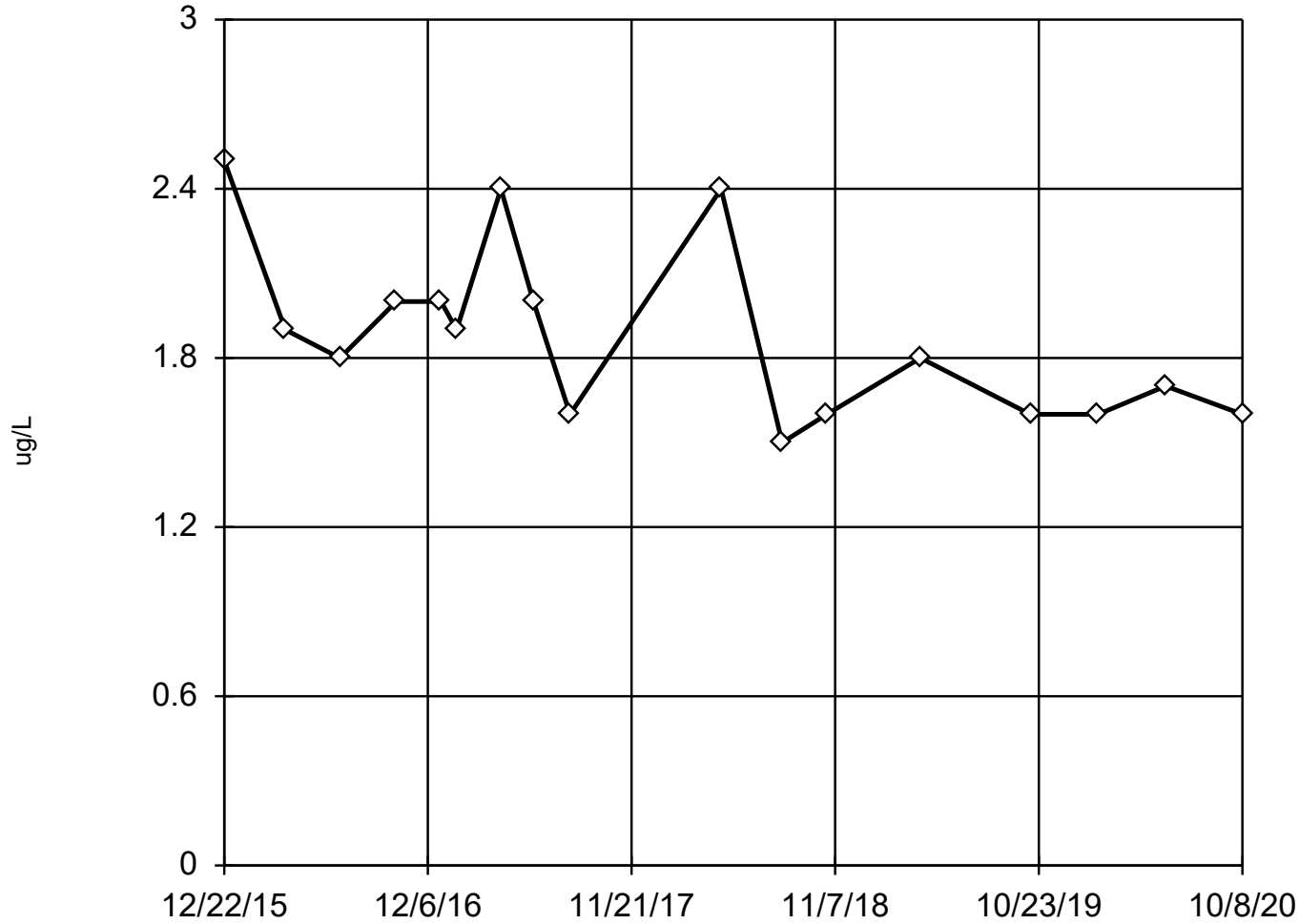
Tukey's Outlier Screening

Constituent: Chromium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	2.1
4/5/2016	0.58 (J)
7/8/2016	0.59 (J)
10/13/2016	<0.39 (U)
12/29/2016	0.7 (J)
1/25/2017	0.53 (J)
4/11/2017	0.7 (J)
6/6/2017	2.3 (J)
8/8/2017	<1 (U)
4/25/2018	<1 (U)
8/8/2018	<1 (U)
10/24/2018	<1 (U)
4/2/2019	<1 (U)
10/9/2019	<1 (U)
2/3/2020	<1 (U)
5/29/2020	<1 (U)
10/8/2020	<1 (U)

Tukey's Outlier Screening

MW-84A (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 3.906, low cutoff = 0.8192, based on IQR multiplier of 3.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Chromium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

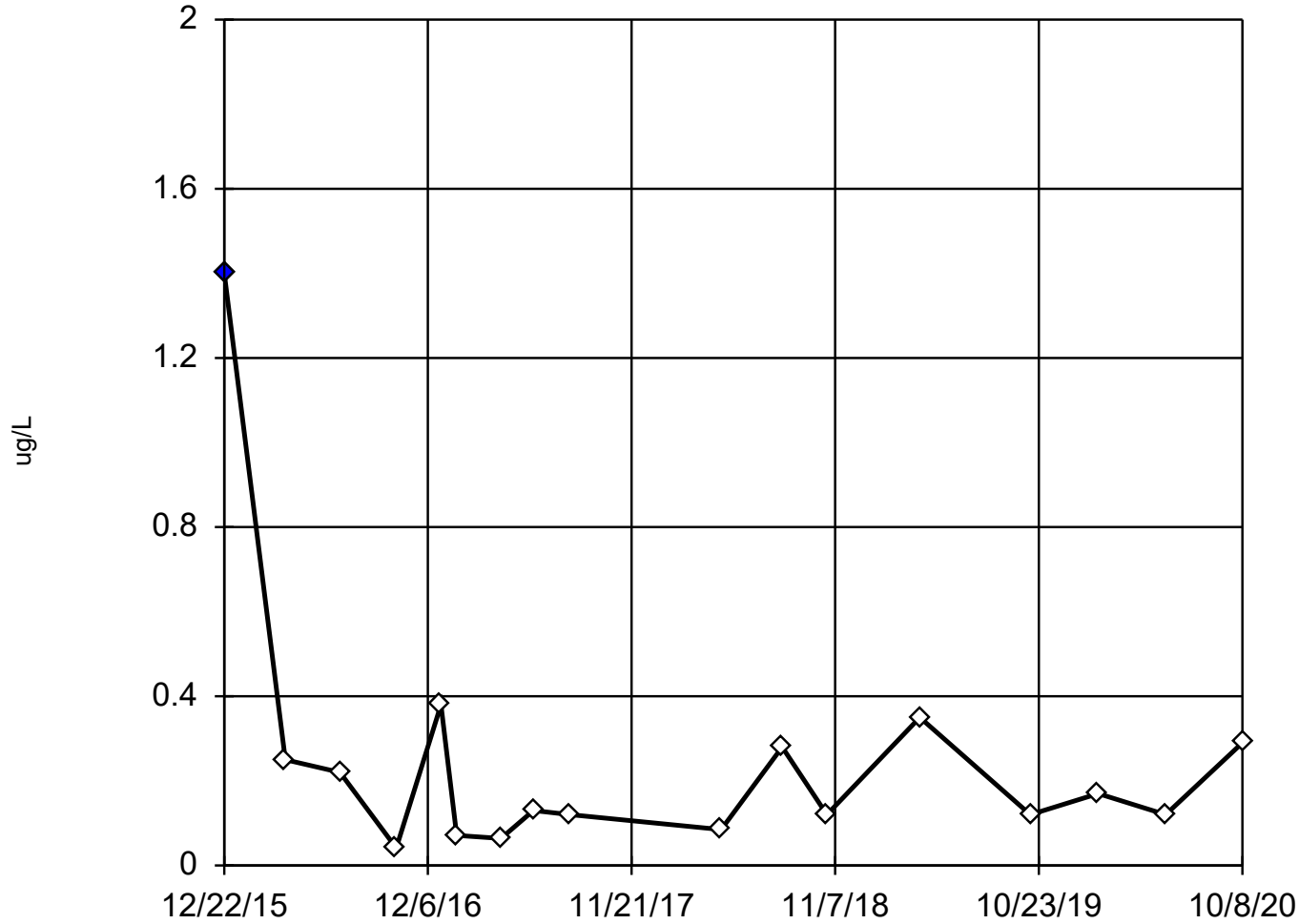
Tukey's Outlier Screening

Constituent: Chromium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	2.5
4/5/2016	1.9
7/8/2016	1.8
10/13/2016	2
12/29/2016	2
1/25/2017	1.9
4/11/2017	2.4
6/6/2017	2 (J)
8/8/2017	1.6 (J)
4/25/2018	2.4 (J)
8/8/2018	1.5 (J)
10/24/2018	1.6 (J)
4/3/2019	1.8 (J)
10/9/2019	1.6 (J)
2/3/2020	1.6 (J)
5/29/2020	1.7 (J)
10/8/2020	1.6 (J)

Dixon's Outlier Test

MW-301 (bg)



n = 17

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.2477.
Std. Dev. = 0.3141.
1.4: c = 0.7901
tab1 = 0.49.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9085
Critical = 0.906
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Cobalt Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

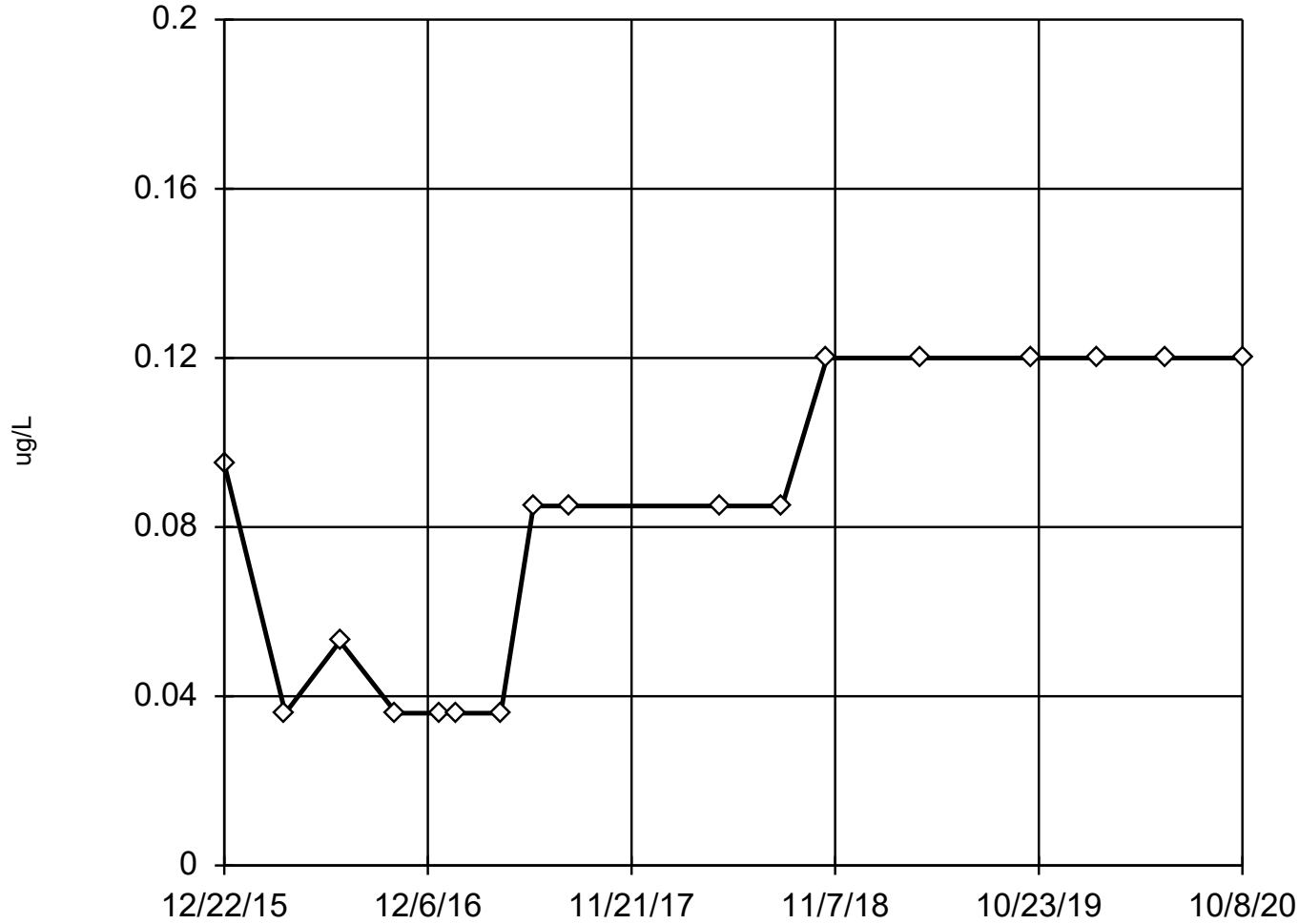
Dixon's Outlier Test

Constituent: Cobalt (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	1.4 (O)
4/5/2016	0.25 (J)
7/8/2016	0.22 (J)
10/13/2016	0.041 (J)
12/29/2016	0.38 (J)
1/25/2017	0.071 (J)
4/11/2017	0.064 (J)
6/6/2017	0.13 (J)
8/8/2017	0.12 (J)
4/25/2018	<0.085 (U)
8/8/2018	0.28 (J)
10/24/2018	<0.12 (U)
4/2/2019	0.35 (J)
10/9/2019	<0.12 (U)
2/3/2020	0.17 (J)
5/29/2020	<0.12 (U)
10/8/2020	0.29 (J)

Tukey's Outlier Screening

MW-84A (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

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

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Cobalt Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

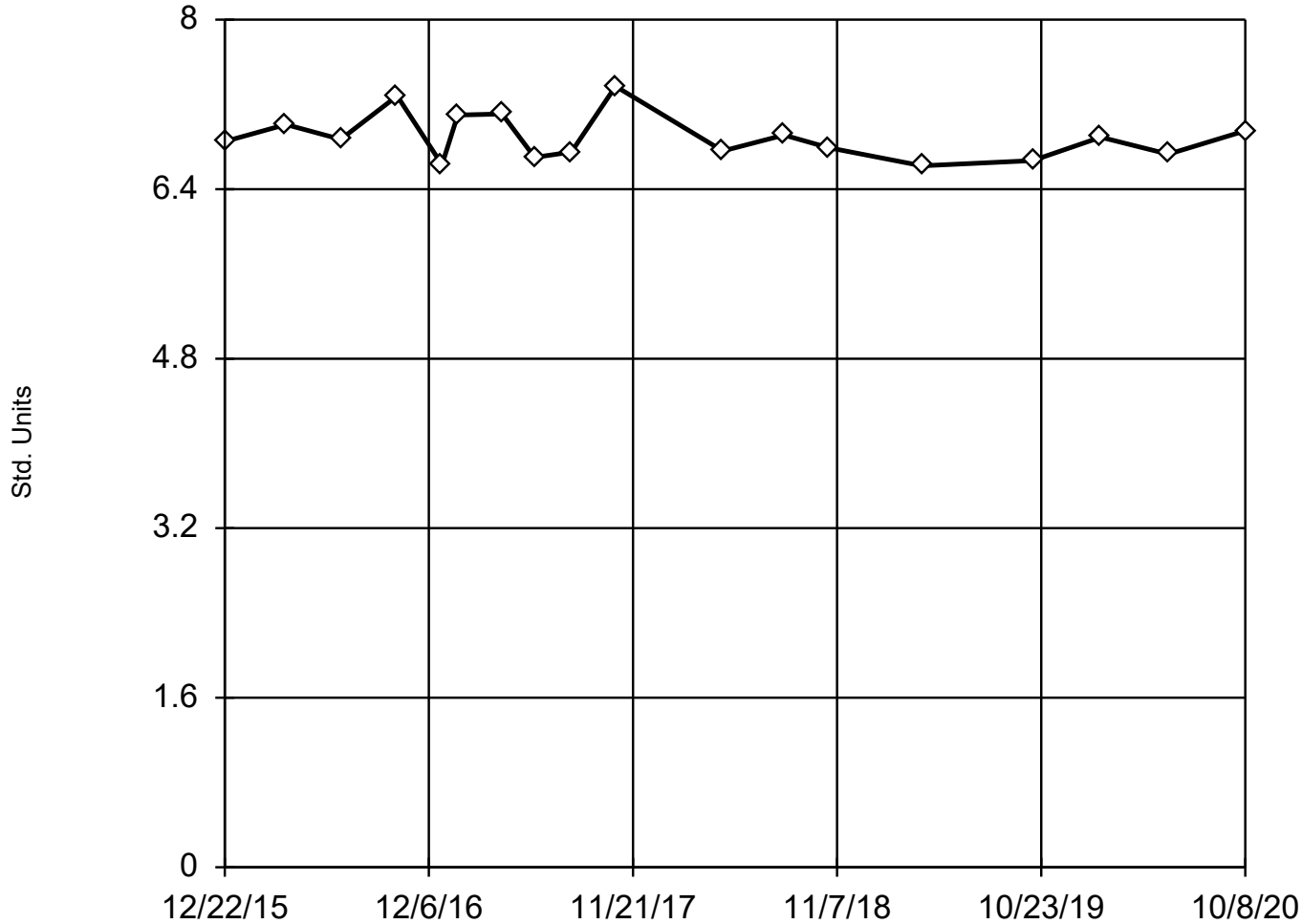
Tukey's Outlier Screening

Constituent: Cobalt (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	0.095 (J)
4/5/2016	<0.036 (U)
7/8/2016	0.053 (J)
10/13/2016	<0.036 (U)
12/29/2016	<0.036 (U)
1/25/2017	<0.036 (U)
4/11/2017	<0.036 (U)
6/6/2017	<0.085 (U)
8/8/2017	<0.085 (U)
4/25/2018	<0.085 (U)
8/8/2018	<0.085 (U)
10/24/2018	<0.12 (U)
4/3/2019	<0.12 (U)
10/9/2019	<0.12 (U)
2/3/2020	<0.12 (U)
5/29/2020	<0.12 (U)
10/8/2020	<0.12 (U)

EPA Screening (suspected outliers for Dixon's Test)

MW-301 (bg)



n = 18
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 6.888, std. dev. 0.2159, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9279
Critical = 0.914
The distribution was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Field pH Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

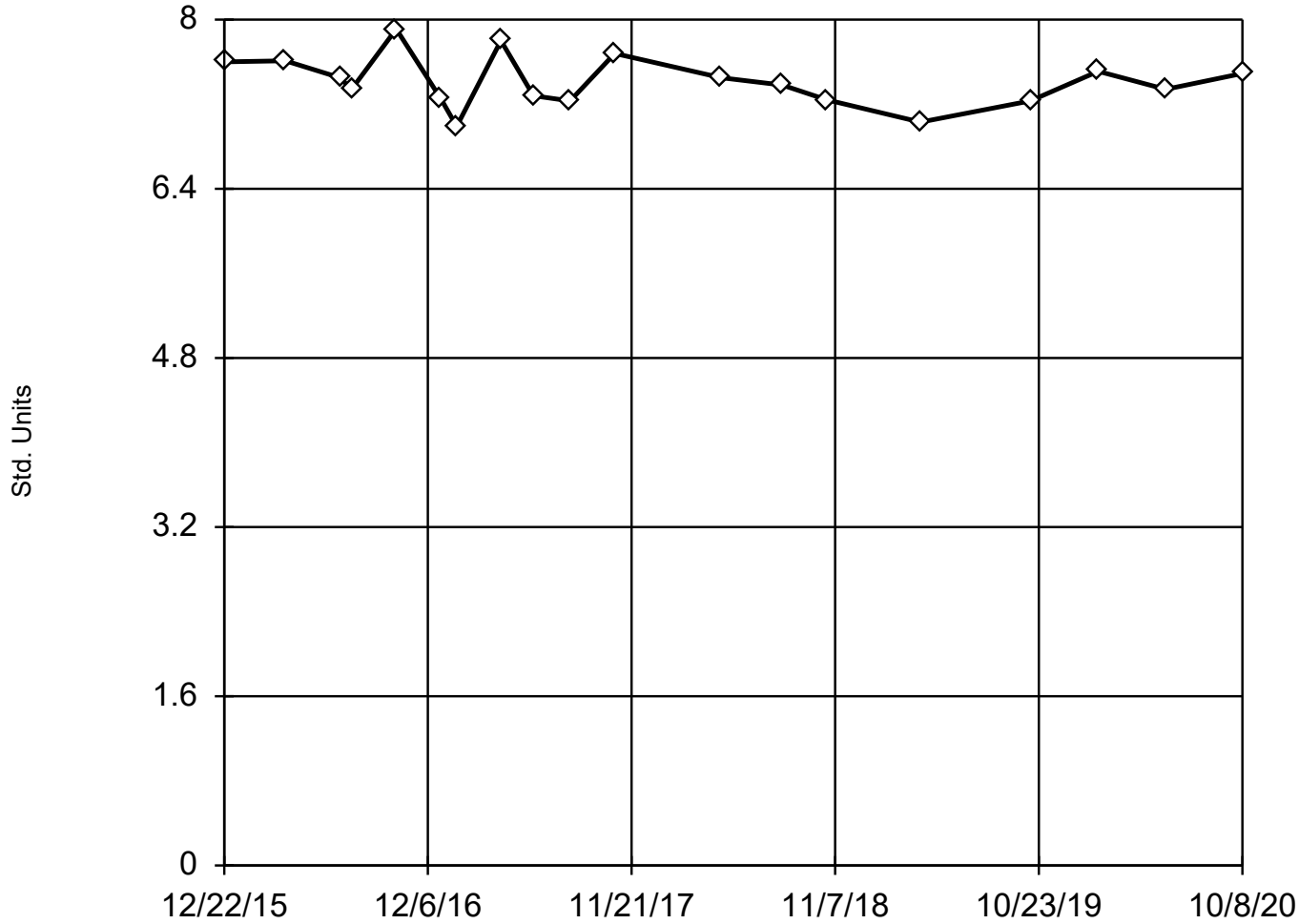
EPA 1989 Outlier Screening

Constituent: Field pH (Std. Units) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	6.85
4/5/2016	7.01
7/8/2016	6.87
10/13/2016	7.28
12/29/2016	6.63
1/25/2017	7.1
4/11/2017	7.11
6/6/2017	6.7
8/8/2017	6.75
10/23/2017	7.37
4/25/2018	6.76
8/8/2018	6.91
10/24/2018	6.79
4/2/2019	6.62
10/9/2019	6.67
2/3/2020	6.89
5/29/2020	6.73
10/8/2020	6.95

EPA Screening (suspected outliers for Dixon's Test)

MW-84A (bg)



n = 19
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7.411, std. dev. 0.2402, critical Tn 2.532

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9755
Critical = 0.917
The distribution was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Field pH Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

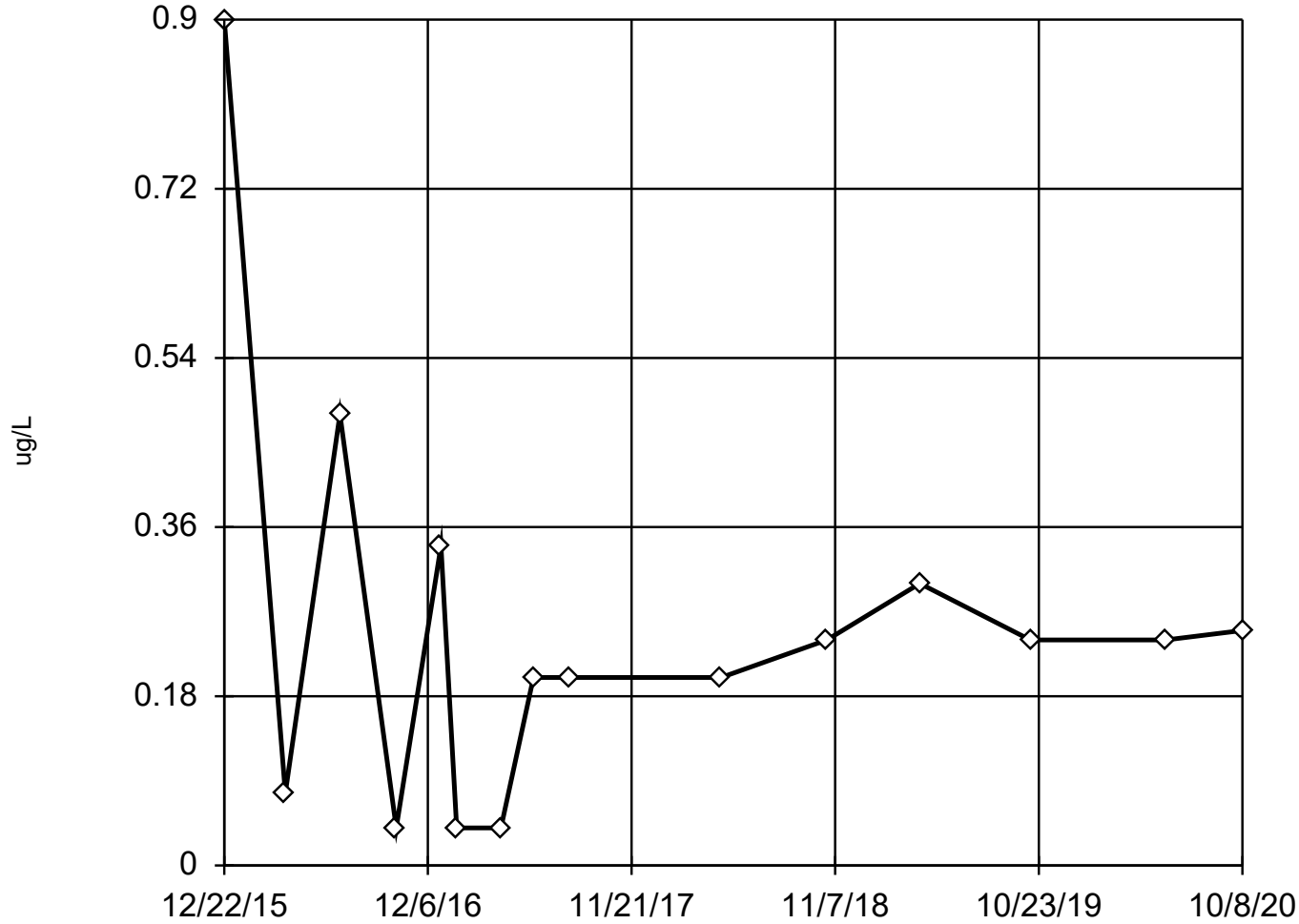
EPA 1989 Outlier Screening

Constituent: Field pH (Std. Units) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	7.6
4/5/2016	7.61
7/8/2016	7.45
7/28/2016	7.34
10/13/2016	7.91
12/29/2016	7.25
1/25/2017	6.99
4/11/2017	7.8
6/6/2017	7.28
8/8/2017	7.23
10/24/2017	7.68
4/25/2018	7.45
8/8/2018	7.38
10/24/2018	7.24
4/3/2019	7.03
10/9/2019	7.23
2/3/2020	7.51
5/29/2020	7.34
10/8/2020	7.49

Tukey's Outlier Screening

MW-301 (bg)



n = 15

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2.752, low cutoff = -0.02881, based on IQR multiplier of 3.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Lead Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

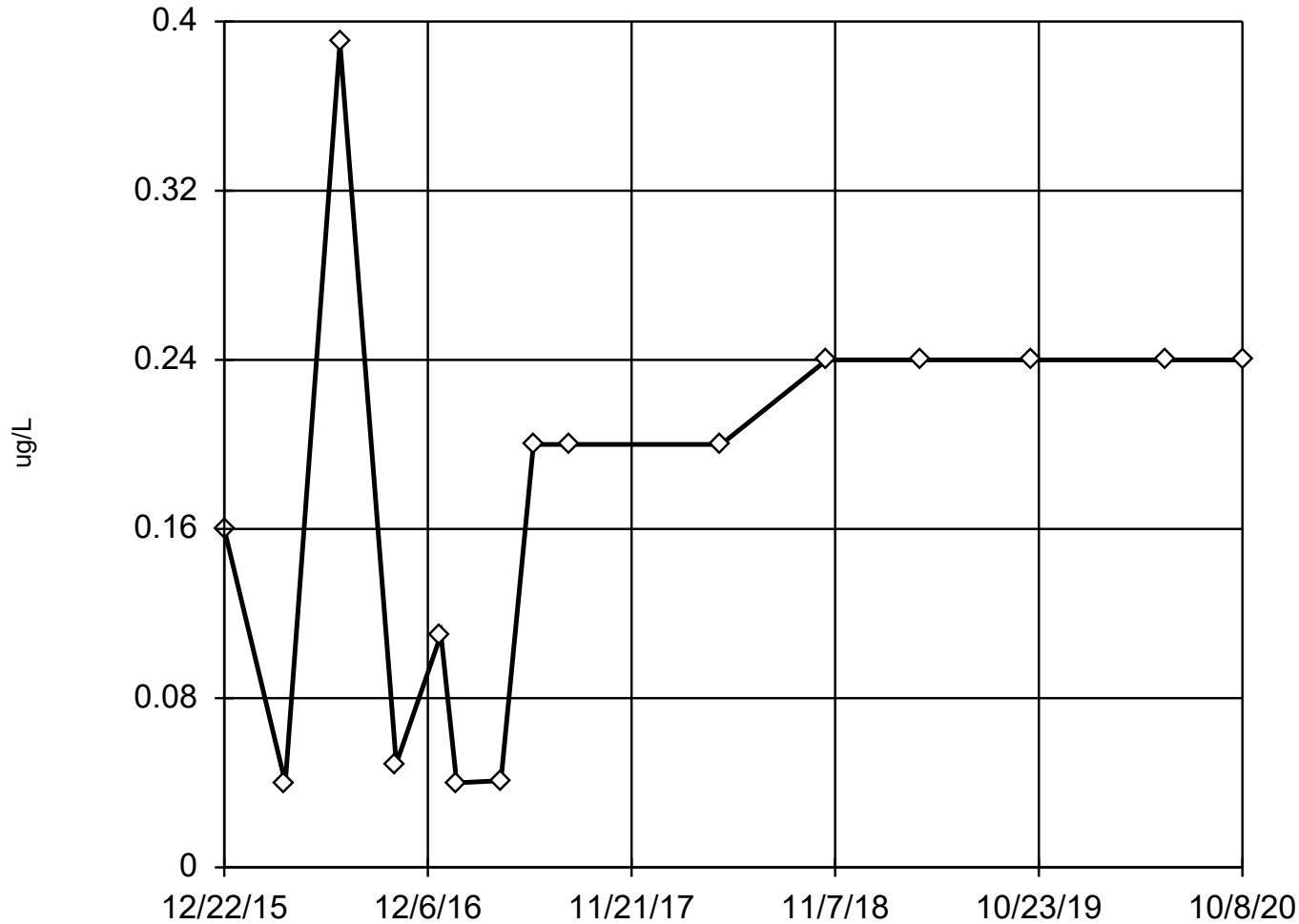
Tukey's Outlier Screening

Constituent: Lead (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	0.9 (J)
4/5/2016	0.077 (J)
7/8/2016	0.48 (J)
10/13/2016	<0.04 (U)
12/29/2016	0.34 (J)
1/25/2017	<0.04 (U)
4/11/2017	<0.04 (U)
6/6/2017	<0.2 (U)
8/8/2017	<0.2 (U)
4/25/2018	<0.2 (U)
10/24/2018	<0.24 (U)
4/2/2019	0.3 (J)
10/9/2019	<0.24 (U)
5/29/2020	<0.24 (U)
10/8/2020	0.25 (J)

Tukey's Outlier Screening

MW-84A (bg)



n = 15

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 0.813, low cutoff = -0.524, based on IQR multiplier of 3.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Lead Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

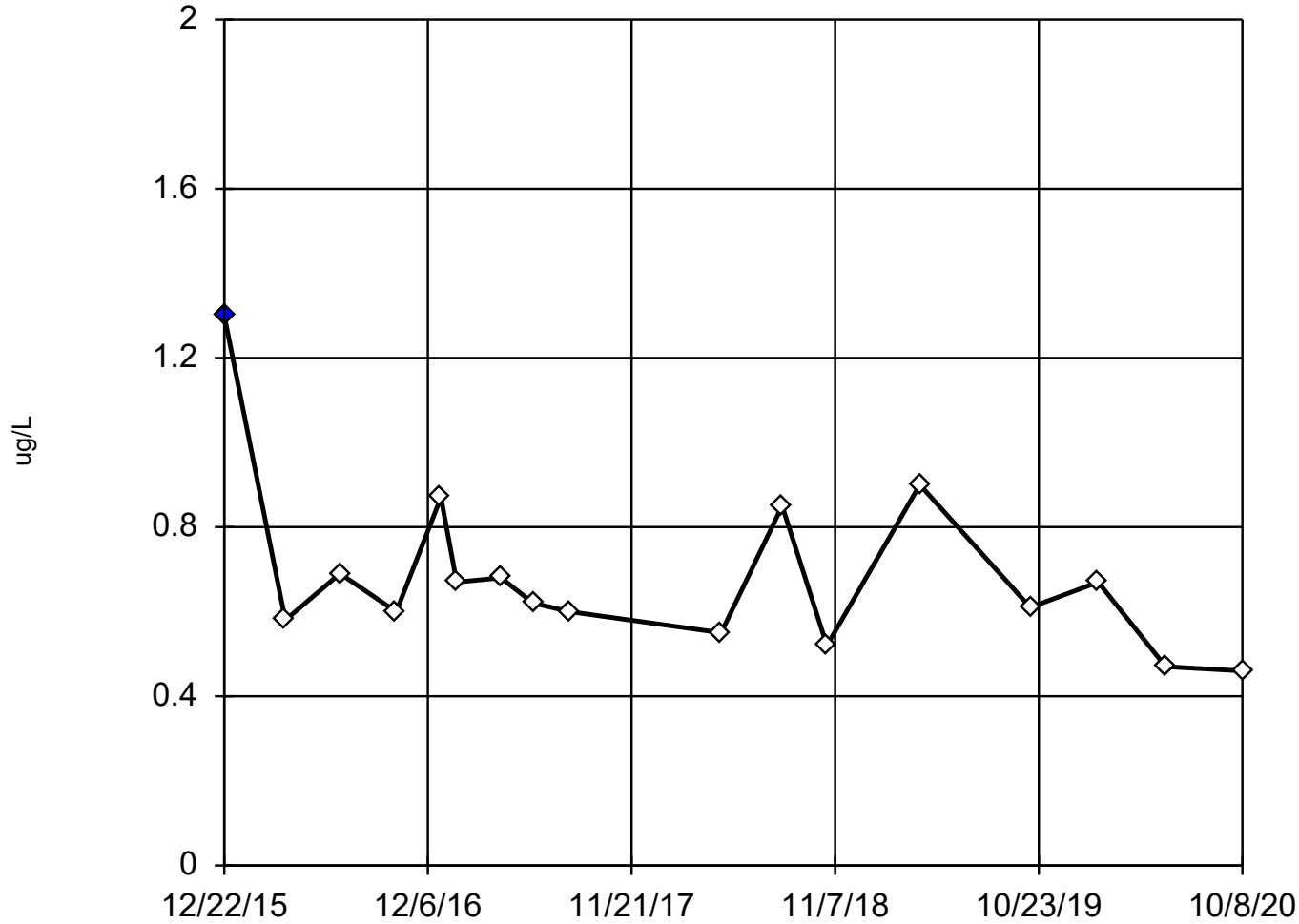
Tukey's Outlier Screening

Constituent: Lead (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	0.16 (J)
4/5/2016	<0.04 (U)
7/8/2016	0.39 (J)
10/13/2016	0.049 (J)
12/29/2016	0.11 (J)
1/25/2017	<0.04 (U)
4/11/2017	0.041 (J)
6/6/2017	<0.2 (U)
8/8/2017	<0.2 (U)
4/25/2018	<0.2 (U)
10/24/2018	<0.24 (U)
4/3/2019	<0.24 (U)
10/9/2019	<0.24 (U)
5/29/2020	<0.24 (U)
10/8/2020	<0.24 (U)

Dixon's Outlier Test

MW-301 (bg)



n = 17

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.6847.
Std. Dev. = 0.2037.
1.3: c = 0.5513
tab1 = 0.49.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9182
Critical = 0.906
The distribution, after removal of suspect value, was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Lithium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

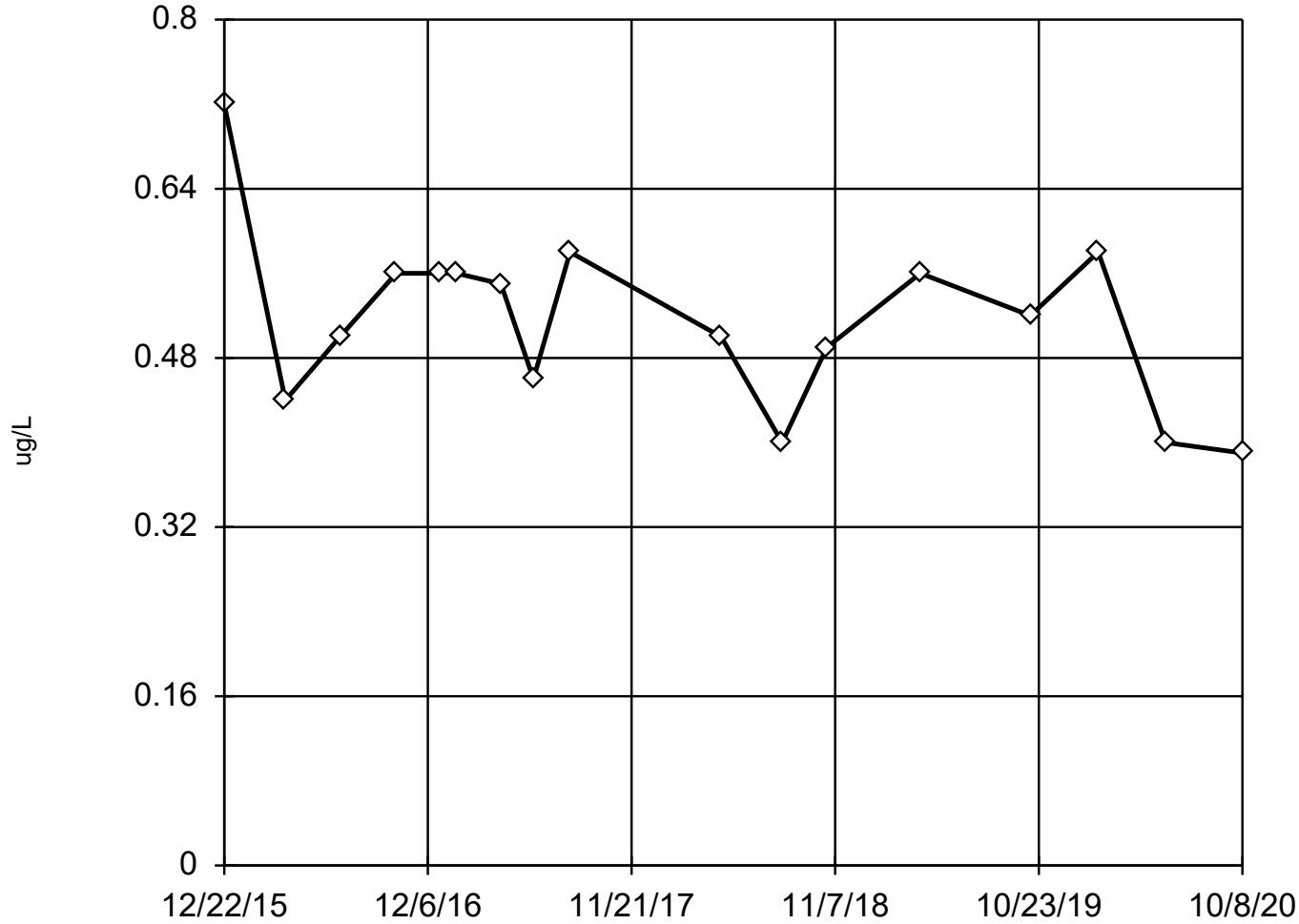
Dixon's Outlier Test

Constituent: Lithium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	1.3 (O)
4/5/2016	0.58 (J)
7/8/2016	0.69 (J)
10/13/2016	0.6 (J)
12/29/2016	0.87 (J)
1/25/2017	0.67 (J)
4/11/2017	0.68 (J)
6/6/2017	0.62 (J)
8/8/2017	0.6 (J)
4/25/2018	0.55 (J)
8/8/2018	0.85 (J)
10/24/2018	0.52 (J)
4/2/2019	0.9 (J)
10/9/2019	0.61 (J)
2/3/2020	0.67 (J)
5/29/2020	0.47 (J)
10/8/2020	0.46 (J)

EPA Screening (suspected outliers for Dixon's Test)

MW-84A (bg)



n = 17
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.5159, std. dev. 0.08352, critical Tn 2.475
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9266
Critical = 0.91
The distribution was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

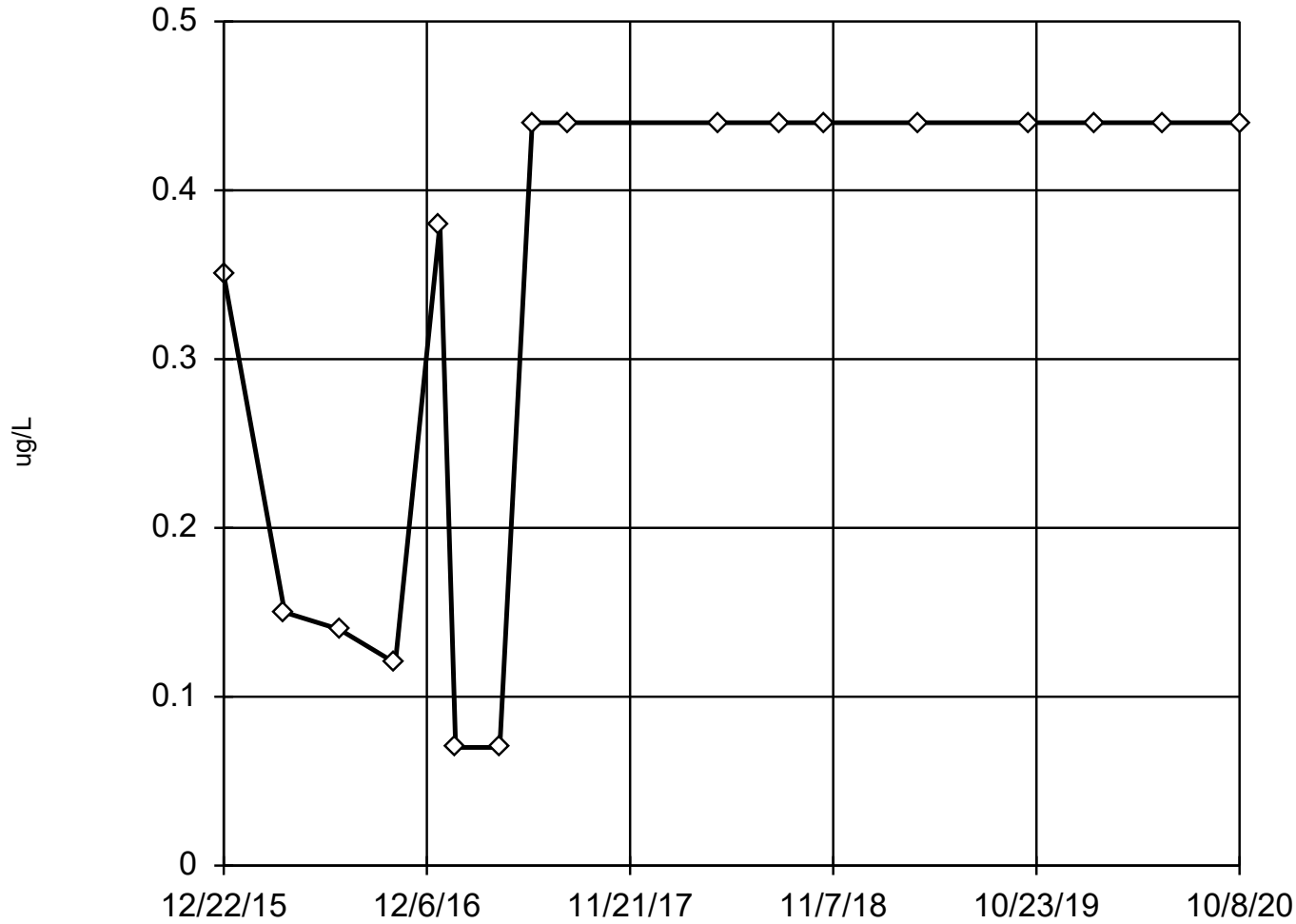
Constituent: Lithium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Lithium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	0.72 (J)
4/5/2016	0.44 (J)
7/8/2016	0.5 (J)
10/13/2016	0.56 (J)
12/29/2016	0.56 (J)
1/25/2017	0.56 (J)
4/11/2017	0.55 (J)
6/6/2017	0.46 (J)
8/8/2017	0.58 (J)
4/25/2018	0.5 (J)
8/8/2018	0.4 (J)
10/24/2018	0.49 (J)
4/3/2019	0.56 (J)
10/9/2019	0.52 (J)
2/3/2020	0.58 (J)
5/29/2020	0.4 (J)
10/8/2020	0.39 (J)

Tukey's Outlier Screening MW-301 (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^4 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.6209,
low cutoff = -0.5768,
based on IQR multiplier of 3.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Molybdenum Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

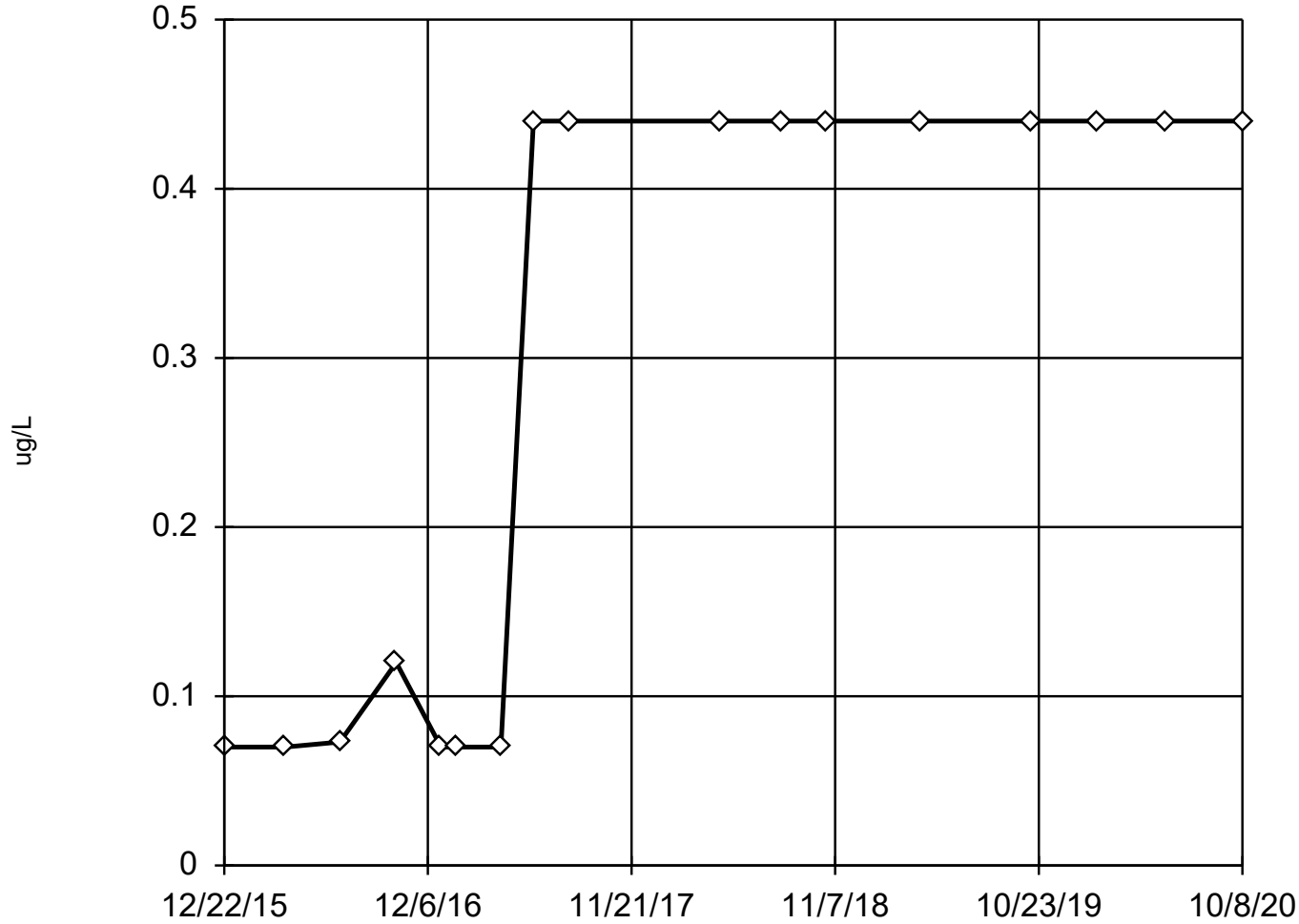
Tukey's Outlier Screening

Constituent: Molybdenum (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	0.35 (J)
4/5/2016	0.15 (J)
7/8/2016	0.14 (J)
10/13/2016	0.12 (J)
12/29/2016	0.38 (J)
1/25/2017	<0.07 (U)
4/11/2017	<0.07 (U)
6/6/2017	<0.44 (U)
8/8/2017	<0.44 (U)
4/25/2018	<0.44 (U)
8/8/2018	<0.44 (U)
10/24/2018	<0.44 (U)
4/2/2019	<0.44 (U)
10/9/2019	<0.44 (U)
2/3/2020	<0.44 (U)
5/29/2020	<0.44 (U)
10/8/2020	<0.44 (U)

Tukey's Outlier Screening

MW-84A (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

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

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Molybdenum Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

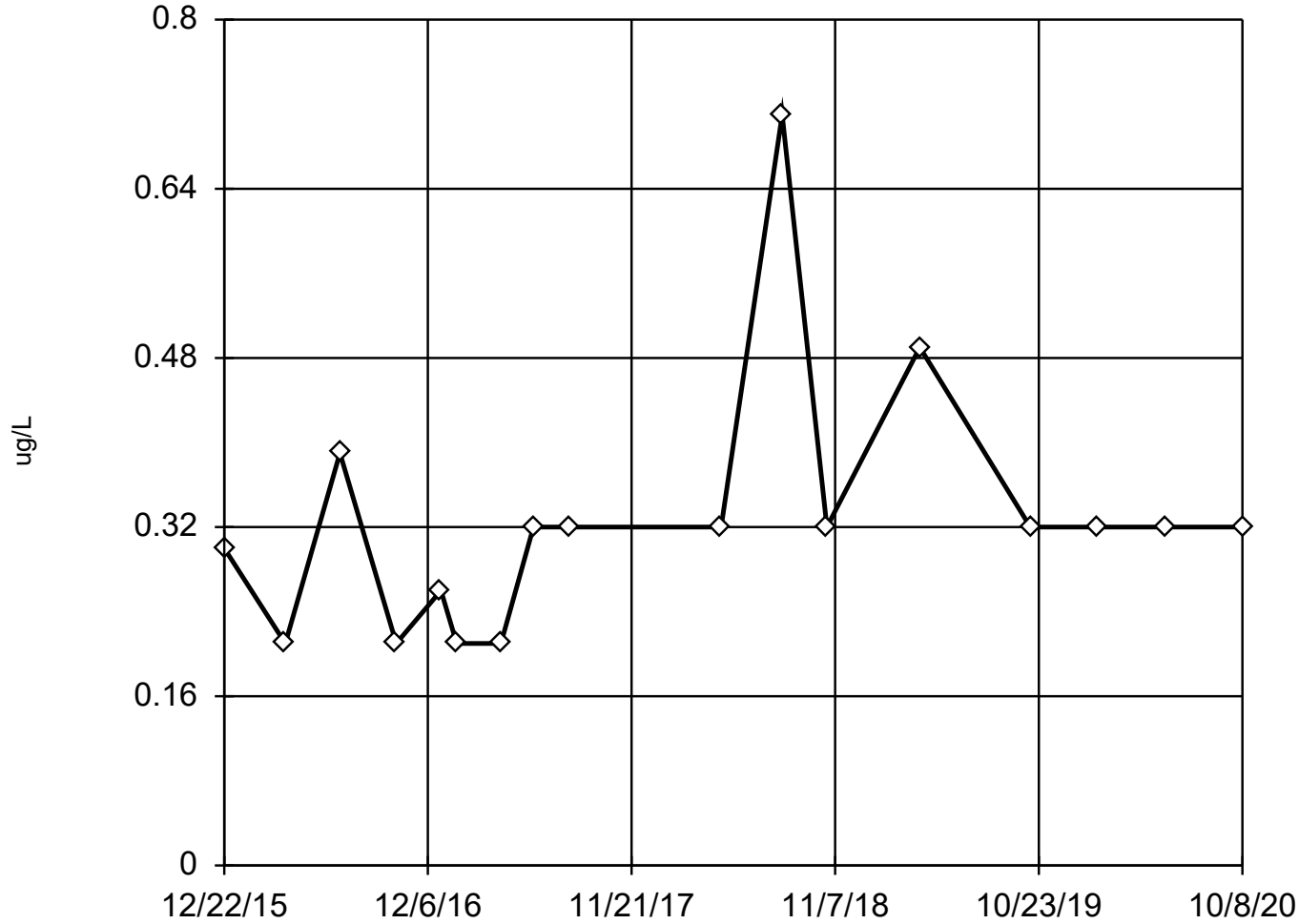
Tukey's Outlier Screening

Constituent: Molybdenum (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	<0.07 (U)
4/5/2016	<0.07 (U)
7/8/2016	0.073 (J)
10/13/2016	0.12 (J)
12/29/2016	<0.07 (U)
1/25/2017	<0.07 (U)
4/11/2017	<0.07 (U)
6/6/2017	<0.44 (U)
8/8/2017	<0.44 (U)
4/25/2018	<0.44 (U)
8/8/2018	<0.44 (U)
10/24/2018	<0.44 (U)
4/3/2019	<0.44 (U)
10/9/2019	<0.44 (U)
2/3/2020	<0.44 (U)
5/29/2020	<0.44 (U)
10/8/2020	<0.44 (U)

Tukey's Outlier Screening

MW-301 (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.8219,
low cutoff = 0.09098,
based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

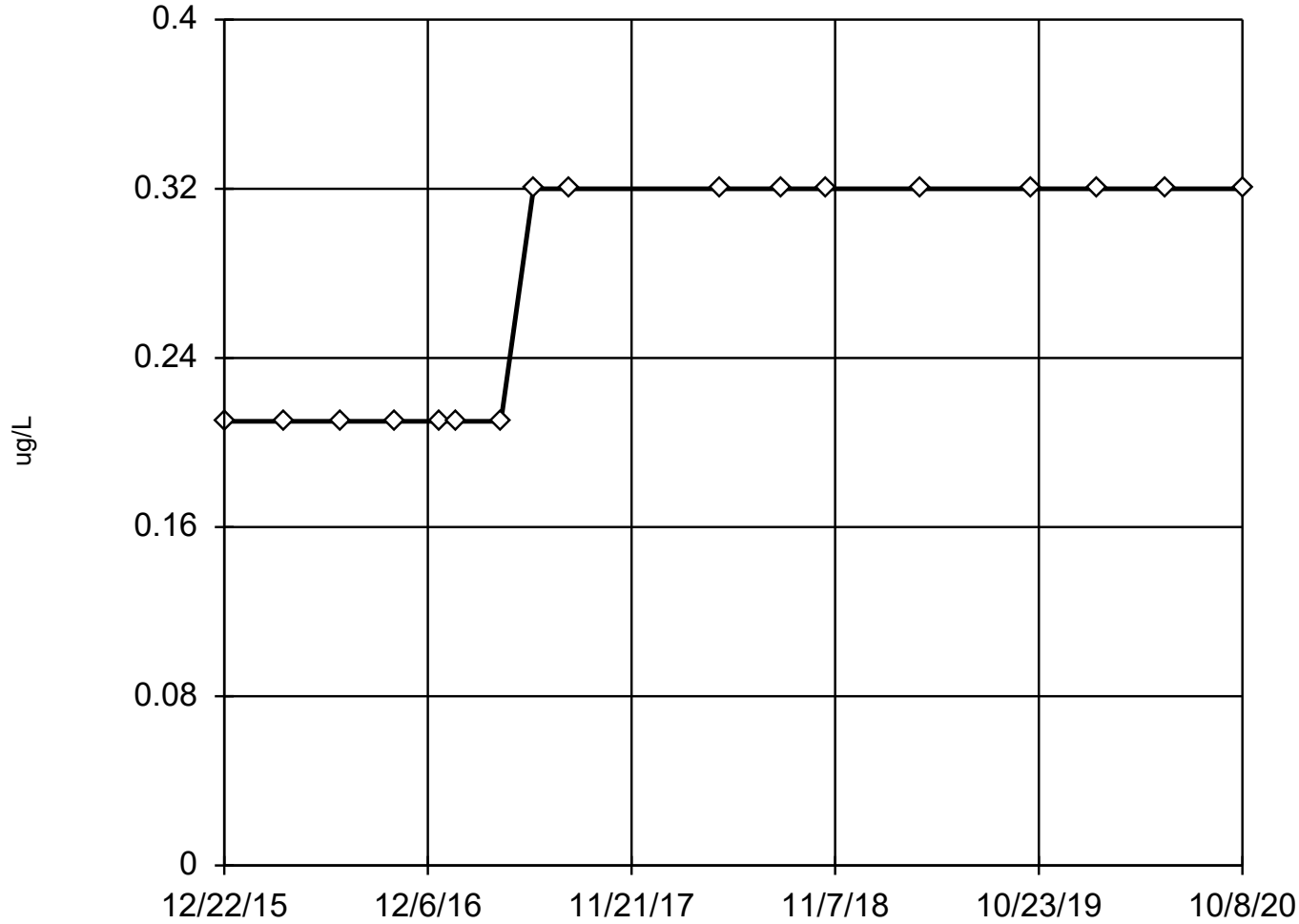
Tukey's Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	0.3 (J)
4/5/2016	0.21 (J)
7/8/2016	0.39 (J)
10/13/2016	<0.21 (U)
12/29/2016	0.26 (J)
1/25/2017	<0.21 (U)
4/11/2017	<0.21 (U)
6/6/2017	<0.32 (U)
8/8/2017	<0.32 (U)
4/25/2018	<0.32 (U)
8/8/2018	0.71 (J)
10/24/2018	<0.32 (U)
4/2/2019	0.49 (J)
10/9/2019	<0.32 (U)
2/3/2020	<0.32 (U)
5/29/2020	<0.32 (U)
10/8/2020	<0.32 (U)

Tukey's Outlier Screening

MW-84A (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

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

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Selenium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

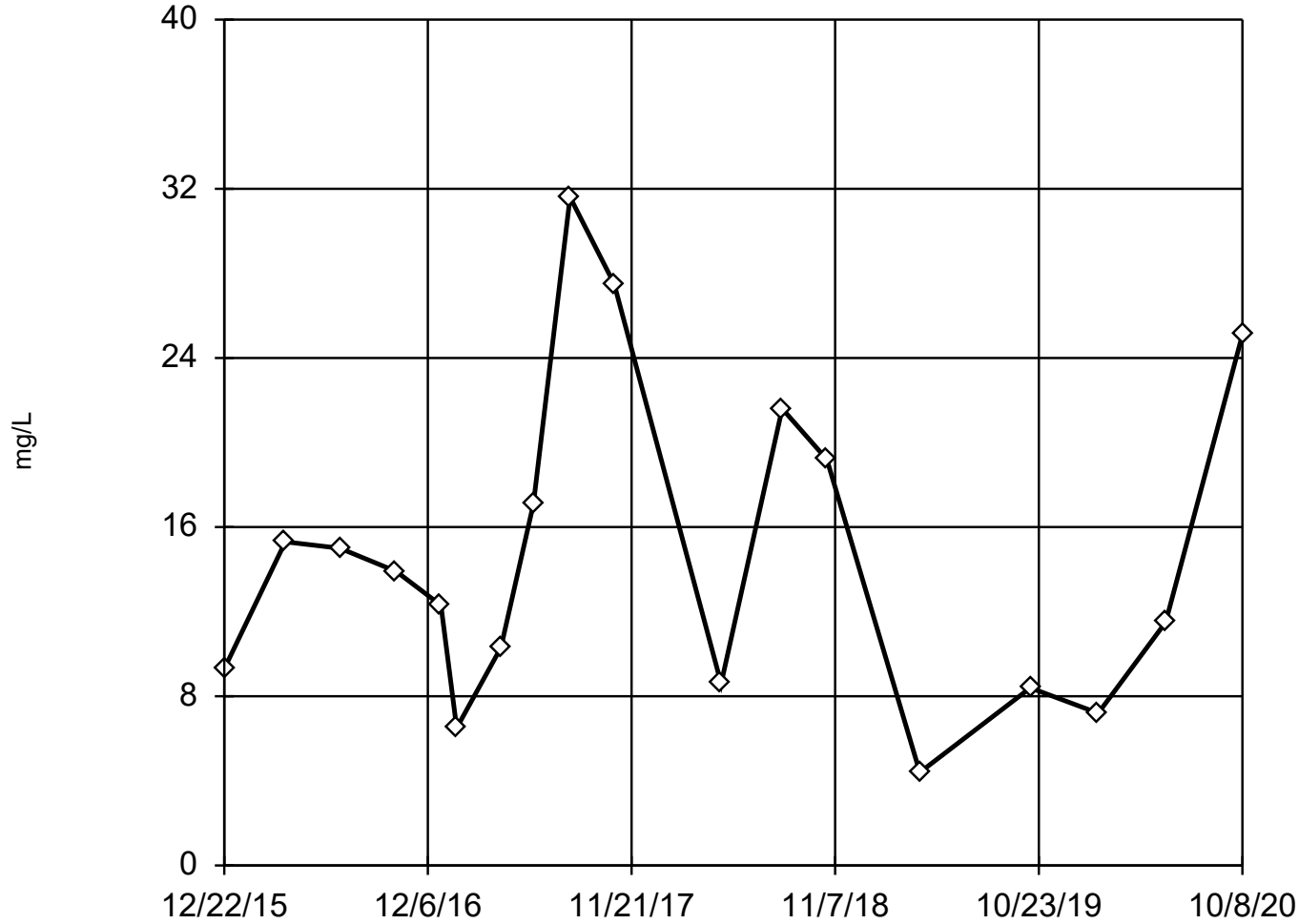
Tukey's Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	<0.21 (U)
4/5/2016	<0.21 (U)
7/8/2016	<0.21 (U)
10/13/2016	<0.21 (U)
12/29/2016	<0.21 (U)
1/25/2017	<0.21 (U)
4/11/2017	<0.21 (U)
6/6/2017	<0.32 (U)
8/8/2017	<0.32 (U)
4/25/2018	<0.32 (U)
8/8/2018	<0.32 (U)
10/24/2018	<0.32 (U)
4/3/2019	<0.32 (U)
10/9/2019	<0.32 (U)
2/3/2020	<0.32 (U)
5/29/2020	<0.32 (U)
10/8/2020	<0.32 (U)

EPA Screening (suspected outliers for Dixon's Test)

MW-301 (bg)



n = 18

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 14.71, std. dev.
7.682, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9333
Critical = 0.914
The distribution was found
to be normally distrib-
uted.

Constituent: Sulfate Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	9.3
4/5/2016	15.3
7/8/2016	15
10/13/2016	13.9
12/29/2016	12.3 (J)
1/25/2017	6.5
4/11/2017	10.3
6/6/2017	17.1
8/8/2017	31.6
10/23/2017	27.5
4/25/2018	8.6
8/8/2018	21.6
10/24/2018	19.2
4/2/2019	4.4
10/9/2019	8.4
2/3/2020	7.2
5/29/2020	11.5
10/8/2020	25.1

EPA Screening (suspected outliers for Dixon's Test)

MW-84A (bg)



n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 2.433, std. dev. 1.069, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9194
Critical = 0.914
The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

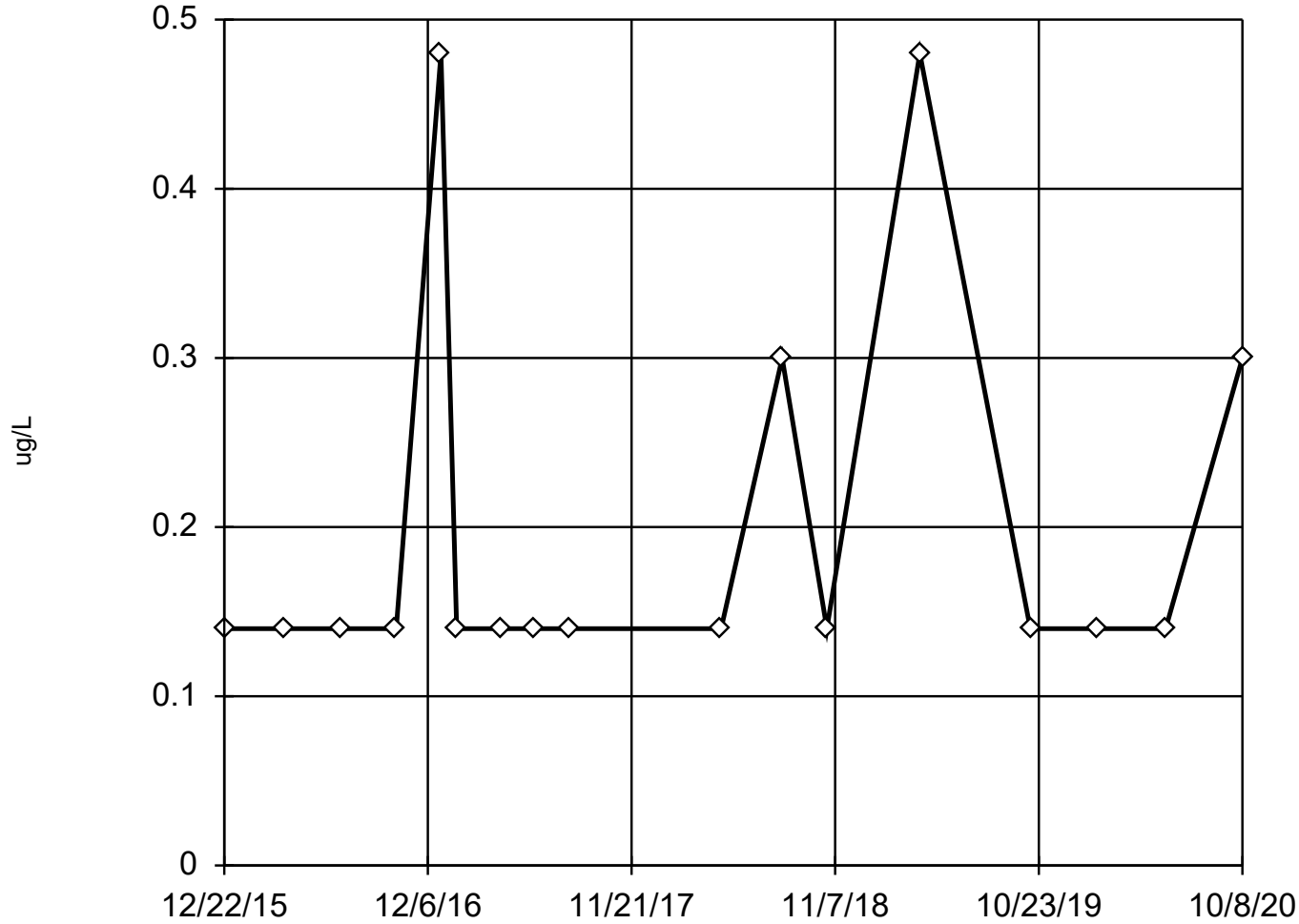
EPA 1989 Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	4.9
4/5/2016	4.3
7/8/2016	3.7 (J)
10/13/2016	2.6 (J)
12/29/2016	2.7 (J)
1/25/2017	3
4/11/2017	2.8 (J)
6/6/2017	2.7 (J)
8/8/2017	2 (J)
10/24/2017	2.2 (J)
4/25/2018	2.8 (J)
8/8/2018	1.9 (J)
10/24/2018	1.6 (J)
4/3/2019	1.4 (J)
10/9/2019	1.3 (J)
2/3/2020	<2.2 (U)
5/29/2020	1.5 (J)
10/8/2020	1.3 (J)

Tukey's Outlier Screening

MW-301 (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.6429,
low cutoff = 0.04463,
based on IQR multiplier of 3.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Thallium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

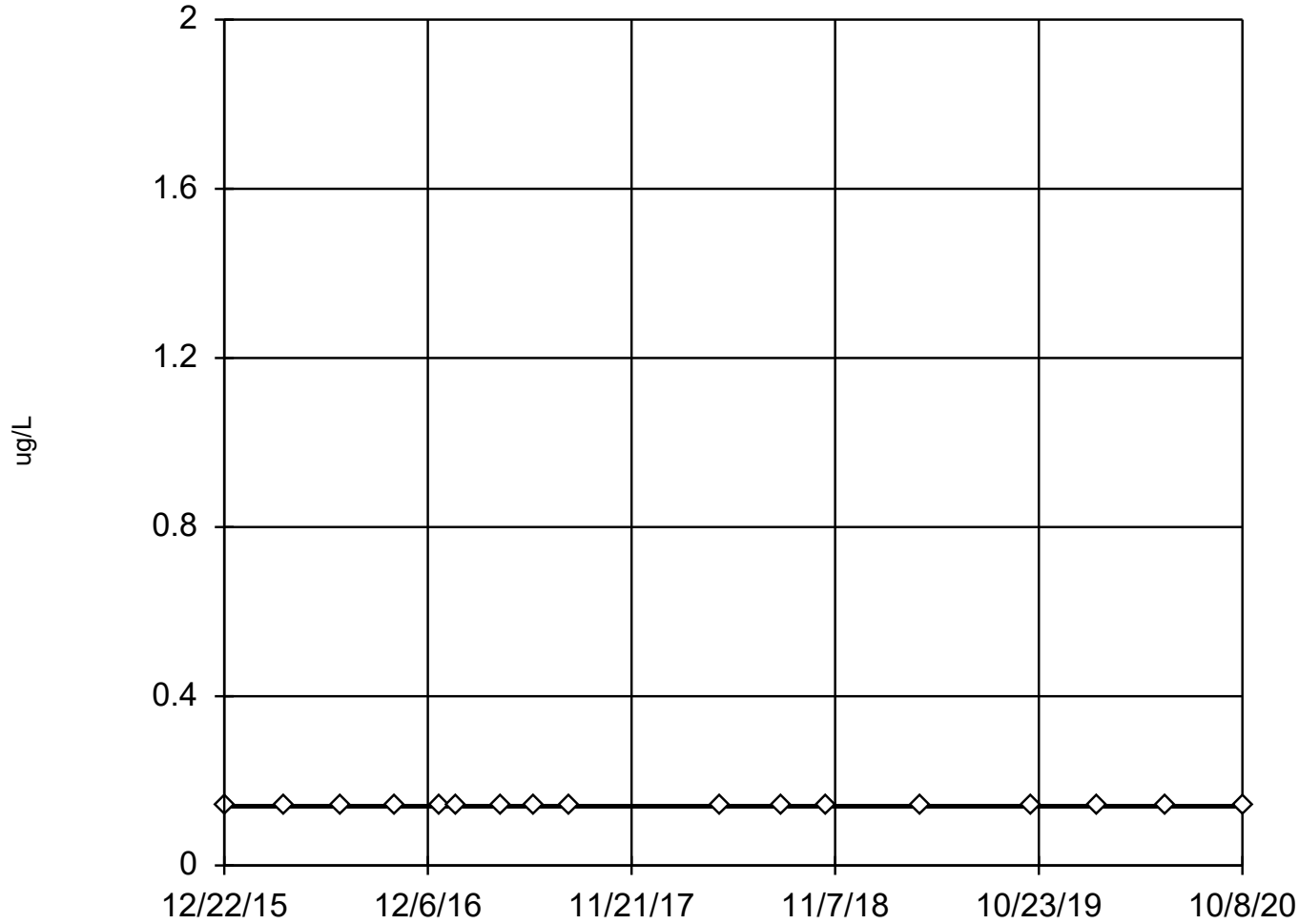
Tukey's Outlier Screening

Constituent: Thallium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	<0.14 (U)
4/5/2016	<0.14 (U)
7/8/2016	<0.14 (U)
10/13/2016	<0.14 (U)
12/29/2016	0.48 (J)
1/25/2017	<0.14 (U)
4/11/2017	<0.14 (U)
6/6/2017	<0.14 (U)
8/8/2017	<0.14 (U)
4/25/2018	<0.14 (U)
8/8/2018	0.3 (J)
10/24/2018	<0.14 (U)
4/2/2019	0.48 (J)
10/9/2019	<0.14 (U)
2/3/2020	<0.14 (U)
5/29/2020	<0.14 (U)
10/8/2020	0.3 (J)

Tukey's Outlier Screening

MW-84A (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

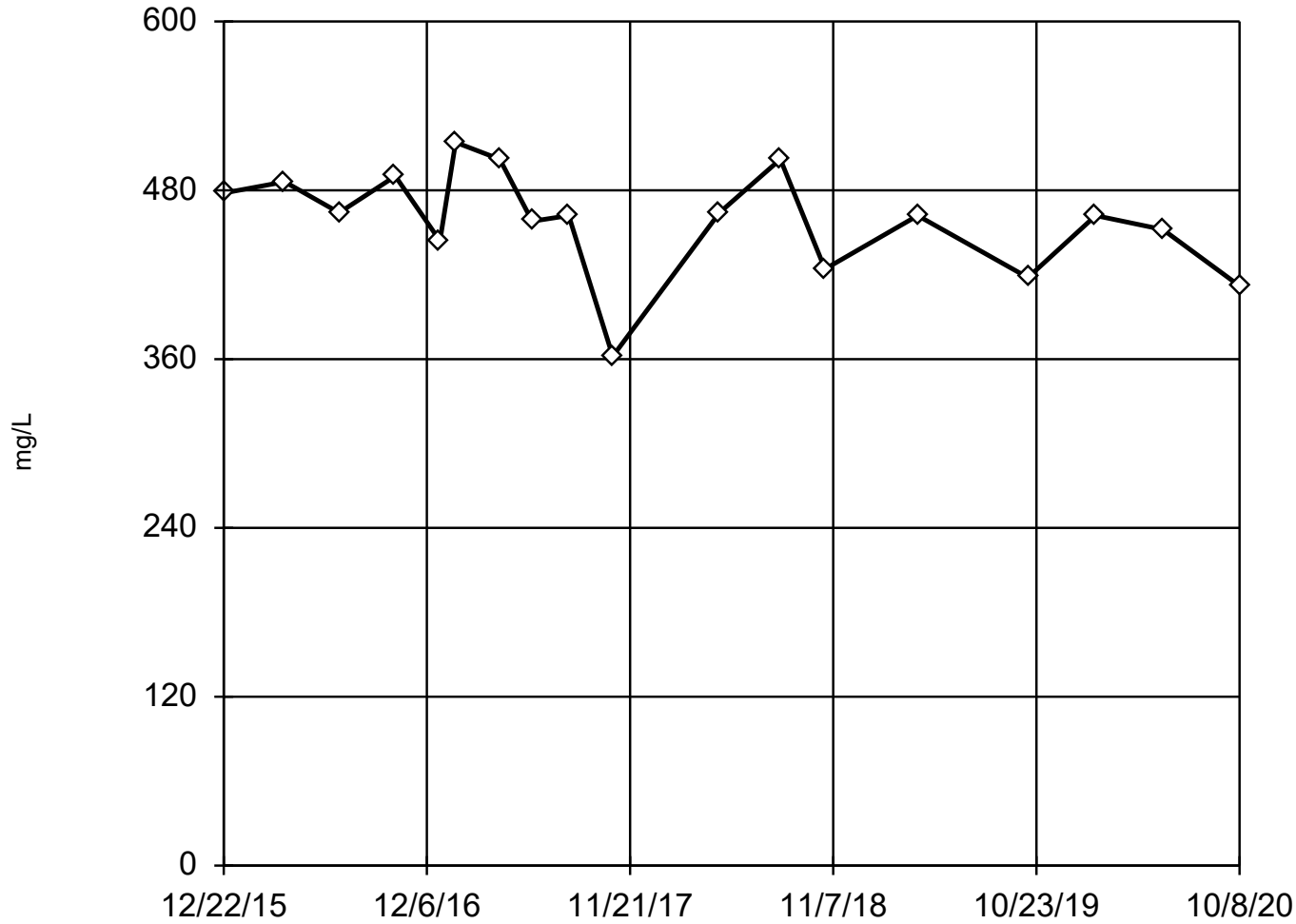
Tukey's Outlier Screening

Constituent: Thallium (ug/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	<0.14 (U)
4/5/2016	<0.14 (U)
7/8/2016	<0.14 (U)
10/13/2016	<0.14 (U)
12/29/2016	<0.14 (U)
1/25/2017	<0.14 (U)
4/11/2017	<0.14 (U)
6/6/2017	<0.14 (U)
8/8/2017	<0.14 (U)
4/25/2018	<0.14 (U)
8/8/2018	<0.14 (U)
10/24/2018	<0.14 (U)
4/3/2019	<0.14 (U)
10/9/2019	<0.14 (U)
2/3/2020	<0.14 (U)
5/29/2020	<0.14 (U)
10/8/2020	<0.14 (U)

Dixon's Outlier Test

MW-301 (bg)



n = 18

No statistical outliers.
Testing for 1 low outlier.
Mean = 458.7.
Std. Dev. = 37.3.
362: c = 0.4
tab1 = 0.475.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9572
Critical = 0.91
The distribution was found
to be normally distrib-
uted.

Constituent: Total Dissolved Solids Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

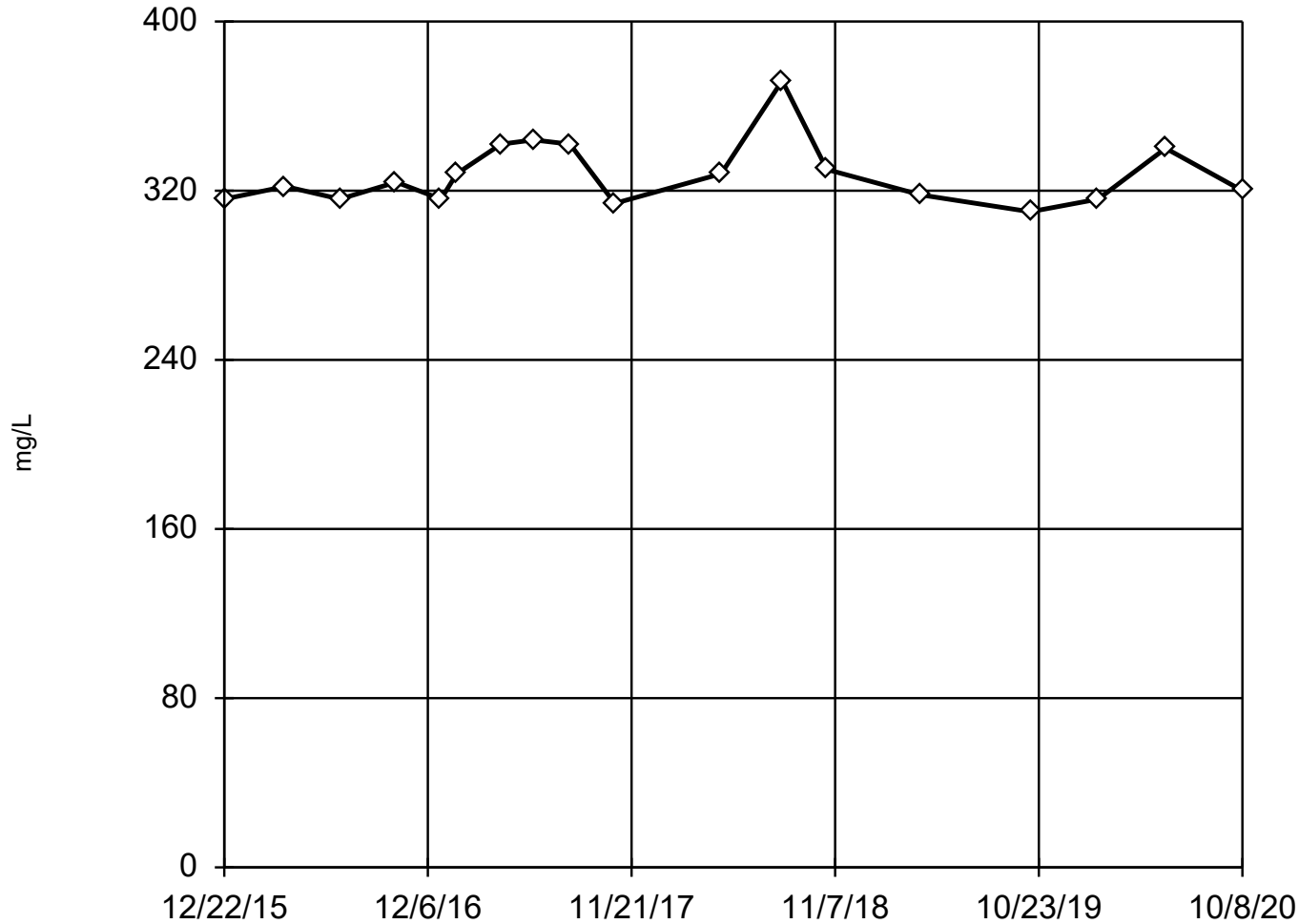
Dixon's Outlier Test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	478
4/5/2016	486
7/8/2016	464
10/13/2016	490
12/29/2016	444
1/25/2017	514
4/11/2017	502
6/6/2017	458
8/8/2017	462
10/23/2017	362
4/25/2018	464
8/8/2018	502
10/24/2018	424
4/2/2019	462
10/9/2019	418
2/3/2020	462
5/29/2020	452
10/8/2020	412

Tukey's Outlier Screening

MW-84A (bg)



n = 18

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 428.5, low cutoff = 251.5, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond

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

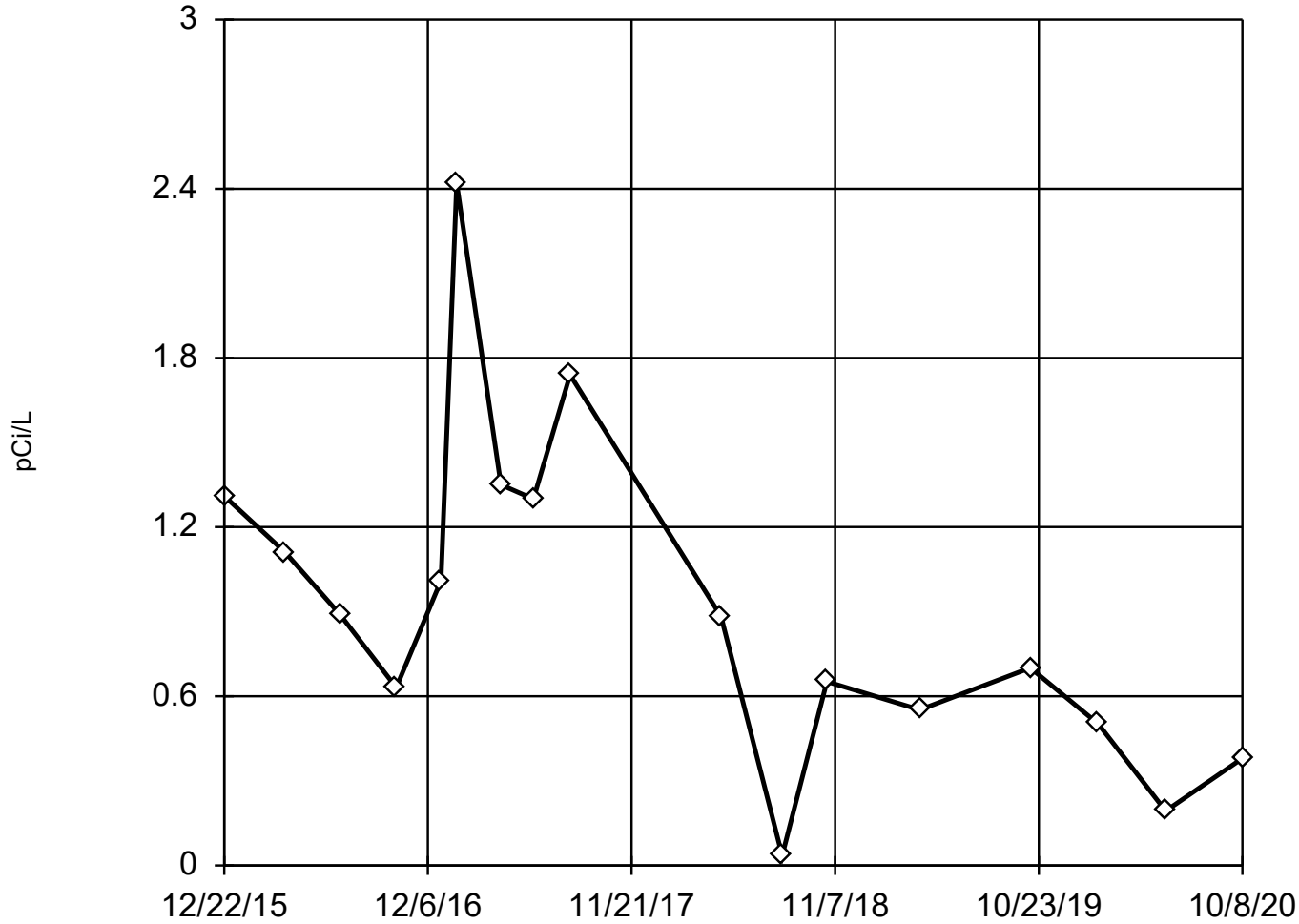
Tukey's Outlier Screening

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	316
4/5/2016	322
7/8/2016	316
10/13/2016	324
12/29/2016	316
1/25/2017	328
4/11/2017	342
6/6/2017	344
8/8/2017	342
10/24/2017	314
4/25/2018	328
8/8/2018	372
10/24/2018	330
4/3/2019	318
10/9/2019	310
2/3/2020	316
5/29/2020	340
10/8/2020	320

Dixon's Outlier Test

MW-301 (bg)



n = 17

No statistical outliers.
Testing for 1 low outlier.
Mean = 0.9211.
Std. Dev. = 0.5899.
0.0351: c = 0.2623
tab1 = 0.49.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9278
Critical = 0.906
The distribution was found to be normally distributed.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Total Radium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

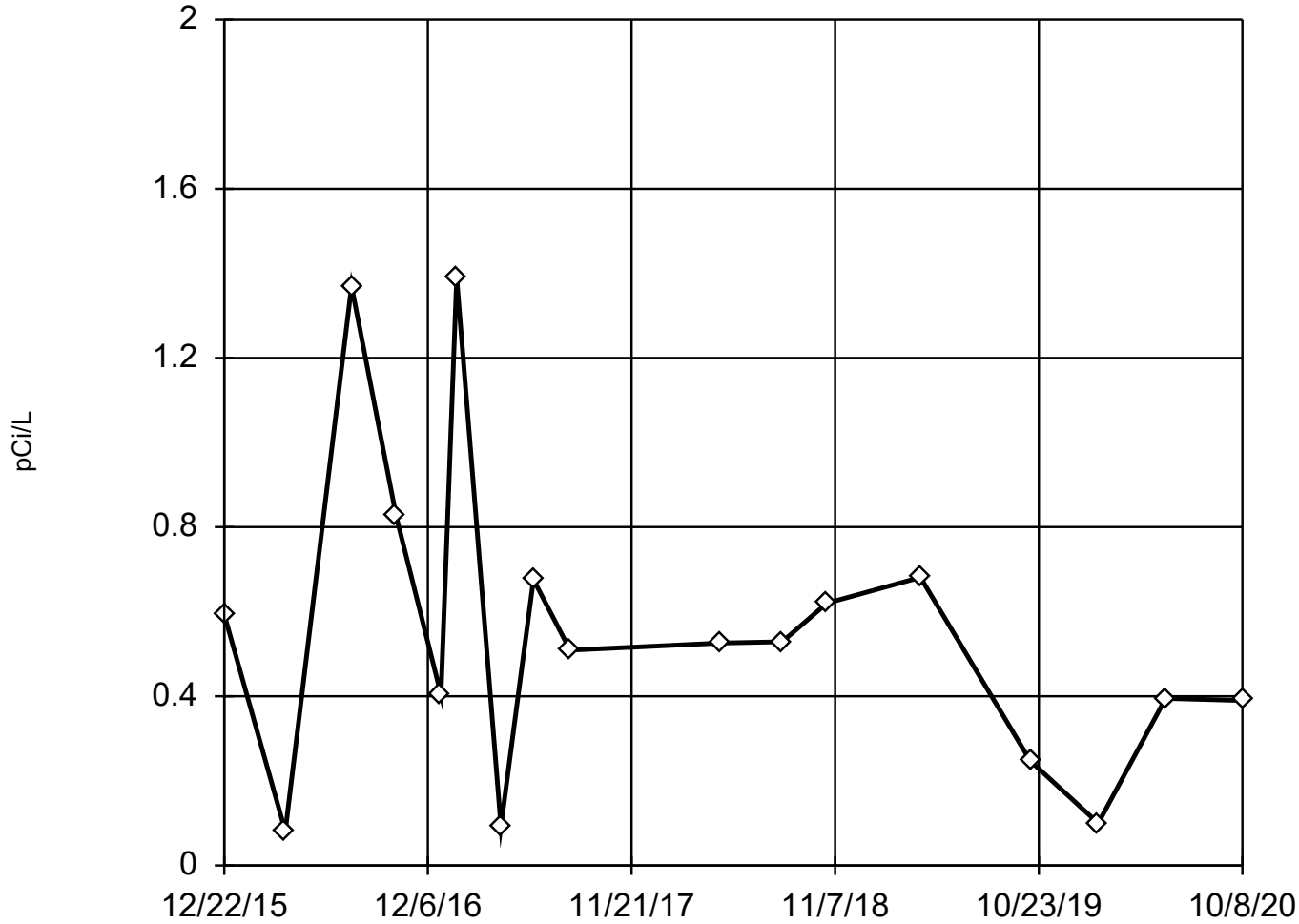
Dixon's Outlier Test

Constituent: Total Radium (pCi/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)
12/22/2015	1.31
4/5/2016	1.11
7/8/2016	0.89
10/13/2016	0.631
12/29/2016	1.01
1/25/2017	2.42
4/11/2017	1.35
6/6/2017	1.3
8/8/2017	1.74
4/25/2018	0.882
8/8/2018	0.0351
10/24/2018	0.652
4/2/2019	0.552
10/9/2019	0.701
2/3/2020	0.502
5/29/2020	0.193
10/8/2020	0.38

Tukey's Outlier Screening

MW-84A (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2.6, low cutoff = -0.05205, based on IQR multiplier of 3.

07/01/2021 - Classification: Internal - ECRM12626135

Constituent: Total Radium Analysis Run 12/28/2020 5:10 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Total Radium (pCi/L) Analysis Run 12/28/2020 5:12 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	0.593
4/5/2016	0.0809
7/28/2016	1.37
10/13/2016	0.825
12/29/2016	0.404
1/25/2017	1.39
4/11/2017	0.0929
6/6/2017	0.676
8/8/2017	0.509
4/25/2018	0.526
8/8/2018	0.529
10/24/2018	0.62
4/3/2019	0.681
10/9/2019	0.247
2/3/2020	0.1
5/29/2020	0.395
10/8/2020	0.39

Attachment 3

Interwell Prediction Limit Analysis Results – Appendix III Constituents

Interwell Prediction Limit

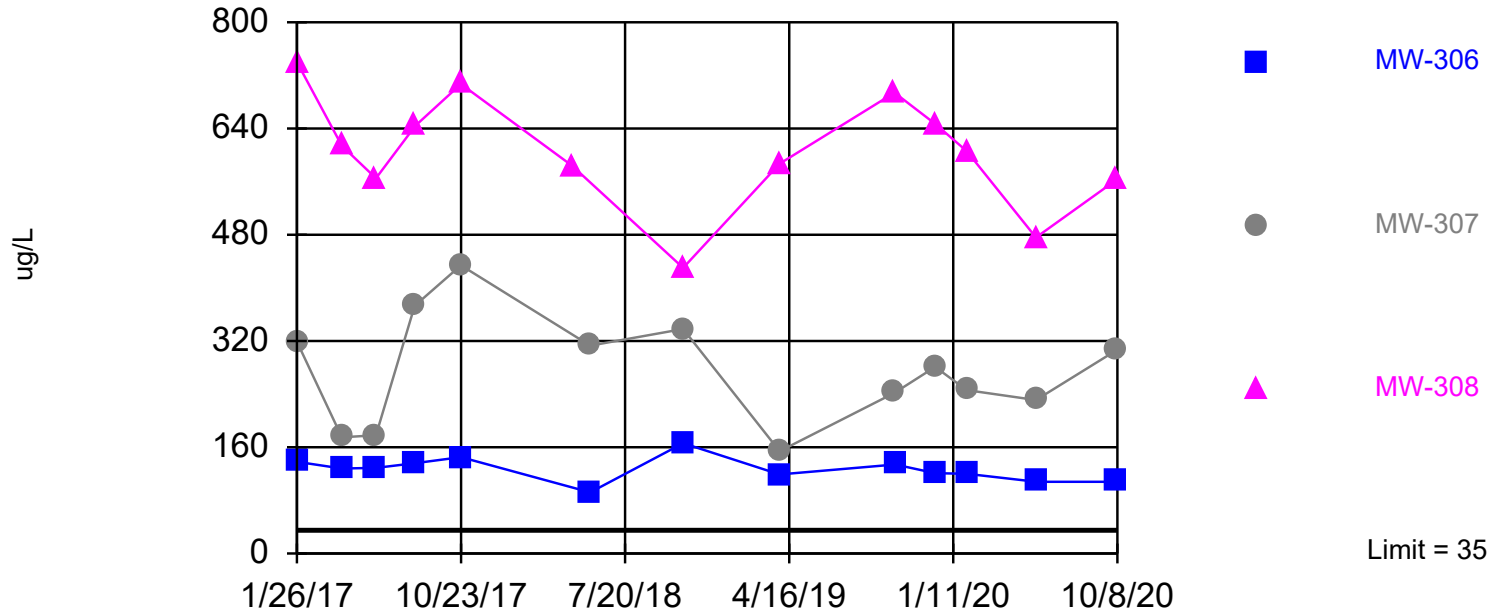
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 12/28/2020, 3:59 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (ug/L)	MW-306	35	n/a	10/7/2020	108	Yes	36	MW-301,MW-84A	21.05	8.077	0	None	No	0.002922	Param 1 of 2
Boron (ug/L)	MW-307	35	n/a	10/8/2020	307	Yes	36	MW-301,MW-84A	21.05	8.077	0	None	No	0.002922	Param 1 of 2
Boron (ug/L)	MW-308	35	n/a	10/7/2020	563	Yes	36	MW-301,MW-84A	21.05	8.077	0	None	No	0.002922	Param 1 of 2
Calcium (ug/L)	MW-306	129000	n/a	10/7/2020	77900	No	36	MW-84A,MW-301	n/a	n/a	0	n/a	n/a	0.001409	NP (normality) 1 of 2
Calcium (ug/L)	MW-307	129000	n/a	10/8/2020	67800	No	36	MW-84A,MW-301	n/a	n/a	0	n/a	n/a	0.001409	NP (normality) 1 of 2
Calcium (ug/L)	MW-308	129000	n/a	10/7/2020	123000	No	36	MW-84A,MW-301	n/a	n/a	0	n/a	n/a	0.001409	NP (normality) 1 of 2
Chloride (mg/L)	MW-306	6.02	n/a	10/7/2020	0.63J	No	36	MW-301,MW-84A	3.728	1.328	0	None	No	0.002922	Param 1 of 2
Chloride (mg/L)	MW-307	6.02	n/a	10/8/2020	12.1	Yes	36	MW-301,MW-84A	3.728	1.328	0	None	No	0.002922	Param 1 of 2
Chloride (mg/L)	MW-308	6.02	n/a	10/7/2020	1.1J	No	36	MW-301,MW-84A	3.728	1.328	0	None	No	0.002922	Param 1 of 2
Field pH (Std. Units)	MW-306	7.76	n/a	10/7/2020	7.25	No	37	MW-301,MW-84A	7.157	0.3479	0	None	No	0.002922	Param 1 of 2
Field pH (Std. Units)	MW-307	7.76	n/a	10/8/2020	7.28	No	37	MW-301,MW-84A	7.157	0.3479	0	None	No	0.002922	Param 1 of 2
Field pH (Std. Units)	MW-308	7.76	n/a	10/7/2020	7.09	No	37	MW-301,MW-84A	7.157	0.3479	0	None	No	0.002922	Param 1 of 2
Sulfate (mg/L)	MW-306	30.8	n/a	10/7/2020	8.4	No	36	MW-301,MW-84A	1.679	1.012	2.778	None	ln(x)	0.002922	Param 1 of 2
Sulfate (mg/L)	MW-307	30.8	n/a	10/8/2020	10.3	No	36	MW-301,MW-84A	1.679	1.012	2.778	None	ln(x)	0.002922	Param 1 of 2
Sulfate (mg/L)	MW-308	30.8	n/a	10/7/2020	0.52J	No	36	MW-301,MW-84A	1.679	1.012	2.778	None	ln(x)	0.002922	Param 1 of 2
Total Dissolved Solids (mg/L)	MW-306	514	n/a	10/7/2020	322	No	36	MW-84A,MW-301	n/a	n/a	0	n/a	n/a	0.001409	NP (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-307	514	n/a	10/8/2020	334	No	36	MW-84A,MW-301	n/a	n/a	0	n/a	n/a	0.001409	NP (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-308	514	n/a	10/7/2020	490	No	36	MW-84A,MW-301	n/a	n/a	0	n/a	n/a	0.001409	NP (normality) 1 of 2

Classification: Internal - ECRM12626135

Exceeds Limit: MW-306, MW-307, MW-308

Boron Interwell Parametric



Background Data Summary: Mean=21.05, Std. Dev.=8.077, n=36. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9147, critical = 0.912. Kappa = 1.726 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.008742. Individual comparison alpha = 0.002922. Comparing 3 points to limit.

Prediction Limit Analysis Run 12/28/2020 3:58 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

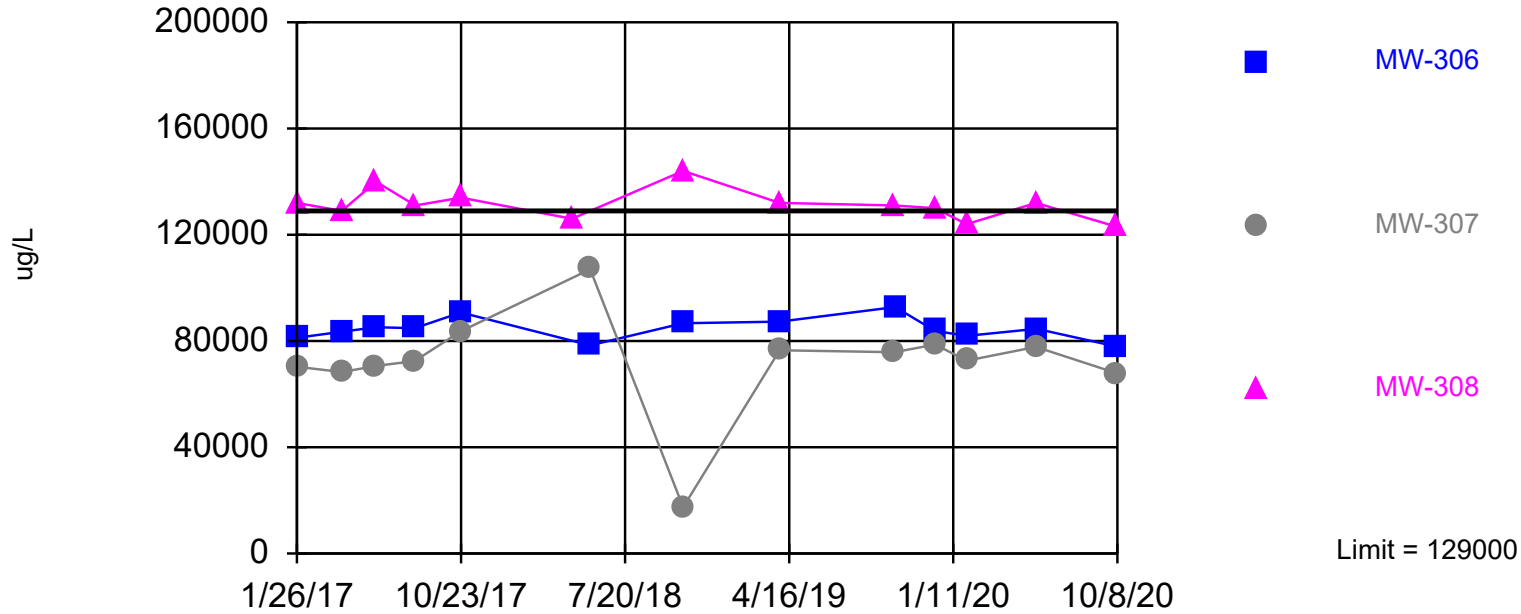
Prediction Limit

Constituent: Boron (ug/L) Analysis Run 12/28/2020 3:59 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	26.5				11.9
4/5/2016	25.2				14
7/8/2016	23.6				14.7
10/13/2016	30.6				11.1
12/29/2016	32.8				14.7
1/25/2017	32.6				16.1
1/26/2017		138	319	740	
4/10/2017		128	175	614	
4/11/2017	28.8				12.9
6/5/2017		129	178	565	
6/6/2017	21.3				14.8
8/8/2017	30.6	136	373		22.9
8/9/2017				644	
10/23/2017	34.3	145	434	707	
10/24/2017					13.8
4/24/2018				584	
4/25/2018	24.3				25
5/24/2018		92	313		
8/8/2018	22.8				12.8
10/24/2018	27.8	166	338	430	10.1 (J)
4/1/2019		119	154	587	
4/2/2019	26.9				
4/3/2019					13.6
10/7/2019			242	694	
10/8/2019		134			
10/9/2019	35.9				12
12/13/2019		121	281	647	
2/3/2020	27.9	120	246	606	15.7
5/27/2020			231	476	
5/28/2020		108			
5/29/2020	21.3				10
10/7/2020		108		563	
10/8/2020	28.8		307		9.7 (J)

Within Limit

Calcium Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 36 background values. Annual per-constituent alpha = 0.008426. Individual comparison alpha = 0.001409 (1 of 2). Comparing 3 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/28/2020 3:58 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

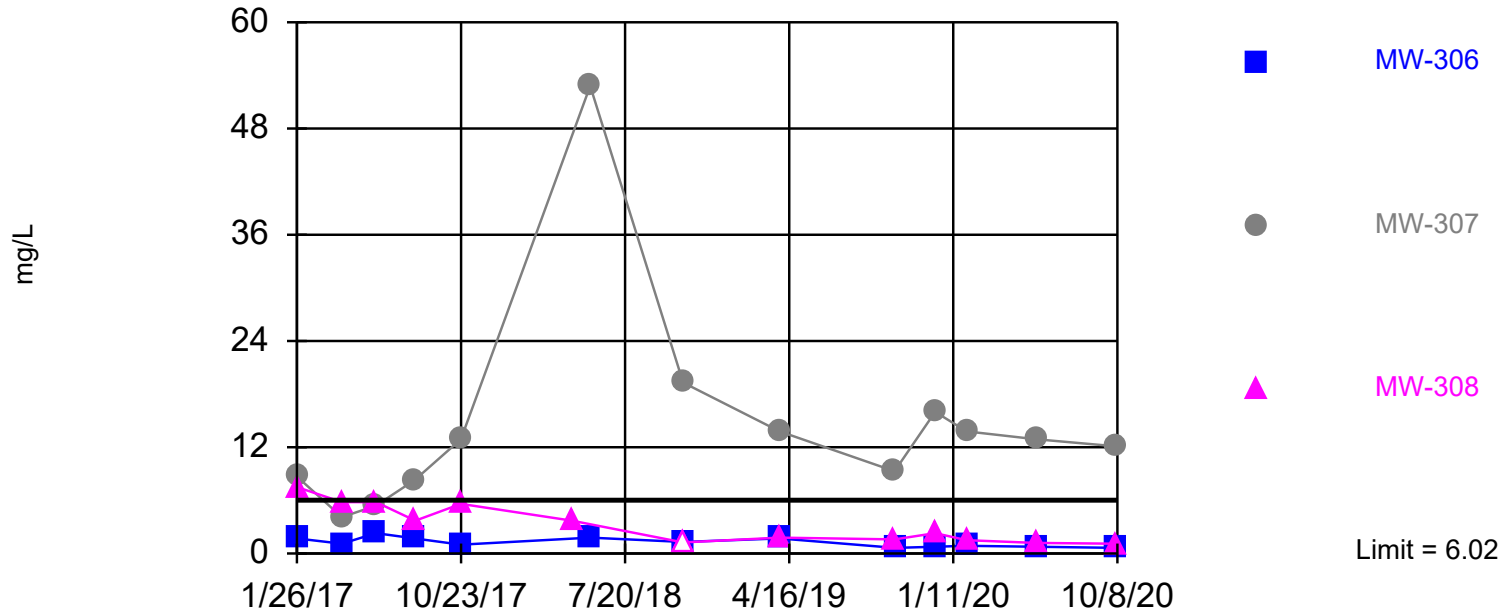
Prediction Limit

Constituent: Calcium (ug/L) Analysis Run 12/28/2020 3:59 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-307	MW-306	MW-308
12/22/2015	126000	74000			
4/5/2016	115000	72200			
7/8/2016	108000	67600			
10/13/2016	118000	74000			
12/29/2016	129000	76000			
1/25/2017	124000	70800			
1/26/2017			70300	81200	132000
4/10/2017			68300	83500	129000
4/11/2017	120000	73200			
6/5/2017			70600	85200	140000
6/6/2017	111000	76100			
8/8/2017	108000	74900	72500	84800	
8/9/2017					131000
10/23/2017	87200		83700	90700	134000
10/24/2017		77500			
4/24/2018					126000
4/25/2018	112000	76600			
5/24/2018			107000	78400	
8/8/2018	105000	76000			
10/24/2018	101000	74000	17400	86700	144000
4/1/2019			76500	87300	132000
4/2/2019	126000				
4/3/2019		80100			
10/7/2019			75800		131000
10/8/2019				92800	
10/9/2019	114000	73500			
12/13/2019			78700	83800	130000
2/3/2020	113000	72700	72600	81900	124000
5/27/2020			77800		132000
5/28/2020				84600	
5/29/2020	112000	77600			
10/7/2020				77900	123000
10/8/2020	93000	69200	67800		

Exceeds Limit: MW-307

Chloride Interwell Parametric



Background Data Summary: Mean=3.728, Std. Dev.=1.328, n=36. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9195, critical = 0.912. Kappa = 1.726 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.008742. Individual comparison alpha = 0.002922. Comparing 3 points to limit.

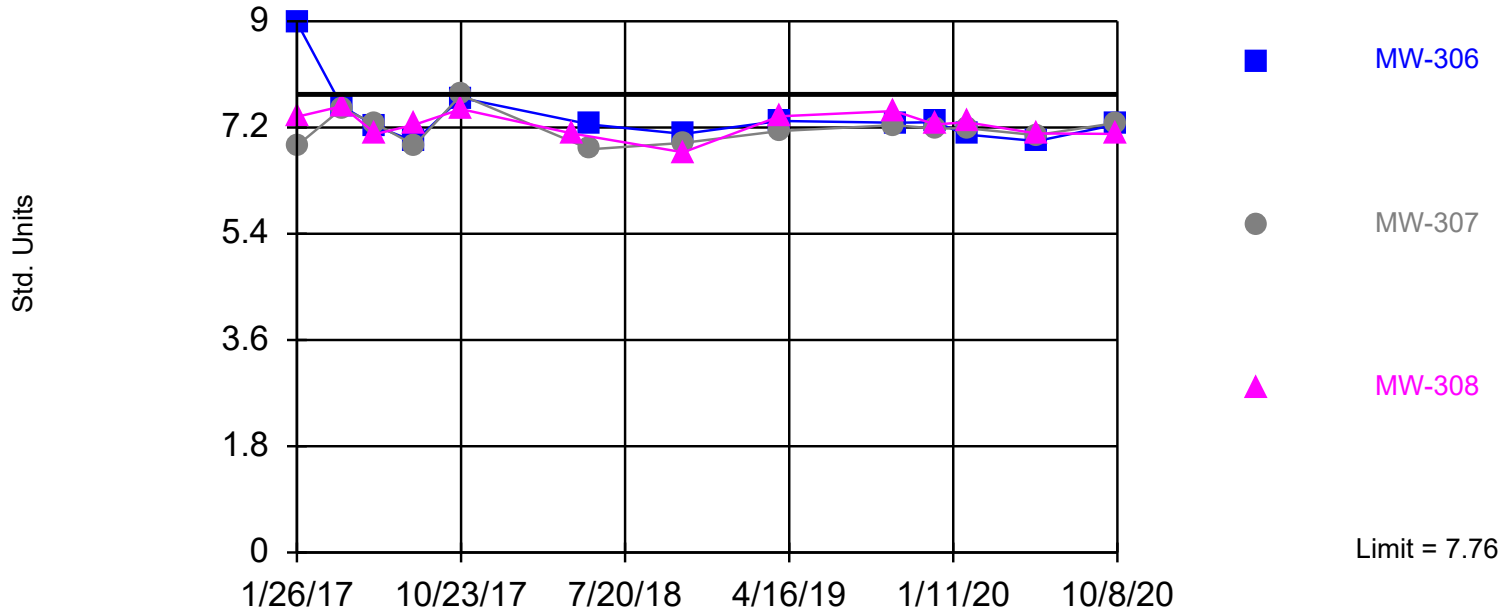
Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 12/28/2020 3:59 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	3.7 (J)				4.9
4/5/2016	4				4.7
7/8/2016	3.5 (J)				5.1
10/13/2016	2.2				4.3
12/29/2016	2 (J)				4.7
1/25/2017	1.5 (J)				4.6
1/26/2017		1.7 (J)	8.7 (J)	7.5 (J)	
4/10/2017		1.1 (J)	4.1	5.8 (J)	
4/11/2017	2				4.9
6/5/2017		2.3	5.4	5.8 (J)	
6/6/2017	3.5				5.5
8/8/2017	5.5	1.7 (J)	8.3		5.5
8/9/2017				3.7	
10/23/2017	4	1 (J)	12.9	5.6 (J)	
10/24/2017					5.1
4/24/2018				3.7 (J)	
4/25/2018	2.3				4.8
5/24/2018		1.8 (J)	52.8		
8/8/2018	5.2				4.9
10/24/2018	3.2	1.3 (J)	19.3	<2.5 (U)	4.2
4/1/2019		1.7 (J)	13.8	1.8 (J)	
4/2/2019	0.79 (J)				
4/3/2019					3.6
10/7/2019			9.3	1.6 (J)	
10/8/2019		0.64 (J)			
10/9/2019	1.7 (J)				3.9
12/13/2019		0.76 (J)	16	2.3 (J)	
2/3/2020	1.3 (J)	0.88 (J)	13.8	1.5 (J)	3.7
5/27/2020			12.9	1.2 (J)	
5/28/2020		0.76 (J)			
5/29/2020	2 (J)				3.7
10/7/2020		0.63 (J)		1.1 (J)	
10/8/2020	3.4		12.1		4.3

Within Limit

Field pH Interwell Parametric



Background Data Summary: Mean=7.157, Std. Dev.=0.3479, n=37. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9592, critical = 0.914. Kappa = 1.722 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.008742. Individual comparison alpha = 0.002922. Comparing 3 points to limit.

Prediction Limit Analysis Run 12/28/2020 3:58 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

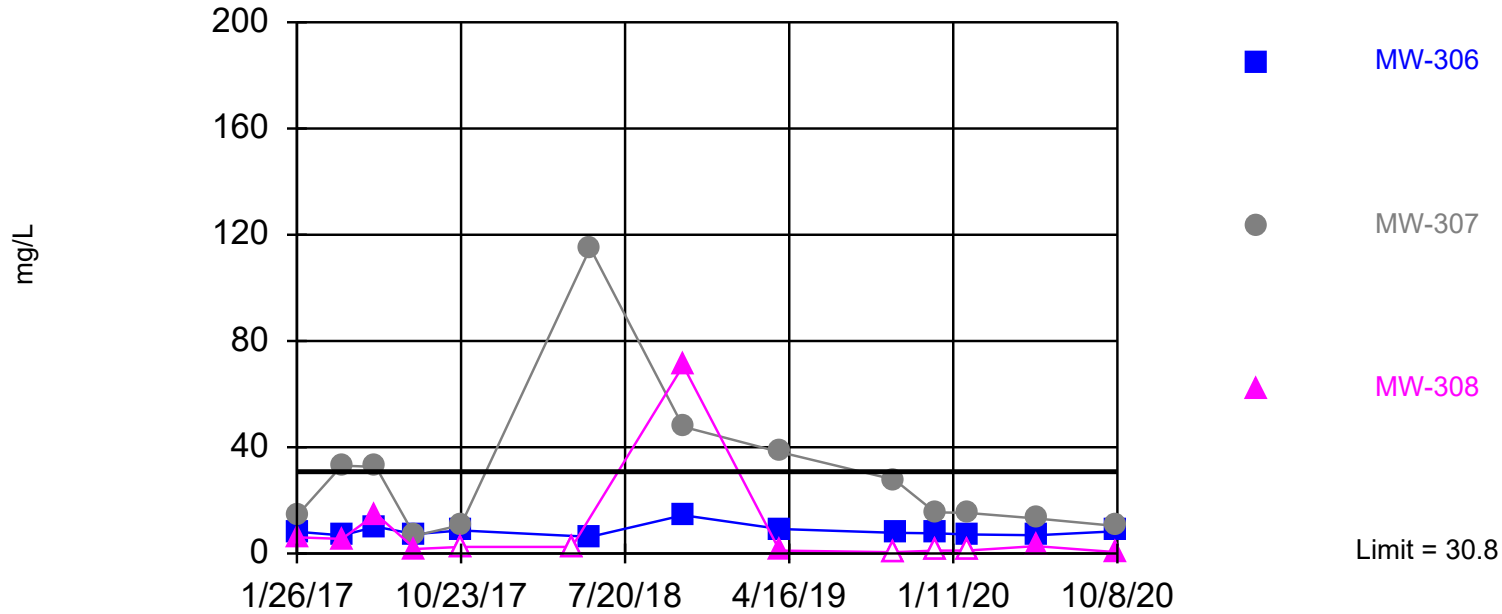
Constituent: Field pH (Std. Units) Analysis Run 12/28/2020 3:59 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	6.85				7.6
4/5/2016	7.01				7.61
7/8/2016	6.87				7.45
7/28/2016					7.34
10/13/2016	7.28				7.91
12/29/2016	6.63				7.25
1/25/2017	7.1				6.99
1/26/2017		8.98	6.89	7.38	
4/10/2017		7.56	7.52	7.56	
4/11/2017	7.11				7.8
6/5/2017		7.22	7.26	7.09	
6/6/2017	6.7				7.28
8/8/2017	6.75	6.96	6.9		7.23
8/9/2017				7.25	
10/23/2017	7.37	7.7	7.75	7.51	
10/24/2017					7.68
4/24/2018				7.1	
4/25/2018	6.76				7.45
5/24/2018		7.25	6.83		
8/8/2018	6.91				7.38
10/24/2018	6.79	7.09	6.94	6.78	7.24
4/1/2019		7.31	7.14	7.39	
4/2/2019	6.62				
4/3/2019					7.03
10/7/2019			7.24	7.48	
10/8/2019		7.28			
10/9/2019	6.67				7.23
12/13/2019		7.29	7.18	7.25	
2/3/2020	6.89	7.08	7.19	7.29	7.51
5/27/2020			7.07	7.1	
5/28/2020		6.97			
5/29/2020	6.73				7.34
10/7/2020		7.25		7.09	
10/8/2020	6.95		7.28		7.49

Within Limit

Sulfate

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=1.679, Std. Dev.=1.012, n=36, 2.778% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.936, critical = 0.912. Kappa = 1.726 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.008742. Individual comparison alpha = 0.002922. Comparing 3 points to limit.

Prediction Limit Analysis Run 12/28/2020 3:58 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

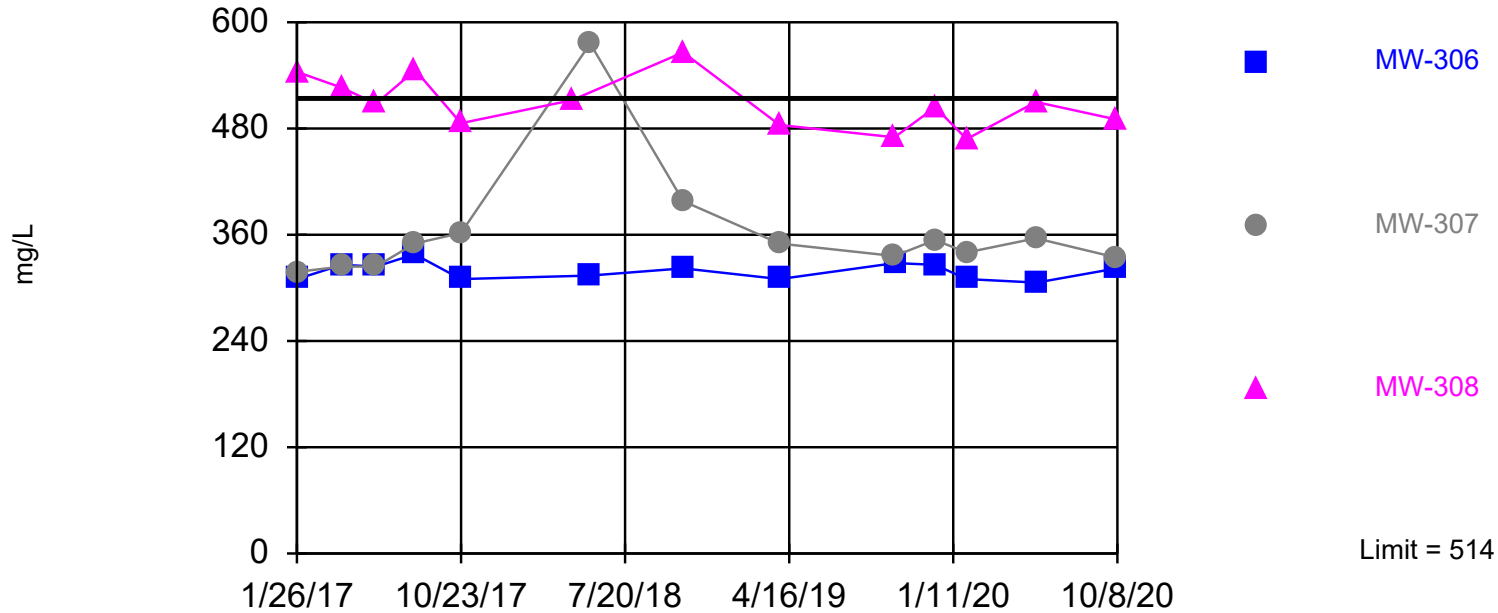
Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 12/28/2020 3:59 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-306	MW-307	MW-308	MW-84A (bg)
12/22/2015	9.3				4.9
4/5/2016	15.3				4.3
7/8/2016	15				3.7 (J)
10/13/2016	13.9				2.6 (J)
12/29/2016	12.3 (J)				2.7 (J)
1/25/2017	6.5				3
1/26/2017		8.2	14.2 (J)	6.1 (J)	
4/10/2017		6.8	33.1	5.5 (J)	
4/11/2017	10.3				2.8 (J)
6/5/2017		10.1	32.6	14.8 (J)	
6/6/2017	17.1				2.7 (J)
8/8/2017	31.6	7.3	6.7		2 (J)
8/9/2017				1.7 (J)	
10/23/2017	27.5	8.7	10.7 (J)	<5 (U)	
10/24/2017					2.2 (J)
4/24/2018				<5 (U)	
4/25/2018	8.6				2.8 (J)
5/24/2018		6.3	115		
8/8/2018	21.6				1.9 (J)
10/24/2018	19.2	14.4	47.7	70.7	1.6 (J)
4/1/2019		9.2	38.2	1.1 (J)	
4/2/2019	4.4				
4/3/2019					1.4 (J)
10/7/2019			27.8	<1 (U)	
10/8/2019		7.8			
10/9/2019	8.4				1.3 (J)
12/13/2019		7.6	15.5	<2.2 (U)	
2/3/2020	7.2	7.2	15.3	<2.2 (U)	<2.2 (U)
5/27/2020			13.2	2.8	
5/28/2020		6.9			
5/29/2020	11.5				1.5 (J)
10/7/2020		8.4		0.52 (J)	
10/8/2020	25.1		10.3		1.3 (J)

Within Limit

Total Dissolved Solids Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 36 background values. Annual per-constituent alpha = 0.008426. Individual comparison alpha = 0.001409 (1 of 2). Comparing 3 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/28/2020 3:59 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-307	MW-306	MW-308
12/22/2015	478	316			
4/5/2016	486	322			
7/8/2016	464	316			
10/13/2016	490	324			
12/29/2016	444	316			
1/25/2017	514	328			
1/26/2017			318	310	544
4/10/2017			324	326	526
4/11/2017	502	342			
6/5/2017			324	324	508
6/6/2017	458	344			
8/8/2017	462	342	350	338	
8/9/2017					546
10/23/2017	362		362	310	486
10/24/2017		314			
4/24/2018					512
4/25/2018	464	328			
5/24/2018			576	314	
8/8/2018	502	372			
10/24/2018	424	330	398	322	566
4/1/2019			350	310	484
4/2/2019	462				
4/3/2019		318			
10/7/2019			336		470
10/8/2019				328	
10/9/2019	418	310			
12/13/2019			354	326	504
2/3/2020	462	316	340	310	468
5/27/2020			356		510
5/28/2020				306	
5/29/2020	452	340			
10/7/2020				322	490
10/8/2020	412	320	334		

Attachment 4

Interwell Prediction Limit Analysis Results – Appendix IV Constituents

Interwell Prediction Limit

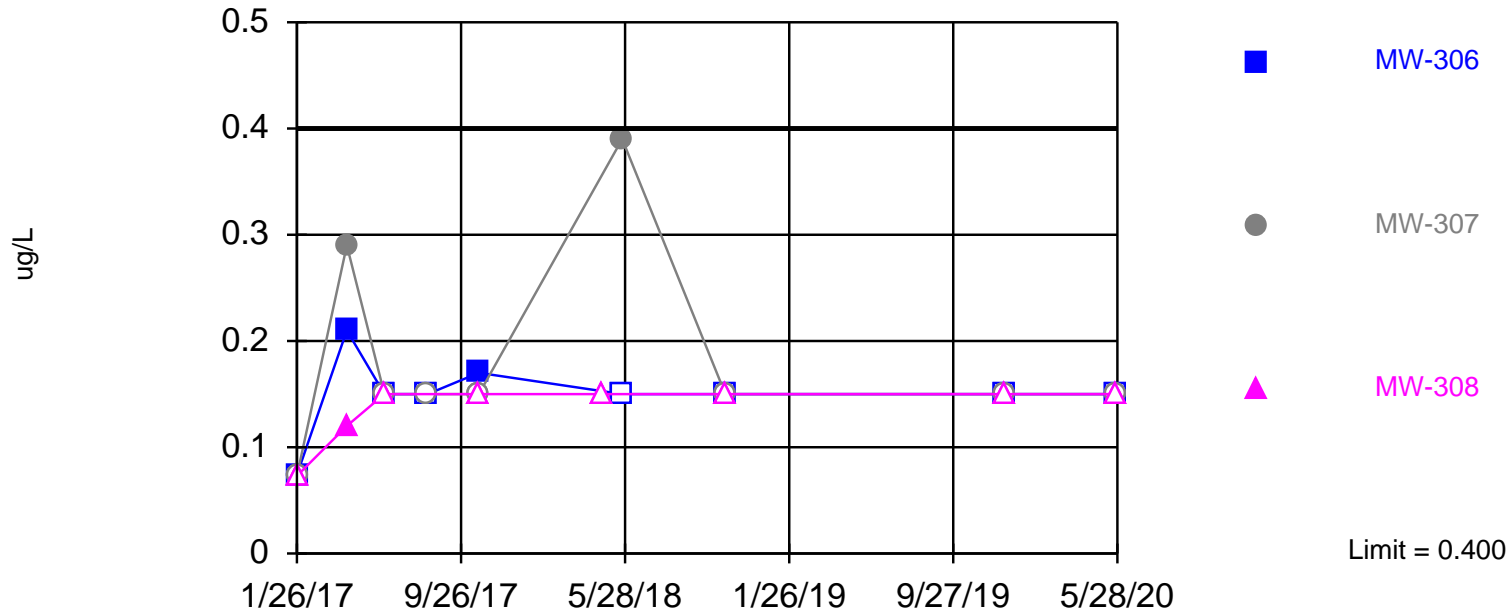
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 1/1/2021, 10:59 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Obsrv.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (ug/L)	MW-306	0.400	n/a	5/28/2020	0.15ND	No	32	MW-84A,MW-301	n/a	n/a	71.88	n/a	n/a	0.001772	NP (NDs) 1 of 2
Antimony (ug/L)	MW-307	0.400	n/a	5/27/2020	0.15ND	No	32	MW-84A,MW-301	n/a	n/a	71.88	n/a	n/a	0.001772	NP (NDs) 1 of 2
Antimony (ug/L)	MW-308	0.400	n/a	5/27/2020	0.15ND	No	32	MW-84A,MW-301	n/a	n/a	71.88	n/a	n/a	0.001772	NP (NDs) 1 of 2
Arsenic (ug/L)	MW-306	0.507	n/a	10/7/2020	0.28ND	No	34	MW-301,MW-84A	0.2558	0.1287	29.41	Kapla...	No	0.00135	Param 1 of 2
Arsenic (ug/L)	MW-307	0.507	n/a	10/8/2020	2.7	Yes	34	MW-301,MW-84A	0.2558	0.1287	29.41	Kapla...	No	0.00135	Param 1 of 2
Arsenic (ug/L)	MW-308	0.507	n/a	10/7/2020	3.7	Yes	34	MW-301,MW-84A	0.2558	0.1287	29.41	Kapla...	No	0.00135	Param 1 of 2
Barium (ug/L)	MW-306	16.9	n/a	10/7/2020	10.5	No	33	MW-301,MW-84A	12.89	2.033	0	None	No	0.00135	Param 1 of 2
Barium (ug/L)	MW-307	16.9	n/a	10/8/2020	13.8	No	33	MW-301,MW-84A	12.89	2.033	0	None	No	0.00135	Param 1 of 2
Barium (ug/L)	MW-308	16.9	n/a	10/7/2020	61.5	Yes	33	MW-301,MW-84A	12.89	2.033	0	None	No	0.00135	Param 1 of 2
Beryllium (ug/L)	MW-306	0.370	n/a	5/28/2020	0.25ND	No	32	MW-301,MW-84A	n/a	n/a	90.63	n/a	n/a	0.001772	NP (NDs) 1 of 2
Beryllium (ug/L)	MW-307	0.370	n/a	5/27/2020	0.25ND	No	32	MW-301,MW-84A	n/a	n/a	90.63	n/a	n/a	0.001772	NP (NDs) 1 of 2
Beryllium (ug/L)	MW-308	0.370	n/a	5/27/2020	0.25ND	No	32	MW-301,MW-84A	n/a	n/a	90.63	n/a	n/a	0.001772	NP (NDs) 1 of 2
Cadmium (ug/L)	MW-306	0.320	n/a	5/28/2020	0.15ND	No	30	MW-84A,MW-301	n/a	n/a	90	n/a	n/a	0.00197	NP (NDs) 1 of 2
Cadmium (ug/L)	MW-307	0.320	n/a	5/27/2020	0.15ND	No	30	MW-84A,MW-301	n/a	n/a	90	n/a	n/a	0.00197	NP (NDs) 1 of 2
Cadmium (ug/L)	MW-308	0.320	n/a	5/27/2020	0.15ND	No	30	MW-84A,MW-301	n/a	n/a	90	n/a	n/a	0.00197	NP (NDs) 1 of 2
Chromium (ug/L)	MW-306	2.36	n/a	10/7/2020	2J	No	34	MW-301,MW-84A	1.015	0.6871	29.41	Kapla...	No	0.00135	Param 1 of 2
Chromium (ug/L)	MW-307	2.36	n/a	10/8/2020	1ND	No	34	MW-301,MW-84A	1.015	0.6871	29.41	Kapla...	No	0.00135	Param 1 of 2
Chromium (ug/L)	MW-308	2.36	n/a	10/7/2020	1ND	No	34	MW-301,MW-84A	1.015	0.6871	29.41	Kapla...	No	0.00135	Param 1 of 2
Cobalt (ug/L)	MW-306	0.380	n/a	10/7/2020	0.12ND	No	33	MW-84A,MW-301	n/a	n/a	57.58	n/a	n/a	0.001673	NP (NDs) 1 of 2
Cobalt (ug/L)	MW-307	0.380	n/a	10/8/2020	0.61J	No	33	MW-84A,MW-301	n/a	n/a	57.58	n/a	n/a	0.001673	NP (NDs) 1 of 2
Cobalt (ug/L)	MW-308	0.380	n/a	10/7/2020	0.12ND	No	33	MW-84A,MW-301	n/a	n/a	57.58	n/a	n/a	0.001673	NP (NDs) 1 of 2
Lead (ug/L)	MW-306	0.900	n/a	5/28/2020	0.24ND	No	30	MW-301,MW-84A	n/a	n/a	63.33	n/a	n/a	0.00197	NP (NDs) 1 of 2
Lead (ug/L)	MW-307	0.900	n/a	5/27/2020	0.24ND	No	30	MW-301,MW-84A	n/a	n/a	63.33	n/a	n/a	0.00197	NP (NDs) 1 of 2
Lead (ug/L)	MW-308	0.900	n/a	5/27/2020	0.24ND	No	30	MW-301,MW-84A	n/a	n/a	63.33	n/a	n/a	0.00197	NP (NDs) 1 of 2
Lithium (ug/L)	MW-306	0.827	n/a	10/7/2020	4.4	Yes	33	MW-301,MW-84A	0.5791	0.1267	0	None	No	0.00135	Param 1 of 2
Lithium (ug/L)	MW-307	0.827	n/a	10/8/2020	0.11ND	No	33	MW-301,MW-84A	0.5791	0.1267	0	None	No	0.00135	Param 1 of 2
Lithium (ug/L)	MW-308	0.827	n/a	10/7/2020	0.11ND	No	33	MW-301,MW-84A	0.5791	0.1267	0	None	No	0.00135	Param 1 of 2
Molybdenum (ug/L)	MW-306	0.440	n/a	10/7/2020	7.1	Yes	34	MW-84A,MW-301	n/a	n/a	79.41	n/a	n/a	0.001574	NP (NDs) 1 of 2
Molybdenum (ug/L)	MW-307	0.440	n/a	10/8/2020	0.64J	No	34	MW-84A,MW-301	n/a	n/a	79.41	n/a	n/a	0.001574	NP (NDs) 1 of 2
Molybdenum (ug/L)	MW-308	0.440	n/a	10/7/2020	1.1J	No	34	MW-84A,MW-301	n/a	n/a	79.41	n/a	n/a	0.001574	NP (NDs) 1 of 2
Selenium (ug/L)	MW-306	0.710	n/a	10/7/2020	0.69J	No	34	MW-84A,MW-301	n/a	n/a	82.35	n/a	n/a	0.001574	NP (NDs) 1 of 2
Selenium (ug/L)	MW-307	0.710	n/a	10/8/2020	0.32ND	No	34	MW-84A,MW-301	n/a	n/a	82.35	n/a	n/a	0.001574	NP (NDs) 1 of 2
Selenium (ug/L)	MW-308	0.710	n/a	10/7/2020	0.32ND	No	34	MW-84A,MW-301	n/a	n/a	82.35	n/a	n/a	0.001574	NP (NDs) 1 of 2
Thallium (ug/L)	MW-306	0.480	n/a	5/28/2020	0.14ND	No	34	MW-301,MW-84A	n/a	n/a	88.24	n/a	n/a	0.001574	NP (NDs) 1 of 2
Thallium (ug/L)	MW-307	0.480	n/a	5/27/2020	0.14ND	No	34	MW-301,MW-84A	n/a	n/a	88.24	n/a	n/a	0.001574	NP (NDs) 1 of 2
Thallium (ug/L)	MW-308	0.480	n/a	5/27/2020	0.14ND	No	34	MW-301,MW-84A	n/a	n/a	88.24	n/a	n/a	0.001574	NP (NDs) 1 of 2
Total Radium (pCi/L)	MW-306	1.76	n/a	10/7/2020	0.721	No	34	MW-301,MW-84A	0.7379	0.5222	0	None	No	0.00135	Param 1 of 2
Total Radium (pCi/L)	MW-307	1.76	n/a	10/8/2020	0.636	No	34	MW-301,MW-84A	0.7379	0.5222	0	None	No	0.00135	Param 1 of 2
Total Radium (pCi/L)	MW-308	1.76	n/a	10/7/2020	1.03	No	34	MW-301,MW-84A	0.7379	0.5222	0	None	No	0.00135	Param 1 of 2

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 32 background values. 71.88% NDs. Annual per-constituent alpha = 0.01059. Individual comparison alpha = 0.001772 (1 of 2). Comparing 3 points to limit.

Prediction Limit

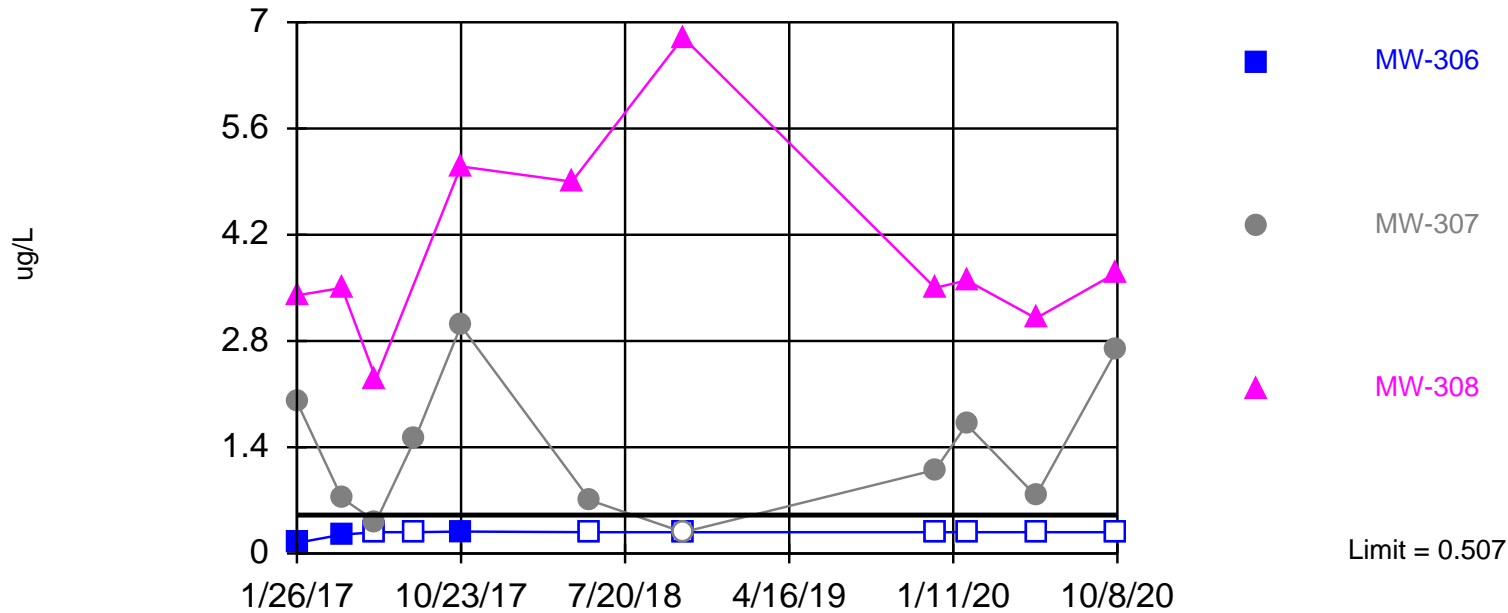
Constituent: Antimony (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-307	MW-308	MW-306
12/22/2015	0.15 (J)	<0.073 (U)			
4/5/2016	0.094 (J)	0.084 (J)			
7/8/2016	0.13 (J)	0.1 (J)			
10/13/2016	<0.073 (U)	<0.073 (U)			
12/29/2016	0.4 (J)	<0.073 (U)			
1/25/2017	<0.073 (U)	<0.073 (U)			
1/26/2017			<0.073 (U)	<0.073 (U)	0.074 (J)
4/10/2017			0.29 (J)	0.12 (J)	0.21 (J)
4/11/2017	<0.073 (U)	<0.073 (U)			
6/5/2017			<0.15 (U)	<0.15 (U)	<0.15 (U)
6/6/2017	<0.15 (U)	<0.15 (U)			
8/8/2017	<0.15 (U)	<0.15 (U)	<0.15 (U)		<0.15 (U)
10/23/2017			<0.15 (U)	<0.15 (U)	0.17 (J)
4/24/2018				<0.15 (U)	
4/25/2018	<0.15 (U)	<0.15 (U)			
5/24/2018			0.39 (J)		<0.15 (U)
8/8/2018	0.36 (J)	<0.15 (U)			
10/24/2018	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)
4/2/2019	0.32 (J)				
4/3/2019		<0.15 (U)			
10/9/2019	<0.15 (U)	<0.15 (U)			
12/13/2019			<0.15 (U)	<0.15 (U)	<0.15 (U)
5/27/2020			<0.15 (U)	<0.15 (U)	
5/28/2020					<0.15 (U)
5/29/2020	<0.15 (U)	<0.15 (U)			
10/8/2020	0.33 (J)	<0.15 (U)			

Exceeds Limit: MW-307, MW-308

Arsenic

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.2558, Std. Dev.=0.1287, n=34, 29.41% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9553, critical = 0.908. Kappa = 1.953 (c=13, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.00135. Comparing 3 points to limit.

Prediction Limit

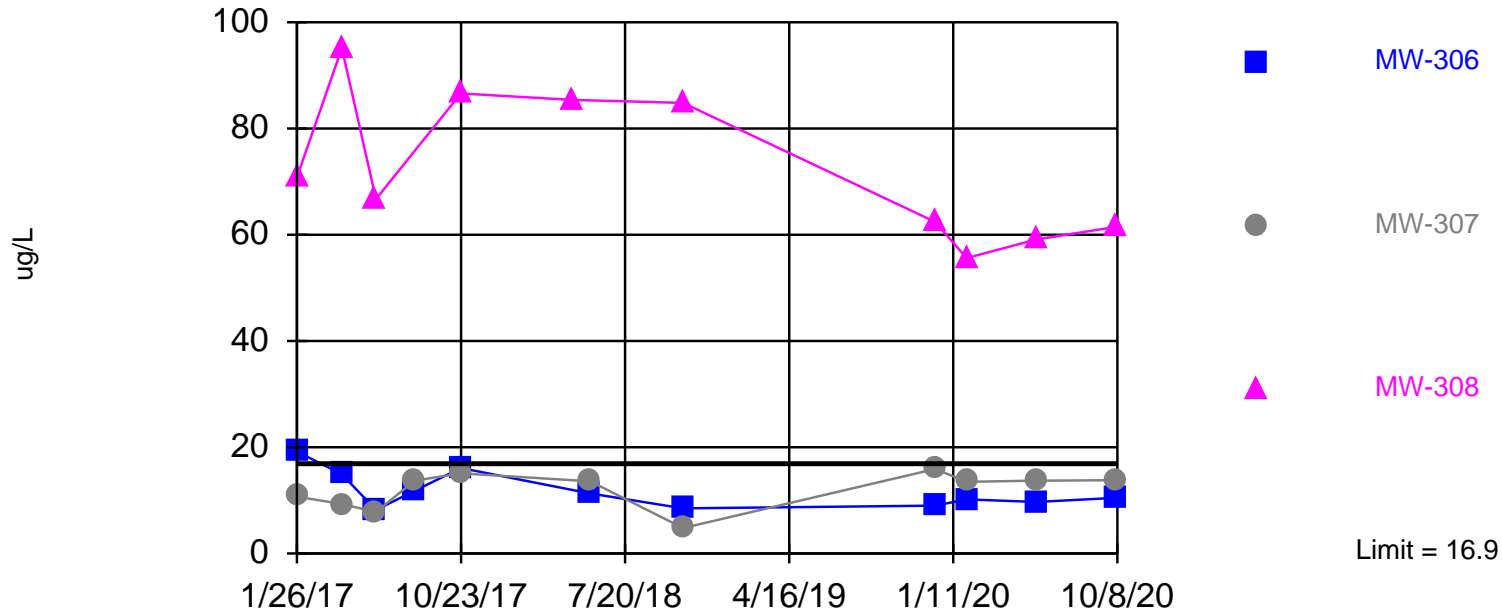
Constituent: Arsenic (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-308	MW-306	MW-307
12/22/2015	0.26 (J)	0.15 (J)			
4/5/2016	0.26 (J)	0.29 (J)			
7/8/2016	0.19 (J)	0.14 (J)			
10/13/2016	0.24 (J)	0.35 (J)			
12/29/2016	0.4 (J)	0.19 (J)			
1/25/2017	0.13 (J)	0.35 (J)			
1/26/2017			3.4	0.14 (J)	2
4/10/2017			3.5	0.25 (J)	0.73 (J)
4/11/2017	0.18 (J)	<0.099 (U)			
6/5/2017			2.3	<0.28 (U)	0.42 (J)
6/6/2017	<0.28 (U)	<0.28 (U)			
8/8/2017	<0.28 (U)	0.28 (J)		<0.28 (U)	1.5
10/23/2017			5.1	0.29 (J)	3
4/24/2018			4.9		
4/25/2018	<0.28 (U)	<0.28 (U)			
5/24/2018				<0.28 (U)	0.7 (J)
8/8/2018	0.45 (J)	<0.28 (U)			
10/24/2018	<0.28 (U)	0.33 (J)	6.8	<0.28 (U)	<0.28 (U)
4/2/2019	0.4 (J)				
4/3/2019		<0.28 (U)			
10/9/2019	0.42 (J)	0.46 (J)			
12/13/2019			3.5	<0.28 (U)	1.1
2/3/2020	<0.28 (U)	0.38 (J)	3.6	<0.28 (U)	1.7
5/27/2020			3.1		0.76 (J)
5/28/2020				<0.28 (U)	
5/29/2020	0.33 (J)	0.34 (J)			
10/7/2020			3.7	<0.28 (U)	
10/8/2020	0.62 (J)	0.49 (J)			2.7

Exceeds Limit: MW-308

Barium

Interwell Parametric



Background Data Summary: Mean=12.89, Std. Dev.=2.033, n=33. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9665, critical = 0.906. Kappa = 1.959 (c=13, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.00135. Comparing 3 points to limit.

Prediction Limit

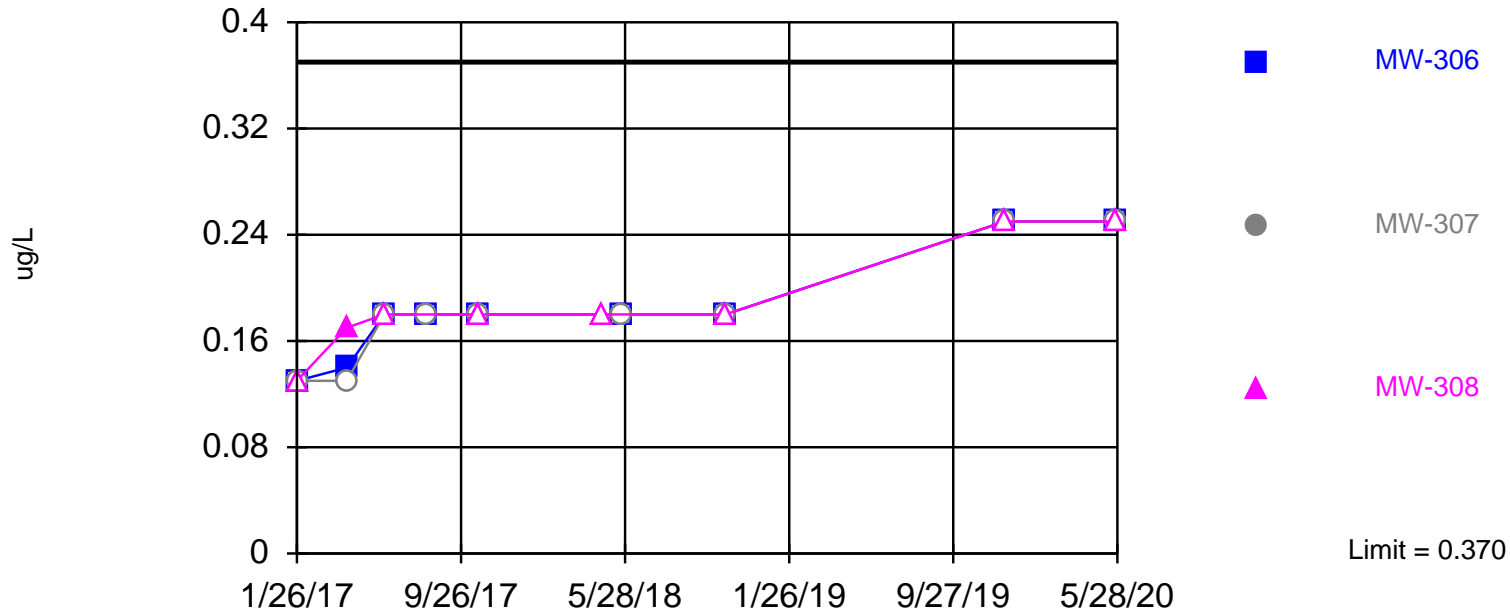
Constituent: Barium (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)	MW-301 (bg)	MW-307	MW-306	MW-308
12/22/2015	15.3	20.2 (X)			
4/5/2016	12.7	11.1			
7/8/2016	12.2	11.6			
10/13/2016	14.2	15.6			
12/29/2016	18.4	15			
1/25/2017	13.8	13.5			
1/26/2017			10.7	19.2	70.8
4/10/2017			9.3	14.9	95.1
4/11/2017	14.1	13.2			
6/5/2017			7.8	8.2	66.7
6/6/2017	13.4	11.3			
8/8/2017	14	11.8	13.7	11.8	
10/23/2017			15.1	16.1	86.6
4/24/2018					85.4
4/25/2018	14.6	9.3			
5/24/2018			13.6	11.3	
8/8/2018	13.7	10.2			
10/24/2018	14.5	11.5	4.8 (J)	8.5	84.8
4/2/2019		11.8			
4/3/2019	14.7				
10/9/2019	13.2	10			
12/13/2019			15.9	9	62.4
2/3/2020	14	10.9	13.5	10.2	55.6
5/27/2020			13.7		59.1
5/28/2020				9.7	
5/29/2020	13.9	9.8			
10/7/2020				10.5	61.5
10/8/2020	12.6	9.4	13.8		

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 32 background values. 90.63% NDs. Annual per-constituent alpha = 0.01059. Individual comparison alpha = 0.001772 (1 of 2). Comparing 3 points to limit.

Prediction Limit

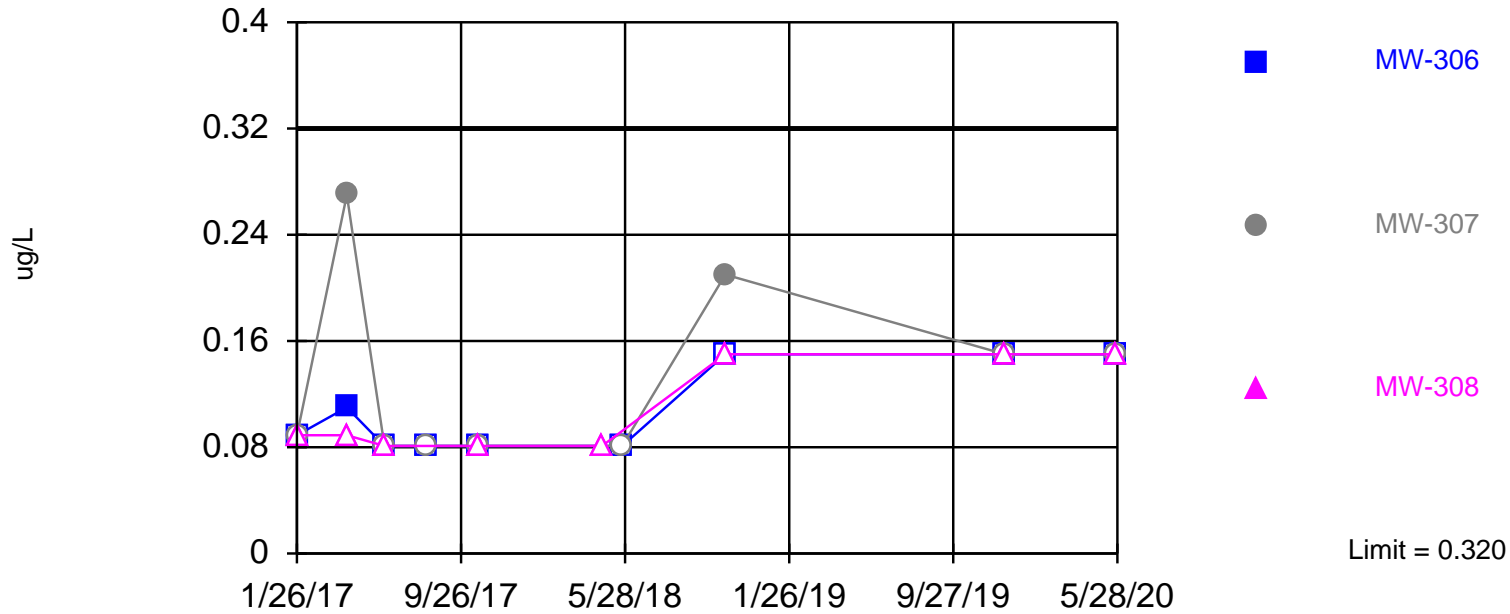
Constituent: Beryllium (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-307	MW-308	MW-306
12/22/2015	<0.13 (U)	<0.13 (U)			
4/5/2016	<0.13 (U)	<0.13 (U)			
7/8/2016	<0.13 (U)	<0.13 (U)			
10/13/2016	<0.13 (U)	<0.13 (U)			
12/29/2016	0.19 (J)	<0.13 (U)			
1/25/2017	<0.13 (U)	<0.13 (U)			
1/26/2017			<0.13 (U)	<0.13 (U)	<0.13 (U)
4/10/2017			<0.13 (U)	0.17 (J)	0.14 (J)
4/11/2017	<0.13 (U)	<0.13 (U)			
6/5/2017			<0.18 (U)	<0.18 (U)	<0.18 (U)
6/6/2017	<0.18 (U)	<0.18 (U)			
8/8/2017	<0.18 (U)	<0.18 (U)	<0.18 (U)		<0.18 (U)
10/23/2017			<0.18 (U)	<0.18 (U)	<0.18 (U)
4/24/2018				<0.18 (U)	
4/25/2018	<0.18 (U)	<0.18 (U)			
5/24/2018			<0.18 (U)		<0.18 (U)
8/8/2018	0.37 (J)	<0.18 (U)			
10/24/2018	<0.18 (U)	<0.18 (U)	<0.18 (U)	<0.18 (U)	<0.18 (U)
4/2/2019	0.28 (J)				
4/3/2019		<0.18 (U)			
10/9/2019	<0.25 (U)	<0.25 (U)			
12/13/2019			<0.25 (U)	<0.25 (U)	<0.25 (U)
5/27/2020			<0.25 (U)	<0.25 (U)	
5/28/2020					<0.25 (U)
5/29/2020	<0.25 (U)	<0.25 (U)			
10/8/2020	<0.25 (U)	<0.25 (U)			

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 30 background values. 90% NDs. Annual per-constituent alpha = 0.01176. Individual comparison alpha = 0.00197 (1 of 2). Comparing 3 points to limit.

Prediction Limit

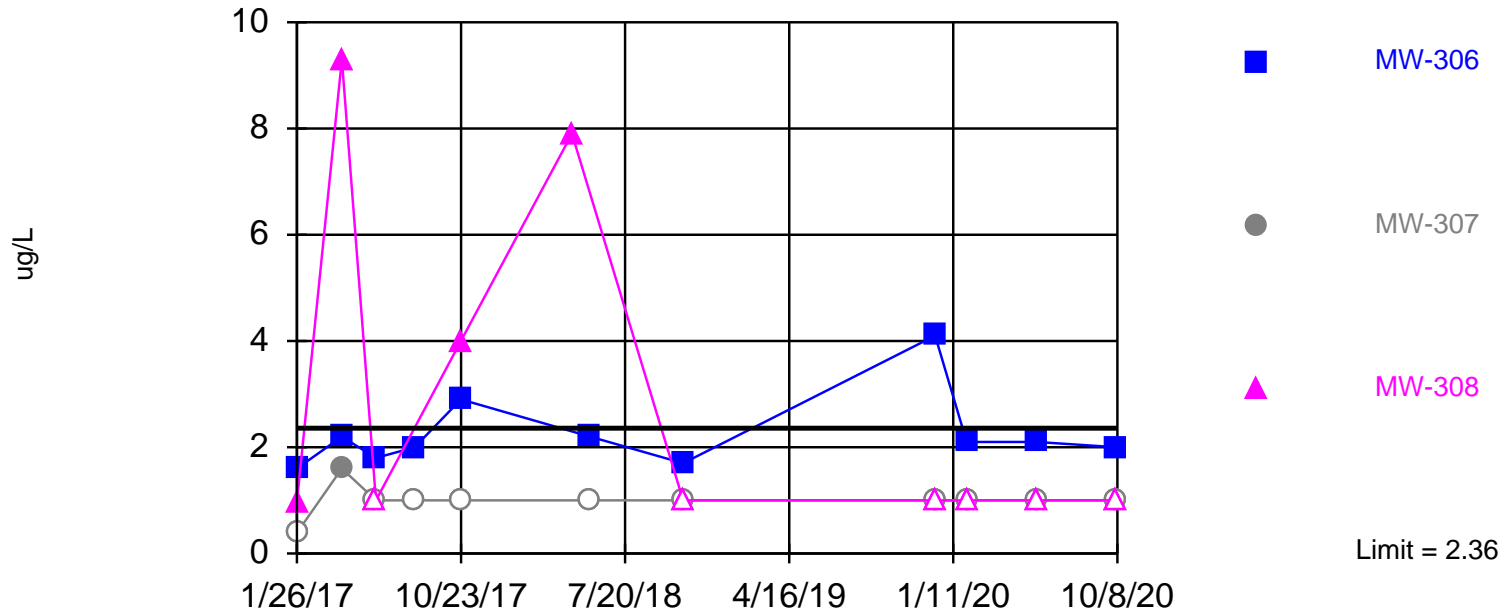
Constituent: Cadmium (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-307	MW-306	MW-308
12/22/2015	<0.089 (U)	<0.089 (U)			
4/5/2016	<0.089 (U)	<0.089 (U)			
7/8/2016	<0.089 (U)	<0.089 (U)			
10/13/2016	<0.089 (U)	<0.089 (U)			
12/29/2016	0.32 (J)	<0.089 (U)			
1/25/2017	<0.089 (U)	<0.089 (U)			
1/26/2017			<0.089 (U)	<0.089 (U)	<0.089 (U)
4/10/2017			0.27 (J)	0.11 (J)	<0.089 (U)
4/11/2017	<0.089 (U)	<0.089 (U)			
6/5/2017			<0.081 (U)	<0.081 (U)	<0.081 (U)
6/6/2017	<0.081 (U)	<0.081 (U)			
8/8/2017	<0.081 (U)	<0.081 (U)	<0.081 (U)	<0.081 (U)	
10/23/2017			<0.081 (U)	<0.081 (U)	<0.081 (U)
4/24/2018					<0.081 (U)
4/25/2018	<0.081 (U)	<0.081 (U)			
5/24/2018			<0.081 (U)	<0.081 (U)	
10/24/2018	<0.15 (U)	<0.15 (U)	0.21 (J)	<0.15 (U)	<0.15 (U)
4/2/2019	0.21 (J)				
4/3/2019		<0.15 (U)			
10/9/2019	<0.15 (U)	<0.15 (U)			
12/13/2019			<0.15 (U)	<0.15 (U)	<0.15 (U)
5/27/2020			<0.15 (U)		<0.15 (U)
5/28/2020				<0.15 (U)	
5/29/2020	<0.15 (U)	<0.15 (U)			
10/8/2020	0.19 (J)	<0.15 (U)			

Within Limit

Chromium

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=1.015, Std. Dev.=0.6871, n=34, 29.41% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9333, critical = 0.908. Kappa = 1.953 (c=13, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.00135. Comparing 3 points to limit.

Prediction Limit

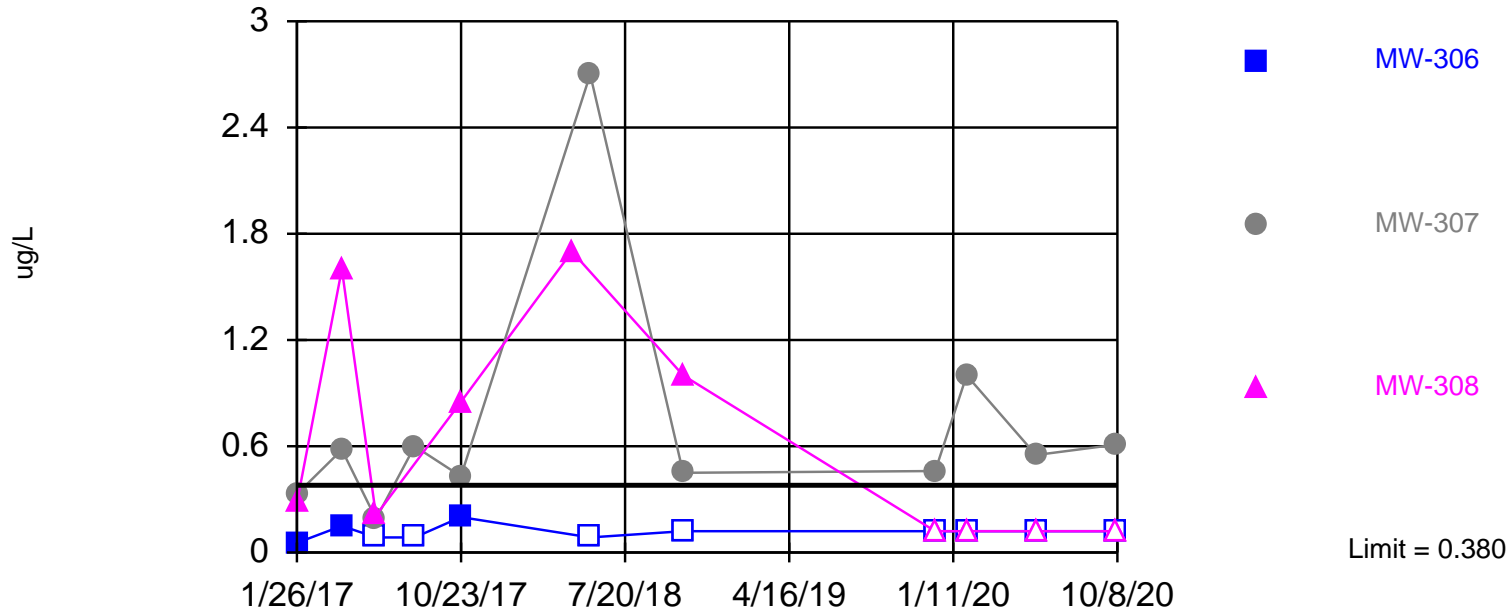
Constituent: Chromium (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-308	MW-306	MW-307
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 (U)	2			
12/29/2016	0.7 (J)	2			
1/25/2017	0.53 (J)	1.9			
1/26/2017			0.97 (J)	1.6	<0.39 (U)
4/10/2017			9.3	2.2	1.6
4/11/2017	0.7 (J)	2.4			
6/5/2017			<1 (U)	1.8 (J)	<1 (U)
6/6/2017	2.3 (J)	2 (J)			
8/8/2017	<1 (U)	1.6 (J)		2 (J)	<1 (U)
10/23/2017			4	2.9 (J)	<1 (U)
4/24/2018			7.9		
4/25/2018	<1 (U)	2.4 (J)			
5/24/2018				2.2 (J)	<1 (U)
8/8/2018	<1 (U)	1.5 (J)			
10/24/2018	<1 (U)	1.6 (J)	<1 (U)	1.7 (J)	<1 (U)
4/2/2019	<1 (U)				
4/3/2019		1.8 (J)			
10/9/2019	<1 (U)	1.6 (J)			
12/13/2019			<1 (U)	4.1	<1 (U)
2/3/2020	<1 (U)	1.6 (J)	<1 (U)	2.1 (J)	<1 (U)
5/27/2020			<1 (U)		<1 (U)
5/28/2020				2.1 (J)	
5/29/2020	<1 (U)	1.7 (J)			
10/7/2020			<1 (U)	2 (J)	
10/8/2020	<1 (U)	1.6 (J)			<1 (U)

Within Limit

Cobalt

Interwell Non-parametric



Limit = 0.380

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 33 background values. 57.58% NDs. Annual per-constituent alpha = 0.009997. Individual comparison alpha = 0.001673 (1 of 2). Comparing 3 points to limit.

Prediction Limit

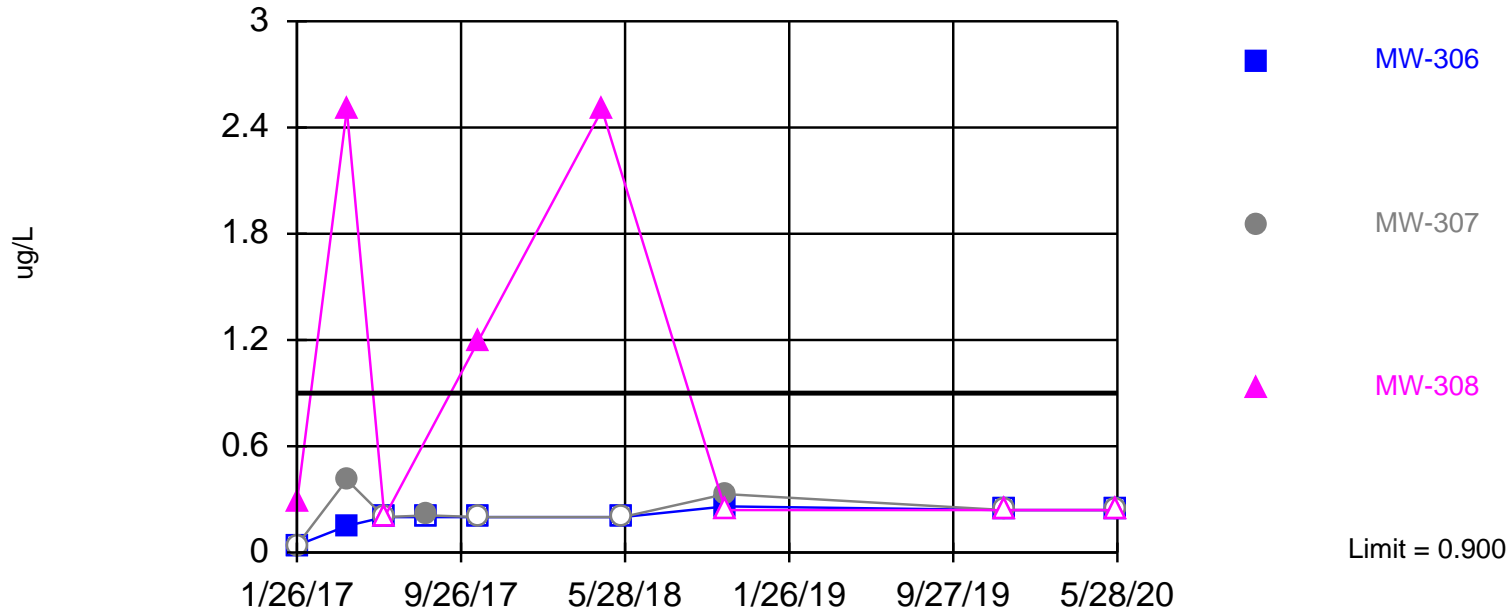
Constituent: Cobalt (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)	MW-301 (bg)	MW-307	MW-306	MW-308
12/22/2015	0.095 (J)	1.4 (X)			
4/5/2016	<0.036 (U)	0.25 (J)			
7/8/2016	0.053 (J)	0.22 (J)			
10/13/2016	<0.036 (U)	0.041 (J)			
12/29/2016	<0.036 (U)	0.38 (J)			
1/25/2017	<0.036 (U)	0.071 (J)			
1/26/2017			0.33 (J)	0.054 (J)	0.28 (J)
4/10/2017			0.58 (J)	0.15 (J)	1.6
4/11/2017	<0.036 (U)	0.064 (J)			
6/5/2017			0.19 (J)	<0.085 (U)	0.21 (J)
6/6/2017	<0.085 (U)	0.13 (J)			
8/8/2017	<0.085 (U)	0.12 (J)	0.6 (J)	<0.085 (U)	
10/23/2017			0.43 (J)	0.2 (J)	0.85 (J)
4/24/2018					1.7
4/25/2018	<0.085 (U)	<0.085 (U)			
5/24/2018			2.7	<0.085 (U)	
8/8/2018	<0.085 (U)	0.28 (J)			
10/24/2018	<0.12 (U)	<0.12 (U)	0.45 (J)	<0.12 (U)	1
4/2/2019		0.35 (J)			
4/3/2019	<0.12 (U)				
10/9/2019	<0.12 (U)	<0.12 (U)			
12/13/2019			0.46 (J)	<0.12 (U)	<0.12 (U)
2/3/2020	<0.12 (U)	0.17 (J)	1	<0.12 (U)	<0.12 (U)
5/27/2020			0.55 (J)		<0.12 (U)
5/28/2020				<0.12 (U)	
5/29/2020	<0.12 (U)	<0.12 (U)			
10/7/2020				<0.12 (U)	<0.12 (U)
10/8/2020	<0.12 (U)	0.29 (J)	0.61 (J)		

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 30 background values. 63.33% NDs. Annual per-constituent alpha = 0.01176. Individual comparison alpha = 0.00197 (1 of 2). Comparing 3 points to limit.

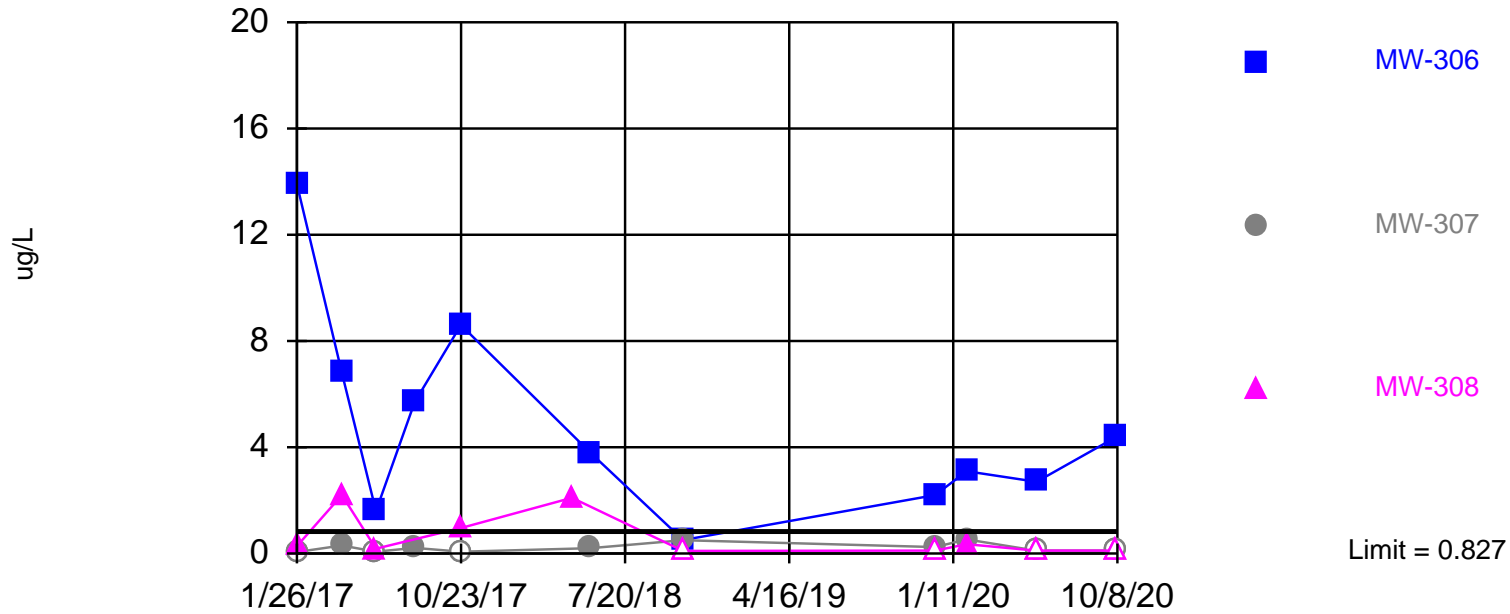
Prediction Limit

Constituent: Lead (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-307	MW-306	MW-308
12/22/2015	0.9 (J)	0.16 (J)			
4/5/2016	0.077 (J)	<0.04 (U)			
7/8/2016	0.48 (J)	0.39 (J)			
10/13/2016	<0.04 (U)	0.049 (J)			
12/29/2016	0.34 (J)	0.11 (J)			
1/25/2017	<0.04 (U)	<0.04 (U)			
1/26/2017			<0.04 (U)	<0.04 (U)	0.28 (J)
4/10/2017			0.41 (J)	0.15 (J)	2.5
4/11/2017	<0.04 (U)	0.041 (J)			
6/5/2017			<0.2 (U)	<0.2 (U)	<0.2 (U)
6/6/2017	<0.2 (U)	<0.2 (U)			
8/8/2017	<0.2 (U)	<0.2 (U)	0.21 (J)	<0.2 (U)	
10/23/2017			<0.2 (U)	<0.2 (U)	1.2
4/24/2018					2.5
4/25/2018	<0.2 (U)	<0.2 (U)			
5/24/2018			<0.2 (U)	<0.2 (U)	
10/24/2018	<0.24 (U)	<0.24 (U)	0.33 (J)	0.26 (J)	<0.24 (U)
4/2/2019	0.3 (J)				
4/3/2019		<0.24 (U)			
10/9/2019	<0.24 (U)	<0.24 (U)			
12/13/2019			<0.24 (U)	<0.24 (U)	<0.24 (U)
5/27/2020			<0.24 (U)		<0.24 (U)
5/28/2020				<0.24 (U)	
5/29/2020	<0.24 (U)	<0.24 (U)			
10/8/2020	0.25 (J)	<0.24 (U)			

Exceeds Limit: MW-306

Lithium Interwell Parametric



Background Data Summary: Mean=0.5791, Std. Dev.=0.1267, n=33. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9232, critical = 0.906. Kappa = 1.959 (c=13, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.00135. Comparing 3 points to limit.

Prediction Limit

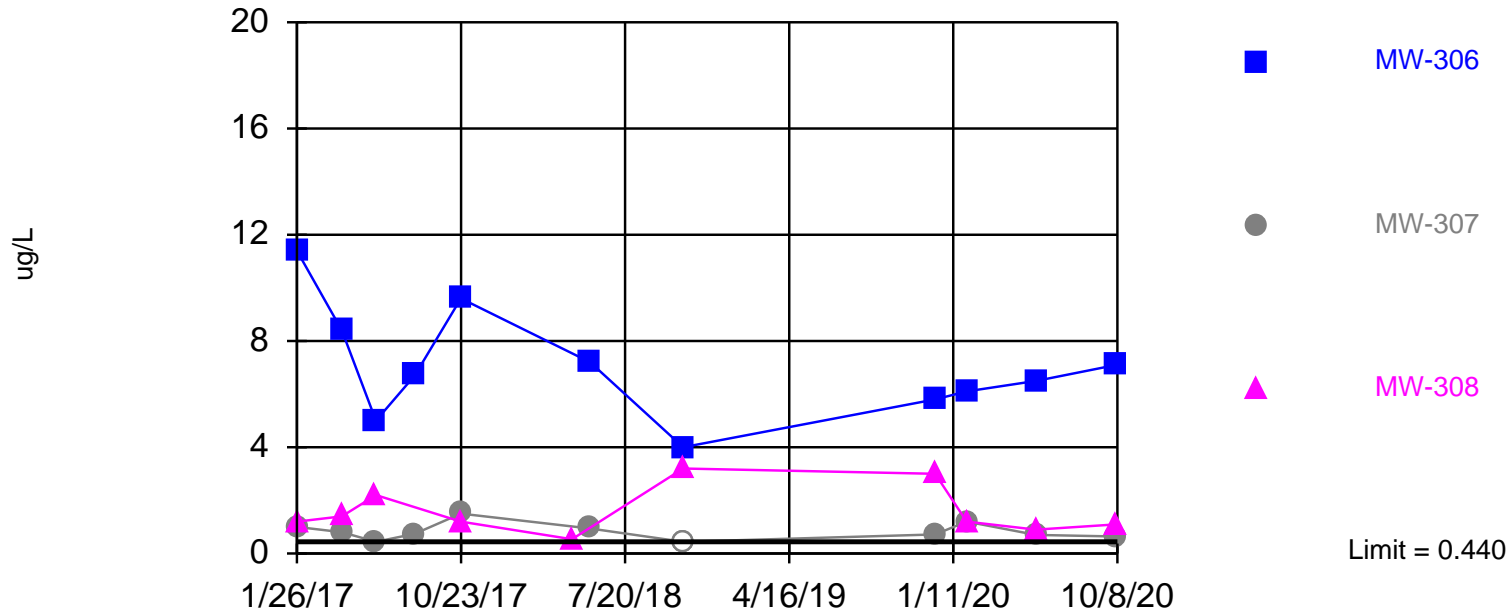
Constituent: Lithium (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)	MW-301 (bg)	MW-307	MW-306	MW-308
12/22/2015	0.72 (J)	1.3 (X)			
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)			
1/26/2017			<0.11 (U)	13.9	0.28 (J)
4/10/2017			0.3 (J)	6.8	2.2
4/11/2017	0.55 (J)	0.68 (J)			
6/5/2017			<0.14 (U)	1.6	0.18 (J)
6/6/2017	0.46 (J)	0.62 (J)			
8/8/2017	0.58 (J)	0.6 (J)	0.21 (J)	5.7	
10/23/2017			<0.14 (U)	8.6	0.96 (J)
4/24/2018					2.1
4/25/2018	0.5 (J)	0.55 (J)			
5/24/2018			0.2 (J)	3.8	
8/8/2018	0.4 (J)	0.85 (J)			
10/24/2018	0.49 (J)	0.52 (J)	0.5 (J)	0.51 (J)	<0.19 (U)
4/2/2019		0.9 (J)			
4/3/2019	0.56 (J)				
10/9/2019	0.52 (J)	0.61 (J)			
12/13/2019			0.24 (J)	2.2	<0.22 (U)
2/3/2020	0.58 (J)	0.67 (J)	0.53 (J)	3.1	0.35 (J)
5/27/2020			<0.22 (U)		<0.22 (U)
5/28/2020				2.7	
5/29/2020	0.4 (J)	0.47 (J)			
10/7/2020				4.4	<0.22 (U)
10/8/2020	0.39 (J)	0.46 (J)	<0.22 (U)		

Exceeds Limit: MW-306

Molybdenum

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 34 background values. 79.41% NDs. Annual per-constituent alpha = 0.009408. Individual comparison alpha = 0.001574 (1 of 2). Comparing 3 points to limit.

Prediction Limit

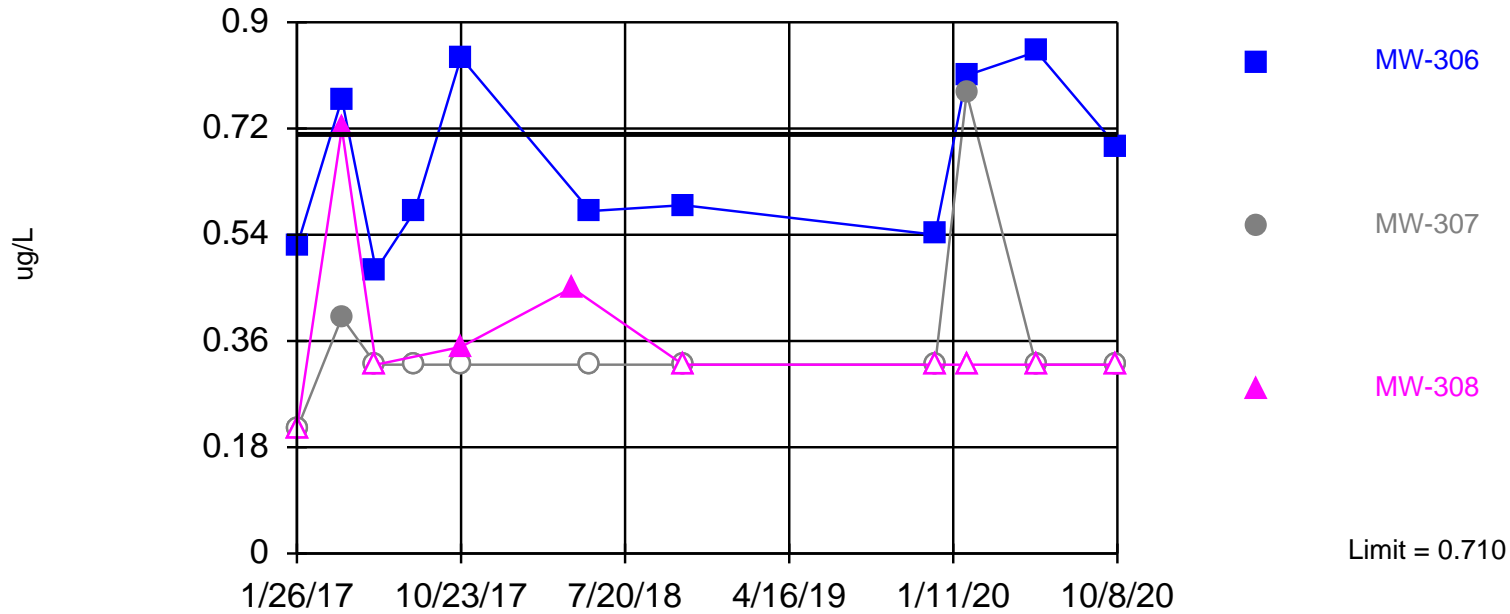
Constituent: Molybdenum (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-308	MW-306	MW-307
12/22/2015	0.35 (J)	<0.07 (U)			
4/5/2016	0.15 (J)	<0.07 (U)			
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 (U)			
1/25/2017	<0.07 (U)	<0.07 (U)			
1/26/2017			1.2	11.4	1
4/10/2017			1.4	8.4	0.8 (J)
4/11/2017	<0.07 (U)	<0.07 (U)			
6/5/2017			2.2	5	0.44 (J)
6/6/2017	<0.44 (U)	<0.44 (U)			
8/8/2017	<0.44 (U)	<0.44 (U)		6.7	0.74 (J)
10/23/2017			1.2 (J)	9.6	1.5 (J)
4/24/2018			0.54 (J)		
4/25/2018	<0.44 (U)	<0.44 (U)			
5/24/2018				7.2	0.94 (J)
8/8/2018	<0.44 (U)	<0.44 (U)			
10/24/2018	<0.44 (U)	<0.44 (U)	3.2	4	<0.44 (U)
4/2/2019	<0.44 (U)				
4/3/2019		<0.44 (U)			
10/9/2019	<0.44 (U)	<0.44 (U)			
12/13/2019			3	5.8	0.72 (J)
2/3/2020	<0.44 (U)	<0.44 (U)	1.2 (J)	6.1	1.2 (J)
5/27/2020			0.9 (J)		0.7 (J)
5/28/2020				6.5	
5/29/2020	<0.44 (U)	<0.44 (U)			
10/7/2020			1.1 (J)	7.1	
10/8/2020	<0.44 (U)	<0.44 (U)			0.64 (J)

Within Limit

Selenium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 34 background values. 82.35% NDs. Annual per-constituent alpha = 0.009408. Individual comparison alpha = 0.001574 (1 of 2). Comparing 3 points to limit.

Prediction Limit

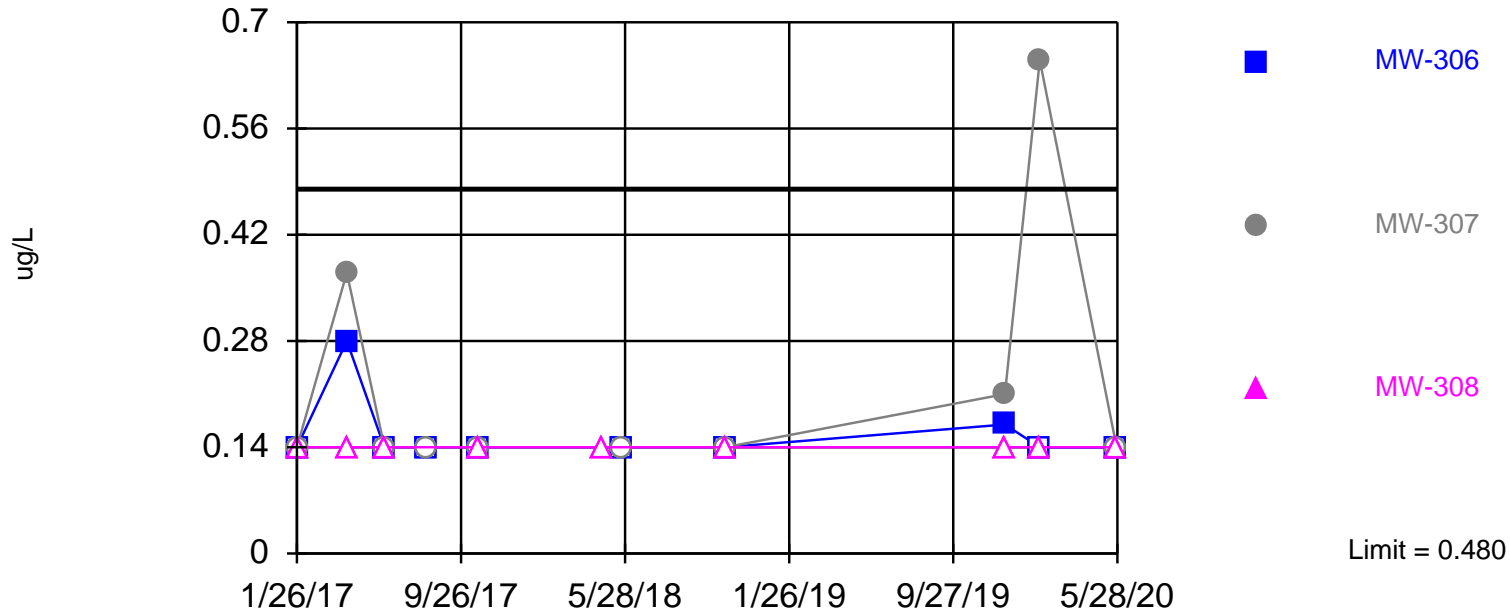
Constituent: Selenium (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-308	MW-306	MW-307
12/22/2015	0.3 (J)	<0.21 (U)			
4/5/2016	0.21 (J)	<0.21 (U)			
7/8/2016	0.39 (J)	<0.21 (U)			
10/13/2016	<0.21 (U)	<0.21 (U)			
12/29/2016	0.26 (J)	<0.21 (U)			
1/25/2017	<0.21 (U)	<0.21 (U)			
1/26/2017			<0.21 (U)	0.52 (J)	<0.21 (U)
4/10/2017			0.72 (J)	0.77 (J)	0.4 (J)
4/11/2017	<0.21 (U)	<0.21 (U)			
6/5/2017			<0.32 (U)	0.48 (J)	<0.32 (U)
6/6/2017	<0.32 (U)	<0.32 (U)			
8/8/2017	<0.32 (U)	<0.32 (U)		0.58 (J)	<0.32 (U)
10/23/2017			0.35 (J)	0.84 (J)	<0.32 (U)
4/24/2018			0.45 (J)		
4/25/2018	<0.32 (U)	<0.32 (U)			
5/24/2018				0.58 (J)	<0.32 (U)
8/8/2018	0.71 (J)	<0.32 (U)			
10/24/2018	<0.32 (U)	<0.32 (U)	<0.32 (U)	0.59 (J)	<0.32 (U)
4/2/2019	0.49 (J)				
4/3/2019		<0.32 (U)			
10/9/2019	<0.32 (U)	<0.32 (U)			
12/13/2019			<0.32 (U)	0.54 (J)	<0.32 (U)
2/3/2020	<0.32 (U)	<0.32 (U)	<0.32 (U)	0.81 (J)	0.78 (J)
5/27/2020			<0.32 (U)		<0.32 (U)
5/28/2020				0.85 (J)	
5/29/2020	<0.32 (U)	<0.32 (U)			
10/7/2020			<0.32 (U)	0.69 (J)	
10/8/2020	<0.32 (U)	<0.32 (U)			<0.32 (U)

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 34 background values. 88.24% NDs. Annual per-constituent alpha = 0.009408. Individual comparison alpha = 0.001574 (1 of 2). Comparing 3 points to limit.

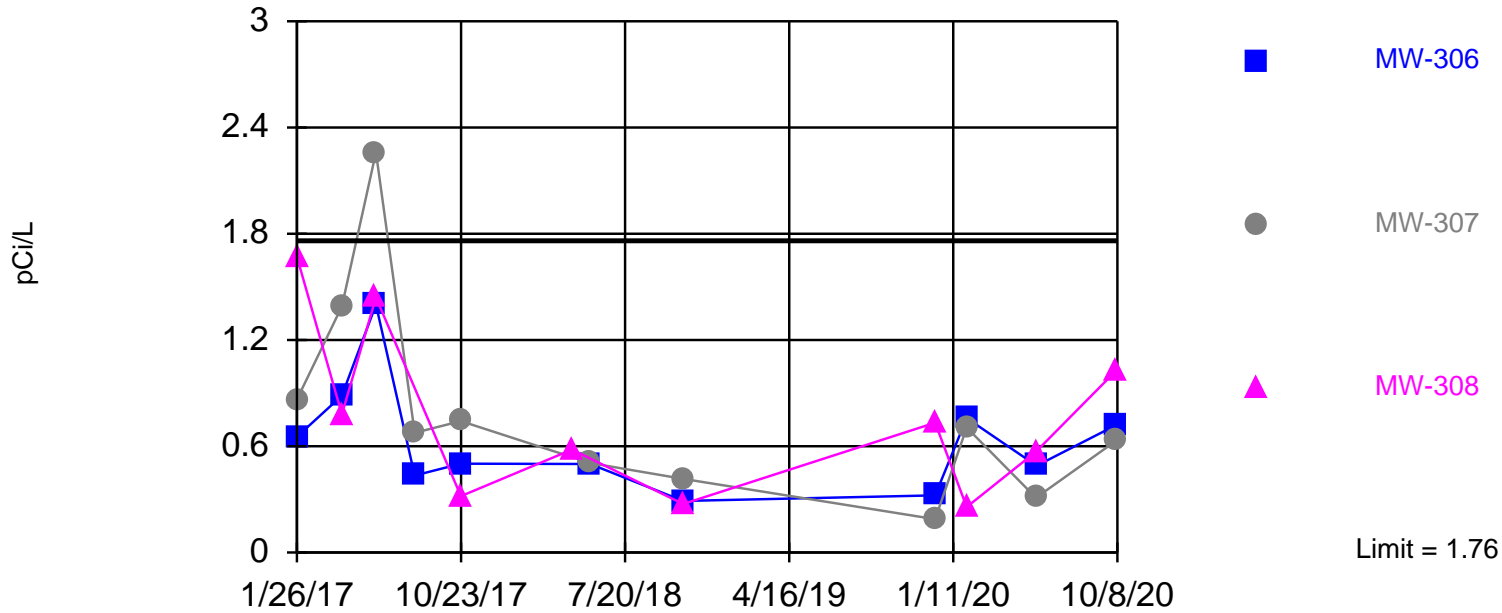
Prediction Limit

Constituent: Thallium (ug/L) Analysis Run 1/1/2021 10:58 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-307	MW-308	MW-306
12/22/2015	<0.14 (U)	<0.14 (U)			
4/5/2016	<0.14 (U)	<0.14 (U)			
7/8/2016	<0.14 (U)	<0.14 (U)			
10/13/2016	<0.14 (U)	<0.14 (U)			
12/29/2016	0.48 (J)	<0.14 (U)			
1/25/2017	<0.14 (U)	<0.14 (U)			
1/26/2017			<0.14 (U)	<0.14 (U)	<0.14 (U)
4/10/2017			0.37 (J)	<0.14 (U)	0.28 (J)
4/11/2017	<0.14 (U)	<0.14 (U)			
6/5/2017			<0.14 (U)	<0.14 (U)	<0.14 (U)
6/6/2017	<0.14 (U)	<0.14 (U)			
8/8/2017	<0.14 (U)	<0.14 (U)	<0.14 (U)		<0.14 (U)
10/23/2017			<0.14 (U)	<0.14 (U)	<0.14 (U)
4/24/2018				<0.14 (U)	
4/25/2018	<0.14 (U)	<0.14 (U)			
5/24/2018			<0.14 (U)		<0.14 (U)
8/8/2018	0.3 (J)	<0.14 (U)			
10/24/2018	<0.14 (U)	<0.14 (U)	<0.14 (U)	<0.14 (U)	<0.14 (U)
4/2/2019	0.48 (J)				
4/3/2019		<0.14 (U)			
10/9/2019	<0.14 (U)	<0.14 (U)			
12/13/2019			0.21 (J)	<0.14 (U)	0.17 (J)
2/3/2020	<0.14 (U)	<0.14 (U)	0.65 (J)	<0.14 (U)	<0.14 (U)
5/27/2020			<0.14 (U)	<0.14 (U)	
5/28/2020					<0.14 (U)
5/29/2020	<0.14 (U)	<0.14 (U)			
10/8/2020	0.3 (J)	<0.14 (U)			

Within Limit

Total Radium Interwell Parametric



Background Data Summary: Mean=0.7379, Std. Dev.=0.5222, n=34. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9112, critical = 0.908. Kappa = 1.953 (c=13, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.004044. Individual comparison alpha = 0.00135. Comparing 3 points to limit.

Prediction Limit Analysis Run 1/1/2021 10:56 AM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

Constituent: Total Radium (pCi/L) Analysis Run 1/1/2021 10:59 AM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)	MW-308	MW-306	MW-307
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			
1/26/2017			1.67	0.653	0.864
4/10/2017			0.78	0.886	1.39
4/11/2017	1.35	0.0929			
6/5/2017			1.44	1.4	2.26
6/6/2017	1.3	0.676			
8/8/2017	1.74	0.509		0.435	0.676
10/23/2017			0.318	0.502	0.742
4/24/2018			0.581		
4/25/2018	0.882	0.526			
5/24/2018				0.5	0.505
8/8/2018	0.0351	0.529			
10/24/2018	0.652	0.62	0.274	0.291	0.416
4/2/2019	0.552				
4/3/2019		0.681			
10/9/2019	0.701	0.247			
12/13/2019			0.733	0.323	0.188
2/3/2020	0.502	0.1	0.257	0.759	0.706
5/27/2020			0.569		0.309
5/28/2020				0.49	
5/29/2020	0.193	0.395			
10/7/2020			1.03	0.721	
10/8/2020	0.38	0.39			0.636